THE OFFICIAL

ESPORTS CERTIFICATION INSTITUTE

EXAM GUIDE

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TO THE FUTURE ECI EXAM SUCCESS STORY

First, thank you very much for purchasing the ECI Exam study materials. Congratulations, as well, for taking an important step toward preparing for the ECI exam. *The Official ECI Exam Guide* is the best tool available to you to prepare you for the ECI exam. By investing in an ECI Exam study guide, you are taking the first step towards employment in the esports industry.

We created this guide with the goal of teaching you the exam materials in a way that is easy to use and understand. Toward that end, we've broken out all exam categories into subcategories. Furthermore, we've included practice problems so that you can see the principles in the book applied to test questions.

That said, it's important to clarify that the **questions in this practice book are not directly representative of what will be on the exam**. Rather than help you anticipate the exam questions, the practice problems in this study guide exist to help you better understand the ideas and concepts found in the exam.

The ECI Exam is graded on a curve against your peers also taking the exam. As a result, preparation directly leads to success. The exam questions are not designed to trick you, nor are they designed to wear you out. All questions on the exam are derived from our advisory board and what they want to see when hiring new employees.

The key to success is discipline and hard work. Now that you have this great study guide as a tool, we encourage you to begin studying as soon as you are ready to do so. Good luck.

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INTRODUCTION TO THE ECI EXAM

The ECI Exam is composed of two multiple-choice sections and an essay. Each multiple-choice section contains 60 questions. After completing both multiple-choice sections, you will be asked to complete an essay within an hour.

Breakdown of ECI Exam	
1. Multiple Choice	60 minutes
2. Multiple Choice	60 minutes
3. Essay	60 minutes
TOTAL	**180 minutes (3 hours)**

Multiple-choice questions may ask you to choose either the best answer or all of the answers that apply to the question. Some multiple-choice questions may also require you to reference a figure when answering a question, so it is important to read carefully.

You will be asked to complete either a "data comprehension" or an "esports industry" content section first; once you have completed it, you will be asked to do the other one. Data comprehension questions cover skills that are applicable across most jobs in esports due to the industry's digital nature. Esports industry content contains esports industry questions that our advisory board expects new hires to know.

After completing both multiple-choice sections, you will be presented with a "problem-solving essay." The essay seeks to test your understanding of a problem in esports through the lens of one company in the industry. Additionally, you will be asked to submit a solution to the problem and will be graded on its efficacy.

Finally, only a percentage of the greater testing group will pass. The exam is meant to help the highest performers stand out, so you are competing directly against those who will be applying for the same jobs that you will. This guide is the first step to overcoming them.

TIPS FOR SUCCESS

Performance on the ECI Exam should never depend on someone's test-taking skills. Instead, the exam should only test for knowledge and understanding of a given topic.

Here are several tips to keep in mind both while studying and when taking the exam. Following these tips will help you perform your best so you can display your understanding of the materials on test day.

Tips For Studying

Practice. There's a reason the idiom "practice makes perfect" exists. Practicing for your exam through the example questions, essays, and exams contained within this study guide is the best way to gain familiarity with the types of questions included in the exam. That way, when test day rolls around, you'll be ready to focus all your attention on the questions and the appropriate answers. We recommend that you do the following:

1. **Treat examples as practice problems** — Each multiple-choice section has several example problems included to illustrate the idea being discussed. These questions are formatted similarly to what you'll see on the exam, so when you come across one, it can be helpful to treat it as a practice problem to solve before moving on to the next section.
2. **Take the practice exam twice** — Consider taking the practice exam at the end of the study guide before studying. Be sure to write your answers separately from the book itself. Then, study the materials and take the exam again when you are done. Once you take the second practice exam, you can check your answers using the study guide. Grade yourself both before and after studying and see where you've improved. Consider why you may have missed the answer the first time and why you got it right the second time. Finally, note the areas where you made errors on your recent exam and review the relevant materials.

Pace and Plan Studying. Properly scheduling your studying has been shown to improve long-term memory regarding exam materials. We recommend beginning your studying process at least a month before the exam and plan which subjects you will study and review each study session. Breaking the content into small, concise sections will help with learning the exam material in its entirety.

Tips For The Exam

Defeat Test Anxiety. Many people experience some level of anxiety or stress before taking an exam. Test anxiety typically manifests as some combination of physical symptoms (shortness of breath, headache, rapid heartbeat, etc.) and emotional symptoms (anger, fear, helplessness, etc.). Test anxiety can interfere with your ability to perform while taking an exam. Strategies for defeating test anxiety include:

1. **Rest** — Getting several nights of quality sleep in a row before taking your exam has been shown to increase your performance on an exam.
2. **Breathing exercises** — Mindful breathing exercises have also been shown to reduce the impact of test anxiety. Try this: inhale deeply through your nose for a mental count of four, hold your breath for a count of seven, and then exhale completely through your mouth for a count of eight. Repeat at least two more times.

Pay Attention To The Time. On any exam, you will find some questions easier to answer than other questions. Be sure to calculate before going into the exam how long you have to spend per question, on average. As an example, you have 55 minutes to answer 60 questions in a multiple-choice section. This equates to 55 seconds per question. That seems fast, but some questions might only take a few seconds to answer. Be sure to keep track of your time while taking the exam. If three questions are remaining, it may be correct to skip one longer question to have time to answer the other two.

ESPORTS INDUSTRY KNOWLEDGE

The ECI Exam esports industry knowledge section consists of one 55-minute section with approximately 60 questions for the section. There are two main types of esports knowledge questions: macro and micro questions. Macro questions make a smaller percentage of the overall exam. Micro questions are broken down into four subsections: sales and marketing, esports fandom, competitive operations, and esports business. Questions will not be grouped by subsection on the exam, but it can be helpful to break them down as such while studying.

Marketing and Sales

No matter your personal interest in marketing or sales jobs in esports, every position you work in will require you to have at least a cursory understanding of both marketing and sales. Because the industry is young, employees frequently need to function in or help with different roles to best perform their job.

An understanding of marketing and sales will help you not only further your company's missions, but also further your own goals. Marketing and sales questions typically are definition-based or check for your understanding of basic topics.

The Basics of Esports Sales

Everything you do in esports will involve some degree of selling, internal or external sales. However, the topics within selling covered on the ECI exam are strictly related to external, revenue-generating sales.

Businesses need revenue to survive and grow. There are two high-level ways in which companies can sell: **business-to-business** (B2B) and **business-to-consumer** (B2C). Examples of B2B sales include, but are not limited to, league sponsorships, contracting agreements between esports orgs and law firms, and other similar agreements between two businesses. Examples of B2C sales include merchandise sales for esports orgs, product sales for peripheral companies, and other similar examples of a company selling something directly to an individual. Both are core to most businesses, but companies will typically focus on generating most of their revenue from one method or the other.

When talking about sales in esports, you must first consider what each party is selling. Some of them are clearer, like law firms that sell their legal services. Some are more obfuscated: esports organizations primarily generate revenue through sponsorships, but what are they selling to those sponsors? A literal interpretation would be that esports organizations sell slots on their jersey and website, while a more nuanced answer might be that esports

organizations are selling their fan's attention, indirectly, to the sponsor. The key here is to consider what the buyer wants in exchange for their money.

Understanding the unique value proposition that your company can provide during the sales process can help you stand out from competitors. No matter your role in the company, your department can be responsible for generating outstanding quality that results in more sales and more success, for the company.

Common Sales Terminology

In addition to the terms B2B and B2C covered in the previous section, there are many commonly seen, sales-related terms that you should know before working in esports. You are very likely to come across the following words while working in the industry:

Churn rate is the percentage of customers who stop doing business with your company over time. Churn rate is calculated as the number of customers lost divided by the total number of customers at the beginning of the time range. For example, if you had 100 customers at the start of the year and lost 6 this year, your annual churn rate was 6%.

A **lead** is a potential buyer of what you are selling. There are two common types of leads. A **cold lead** is when you do not have an existing relationship with or introduction to the potential buyer. A **warm lead** is when you do have an existing relationship with or introduction to the potential buyer.

You will likely hear people talking about closing deals, especially in the case of B2B sales. To **close** a deal means to finalize it, typically through a contract, which obligates the deal to go through per the terms of the contract.

A sales **pipeline** is a way of representing where in the sales process your potential buyers are. This can be customized to each company's sales process, but typically it involves the process of moving potential buyers from leads to customers.

Customer acquisition cost (CAC) is defined as the amount of money your company spends, on average, to acquire one customer. These costs can be marketing, advertising, or anything else, so long as they are related to acquiring a new customer. Your CAC can be calculated by taking the amount of money spent on acquiring customers during a time frame and dividing it by the number of customers gained over that time frame.

Lifetime value (LTV) is the total net profit that a customer will bring you over the entire relationship (the lifetime) with them. For example, if your customers pay an average of $10/year, and you stay with your customers for 5 years on average, your average customer will have an LTV of $50 ($10 * 5).

A **sales manager** is someone responsible for managing the sales pipeline. The job of sales managers is to close potential customers within their set of goals.

An **account manager** is someone responsible for managing the relationship with the customer after the customer closes. Typically, this job involves managing both internal channels regarding the partner and managing partner expectations. Sometimes, an account manager will also be responsible for getting the partner to agree to a new agreement when their existing contract is expiring.

Consider this example problem:

Problem) How would you calculate your company's sponsorship churn rate?

a) Note how many dollars in sponsorship revenue the company loses if the company's average sponsorship does not renew.
b) Take the total amount of money recognized over a time frame and divide it by the number of deals closed during that time.
c) Multiply your average sponsorship deal value by the average number of deals you close over a time frame.
d) Take the number of customers lost during a time frame and divide it by the total customers at the beginning of that time frame.

Churn rate is counted as the number of customers lost during a time frame divided by the total number of customers you held at the beginning of the time frame. This is true irrespective of what churn rate you are measuring. The question asks for you to calculate your company's "sponsorship churn rate," but in fact, you only need to address what churn rate means.

Answer (d) is the definition of how to calculate your company's churn rate; as such, answer (d) is correct.

Common Marketing Terminology

While sales focus on converting potential customers to paying customers, marketing deals with the creation, communication, and delivery of your company's message. There are also several common terms you are likely to come across while working in the industry.

A/B testing is the process of testing two versions of something, be it a web page, a product, an email, etc. to see which one performs better.

Bounce rate is the number of people who come to your page, typically a website page, and leave without clicking through to anything.

Copy is the exact text that is published, digitally or otherwise. For example, the language used on a specific social media post is the copy of the post. People who specialize in creating copy for companies are known as **copywriters**.

A **call to action (CTA)** is the message you give to your audience that tells them what action you want them to do, for example, "buy now."

Click-through rate (CTR) is the rate at which people who see your call to action actively click through the link.

Search engine optimization (SEO) is the process of bettering your website pages so that they rank higher on organic search engine results.

A **key performance indicator (KPI)** is a metric created when going into a project that measures the performance of various factors over time. For example, a KPI of a social media marketing campaign could be to grow followers for the company account and tracking it would be as simple as tracking follower growth throughout the campaign.

Direct marketing is a type of marketing that deals directly with your end user, rather than a third party. For example, if you are a software company, marketing directly to your potential customers through Twitter would be direct marketing. Sponsoring an esports team to increase sales would not be direct marketing.

User interface (UI) refers to the visual presentation of a product. In other words, UI is how the product looks and feels, visually.

User experience (UX) refers to the experiential aspect of a product. In other words, UX is how the product feels to use as the intended user audience.

Content Marketing

Content marketing is a type of marketing that deals with the creation and distribution of any type of content that is targeted to a specific audience. VODs, social media content, and blogs are all commonly seen types of esports content used in marketing. However, content marketing can take any form of content.

As esports becomes increasingly focused on content creators, influencers, and the like, content marketing is fast becoming a major part of any esports business strategy. Content marketing encompasses all media types, including, but not limited to, produced videos, vlogs, blog posts, and more. Content pricing depends heavily on which types of content you try to create.

Content marketing has been shown to increase the effectiveness of your social media strategy, SEO, PR, and more. Effectively designing content that speaks to your customers

can be exceedingly difficult. Many of the leading brands in esports have partnered with large content creators, such as streamers, to further their own content marketing strategy.

Even small-scale companies that cannot afford to partner with content creators can use content marketing. Blogs and podcasts are increasingly popular, cost-effective ways to create content around a company, product, or brand. Furthermore, these methods are cheap to use.

Content marketing, when done correctly, can provide potential customers and fans insight into the company that would otherwise be impossible. Content marketing is an engaging, cost-effective way of marketing that can be utilized by any individual or company. “Show, don’t tell” is a golden rule in marketing.

Consider this example problem:

Problem) Content marketing can take the form of which of the following? (choose all that apply)

a) Blogs
b) Images
c) Videos
d) Podcasts

Blogs can be classified under content marketing. For example, many consultants or companies selling a service will utilize free blog posts about their area of expertise to draw people to their website where they hope to turn blog readers into customers.

Images are probably the most common form of content marketing. Images can be quickly created, are more engaging than basic text posts, and almost all platforms offer ways to display them. Social media marketing is full of posts with images that have been shown to perform better on average than simple text posts.

Videos are another commonly seen type of content marketing. Videos are engaging, typically longer-form vehicles for conveying message(s) to viewers. For esports, with its strong video and streaming viewership, video-based content marketing is a staple of the industry.

Finally, podcasts are an increasingly popular form of content that can certainly be used to draw awareness to a company. Many individuals in recent years have grown enormous brands through podcasting, which in turn grows their companies. Companies can create podcasts as well.

Content marketing can take the form of any type of content. The answers listed are all types of content, so (a), (b), (c), and (d) are all correct answers.

Professionalism on Social Media

Finally, the ECI exam might ask you a question regarding professionalism on social media. Social media is a way to interact with friends, industry colleagues, and fans. However, there have been many instances of esports employees posting inappropriate content on social media and harming themselves or their company (or both).

Remember that you represent yourself and your company on social media. Also, remember that your social media posts may have long-lasting consequences, so be thoughtful about what you post.

Consider this example problem:

Problem) Which of the following are common ways to get in trouble with your company through your usage of social media? (choose all that apply)

a) Posting inappropriate pictures of others without their consent
b) Complaining about a league you participate in
c) Not maintaining a clear profile picture

d) Frequently commenting inappropriate things under stranger's photos

While there are no set, industry-wide guidelines on what you should or shouldn't post on social media, there are some things that will often get you in trouble with your company if you post them.

Answer (a), posting inappropriate pictures of others without their consent, is likely to get you in trouble with your company. Depending on the nature of the photos, you might even get fired for posting something illegal. It never hurts to gain the other party's consent so consider asking "Can I post this picture?"

Answer (b), complaining about a league you participate in, is also likely to draw ire from your company. Use judgment about the situation but know that complaining about a league might result in the company getting messages from the league about your post, which in turn will likely result in you getting into trouble.

Answer (c), not maintaining a clear profile picture, is usually fine. Sometimes the company you work for might require something specific as your profile picture on social media, but typically, they will not care.

Answer (d), frequently commenting inappropriate things under a stranger's photos, is never ok. The action itself can be considered harassment in many cases and will almost always get you in trouble with your company.

In all cases, however, you can consult your company's rules for social media usage to ensure that you are in the clear. If you are in doubt about whether something is appropriate to post, either ask or simply don't post it. This is even true when you believe to be posting privately, as frequently private comments and posts will still be spread.

The correct answers are (a), (b), and (d).

Esports Business

There are general principles and frameworks of business to keep in mind when working in esports. Like the other topics included under the esports knowledge section of the exam, these topics are applicable regardless of your role in the space.

Questions on the esports business are included because they illustrate a deeper understanding of the industry. This understanding is a prerequisite for driving growth in esports. The questions on the exam test for your understanding of the definitions and concepts covered in this section.

Incentives in Esports

Understanding how incentives of ownership and business direction impact a business will allow you to see the invisible drivers that move businesses in one direction or another. When some esports teams choose to focus on competitive success and others choose to focus on content creation, the logic behind their differences has to do with their incentive structures coupled with their goals. Esports software companies might spend levels of money on marketing that it seems obvious that they're running a deficit, but that could be a function of their model as well. **Incentives**, in this case, means the underlying motivator that causes people or companies to do something in a certain way.

There are two main incentives to consider: ownership structure and role in the industry, both of which impact your company's goals and corporate structure. There are a variety of ownership structures, but for the purpose of the exam, we will ask about venture capital-backed, private equity-backed, and independently backed (teams that are typically owned by the founder) structures.

Private equity (PE) companies specialize in investing in existing privately held companies. Typically, PE companies work towards establishing profit for the company to eventually reach a liquidity event, which is an event through which shareholders can exchange their

shares of the company for money. They also often own most of the company, upwards of 60-80%.

Venture capital (VC) companies are a form of private equity companies that invest in up-and-coming businesses and new ventures. Venture capital typically searches for companies with strong growth potential and invests heavily into fueling the growth of their business, even at a loss. The business model of venture capital requires only a handful (as low as 5-10%) of the companies they invest into in their portfolio of companies to succeed to generate a return for the venture capital firm. Rather than aim for consistent, small growth across all companies, VC companies fund companies to a few of their portfolio companies to become enormous successes, covering any losses from other investments. So, they invest heavily into growth and worry about turning a profit later. In the mid-2010s many venture capitalists entered esports, and today several teams are owned by venture capital companies.

Finally, there are many **independently owned** organizations in esports. Usually, these companies are owned by the founders and have not accepted any major outside funding. The incentives of these businesses are more nuanced and depend heavily on the type of company and the founders' goals. Typically, however, they are looking to be profitable and grow sustainably. Many of the consulting and service companies in esports fall into this category.

Your company's place in the industry heavily impacts your goals for the esports industry, too. Publishers have dramatically different incentives than teams, teams have dramatically different incentives than tournament operators, and so on. This is true in traditional sports leagues and is true in esports today. Each individual company's goals are subjective, but there are general trends that most companies in a specific role follow.

While **game publishers** can make money through events and marketing related to their game's esports scene, a typical publisher's main incentive is to generate more users for their game. Publishers are in the business of maximizing users for the game they are publishing, and esports is often viewed as a marketing endeavor towards that end. Sometimes

publishers take a more active role in developing the esports scene, but usually esports revenue lags far behind game-related revenues for publishers.

Teams are incentivized to maximize viewership and engagement with their network of brands in addition to growing an underlying value of their assets if any. Most team revenue today is derived through sponsorships, and primary assets include player contract values and league franchise slots. Teams typically sell sponsorships against viewership and engagement of their own owned and operated brands, as well as their player's brands to which they have rights. Teams typically aim to maximize fandom, the value of player contracts, and the value of the league they participate in.

Tournament operator (TO) incentives include bolstering viewership for the tournaments that they host. A tournament operator's primary revenue streams today are sponsorships and media rights, both of which are worth more money as their tournament's viewership increases.

Industry **pundits** are incentivized to maximize their own following and brand. Pundits make money through contracted work, consulting, and other similar jobs that require their knowledge and insight. As such, both a reliable brand and a strong following help in bolstering a pundit's position in the space.

Ultimately, parties are incentivized to maximize their revenue earning potential. While this doesn't necessarily cause conflict, differences in incentives between various companies can cause strong distinctions in business strategy to arise between companies.

Esports Organization Business Model

Esports organizations today are far more robust than they were a few years ago. In the middle of the last decade, nearly all esports organizations were structured like traditional sports teams with a full focus on competition. In recent years, however, the structure of esports organizations has developed dramatically to include many different sources of

revenue. To understand the esports organization's business model, it is important to talk about both the common revenue sources as well as the underlying assets held by teams.

Revenue refers to the capital/income that a team brings in yearly through the course of their normal business. Typical revenue streams for traditional sports include revenue sources like media rights, sponsorships, merchandising, ticketing, and food and beverage sales. However, esports only has two of those revenue streams readily available: sponsorships and merchandising. Teams were able to secure media rights deals in the mid-2010s, but today most media platforms such as Twitch recognize that the majority of viewership is through individual streams and tournament broadcasts, not the team channels. As a result, media rights have dried up. Furthermore, as most esports do not have home stadiums, there are no revenues associated with ticketing or food and beverage sales. As a result, competitive revenues have lagged some internal industry expectations.

Many teams have flagged competitive esports's lagging revenues as a major issue for their business. As a result, the competitive esports events are increasingly viewed by some organizations as an asset and marketing arm for their overall brand. These organizations might aim to break even on their competitive operations and monetize through other methods like entertainment, software as a service (SaaS), talent management, or merchandising.

