



DASH CAT 6

Instructions

The passage below is accompanied by a set of questions. Choose the best answer to each question.

Asmat is, in its way, a perfect place. Everything you could possibly need is here. It's teeming with shrimp and crabs and fish and clams. In the jungle there are wild pig, the furry, opossumlike cuscus, and the ostrichlike cassowary. And sago palm, whose pith can be pounded into a white starch and which hosts the larvae of the Capricorn beetle, both key sources of nutrition. The rivers are navigable highways. Crocodiles 15 feet long prowl their banks, and jet-black iguanas sun on uprooted trees. There are flocks of brilliant red-and-green parrots. Hornbills with five-inch beaks and blue necks. And secrets, spirits, laws and customs, born of men and women who have been walled off by ocean, mountains, mud and jungle for longer than anyone knows.

Until 50 years ago, there were no wheels here. No steel or iron, not even any paper. There's still not a single road or automobile. In its 10,000 square miles, there is but one airstrip, and outside of the main "city" of Agats, there isn't a single cell tower. Here it's hard to know where the water begins and the land ends, as the Arafura Sea's 15-foot tides inundate the coast of southwest New Guinea, an invisible swelling that daily slides into this flat swamp and pushes hard against great outflowing rivers. It is a world of satiny, knee-deep mud and mangrove swamps stretching inland, a great hydroponic terrarium.

We were crossing the mouth of the Betsj River, a turbulent place of incoming tide and outrushing water, when the waves slammed and our 30-foot longboat rolled. I crawled forward, reached under a plastic tarp and fumbled blindly in my duffel for the Ziploc bag holding my satellite phone, and slipped it into my pocket. I hadn't wanted to bring the phone, but at the last minute I'd thought how stupid it would be to die for want of a call. If Michael Rockefeller had had a radio when his catamaran overturned in this exact spot in 1961, he never would have disappeared.

He was 23 years old, the privileged son of New York Gov. Nelson Rockefeller, seven months into the adventure of a lifetime that had transformed him from clean-cut student to bearded photographer and art collector. One moment his boat was being tossed by the waves, just as ours was, and the next he and his Dutch companion were clinging to an overturned hull. And then Rockefeller had swum for shore and vanished. No trace of him was ever found, despite a two-week search involving ships, airplanes, helicopters and thousands of locals prowling the coasts and jungle swamps. The fact that such a simple, banal thing had happened to him made what was happening to us feel all the more real. There would be no foreboding music. One bad wave and I'd be clinging to a boat in the middle of nowhere.

The official cause of Michael's death was drowning, but there had long been a multitude of rumors. He'd been kidnapped and kept prisoner. He'd gone native and was hiding out in the jungle. He'd been consumed by sharks. He'd made it to shore, only to be killed and eaten by the local Asmat headhunters. The story had grown, become mythical. There had been an off-Broadway play about him, a novel, a rock song, even a television show in the 1980s hosted by Leonard Nimoy.



1. In the context of the first paragraph, the term 'walled off' has been used to indicate that:

- A. the rituals and customs characteristic of the Asmat people represent their natural surroundings.
- B. the Asmat people have been secluded from others due to the natural surroundings.
- C. there is a gap inherent in the cultures and traditions of the Asmat people.
- D. The spiritual and social aspects of the lives of the Asmat people are cordoned off completely.

Sol. And secrets, spirits, laws and customs, born of men and women who have been walled off by ocean, mountains, mud and jungle for longer than anyone knows.

From the above line, the author wants to convey that there are certain aspects of the Asmat life that is created by people who have been separated from the rest of the world by a natural barrier made by the ocean, mountains, mud and the jungle for long time. Thus, Option B is the correct answer here.

Options A, C, and D distort the author's message. Hence, they can be eliminated.

2. The purpose of the second paragraph is to:

- A. underscore the role of the difficult environment in the lack of development in Asmat.
- B. highlight the dangerous conditions in which the Asmat people live.
- C. paint a picture of the unique environment present in Asmat.
- D. highlight the interconnection of development and the natural environment.

Sol. Until 50 years ago, there were no wheels here. No steel or iron, not even any paper. There's still not a single road or automobile. In its 10,000 square miles, there is but one airstrip, and outside of the main "city" of Agats, there isn't a single cell tower. Here it's hard to know where the water begins and the land ends, as the Arafura Sea's 15-foot tides inundate the coast of southwest New Guinea, an invisible swelling that daily slides into this flat swamp and pushes hard against great outflowing rivers. It is a world of satiny, knee-deep mud and mangrove swamps stretching inland, a great hydroponic terrarium.

In the second paragraph, the author tries to describe the peculiar environment in which Asmat is situated. They do not have many things that are taken for granted in the modern world. Moreover, the natural aspects of the region is a wonder in its own. Here, the author does not have an ulterior motive while mentioning this beauty and mentions it solely to paint a picture in the minds of the reader, which would act as a base for the rest of the passage. Thus, Option C is the correct answer.

3. What was the significance of Michael's story in the author's travels mentioned in the passage?

- A. It was a crude parallel that went on to become a host of various conspiracy theories.
- B. It gave the author the necessary incentive to always carry a phone with him.
- C. It was a clear warning to the author not to venture close to the water of Asmat.
- D. It was a similar event that gave the author a reality check about his own journey.



Sol. One moment his boat was being tossed by the waves, just as ours was, and the next he and his Dutch companion were clinging to an overturned hull. And then Rockefeller had swum for shore and vanished. No trace of him was ever found, despite a two-week search involving ships, airplanes, helicopters and thousands of locals prowling the coasts and jungle swamps. The fact that such a simple, banal thing had happened to him made what was happening to us feel all the more real. There would be no foreboding music. One bad wave and I'd be clinging to a boat in the middle of nowhere.

To bring his own travels into perspective, the author shares a supposedly famous story about a person who was lost under similar conditions. This gave the author a reality check that a minor disturbance could be detrimental to him. Thus, Option D is the correct answer.

Option A does not show any significance of the story in the author's travels.

Option B is distorted. It mentions about author carrying the phone everywhere he went, which is not implied in the passage.

Option C has not been mentioned in the passage anywhere.

4. The last paragraph serves to highlight the:

- A. the plethora of conspiracy theories that sprouted about Michael's death.
- B. dangers that the author himself could face if he continued on the journey.
- C. The possible dangers that might lurk in Asmat and surrounding waters.
- D. The fickle-minded nature of the journalists and laypeople who conjure up stories.

Sol. The official cause of Michael's death was drowning, but there had long been a multitude of rumors. He'd been kidnapped and kept prisoner. He'd gone native and was hiding out in the jungle. He'd been consumed by sharks. He'd made it to shore, only to be killed and eaten by the local Asmat headhunters. The story had grown, become mythical. There had been an off-Broadway play about him, a novel, a rock song, even a television show in the 1980s hosted by Leonard Nimoy.

In the last passage, we can see that the author is trying to highlight all the stories that were made up to explain Michael's death. The author also considers them 'rumours' and 'mythical'. Thus, we can say that the author is trying to highlight all the associated conspiracy theories, without actually sensing any danger in them. Thus, Option A is the correct answer.

Instructions

The passage below is accompanied by a set of questions. Choose the best answer to each question.

Isaiah Berlin understood the parable of the fox and the hedgehog - 'the fox knows many things, but the hedgehog knows one big thing' - to illustrate two styles of thinking. Hedgehogs relate everything to a single vision, a universally applicable organising principle for understanding the world. Foxes, on the other hand, embrace many values and approaches rather than trying to fit everything into an all-encompassing singular vision.



Debates about economic globalisation are often dominated by hedgehogs - actors who interpret and evaluate the dynamics and consequences of globalisation through a single lens. Take the narrative that dominated the debate about globalisation in the West from the collapse of the Soviet Union until the global financial crisis in 2008. On this view, economic liberalisation promised to grow the pie so that everyone - developed and developing countries, rich and poor - would be better off. This confident perspective touted free trade as a win-win outcome that would create peace and prosperity for all.

In recent years, this view has been challenged by a variety of narratives that stress that economic globalisation produces many losers. Right-wing populists lament the decay of America's rust belt, warning of the need to protect the native working class against the offshoring of manufacturing jobs and the onshoring of immigrants. Left-wing populists and critics of corporate power protest that globalisation's advantages often accrue mainly to rich people and powerful multinationals, hollowing out the middle class.

We are at a critical juncture: a relatively long period of stability in mainstream thinking about economic globalisation has given way to a situation of dramatic flux. During such periods, narratives assume particular relevance because they offer new ways for actors to understand what the problem is and what should be done about it.

The interplay of different narratives could be the starting point of a nuanced appraisal of the complexities, uncertainties and ambiguities of economic globalisation. More often, however, debates about economic globalisation devolve into stand-offs among hedgehogs who emphasise the validity of their perspective while seeking to expose their opponents as economically illiterate, politically dangerous or morally bankrupt.

A prime example of such a standoff was the reaction by establishment figures to the critiques of free trade and immigration that animated Donald Trump's presidential campaign in the United States and the Brexit movement in the United Kingdom. Many curled up into a ball of spikes, disparaging opponents for their stupidity and self-interest. But proponents of the insurgent narratives have been no less at fault: they have drawn much of their energy from their ability to present a radically different perspective, often at the cost of nuance and a willingness to compromise.

None of this is to say that the perspectives brought to light by the hedgehogs are not valid and valuable. Some of them harness the empirical and theoretical tools of particular academic disciplines to build our knowledge of the global economy, polity and environment. Others articulate a particular value system and spell out its ethical ramifications for organising the global flow of goods, people, capital, data and ideas.

Yet debates dominated by hedgehogs hinder us from moving forward. These debates tend to oscillate between two extremes. On some issues, proponents of different narratives seem to inhabit different worlds, with little or no interaction (silos). Some know a lot about inequality, for instance, but little about great-power competition or how the two might relate. At other times, the advocates of rival approaches clash forcefully, but the sides are so deeply entrenched in their own worldviews that genuine dialogue seems impossible (polarisation).

In order to grapple with complex issues such as economic globalisation, we need to develop more fox-like approaches that seek to overcome the silos and polarisation that are the hallmark of contemporary debates.



5. In the context of debates on economic globalisation, which of the following individuals would not be labelled as a ‘hedgehog’?

- A. A church-goer who responds with hostility when his religious belief is countered with rational questions.
- B. A politician who firmly holds that universal basic income is beneficial but fails to factor in other social welfare alternatives.
- C. A manager who takes suggestions from his team members but decides to not act upon them.
- D. An activist who asserts that the entire world should adopt veganism but does not want to talk about its environmental impact.

Sol. The following has been said about 'hedgehogs' in the context of debates on economic globalisation:

“Debates about economic globalisation are often dominated by hedgehogs - actors who interpret and evaluate the dynamics and consequences of globalisation through a single lens.”

“More often, however, debates about economic globalisation devolve into stand-offs among hedgehogs who emphasise the validity of their perspective while seeking to expose their opponents as economically illiterate, politically dangerous or morally bankrupt.”

Therefore, certain conspicuous traits come forth:

- (1) focus on one specific belief at the cost of overlooking other narratives; not much weight is given to other ideas that stray from personal belief
- (2) hostility in the face of rebuttal or counterarguments

We notice that Options A, B and D replicate these characteristics. Option C does not fit this criterion.

6. Which of the following is true as per the passage?

- A. Because of their unvalidated claims and extreme worldviews, hedgehogs are polarising the debate on economic globalisation.
- B. The critique of free trade and immigration policies that animated Donald Trump’s presidential campaign in the United States was unwarranted.
- C. Uninterrupted global trade prior to the 2008 Financial crisis enabled all nations to grow economically.
- D. A more fox-like approach to the debate on economic globalisation will help us negate the silos and polarisation that currently afflict it.

Sol. Option A: This is not stated in the passage. The first half of Option A is contrary to the author's view: "None of this is to say that the perspectives brought to light by the hedgehogs are not valid and valuable."

Option B: While the author cites the example of this standoff on certain aspects associated with globalisation, he does not call it 'unwarranted'. Thus, Option B can be rejected.

Option C: The author refutes this assertion in the third paragraph as follows: {This confident perspective touted free trade as a win-win outcome that would create peace and prosperity for



all...In recent years, this view has been challenged by a variety of narratives that stress that economic globalisation produces many losers}

Option D: This can be inferred from the ending lines: “In order to grapple with complex issues such as economic globalisation, we need to develop more fox-like approaches that seek to overcome the silos and polarisation that are the hallmark of contemporary debates.”

7. Complete the following statement: The third paragraph...

- A. showcases the distinct perspectives of left-wing and right-wing populists on the subject of economic globalization.
- B. counters the dominant narrative on globalisation by asserting how it is not a win-win scenario for all.
- C. presents how economic globalisation is detrimental to the well-being of all stakeholders involved in the process.
- D. highlights the antagonism between right-wing and left-wing populists on the subject of economic globalisation.

Sol. “In recent years, this view has been challenged by a variety of narratives that stress that economic globalisation produces many losers. Right-wing populists lament the decay of America’s rust belt, warning of the need to protect the native working class against the offshoring of manufacturing jobs and the onshoring of immigrants. Left-wing populists and critics of corporate power protest that globalisation’s advantages often accrue mainly to rich people and powerful multinationals, hollowing out the middle class.”

In the preceding paragraph, the author presents a dominant narrative in the debate on economic globalisation: the belief that free trade was beneficial to all. {"On this view, economic liberalisation promised to grow the pie so that everyone - developed and developing countries, rich and poor - would be better off. This confident perspective touted free trade as a win-win outcome that would create peace and prosperity for all."} In the third paragraph, he refutes this claim and says that such a policy has created many 'losers' in the process; the author emphasises how it fell short of its promise of bringing widespread peace and prosperity. Option B correctly captures the purpose of the third paragraph.