Though it was not always the case, today many esports organizations have a strong internal focus on entertainment as a business vertical. **Entertainment** here is used as a catch-all to include streaming, VOD content, player brands, and influencers. Similar to competitive monetization structures, entertainment monetizes through selling the attention of viewers to fans. Though esports viewership continues to grow, in recent years influencer viewership has ballooned tremendously. In August 2015, for example, Twitch had a peak concurrent viewer average of just over 600.000 people on the site. In August 2020, Twitch averaged over 2 million concurrent users on the site, and most of the growth has gone to influencers. Therefore, a strong entertainment arm has potential for revenue that is in line with the potential for competitive revenue. Furthermore, funding entertainment resources

is less costly than funding competitive resources as organizations typically do not need to provide additional benefits like housing, food, or practice facilities for their creators. A good example of this is NRG and its content creator initiatives which have dramatically increased the popularity of the brand.

Software companies are another revenue stream that's becoming increasingly common. **Software as a service (SaaS)** companies, which are companies that develop software and host it through their servers for people to use online are becoming popular. The competitive esports ecosystem is built on top of the games that are being played. As a result, some esports companies are utilizing their relative expertise in the games to provide game-related software or SaaS to individuals. A good example of this is TSM, who owns the Blitz.gg product line.

Merchandising is another popular additional revenue stream. While teams have been creating team-related merchandise for many years now, recently many esports organizations have invested more resources into fleshing out their merchandise divisions. As a result, many companies, such as 100 Thieves and Team Liquid, have lucrative merchandise verticals within their company that are complementary to their esports teams.

Assets are the items of value that your business owns or creates. Assets can include anything that a company owns, such as cash, league franchise slots, player contracts, or facilities. Along with revenue, assets are what drive the valuation of businesses. The value of an asset is determined by the price that you or others would pay for it.

The most notable example of an asset in esports is a slot in a franchised league. Teams in franchised leagues have already paid a buy-in price to participate in the league. That buy-in price sets the standard for what value that league participation slot holds. Furthermore, guaranteed participation in the league helps protect the value of the slot. Typically, only the most popular, most lucrative, and most expensive esports leagues have or will become franchised leagues because less popular leagues always run a greater risk of failure.

Non-franchised league slots can also be considered assets, but because future participation in the league usually isn't guaranteed and there is no precedent for price in the league, they are usually considered less valuable assets. In exchange, it is usually less expensive to participate in these leagues.

Esports organization facilities are also assets so long as the organization owns the facility. Facilities **depreciate** over time, meaning that the value of the facility goes down due to wear and tear, but owning a building provides clear additional asset value as the building can always be sold for some amount of money.

Teams also own more abstract assets, such as a team's brand, their creator's and player's brands, player contracts, etc. The value of these assets is less clearly defined as there is no physical underlying asset. Instead, the value is set on a case-by-case basis, typically by what the buyer believes them to be worth.

Finally, some esports organizations have created venture capital arms or similar vehicles for investment into other companies in the industry. Depending on the structure of these investment arms, any ownership in other companies might be classified as an asset attributed to the esports organization too.

Consider this example problem:

Problem) Non-franchised leagues are typically cheaper to operate in than franchised leagues but do not have as great of underlying asset value.

a) TRUE
b) FALSE

There are two aspects to this question: cost and asset value.

Non-franchised leagues typically do not require money from participating teams to compete and instead focus on the best teams competing. While it depends on the game,

franchised leagues tend to be larger, consequentially making them more expensive to compete in than the average non-franchise league.

Regarding asset value: franchise leagues are thought of as having a higher asset value for two reasons. First is the defensibility of their slot in the league. By definition, franchise teams are not easily removed from the league. The second reason for higher asset value is the buy-in price, which sets a standard for the perceived value of the slot in the league. Non-franchised leagues have less defensibility for a given team's participation in the league and do not have a buy-in price that sets a precedent for how participation in the league is valued.

Both qualifier statements, that non-franchised leagues are cheaper to operate within and have lower underlying asset value than franchise leagues, are true. Therefore, the answer is (a).

Merchandising

Merchandising is a common business vertical that many esports companies, game publishers, and peripheral companies participate in, especially those with a public-facing brand. Typically, there are two primary goals for developing merchandise for your company. The first is to generate an additional revenue stream. The second is to further the brand of your company. Both exist simultaneously, but the primary focus between the two shifts depends on which company is releasing the merchandise.

Merchandise can be an effective method to generate additional revenue for your company. Esports is an entertainment industry insofar as the core product of the industry is the competitive viewing experience provided to fans. Many companies in the space have built public brands that either participate in or are adjacent to this competition. As a result, these companies already have strong attention from fans. Developing merchandise around a company's brand can be another way to generate revenue from the attention that these companies have gathered.

Merchandise can also be an effective method to develop the brand of your company, both through improved recognition and perceived value of your company. A fan wearing your company's merchandise constitutes advertising for your brand. Having company-branded peripherals might cause fans to think more of your company as they use those products. Limited-edition merchandise releases can generate additional conversations about your company. Great quality merchandise can cause people to associate your company as being of a higher quality. These are just a few examples of the ways that a company's brand can be positively impacted through its merchandise.

There are also differences between companies that have dedicated merchandising teams and those that don't. Companies that have dedicated merchandising teams often spend more resources, such as salary and costs of development, before releasing merchandise than companies that do not have dedicated merchandise teams. In return, companies with dedicated merchandising teams usually generate more revenue from their merchandise than those that do not.

Furthermore, companies that have dedicated merchandising teams, there are a variety of business models. The two most popular business models in esports for merchandise are exclusivity-focused models and models that involve the company producing as wide a range of goods as possible.

Exclusivity models utilize limited availability of products to induce a sense of urgency in buyers and increase the perceived value of their merchandise. Most of these models are used by lifestyle brands that sell higher quality, more expensive merchandise. Frequently the merchandise sales only occur on scheduled dates a few times a year, and releases of new merchandise are colloquially referred to as "drops." Exclusivity models are particularly useful for generating hype around the brand and often generate strong profit. However, they are capped in their ability to generate profit by the number of items produced in each drop.

Models that involve companies producing as wide a range of goods as possible focus less on the perceived value of their goods and more on providing goods to as many people as cost-

effectively as possible. This model does not typically result in the same increase in brand value or likelihood of strong returns that exclusivity models do. However, producing as many goods as possible has uncapped revenue potential, unlike exclusivity models.

Costs of goods sold (COGS) refer to the costs of developing sold goods. In the case of merchandising, it frequently refers to the costs related to the production and distribution of merchandise. **Gross revenue** refers to the revenue generated from an item subtracted by the COGS of that item. Typically, companies use gross revenue for physical items like merchandise.

Consider this example problem:

Problem) Which of the following are examples of merchandise that are nearly ubiquitous to esports organizations, irrespective of the goals of their merchandising arm? (choose all that apply)

a) Jerseys
b) Team-branded shirts
c) Player-branded shirts
d) Event-based, limited edition items

This problem asks you to recognize which items of merchandise are produced by esports organizations, regardless of whether the organization creates merchandise with a primary focus on revenue or branding. It is testing for your familiarity with the norms of esports teams. In other words, which of the above pieces of merchandise do nearly all organizations produce?

Jerseys are one of the two most common esports organization merchandise items. Every major esport features players participating in a team jersey. Therefore, irrespective of the primary focus of a business's merchandising body, jerseys are likely to be produced.

Team-branded shirts are the second of the two most common esports organization merchandise items. They are commonly produced because they are easy to create, and

simply branded shirts are staples in clothing. Therefore, like jerseys, all esports organizations are likely to produce them.

Player-branded shirts are also seen often but are less likely to be produced than jerseys or team-branded shirts. This is because teams must acquire the rights to a player's brand to produce merchandise with their branding. Companies with strong player brands might choose to produce these, but companies without strong player brands likely will not.

Event-based, limited edition items are also very common in esports, as teams can naturally advertise them through participation in the special event. However, they are not ubiquitous by any means.

The correct answers to this question are (a) and (b).

Business 101

During your time in esports, you are likely to come across at least a handful of industry-neutral business terms. Below are a few of the common business ideas and terms that are also useful in esports.

A **one-pager** is a short business memo, typically contained to one page, that summarizes the topic covered on the document. One-pagers are frequently used to provide a high level of understanding to those who need to understand what is happening but do not need to get into the fine details of a situation.

A **SWOT analysis** is the most common business strategy tool and involves outlining the strengths and weaknesses of your business, as well as the external opportunities and threats present to your business. A SWOT analysis can be used on your business at large or with specific subsections of your company.

A **PEST analysis** is a less common business strategy tool that involves outlining the political, economic, social, and technological factors that impact your business. A business cannot interfere with these four ideas without tremendous force and understanding how they

influence your business is important for navigating within your market. PEST analysis is frequently used as a complementary tool to a SWOT analysis.

Competitive advantage refers to the attribute or factors that allow your business to operate with higher quality, more cheaply, or more efficiently than your competitors. Identifying your business's competitive advantage and utilizing it efficiently are key to outperforming competitors when competing for similar resources.

A business "**moat**" is a term coined by Warren Buffett that refers to a key competitive advantage that renders a business harder to replicate or replace. A defensible business moat helps a business maintain profits and market share over time.

Return on investment (ROI) is a common measure of how efficient or profitable an investment is. Investment does not necessarily refer to an investment into a business but can be resource deployment, time investment, or cost investment into any project that is intended to grow and return value. ROI is calculated as current value of investment – cost of investment)/cost of investment.

Mission statements are short statements made by a company that outlines that company's business, objectives, and approach to reach their objectives. Typically, mission statements deal with values and abstract macro-objectives.

Vision statements are short statements that illustrate the intended future position of the company. Typically, vision statements deal with the market, competitors, and definitive macro-objectives.

Consider this example problem:

Problem) What do the letters in SWOT analysis stand for?

a) Strengths, weaknesses, obligations, threats
b) Strengths, weaknesses, opportunities, time
c) Strengths, weaknesses, opportunities, threats

d) Strengths, weaknesses, obligations, time

A SWOT analysis deals with the internal strengths and weaknesses of the company and the external opportunities and threats present. The correct answer is (c).

The Macro Esports Market

Before delving into the specifics of esports topics, it is valuable to develop a high-level understanding of the greater esports market, including its history, its major players, its various platforms, and its differences in international markets.

While esports is relatively young when compared to most other industries, it has still undergone many major changes. Insight into the history of esports will help you to not only gain a deeper understanding of the space, of those who work in esports, and of esports fans, but also develop a better ability to appreciate and anticipate the future of the industry. Macro esports questions are primarily comprised of the history and current state of the largest games, esports teams, and platforms.

A Short Summary of the History of Esports

Many believe Stanford University's *Spacewar!* Tournament in October 1972 was the first esports tournament. The top prize? A year's subscription to *Rolling Stone* magazine. If that was indeed the beginning of esports, then the industry is nearly 50 years old! During these early days, tournaments were mostly **grassroots**; tournaments sprung up because fans loved the game and wanted to compete against one another. Sometimes, magazines, local businesses, or even game publishers would get involved. However, by and large, the fans themselves were driving the games.

Esports continued to grow through tournaments of games like *Street Fighter* and *Golden Eye*. As esports grew into the 90s and 2000s, game publisher-hosted tournaments became more popular, although grassroots events were still the norm.

Quake, one of if not the largest esport game of the mid-to-late 1990s, held the first-ever global esport event in 1997. Several thousand people participated in the event and *Quake* is often credited to have hosted the first global esport event. Taking advantage of *Quake*'s popularity, several gaming leagues sprung up and esports began to see increasingly larger prize pools.

Many believe that the start of "modern" wave of esports began when *StarCraft* was released in 1998. In the early 2000s, *StarCraft* grew massively in popularity (both as a game and as an esport). Especially in South Korea, dedicated "professional" players appeared, and by 2003, these players began organizing into teams. Many of the current trappings of "mainstream esports" (the current ecosystem focused on professional players, esport organizations, tournaments, sponsors, and growth of ancillary esports businesses and publications), can be said to have originated in South Korea with *StarCraft* (and its even more popular expansion *StarCraft: Brood War*).

Through the first decade of the 2000s, major tournament organizers, most notably Major League Gaming (MLG), ESL, and DreamHack, began organizing and hosting events globally. These organizers paved the way for the explosion of game and esport popularity in the 2010s when newer games like *DOTA 2*, *League of Legends*, *Counter-Strike: Global Offensive (CS:GO)* came into the public zeitgeist.

Just like in esports infancy in the 20th century, during the early 2010s most tournaments and events were still grassroots. These events were hosted by tournament providers or held as one-off tournaments by game publishers or developers. However, by the second half of the 2010s, esports began to evolve. One major change came with the formation of franchised esports leagues. Formed with teams paying an entry fee (with some fees in the tens of millions of dollars) in exchange for guaranteed continued participation in the esports game and league, **franchised leagues** appeared throughout the esports ecosystem internationally. These franchised leagues guaranteed participation and, in some cases, began to share in the game/league's revenue, which allowed the participatory teams to receive a pre-negotiated percentage of the league's generated revenue.

This is just a small sliver of the esports history pie. The industry is comprised of hundreds of games spanning many decades. Each game has a rich and unique history and culture specific to the time when it was released and when it became popular. Here are many of the most popular game's simplified histories.

Fighting Games

Fighting games are among the oldest esports titles. Beginning back in coin operated arcades around the world, today, fighting games can be found at large in-person events such as the Evolution Championship Series (Evo). Evo founded in 1996 and is generally considered to be the premiere fighting game event of the year. There have been many fighting games with major contributions to the modern fighting game landscape. Here are a few examples:

Arguably the most influential game to modern fighting games was *Street Fighter II*, released in 1991. *Street Fighter II* was immensely popular in arcades throughout the world. Capcom, the developers of *Street Fighter*, later released console versions of *Street Fighter II*. In particular, the SNES version sold well, cementing *Street Fighter II*'s place as the best-selling fighting game for many years.

As with many fighting games, arcade competition featured two players playing against one another. Arcades positioned the *Street Fighter* franchise well for player-versus-player (PVP) competition. As a result, *Street Fighter II* and its subsequent sequels have become the focal point for the majority of fighting game tournaments.

In addition to 2D fighting games, 3D fighting games such as *Virtua Fighter*, *Tekken*, and especially *Tekken 3* released in 1997 set the standard for 3D-fighting games. While other popular fighters such as *Street Fighter* and *Mortal Kombat* played out on a two-dimensional plane, 3D fighters allowed players to reposition their characters into the background or foreground (on a pseudo-circular stage). *Tekken 3* was one of the greatest selling games of the late 90s and was foundational in fighting game development.

The *Marvel vs. Capcom* franchise, especially *Marvel vs. Capcom 2* released in 2000, was the first fighting game to feature an enormous roster of playable characters from non-gaming intellectual property. While the *Marvel vs. Capcom* series plays on a similar plane to *Street Fighter* or *Mortal Kombat*, *Marvel vs. Capcom* allows players to select a team of characters, tagging in or out at any point during the match. The *Marvel vs. Capcom* series has also

continued to be a staple of the fighting game genre and set the bar for team-based fighters to follow.

Finally, *Super Smash Bros*., especially *Super Smash Bros. Melee*, released in 2001, has been formational in the development of the fighting game genre. Featuring a large roster of characters from other Nintendo games, *Smash* was able to find a wider audience, including players unfamiliar with previous fighting game titles. Smash is unique for their system where you don't deplete an opponent's health, but instead must knock them out of bounds.

Of particular importance, *Super Smash Bros.* did not have the competitive esport support of Nintendo, the game studio behind its development. *Super Smash Bros*. is a great example of an esport built on a strong history in grassroots movements, gaining popularity through the competitive players and fans who make up its ecosystem.

Today, fighting games have a strong, dedicated fanbase that is smaller than many other premiere esports but who has continued their support of the genre for a long time.

Real-Time Strategy (RTS) Games

Emerging in the 90s, RTS games gained popularity throughout the history of modern esports. Many games that were created and optimized for the PC environment, like *Command and Conquer*, *StarCraft*, *Age of Empires*, and the *Warcraft* series dominated and impacted the RTS ecosystem for the subsequent decades. It's worth singling out Blizzard's *StarCraft* as a major influence in RTS esports.

The *Warcraft* series was Blizzard's first foray into RTS titles. The first *Warcraft* was released in 1994, but *Warcraft III*, released in 2002 was the biggest hit of the series. Although many know *Warcraft* better for its hugely popular MMORPG (*World of Warcraft*), *Warcraft 3* served as a flagbearer of RTS play and helped originate a variety of new game modes as we'll discuss later.

Released in 1998, *StarCraft*, and its genre-defining expansion *Brood War*, is often credited as the first esport to truly feature full-time professional players, teams, and a comprehensive ecosystem. By 2003, major South Korean companies such as SK Telecom, Samsung, and KT led the way in sponsoring top players as full-time esports professionals. While *StarCraft* was very popular globally, South Korea had the largest esports scene and greatest viewership.

In 2010, Blizzard released *StarCraft II: Wings of Liberty*, the sequel to the original *StarCraft*. The game also found a strong competitive player base and combined with the growth of livestreaming platforms in the early 2010s, helped form modern perceptions around esports. Both games had, and continue to have, strong populations that are somewhat independent of one another. Today, RTS titles no longer hold the pole position for esports in terms of their global reach and popularity.

Multiplayer Online Battle Arenas (MOBA)

Multiplayer Online Battle Arenas, or MOBAs, are currently the most watched esport genre. *Defense of the Ancients* (*DotA* or *DOTA*) was originally created as a mod for *Warcraft III* and is often credited as the first popular implementation of a MOBA-style game. Additionally worth mentioning is a game called *Aeon of Strife*, a mod for *StarCraft* released in 1998, which many game historians consider to be the first MOBA-style game.

Defense of the Ancients featured many gameplay mechanics, such as leveling up heroes, buying items, etc. that are still staples of the genre today. A follow-up version to *DotA* called *DotA: Allstars* catapulted the game into mainstream popularity and was played for years on the competitive circuit.

In 2004, the first league for *DotA: Allstars* was announced, and in 2005, the World Cyber Games launched a tournament for *DotA*. *DotA* was a hugely popular game, both in terms of player count and viewership, and laid the groundwork for the genre.

League of Legends was created by Riot Games. Released in 2009, *League of Legends* is the largest esport today by both viewership and player base. *League of Legends* is an example of an esport that has almost always had strong developer support from its publisher, Riot Games. Beginning in 2011, *League of Legends* features yearly World Championship tournaments. Building off the success of its initial foray into esport competition, Riot Games began to invest into the esports ecosystem.

League of Legends historically competed through a Riot-operated **relegation system**, where the bottom teams in the professional league could be replaced by the top amateur teams annually. Starting in 2012, Riot formed these LoL leagues throughout the world. In 2018, Riot introduced franchising to the North American League Championship Series (NALCS), through which competing teams became permanent partners. In subsequent years, most major regions of competition followed suit in developing regionally franchised leagues.

In 2011, Valve released *Dota 2* as an indirect sequel to *DotA*. Unlike the modded *DotA*, *Dota 2* has a large publisher-backed esports ecosystem. Valve utilized esports to draw *DotA* players over to *Dota 2* by inviting sixteen winning and popular *DotA* teams to participate in a *Dota 2* pre-launch tournament. Known as The International, the tournament over the subsequent decade boasted the largest prize pool each year. These large prize pools were crowdfunded by Valve through selling in-game cosmetics, battle passes, and other microtransactions.

From 2015-2017, Valve hosted Major tournaments, or large seasonally held tournaments featuring the top teams of the year. However, in 2017 they shifted away from this format toward the Dota Pro Circuit, which is a regionally based tournament circuit culminating in The International tournament each year.

There have been several other notable MOBAs in the past decade, including, but not limited to, games like *Heroes of the Storm*, *Smite*, and others. However, only *Dota 2* and *League of Legends* exist today among the largest esport titles.

Shooting Games

Shooter games, such as first-person shooters (FPS) like *Wolfenstein 3D* and *Doom* as well as third-person shooters (TPS) like *Tomb Raider*, are another staple in esports history. Shooter games tend to skew more mature, with a slightly older fan base and player base. Shooters have a longer history in gaming than many of the other genres on this list; as such, they have permeated pop culture more than most other games. There have been many shooters that have had a large impact on the scene, not just those contained below.

Released in 1993, *Doom* is responsible for popularizing the arena-style deathmatch format for shooter games and can also lay claim to the first online FPS community. Its success helped inspire the FPS genre and paved the way for many subsequent FPS games.

Released in 1996, *Quake* was the successor to *Doom*. *Quake* added online multiplayer as well as several other formats to *Doom*'s popular multiplayer gameplay. *QuakeWorld*, an update to *Quake* released in late 1996, also set the standard for a lot of the online framework you see in online multiplayer games today. *Quake* has had a long history of esports events, notably QuakeCon, and is still around as an esport today, though its popularity has waned.

Call of Duty is the best-selling FPS title to date. The franchise has permeated pop culture, especially in the United States. The first *Call of Duty* title was released in 2003, but *Call of Duty 4*, which was released in 2007, was the game's primary entry point into esports. *Call of Duty 4* was the base for the formation of the Major League Championship, the first major *Call of Duty* tournament hosted in 2009. *Call of Duty* is also notable for the development of major influencer personalities, such as Matt "Nadeshot" Haag and Hector "H3CZ" Rodriguez. YouTube and the proliferation of gaming content played a large part in *Call of Duty*'s rise to prominence.

The *Counter-Strike* series is another extremely popular FPS series. Initially developed as a mod for Valve's *Half-Life*, *Counter-Strike* was acquired and released as a first-party title by Valve in 2000. *Counter-Strike* is currently the most popular esport shooting game with especially strong fanbases throughout Europe and South America. Like most esports,

Counter-Strike grew into an esport with early grassroots tournaments support. The game was quickly picked up by the Cyberathlete Professional League and the World Cyber Games, among other leagues, who pushed the game to much greater heights.

In 2012, the latest sequel to *Counter-Strike*, *Counter-Strike: Global Offensive* (*CS:GO*) was released. Today, *CS:GO* is among the top three esports measured by average viewership for events.

Non-traditional shooters, such as *Overwatch*, have recently become very popular as well. *Overwatch*, developed by Activision Blizzard and released in 2016, exists as a crossover between a MOBA and a shooting game. Often compared to the Valve's *Team Fortress 2*, *Overwatch* showcases the combination of character-based mechanics and tactical gameplay. Today, the Overwatch League is a franchised league owned and operated by Activision Blizzard that competes across the globe.

Fortnite is another non-traditional shooter with wild popularity. *Fortnite* exemplifies the "Battle Royale" style of gameplay, where dozens of players fight each other to be the last person or group standing in a large map.

Others

There are too many games and genres in esports to list here. I have covered many of the most popular above, but several others still exist. For example, *Hearthstone* is a digital trading card game that has a strong esports scene backed by tournaments hosted by Blizzard. *Rocket League*, developed by Psyonix and recently acquired by Epic Games, has a moderate fan base and is growing quickly. *World of Warcraft* (*WoW*) had a large esports fan base in the early 2010s but has since waned. Many sports games, like *FIFA*, *Madden*, *NBA 2K*, and others are very popular too.

The history of esports is long and varied, but hopefully the information contained in this section gives you a good introduction to the space.

Consider this example problem:

Problem) Esports tournaments can be traced back to which decade?

a) 1970s
b) 1880s
c) 2000s
d) 2010s

The answer to this question is (a), 1970s. The earliest esports tournament is thought to be the Stanford *Spacewar!* tournament held in 1972.

Competitive League Structures of Top Games

Esports games typically follow one of three league formats across the entire game's esports landscape. Each game has its own independent ecosystem with varying levels of developer or publisher involvement. The three common formats are franchises, tournament-based, and open league structures.

Franchises were not common in esports until the past few years, and they have become increasingly commonplace across the largest esports titles. Franchise leagues typically require member teams to pay a fee to participate in the league but in exchange grant member teams guaranteed participation in the league. Additionally, many teams in these franchise leagues often receive a share of the league's revenues, typically composed of some percentage of sponsorship and media rights' revenues paid to the league.

Franchise leagues have pros and cons. Sometimes, the leagues are thought to stifle competition, as the participating teams do not need to outperform anyone to retain their place in the league. Furthermore, franchise leagues increase the barrier to entry for new teams. While some consider this to be a negative, franchise league teams often want a higher barrier to entry as scarcity is often tied to an increase in **asset value**, or the value of the slot of participation in the league. Furthermore, franchise teams will argue that

franchising allows them to spend more resources developing talent rather than having to worry about competing with those in the next highest league for a participation slot.

Games with franchised leagues in 2021 include *League of Legends* (LCS, LEC, etc.), *Overwatch* (OWL), *NBA 2K*, *Call of Duty*, *CS:GO* (EPL, Flashpoint). The MLB, NFL, and NBA are good comparisons for this league format.

Some games operate through one-off tournaments, without a true overarching league format. These tournament-based games typically do not have too much structure in place beyond common rulesets.

For example, the tournament series Evo is often considered the pinnacle of fighting game tournaments, but this belief is driven by fan sentiment and not by a governing league body.

Common examples of games that fall under this format are fighting games, such as *Street Fighter*, *Tekken*, *Smash*, etc. These games tend to have strong grassroots movements, relying on fans for esports presence. Unfortunately, these games have other risks, including limited revenues and publisher risk. This risk is best exemplified by the animosity between Nintendo and the *Super Smash Bros* esports ecosystem.

One other important competitive structure (relevant to this exam) is open leagues. Structured similarly to European football, open league structures might have league-based matches, like franchised leagues, but allow for relegation between the highest-ranked second-league teams and the lowest-ranked first-league teams. Open league structures might also be closer to one-off tournaments, but the difference is that the tournaments are a part of a larger structure.

Dota 2's Dota Pro Circuit is a great example of an open league structure. Valve hosts many Regional Leagues, and winners of those Regional Leagues participate in Major tournaments. Teams that accumulate many points across all the tournaments they compete in qualify for The International, the largest *Dota 2* tournament of each year.

Strengths of open league structures include the ability for new teams to compete directly against more established teams, in theory allowing the best teams to rise to the top each year. Weaknesses include a lack of the underlying asset value found in franchises and greater competition for resources, sponsorships, and otherwise.

Examples of games that operate under open league structures include *Dota 2*, *CS:GO* (non-Flashpoint/EPL), *Rocket League*, and many more. This is the most common league structure for "tier 2" esports, meaning esports that are large but not quite at the level of games like *League of Legends* or *CS:GO* in terms of viewership. Soccer and tennis are both great examples of this structure.

Consider this example problem:

Problem) Which of the following games have franchised, North American esports leagues? (choose all that apply)

a) *Rocket League*
b) *League of Legends*
c) *Overwatch*
d) *Super Smash Bros. Melee*

Answer (a), *Rocket League* is incorrect. While *Rocket League* does play in a league format, they do not have franchised slots presently.

Answer (b), *League of Legends*, is correct. The LCS is the North American franchised LoL league.

Answer (c), *Overwatch*, is also correct. *Overwatch* operates the Overwatch League that operates in North America.

Answer (d), *Super Smash Bros. Melee*, is incorrect. It does not have a franchised league.

The answers are (b) and (c).

PC vs. Mobile vs. Console Esports

Today, when discussing esports, you are most likely talking about PC-based esports. In the absolute earliest days of esports, arcade-based competition was popular. Eventually, PC-based competition took over through Local Area Network (LAN) competitions. The improvement of internet play capabilities, netcode, allowed PCs to have stable online play.

Typically, preferences for mobile, PC, and console are regionally divided. For example, mobile gaming is much more popular in Southeast Asia than it is in North America. Conversely, console gaming is much more popular in the United States and Japan than in many other countries. Japan also has a relatively low player count in PC-based esport titles while western Europe has a strong PC-player base.

With an increase in **cross play**, the ability for players on different platforms to play with one another, console, mobile, and PC esports have all flourished in different ways. Today, mobile esports are the fastest growing section of esports globally, largely led by China and India. PC esports still hold the number one position. Console esports are smaller than their two counterparts, but because of games like *Super Smash Bros.*, *Fortnite*, and *Rocket League*, the scene is still strong.

Each type of gaming has its own strengths and weaknesses. For example, PC gaming typically allows for greater precision and skill expression but has a high barrier to entry as it requires a good PC and strong internet, both of which can be costly. Mobile gaming only requires a phone, a much lower barrier to entry. However, mobile gaming is not precise in the same way. Console gaming is comfortable for many who grew up with consoles, it offers more precision than mobile gaming (but usually less than PC gaming), and it is cheaper than PC gaming (but more expensive than mobile gaming).

Consider this example problem:

Problem) PC vs. mobile vs. console esports user preferences are somewhat divided by region and nationality.

a) TRUE
b) FALSE

The answer to the above is (a), true. While there are no hard divisions, cultural norms by nationality do impact esports fan demographics and whether they prefer PCs, mobile devices, or consoles for gaming.

Differences in International Esports Markets

Finally, it is worth noting some of the differences in international esports markets. Like platform preferences, international esports markets all developed at least somewhat independently of each other and are varied in which games are popular.

For example, the largest esport, measured by average viewers, in the US right now is *League of Legends*. However, India's most watched esport is *Player Unknown's Battle Grounds* (*PUBG*). *CS:GO* has a larger audience, per capita, in Brazil and Western Europe than in the United States. Fighting game esports enjoy a greater popularity in Japan than they do in Southeast Asia.

Some countries have more cultural acceptance for esports than others, as well. For example, it is more common in China or South Korea to see esports-related posters and advertisements, than it is in the United States. In the US, games like *Fortnite* are popular not so much for their esports presence, but more for their influencers.

Every country and region has its own sets of cultural and societal expectations and norms that dictate their local esports markets. When working in esports, you'll likely interact with other countries and their esports businesses. It is important to keep in mind the differences between you to operate most considerately and effectively.

Esports Fandom

Understanding esports fandom is valuable for anyone working in the industry. Esports fandom includes esports fans, gaming fans, game viewership, and the general landscape of the industry through which fans interact. Working in the industry means that esports fans are typically your customers.

Esports fandom questions mainly focus on your understanding of the differences between esports and gaming and the scale of the industry.

Esports vs. Gaming

While the terms are sometimes used interchangeably, the esports and gaming industries are not the same thing. Esports are the subsection of the gaming industry that focuses entirely on the competitive aspect of video games.

Gaming focuses more on the entertainment aspect of video games while esports focuses more on the competitive aspect. This is not to say that esports does not provide entertainment or vice-versa. However, the core of the esports industry is competition.

Globally, esports has an estimated 474 million fans, per Statista in 2021. Statista also estimates that there are 2.7 *billion* gamers, or almost six times the number of fans.

Esports fans heavily skew male (70%+) in the United States. However, video game players in the US are much more evenly distributed between the sexes (59% male). Esports fans tend to skew younger than the average gaming fan, too.

The esports industry is reported to generate over $1 billion in revenue in 2021 while the gaming industry is projected to generate over twenty times that amount of revenue. And the esports industry is not the same as the gaming industry: the two industries have major differences in demographics, value, and scope.

Consider this example problem:

Problem) "Esports" and "gaming" are two interchangeable terms for the same industry.

a) TRUE
b) FALSE

Though they are often used interchangeably, esports and gaming are not two terms for the same thing. Esports is more the competitive subsection of the overall gaming industry. Though it is tough to draw a clear line in the sand for what esports is or is not, using the two terms interchangeably is incorrect.

Therefore, the answer is (b), false.

Streaming Platforms

Streaming is closely related to the esports industry. Livestreaming has been at the core of both competitive and casual events around the esports industry. The growth of esports is often heavily tied to the growth of Twitch.tv and vice versa.

While Twitch is the most popular streaming platform for esports events in North America and Europe, it is not the most popular platform for every country or region. For example, Twitch and YouTube are both blocked in China, where DouYu and Huya are among the most popular livestreaming platforms for video games.

YouTube has been gaining market share in gaming livestreams and has emerged as a strong competitor to Twitch. Furthermore, platforms like Facebook Live have had a stronger gaming presence in South America, particularly in Brazil, than in North America.

Streaming platforms monetize through a few different ways.

First, when you watch an ad that plays during a livestream, the company advertising is paying the streaming service for that ad. The streaming service then pays the streamer you are watching a cut of the revenue.

Second, platforms have implemented subscription and other money transfer systems, where the platforms take a percentage of payments.

There are also many other ways streaming platforms make money, but the above two methods are commonly implemented around the world.

Consider this example problem:

Problem) Which of the following streaming platforms are focused on gaming or have a specific vertical that focuses on gaming? (choose all that apply)

a) Twitch
b) YouTube
c) Peacock
d) Facebook
e) Netflix
f) DouYu
g) Hulu

The answers are (a), (b), (d), (f).

Esports Viewership

Viewership is arguably the most important metric for the entire esports industry. Like traditional sports, the majority value in esports leagues is derived as a function of the number of fans who interact with the game, the teams, and the periphery. A league with over a million viewers will almost certainly have more business value than a league with 100,000 viewers.

How does one measure viewership? There are many methods, and which one you choose to use depends on what information you are trying to gain.

The most common way of measuring TV viewership is the Nielsen TV rating system, a standardized scalar that is used consistently and lets programs be compared against one another. However, esports has no standard scale. Instead, esports viewership is often measured through average viewership and peak viewership.

Average viewership is the average number of viewers over the course of a broadcast. If there were 200 viewers in the first minute and 400 viewers in the second minute, the average viewership over the two minutes the would be 300.

Average minute audience (AMA) is a way to standardize the calculation of average viewership by recording the viewership at each minute and then averaging the values across the span of the program. Though AMA still might miss quick fluctuations in viewership, a consistent timing window for recording viewership can help to standardize livestream analysis.

Peak viewership is simply the largest number of people who were watching the livestream at any point during the duration of the broadcast.

Esports viewership for the same livestream can exist across many different platforms. For example, the LCS is broadcast on both YouTube and Twitch, and Riot Games will give some streamers the right to broadcast the game onto their personal channels. The aggregate of viewership across all platforms is typically used when discussing esports game viewership.

Tiers of Esports Games

Frequently, you will hear esports games discussed in the context of "tiers" where "tier 1" games are the highest tier and games descend numerically in tier from there. **Tiers** are a shorthand used to determine how influential the game is. Other shorthand terms for esports tiers include "largest esports," "top esports," and other similar accolades that do not have a clear definition.

When discussed casually, most people tend to use viewership as a measure of the scale of an esport. Viewership is typically correlated with engagement, interest, and industry impact with the game. Therefore, higher-tiered esports can be thought to have more viewership than their lowered-tier counterparts. Typically, this is referring to average viewership, but peak viewership is considered as well when it is exceptional.

Tiers and other similar qualifications are subjective measurements of scale that attempt to clearly delineate the value of a game to the overall industry. They can be especially useful in conversation, especially when working with those outside of the industry.

Consider this example problem:

Problem) Viewership is the most common metric by which esports game value is measured.

a) TRUE
b) FALSE

Viewership is the most common method used to group games by tier, which is a shorthand for estimating an esports' value. Therefore, the answer is (a), true.

Esports Team Popularity

Esports team popularity is another subjectively measured qualification that functions as a shorthand for how influential a team is. Like tiers of games, there is no one metric that can determine a team's popularity. Social media following and engagement tend to be the closest approximation because social media following and engagement often translate best into market penetration and fan attention which is what sponsors look for.

The esports team landscape has evolved tremendously since the advent of esports teams in the early 2000s. In the late 2000s and early 2010s, both VOD and livestreaming were growing as content mediums. Fans gained much deeper insights into esports players' lives and personalities.

Teams like OpTic Gaming and FaZe clan became extremely popular through strong competitive performance coupled with casual gameplay-related content. At the same time, teams like Evil Geniuses, TSM, and Fnatic grew huge fandoms through strong competitive performances and esports-related content.

In the late 2010s, the era of *Fortnite* brought massive viewership to gaming and entertainment content creators. Today, competitive performance is tied less to a team's popularity than it ever has been. While still important, competitive performance seems less tied to changes in social followership and engagement than in previous decades. Currently, esports organization scale is driven by the most followed creators and personalities associated with the organization. Of course, growing popularity still requires organizations to capitalize upon their creators' follower counts, so there is a lot of work and nuance that goes into the situation.

The takeaway is that esports is a fluid industry that while still a competitive industry by nature, has been shifting away from purely competitive companies and towards competitive organizations with strong entertainment and media arms. Competition is at the core of esports, but a lot of its growth is coming through content and entertainment.

Consider this example problem:

Problem) The list of the most popular esports orgs today closely mirrors the most popular teams from ten years ago.

a) TRUE
b) FALSE

While not explicitly covered above, one can probably infer that since what makes a team popular has shifted so dramatically over the past decade, the most popular esports organizations from ten years ago are not the most popular today. So, the correct answer is (b), false.

It is worth further familiarizing yourself with the lists of the most popular esports organizations and games in the past and today and researching independently why their popularity has changed. As fandom is an extremely complex topic; the section above covers only the tip of the iceberg.

Competitive Operations

Esports is a competitive industry at its core. Whether you work directly on competitive operations or not, you will certainly need to have an understanding of competitive operations. Competitive operations touch on all other aspects of the industry.

Questions in the competitive operations section test for your understanding of the esports team model, the tournament model, and contracts.

Contracts

Today, the vast majority of modern esports players or content creators that play for a professional esport organization have signed a contract with that team. Contracts set expectations around what players and teams are getting from one another. For example, a player might be contractually obligated to film four videos per month. Typically, players and creators are contracted while employees are not.

There are many common terms found in player and content creator contracts that you should be aware of. For the following terms, assume that the player/creator is being signed to a company.

Compensation is the amount of value that the player/creator is being paid by the company. This is usually just salary but can also include bonuses, equity, or other agreed-upon values.

Services refer to the services that the player/creator is agreeing to do in exchange for the compensation and other things in the contract. This frequently includes items such as streaming obligations, video obligations, sponsorship obligations.

Termination is the section that refers to how the agreement can be terminated and at what cost. Usually, the employer will include rights that allow them to terminate the contract if the player/contractor breaches certain clauses. Often employers will need to pay the player/contractor a fee to terminate their contract without cause.

Intellectual Property (IP) rights are also common, especially in the case of content creators. Both content creators and players are brands themselves, so they have fans associated with them as individuals. Both the players/creators and their work can be considered to fall under intellectual property rights and should be carefully considered.

Other terms that might be present include, but are not limited to, travel, housing, exclusivity, transferability, merchandising, arbitration, or non-solicitation/poaching rights. Deciding on a contract is an iterative process that requires both parties to negotiate the give-and-take until they are happy with the agreement they have come to.

The Esports Player Business Model

Teams value players not only as competitors, but often also as brands. An organization's competitive players may also be content creators and influencers. At the most basic level, teams and esports organizations generate revenue by monetizing fan's attention, and players capture that fan attention in many ways.

Reflecting the importance of players to organizations, player contracts will depend heavily on factors such as representation/negotiation, the game the player competes in, and the player's individual brand and following. Ultimately, the team's focus for the player tends to be reflected in the contract.

Historically, players made money through tournament winnings. Teams would take a percentage of the player's winnings in exchange for a salary/other benefits provided to the player, but players would still make a large portion of their earnings through tournament winnings.

Today, players earn an increasingly larger amount from their salaries. In the mid-2010s, as esports grew, revenues to teams began to rise. So, the teams started paying higher salaries and better benefits to the players. These higher salaries and benefits are dependent on the game and are negotiated contract by contract, but they frequently include more stringent

player requirements such as work required around company sponsorships and more required streaming hours.

While salaries have grown in certain esports such a *League of Legends* and *Counter-Strike: Global Offensive*, player revenues in certain esports still rely heavily on prize pools and tournament results.

For example, fighting games, while followed by a dedicated community, do not typically generate tremendous revenue for teams. As such, it's much harder to pay fighting game professional players high salaries, so their salaries are often lower, and prize pool earnings are higher.

Comparatively, in *League of Legends*, professional players are on average paid a salary that is multiple times the prize pool of events. As a result, teams tend to consider the prize pool as a bonus.

Additionally, players earn the lion's share of tournament winnings when there are large payouts tied to tournaments. *Dota 2*'s The International, with its tens of millions of dollars in prize pool, provide higher tournament-based income to players, as tournament winnings can outpace salaries.

There are of course more ways for players and creators to make money. Players can sell individual partnerships against their own brand (provided that individual sponsorships are allowed for in their contracts). Players can create merchandise lines, or entire brands, that capitalize upon their popularity to sell physical items. Streaming is also a common way for famous players to make money. In fact, some players can make so much money through streaming that they decide to retire from professional play.

Teams also typically employ a player-manager to manage the player's schedules and availabilities. Player managers are responsible for players during practice times and at any times that the players are at industry events, competitive, sponsor-related, or otherwise.

International Nuances

There are major nuances in competitive operations between regions and nations. While all teams across all regions are competitors and share the base structure of players, managers, coaches, etc., each region will have individual quirks that impact the underlying business. These can be a function of cultural norms regarding the games or industry norms set over time. Additionally, revenue potential such as sponsorship potential, streaming earnings, and the like affect the structure of competitive operations by region.