8. Current debates about economic globalisation are marked by all of the following elements EXCEPT:

- A. Most claims by proponents of economic globalisation are substantiated by empirical and theoretical tools of particular academic disciplines.
- B. Discourse on the subject is rife with conflict such that hedgehogs tend to validate their own claims and disparage that of their opponents.
- C. Discussions occur in extremes with some hedgehogs having an understanding of one particular narrative and being ignorant of others.
- D. The discourse is predominantly steered by hedgehogs who assess the underlying dynamics of globalization and its impact through a single lens.



Sol. Option A: The statement here has not been stated or implied in the passage.

Option B: We can infer this from: “More often, however, debates about economic globalisation devolve into stand-offs among hedgehogs who emphasise the validity of their perspective while seeking to expose their opponents as economically illiterate, politically dangerous or morally bankrupt.”

Option C: We can infer this from: “These debates tend to oscillate between two extremes. On some issues, proponents of different narratives seem to inhabit different worlds, with little or no interaction (silos). Some know a lot about inequality, for instance, but little about great-power competition or how the two might relate. At other times, the advocates of rival approaches clash forcefully, but the sides are so deeply entrenched in their own worldviews that genuine dialogue seems impossible (polarisation).”

Option D: We can infer this from: “Debates about economic globalisation are often dominated by hedgehogs - actors who interpret and evaluate the dynamics and consequences of globalisation through a single lens.”

Instructions

The passage below is accompanied by a set of questions. Choose the best answer to each question.

Think about biting into a piece of chocolate. What makes it enjoyable? Is it the sweetness? The way it melts in your mouth? The crunch? The sound it makes? All of the above? A team at the University of Amsterdam is attempting to use physics and geometry to answer some of these questions, and to—hopefully—create an even more enjoyable treat. Their result, a spiral-shaped 3-D printed candy, doesn't look like anything currently on the supermarket shelf. But it may just be the future of food.

“There wasn't anyone on the team who didn't like chocolate, fortunately,” says Corentin Coulais, a physicist at the University of Amsterdam who led the research, laughing. Coulais normally works with non-food “metamaterials”—materials with structures and properties not found in nature. In the past, his work has involved shape-changing materials with applications for robotics, prosthetic limbs and electronics. But a partnership with the food and consumer goods giant Unilever had him and his team turning their minds to chocolate. First, the researchers tempered dark chocolate containing 72 percent cacao—heating and cooling it carefully to give it a stable structure. Then they printed the chocolate into a series of spiral shapes using a 3-D printer. Some of the spirals were simple s-shapes, while others were more intricate, almost like labyrinths. The team then submitted the chocolates to a series of mechanical tests to see how they would break when “bitten.” When the chocolates were pressed from above, they shattered into many pieces (especially the more elaborately spiraled ones). When bitten from the side, they usually cracked only once.

Why does this matter? Well, the next step of the research, published last month in the journal *Soft Matter*, involved giving the chocolates to a very lucky panel of human testers. The investigators asked which shapes the testers preferred and why. “The more intricate the shape, the more crack it had, and the more they seemed to enjoy it,” Coulais says. This fact that testers enjoyed the more brittle chocolate was not surprising. Previous research has shown that people enjoy the sensation of food crunching or breaking in their mouths. They especially enjoy hearing the shattering sounds; taste researcher Alan Hirsch describes it as the “music of



mastication.” Some scientists think this may be because crunchiness is a signal of freshness—think fresh apples versus wilted cabbage—and that texture helped our ancestors seek out the most nourishing foods.

Chocolate, of course, is not famous for being healthy. But the research is part of the broader field of “edible metamaterials,” which has potential for creating foods that are more nutritious, easier to eat, or better for the environment. There are “exciting times ahead in the development of ‘metafoods,’” says Fabio Valoppi, a researcher at the University of Helsinki who studies edible metamaterials. The field is young, Valoppi says, but it’s full of promise. Valoppi mentions recent research on morphing pasta, or geometrically engineered pasta that goes from flat to 3-D during cooking. “You can imagine that having such a type of pasta can help reduce our ecological footprint by reducing emissions and transportation costs,” he says. “Flat pasta can be stacked more efficiently in a package, and having it morphing during cooking will allow us to eat them with the shapes we love the most.”

9. The main purpose of the study mentioned in the passage is to:

- A. determine which qualities would make the experience of chocolate eating more enjoyable.
- B. take the first step in the development of metafoods which are superior to conventional foods.
- C. find out what would be the ideal taste, shape and size of chocolates to improve the consumer experience.
- D. create an environmentally friendly and healthy eating option for the consumers.

Sol. Think about biting into a piece of chocolate. What makes it enjoyable? Is it the sweetness? The way it melts in your mouth? The crunch? The sound it makes? All of the above? A team at the University of Amsterdam is attempting to use physics and geometry to answer some of these questions, and to—hopefully—create an even more enjoyable treat. Their result, a spiral-shaped 3-D printed candy, doesn’t look like anything currently on the supermarket shelf. But it may just be the future of food.

The above excerpt shows that the study aims to answer some of the questions mentioned above. Moreover, throughout the passage, only the aesthetic aspects are discussed, and not the taste, sweetness, etc. Hence, the correct answer is Option A.

B: The development of metafoods is not concerned with the study. The study is just part of the industry that also deals with metafood production.

C: Option C is incorrect as it also includes 'taste', which does not come under the ambit of the study.

D: For the same reason as Option B, Option D can be eliminated.

10. Which of the following is definitely true about the spiral-shaped chocolates?

- A. The composition had an unusually high amount of cacao in it.
- B. They came in more than one shape.
- C. Metamaterials were an important constituent in them.
- D. The number of pieces they broke into changed with a change in bite angle.



Sol. A: Since we do not know what the usual percentage of cacao in chocolate looks like, option A is not definitely true.

B: Some of the spirals were simple s-shapes, while others were more intricate, almost like labyrinths.

Option B is the correct answer.

C: Option C is incorrect. Coulais earlier worked with non-food metamaterials.

D: It cannot be said that the number of pieces the chocolate broke in changes with a change in bite angle. It is possible that it only changes when the angle change is 90 degrees, that is vertical to horizontal.

11. Which of the following statements, if true, would cast the most doubt on the justification given by scientists in the last sentence of the penultimate paragraph?

- A. Certain fresh foods are not as nutritious as other stale foods.
- B. A few foods exist that are soft but become crunchy as they go stale with time.
- C. Knowledge and habits gained by humans are not passed on to their progeny.
- D. A study showed that crunchy foods cause better jaw development and keep teeth healthy.

Sol. Previous research has shown that people enjoy the sensation of food crunching or breaking in their mouths. They especially enjoy hearing the shattering sounds; taste researcher Alan Hirsch describes it as the “music of mastication.” Some scientists think this may be because crunchiness is a signal of freshness—think fresh apples versus wilted cabbage—and that texture helped our ancestors seek out the most nourishing foods.

In the sentence, the author mentions how scientists justify the fact that people enjoy crunchy food. Scientists say that crunchiness signifies the freshness of foods, and this has been ingrained in us since ancestral times.

A: Option A does not weaken the justification. Certain nutritious foods, even after going stale, would remain more nutritious than other less nutritious but fresh foods.

B: It has not been mentioned that these foods were an important part of our ancestral foods, important enough to make a habit of opting for softer foods.

C: Option C is the correct answer. If this knowledge was not passed, our bodies would have no way of knowing that crunchy means fresh.

D: Option D tries to introduce an additional explanation. This does not weaken the justification as much as Option C, since we do not know which of the two explanations is scientifically better. Hence, Option D can be eliminated.

12 In the context of the wider field of edible metamaterials, the chocolate experiment can be best said to be:

- A. an aberration, as it focuses on unhealthy food rather than improving the nutrition intake of consumers.
- B. a representative of the emerging field and an important innovation to be considered seriously.
- C. a part of a broad field whose objectives are not representative of the objectives of the field.
- D. a trailblazer that would pave the way for other such studies in the future.



Sol. Chocolate, of course, is not famous for being healthy. But the research is part of the broader field of “edible metamaterials,” which has potential for creating foods that are more nutritious, easier to eat, or better for the environment. There are “exciting times ahead in the development of ‘metafoods,’” says Fabio Valoppi, a researcher at the University of Helsinki who studies edible metamaterials.

From the above excerpt, we can see that the author points out that the chocolate experiment is but a part of a broader field. He also cautions that it is not entirely representative of the field, since the field has other motives that do not sit well with the unhealthy nature of chocolates. Hence, Option C is the correct answer.

Option A comes close. However, we cannot say that it is an aberration. Many studies in the field might have similar objectives.

Since it is not a representative of the field completely, Option B can be eliminated.

It has not been mentioned anywhere that the study is first of its kind, hence, we cannot call it a trailblazer. Option D can be eliminated.

Instructions

The passage below is accompanied by a set of questions. Choose the best answer to each question.

In the history of Western aesthetics, the subject matters that received attention ranged from natural objects and phenomena, built structures, utilitarian objects, and human actions, to what is today regarded as the fine arts. However, beginning with the nineteenth century, the discourse has become increasingly focused on the fine arts. This narrowing attention occurred despite the prominence of the aesthetic attitude theory in modern aesthetics, according to which there is virtually no limit to what can become a source of aesthetic experience. The tendency to equate aesthetics with the philosophy of art became widespread in twentieth century aesthetics, particularly within the Anglo-American tradition.

Challenges to this rather limited scope of aesthetics began during the latter half of the twentieth century with a renewed interest in nature and environment, followed by the exploration of popular arts. Everyday aesthetics continues this trajectory of widening scope by including objects, events, and activities that constitute people’s daily life. However, it is more accurate to characterize this recent development as restoring the scope of aesthetics rather than opening a new arena.

In addition, many cultural traditions outside the Western sphere have long been concerned with the aesthetics of daily life. In some cultural traditions, such as Inuit and Navajo, aesthetic considerations are thoroughly integrated in daily activities, including making things such as tools (Papanek 1995; Witherspoon 1996). Even in other traditions, such as Japanese and Chinese, with distinctive art-making practices of paintings, literature, theatre, and the like, aesthetic practices permeate people’s daily life. One of the findings of comparative aesthetics is that a greater emphasis is placed on the aesthetics of everyday life in many non-Western cultures than in the West (Higgins 2005).

Thus, the perception that everyday aesthetics is a new frontier of aesthetics discourse needs to be situated in the context of late twentieth-century Anglo-American aesthetics. That is, it was established as a reaction against what was considered to be an undue restriction on the scope of



aesthetics. It aims to give due regard to the entirety of people's multi-faceted aesthetic life, including various ingredients of everyday life: artifacts of daily use, chores around the house, interactions with other people, and quotidian activities such as eating, walking, and bathing. Everyday aesthetics also seeks to liberate aesthetic inquiry from an almost exclusive focus on beauty (and to a certain extent sublimity) characteristic of modern Western aesthetics. It includes within its purview those qualities that pervade everyday experience, such as pretty, cute, messy, gaudy, tasteful, dirty, lively, monotonous, to name only a few. These items and qualities are characterized by their ubiquitous presence in the daily life of people, regardless of their identity, occupation, lifestyle, economic status, social class, cultural background, and familiarity with art.

Beyond attending to more items and qualities for its inquiry, everyday aesthetics also raises theoretical issues that have not received adequate attention from the prevailing mainstream Western aesthetics. These include: indeterminate identity of the object of aesthetic experience due to a lack of an institutionally agreed-upon framing; changes and modifications everyday objects go through; general anonymity of the designer and creator, as well as absence of any clear authorship behind everyday objects; bodily engagements with objects and activities and their pragmatic outcome; perceived lack of criteria for aesthetic judgments. By raising these issues, everyday aesthetics challenges long-held assumptions underlying art-centered aesthetics discourse.

13. The increased focus of aesthetics on only fine arts was peculiar due to:

- A. the fact that the prevalent aesthetic theory did not clearly define the scope of items that could be sources of aesthetics.
- B. the rich history of aesthetics that has a broader range of sources in aesthetics.
- C. the fact that prevalent perception held that a broader range of sources could incite an aesthetic experience.
- D. the fact that aesthetics can be equated to the philosophy of art.

Sol. Direction: Aesthetics being endemic to art only, and not universal with unlimited sources.

The reason why this seems peculiar: This has occurred in spite of the dominance of aesthetic theory, which says that there is no limit to sources that can generate aesthetic experience. Thus, considering only art to be a source of this aesthetics, and at the same time accepting that there is no limit to the sources of aesthetics, is peculiar. Thus, Option C is the correct answer.

- A: Option A is a distortion of what has been said in the passage. An absence of a clear definition for the source of aesthetics has not been implied.
- B: The rich history is not the reason for this peculiarity as explained above.
- D: This has not been cited as a reason for the peculiarity.



14. "However, it is more accurate to characterize this recent development as restoring the scope of aesthetics rather than opening a new arena."

Which of the following would do most to weaken the above statement in the context of its usage in the passage?

- A. Most of the fine arts in earlier times had living things as the primary subject instead of objects.
- B. Early cultures focused on utility, and aesthetic appearance was an unintended consequence.
- C. Scientists have found tools from the stone age that have a unique, aesthetic appearance.
- D. Most art forms practised today are just reimaginings of much older art forms.

Sol. The statement implies that making daily objects the subject of aesthetics is not a new concept and has been done before. Thus, a statement that implies that it is a novel concept will weaken it the most.

A: Even if most of the fine arts dealt with living objects, we cannot say the aesthetics of daily objects was not appreciated.

B: It implies that people were not focused on aesthetics and only on utility. Any aesthetic feature was just an unintended consequence. Hence, Option B weakens the statement and is the correct answer.

C: This, in fact, strengthens the argument. This is evidence supporting the sentiment in the statement.

D: This is tangential to the given statement and hence can be eliminated.

15. Which of the following is NOT true about the new frontier of aesthetics mentioned in the penultimate paragraph?

- A. It broadened the focus of aesthetics from beauty to a plethora of qualities.
- B. It was formed with an aim to impart different facets to people's lives.
- C. It was formed because limiting the scope of aesthetics to fine arts seemed restrictive.
- D. It included regular objects that form a part of our daily life.

Sol. Everyday aesthetics also seeks to liberate aesthetic inquiry from an almost exclusive focus on beauty...

Option A can be inferred from the above line.

Option B is not true. The new frontier of aesthetics aimed to capture different facets of life and not to impart different facets to people's lives. Hence, Option B is the correct answer.

That is, it was established as a reaction against what was considered to be an undue restriction on the scope of aesthetics.

Option C can be inferred from the above excerpt.

It aims to give due regard to the entirety of people's multi-faceted aesthetic life, including various ingredients of everyday life: artifacts of daily use, chores around the house, interactions with other people, and quotidian activities such as eating, walking, and bathing.

Option D can be inferred from the above lines.



16. Which of the following is NOT a point of difference between mainstream Western aesthetics and the new frontier of aesthetics?

- A. The authorship of the aesthetic subject.
- B. The varying semblance of the subject.
- C. The utility of the subjects.
- D. Lack of distinguishing features of the subject.

Sol. These include: indeterminate identity of the object of aesthetic experience due to a lack of an institutionally agreed-upon framing; changes and modifications everyday objects go through (option B); general anonymity of the designer and creator, as well as absence of any clear authorship (option A) behind everyday objects; bodily engagements with objects and activities and their pragmatic outcome (option C); perceived lack of criteria for aesthetic judgments.

From the above excerpt, Options A, B, and C can be inferred.

Option D talks about a lack of distinguishing features, which has not been mentioned anywhere. Option D is the answer.

17. The passage given below is followed by four alternate summaries. Choose the option that best captures the essence of the passage.

Sir Frederic Bartlett demonstrated in his book Remembering (1932), no two people will repeat a story they have heard the same way and why, over time, their recitations of the story will diverge more and more. No 'copy' of the story is ever made; rather, each individual, upon hearing the story, changes to some extent - enough so that when asked about the story later - they can re-experience hearing the story to some extent, although not very well.

- A. An exact copy of a story is not stored in human minds, and the renderings of the same story change with person and time.
- B. Remembering postulates that human memory is flexible and each person is unique in the way they experience the world.
- C. When stories propagate, their meanings change as each listener perceives the story with a different context.
- D. Human memory is flexible, and every story that passes through it gets altered with each retelling.

Sol. The main points of the paragraph:

1. No two people tell a story in the same manner.
2. The retelling of stories changes with time.
3. No exact copy of the story is kept in our minds.

Option A captures this aptly and is the correct answer.

B: Misses out on a lack of a copy in our minds.

C: Misses out on the fact that the retellings change with time.

D: Misses out on the fact that different people have different versions of the same story.



18. The passage given below is followed by four alternate summaries. Choose the option that best captures the essence of the passage.

As important as fungal networks are, they are often left out of conservation and climate plans. To address this problem a team of scientists announced a massive undertaking in early 2021: to map the Earth's fungal networks. The initiative, called the Society for the Protection of Underground Networks (SPUN), was founded by Toby Kiers, an evolutionary biologist at Vrije Universiteit Amsterdam, and Colin Averill, a microbial ecologist at ETH Zürich. To achieve the goal, Kiers, Averill and their collaborators are building the ultimate map. It'll help scientists understand how climate change affects mycorrhizal communities and zero in on regions that need the most attention, such as those threatened by deforestation or agriculture.

- A. Mycorrhizal communities are being brought out to the front by a new program launched on fungal networks by SPUN and its collaborators.
- B. SPUN is a multi-disciplinary initiative founded by academics to research the overlooked area of underground fungal networks by preparing an ultimate global map of them.
- C. The ultimate map of fungal networks will help scientists study the ill effects of climate change on microbial communities.
- D. The initiative of SPUN to map the oft-overlooked fungal networks will help understand the impact of climate change on them and aid conservation efforts.

Sol. The main points of the paragraph are:

1. SPUN is trying to map the fungal networks that are often forgotten in climate plans and conservation efforts.
2. This will help scientists understand the impact of climate change on mycorrhizal communities and pinpoint areas where help is needed.

A: Option A misses out on the 2nd point.

B: Option B also misses out on the 2nd part.

C: Option C leaves out SPUN.

D: Option D aptly captures the above two points and is the correct answer.

19. Five sentences related to a topic are given below. Four of them can be put together to form a meaningful and coherent short paragraph. Identify the odd one out.

1. The procedure was the first time that a genetically-modified animal heart functioned as a human heart without immediate rejection by the body.
2. A 57-year-old man who was the first to receive a pig heart transplant died two months after the procedure, per the University of Maryland School of Medicine.
3. On New Year's Eve, the Food and Drug Administration granted emergency authorization for the never-done-before surgery.
4. Mr. Bennett became known by millions of people around the world for his courage and steadfast will to live.
5. David Bennett Sr. received the organ on January 7 as a last-ditch effort to save his life after suffering from severe heart disease.



Sol. A brief reading of the sentences suggests that the paragraph is about the transplantation of a genetically modified pig heart in a human.

Here, most of the sentences can stand independently, and we cannot eliminate a sentence based on arranging 4 of them and seeing which one does not fit. Hence, we need to check what each sentence talks about, and then check which one of them is out of context.

Four of them are concerned with an objective narration of the event: what happened, why it was significant. They primarily deal with the scientific aspect of the matter.

Sentence 4, however, is eulogistic in nature, which does not fit the tone of the remaining sentences. Hence, 4 is out of context here.

20. Five sentences related to a topic are given below. Four of them can be put together to form a meaningful and coherent short paragraph. Identify the odd one out.

1. Ultimately, deconstructionist superhero films almost always revert to the same basic message: we all need to believe in heroes, no matter how flawed they may be.
2. Marvel became the biggest player in the game by carefully threading the needle between earnestness and irony.
3. Marvel's Captain America: Civil War picks up on this thread, looking at the collateral damage wrought by its heroes' good intentions, while weighing their right to use unilateral force.
4. The company's focus on world-building didn't leave much room for deconstruction at the outset, but the films did eventually get around to it.
5. Like Nolan's Bat films, Marvel's Avengers: Age of Ultron highlights the self-perpetuating cycle of destruction superheroes bring upon themselves and the world.

Sol. We see that the paragraph is about how Marvel introduced deconstructionism to their superhero movies. 2 introduces the topic at hand by briefly mentioning that Marvel has actually achieved the feat. The remaining sentences detail how it achieved it. 4 highlights an obstacle that it had to overcome to do so. 5 then takes some of the examples of Marvel movies to show how it was done.

1 talks about how deconstructionist movies revert to the same basic message. This isn't in line with how Marvel changed to this type of superhero storyline. Hence, it is the odd one out.

21. Choose the most logical order of sentences from among the given choices to construct a coherent paragraph.

1. As a piece of literature Anne Frank's diary has come to define the Dutch experience of Nazi occupation, but her perspective on that period as a child in hiding is necessarily a restricted one.
2. German-born Anne and her family had moved to Amsterdam when she was four to escape persecution, and she encounters the Dutch as brave protectors.
3. One late entry in the diary is touched with this irony.
4. Yet the death rate amongst Dutch Jews (at more than 75%, double that of any other western country) reflects a deeply collaborative nation, where most arresting officers were native, not German.



Sol. A brief reading of the sentences suggests that the paragraph is about the Nazi occupation of Holland as depicted by the diary of Anne Frank. 1 should be the opening sentence, that introduces the topic at hand. 2 then sets the context for the rest of the paragraph, by mentioning that Anne had moved from Germany to Holland, and viewed the natives as brave protectors. 4 then presents what actually happened, and contrasts this to what has been said in 2. 3 then talks about how this ironical situation finds mention in the diary. Thus, the correct sequence is 1243.

22. Choose the most logical order of sentences from among the given choices to construct a coherent paragraph.

1. Why has this type of show gained so much traction so quickly?
2. Consequently, there are so many murder shows that it is now impossible to surprise anyone.
3. My theory is that it's all down to true crime run-off. The true-crime genre has been at saturation point for years now, to the extent that every murder to have happened anywhere in the world over the last 75 years now has its own six-part Netflix series.
4. They have all started to blend into one, hitting all of the same beats at exactly the same time. A chimp could make a murder show at this point.

Sol. A brief reading of the sentences suggests that the paragraph is a criticism of a new wave of true crime shows that are coming up. 13 is a mandatory pair, where 1 asks a question and 3 expresses the author's opinion as an answer to the same. 24 is another mandatory pair, where 'they' in 4 refers to the number of TV shows mentioned in 3. Out of 13 and 24, 13 seems to be an apt opening sentence, which is added on by 24. Hence, the correct sequence is 1324.

23. Choose the most logical order of sentences from among the given choices to construct a coherent paragraph.

1. "We must change our diet. The planet can't support billions of meat-eaters," even David Attenborough said in his 2020 biographical documentary A Life on Our Planet.
2. A 2013 UN report found that 14.5% of our global greenhouse gas emissions were caused by the livestock industry, while a 2018 study in the journal Science stated that if we stopped consuming meat and dairy, farmland could be reduced by 75% while still feeding the planet's population
3. Meat and dairy consumption has become an issue of planetary urgency.
4. This would effectively enable us to rewild the world.

Sol. A brief reading of the sentences suggests that the author is talking about the advantages of a vegan diet. 3 sets the context of the discussion by introducing the current state of affairs. 2 then presents facts to back up the claim presented in 3. 4 then follows 2, mentioning that the advantages mentioned in 2 would enable us to rebuild the wild. 1 can then conclude the discussion by quoting a person of significance, supporting the author's arguments further. Hence, the correct sequence will be 3241.



24. The passage given below is followed by four alternate summaries. Choose the option that best captures the essence of the passage.

When the British actively began to study India - scholasticism financed by organised loot - it had an unexpected impact. A new class of Indians who were slowly coming to terms with the surrounding oppressive air of colonialism - and yet felt seduced by the new intellectual spaces opened up by access to European knowledge - began to think anew about dharma. They had their feet in both worlds - the world of European academia and the world of traditional Hinduism, often called 'Sanatana dharma', the eternal dharma. From the radical poet Bankim Chandra Chatterjee to the reforming politician Mahatma Gandhi, 'dharma' became a site for critical reflection and social actions in the age of colonialism.

- A. When the British began studying India, this unexpectedly caused Indians to think again about dharma and it became a site for critical reflection and social actions.
- B. The scholasticism of organized loot by the British and their seductive intellectual concepts made Indians modify the concept of dharma and accommodate colonialism.
- C. The intellectualism brought by the Britishers made the concept of dharma obsolete and a new wave of colonialism flourished in India.
- D. The modern conception of dharma is an adequate mix of both religious and spiritual values combined with scientific enquiry and critical evaluation.

Sol. The main points of the passage are:

1. The British began studying India, and this had an unexpected impact.
2. Indians were able to come up with a new view of dharma - it became a site for critical reflection and social actions.

A: Captures the above two points aptly and is the correct answer.

B: It has not been mentioned that colonialism was accommodated in dharma, but certain European intellectual values were.

C: It has not been mentioned that the concept of dharma was rendered obsolete.

D: Option D runs tangent to the discussion by mentioning the modern concept of dharma.

Instructions

Five students take a test in five subjects. No two secured the same grade in a subject, and no person secured the same grade in any two subjects. Maximum marks for Maths, Physics, Chemistry, English and Sanskrit are 150, 60, 90, 100 and 120, respectively. All of them have secured integer marks in all the subjects. Each question in Maths is three marks for a correct answer, and for the remaining subjects, it is one mark. There is no negative marking for wrong questions or unattempted questions in any subject.

Grade A - $\geq 90\%$

Grade B - $80\% \leq b < 90\%$

Grade C - $60\% \leq c < 80\%$



Grade D - $40\% \leq d < 60\%$

Grade F - $0\% \leq f < 40\%$

Person scoring any marks in grade F range fails in that particular subject.

1. Tina secured 75 marks in Chemistry, and Qutub failed in Sanskrit
2. Seeta attempted all the Maths questions with 50% accuracy
3. Rani secured a top 3 rank in Chemistry, and she scored 105 marks in Maths.
4. Rank of Qutub in Maths is equal to the rank of Rani in Chemistry
5. Grade secured by Rani in English is the same as the grade secured by Seeta in Sanskrit.
6. Rank of Qutub in Sanskrit is equal to the rank of Rani in Physics
7. In Chemistry, Pranav obtained the least possible passing marks.

25. What is the difference between the ranks of Pranav in Physics and Seeta in English?

- A. 0
- B. 1
- C. 2
- D. Can't be determined

Sol. It is given in statement 1 that Tina scored 75 marks in chemistry. This implies she scored 83.33% and secured a B grade.

It is mentioned in the question that each maths question is of 3 marks and the maximum marks of Maths is 150. This implies 50 questions in Maths, and Seeta attempted all the questions with 50% accuracy. Hence, Seeta scored $25 \times 3 = 75$ marks.

Therefore, Seeta scored 50% in Maths and secured a D grade

In statement 7, it is mentioned that Pranav passed the chemistry test with one mark. This implies Pranav scored 36 marks in chemistry and secured a D grade.

	Maths	Physics	Chem	English	Sansk
Pranav			D		
Qutub					
Rani					
Seeta	D				
Tina			B		

Rani scored 105 marks in maths, i.e. she scored 75% in maths and secured a C grade. In statement 3, it is mentioned that Rani was among the top 3 in chemistry; this means she secured A, B or C grades. As Tina secured a B in chemistry, Rani did not secure a B grade in chemistry. Rani secured a C grade in Maths; this implies Rani secured an A grade in chemistry. In statement 4, it is mentioned that the rank of Qutub in maths is the same as the rank of Rani in chemistry. Therefore, Qutub secured an A grade in maths.



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	Maths	Physics	Chem	English	Sansk
Pranav			D		
Qutub	A				
Rani	C		A		
Seeta	D				
Tina			B		

In statement 1, it is mentioned that Qutub failed in Sanskrit; this implies Qutub secured an F grade in Sanskrit. In statement 6, it is said that the rank of Qutub in Sanskrit is equal to the rank of Rani in physics. Therefore, Rani secured an F grade in physics.