Cultural norms are one factor that can impact competitive operations. For example, LAN Gaming Centers such as "PC Bangs" in Korea are very popular in many Asian countries, but they are far less popular in North America. In China, *League of Legends* teams have begun to open their office building's ground floor as a gaming centers, allowing fans to come and play. While this drives additional revenue and fandom for Chinese teams, North American organizations have an uphill battle on this implementation as a function of a historical lack of local demand for PC Bangs.

Industry norms can also vary heavily between regions. As a region continues to grow its esports scene, what is in practice at the time eventually becomes the standard industry practice and an expectation for both current and future players. This means that, based on regional salary expectations, sponsorship expectations, and the like, two region's contracts can look wildly different. This has caused local esports markets around the world to grow slightly differently from one another.

Revenue potential such as the ability to sell sponsorships is the third major factor impacting competitive operational structures. Player salaries between the LCS and LEC are often compared, with the LCS offering higher salaries between the two leagues. Though there are many factors involved, a major driving force for this is sponsorship revenue potential: the NA-based esports teams drive more sponsorships, usually at greater monetary value, than the EU-based teams do. NA-based teams can therefore reasonably offer more money than their European League counterparts.

Consider this example problem:

Problem) Which of the following factors might cause differences to arise over time between the two region's esports markets?

a) Sponsorship availability
b) Local game preferences
c) Different fan demographics
d) Cultural acceptance

Differences between regional esports markets can arise as a function of anything but primarily through differences in cultural norms, industry norms that develop over time, and differences in revenue potential.

Sponsorship availability marks a difference in revenue potential that might impact a region's esports market. Markets with higher sponsorship potential will likely place more value on brands and monetization ability.

Game preferences in local communities can also impact esports mark development. For example, markets that trend towards *CS:GO* will have more of a bias towards tournament-winnings than one that has a strong *LoL* focus.

Fan demographics also change the landscape of the esports scene. Demographics heavily influence which games and mediums are popular, which in turn influences how teams are structured.

Finally, cultural acceptance of esports changes the landscape of the market as well. Markets that have a stronger acceptance of esports tend to have greater expectations of professional teams and players, competitively, while caring slightly less about the brand aspect. Additionally, sponsorships can be easier to acquire in regions where the esport is accepted at large.

The correct answers are (a), (b), (c), and (d).

How to Read a Tournament Bracket

It is important to be able to read and interact with tournament brackets. Specifically, the three most common tournament brackets in esports are single elimination, double elimination, and round-robin tournaments.

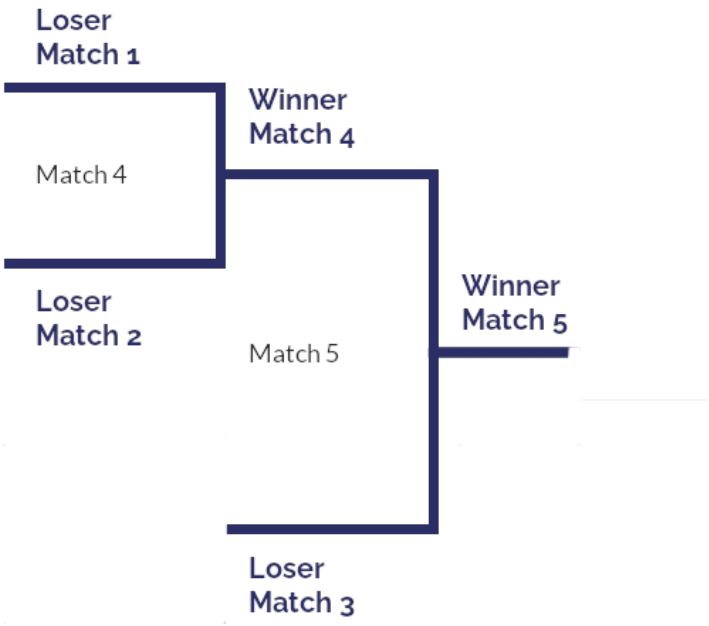
Single elimination tournaments are tournament brackets where teams face off against each other in a series of matches. The winning team advances to the next round of the bracket while the losing team is eliminated from the tournament. Single elimination brackets look like this:

The advantages of single-elimination tournaments are the overall pace of the tournament and increased volatility of placements. Single elimination tournaments are fast because teams are immediately eliminated upon a loss, meaning that the number of matches played in a typical bracket is only equal to the number of teams minus one. For example, in a bracket with four teams a winner can be determined after three matches have been played.

Furthermore, single-elimination tournaments are more volatile because one upset match will immediately disqualify a better team, whereas in other formats they would have additional chances to advance through the tournament.

Double elimination tournaments function similarly to single-elimination tournaments except that teams must lose twice to be eliminated. They include a lower bracket as well that pits the losing teams against one another. Once teams lose in the lower bracket, they are eliminated. This results in an additional grand finals match, where the winner of the upper bracket and the winner of the lower bracket face off against one another. Double elimination brackets look like this:

Upper Bracket



Lower Bracket

The advantages of double elimination tournaments include decreased volatility in final placements of teams when compared to single-elimination matches and the ability to qualify third and fourth-place teams without the use of a consolation match.

Round-robin tournaments are tournaments where players play all other players in the tournament in turn. A good example of this is the LCS, where all teams face off against each other exactly twice before the Mid-Season Showdown. A **Swiss** tournament is similar to a Round-Robin tournament, except that in Swiss tournaments you do not necessarily play all of the other players. A round-robin bracket can look like this:

Teams	Day 1	Day 2	Day 3
Team 1 Team 2 Team 3 Team4	Game 1 Team 1 vs. Team 2 Game 2 Team 3 vs. Team 4	Game 1 Team 1 vs. Team 3 Game 2 Team 2 vs. Team 4	Game 1 Team 1 vs. Team 4 Game 2 Team 2 vs. Team 3

The advantage of round-robin tournaments is the guaranteed number of matches played per team that provides the best insight into how teams stack up against one another. As more matches are played, the better teams should outperform the worse teams because the impact of one-off fluke losses is lessened.

Finally, all types of tournaments can be seeded. **Seeding** a tournament is the process of applying rankings to the teams participating in each tournament. Seeding is particularly common in single and double elimination brackets. In the above examples for single and double elimination brackets, the teams are seeded based on perceived skill, where team 1 is perceived to be the best, then team 2, then 3, and finally 4.

The distribution of teams is also reflective of a typical distribution of seeded teams. The best team plays the worst team, usually at the top of the bracket. Then the next best team plays the next worse team at the bottom of the bracket, ensuring that the two best teams will not face each other until the finals, assuming that they both make it there. Typically, rankings are determined by previous results or some sort of model, but other times experts will gather to vote on the relative rankings of teams.

Consider this example problem:

Problem) What is the minimum number of games a team must play to win the entire double-elimination tournament pictured below?

a) 2
b) 4

c) 6

d) 8

The minimum number of games required to win the entire bracket would be winning every game from the beginning of the upper bracket. To do that, a team would need to win in Round 1, Round 2, the Semifinals, and the Finals. They do not need to win in the last match off to the side, as the team they face in the Finals would already have one loss from earlier in the bracket. Therefore, the minimum number of games required is 4, or (b).

Closing Notes

The esports industry knowledge section of the ECI exam exists to test your familiarity with esports industry topics that are central to working in esports. A strong understanding of the ideas and histories contained above will set you up for best anticipating and dealing with the uncertainty present in the future of esports.

When reviewing this section, we recommend that you turn to outside research in addition to the sections above. For example, sign up for a Google News Alert around esports. Follow some industry executives on Twitter. The esports industry knowledge section mostly reflects what you are expected to know for the ECI Exam, but each topic can be learned in much greater depth. Knowledge of the above topics will help lay a strong foundation for your future success in esports.

DATA COMPREHENSION

The ECI Exam data comprehension section consists of a 55-minute section with approximately 60 questions. There are five types of data comprehension questions: measurement, graph, data gathering, decision-making, and statistical framework. Questions will not be grouped by subsection on the exam, but it can be helpful to break them down for study.

Measurements

The first selection of questions on the ECI Exam can be grouped under the sub header measurements. This section is comprised of questions that test your ability to calculate and analyze data. This section checks for an understanding of definitions and requires only simple calculations. You are encouraged to use a calculator during this section.

Questions within the measurements section are included on the exam because all roles within esports require reading charts and performing basic analysis. A good grasp of the topics contained within the measurements section will allow you to analyze both your performance and your company's performance to best strategize for the future.

Mean, Median, Mode, and Range

You will see questions concerning mean, median, mode, and range on the ECI Exam. The **mean** is the average of the data set. You calculate the mean by adding all of the values in a set together and dividing by the number of items in the set. As an example, consider a set with five numbers: 5, 5, 10, 15, 20. The mean would be calculated by adding together the five numbers to get 45 (5+5+10+15+20 = 45) and then dividing by the number of items in the set. The answer is 9 (45/5 = 9).

The **median** of the set is the middlemost number. What if our set was ordered randomly, like {20, 10, 15, 5, 10}? First, you arrange the set from least to greatest in value {5, 5, 10, 15, 20} and then take the middlemost number. The median here would be 10. If there are an even number of items in the set—say {5, 10, 15, 20} —then you take the mean of the two middlemost numbers in the set. In this case, the median would be 12.5 (10+15 = 25 → 25/2 = 12.5).

Mode is the number that occurs most frequently in the set. In our set (5, 5, 10, 15, 20), 5 is the number that occurs the most frequently, so 5 is the mode. You can have multiple modes as well. If the set is {5, 5, 10, 15, 15}, then 5 and 15 both appear twice, so 5 and 15 would both be the modes of the set.

Finally, the **range** of the set is calculated by taking the uppermost value of the set and subtracting the lowest value of the set. In our set (5, 5, 10, 15, 20), 20 is the uppermost value and 5 is the lowest value. The range, therefore, is 15 (20-5 = 15).

Consider these two example problems:

Problem) A team has three players with a mean salary of $180,000. The team then signs a fourth player, and the mean salary of the players is now $200,000. What is the salary of the fourth player?

a) $170,000
b) $200,000
c) $260,000
d) $300,000

To solve this, it can be helpful to write out the math. First, we are told that there are three players with a mean salary of $180,000. We do not know what their exact salaries are, but we know that the three of them average out to $180,000. So, we should pick three numbers that average to $180,000. Let us do $180,000, $180,000, and $180,000 to keep it simple.

We also know that adding a fourth player increased the salary to $200,000. Since the mean went up, we can know that we needed to add more than the $170,000 for answer (a). So, we can cross that off. Additionally, since the mean went up to $200,000, we probably added a number higher than $200,000, so we can cross off answer (b) as well.

To pick between answers (c) and (d), we can do the math. Answer (c) would be $260,000 + $180,000 + $180,000 + $180,000 = $800,000. Dividing $800,000/4 gives us $200,000, or the answer. So, the correct answer is (c).

We can check (d) as well to be sure. $180,000 + $180,000 + $180,000 + 300,000 = $840,000. $840,000/4 = $210,000, so (d) is not correct.

It doesn't matter what numbers we use for the existing set, either. If you compare the new total with the old total ($800,000 – $540,000), you always get the answer of $180,000. Additionally, if you take $100,000, $200,000, and $240,000, these also average out to $180,000. If we add answer (c): $100,000 + $200,000 + $240,000 + $260,000 = $800,000. $800,000/4 = $200,000. So (c) is still correct.

-

Problem) A new esports organization hired 15 employees in November then 10 more in December. In November, the range of salary for new employees was $25,000. The lowest salary for a new employee hired in November was $65,000. In December, the range of salaries for employees hired in December was $30,000, and the lowest salary for a newly hired employee was $72,000. What was the range of salaries for all 25 employees hired in both months?

a) $32,000
b) $35,000
c) $36,000
d) $37,000

This problem tests your understanding of range. In November, the lowest salary was $65,000. The range was $25,000. You can calculate what the new employee with the highest salary received: $65,000 + $25,000 = $90,000. In December, the lowest salary for an inbound employee was $72,000. The range was $30,000, so the highest-paid employee received a salary of: $72,000 + $30,000 = $102,000.

November: $65,000 … $90,000

December: $72,000 … $102,000

So, the range between the two months is $102,000 - $65,000 = $37,000, or answer (d).

Standard Deviation and Variance

Measurement questions also test your understanding of variation in data through concepts like standard deviation and variance. **Standard deviation** is a common measurement of how much variation exists in a data set. A low standard deviation means that the data is close to the mean of the set, while a high standard deviation means that the data is more spread out.

Standard deviation is often used in probability as a way of measuring how far away a data point is from the mean. Consider a case where we have two players who play two different video games. They each play ten matches in their respective games and get the following number of points:

Player 1 (Game 1) – 14,14,16,16,20,22,22,32,34,40

Player 2 (Game 2) – 21,21,22,22,23,23,24,24,25,25

Both players have a mean of 23 points across all games, but Player 2's games are much less spread out in score. If you played both games, it would be impressive to score 30 points in either game, but it's *probably* easier to score 30 points in Game 1 than it is Game 2. We can't know for sure that that is true, but it appears to be the case.

When it comes to the ECI Exam, we do not ask you to calculate standard deviation. In the workplace, you can use a program like Excel to calculate it for you. Instead, **you should know some common standard deviation conversions for a normally distributed graph** (we'll get to those later): 1 standard deviation events happen within ~68.2% of the time, 2 standard deviations happen within ~95.4% of cases, 3 standard deviations occur within ~99.8% of situations, and 4 standard deviations are nearly 100% of all cases.

Variance is another simple measure of the distance between numbers in a data set. To calculate variance, you simply square the standard deviation (inversely, the standard deviation is the square root of the variance). You will not be asked to calculate variance on the exam either.

Consider this example problem:

Problem) A *Valorant* pro plays eight matches and reports accuracy of 84%, 79%, 69%, 82%, 90%, 78%, 80%, and 78%. The mean and standard deviation of the games are 80% and 6%, respectively. What percent of the eight games did the player perform within one standard deviation of their mean accuracy?

a) 62.5%
b) 75.0%
c) 80.0%
d) 82.5%

Since the mean of the games is 80% accuracy, and the standard deviation is 6%, games within one standard deviation would have a range of 74% to 86% (80% - 6% =74% … 80% + 6% = 86%). Only two of the games—69% accuracy and 90% accuracy—were outside of that range.

Since two were outside of the range of one standard deviation, six of the eight games were performed WITHIN one standard deviation of the player's mean accuracy. 6/8 = 3/4 = 75%. The correct answer is (b).

Quartiles and Percentiles

You will also likely run into questions testing for your understanding of quartiles and percentiles. Quartiles and percentiles serve the same purpose: to divide up a set into parts for easier understanding. **Quartiles** divide a data set into four equal parts. **Percentiles** divide a data set into 100 equal parts.

Quartiles are divided into four equal sections equivalent to 25% of the data. There are three quartile dividers: 25%, 50%, and 75%. Sometimes, the sections of data that are broken apart by the dividers are referred to as quartiles as well: Q1 being the bottommost 25%, the next highest 25% being Q2, Q3 is the next, and Q4 is the greatest 25%.

However, percentiles are flexible and can function within any multiple of 1%. There can be up to 99% percentile dividers. Perhaps counterintuitively, being in the 99th percentile of something means that you are within the top 1%. Inversely, being in the 1st percentile for something means that you fall within 99% of all people for that thing.

Consider this example problem:

Problem) There are 200 employees working for a certain game developer: 25% work on developing a MOBA, and the remaining 75% work on developing an FPS. How many people are working on developing a MOBA?

a) 50
b) 100
c) 125
d) 150

We know that 25% of employees develop the company's MOBA while 75% of employees are developing an FPS. So, 50 employees work on a MOBA (50 / 200 is 25%) while 150 work on the FPS (150 / 200 is 75%). The answer is (a), 50 employees.

Ratios

Another type of question that will likely appear on the exam concerns ratios. A **ratio** is a way of expressing a relationship between two different proportions. Frequently, ratios are depicted using a colon between two numbers, e.g., 3:2.

When ratios are depicted with a colon, like in the example of 3:2, comparison can be described as follows: for every 3 of something, there are 2 of something else. The larger number does not need to go first in the comparison, either. When making a comparison it is important to be clear which of the numbers in a ratio is related to which of the things being compared.

Consider this example problem:

Problem) An esports team retail store that only sells jerseys and accessories found that its revenues last month from jerseys and accessories could be expressed as a ratio of 3:1, respectively. If last month's total revenues were $4,000, how much revenue was made from jerseys?

a) $4,000
b) $3,000
c) $2,000
d) $2,500

Jerseys and accessories had revenues with a comparison of 3:1, respectively. In other words, for every $3 in jerseys sold, accessories sold $1.

If there are $3 of jerseys sold for every $1 of accessories, $3 of $4 sold, or 75%, are from jerseys, and 75% of $4,000 is equal to $3,000. The answer is (b), $3,000.

Categorical and Quantitative Variables

The last measurement section topic covers categorical and quantitative variables. A **categorical variable** is something that has two or more categories, but there is no intrinsic ordering to the categories. For example, color is a categorical variable. There are many categories to color such as blue, purple, yellow, red, etc. but no color must come before the other.

Alternatively, **quantitative variables** are things that can be expressed numerically. For example, the number of pets you own is a quantitative variable. You either own zero, one, two, three, four, etc. and zero always comes before one, which comes before two, which comes before three, and so on.

Consider this example problem:

Problem) Which of the following are examples of categorical variables? (Choose all that apply)

a) Salary
b) State of Residence
c) College Major
d) Age

Answer (a), salary, is a quantitative variable because it can be numerically expressed (I make $35,000) and is ordered ($35,000 is less than $36,000). Answer (b) is a categorical variable. It is not a number, and states like Idaho do not come before or after a state like Alaska in value. Answer (c) is a categorical variable, as it is neither a number nor does one major have greater or lesser value than another. Answer (d) is a quantitative variable because age can be expressed numerically, and ages can be ordered by value.

The correct answers are (b) and (c).

Graphs

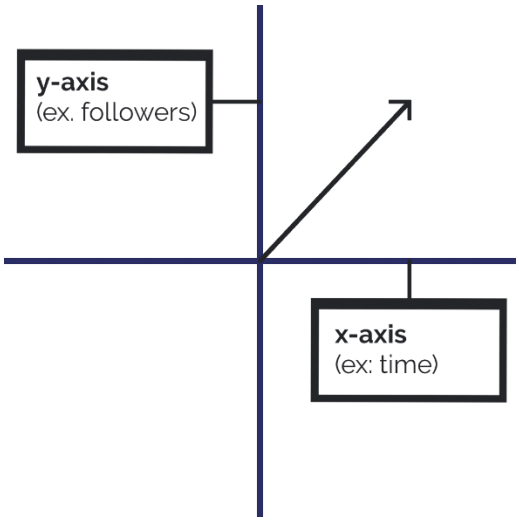
The next grouping of questions deals with graphs. Being able to read graphs is important because they help illustrate how two things compare. This section checks for your ability to read, create, and explain graphs and graphing-related functions.

Graph questions are included because most data you see when working in esports will be presented in graph form. Almost all social media back-ends will present data through graphs. As an example, a graph of social media followers may show a change in social media following over time. Understanding how to work with graphs is important for both understanding and explaining points related to your position in the market and your trajectory of growth.

Axes

The ECI Exam may ask a question regarding the axes on a graph. And understanding what each axis on a graph represents is a prerequisite to being able to read a graph. An **axis** on a graph is the measure line that functions as a point of reference of change in value. In a coordinate plane, the x-axis is the horizontal axis, and the y-axis is the vertical axis. Typically, the x-axis is used for the independent variable, and the y-axis is used for the dependent variable. As an example, let's say that the x-axis represents time while the y-axis represents followers. Time is the independent variable—its value doesn't change when followers change. Followers are the dependent variable, as their value depends on when it is being measured.

Here's an example graph that depicts this:

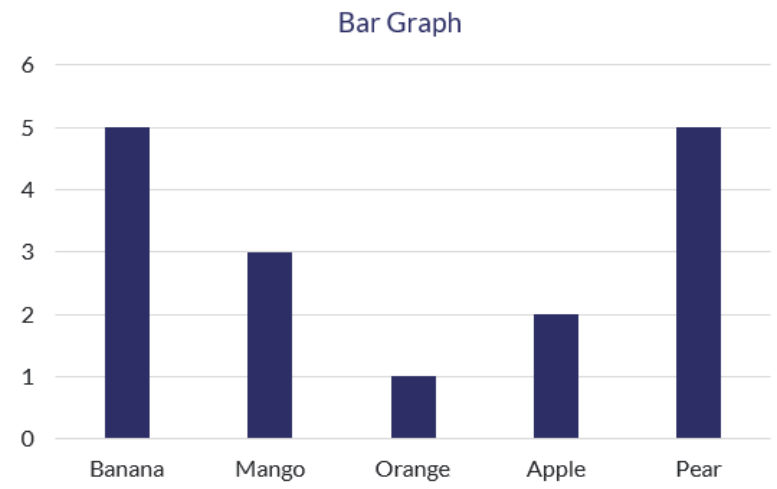


In the above example graph, as the value of time moves to the right, the value of followers goes up. This example shows a gain of more followers as time passes.