	Maths	Physics	Chemi	English	Sansk
Pranav			D		
Qutub	A				F
Raani	C	F	A		
Seeta	D				
Tina			B		

It is mentioned that the grade secured by Rani in English is the same as the grade secured by Seeta in Sanskrit. This can be B or D. As Seeta secured a D grade in maths, she cannot secure a D grade in Sanskrit. Therefore, Rani and Seeta secured grade B in English and Sanskrit, respectively.

Final Table:

	Maths	Physics	Chem	English	Sansk
Pranav	B		D	F	
Qutub	A	B	C	D	F
Rani	C	F	A	B	D
Seeta	D		F		B
Tina	F	D	B		

	Maths	Physics	Chemistry	English	Sanskrit
Grade A	≥ 135	≥ 54	≥ 81	≥ 90	≥ 108
Grade B	$120 \leq b < 135$	$48 \leq b < 54$	$72 \leq b < 81$	$80 \leq b < 90$	$96 \leq b < 108$
Grade C	$90 \leq c < 120$	$36 \leq c < 48$	$54 \leq c < 72$	$60 \leq c < 80$	$72 \leq c < 96$
Grade D	$60 \leq d < 90$	$24 \leq d < 36$	$36 \leq d < 54$	$40 \leq d < 60$	$48 \leq d < 72$
Grade F	$0 \leq f < 60$	$0 \leq f < 24$	$0 \leq f < 36$	$0 \leq f < 40$	$0 \leq f < 48$

Maths marks of all students should be multiple of 3 as it mentioned that each maths question is awarded three marks for correct response.

Case 1:

	Maths	Physics	Chem	English	Sansk
Pranav	B	A	D	F	C
Qutub	A	B	C	D	F
Rani	C	F	A	B	D
Seeta	D	C	F	A	B
Tina	F	D	B	C	A



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Total minimum score possible for Pranav = $120 + 54 + 36 + 0 + 72 = 282$

Total maximum score possible for Pranav = $132 + 60 + 36 + 39 + 95 = 362$

Total minimum score possible for Qutub = $135 + 48 + 54 + 40 + 0 = 277$

Total maximum score possible for Qutub = $150 + 53 + 71 + 59 + 47 = 380$

Total minimum score possible for Rani = $105 + 0 + 81 + 80 + 48 = 314$

Total maximum score possible for Rani = $105 + 23 + 90 + 89 + 71 = 378$

Total minimum score possible for Seeta = $75 + 36 + 0 + 90 + 96 = 297$

Total maximum score possible for Seeta = $75 + 47 + 35 + 100 + 107 = 364$

Total minimum score possible for Tina = $0 + 24 + 75 + 60 + 108 = 267$

Total maximum score possible for Tina = $57 + 35 + 75 + 79 + 120 = 366$

	Maths	Physics	Chem	English	Sansk	Min.score	Max.score
Pranav	B	A	D	F	C	282	362
Qutub	A	B	C	D	F	277	380
Rani	C	F	A	B	D	314	378
Seeta	D	C	F	A	B	297	364
Tina	F	D	B	C	A	267	366

Case 2:

	Maths	Physics	Chem	English	Sansk
Pranav	B	C	D	F	A
Qutub	A	B	C	D	F
Rani	C	F	A	B	D
Seeta	D	A	F	C	B
Tina	F	D	B	A	C

Total minimum score possible for Pranav = $120 + 36 + 36 + 0 + 108 = 300$

Total maximum score possible for Pranav = $132 + 47 + 36 + 39 + 120 = 374$

Total minimum score possible for Qutub = $135 + 48 + 54 + 40 + 0 = 277$

Total maximum score possible for Qutub = $150 + 53 + 71 + 59 + 47 = 380$

Total minimum score possible for Rani = $105 + 0 + 81 + 80 + 48 = 314$

Total maximum score possible for Rani = $105 + 23 + 90 + 89 + 71 = 378$

Total minimum score possible for Seeta = $75 + 54 + 0 + 60 + 96 = 285$

Total maximum score possible for Seeta = $75 + 60 + 35 + 79 + 107 = 356$

Total minimum score possible for Tina = $0 + 24 + 75 + 90 + 72 = 261$

Total maximum score possible for Tina = $57 + 35 + 75 + 100 + 95 = 362$

	Maths	Physics	Chem	English	Sansk	Min.score	Max.score
Pranav	B	C	D	F	A	300	374
Qutub	A	B	C	D	F	277	380
Rani	C	F	A	B	D	314	378
Seeta	D	A	F	C	B	285	356
Tina	F	D	B	A	C	261	362



In both cases, the difference between the ranks of Pranav in Physics and Seeta in English is 0
 Answer is option A.

26. What is the least possible total score that any of the students can secure?

Sol. It is given in statement 1 that Tina scored 75 marks in chemistry. This implies she scored 83.33% and secured a B grade.

It is mentioned in the question that each maths question is of 3 marks and the maximum marks of Maths is 150. This implies 50 questions in Maths, and Seeta attempted all the questions with 50% accuracy. Hence, Seeta scored $25 \times 3 = 75$ marks.

Therefore, Seeta scored 50% in Maths and secured a D grade

In statement 7, it is mentioned that Pranav passed the chemistry test with one mark. This implies Pranav scored 36 marks in chemistry and secured a D grade.

	Maths	Physics	Chem	English	Sansk
Pranav			D		
Qutub					
Rani					
Seeta	D				
Tina			B		

Rani scored 105 marks in maths, i.e. she scored 75% in maths and secured a C grade. In statement 3, it is mentioned that Rani was among the top 3 in chemistry; this means she secured A, B or C grades. As Tina secured a B in chemistry, Rani did not secure a B grade in chemistry. Rani secured a C grade in Maths; this implies Rani secured an A grade in chemistry. In statement 4, it is mentioned that the rank of Qutub in maths is the same as the rank of Rani in chemistry. Therefore, Qutub secured an A grade in maths.

	Maths	Physics	Chem	English	Sansk
Pranav			D		
Qutub	A				
Rani	C		A		
Seeta	D				
Tina			B		

In statement 1, it is mentioned that Qutub failed in Sanskrit; this implies Qutub secured an F grade in Sanskrit. In statement 6, it is said that the rank of Qutub in Sanskrit is equal to the rank of Rani in physics. Therefore, Rani secured an F grade in physics.

	Maths	Physics	Chemi	English	Sansk
Pranav			D		
Qutub	A				F
Raani	C	F	A		
Seeta	D				
Tina			B		



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It is mentioned that the grade secured by Rani in English is the same as the grade secured by Seeta in Sanskrit. This can be B or D. As Seeta secured a D grade in maths, she cannot secure a D grade in Sanskrit. Therefore, Rani and Seeta secured grade B in English and Sanskrit, respectively.

Final Table:

	Maths	Physics	Chem	English	Sansk
Pranav	B		D	F	
Qutub	A	B	C	D	F
Rani	C	F	A	B	D
Seeta	D		F		B
Tina	F	D	B		

	Maths	Physics	Chemistry	English	Sanskrit
Grade A	≥ 135	≥ 54	≥ 81	≥ 90	≥ 108
Grade B	$120 \leq b < 135$	$48 \leq b < 54$	$72 \leq b < 81$	$80 \leq b < 90$	$96 \leq b < 108$
Grade C	$90 \leq c < 120$	$36 \leq c < 48$	$54 \leq c < 72$	$60 \leq c < 80$	$72 \leq c < 96$
Grade D	$60 \leq d < 90$	$24 \leq d < 36$	$36 \leq d < 54$	$40 \leq d < 60$	$48 \leq d < 72$
Grade F	$0 \leq f < 60$	$0 \leq f < 24$	$0 \leq f < 36$	$0 \leq f < 40$	$0 \leq f < 48$

Maths marks of all students should be multiple of 3 as it mentioned that each maths question is awarded three marks for correct response.

Case 1:

	Maths	Physics	Chem	English	Sansk
Pranav	B	A	D	F	C
Qutub	A	B	C	D	F
Rani	C	F	A	B	D
Seeta	D	C	F	A	B
Tina	F	D	B	C	A

Total minimum score possible for Pranav = $120 + 54 + 36 + 0 + 72 = 282$

Total maximum score possible for Pranav = $132 + 60 + 36 + 39 + 95 = 362$

Total minimum score possible for Qutub = $135 + 48 + 54 + 40 + 0 = 277$

Total maximum score possible for Qutub = $150 + 53 + 71 + 59 + 47 = 380$

Total minimum score possible for Rani = $105 + 0 + 81 + 80 + 48 = 314$

Total maximum score possible for Rani = $105 + 23 + 90 + 89 + 71 = 378$

Total minimum score possible for Seeta = $75 + 36 + 0 + 90 + 96 = 297$

Total maximum score possible for Seeta = $75 + 47 + 35 + 100 + 107 = 364$

Total minimum score possible for Tina = $0 + 24 + 75 + 60 + 108 = 267$

Total maximum score possible for Tina = $57 + 35 + 75 + 79 + 120 = 366$



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	Maths	Physics	Chem	English	Sansk	Min.score	Max.score
Pranav	B	A	D	F	C	282	362
Qutub	A	B	C	D	F	277	380
Rani	C	F	A	B	D	314	378
Seeta	D	C	F	A	B	297	364
Tina	F	D	B	C	A	267	366

Case 2:

	Maths	Physics	Chem	English	Sansk
Pranav	B	C	D	F	A
Qutub	A	B	C	D	F
Rani	C	F	A	B	D
Seeta	D	A	F	C	B
Tina	F	D	B	A	C

Total minimum score possible for Pranav = $120 + 36 + 36 + 0 + 108 = 300$

Total maximum score possible for Pranav = $132 + 47 + 36 + 39 + 120 = 374$

Total minimum score possible for Qutub = $135 + 48 + 54 + 40 + 0 = 277$

Total maximum score possible for Qutub = $150 + 53 + 71 + 59 + 47 = 380$

Total minimum score possible for Rani = $105 + 0 + 81 + 80 + 48 = 314$

Total maximum score possible for Rani = $105 + 23 + 90 + 89 + 71 = 378$

Total minimum score possible for Seeta = $75 + 54 + 0 + 60 + 96 = 285$

Total maximum score possible for Seeta = $75 + 60 + 35 + 79 + 107 = 356$

Total minimum score possible for Tina = $0 + 24 + 75 + 90 + 72 = 261$

Total maximum score possible for Tina = $57 + 35 + 75 + 100 + 95 = 362$

	Maths	Physics	Chem	English	Sansk	Min.score	Max.score
Pranav	B	C	D	F	A	300	374
Qutub	A	B	C	D	F	277	380
Rani	C	F	A	B	D	314	378
Seeta	D	A	F	C	B	285	356
Tina	F	D	B	A	C	261	362

The least possible score is 261, secured by Tina.

The answer is 261.

27. Find the difference between minimum total marks secured by Qutub and maximum total marks secured by Rani?

- A. 103
- B. 99
- C. 101
- D. 64



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Sol. It is given in statement 1 that Tina scored 75 marks in chemistry. This implies she scored 83.33% and secured a B grade.

It is mentioned in the question that each maths question is of 3 marks and the maximum marks of Maths is 150. This implies 50 questions in Maths, and Seeta attempted all the questions with 50% accuracy. Hence, Seeta scored $25 \times 3 = 75$ marks.

Therefore, Seeta scored 50% in Maths and secured a D grade

In statement 7, it is mentioned that Pranav passed the chemistry test with one mark. This implies Pranav scored 36 marks in chemistry and secured a D grade.

	Maths	Physics	Chem	English	Sansk
Pranav			D		
Qutub					
Rani					
Seeta	D				
Tina			B		

Rani scored 105 marks in maths, i.e. she scored 75% in maths and secured a C grade. In statement 3, it is mentioned that Rani was among the top 3 in chemistry; this means she secured A, B or C grades. As Tina secured a B in chemistry, Rani did not secure a B grade in chemistry. Rani secured a C grade in Maths; this implies Rani secured an A grade in chemistry. In statement 4, it is mentioned that the rank of Qutub in maths is the same as the rank of Rani in chemistry. Therefore, Qutub secured an A grade in maths.

	Maths	Physics	Chem	English	Sansk
Pranav			D		
Qutub	A				
Rani	C		A		
Seeta	D				
Tina			B		

In statement 1, it is mentioned that Qutub failed in Sanskrit; this implies Qutub secured an F grade in Sanskrit. In statement 6, it is said that the rank of Qutub in Sanskrit is equal to the rank of Rani in physics. Therefore, Rani secured an F grade in physics.

	Maths	Physics	Chemi	English	Sansk
Pranav			D		
Qutub	A				F
Raani	C	F	A		
Seeta	D				
Tina			B		

It is mentioned that the grade secured by Rani in English is the same as the grade secured by Seeta in Sanskrit. This can be B or D. As Seeta secured a D grade in maths, she cannot secure a D grade in Sanskrit. Therefore, Rani and Seeta secured grade B in English and Sanskrit, respectively.



Final Table:

	Maths	Physics	Chem	English	Sansk
Pranav	B		D	F	
Qutub	A	B	C	D	F
Rani	C	F	A	B	D
Seeta	D		F		B
Tina	F	D	B		

	Maths	Physics	Chemistry	English	Sanskrit
Grade A	≥ 135	≥ 54	≥ 81	≥ 90	≥ 108
Grade B	$120 \leq b < 135$	$48 \leq b < 54$	$72 \leq b < 81$	$80 \leq b < 90$	$96 \leq b < 108$
Grade C	$90 \leq c < 120$	$36 \leq c < 48$	$54 \leq c < 72$	$60 \leq c < 80$	$72 \leq c < 96$
Grade D	$60 \leq d < 90$	$24 \leq d < 36$	$36 \leq d < 54$	$40 \leq d < 60$	$48 \leq d < 72$
Grade F	$0 \leq f < 60$	$0 \leq f < 24$	$0 \leq f < 36$	$0 \leq f < 40$	$0 \leq f < 48$

Maths marks of all students should be multiple of 3 as it mentioned that each maths question is awarded three marks for correct response.