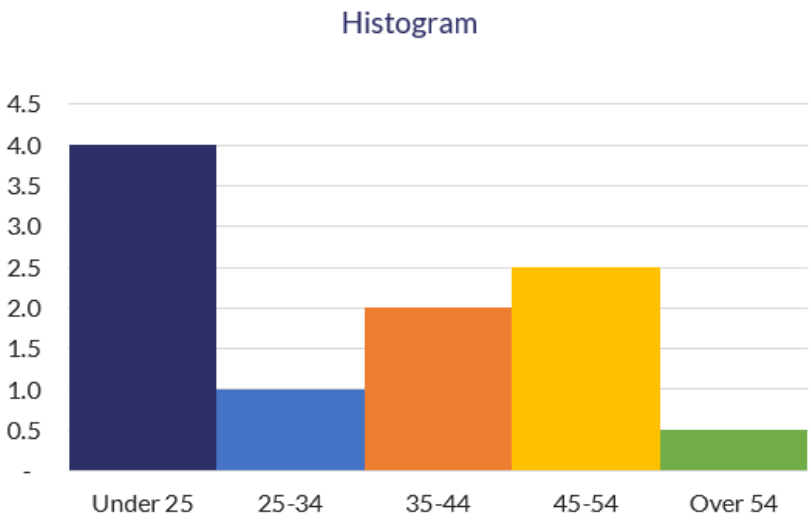
Bar Graph and Histograms

You are also likely to run into questions regarding bar graphs or histograms. Bar graphs and histograms are similar in many ways, except bar graphs measure categories while histograms measure ranges. A **bar graph** is a chart that uses columns (called bars) to represent a total amount of observations for given categories. On the x-axis you have the categories, while on the y-axis you usually have some measure of value. Alternatively, a **histogram** is a chart that uses columns to represent the distribution of numerical data across a category. Broadly speaking, bar graphs present categorical data while histograms present numerical data.

A bar graph might be used to calculate how many of your favorite fruits you have. In that case, the x-axis would have your favorite fruits, while the y-axis would have quantities. It might look something like this:



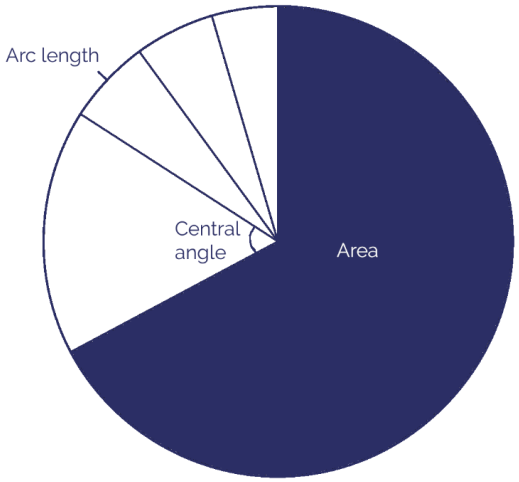
A histogram might be used to measure the age ranges of consumers for your company. That chart might look like this:



Finally, you'll notice that bar graphs have gaps between the columns while histograms don't. It's a common stylistic differentiation that can help with identifying which type of chart you're looking at.

Pie Chart

A **pie chart** is a chart that divides a circle into many slices to illustrate numerical proportions between several items. In a pie chart, the arc length of each slice, the area of each slice, and the central angle of each slice are proportional to the value it represents. In other words, a slice that has two times the arc length of another slice will have two times the area and central angle of that slice.

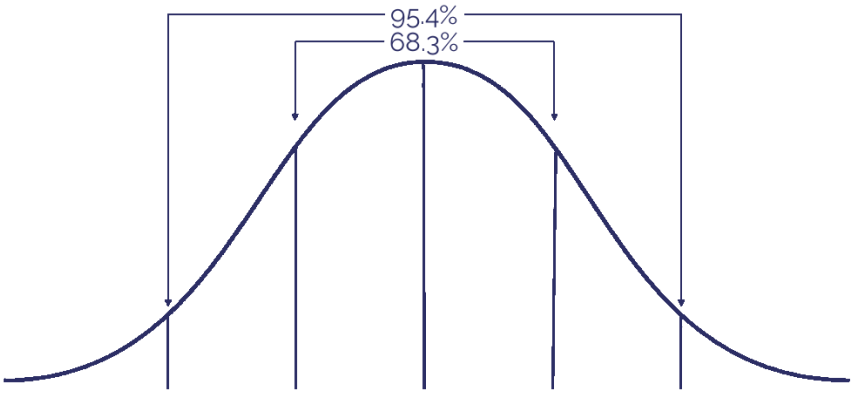


Pie charts are useful for presentations that compare the values of two subcategories against one another. Consider an example pie chart that shows where an esports team's fans come from, broken out by country. If the "Brazil" slice of the graph is two times larger than the "Iceland" slice of the graph, the esports team has two times as many fans in Brazil as in Iceland.

Normal Distribution (Bell Curve)

A **normal distribution**, also known as a Gaussian distribution or a **bell curve**, is an evenly distributed graph around the mean that illustrates how data near the mean of the dataset occurs more frequently than data far from the mean. In other words, it measures the

likelihood of a value occurring in a data set, and the values near the mean appear more often than those far from the mean. A bell curve looks like this:



The percentages at the top denote the percentage of the data captured within the values of 1 standard deviation and 2 standard deviations from the mean. In other words, on the above normal distribution graph, 68.3% of the data set falls within the inner two arrows, while 95.4% of the data set falls within the outer two arrows.

Normal distributions are useful ways to measure probability, which in turn helps you judge how likely an event is to occur. Consider the scenario where a player kills their opponent an average of six times per game. If the data is normally distributed, and the standard deviation is 1, you know that a game where this player kills their opponent eight times is very rare because it is two standard deviations away and barely falls within 95.4% of the scenarios.

The standard deviation guide mark percentiles only work for a normally distributed graph. If the graph is not normally distributed, the assumption that one standard deviation is equal to 68.3% of the scenarios might not be accurate.

Finally, very large data sets tend to approximate a normal distribution. This is because of something called the central limit theorem, but you will not be tested on that.

Consider this example problem:

Problem) Which of the following are key properties of a bell curve? (Choose all that apply)

a) The curve is symmetrical at the center.
b) 95% of the data falls within one standard deviation of the mean.
c) It compares the values of many different categories of data.
d) A very large data set will often look like a bell curve.

A normal distribution curve is symmetrical around the mean, so answer (a) is correct. Answer (b), however, is incorrect. Approximately 95% of the data falls within two standard deviations of the mean, not one.

Answer (c) is also incorrect. It is loosely describing a bar graph, not a normal distribution curve. Finally, answer (d) is also true because of the central limit theorem.

The correct answers for this problem are (a) and (d).

Correlation, Scatter Plots, and Regressions

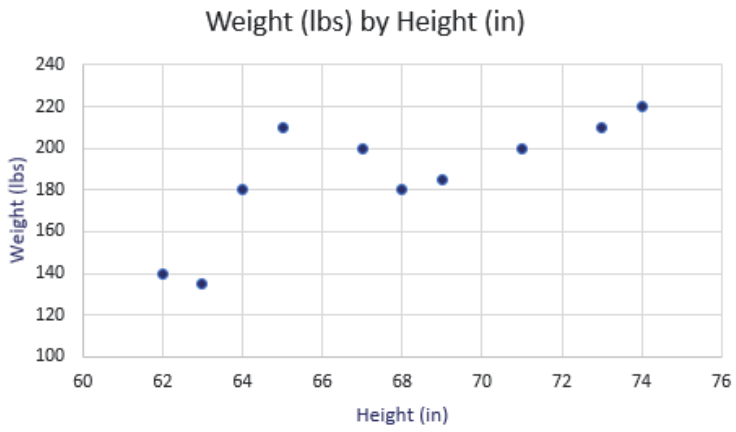
Correlation questions and regression questions are two more types of questions that you might come across while taking the ECI Exam. **Correlation** is a statistic that measures how closely two variables impact one another. If item A has a strong correlation with item B, moving item A will move item B almost as much. As a real example, if time spent studying is strongly correlated to your chance of passing the ECI Exam, then spending more time studying will strongly improve your chances of passing the exam.

When calculating correlation, you will typically calculate a **correlation coefficient**, or a numerical measure of correlation strength. Correlation coefficients range from -1 to 1. A correlation coefficient of 1 means that if one variable moves one unit, the other variable moves one unit in the same direction. A correlation coefficient of -1 means that if one variable moves one unit, the other variable moves one unit in the other direction. 0 means that the two are totally uncorrelated.

Typically, correlation coefficients above 0.7 are considered "strong" while coefficients less than 0.5 are considered "weak." Correlation coefficients between 0.5 and 0.7 are considered moderate.

A common phrase in statistics is "correlation does not imply causation." This is important to keep in mind. Just because two variables are correlated does not mean that one causes the other to move. Consider the example of studying for the ECI Exam—if studying and pass-rates are correlated, then if you spend a lot of time studying, you are more likely to pass the exam. However, you might also be more likely to get a hand cramp from working so hard. Hand cramps, in this case, would also be correlated with studying, and with passing the exam. But getting a hand cramp doesn't cause you to be more likely to pass the exam—they simply occur at the same time.

Let's say you have a data set that lists ten people's heights and weights. If you were to plot height (in inches) on the x-axis and weight (in pounds) on the y-axis, it might look something like this:



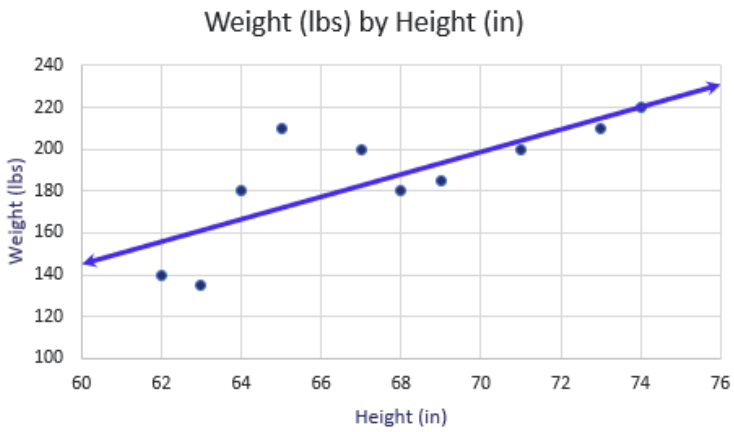
The above graph is what is called a scatter plot. A **scatter plot** is a type of graph that displays variables (typically two) on a graph, showing the relationship between two sets of data. In this example, the scatter plot depicts the relationship between height in inches and weight in pounds for the data set.

On a scatter plot, the x-axis is typically the independent variable, while the y-axis is the dependent variable. In the case of the above graph, the x-axis is height, and the y-axis is weight. With these two points, we can calculate the correlation between height and weight for our data set.

But even though we know the correlation between height and weight, without a tool to model the relationship between the independent and dependent variables, we will not be able to predict the relationship between the two for data points that we do not know. That's where regressions come in.

A **regression** is a data modeling tool that estimates the relationship between a dependent variable, the thing that you're measuring, and an independent variable, the thing that you're measuring against. There are many types of regressions, and it is up to the data analyst to decide if the chart requires a linear regression, exponential regression, logarithmic regression, or any other type of regression. You decide the type of regression needed by the relationship between the two variables. If the variables are linearly correlated, meaning as the x-axis variable increases, the y-axis variable increases proportionally, then you would want a linear regression. If the variables are exponentially correlated, meaning that as you increase the x-axis variable, the y-axis variable increases exponentially, then you would want to use an exponential regression, and so on.

Height and weight are linearly correlated. A regression line between the two variables would then look like this:



There are many different types of regressions, not just linear, exponential, and logarithmic. You will not be asked to make a regression on the exam, but it is important to know what they are so that you can both understand them and create them in the workplace.

Consider this example problem:

Problem) Several factors and their correlation coefficients with esports viewership are given below. Which of the following factors is most strongly correlated with esports viewership?

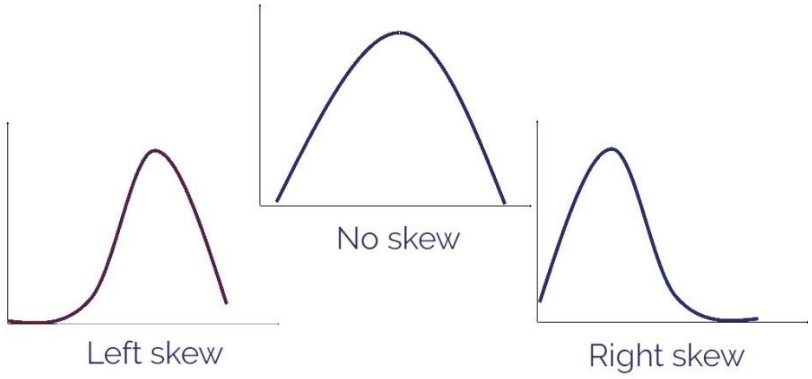
a) Factor 1 – positive 0.5
b) Factor 2 – negative 0.1
c) Factor 3 – negative 0.8
d) Factor 4 – positive 0.7

Correlation coefficients fall between -1 and 1, with correlation coefficients closer to -1 and 1 having the strongest correlations with a given variable. The strength of the correlation does not depend on whether it is a positive or negative correlation.

The answer is (c) because factor 3 has the strongest correlation overall.

Data Skew and Tails

Finally, you are likely to run into graphical questions regarding the concepts of data skew and data tails. **Data skew** is a measure of how non-uniform the data is in a data set. If one end of the data, also known as a **tail**, is longer than the other, then the data is skewed. Skew looks like this:



In the above graph, the left-skewed chart has a long tail on the left and the right-skewed chart has a long tail on the right.

When there is no skew, the median and the mean of the data set will be the same, resulting in a symmetric graph. If the median is larger than the mean, then the graph will typically be skewed to the left. If the mean is larger than the median, the graph will typically be skewed to the right. This is not always true but is a good rule of thumb.

It is possible to have skew without tails or tails without skew, as well. Skew without tails would look like the graph above with no skew, but the vertex would be shifted toward the right or the left. Tails without skew would look like a combination of the left and right skew graphs, where the graph is symmetrical but both ends have tails.

Consider this example problem:

Problem) If the mean is greater than the median in a data set, the resulting graph will probably be right-skewed.

a) TRUE
b) FALSE

The above statement is true, so (a) is correct.

Data Gathering

Sometimes, you will need to gather data yourself. The ECI Exam will ask you questions regarding data gathering best practices, including questions regarding commonly utilized data gathering methodologies and pitfalls.

Questions on the data gathering section are included because, while you will primarily be working with pre-formatted data in esports, there will likely be times where you must build data sets on your own to solve complex problems. Understanding how to gather data in the most efficient and least error-prone way is important for making good decisions.

Samples

One data-gathering topic you are sure to come across is a sample. A **sample** is a selected subsection taken from the greater population. Samples are sometimes used to make analysis easier because it is often easier to work with fewer numbers than more. Sometimes, samples are used when you cannot get data about the whole population, but you want to make conjectures about the greater population anyway. Samples are a bedrock idea upon which many other concepts in this section are founded.

If one million people have attended your company's events in the past, for example, you would have a hard time surveying all one million attendees – dealing with a million responses would be a challenge. If you were to take a one-thousand-person subsection of this greater population (all one million people who have attended your events), that would be a sample.

If you are trying to analyze all of the *Fortnite* fans in the world, you almost certainly cannot get accurate data on each and every one. Instead, you might take a handful of participants from many countries around the world to try to best represent the greater *Fortnite* fandom with a smaller group. This would also be a sample.

There are many methods to creating a sample, and not all methods are equally useful for all situations. This section of the exam will explore several common methods for sample gathering and their strengths and weaknesses.

Sampling is useful for using a subsection of a larger population to make assumptions about that larger population. However, sampling doesn't allow you to make assumptions about a greater population and then further make assumptions about subsections within that population.

For example, let's say we have a pepperoni pizza. The pizza is cut into eight equal slices. We want to know how many pepperonis there are, so we take a sample of one slice. On that one slice, there are five pepperonis. We might then infer that the total pizza has about 40 pepperonis because the slice was an even eighth of the pizza. Even if we assume the pizza has 40 pepperonis, it's hard to assume that each other slice has an even 5 pepperonis. Our sample, the slice, lets us assume information about the whole pizza, but it's hard to make an assumption about other subsections, or other slices, using it.

Frequently, to make assumptions about a subsection, you would not need to use sampling of a larger population. That subsection might be small enough that you can simply run an analysis on it (e.g., we pick up the piece of pizza that we want to know about). If you cannot analyze that subsection for whatever reason, you would want to make that subsection your greater population and draw a sample from that.

Cluster Sampling

There are many methods for gathering samples. One such method is known as cluster sampling. **Cluster sampling** is a technique that divides the greater population into multiple sub-groups, or clusters, for analysis. When you want to cluster sample a larger data set, you decide how you want to break it up, then perform analysis on each smaller data set.

For example, someone wanting to research esports fans as a large population will almost certainly run into a wall: there are too many esports fans to survey. That person then might

choose to break “esports fans” into smaller groups, or clusters, of populations to survey, such as *League of Legends* fans, *Counter Strike* fans, *Call of Duty* fans, *Smash* fans, and so on. They then might choose to cluster again, breaking *League of Legends* fans into groups differentiated through *League of Legends* fans by city. After analyzing each cluster’s data, this person can use the clusters to estimate the larger population’s data.

Breaking the group into clusters allows for you to research a larger population when you don’t have the means to do so. It saves time and uses fewer resources to gather data, but cluster sampling does have flaws.

First, cluster sampling only allows you to estimate the greater population. Cluster sampling is useful when you don’t have the means to capture the larger population, so you break the greater population into more manageable chunks, clusters, and analyze those. Once you have analyzed the clusters, you can estimate the greater population’s data by extrapolating information from each cluster. However, you aren’t accounting for each and every data point in the data set. In real terms, if you want to study *Smash* fans in the U.S. and decide to cluster *Smash* fans across the 100 largest cities in the U.S., you will be able to paint a good picture of American *Smash* fans. However, you might not be accounting for *Smash* fans in rural cities, suburbs, etc.

Second, cluster sampling creates more bias in research. Any time that a person is manually deciding the representation of samples in research, it presents an opportunity for bias to impact the data. For example, if you are analyzing big brands that might want to sponsor *Overwatch* streamers, and you decide that there are no big brands in Europe to consider, you are biasing your data to ignore European brands.

Consider this <u>example problem</u>:

Problem) What are some advantages to using cluster sampling? (choose all that apply)

a) It introduces less potential bias into the data than gathering data on the greater population,
b) It requires fewer resources than gathering data on the greater population,

c) It is easier to capture data than gathering data on the greater population.
d) It creates a more accurate analysis than using data gathered from the greater population.

Cluster sampling is great for analyzing large sets of data by breaking them into manageable pieces, but in doing so you potentially introduce bias and reduce the accuracy of the data for the greater data set.

Answer (a) is incorrect because cluster sampling introduces more bias than just analyzing the larger population (assuming you have the resources to do so).

Answer (b) is correct. Cluster sampling, by breaking the data down into smaller clumps, requires you to gather less data, thereby requiring fewer resources.

Answer (c) is also correct. It is always easier to capture data on smaller subsections of a larger group than the larger group as a function of the number of data points you need to account for.

Answer (d) is incorrect because cluster sampling estimates the population at large. Analysis on the entire data set may be as accurate or even more accurate than analyzing a data subset.

The correct answers are (b) and (c).

Classification

Another subtopic of questions you might run across on the ECI Exam is data classification. **Data classification** is close to data clustering in that it is the act of organizing data into broad categories. If your data set is all the people who were in your high school freshman English class, then classification is grouping them. This can be done by any descriptive characteristic such as height, age, hair color, etc.

Classifying data is an easy way to group it into explainable chunks. Rather than saying "Three of our customers surveyed, Sally, Abebe, and Maurice, ages 13, 15, and 16, reported that they loved our product," it is easier to say, "All of our customers aged 18 and under surveyed reported that they loved our product." By breaking down data into classifications, it becomes more easily communicated with others.