Case 1:

	Maths	Physics	Chem	English	Sansk
Pranav	B	A	D	F	C
Qutub	A	B	C	D	F
Rani	C	F	A	B	D
Seeta	D	C	F	A	B
Tina	F	D	B	C	A

Total minimum score possible for Pranav = $120 + 54 + 36 + 0 + 72 = 282$

Total maximum score possible for Pranav = $132 + 60 + 36 + 39 + 95 = 362$

Total minimum score possible for Qutub = $135 + 48 + 54 + 40 + 0 = 277$

Total maximum score possible for Qutub = $150 + 53 + 71 + 59 + 47 = 380$

Total minimum score possible for Rani = $105 + 0 + 81 + 80 + 48 = 314$

Total maximum score possible for Rani = $105 + 23 + 90 + 89 + 71 = 378$

Total minimum score possible for Seeta = $75 + 36 + 0 + 90 + 96 = 297$

Total maximum score possible for Seeta = $75 + 47 + 35 + 100 + 107 = 364$

Total minimum score possible for Tina = $0 + 24 + 75 + 60 + 108 = 267$

Total maximum score possible for Tina = $57 + 35 + 75 + 79 + 120 = 366$

	Maths	Physics	Chem	English	Sansk	Min.score	Max.score
Pranav	B	A	D	F	C	282	362
Qutub	A	B	C	D	F	277	380
Rani	C	F	A	B	D	314	378
Seeta	D	C	F	A	B	297	364
Tina	F	D	B	C	A	267	366



Case 2:

	Maths	Physics	Chem	English	Sansk
Pranav	B	C	D	F	A
Qutub	A	B	C	D	F
Rani	C	F	A	B	D
Seeta	D	A	F	C	B
Tina	F	D	B	A	C

Total minimum score possible for Pranav = 120 + 36 + 36 + 0 + 108 = 300

Total maximum score possible for Pranav = 132 + 47 + 36 + 39 + 120 = 374

Total minimum score possible for Qutub = 135 + 48 + 54 + 40 + 0 = 277

Total maximum score possible for Qutub = 150 + 53 + 71 + 59 + 47 = 380

Total minimum score possible for Rani = 105 + 0 + 81 + 80 + 48 = 314

Total maximum score possible for Rani = 105 + 23 + 90 + 89 + 71 = 378

Total minimum score possible for Seeta = 75 + 54 + 0 + 60 + 96 = 285

Total maximum score possible for Seeta = 75 + 60 + 35 + 79 + 107 = 356

Total minimum score possible for Tina = 0 + 24 + 75 + 90 + 72 = 261

Total maximum score possible for Tina = 57 + 35 + 75 + 100 + 95 = 362

	Maths	Physics	Chem	English	Sansk	Min.score	Max.score
Pranav	B	C	D	F	A	300	374
Qutub	A	B	C	D	F	277	380
Rani	C	F	A	B	D	314	378
Seeta	D	A	F	C	B	285	356
Tina	F	D	B	A	C	261	362

Minimum total marks secured by Qutub = 277

Maximum total marks secured by Rani = 378

Difference = 378 - 277 = 101

Answer is option C.

28. If total marks scored by Seeta is 364, which of the following cannot be the score of Pranav?

- A. 286
- B. 313
- C. 348
- D. 373

Sol. It is given in statement 1 that Tina scored 75 marks in chemistry. This implies she scored 83.33% and secured a B grade.

It is mentioned in the question that each maths question is of 3 marks and the maximum marks of Maths is 150. This implies 50 questions in Maths, and Seeta attempted all the questions with 50% accuracy. Hence, Seeta scored 25*3 = 75 marks.



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Therefore, Seeta scored 50% in Maths and secured a D grade

In statement 7, it is mentioned that Pranav passed the chemistry test with one mark. This implies Pranav scored 36 marks in chemistry and secured a D grade.

	Maths	Physics	Chem	English	Sansk
Pranav			D		
Qutub					
Rani					
Seeta	D				
Tina			B		

Rani scored 105 marks in maths, i.e. she scored 75% in maths and secured a C grade. In statement 3, it is mentioned that Rani was among the top 3 in chemistry; this means she secured A, B or C grades. As Tina secured a B in chemistry, Rani did not secure a B grade in chemistry. Rani secured a C grade in Maths; this implies Rani secured an A grade in chemistry. In statement 4, it is mentioned that the rank of Qutub in maths is the same as the rank of Rani in chemistry. Therefore, Qutub secured an A grade in maths.

	Maths	Physics	Chem	English	Sansk
Pranav			D		
Qutub	A				
Rani	C		A		
Seeta	D				
Tina			B		

In statement 1, it is mentioned that Qutub failed in Sanskrit; this implies Qutub secured an F grade in Sanskrit. In statement 6, it is said that the rank of Qutub in Sanskrit is equal to the rank of Rani in physics. Therefore, Rani secured an F grade in physics.

	Maths	Physics	Chem	English	Sansk
Pranav			D		
Qutub	A				F
Raani	C	F	A		
Seeta	D				
Tina			B		

It is mentioned that the grade secured by Rani in English is the same as the grade secured by Seeta in Sanskrit. This can be B or D. As Seeta secured a D grade in maths, she cannot secure a D grade in Sanskrit. Therefore, Rani and Seeta secured grade B in English and Sanskrit, respectively.



Final Table:

	Maths	Physics	Chem	English	Sansk
Pranav	B		D	F	
Qutub	A	B	C	D	F
Rani	C	F	A	B	D
Seeta	D		F		B
Tina	F	D	B		

	Maths	Physics	Chemistry	English	Sanskrit
Grade A	≥ 135	≥ 54	≥ 81	≥ 90	≥ 108
Grade B	$120 \leq b < 135$	$48 \leq b < 54$	$72 \leq b < 81$	$80 \leq b < 90$	$96 \leq b < 108$
Grade C	$90 \leq c < 120$	$36 \leq c < 48$	$54 \leq c < 72$	$60 \leq c < 80$	$72 \leq c < 96$
Grade D	$60 \leq d < 90$	$24 \leq d < 36$	$36 \leq d < 54$	$40 \leq d < 60$	$48 \leq d < 72$
Grade F	$0 \leq f < 60$	$0 \leq f < 24$	$0 \leq f < 36$	$0 \leq f < 40$	$0 \leq f < 48$

Maths marks of all students should be multiple of 3 as it mentioned that each maths question is awarded three marks for correct response.

Case 1:

	Maths	Physics	Chem	English	Sansk
Pranav	B	A	D	F	C
Qutub	A	B	C	D	F
Rani	C	F	A	B	D
Seeta	D	C	F	A	B
Tina	F	D	B	C	A

Total minimum score possible for Pranav = $120 + 54 + 36 + 0 + 72 = 282$

Total maximum score possible for Pranav = $132 + 60 + 36 + 39 + 95 = 362$

Total minimum score possible for Qutub = $135 + 48 + 54 + 40 + 0 = 277$

Total maximum score possible for Qutub = $150 + 53 + 71 + 59 + 47 = 380$

Total minimum score possible for Rani = $105 + 0 + 81 + 80 + 48 = 314$

Total maximum score possible for Rani = $105 + 23 + 90 + 89 + 71 = 378$

Total minimum score possible for Seeta = $75 + 36 + 0 + 90 + 96 = 297$

Total maximum score possible for Seeta = $75 + 47 + 35 + 100 + 107 = 364$

Total minimum score possible for Tina = $0 + 24 + 75 + 60 + 108 = 267$

Total maximum score possible for Tina = $57 + 35 + 75 + 79 + 120 = 366$

	Maths	Physics	Chem	English	Sansk	Min.score	Max.score
Pranav	B	A	D	F	C	282	362
Qutub	A	B	C	D	F	277	380
Rani	C	F	A	B	D	314	378
Seeta	D	C	F	A	B	297	364
Tina	F	D	B	C	A	267	366



Case 2:

	Maths	Physics	Chem	English	Sansk
Pranav	B	C	D	F	A
Qutub	A	B	C	D	F
Rani	C	F	A	B	D
Seeta	D	A	F	C	B
Tina	F	D	B	A	C

Total minimum score possible for Pranav = $120 + 36 + 36 + 0 + 108 = 300$

Total maximum score possible for Pranav = $132 + 47 + 36 + 39 + 120 = 374$

Total minimum score possible for Qutub = $135 + 48 + 54 + 40 + 0 = 277$

Total maximum score possible for Qutub = $150 + 53 + 71 + 59 + 47 = 380$

Total minimum score possible for Rani = $105 + 0 + 81 + 80 + 48 = 314$

Total maximum score possible for Rani = $105 + 23 + 90 + 89 + 71 = 378$

Total minimum score possible for Seeta = $75 + 54 + 0 + 60 + 96 = 285$

Total maximum score possible for Seeta = $75 + 60 + 35 + 79 + 107 = 356$

Total minimum score possible for Tina = $0 + 24 + 75 + 90 + 72 = 261$

Total maximum score possible for Tina = $57 + 35 + 75 + 100 + 95 = 362$

	Maths	Physics	Chem	English	Sansk	Min.score	Max.score
Pranav	B	C	D	F	A	300	374
Qutub	A	B	C	D	F	277	380
Rani	C	F	A	B	D	314	378
Seeta	D	A	F	C	B	285	356
Tina	F	D	B	A	C	261	362

Total marks scored by Seeta = 364.

This refers to case 1.

Minimum possible score of Pranav is 282 and maximum possible score is 362.

The answer is option D.

29. If the average score of Tina in the five subjects is 52.8, what is Pranav's grade in Sanskrit?

- A. A
- B. B
- C. C
- D. D

Sol. It is given in statement 1 that Tina scored 75 marks in chemistry. This implies she scored 83.33% and secured a B grade.

It is mentioned in the question that each maths question is of 3 marks and the maximum marks of Maths is 150. This implies 50 questions in Maths, and Seeta attempted all the questions with 50% accuracy. Hence, Seeta scored $25 \times 3 = 75$ marks.



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Therefore, Seeta scored 50% in Maths and secured a D grade

In statement 7, it is mentioned that Pranav passed the chemistry test with one mark. This implies Pranav scored 36 marks in chemistry and secured a D grade.

	Maths	Physics	Chem	English	Sansk
Pranav			D		
Qutub					
Rani					
Seeta	D				
Tina			B		

Rani scored 105 marks in maths, i.e. she scored 75% in maths and secured a C grade. In statement 3, it is mentioned that Rani was among the top 3 in chemistry; this means she secured A, B or C grades. As Tina secured a B in chemistry, Rani did not secure a B grade in chemistry. Rani secured a C grade in Maths; this implies Rani secured an A grade in chemistry. In statement 4, it is mentioned that the rank of Qutub in maths is the same as the rank of Rani in chemistry. Therefore, Qutub secured an A grade in maths.

	Maths	Physics	Chem	English	Sansk
Pranav			D		
Qutub	A				
Rani	C		A		
Seeta	D				
Tina			B		

In statement 1, it is mentioned that Qutub failed in Sanskrit; this implies Qutub secured an F grade in Sanskrit. In statement 6, it is said that the rank of Qutub in Sanskrit is equal to the rank of Rani in physics. Therefore, Rani secured an F grade in physics.

	Maths	Physics	Chem	English	Sansk
Pranav			D		
Qutub	A				F
Raani	C	F	A		
Seeta	D				
Tina			B		

It is mentioned that the grade secured by Rani in English is the same as the grade secured by Seeta in Sanskrit. This can be B or D. As Seeta secured a D grade in maths, she cannot secure a D grade in Sanskrit. Therefore, Rani and Seeta secured grade B in English and Sanskrit, respectively.



Final Table:

	Maths	Physics	Chem	English	Sansk
Pranav	B		D	F	
Qutub	A	B	C	D	F
Rani	C	F	A	B	D
Seeta	D		F		B
Tina	F	D	B		

	Maths	Physics	Chemistry	English	Sanskrit
Grade A	≥ 135	≥ 54	≥ 81	≥ 90	≥ 108
Grade B	$120 \leq b < 135$	$48 \leq b < 54$	$72 \leq b < 81$	$80 \leq b < 90$	$96 \leq b < 108$
Grade C	$90 \leq c < 120$	$36 \leq c < 48$	$54 \leq c < 72$	$60 \leq c < 80$	$72 \leq c < 96$
Grade D	$60 \leq d < 90$	$24 \leq d < 36$	$36 \leq d < 54$	$40 \leq d < 60$	$48 \leq d < 72$
Grade F	$0 \leq f < 60$	$0 \leq f < 24$	$0 \leq f < 36$	$0 \leq f < 40$	$0 \leq f < 48$

Maths marks of all students should be multiple of 3 as it mentioned that each maths question is awarded three marks for correct response.