Consider this example problem:

Problem) Which of the following might be examples of ways to classify data? (choose all that apply)

a) Classification through qualitative attributes
b) Classification through quantitative attributes
c) Classification through subjective attributes
d) All the above

Data can be classified through almost any provably definable method. Quantitative variables and qualitative variables are both fair game, so answers (a) and (b) are correct.

Subjective data can be classifiable as well. If you are classifying your data with a subjective method, it is probably important to note that you have done so whenever you share it, but it is still certainly doable. So (c) is correct too.

Therefore, the answer is (d), all the above.

Quota Sampling

Quota sampling is another type of sampling method that might be covered on the exam. **Quota sampling** is a type of representative sampling wherein someone manually selects the sample points to accurately reflect the characteristics of the greater population.

For example, let's say that you are looking at *StarCraft* fans in the United States. You are trying to learn more about *StarCraft* fans in the U.S., and in doing so, you have found out the

number of *StarCraft* players, broken down by state. For whatever reason, you decide that the experiences of *StarCraft* players in California vary from those in Texas which then vary from those in Idaho. To best reflect the greater set of *StarCraft* players in the U.S., you decide to create a sample of *StarCraft* players broken down by state. If New Jersey has 2/3 of the American *StarCraft* players, then your sample is 2/3 comprised of people from New Jersey.

Quota sampling's strengths are that it is fast, low resource, and can give a voice to populations that can be underrepresented in other methods of sampling. Quota samples are frequently used by political organizations for these reasons.

Quota sampling's weaknesses are that it introduces a large amount of potential bias into the sample, as the individual creating the sample decides what is representative of the greater population. In the above example of *StarCraft* fans in the United States, if division by state is not representative of distinct experiences for what you are trying to study, then your sample is probably not very good.

Consider this example problem:

Problem) Quota sampling is an unbiased way of sampling a population.

a) TRUE
b) FALSE

Quota sampling is one of the most biased methods for sampling populations as it relies heavily on the sample creator's vision for the greater population. So, the answer is (b), false.

Oversampling and Undersampling

The oversampling and undersampling methods are similar to quota sampling. While these may sound like mistakes you might make, **oversampling** and **undersampling** are valid

methods for generating a sample. They intentionally introduce a bias when generating a sample to account for an imbalance already present in the data.

For example, let's say that you have a population of 100 people who all wear either red shirts or blue shirts. People wearing blue shirts have vastly different opinions from those wearing red shirts. In your first sample of ten people you randomly selected, you got four people with blue shirts and six people with red shirts. However, after gathering that sample, you found out that 90 people in the population wear blue shirts, and only 10 people wear red shirts. Your sample of 40% blue and 60% red is vastly overrepresenting the red shirt wearers.

When you go to sample the population again, you might intentionally undersample red shirt wearers this time. If you sample no red shirt wearers and 10 blue shirt wearers this time, your total of 20 people between the two samples is a closer sample to the overall population, but you are actively undersampling red shirt wearers in this new sample.

Oversampling and undersampling can help you get a much more representative sample, but like quota sampling, they introduce the potential for bias from the person doing the sampling. Be thoughtful when deciding to oversample or undersample a population and be cognizant of checking for potential errors in the future.

Consider this example problem:

Problem) Oversampling and undersampling potentially introduce bias into data.

a) TRUE
b) FALSE

Like quota sampling, oversampling and undersampling allow for the data sampler to introduce bias into the data. This is true any time someone decides how to gather a sample that isn't through random methods.

So, the correct answer is (a), true.

Dimensionality Reduction

Sometimes, data will be too overwhelming to reasonably comb through all of it. At times, you might have too much data to analyze at once. Other times, you might have data that is completely irrelevant to what you are searching for. Dimensionality reduction is the act of transforming data from a high dimensional space to a low dimensional space. In simple terms, **dimensionality reduction** is the act of consciously removing data points so that the overall data population is easier to work with.

For example, let's say that you have a spreadsheet with all of your game's user data. Each row is a new user, and each column has different categories, such as age, nationality, time spent playing, and their score of your game on a scale of 1 to 10. It might look like this:

Users	Age	Nationality	Time played (hr)	Score (1-10)
User 1	18	USA	13.1	7
User 2	19	GER	2.0	8
User 3	21	BR	102.2	10
User 4	35	BR	1.7	1
User 5	28	USA	0.7	1
User 6	48	USA	12.5	3
User 7	78	USA	1.2	8
User 8	14	BR	212.2	9
User 9	23	CN	58.5	9
User 10	25	USA	120.8	10
User 11	14	MEX	2.2	10
User 12	18	CH	0.0	10
User 13	12	USA	16.7	2
User 14	8	CN	18.4	10
User 15	56	DEN	4.0	8
User 16	17	USA	4.3	4
User 17	32	MEX	12.9	3
User 18	35	MEX	303.7	19
User 19	14	USA	0.0	13
User 20	40	POR	10.2	12
Averages:	**27.8**	**-**	**44.9**	**7.9**

The average user surveyed gave the game a 7.9 out of 10. But what if you only wanted to know those between the ages of 19 and 34, inclusive? Then you would reduce the data set to look like this:

Users	Age	Nationality	Time played (hr)	Score (1-10)
User 2	19	GER	2.0	8
User 3	21	BR	102.2	10
User 5	28	USA	0.7	1
User 9	23	CN	58.5	9
User 10	25	USA	120.8	10
User 17	32	MEX	12.9	3
Averages:	**24.7**	**-**	**49.5**	**6.8**

Those between the ages of 19 and 34 only scored the game a 6.8 out of 10. However, you now only have 6 data points, as opposed to 20.

Recall that more data points produce more accurate estimates about the population at large. As such, dimensionality reduction typically decreases the accuracy of the data.

Consider this example problem:

Problem) What are some disadvantages to using dimensionality reduction? (choose all that apply)

a) Reduced processing time
b) Reduced range of data
c) Reduced storage space
d) Reduced estimation accuracy

Dimensionality reduction is the action of reducing data points so that the data you want to analyze becomes clearer and easier to work with.

Answers (a), (b), and (c) are all not negative in and of themselves. Answers (a) and (c) are positive attributes to dimensionality reduction, while answer (b), reduced range of data, is not a disadvantage. Reducing the range of the data is only a change to an attribute, not a positive or a negative. Furthermore, dimensionality reduction does not always reduce the range of the data as you could be removing data in the middle of the set, not the ends.

Answer (d), on the other hand, is a negative. Furthermore, dimensionality reduction indeed reduces the accuracy of estimating the greater data population. So, answer (d) is the correct answer.

Hypothesis Testing

During your exam, you might also run into questions regarding hypothesis testing. Hypothesis testing is a core component of any data process because it is how you refine your assumptions and understandings over time to arrive at the "best" outcomes, whatever those might be. **Hypothesis testing** is the process of confirming or denying previously held beliefs through additional research.

The methodology for hypothesis testing can vary greatly, so it is simpler to talk about good hypotheses and what to check for when conducting hypothesis testing than it is to list all of the possible methods.

A good hypothesis is simple. Though a hypothesis does not necessitate simplicity, a simple hypothesis has less room for error. A simple hypothesis will only have a few variables to test, while a complex hypothesis might have many (and therefore requires much more data and testing). Furthermore, a simple hypothesis is easier to communicate, so it can be more easily explained during everyday business.

A good hypothesis is testable. Without testing, there is no way to know if you're right. Plus, if you cannot test your hypothesis, you cannot improve upon your hypothesis. No one knows everything, and things change. You will not always be correct in your assumptions, so it is important to be able to take in new data to adapt both in the present and in the future.

A good hypothesis is falsifiable. The ability to be wrong is key to a good hypothesis. If a hypothesis can't be proven wrong, then it isn't a hypothesis. (Typically, it will either be a fact, a guess, or flat out wrong.)

Once you have a good hypothesis, you are ready to begin hypothesis testing. Hypothesis testing will vary wildly depending on what role you fill and what data you are sourcing, but good hypothesis testing usually follows a few key principles.

First, clearly outline your hypothesis. What is your assumption? Perhaps my hypothesis is that "LCS players spend more money per year on shoes than LEC players do."

Second, set out what the opposite of your assumption is. The opposite of the assumption above is not that LEC players spend more than LCS players but that "LCS players **do not** spend more money per year on shoes than LEC players do."

Third, denote a significance level, or the probability that you are incorrect in your assumption, that you are comfortable with. If I'll never be able to survey every LCS and LEC player, am I comfortable with a 95% chance of being correct? If I can survey every player, maybe I want a 100% chance.

Fourth, run your data analysis (perhaps using the decision-making methods covered in the next section!) and compare your results.

As a final note, when testing a hypothesis, try to minimize the number of independent variables you are testing for at any one time. This means that you should only be testing for one factor at a time, if possible. Rather than testing to see if "older LCS players spend more on shoes than older LEC players, while younger LEC players spend more on shoes than younger LCS players," break it into two separate tests where you compare old LEC and LCS players and then young LEC and LCS players.

Consider this <u>example problem</u>:

Problem) Which of the following are characteristics of a well-constructed hypothesis? (choose all that apply)

a) It is concise.
b) It is testable.

c) It can be incorrect.
d) It is unique.

A good hypothesis is simple, testable, and falsifiable. Answers (a), (b), and (c) are correct.

However, a good hypothesis does not need to be unique. Everyone in the world could have thought of this hypothesis before you did, but that doesn't make it a bad hypothesis. Answer (d) is incorrect, so the correct answers are (a), (b), and (c).

Decision Making

You have your data, but how do you use it? Decision-making is one of the most important sections of the ECI Exam because data without a strategy to implement it is almost useless. You can think of the decision-making section as the means through which you utilize the rest of your data-related abilities, so these questions include commonly utilized decision-making frameworks and pitfalls.

Predictive and Prescriptive Analysis

Prescriptive analysis is a decision-making methodology used to solve a problem. The first step of prescriptive analysis is **predictive analysis**, which is an analysis used to make predictions about the future. For example, if you have a data set including the winner of the last ten head-to-head matches between two *Dota 2* teams, you might use predictive analysis to decide who is going to win their next face-off. For example, if team A has beaten team B all ten times, you might predict team A to win again. If team A won the first six matches, but team B won the last four matches, you might predict that team B will continue their recent winning trend.

Prescriptive analysis helps you find the best course of action in a given scenario using predictive analysis, the possible decisions, and the anticipated effects of those decisions. If you are a *Dota 2* player with offers to sign with team A or team B for the next year, prescriptive analysis can help you make that decision. Making a prediction about which team will win, analyzing which options you have (sign with team A, team B, or neither), and the effects of these options will help you come to the best decision for your goals. If your ultimate goal is to become the most winning *Dota 2* player ever, for example, you might want to sign with the team that you predict will win their next face-off.

The only questions on the ECI Exam regarding these topics will be definitional. These concepts are important, both for knowing which methodologies to use when conducting analysis and also for conversing with others about your thoughts and analysis.

Consider this example problem:

Problem) Predictive analysis is a step within prescriptive analysis.

a) TRUE
b) FALSE

Prescriptive analysis is the multi-step process that helps you analyze decisions based on predictive analysis and several other factors. Therefore, the answer is (a), true.

Bias

Bias is an extremely important concept to understand when working with data in any capacity. **Bias** means the influence of prejudice, predetermined ideas, or bad techniques that impact a data set one way or the other. There are many, many types of bias.

Confirmation bias is a type of bias where the person doing the data analysis wants to prove an assumption that they already hold. Then, the person continues to work with the data, gathering more samples, manipulating the data repeatedly until it confirms the assumption they are holding.

Selection bias is a type of bias where the person doing the data analysis selects a sample from their data set that is not representative of the overall population. Consider the situation where you want to survey Americans on their dietary habits. If you only go to LCS matches and survey Americans there, you are not asking a group of people that is representative of Americans at large. You are probably not even asking a group of people that is representative of *League of Legends* fans holistically because those who go to the LCS probably either live in Los Angeles, are wealthy enough to travel to Los Angeles, or are superfans of the league. A survey of *League of Legends* fans conducted on-site at the LCS will only return data on a particular subsection of all fans.

Survivorship bias is another type of common bias. Survivorship bias refers to the bias that occurs when listening to those who passed some selection process because it often ignores those who failed to pass that selection process. Consider founders of major technology corporations. If you listen to founders like Mark Zuckerberg, you might conclude that dropping out of college is going to lead you to huge success in building companies. After all, Zuckerberg dropped out before Facebook, Dorsey did it before Twitter, Spiegel dropped out before Snapchat, Karp even dropped out of high school before Tumblr, and so on. However, considering their stories of success and ignoring the tens of thousands of founder-hopefuls who dropped out of college and did not succeed in building companies is an example of survivorship bias.

Nonresponse bias is another common type of bias that occurs when people are unwilling to respond to a survey due to a factor that makes them differ from those who respond. For example, let's say you ask Americans to fill out a survey asking what their favorite types of food are. Since you like meat, you list only four types of meat as choices, and there are no other choices. People who don't prefer one of those four types of meat to all other foods are very unlikely to respond to your survey. As a result, you might think that 50% of Americans think that answer #1 was their favorite food, but in fact, only 50% of those who responded had answer #1 as their favorite.

Finally, response bias is one more type of bias that you might see. This is a very, very common type of bias present in surveys where participants choose to respond inaccurately or falsely to questions. Questions can be worded to subtly push a survey participant to respond more positively or negatively to a question. A good way to mitigate response bias is to ask the same question in multiple ways to reduce the impact that the question itself might have on the respondent's answer.

There are many other types of bias present in data. We cannot possibly cover all types of bias that you might come across in this guide.

When working with a data set, it is important to try to remain as objective as possible, ensure that your sample is as representative of the greater population as possible, and stay

unbeholden to one particular outcome. Furthermore, continuously consider what types of logical flaws could be present in your analysis and how you can avoid them.

CPM and CPC

CPM and CPC are common advertising terms that are important for those in any digital industry to know. **CPM**, cost per mille, refers to the cost that an advertiser pays for one thousand views of an advertisement. **CPC**, cost per click, refers to the cost that an advertiser pays for one click of a link on an advertisement. Both are very common ways of advertising online, including social media and live-streaming platforms. When a company launches an ad, they will choose the type of return they want: clicks or impressions.

CPM is often used to drive brand awareness because advertising money is being used to drive impressions on the advertisement. There is no guarantee of conversion to the website. CPC, on the other hand, is typically used to drive sales to a product.

For example, a company launching a new spin-off of their business might choose to focus on CPM to try to establish a link between their main business and the spin-off. This would hopefully give credence to the new entity. Alternatively, an established brand might run advertisements on an existing product using CPC to generate more revenue during a special time of year, such as the holiday season.

Another way to think about it is that CPM pays off in the long-run by having more people aware of your brand, allowing the company to perform better in the future. CPC is designed to generate a return immediately by having more people click through to your products.

You will never be asked to calculate anything regarding CPM or CPC; instead, it is important to understand these concepts as they appear frequently in a digital industry like esports.

For example, CPC, or cost per click, is often what you buy ads against when you want to focus on clickthrough from your advertisement.

Outliers

Outliers are another important data concept to understand when making decisions for your business. An **outlier** is a data point that is significantly different from other data points in the overall population. For example, let's say you have a data set that is a list of all of the food in your house. There are 100 items on the list, and 99 of them are various types of fruits and vegetables while one of them is a slice of bacon. If you are using this data to determine what type of eater you are, it is logical to deduce that you are probably a vegetarian or a vegan. The slice of bacon is an outlier in your data set containing the foods in your house. In other words, the slice of bacon is a one-off, maybe a mistake, that is not representative of the majority of the data set.

It is up to you to decide what is an outlier and what is not. In the example above, maybe you are not a vegetarian or vegan. Maybe the reason that the data returned only fruits and vegetables is because you ate all of the meat in the house, leaving the fruits and vegetables. In this case, there would be selection bias present in the data set, and the bacon would not be an outlier.

Including outliers in your decision-making process might be correct, or it might be incorrect. It depends on what you are trying to measure. For example, if you are trying to decide which age range of customers you should market towards, you probably do not want to include outliers in your data set. If you have had five customers for your toy for children, and the customers are ages 12, 12, 11, 13, and 63, the 63-year-old is probably an outlier. If you take the average of all five peoples' ages, you get approximately 22 years old. However, if you consider that the 63-year-old is not your target consumer; maybe they were purchasing something as a gift for an 11-year-old, then the average age of the other four people who purchased your toy is 12 years old. It is up to you to decide if you should be marketing to 12-year-olds, 22-year-olds, or some other age range.

Consider this example problem:

Problem) You are observing ticket prices for an upcoming esports event and see these prices: $78, $79, $81, $82, $83. A day later, you find a ticket priced at $65. How does this price affect the ticket pricing data originally observed?

a) The median increased, and the range decreased.
b) The mean increased, and the range increased.
c) The mean decreased, and the range increased.
d) The mean was unchanged, and the range decreased.

In this problem, you have already seen five ticket prices with a range of $5 and a mean of $80.60. After finding a ticket priced at $65, both the range and the mean will change. The range would be unchanged if the new ticket was priced within the old range of $78-$83, and the mean would remain unchanged if the new ticket was priced equal to the old mean, but neither is true.

In this case, the new ticket is priced below the mean and under the lower-bound of the previous range, so the mean will decrease while the range increases. Answer (c) is correct.

Questions like these are important in scenarios when you are making decisions based on these data sets. For example, if you are pricing tickets for your own upcoming esports events, you might have priced all of the tickets between $78 and $83, or at least within a $5 range. However, if you include the $65 outlier in your analysis, your event's range of ticket prices might shift.

Probability

Probability is one of the most important concepts in data analysis and decision making. **Probability** can be defined as a numerical representation of the likelihood of an event occurring. If you flip a coin, the probability that it lands on heads is ½, while the probability that it lands on tails is ½.

Probability is so important because we can never be sure about the future, no matter what it is you are measuring. However, probability helps us measure the likelihood that a thing will happen. While you cannot make perfect decisions, if you make many good decisions over time that are based on probability, you are very likely to find success in whatever it is that you are doing.

For example, let's say that you are a team owner. You are looking to sign a new *CS:GO* team. Let's also assume that money is not an issue. Even if you have the best data on every player's performance and sign the team that is the most likely to win, you always have a chance of failing. Maybe the players have a bad season. Maybe they peaked a day prior, and each subsequent tournament they perform worse. There is always luck involved, so you can never guarantee continued success.

However, if you make a decision based on the best players or team and continue to make decisions to swap out players based on who is performing well and you think will be successful, you are likely to succeed over time. Of course, all players could sign with you and then immediately start performing poorly, but it's very unlikely that will happen every time (and if it does, there is probably a problem with you or your decision-making process).

When people hedge their statements with words like "probably," they are referring to probability. It will "probably" rain tomorrow, but it isn't ever guaranteed until the rain either falls or does not.

On the exam, probability questions will require some math to solve.

Consider this example problem:

Problem) A population of 24,000 esports fans was surveyed: 80 percent own a console, 88 percent own a PC, and 72 percent own a console and a PC. If one fan is randomly selected from the 24,000, what is the probability that the one fan will be someone who owns a PC but not a console?

a) 0.04

b) 0.08

c) 0.12

d) 0.16

This problem asks you to calculate a probability of a random person being selected and only owning a PC, not a console. The answers are given as decimals but can be read as percentages (e.g., answer (a), 0.04, can be read as 4%).

To answer this question, we can start constructing a list. That list might look like this:

TOTAL	24,000	*Given to us*
CONSOLE	19,200	*80%*
PC	21,120	*88%*
BOTH	17,280	*72%*
CONSOLE NO PC	?	*We'll get here*
PC NO CONSOLE	?	*We'll get here*
NEITHER	?	*We'll get here*

To calculate the number of people who own a console but not a PC, we would subtract the number who own a console from the number who own both. Then, we do the same for the PC.

Finally, to calculate the number of people who own neither console, we subtract the number who own a console but not a PC, the number who own a PC but not a console, and the number who own both from the total number of people in our sample. This is not necessary to answer the question above but is worth knowing how to do.

TOTAL	24,000	*Given to us*
CONSOLE	19,200	*80%*
PC	21,120	*88%*
BOTH	17,280	*72%*
CONSOLE NO PC	1,920	*CONSOLE - BOTH*
PC NO CONSOLE	3,840	*PC - BOTH*
NEITHER	960	*TOTAL - BOTH - CONSOLE NO PC - PC NO CONSOLE*

Finally, to calculate the percentage randomly selecting someone who owns a PC but not a console, we divide 3,840 (the number of fans who own a PC but not a console) by 24,000 (the total number of fans that might get picked).

Probability:	0.16	*PC NO CONSOLE % TOTAL*

The answer is (d), 0.16 or 16%.