Case 1:

	Maths	Physics	Chem	English	Sansk
Pranav	B	A	D	F	C
Qutub	A	B	C	D	F
Rani	C	F	A	B	D
Seeta	D	C	F	A	B
Tina	F	D	B	C	A

Total minimum score possible for Pranav = $120 + 54 + 36 + 0 + 72 = 282$

Total maximum score possible for Pranav = $132 + 60 + 36 + 39 + 95 = 362$

Total minimum score possible for Qutub = $135 + 48 + 54 + 40 + 0 = 277$

Total maximum score possible for Qutub = $150 + 53 + 71 + 59 + 47 = 380$

Total minimum score possible for Rani = $105 + 0 + 81 + 80 + 48 = 314$

Total maximum score possible for Rani = $105 + 23 + 90 + 89 + 71 = 378$

Total minimum score possible for Seeta = $75 + 36 + 0 + 90 + 96 = 297$

Total maximum score possible for Seeta = $75 + 47 + 35 + 100 + 107 = 364$

Total minimum score possible for Tina = $0 + 24 + 75 + 60 + 108 = 267$

Total maximum score possible for Tina = $57 + 35 + 75 + 79 + 120 = 366$

	Maths	Physics	Chem	English	Sansk	Min.score	Max.score
Pranav	B	A	D	F	C	282	362
Qutub	A	B	C	D	F	277	380
Rani	C	F	A	B	D	314	378
Seeta	D	C	F	A	B	297	364
Tina	F	D	B	C	A	267	366



Case 2:

	Maths	Physics	Chem	English	Sansk
Pranav	B	C	D	F	A
Qutub	A	B	C	D	F
Rani	C	F	A	B	D
Seeta	D	A	F	C	B
Tina	F	D	B	A	C

Total minimum score possible for Pranav = $120 + 36 + 36 + 0 + 108 = 300$

Total maximum score possible for Pranav = $132 + 47 + 36 + 39 + 120 = 374$

Total minimum score possible for Qutub = $135 + 48 + 54 + 40 + 0 = 277$

Total maximum score possible for Qutub = $150 + 53 + 71 + 59 + 47 = 380$

Total minimum score possible for Rani = $105 + 0 + 81 + 80 + 48 = 314$

Total maximum score possible for Rani = $105 + 23 + 90 + 89 + 71 = 378$

Total minimum score possible for Seeta = $75 + 54 + 0 + 60 + 96 = 285$

Total maximum score possible for Seeta = $75 + 60 + 35 + 79 + 107 = 356$

Total minimum score possible for Tina = $0 + 24 + 75 + 90 + 72 = 261$

Total maximum score possible for Tina = $57 + 35 + 75 + 100 + 95 = 362$

	Maths	Physics	Chem	English	Sansk	Min.score	Max.score
Pranav	B	C	D	F	A	300	374
Qutub	A	B	C	D	F	277	380
Rani	C	F	A	B	D	314	378
Seeta	D	A	F	C	B	285	356
Tina	F	D	B	A	C	261	362

Average score of Tina = 52.8

Total score of Tina = $52.8 \times 5 = 264$

Minimum score of Tina in case 1 is 267. Therefore, it is not possible in case 1.

This is only possible in case 2.

Pranav's grade in Sanskrit is A

Answer is option A.

30. If the total marks scored by Pranav is 374, what is the difference between the maximum score and the minimum score scored by Tina?

- A. 99
- B. 101
- C. 103
- D. 91

Sol. It is given in statement 1 that Tina scored 75 marks in chemistry. This implies she scored 83.33% and secured a B grade.



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It is mentioned in the question that each maths question is of 3 marks and the maximum marks of Maths is 150. This implies 50 questions in Maths, and Seeta attempted all the questions with 50% accuracy. Hence, Seeta scored $25 \times 3 = 75$ marks.

Therefore, Seeta scored 50% in Maths and secured a D grade

In statement 7, it is mentioned that Pranav passed the chemistry test with one mark. This implies Pranav scored 36 marks in chemistry and secured a D grade.

	Maths	Physics	Chem	English	Sansk
Pranav			D		
Qutub					
Rani					
Seeta	D				
Tina			B		

Rani scored 105 marks in maths, i.e. she scored 75% in maths and secured a C grade.

In statement 3, it is mentioned that Rani was among the top 3 in chemistry; this means she secured A, B or C grades. As Tina secured a B in chemistry, Rani did not secure a B grade in chemistry. Rani secured a C grade in Maths; this implies Rani secured an A grade in chemistry.

In statement 4, it is mentioned that the rank of Qutub in maths is the same as the rank of Rani in chemistry. Therefore, Qutub secured an A grade in maths.

	Maths	Physics	Chem	English	Sansk
Pranav			D		
Qutub	A				
Rani	C		A		
Seeta	D				
Tina			B		

In statement 1, it is mentioned that Qutub failed in Sanskrit; this implies Qutub secured an F grade in Sanskrit. In statement 6, it is said that the rank of Qutub in Sanskrit is equal to the rank of Rani in physics. Therefore, Rani secured an F grade in physics.

	Maths	Physics	Chemi	English	Sansk
Pranav			D		
Qutub	A				F
Raani	C	F	A		
Seeta	D				
Tina			B		

It is mentioned that the grade secured by Rani in English is the same as the grade secured by Seeta in Sanskrit. This can be B or D. As Seeta secured a D grade in maths, she cannot secure a D grade in Sanskrit. Therefore, Rani and Seeta secured grade B in English and Sanskrit, respectively.



Final Table:

	Maths	Physics	Chem	English	Sansk
Pranav	B		D	F	
Qutub	A	B	C	D	F
Rani	C	F	A	B	D
Seeta	D		F		B
Tina	F	D	B		

	Maths	Physics	Chemistry	English	Sanskrit
Grade A	≥ 135	≥ 54	≥ 81	≥ 90	≥ 108
Grade B	$120 \leq b < 135$	$48 \leq b < 54$	$72 \leq b < 81$	$80 \leq b < 90$	$96 \leq b < 108$
Grade C	$90 \leq c < 120$	$36 \leq c < 48$	$54 \leq c < 72$	$60 \leq c < 80$	$72 \leq c < 96$
Grade D	$60 \leq d < 90$	$24 \leq d < 36$	$36 \leq d < 54$	$40 \leq d < 60$	$48 \leq d < 72$
Grade F	$0 \leq f < 60$	$0 \leq f < 24$	$0 \leq f < 36$	$0 \leq f < 40$	$0 \leq f < 48$

Maths marks of all students should be multiple of 3 as it mentioned that each maths question is awarded three marks for correct response.

Case 1:

	Maths	Physics	Chem	English	Sansk
Pranav	B	A	D	F	C
Qutub	A	B	C	D	F
Rani	C	F	A	B	D
Seeta	D	C	F	A	B
Tina	F	D	B	C	A

Total minimum score possible for Pranav = $120 + 54 + 36 + 0 + 72 = 282$

Total maximum score possible for Pranav = $132 + 60 + 36 + 39 + 95 = 362$

Total minimum score possible for Qutub = $135 + 48 + 54 + 40 + 0 = 277$

Total maximum score possible for Qutub = $150 + 53 + 71 + 59 + 47 = 380$

Total minimum score possible for Rani = $105 + 0 + 81 + 80 + 48 = 314$

Total maximum score possible for Rani = $105 + 23 + 90 + 89 + 71 = 378$

Total minimum score possible for Seeta = $75 + 36 + 0 + 90 + 96 = 297$

Total maximum score possible for Seeta = $75 + 47 + 35 + 100 + 107 = 364$

Total minimum score possible for Tina = $0 + 24 + 75 + 60 + 108 = 267$

Total maximum score possible for Tina = $57 + 35 + 75 + 79 + 120 = 366$

	Maths	Physics	Chem	English	Sansk	Min.score	Max.score
Pranav	B	A	D	F	C	282	362
Qutub	A	B	C	D	F	277	380
Rani	C	F	A	B	D	314	378
Seeta	D	C	F	A	B	297	364
Tina	F	D	B	C	A	267	366



Case 2:

	Maths	Physics	Chem	English	Sansk
Pranav	B	C	D	F	A
Qutub	A	B	C	D	F
Rani	C	F	A	B	D
Seeta	D	A	F	C	B
Tina	F	D	B	A	C

Total minimum score possible for Pranav = $120 + 36 + 36 + 0 + 108 = 300$

Total maximum score possible for Pranav = $132 + 47 + 36 + 39 + 120 = 374$

Total minimum score possible for Qutub = $135 + 48 + 54 + 40 + 0 = 277$

Total maximum score possible for Qutub = $150 + 53 + 71 + 59 + 47 = 380$

Total minimum score possible for Rani = $105 + 0 + 81 + 80 + 48 = 314$

Total maximum score possible for Rani = $105 + 23 + 90 + 89 + 71 = 378$

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Total maximum score possible for Seeta = $75 + 60 + 35 + 79 + 107 = 356$

Total minimum score possible for Tina = $0 + 24 + 75 + 90 + 72 = 261$

Total maximum score possible for Tina = $57 + 35 + 75 + 100 + 95 = 362$

	Maths	Physics	Chem	English	Sansk	Min.score	Max.score
Pranav	B	C	D	F	A	300	374
Qutub	A	B	C	D	F	277	380
Rani	C	F	A	B	D	314	378
Seeta	D	A	F	C	B	285	356
Tina	F	D	B	A	C	261	362

Pranav's total marks = 374

This refers to case 2.

Difference between maximum score and minimum score of Tina in case 2 = $362 - 261 = 101$

Answer is option B.

Instructions

A company has started a 'Walk Fit' contest to promote a sense of fitness among employees. Five employees, Anand, Vishal, Surya, Preethi and Ritika, visited a mall and were in the top 5 among all the employees on that particular day. All five of them visited the mall at different times and left it at different times. No two of them spent the same duration at the mall. They visited at 11 am, 11:20 am, 11:30 am, 12 pm and 1 pm in any order, and they left at 12:20 pm, 12:30 pm, 1 pm, 1:30 pm, and 1:40 pm in any order. All of them spent less than two hours in the mall.

1. Highest steps, second-highest steps and third-highest steps are in A.P.



- Anand visited the mall at 11 am and walked 6400 steps. The average number of steps walked by the top five employees is 7280
- Surya spent the least time in the mall, i.e. 40 minutes and walked the least number of steps among the five employees. No one spent less than one hour in the mall except Surya.
- The highest, third least, and least steps are in A.P. Highest steps are twice the least steps.
- Every person who enters the mall walks more steps than the previous person except the last person.
- Ritika spent her whole time in the mall shopping with Preethi.

31. Who walked the maximum steps on that particular day among all the employees?

- A. Anand
- B. Vishal
- C. Preethi
- D. Ritika

Sol. Let the number of steps be l, m, n, p, q in descending order.

It is given l, m, n are in A.P

$$m = l - d$$

$$n = l - 2d$$

It is also given that l, n, q are in A.P and from above values,

$$n = l - 2d$$

Therefore, $q = l - 4d$

It is given highest steps are twice the least steps.

$$l = 2q$$

$$l = 2l - 8d$$

$$l = 8d$$

The number of steps will be $8d, 7d, 6d, p, 4d$ in descending order.

It is given, average number of steps walked by all of them = 7280.

Total number of steps walked by five of them = $7280 \times 5 = 36400$.

It is mentioned that Anand walked 6400 steps

If $4d = 6400, d = 1600$

Total number of steps = $25d + p$

$$25d + p = 36400$$

We will get a negative p value. Therefore, $4d$ is not equal to 6400.

If $8d = 6400, d = 800$

$$25d + p = 36400$$

$$p = 16400$$

p cannot be greater than $8d$. Therefore, $8d$ is not equal to 6400.

The only possible case is $p = 6400$.

$$25d + 6400 = 36400$$

$$d = 1200$$

Therefore, the number of steps is 9600, 8400, 7200, 6400 and 4800.

Anand has arrived first and walked 6400 steps. It is mentioned that every person who enters the mall walks more than the previous person except the last person; this implies that the last



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person walks 4800 steps. Surya walks the least steps, which means that Surya is the last person to enter the mall. Surya spent 40 minutes in the mall, which means he left the mall at 1:40 pm.

Name	In	Duration	Out	Steps
Anand	11			6400
	11:20			7200
	11:30			8400
	12			9600
Surya	1	40	1:40	4800

It is given that they all spend less than 2 hours in the mall. The one who entered the mall at 11, 11:20 or 11:30 pm cannot leave at 1:30 pm. Therefore, the one who entered at 12 will leave the mall at 1:30 pm.

Name	In	Duration	Out	Steps
Anand	11			6400
	11:20			7200
	11:30			8400
	12	90	1:30	9600
Surya	1	40	1:40	4800

It is mentioned Ritika spent her whole time shopping with Preethi. This means that Ritika visited the mall after Preethi and left before Preethi. This implies, Ritika and Preethi are not the one who entered the mall at 12. Therefore, Vishal entered the mall at 12 and left the mall at 1:30 pm.

Name	In	Duration	Out	Steps
Anand	11			6400
	11:20			7200
	11:30			8400
Vishal	12	90	1:30	9600
Surya	1	40	1:40	4800

Ritika should visit the mall after Preethi visited. Therefore, Ritika visited at 11:30 am and Preethi visited at 11:20 am.

Name	In	Duration	Out	Steps
Anand	11			6400
Preethi	11:20			7200
Ritika	11:30			8400
Vishal	12	90	1:30	9600
Surya	1	40	1:40	4800

It is given, only Surya spends less than an hour in the mall. Therefore, Ritika cannot leave the mall at 12:20 pm. Preethi must leave the mall after Ritika; therefore, Ritika cannot leave the



mall at 1 pm. This implies, Ritika left the mall at 12:30 pm. It is given, all of them spent less than two hours in the mall. This implies Anand left the mall at 12:20 pm.

Final Arrangement:

Name	In	Duration	Out	Steps
Anand	11	80	12:20	6400
Preethi	11:20	100	1	7200
Ritika	11:30	60	12:30	8400
Vishal	12	90	1:30	9600
Surya	1	40	1:40	4800

Vishal walked maximum number of steps on that particular day. Therefore, answer is option B.

32. Assuming there is only one gate for entry and exit, who among the following had a chance to meet each other at the gate while leaving or arriving?

- A. Ritika - Surya
- B. Vishal - Surya
- C. Anand - Surya
- D. Preethi - Surya

Sol. Let the number of steps be l, m, n, p, q in descending order.

It is given l, m, n are in A.P

$$m = l - d$$

$$n = l - 2d$$

It is also given that l, n, q are in A.P and from above values,

$$n = l - 2d$$

Therefore, $q = l - 4d$

It is given highest steps are twice the least steps.

$$l = 2q$$

$$l = 2l - 8d$$

$$l = 8d$$

The number of steps will be 8d, 7d, 6d, p, 4d in descending order.

It is given, average number of steps walked by all of them = 7280.

Total number of steps walked by five of them = $7280 * 5 = 36400$.

It is mentioned that Anand walked 6400 steps

$$\text{If } 4d = 6400, d = 1600$$

Total number of steps = $25d + p$

$$25d + p = 36400$$

We will get a negative p value. Therefore, 4d is not equal to 6400.

$$\text{If } 8d = 6400, d = 800$$

$$25d + p = 36400$$

$$p = 16400$$

p cannot be greater than 8d. Therefore, 8d is not equal to 6400.



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The only possible case is $p = 6400$.

$$25d + 6400 = 36400$$

$$d = 1200$$

Therefore, the number of steps is 9600, 8400, 7200, 6400 and 4800.

Anand has arrived first and walked 6400 steps. It is mentioned that every person who enters the mall walks more than the previous person except the last person; this implies that the last person walks 4800 steps. Surya walks the least steps, which means that Surya is the last person to enter the mall. Surya spent 40 minutes in the mall, which means he left the mall at 1:40 pm.

Name	In	Duration	Out	Steps
Anand	11			6400
	11:20			7200
	11:30			8400
	12			9600
Surya	1	40	1:40	4800

It is given that they all spend less than 2 hours in the mall. The one who entered the mall at 11, 11:20 or 11:30 pm cannot leave at 1:30 pm. Therefore, the one who entered at 12 will leave the mall at 1:30 pm.

Name	In	Duration	Out	Steps
Anand	11			6400
	11:20			7200
	11:30			8400
	12	90	1:30	9600
Surya	1	40	1:40	4800

It is mentioned Ritika spent her whole time shopping with Preethi. This means that Ritika visited the mall after Preethi and left before Preethi. This implies, Ritika and Preethi are not the one who entered the mall at 12. Therefore, Vishal entered the mall at 12 and left the mall at 1:30 pm.

Name	In	Duration	Out	Steps
Anand	11			6400
	11:20			7200
	11:30			8400
Vishal	12	90	1:30	9600
Surya	1	40	1:40	4800

Ritika should visit the mall after Preethi visited. Therefore, Ritika visited at 11:30 am and Preethi visited at 11:20 am.



Name	In	Duration	Out	Steps
Anand	11			6400
Preethi	11:20			7200
Ritika	11:30			8400
Vishal	12	90	1:30	9600
Surya	1	40	1:40	4800

It is given, only Surya spends less than an hour in the mall. Therefore, Ritika cannot leave the mall at 12:20 pm. Preethi must leave the mall after Ritika; therefore, Ritika cannot leave the mall at 1 pm. This implies, Ritika left the mall at 12:30 pm.

It is given, all of them spent less than two hours in the mall. This implies Anand left the mall at 12:20 pm.

Final Arrangement:

Name	In	Duration	Out	Steps
Anand	11	80	12:20	6400
Preethi	11:20	100	1	7200
Ritika	11:30	60	12:30	8400
Vishal	12	90	1:30	9600
Surya	1	40	1:40	4800

Preethi left the mall at 1 pm and Surya entered the mall at 1pm. Therefore, Preethi and Surya had a chance to meet at the gate.

Answer is option D.

33. If four of the five employees have planned to play a game in the mall, find the maximum time(in minutes) they have to finish the game.

Sol. Let the number of steps be l, m, n, p, q in descending order.

It is given l, m, n are in A.P

$$m = l - d$$

$$n = l - 2d$$

It is also given that l, n, q are in A.P and from above values,

$$n = l - 2d$$

Therefore, $q = l - 4d$

It is given highest steps are twice the least steps.

$$l = 2q$$

$$l = 2l - 8d$$

$$l = 8d$$

The number of steps will be 8d, 7d, 6d, p, 4d in descending order.

It is given, average number of steps walked by all of them = 7280.

Total number of steps walked by five of them = $7280 * 5 = 36400$.

It is mentioned that Anand walked 6400 steps

If $4d = 6400$, $d = 1600$



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Total number of steps = $25d + p$

$$25d + p = 36400$$

We will get a negative p value. Therefore, $4d$ is not equal to 6400 .

$$\text{If } 8d = 6400, d = 800$$

$$25d + p = 36400$$

$$p = 16400$$

p cannot be greater than $8d$. Therefore, $8d$ is not equal to 6400 .

The only possible case is $p = 6400$.

$$25d + 6400 = 36400$$

$$d = 1200$$

Therefore, the number of steps is $9600, 8400, 7200, 6400$ and 4800 .

Anand has arrived first and walked 6400 steps. It is mentioned that every person who enters the mall walks more than the previous person except the last person; this implies that the last person walks 4800 steps. Surya walks the least steps, which means that Surya is the last person to enter the mall. Surya spent 40 minutes in the mall, which means he left the mall at $1:40$ pm.

Name	In	Duration	Out	Steps
Anand	11			6400
	11:20			7200
	11:30			8400
	12			9600
Surya	1	40	1:40	4800

It is given that they all spend less than 2 hours in the mall. The one who entered the mall at $11, 11:20$ or $11:30$ pm cannot leave at $1:30$ pm. Therefore, the one who entered at 12 will leave the mall at $1:30$ pm.

Name	In	Duration	Out	Steps
Anand	11			6400
	11:20			7200
	11:30			8400
	12	90	1:30	9600
Surya	1	40	1:40	4800

It is mentioned Ritika spent her whole time shopping with Preethi. This means that Ritika visited the mall after Preethi and left before Preethi. This implies, Ritika and Preethi are not the one who entered the mall at 12 . Therefore, Vishal entered the mall at 12 and left the mall at $1:30$ pm.

Name	In	Duration	Out	Steps
Anand	11			6400
	11:20			7200
	11:30			8400
Vishal	12	90	1:30	9600
Surya	1	40	1:40	4800



Ritika should visit the mall after Preethi visited. Therefore, Ritika visited at 11:30 am and Preethi visited at 11:20 am.

Name	In	Duration	Out	Steps
Anand	11			6400
Preethi	11:20			7200
Ritika	11:30			8400
Vishal	12	90	1:30	9600
Surya	1	40	1:40	4800

It is given, only Surya spends less than an hour in the mall. Therefore, Ritika cannot leave the mall at 12:20 pm. Preethi must leave the mall after Ritika; therefore, Ritika cannot leave the mall at 1 pm. This implies, Ritika left the mall at 12:30 pm. It is given, all of them spent less than two hours in the mall. This implies Anand left the mall at 12:20 pm.

Final Arrangement:

Name	In	Duration	Out	Steps
Anand	11	80	12:20	6400
Preethi	11:20	100	1	7200
Ritika	11:30	60	12:30	8400
Vishal	12	90	1:30	9600
Surya	1	40	1:40	4800

There are maximum employees(four) in the mall between 12 - 12:20 pm. Four of them Anand, Preethi, Ritika and Vishal are at the mall between 12 - 12:20 pm. Therefore, they have maximum of 20 minutes to finish the game.

34. Who among the five employees has the lowest speed (steps per minute)?

- A. Anand
- B. Preethi
- C. Ritika
- D. Surya

Sol. Let the number of steps be l, m, n, p, q in descending order.

It is given l, m, n are in A.P

$m = l - d$

$n = l - 2d$

It is also given that l, n, q are in A.P and from above values,

$n = l - 2d$

Therefore, $q = l - 4d$

It is given highest steps are twice the least steps.

$l = 2q$

$l = 2l - 8d$



$l = 8d$

The number of steps will be $8d, 7d, 6d, p, 4d$ in descending order.

It is given, average number of steps walked by all of them = 7280.

Total number of steps walked by five of them = $7280 * 5 = 36400$.

It is mentioned that Anand walked 6400 steps

If $4d = 6400, d = 1600$

Total number of steps = $25d + p$

$25d + p = 36400$

We will get a negative p value. Therefore, $4d$ is not equal to 6400.

If $8d = 6400, d = 800$

$25d + p = 36400$

$p = 16400$

p cannot be greater than $8d$. Therefore, $8d$ is not equal to 6400.

The only possible case is $p = 6400$.

$25d + 6400 = 36400$

$d = 1200$

Therefore, the number of steps is 9600, 8400, 7200, 6400 and 4800.

Anand has arrived first and walked 6400 steps. It is mentioned that every person who enters the mall walks more than the previous person except the last person; this implies that the last person walks 4800 steps. Surya walks the least steps, which means that Surya is the last person to enter the mall. Surya spent 40 minutes in the mall, which means he left the mall at 1:40 pm.

Name	In	Duration	Out	Steps
Anand	11			6400
	11:20			7200
	11:30			8400
	12			9600
Surya	1	40	1:40	4800

It is given that they all spend less than 2 hours in the mall. The one who entered the mall at 11, 11:20 or 11:30 pm cannot leave at 1:30 pm. Therefore, the one who entered at 12 will leave the mall at 1:30 pm.

Name	In	Duration	Out	Steps
Anand	11			6400
	11:20			7200
	11:30			8400
	12	90	1:30	9600
Surya	1	40	1:40	4800

It is mentioned Ritika spent her whole time shopping with Preethi. This means that Ritika visited the mall after Preethi and left before Preethi. This implies, Ritika and Preethi are not the one who entered the mall at 12. Therefore, Vishal entered the mall at 12 and left the mall at 1:30 pm.



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Name	In	Duration	Out	Steps
Anand	11			6400
	11:20			7200
	11:30			8400
Vishal	12	90	1:30	9600
Surya	1	40	1:40	4800

Ritika should visit the mall after Preethi visited. Therefore, Ritika visited at 11:30 am and Preethi visited at 11:20 am.

Name	In	Duration	Out	Steps
Anand	11			6400
Preethi	11:20			7200
Ritika	11:30			8400
Vishal	12	90	1:30	9600
Surya	1	40	1:40	4800

It is given, only Surya spends less than an hour in the mall. Therefore, Ritika cannot leave the mall at 12:20 pm. Preethi must leave the mall after Ritika; therefore, Ritika cannot leave the mall at 1 pm. This implies, Ritika left the mall at 12:30 pm. It is given, all of them spent less than two hours in the mall. This implies Anand left the mall at 12:20 pm.

Final Arrangement:

Name	In	Duration	Out	Steps
Anand	11	80	12:20	6400
Preethi	11:20	100	1	7200
Ritika	11:30	60	12:30	8400
Vishal	12	90	1:30	9600
Surya	1	40	1:40	4800

$$\text{Anand's speed} = \frac{6400}{80} = 80 \text{ steps per minute}$$

$$\text{Preethi's speed} = \frac{7200}{100} = 72 \text{ steps per minute}$$

$$\text{Ritika's speed} = \frac{8400}{60} = 140 \text{ steps per minute}$$

$$\text{Surya's speed} = \frac{4800}{40} = 120 \text{ steps per minute}$$

Preethi has lowest speed.

Answer is option B



Instructions

A chess tournament takes place at the “International Chess Club” in Mumbai. 64 players participated in the tournament, and each of them was seeded from 1 - 64, with 1 being the highest seed and 64 being the lowest. The higher the seed, the greater the chances of winning for that player. A match where a higher seeded player wins the game is called a “Regular” match, and where a lower-seeded player manages to win is called an “Upset”.

The tournament is conducted in a knockout format having six rounds. In each round, the highest-seeded player plays against the lowest seeded player. For example, in round 1, the player seeded 1 plays against the player seeded 64, the player seeded 2 plays against the player seeded 63 and so on.

Based on the information given, answer the following questions.

35. If all the matches in rounds 1, 3 and 5 resulted in an upset, and all the games in rounds 2, 4 and 6 were regular matches, what was the seed value of the tournament winner?

- A. 44
- B. 43
- C. 64
- D. 22

Sol. All the games in rounds 1, 3 and 5 resulted in an upset, and all the games in rounds 2, 4 and 6 were regular matches. Thus, the team matchups in all the rounds will be as given below.

The teams in the coloured column were the winners of their respective matches.

Round 1	
Player1	Player2
1	64
2	63
3	62
..	..
..	..
..	..
..	..
30	35
31	34
32	33



Round 2	
Player1	Player2
33	64
34	63
35	62
..	..
..	..
..	..
..	..
36	51
47	50
48	49

Round 3	
Player1	Player2
33	48
34	47
35	46
36	45
37	44
38	43
39	42
40	41

Round 4	
Player1	Player2
41	48
42	47
43	46
44	45

Round 5	
Player1	Player2
41	44
42	43

Round 6	
Player1	Player2
43	44

Thus, the winner of the tournament is the player originally seeded 43.

Hence, option B is the answer.



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36. If all the matches in rounds 1, 3 and 5 were regular matches, and all the games in rounds 2, 4 and 6 resulted in an upset, which of the following players were the losers of round 5?

- A. Seed 23 and Seed 24
- B. Seed 41 and Seed 42
- C. Seed 43 and Seed 44
- D. Seed 21 and Seed 22

Sol. All the games in rounds 2, 4 and 6 resulted in an upset, and all the games in rounds 1, 3 and 5 were regular matches. Thus, the team matchups in all the rounds will be as given below.

The teams in the coloured column were the winners of their respective matches.

Round 1	
Player1	Player2
1	64
2	63
3	62
..	..
..	..
..	..
..	..
30	35
31	34
32	33

Round 2	
Player1	Player2
1	32
2	31
3	30
..	..
..	..
..	..
..	..
14	19
15	18
16	17

Round 3	
Player1	Player2
17	32
18	31
19	30
20	29
21	28
22	27
23	26
24	25

Round 4	
Player1	Player2
17	24
18	23
19	22
20	21

Round 5	
Player1	Player2
21	24
22	23

Round 6	
Player1	Player2
21	22

Thus, the losers of round 5 were Seed 23 and Seed 24.

Hence, option A is the answer.

37. What is the difference between the seed number of the winners of a tournament where every match resulted in an upset and a tournament where every match was a regular match?

Sol. Case 1: Every match of the tournament resulted in an upset.

Round 1: Players with seeds 33 - 64 will win.

Round 2: Players with seeds 49 - 64 will win.