Statistical Significance

An event is considered to be **statistically significant** when there is a low probability that it happened by random chance. The threshold for what a "low probability" means is set by the person making the decision.

In hypothesis testing, statistical significance is measured with a **p-value**, which is the percentage chance that repeating the testing will give you as extreme, or more extreme, a result as what was observed. A null hypothesis is a pre-requisite to using p-values. In this case, a null hypothesis is an overarching assumption that you are building your model around.

For example, let's say you are flipping a coin. You're going to flip it five times—and your null hypothesis is that it is a fair coin, so it has a 50% chance of landing on heads or tails. If it lands on heads five times, there was a $(1/2)^5$, or 1/32 chance of that happening. The p-value of this occurrence would be 1/32, approximately a 3% chance of occurring. In other words, there is only a 3% chance that if you flip a fair coin five more times it will land on heads five times or tails five times.

However, this is only true if the null hypothesis is correct. If the coin were weighted such that it lands on heads 9/10 times that it is flipped, then the likelihood of getting heads five times in a row becomes $(9/10)^5$, or 59049/100000. In other words, the p-value of this occurrence is 59049/100000, approximately a 59% chance of occurring. This is why p-values require a null hypothesis for reliability.

Most commonly, a p-value of .05 is used to determine statistical significance. You will not be asked to calculate p-values on the exam, but it is important to understand what a p-value is.

Consider this example problem:

Problem) What does a p-value represent in hypothesis testing?

a) The probability of future occurrence of an as-likely-or-less-likely event
b) The probability of future occurrence of an as-likely event
c) The probability that the null hypothesis can be accepted
d) The probability that the null hypothesis can be rejected

P-value represents the likelihood of occurrence of an event that is as extreme, or more extreme, than the measured p-value. Answers (c) and (d) can be crossed off because p-values represent the likelihood of events occurring, not the validity of the null hypothesis.

Answer (b) is incorrect because it does not account for events that are more extreme than the p-value.

Answer (a) is the correct answer.

Frameworks

Finally, there are a few general frameworks to keep in mind when discussing data and esports. These topics are concepts or ideas that are useful for both thinking about whatever situation you are in and communicating with others.

Questions on the framework section are included because these are commonly seen ideas and principles that make working in esports easier. Framework questions will not require math. They test for your understanding of the definitions and concepts covered herein.

Descriptive and Inferential Statistics

The first of several framework topics that you are likely to see on the exam are descriptive and inferential statistics. All statistics are one or the other. **Descriptive statistics** summarize an existing data set. Descriptive statistics are entirely contained within the data set itself. Measures of frequency, mean, median, mode, range, quartiles, variance, standard deviation, and similar functions are all examples of descriptive statistics. Descriptive statistics are typically facts.

Inferential statistics draw conclusions about an additional population outside of your data set by extrapolating the findings of your data set. Inferential statistics are typically used when decision-making. Hypothesis tests, probabilities and confidence intervals, regression analysis, and similar functions are all examples of inferential statistics. Inferential statistics are typically used for making guesses and predictions.

You will certainly run into both when dealing with data. Data given to you in the esports world almost always will come in the form of descriptive statistics. It will be your job to take the descriptive statistics and apply decision-making techniques and frameworks to create inferential statistics and draw conclusions about the direction that your company should be heading.

Consider these two example problems:

Problem) Descriptive statistics can be used to conduct what type of analysis? (choose all that apply)

e) Anticipate future events using data
f) Narrow down the correct recommendation for a specific decision
g) Describe and summarize past information
h) Determine the likelihood of various trends

Descriptive statistics summarize existing data, while inferential statistics make conjectures about the future. Answer (a), anticipate future events using data, involves predictions of future events, so (a) is incorrect.

Answer (b), narrowing down a correct recommendation for a specific decision, is similarly incorrect. This answer implies that you have yet to make a decision, meaning that you are not analyzing future data but instead drawing assumptions about the future.

Answer (c), describing and summarizing past information, is something that descriptive statistics can do. If that past information is fully contained, descriptive statistics can be used to answer questions about the data itself. So (c) is correct.

Answer (d), determining the likelihood of various trends, is incorrect for the same reasons that (a) and (b) are incorrect. It is incorrect because it attempts to make predictions of the future.

The only correct answer is (c).

-

Problem) Is the following statement descriptive or inferential?

"10% of esports fans are predicted to attend at least one in-person event this year."

a) Descriptive
b) Inferential

Descriptive stats tell you what is about a known data set, while inferential stats make conjectures about the future. Given that the statement is a prediction about the future, the data would be inferential. The answer is (b).

Qualitative and Quantitative Data

While descriptive and inferential statistics divide how you work with the data, qualitative and quantitative data divide the data itself. **Qualitative data** is data that describes qualities or characteristics, typically without the use of numbers. Qualitative data can include things like notes, colors, categories, gender, descriptive temperatures, and more.

Quantitative data refers to data that involves numbers and typically can be placed in numerical order. Examples of quantitative data include height, weight, age, duration, numerical temperatures, and more.

Quantitative data answers the "what," "where," "when," "how," and "who" questions, while qualitative data answers the "why."

Often, there is a tendency to prefer quantitative data to qualitative data or vice versa. Both types of data are critically useful in different situations, and as such, it is important to be aware of, and able to work with, both.

Dirty Data

Dirty data, sometimes called rogue data, is another topic that you might come across on the exam. **Dirty data** refers to inaccurate, incomplete, or inconsistent data. Typically, dirty data exists in a computer database. Examples of dirty data include duplicate data, outdated data, incomplete data, incorrect data, and inconsistent data.

Dirty data is cleaned through the process of **data cleansing**, the action of deleting and/or correcting inaccurate data from a database. Data cleansing can be done manually or automatically using a data wrangling tool.

Dirty data is extremely common, especially when using data that was gathered in the past, even in the recent past. It is important to be aware of the possibility of your data having issues. Remember to stay vigilant when working with data to ensure that your results are accurate.

Consider this example problem:

Problem) Which of the following are examples of dirty data? (choose all that apply)

a) Incomplete data
b) Erroneous data
c) Standardized data
d) Duplicate data

Dirty data refers to data that is faulty. As such, answers (a), (b), and (d) are correct. Answer (c), on the other hand, is not correct because standardizing data does not mean that it is inaccurate. So, the answers are (a), (b), and (d).

Law of Diminishing Returns

One of two laws, or common behaviors or ideas found across many data sets, covered on the exam is the law of diminishing returns. The law of diminishing returns originates from economics. The **law of diminishing returns** states that, at a certain point, the amount of return that you get for additional investment of resources decreases.

For example, consider the situation where you are fishing. In this example, your resource being invested is your time, while your return is the number of fish that you catch. In your first hour, you might catch ten fish. In your next hour, you might catch only eight. Then six, then five, and so on as the number of fish available decreases. Eventually, no matter how long you spend fishing, you will not be able to generate a return, catching fish, on your investment, time spent.

The law of diminishing returns is not a "law" in that it is always true or applicable, but it is a reality of many situations. It is important to both understand the law of diminishing returns and be able to recognize it in real situations such that when you come across it you can make decisions while taking it into account.

Consider this example problem:

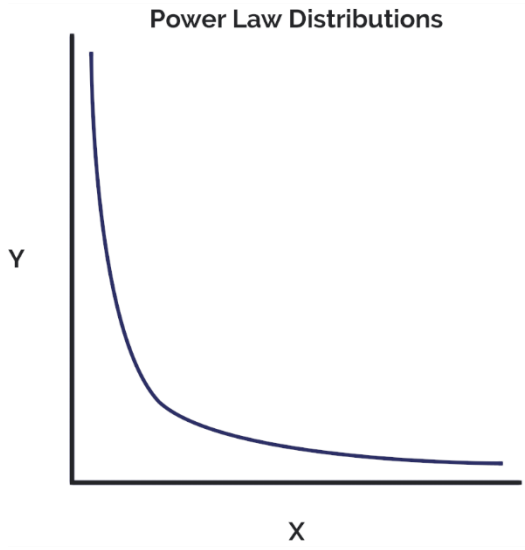
Problem) Choose the best end to the following sentence: "The law of diminishing returns states that as one input variable is increased, there is a point at which _____."

a) the marginal output per increase in input is zero
b) the marginal output per increase in input is negative
c) the marginal output per increase in input increases
d) the marginal output per increase in input decreases

This question asks for your understanding of the definition of the law of diminishing returns, which states that at a certain point the amount of output for increases in input decreases. Therefore, the answer is (d).

Power Law

The other statistics law that might be found on the exam is the power law. A **power law** is a functional relationship between any two things where the majority of one thing is derived through a minority of the other thing and vice versa. Often it is easier to understand graphically. If you map one variable on the x-axis and one on the y-axis, it will look like this:



A small percentage of the length of the x-axis generates the majority of the y-axis movement. Alternatively, a small percentage of the height of the y-axis generates the majority of the movement along the x-axis. This is a power law.

The most well-known power law is the Pareto Principle, also sometimes called the 80-20 rule, which states that 80% of productivity is derived from 20% of the input (conversely, 20% of productivity is derived from 80% of the input).

Some real examples of the Pareto Principle might be: 80% of your revenues are generated by 20% of your products, 80% of your content viewership comes from 20% of your fans, or 80% of your time is spent on 20% of the value you are generating.

As with the law of diminishing returns, power laws are not “laws” in that they are always correct. However, power laws come up frequently, so it is valuable to be able to recognize them in the workplace. If you notice that the situation you are in is a power law situation, consider whether or not it makes sense to convert some of your energy towards another project that will generate more value for your time invested.

Closing Notes

The data comprehension section of the ECI exam exists to test your understanding of, and ability to implement, various data analysis-related techniques that are commonly seen across any role one might take working in esports. A general understanding of the definitions contained in this section will set you up for success.

While reviewing this section, we recommend that you think of real-world applications for each of the topics contained. The test is created to reflect what you will need to know while working in esports, so the topics were crafted based on what is commonly seen in the industry. As such, it can only help to be prepared with real-world examples for each of the topics covered.

PROBLEM-SOLVING ESSAY

The ECI Problem Solving Essay is designed to test your flexibility and creativity in solving problems that are present in the esports industry today. Through artificial situations framed by real companies and real problems, the essay section of the exam asks you to showcase your knowledge of the industry and its problems. In presenting your solution, your ability to showcase your understanding of the situation both at a macro and a micro scale will be graded. Furthermore, you will be judged on your understanding of the company's current solution and the presentation of your new solution.

You will **not** be judged on the quality of your writing. Instead, you will be judged entirely by the content of your answer.

Important Features to Note

The essay section of the exam gives you 60 minutes to read the prompt, formulate an answer, and write your response. Your writing abilities will not be judged, so it is not necessarily important how you format your essay, though chunking your content into paragraphs might be helpful to ensure that you address everything being asked of you.

Unlike the multiple-choice section of the exam, the essay section is graded by a team of graders while withholding all identifying information of the person who wrote the response. Graders are instructed to score the essays strictly in line with the grading rubric, and scores are then averaged out across all graders to ensure minimal bias on the essay grading portion.

Scoring Rubric

Your essay will be scored on a scale from 0-15. However, as long as you complete the essay, you will not get a 0. Instead, the essay will be scored through three general criteria. First, does your essay show that you understand the problem presented, both as it pertains to the company and the industry as a whole? Next, do you propose a solution to the problem that the company could feasibly implement? Finally, is your solution something that could be possibly implemented in reality?

These are not real problems. Our advisory board members submit sample projects for ECI Members to work on, but they do not submit essay prompts. Instead, these prompts have been crafted by the ECI team with the real world in mind.

It is very important to note that your solution does not need to be a real, perfect solution to a constructed problem. We do not expect you to propose a working solution to the company's problems. Instead, we ask that you propose a solution to the problem that is feasible and explains your understanding of the situation, even if that problem is something that the company has done before. Laying out the pros and cons of said solution will demonstrate that you understand the situation, your solution, and the unseen factors that might limit or affect the company.

Think about the problem, both as it pertains to the industry generally and as it fits into the company's specific situation. Then, consider the company's current strategy. Why are they doing what they are doing? What are the pros and cons? Finally, craft an alternate solution to the problem presented. What are the strengths and weaknesses of your solution? Why might it be a better fit for the company? Why might they not have implemented it yet?

Simplified Scoring Rubric

	Comprehension	Solution	Efficacy
5	1. Understands the issue presented as it pertains to both the industry and the company 2. Is free of errors and omissions	1. Highlights the strengths and weaknesses of the company's current strategy 2. Clearly proposes a solution to the problem 3. Outlines all of the pros and cons of the new solution	1. Introduces a solution to the problem that the company could feasibly implement 2. Introduces a solution to the problem that the company could implement in time and cost-effectively
4	1. Understands the issue presented as it pertains to both the industry and the company 2. Contains one or two errors or omissions	1. Highlights the strengths and weaknesses of the company's current strategy with minor omissions 2. Clearly proposes a solution to the problem 3. Outlines most of the pros and cons of the solution	1. Introduces a solution to the problem that the company could feasibly implement 2. Introduces a solution to the problem that the company could implement time OR cost-effectively
3	1. Demonstrates some comprehension of the issue presented as it pertains to either the industry as a whole or the specific company's situation 2. Contains three or four errors or omissions pertaining to the scenario	1. Highlights the strengths and weaknesses of the company's current strategy with minor omissions 2. Proposes a pseudo-solution to the problem 3. Outlines some of the pros and cons of the solution	1. Introduces a solution to the problem that the company could implement with much difficulty 2. Introduces a solution to the problem that the company could implement time OR cost-effectively
2	1. Demonstrates little comprehension of the issue presented as it pertains to either the industry or the company 2. Contains four or five errors or omissions pertaining to the scenario	1. Highlights the strengths and weaknesses of the company's current strategy with major omissions 2. Proposes a pseudo-solution to the problem 3. Outlines a few of the pros and cons of the solution	1. Introduces a solution to the problem that the company could implement with much difficulty 2. Introduces a solution to the problem that the company could not implement time or cost-effectively
1	1. Demonstrates no comprehension of the issue presented in any capacity	1. Does not propose a solution to the problem	1. Introduces a solution to the problem that cannot be implemented

Please visit https://www.esportsci.org/problem-solving-essay/ for an up-to-date, complete scoring breakdown.

Recommended Essay Workflow

While there is no formula for writing a good problem-solving essay, we have some recommendations that, if you follow them, will ensure that you are properly accounting for the criteria you will be graded on. If you have an alternate strategy for essay writing that you prefer, that is totally acceptable. Remember that you are not being graded on your writing but instead on your ability to comprehend and problem solve a situation in esports.

Analyze the Prompt

Though it might seem obvious, the first step of successful essay writing is to read the prompt closely. In addition to reducing the likelihood of misreading something and writing for the wrong prompt, close analysis of the prompt will ensure that you do not miss any critical information. The ECI essay does not write long prompts because we are not testing for your reading ability. Instead, we try to be as succinct as possible so that all of the information in the prompt is relevant to answering the essay.

When reading your prompt, consider the macro context (Is it framed through a team's perspective? A league? The whole industry?) and the micro context (Are you asked to solve a problem for a law firm? A team? An agency?). Then, consider the macro context within the micro context (How is this specific company different than other companies in the space?).

Taking time to carefully read and think through the prompt will set you up for a strong essay that addresses the facets through which you will be graded.

Brainstorm Solutions

After carefully thinking through the prompt, including both the presented problem and how it pertains to the company you are solving for, we recommend that you spend a few minutes brainstorming solutions. The word 'solutions' here is intentionally plural because the best idea might not come to you immediately. Consider the problem from several different

angles and note a few solutions that you might be able to come up with, including their strengths and weaknesses.

Select One Idea; Discard the Rest

You are only asked to write about one solution. As such, we recommend choosing the idea that you have come up with that you believe to be the best solution to the problem.

"Best" is relative, in this sense. For example, it might be the solution that is the easiest to implement or the one that has the highest likelihood of success. If you feel that the solution is the best one for rectifying the problem from the company's perspective, and you can articulate why that is your belief along with your solution's strengths and weaknesses, then it likely best addresses the prompt.

Outline a Logical Flow

Finally, before you write we suggest that you take up to five minutes to outline the flow of your essay. What are the key topics that you want to touch on? How should you structure the overall essay so that it flows logically?

You will not be graded on writing abilities, but presenting a logical flow is important for communicating your ideas. For example, if you were to present your solution to the prompt and why your solution is great before listing what the company's weaknesses are, it might be hard to understand how your solution addresses the prompt.

In total, this process should take anywhere from five to ten minutes of your total essay writing time. While you are using a part of your time to plan rather than answer the prompt, experience shows that planning rather than just jumping into an essay decreases the total amount of time it takes to answer the prompt and improves the quality of your response.

Sample Essay Prompt

Below is a sample ECI exam essay prompt and analysis of the relevant lines and thought processes that would score well divided by each grading rubric criteria.

Sample Prompt

> You have been recently hired as a salesperson for Deities, a major esports organization in North America competing in many premiere esports titles, including *League of Legends* and *Overwatch*, among others. Before your joining, Deities signed a one-year partnership with Example Clothing Inc. (ECI) centered around Deities' *Call of Duty* team. You are responsible for securing a partnership extension with ECI, but Deities sold their *Call of Duty* team around the same time that you joined the company.
>
> How can you transition the partnership away from *Call of Duty* while maintaining the aspects of the previous deal that ECI liked? What was the value that Deities provided to ECI? What are some examples of inventory that might be included in the renewal?

Comprehension

To score full comprehension marks on your essay, you must demonstrate that you:

1. Understand the issue presented as it pertains to the company; and,
2. Understand the issue presented in its macro industry context.

Furthermore, you should check to ensure that your answer is free of errors and omissions.

In the above sample, you are a salesperson trying to secure a deal renewal with a lifestyle clothing brand. You work for Deities, a large, well-established esports organization competing in many games. The lifestyle clothing brand, ECI, is interested in *Call of Duty* as an esport, but Deities recently sold their team.

Several macro-industry points are relevant to this situation. ECI might not renew their contract with Deities and instead opt to sponsor another team that has an active *Call of Duty*

roster. ECI might also choose to renew their contract with Deities despite the lack of Deities' *Call of Duty* roster. Sales is not an absolute thing until the contract is signed.

Another macro-industry point to consider is why ECI likes *Call of Duty* as an esport. What are the various aspects of *Call of Duty* esports that other titles do not have? For example, *Call of Duty* has a much larger console player base than most popular esports in the United States. Furthermore, *Call of Duty* is a red-blood, first-person shooter game, which means that it involves more mature themes than many other popular esports.

Moving to micro-industry topics, consider Deities' specific aspects of the issue presented. Deities recently sold their *Call of Duty* roster, distancing themselves from the game, and subsequently the branding of the game. Deities has a unique combination of team rosters and content creators that no other team currently has. Deities is also already sponsored by ECI, so any deal negotiations will proceed differently from a first-time sponsorship.

The paragraphs above outline an example of what you could cover in your essay to demonstrate understanding of the situation as it pertains to the macro and the micro. There is not one "correct" answer, but there *are* incorrect answers that will lose you points. For example, saying that *Call of Duty* is a MOBA like *League of Legends* is strictly incorrect.

Solution

This is the creative part of the essay process. Given the situation as it pertains to both the industry-wide and company-specific aspects of the problem, propose a solution to the problem. Even more so than for the comprehension criteria, there is no "right answer" to the solution you present. However, there are some guidelines to consider when crafting and presenting your answer.

You should ensure that your stated solution communicates:

1. The strengths and weaknesses of the company's existing situation; and,
2. The strengths and weaknesses of your solution, and how they interact together.

An example solution to the essay prompt above would be to offer ECI a renewal focused around both the *League of Legends* and *Overwatch* teams for the price of what you would have sold a renewal around *Call of Duty* for. The previous *Call of Duty*-focused sponsorship allowed ECI to receive the exact asset they wanted. A *Call of Duty*-focused sponsorship might have given ECI the branding that they wanted (recall the macro notes above). A weakness of the new partnership is that neither *League of Legends* nor *Overwatch* is a red-blood game, so you may be losing out on some of the brand association. That said, *Overwatch* is a shooter game as well, so ECI might not mind. Furthermore, *League of Legends*' viewership is much higher than *Call of Duty*'s. Especially when combined with *Overwatch* viewership, the new deal should allow ECI's brand to reach a much wider audience.

By offering the renewal with the two teams for the same price as you would have for just *Call of Duty*, you decrease the likelihood that ECI feels like the price is too high and looks for another company in *Call of Duty* (macro notes). However, a weakness of pricing the renewal at that price is that you are likely undercutting yourself. Perhaps if you walked away from the sponsorship with ECI and went to market, you could find a sponsor for more money. Furthermore, if you are selling sponsorships for a lower amount of money, you are devaluing your brand for future deals.

Again, there is no correct answer here. The example above is just one example of topics you might want to touch on for an essay like this. It is important to note, though, that not renewing the deal is not an answer to the problem, since the sample prompt specifically asks you to propose a new partnership that retains ECI as a partner. Be sure to address the prompt directly.

Efficacy

Your essay response will also be scored by how realistically it could be implemented. The efficacy section checks to see how:

1. Feasible the solution is,

2. Time-sensitive the solution is; and,
3. Cost-effective the solution is.

The example proposed solution above is very feasible and time sensitive. Deities already owns the two properties that are being offered for the sponsorship. It is time-sensitive, as Deities can immediately begin working with their teams to fulfill the sponsorship. The solution is only neutrally cost-effective, however. While it does not add additional costs, you might be limiting potential gains because *Overwatch* and *League of Legends* together should sell for more than *Call of Duty* by itself.

An alternate proposed solution might be to buy back the *Call of Duty* team. This might be feasible (Deities recently sold their team so should have the cash to buy a team) but is not time-sensitive (deals like this take a long time) or cost-effective (buying a *Call of Duty* team costs tens of millions of dollars).

Another solution—giving ECI a controlling stake in Deities so that they can do what they want in exchange for the sponsorship—is not feasible.

Ensuring that your solution is feasible, cost-effective, and time-sensitive is key to proposing a "good" solution.

Final Notes

The problem-solving essay is a place for you to flex your knowledge of the esports industry and its problems. Though you are given a prompt that may or may not be in your intended vertical of esports, your understanding of the esports industry and the various businesses in esports will set you up for success.

The ECI Exam

PRACTICE TEST

2 Shortened Multiple Choice Sections (45/60 Questions each)

1 Essay

2.5 Hours

ESPORTS CERTIFICATION INSTITUTE

SECTION 1 – DATA COMPREHENSION

1

A normally distributed data set has a mean and standard deviation of 11.5 and 2.0, respectively. What value is exactly 2 standard deviations less than the mean?

a) 7.5
b) 8
c) 8.5
d) 9

2

Trend lines are used on scatter plots to determine the exact values of points within the data set.

a) TRUE
b) FALSE

3

A player is practicing their accuracy and has set a target of 80% average accuracy in six games. In their first five games, they averaged 78% accuracy. What must the player's accuracy be in the last game to achieve their goal of 80% accuracy across the six games?

a) 90%
b) 88%
c) 82%
d) 80%

4

A result is statistically significant when what is true? (choose all that apply)

a) The null hypothesis is true.
b) The alternative hypothesis is true.
c) The p-value is less than or equal to the significance level.
d) The p-value is greater than the significance level.

5

A data set from the marketing team shows that the company's mean (average) Twitter post receives 30 retweets with a standard deviation of 2.5. Which of the following values are **more** than 2 standard deviations from the mean? (choose all that apply)

a) 22.5
b) 23.5
c) 32.5
d) 36.0

6

A study of gamers in the US found that on average gamers played 72 minutes of video games a week. The data set was normally distributed and had a standard deviation of 3 minutes. Which of the following times fall between one and two standard deviations away from the mean? (choose all that apply)

a) 67
b) 68
c) 73
d) 77

7

In a survey, you create a question to ask for the respondent's location. This is an example of which of the following?

a) Quantitative data
b) Qualitative data

8

You observe the following data set for esports merchandise prices: 2, 12, 15, 19, 11, 16, 18, 12, 12, 42. You remove the outliers (2, 42) from this data set. What effect does removing the outlier have on the distribution of the data? (choose all that apply)

a) The mean will decrease.
b) The median will decrease.
c) The mean will increase.
d) The median will increase.

9

A data set that follows a power law relationship will have a right skew.

a) TRUE
b) FALSE

10

What are some of the cons of an advertisement model based on CPM? (choose all that apply)

a) Duplicate views from the same visitor can skew views.
b) It lowers brand awareness.
c) Even if the ad does not load, it counts as an impression.
d) You pay for displaying ads rather than conversions.

11

What are some of the potential consequences of NOT cleaning dirty data? (choose all that apply)

a) Wasted resources
b) Faulty communications
c) Lost productivity
d) Unnecessary marking spend

12

Which of the following is an example of quantitative data? (choose all that apply)

a) Salary
b) Major
c) Years of work experience
d) Height

13

Forty percent of the employees at an esports company have passed the ECI exam. Among the employees who have not passed the exam, 32 have black hair and 16 do not. How many employees does the esports company have?

a) 60
b) 80
c) 96
d) 108

14

You survey people who play video games to determine if people think that playing video games is detrimental to people's health. Which type of bias is present in your survey?

a) Lack of accuracy
b) Selection bias
c) Nonresponse bias
d) Response bias

15

What does a negative correlation coefficient imply? (choose all that apply)

a) The correlation is less than -1.
b) The two variables with this correlation move in opposite directions.
c) The two variables with this correlation move in unrelated directions.
d) The two variables with this correlation move in the same direction.

16

Which of the following are arguments to use a scatter plot? (choose all that apply)

a) To discretize values clearly
b) To show large quantities of data
c) To show a correlation between variables and clustering effects
d) To compare two values as a part of a greater whole

17

Range is typically used for which of the following reasons? (choose all that apply)

a) Determining the average of a data set
b) Identifying the standard deviation of the data set
c) Reflecting the spread of the data set
d) Identifying outliers in the data set

18

Oversampling adjusts the distribution of a data set to better balance the representation of categories.

a) TRUE
b) FALSE

19

Your marketing team is experimenting with creating a soft drink. The ratio, by volume, of flavoring to sugar to water in the drink is 1 : 5 : 25. The soft drink will be altered so that the ratio of flavoring to sugar is halved while the ratio of sugar to water is doubled. If the final drink contains four ounces of sugar, how many ounces of water will it contain?

a) 5
b) 10
c) 16
d) 20

20

CPM is useful for advertisers who want to drive brand awareness and engagement.

a) TRUE
b) FALSE

21

A *Valorant* player reports the following kills from their matches: 10, 10, 11, 12, 13, 14, 21, 22, 25, 26, 29, 35, 37, 38. What is the value of the 3rd quartile of the data set?

a) 21.5
b) 26
c) 29
d) 35

22

A correlation coefficient tells you information regarding which of the following? (choose all that apply)

a) Predictions about a value for a variable given a specific value of another variable
b) The strength of the relationship between the two variables
c) The direction of the relationship between the two variables
d) None of the above

23

Dimensionality reduction is the process by which you reduce the size of your data set but keep the number of input variables constant.

a) TRUE
b) FALSE

24

When graphing data, a trend line can help you identify which of the following in your data set? (choose all that apply)

a) Outliers
b) The median
c) The mean
d) The range

25

Which of the following are types of descriptive statistics? (choose all that apply)

a) Measures of frequency
b) Measures of position
c) Measures of central tendency
d) Measures of variation

26

For what reasons might you want to use prescriptive analytics? (choose all that apply)

a) To make decisions based on model predictions
b) To narrow down the correct recommendation for a specific decision
c) To determine the likelihood of various trends
d) To discover new connections within data

27

Bar graphs are used to present similar data to which of the following types of graphs? (choose all that apply)

a) Stem and leaf graphs
b) Line graphs
c) Tree diagrams
d) Scatter plots

28

Gamer A spent $14 less than Gamer B did on merchandise this year. If Gamer A spent $196 on merchandise this year, then Gamer A's merchandise spend is what percentage **less** than Gamer B's merchandise spend in that same year?

a) 6.7%
b) 7.1%
c) 7.5%
d) 7.9%

29

After hypothesis testing, you can take the result as correct 100% of the time.

a) TRUE
b) FALSE

30

You are surveying *League of Legends* players about their rank. In your survey, you ask the players what rank that they think that they should be. This is a question from which what type of bias might arise? (choose all that apply)

a) Lack of accuracy
b) Selection bias
c) Nonresponse bias
d) Response bias

31

Classification can be used with subjective or arbitrary attributes.

a) TRUE
b) FALSE

32

Three players reported that the amount of time they spent practicing for a game was between zero and ten hours, inclusive. If the mean number of hours the students reported that they practiced was 7.5 hours, what was the least possible number of hours that one of the players spent practicing?

a) 2.0
b) 2.5
c) 4.0
d) 4.5

33

Someone's favorite esport is an example of which of the following?

a) Quantitative data
b) Qualitative data

34

The law of diminishing returns states that as one input variable is increased, there is a point at which what happens?

a) The marginal per unit output decreases.
b) The marginal per unit output is zero.
c) The marginal per unit output is negative.
d) Nothing is produced.

35

When reading a bar graph, the width of the bar on the x-axis is important.

a) TRUE
b) FALSE

36

It is useful to use multi-stage cluster sampling when which of the following are true? (choose all that apply)

a) You are surveying a population that is widely dispersed.
b) You are trying to decrease bias in your survey.
c) You have limited time and money to conduct the survey.
d) You have a small but diverse data set.

37

When sampling a population of 500 people, the population is 40% left-handed. For the study, 40 lefties and 60 righties are chosen. This is an example of which type of sampling?

a) Cluster sampling
b) Representative sampling
c) Convenience sampling
d) Quota sampling

38

Which of the following are key characteristics of a good hypothesis?

a) Simplicity
b) Testability
c) Mutual exclusivity
d) Normal distributivity

39

A marketing firm conducted a study on 2500 individuals to determine the number of hours of video games people play a month. The study returned a normally distributed data set with mean 9 and standard deviation of 3. Approximately how many people play between 9 and 12 hours of video games per month?

a) 725
b) 750
c) 800
d) 850

40

Which of the following methods might you employ to reduce the impact of a population that has been over accounted for in previous samples?

a) Oversampling
b) Undersampling
c) Cluster sampling
d) Random sampling

41

Which of the following graphs would be useful in determining data skewness? (choose all that apply)

a) Histogram
b) Stem and leaf
c) Box plot
d) Bar chart

42

When using probability samples, the chance of a respondent being selected from the population is unknown.

a) TRUE
b) FALSE

43

The larger your sample size, the higher the likelihood of error in generalizing to the population.

a) TRUE
b) FALSE

44

Sampling provides a valid alternative to a census when it is impractical to survey a larger population.

a) TRUE
b) FALSE

45

When analyzing a skewed distribution, what set of measures of center and spread are most appropriate to analyze the distribution? (choose all that apply)

a) Mean
b) Median
c) Standard Deviation
d) Interquartile range

SECTION 2 – ESPORTS KNOWLEDGE

1

Which continent has the greatest number of esports fans?

a) North America
b) Europe
c) Asia
d) South America

2

Of the following four esports, which esport has the largest audience reach?

a) Overwatch
b) Counter-Strike: Global Offensive (CS:GO)
c) Call of Duty: Black Ops - Cold War
d) Rocket League

3

Which of the following is another way to describe content marketing?

a) Selling content for attention
b) Media-based advertising
c) Product marketing
d) None of the above

4

While esports has grown into a global industry, which country is typically attributed with having initially popularized esports?

a) USA
b) China
c) South Korea
d) Sweden

5

As an esports player-manager, you a responsible for ensuring that your players are present and prompt for all competitive matches.

a) TRUE
b) FALSE

6

In the traditional Venture Capital investment model, how often do investments fail?

a) Almost all venture capital backed companies fail
b) Half of all venture capital backed companies fail
c) A third of all venture capital backed companies fail
d) No venture backed companies fail

7

When looking to reach audiences in China, which of the following streaming platforms would be the best to use? (choose all that apply)

a) Twitch
b) DouYu
c) Azubu
d) Facebook

8

Why do some publishers choose to use a franchise model for their esports leagues? (choose all that apply)

a) Franchise fees allow for additional capital for the scene
b) Franchised leagues dramatically increase viewership
c) Franchises provide team owners with stability
d) Governments forced publishers to franchise esports leagues

9

North American esports fans skew younger than North American gaming fans on average.

a) TRUE
b) FALSE

10

Advantages of operating within a market niche include which of the following? (choose all that apply)

a) Lower competition in the short run
b) Lower competition in the long run
c) Defensibility from larger firms
d) Higher revenue potential

11

Which of the following could be classified as a "lead" as it pertains to a partnership?

a) An early show of interest from a prospective partner
b) A business that currently sponsors your company
c) Someone from a contact list
d) A brand that you like

12

An esports player-manager attending an esports event afterparty with their players can assume that they are "off the clock."

a) TRUE
b) FALSE

13

How are the esports and gaming industries different?

a) Esports is necessarily competitive, while gaming is necessarily not competitive.
b) Esports is a subsection of gaming.
c) Gaming is entirely about entertainment, while esports is entirely about competition.
d) Esports and gaming are two different words for the same thing.

14

What is a "deliverable" as it pertains to a partnership? (choose the best answer)

a) Something that one party in a partnership owes to another party
b) An agreement that two companies come to regarding what to focus on
c) A yearly gift that partners send to one another
d) A collection of graphic assets that partners can use for public relations

15

Franchised esports slots are considered assets that are **stagnant** in value.

a) TRUE
b) FALSE

16

Which of the following games are more played on PC than on mobile or console? (choose all that apply)

a) *League of Legends*
b) *PUBG*
c) *Call of Duty*
d) Fortnite

17

In a typical esports sales cycle, _____ is the best quarter for B2B sales.

a) Q1
b) Q2
c) Q3
d) Q4

18

Which of the following esports primarily operate under a closed-circuit, franchised, competitive league structure? (choose all that apply)

a) *League of Legends*
b) *DOTA 2*
c) *Overwatch*
d) *Counter-Strike: Global Offensive*

19

What is the most watched esport globally, measured by average concurrent viewers for the last calendar year?

a) *League of Legends*
b) *PUBG Mobile*
c) *Fortnite*
d) *Overwatch*

20

If Team C advances to the finals of this single game elimination tournament, how many games would they have already played to get there?

a) 1
b) 2
c) 3
d) 4

21

What are some of the benefits of maintaining a personal social media presence? (chose all that may apply)

a) Showing employers that you understand industry trends
b) Sharing articles privately
c) Building a personal brand
d) Posting to generate reactions from your audience

22

Which of the following are among the top-10 largest esports orgs today, measured by aggregate social media following across all platforms? (choose all that apply)

a) FaZe Clan
b) G2 Esports
c) Cloud9
d) Hellraisers

23

Conflict is constructive when which of the following is true?

a) It helps to build new insights into a relationship.
b) Both people get what they want.
c) It prevents all future conflict.
d) There are a clear winner and a clear loser.

24

Someone who is looking to determine a company's competitive advantage might look to identify which of the following areas? (choose the best answer)

a) The company can offer a solution to a problem that is superior to the competitors' solution.
b) The company can offer a related product at a discounted price.
c) The company can offer the product to a broader market.
d) The company can offer a new product line.

25

What is the most watched esport, globally, measured by hours watched in a year?

a) League of Legends
b) PUBG Mobile
c) Fortnite
d) Overwatch

26

Which of the following esports primarily operate through a mixture of tournaments throughout the year?

a) League of Legends
b) DOTA 2
c) Overwatch
d) Counter-Strike: Global Offensive

27

North American esports fans skew more gender diverse than North American gaming fans.

a) TRUE
b) FALSE

28

Esports teams generally sell _____ to sponsors. (choose the best answer)

a) Viewership from fans
b) Player attention
c) League representation
d) All of the above

29

Super Smash Brothers' competitive origin stems back to which of the following?

a) Grassroots tournaments
b) Media-hosted tournaments
c) Developer-hosted tournaments
d) Publisher-hosted tournaments

30

How do teams competing in open esports ecosystems make money? (choose all that apply)

a) Sponsorships
b) Media rights
c) Tournament winnings
d) League revenue sharing

31

Esports companies, irrespective of business, are heavily influenced by the incentives of the company's major investors.

a) TRUE
b) FALSE

32

What are some key areas in which esports teams are not able to generate revenue common to a traditional sports team? (choose all that apply)

a) Local media deals
b) Concessions
c) Geo-located venue and ticket sales
d) Merchandising

33

Which of the following games are played **more** on mobile or console than on PC? (choose all that apply)

a) *League of Legends*
b) PUBG
c) *Call of Duty*
d) *Fortnite*

34

Which of the following is the largest source of revenue for most esports teams?

a) Sponsorships
b) Advertising
c) Merchandise
d) Ticketing

35

Which of the following was among the top-10 largest esports orgs in 2014, measured by fandom?

a) 100 Thieves
b) San Francisco Shock
c) G2 Esports
d) Evil Geniuses

36

A major difference between modern esports fandoms and older esports fandoms is that modern fandoms are more driven by influencers and media than they previously were.

a) TRUE
b) FALSE

37

When posting on social media, you should consider which of the following? (choose all that apply)

a) The audience for the post
b) Whether the content is viral
c) The reflection on your friends and employer
d) Your personal brand

38

Which of the following could be arguments for a player receiving a salary? (choose all that apply)

a) Stable income
b) Corporate healthcare
c) Operational freedom
d) Higher revenue potential

39

Recent esports ecosystems are typically created and promoted by game publishers. In the early days of esports, what was the most common form of tournament?

a) Collaboration between publishers and tournament organizers
b) Grassroots movements
c) MLG events
d) “Major and minor” division of events

40

Which of the following is another way to say, "content in a text-based format"?

a) Clickthrough
b) SEO
c) KPI
d) Copy

41

Which of the following is a simple and effective process for collecting information on the organization's current state by answering four basic questions about the company?

a) SWOT analysis
b) Decline analysis
c) TRUMP analysis
d) AMAZ analysis

42

Imagine that there is a streamer who streams *League of Legends* gameplay on Twitch. Who owns their Twitch channel content?

a) Twitch
b) The streamer
c) Riot Games
d) Tencent

43

The majority of esports team revenue is derived through which of the following?

a) Direct to consumer sales
b) Business to business sales
c) An approximately even mixture of answers (a) and (b)
d) It is impossible to say.

44

Which of the following are commonly considered to be factors hampering the growth of esports? (choose all that apply)

a) Publishers are incentivized to make new games instead of investing in the esports scene.
b) Investors do not want to invest in the esports scene as they do not see future returns.
c) Nuanced differences between esports make it hard to gain a mass following.
d) Lack of fan interest.

45

When determining the size of an esport, what are some key indicators to consider? (choose all that apply)

a) Monthly active players
b) Tournament format
c) Hours watched
d) AMA

PRACTICE EXAM MULTIPLE CHOICE ANSWER KEY

DATA COMPREHENSION

1	A
2	B
3	A
4	C
5	A; B; D
6	C
7	B
8	A
9	A
10	A; C
11	A; B; C; D
12	A; C; D
13	B
14	B
15	B
16	B; D
17	C; D
18	A
19	C
20	A
21	C
22	B; C
23	B
24	A; D
25	A; B; C; D
26	A
27	A
28	B
29	B
30	A
31	B
32	D
33	B
34	A
35	B
36	D
37	B
38	A; C
39	D
40	B
41	A; B; C; D
42	B
43	B
44	A
45	A; B; D

ESPORTS KNOWLEDGE

1 C
2 B
3 A
4 C
5 A
6 A
7 B
8 A; C
9 A
10 A
11 A
12 B
13 B
14 A
15 B
16 A
17 D
18 A; C
19 A
20 B
21 A; C
22 A; B; C
23 A
24 A
25 A
26 B; D
27 B
28 D
29 A
30 A; C
31 A
32 A; B; C
33 B; C; D
34 A
35 D
36 A
37 A; C; D
38 A; B
39 B
40 D
41 A
42 B
43 B
44 A; C
45 A; C; D

PRACTICE ESSAY

Prompt

As a newly hired marketer for an athletic apparel company, your first role is to create a campaign to market your brand to LCS fans. You are told that the most important outcome of the marketing campaign is increased brand awareness.

Propose two marketing campaigns at different price points that your company can implement to grow brand awareness among LCS fans. What are the strengths and weaknesses of each campaign?

FINAL NOTES

We at Esports Certification Institute would like to extend you our heartfelt thanks for your purchasing this guide and allowing us to be one small part of your journey through esports. In line with our mission to increase diversity and inclusion, foster meritocracy, and promote professionalism in esports, it is our privilege to work with so many unique people all over the world. We are excited to see where your journey through esports takes you.

We want to hear from you in the future. Please keep us updated on your story in esports, and if you see any opportunities for us to improve, please do not hesitate to reach out. Best of luck both on the ECI Exam and in life. We are proud of you for taking the first steps towards your career in esports and are wishing for your continued success.

If you would like to reach out to us, please send us an email at contact@esportsci.org.

Thanks!