Round 3: Players with seeds 57 - 64 will win.

Round 4: Players with seeds 61 - 64 will win.

Round 5: Players with seeds 63 and 64 will win.

Round 6: The player with seed 64 will win the tournament.

Case 2: Every match in the tournament was a regular match.



Round 1: Players with seeds 1 - 32 will win.

Round 2: Players with seeds 1 - 16 will win.

Round 3: Players with seeds 1 - 8 will win.

Round 4: Players with seeds 1 - 4 will win.

Round 5: Players with seeds 1 and 2 will win.

Round 6: The player with seed 1 will win the tournament.

Thus, the difference between the seeds of winners = $64 - 1 = 63$.

38. Additional information: In case of an upset, the seed value of the winner is changed to the seed value of the loser. For example, if the match between the players seeded 1 and 64 resulted in an upset, the seed of the winner will change from 64 to 1 for the next round.

If all the games in rounds 1, 3 and 5 resulted in an upset and all the games in rounds 2, 4 and 6 were regular matches, what was the original seed value of the tournament's winner?

- A. 49
- B. 50
- C. 51
- D. 52

Sol. All the games in rounds 1, 3 and 5 resulted in an upset, and all the games in rounds 2, 4 and 6 resulted in regular matches. After each upset, the winner gets the seed value of the loser. Thus, the team matchups in each round of the tournament are as given below.

Players in the coloured column are the winners of their respective matches.

Round 1	
Player1	Player2
1	64
2	63
3	62
..	..
..	..
..	..
..	..
30	35
31	34
32	33



Round 2			
Player 1	Original Seed	Player 2	Original Seed
1	64	32	33
2	63	31	34
3	62	30	35
4	61	29	36
5	60	28	37
6	59	27	38
7	58	26	39
8	57	25	40
9	56	24	41
10	55	23	42
11	54	22	43
12	53	21	44
13	52	20	45
14	51	19	46
15	50	18	47
16	49	17	48

Round 3			
Player 1	Original Seed	Player 2	Original Seed
1	64	16	49
2	63	15	50
3	62	14	51
4	61	13	52
5	60	12	53
6	59	11	54
7	58	10	55
8	57	9	56

Round 4			
Player 1	Original Seed	Player 2	Original Seed
1	49	8	56
2	50	7	55
3	51	6	54
4	52	5	53

Round 5			
Player 1	Original Seed	Player 2	Original Seed
1	49	4	52
2	50	3	51



Finals			
Player	Original Seed	Player	Original Seed
1	52	2	51

Thus, the player seeded 52 won the tournament.

Hence, option D is the correct answer.

39. Additional information: In case of an upset, the seed value of the winner is changed to the seed value of the loser. For example, if the match between the players seeded 1 and 64 resulted in an upset, the seed of the winner will change from 64 to 1 for the next round.

If all the games in rounds 1, 3 and 5 resulted in an upset and all the games in rounds 2, 4 and 6 were regular matches, what is the sum of original seed values of the losers of round 5?

- A. 103
- B. 83
- C. 99
- D. 87

Sol. All the games in rounds 1, 3 and 5 resulted in an upset, and all the games in rounds 2, 4 and 6 resulted in regular matches. After each upset, the winner gets the seed value of the loser. Thus, the team matchups in each round of the tournament are as given below.

Players in the coloured column are the winners of their respective matches.

Round 1	
Player1	Player2
1	64
2	63
3	62
..	..
..	..
..	..
..	..
30	35
31	34
32	33



Round 2			
Player 1	Original Seed	Player 2	Original Seed
1	64	32	33
2	63	31	34
3	62	30	35
4	61	29	36
5	60	28	37
6	59	27	38
7	58	26	39
8	57	25	40
9	56	24	41
10	55	23	42
11	54	22	43
12	53	21	44
13	52	20	45
14	51	19	46
15	50	18	47
16	49	17	48

Round 3			
Player 1	Original Seed	Player 2	Original Seed
1	64	16	49
2	63	15	50
3	62	14	51
4	61	13	52
5	60	12	53
6	59	11	54
7	58	10	55
8	57	9	56

Round 4			
Player 1	Original Seed	Player 2	Original Seed
1	49	8	56
2	50	7	55
3	51	6	54
4	52	5	53

Round 5			
Player 1	Original Seed	Player 2	Original Seed
1	49	4	52
2	50	3	51

Finals			
Player 1	Original Seed	Player 2	Original Seed
1	52	2	51





Thus, the losers of round 5 have seeds 49 and 50.

The required sum = $49 + 50 = 99$

Hence, option C is the answer.

40. Additional information: In case of an upset, the seed value of the winner is changed to the seed value of the loser. For example, if the match between the players seeded 1 and 64 resulted in an upset, the seed of the winner will change from 64 to 1 for the next round.

If all the games in rounds 1, 3 and 5 resulted in an upset and all the games in rounds 2, 4 and 6 were regular matches, what is the sum of the seed values from each round for the tournament's winner?

Sol. All the games in rounds 1, 3 and 5 resulted in an upset, and all the games in rounds 2, 4 and 6 resulted in regular matches. After each upset, the winner gets the seed value of the loser. Thus, the team matchups in each round of the tournament are as given below.

Players in the coloured column are the winners of their respective matches.

Round 1	
Player1	Player2
1	64
2	63
3	62
..	..
..	..
..	..
..	..
30	35
31	34
32	33

Round 2			
Player	Original Seed	Player	Original Seed
1	64	32	33
2	63	31	34
3	62	30	35
4	61	29	36
5	60	28	37
6	59	27	38
7	58	26	39
8	57	25	40
9	56	24	41
10	55	23	42
11	54	22	43
12	53	21	44
13	52	20	45
14	51	19	46
15	50	18	47
16	49	17	48



Round 3			
Player	Original Seed	Player	Original Seed
1	64	16	49
2	63	15	50
3	62	14	51
4	61	13	52
5	60	12	53
6	59	11	54
7	58	10	55
8	57	9	56

Round 4			
Player	Original Seed	Player	Original Seed
1	49	8	56
2	50	7	55
3	51	6	54
4	52	5	53

Round 5			
Player	Original Seed	Player	Original Seed
1	49	4	52
2	50	3	51

Finals			
Player	Original Seed	Player	Original Seed
1	52	2	51

The winner of the tournament is the player initially seeded 52.

Thus, the sum of all the seed values of the winner = $52 + 13 + 13 + 4 + 4 + 1 = 87$.

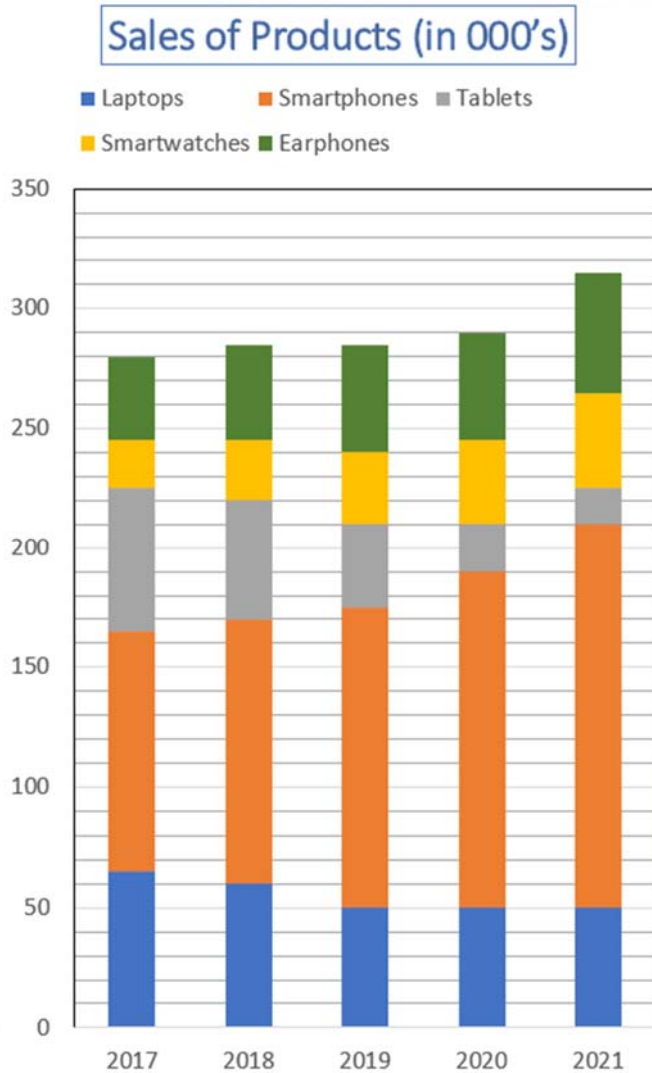
Hence, the required answer is 87.



Instructions

The given bar graph shows the sales of different products (Laptops, smartphones, tablets, smartwatches and earphones) for the tech company “TwoMinus” over the period 2017-2021.

Each value shown in the graph is a multiple of 5.



Based on the information provided, answer the questions that follow.

41. Which product showed the highest percentage of increase/decrease in sales from 2017-2021?

- A. Smartphones
- B. Tablets
- C. Smartwatches
- D. Earphones



Sol. Translating the data from the chart into a table, we get

	Laptops	Smartphones	Tablets	Smartwatches	Earphones
2017	65	100	60	20	35
2018	60	110	50	25	40
2019	50	125	35	30	45
2020	50	140	20	35	45
2021	50	160	15	40	50

The percentage change for each product is as follows:

$$\text{Laptops} = \frac{(65-50) \times 100}{50} = 30\%$$

$$\text{Smartphones} = \frac{(160-100) \times 100}{100} = 60\%$$

$$\text{Tablets} = \frac{60-15}{60} \times 100 = 75\%$$

$$\text{Smartwatches} = \frac{40-20}{20} \times 100 = 100\%$$

$$\text{Earphones} = \frac{50-35}{35} \times 100 = 42.86\%$$

Thus, the maximum change percentage change in sales is shown by Smartwatches.

Hence, option C is the answer.

42. If the average selling prices of Laptops, Smartphones, Tablets, Smartwatches and Earphones are in the ratio of 4:3:3:2:1, then what is the ratio of revenue obtained from Smartwatches to Laptops in the year 2021?

- A. 2:5
- B. 5:2
- C. 4:5
- D. 5:8

Sol. Translating the data from the chart into a table, we get

	Laptops	Smartphones	Tablets	Smartwatches	Earphones
2017	65	100	60	20	35
2018	60	110	50	25	40
2019	50	125	35	30	45
2020	50	140	20	35	45
2021	50	160	15	40	50

The average selling prices of Laptops, Smartphones, Tablets, Smartwatches and Earphones are in the ratio of 4:3:3:2:1.

Let the selling price of each smartwatch and laptop be 2a and 4a, respectively.



Thus, the revenue generated from Smartwatches = $2a \times 40000 = 80000a$

The revenue generated from laptop sales = $4a \times 50000 = 200000a$

Thus, the ratio of revenues from smartwatches and laptops = $\frac{80000a}{200000a} = 2/5 = 2:5$

Hence, option A is the answer.

43. If the profit earned on each laptop, smartphone, tablet, smartwatch and earphones is 20%, 10%, 20%, 25% and 25%, respectively, what is the overall profit earned by the company in the year 2018? (Use data from the previous question)

- A. 25.19%
- B. 16.2%
- C. 15.69%
- D. 16.35%

Sol. Translating the data from the chart into a table, we get

	Laptops	Smartphones	Tablets	Smartwatches	Earphones
2017	65	100	60	20	35
2018	60	110	50	25	40
2019	50	125	35	30	45
2020	50	140	20	35	45
2021	50	160	15	40	50

The average selling prices of Laptops, Smartphones, Tablets, Smartwatches and Earphones are in the ratio of 4:3:3:2:1.

Let the selling prices of laptops, smartphones, tablets, smartwatches and earphones be $4a$, $3a$, $2a$ and a , respectively.

Thus, the revenues and profits obtained from the products are:

Laptops:

$$\text{revenue} = 4a \times 60 = 240a$$

$$\text{cost} = \frac{240a}{1.2} = 200a$$

$$\text{profit} = 240a - 200a = 40a$$

Smartphones:

$$\text{revenue} = 3a \times 110 = 330a$$

$$\text{cost} = \frac{330a}{1.1} = 300a$$

$$\text{profit} = 330a - 300a = 30a$$

Tablets:

$$\text{revenue} = 3a \times 50 = 150a$$



$$\text{cost} = \frac{150a}{1.2} = 125a$$

$$\text{profit} = 150a - 125a = 25a$$

Smartwatches:

$$\text{revenue} = 2a \times 25 = 50a$$

$$\text{cost} = \frac{50a}{1.25} = 40a$$

$$\text{profit} = 50a - 40a = 10a$$

Earphones:

$$\text{revenue} = a \times 40 = 40a$$

$$\text{cost} = \frac{40a}{1.25} = 32a$$

$$\text{profit} = 40a - 32a = 8a$$

Thus, the total cost = $200a + 300a + 125a + 40a + 32a = 697a$

The total profit earned = $40a + 30a + 25a + 10a + 8a = 113a$

Thus, the overall profit of the company = $\frac{(113a \times 100)}{697a} = 16.2\%$

Hence, option B is the answer.

44. Additional information: The total sales of the company increased by 60% in the year 2022 over 2021, and laptops and earphones constituted 50% of the sales.

If the sales of smartphones and tablets did not decrease, what will be the maximum percentage increase in the sales of smartwatches?

- A. 92.5%
- B. 50%
- C. 192.5%
- D. 150%

Sol. Translating the data from the chart into a table, we get

	Laptops	Smartphones	Tablets	Smartwatches	Earphones
2017	65	100	60	20	35
2018	60	110	50	25	40
2019	50	125	35	30	45
2020	50	140	20	35	45
2021	50	160	15	40	50

The total sales in 2021 = $50 + 160 + 15 + 40 + 50 = 315$

The sales increased by 60% in 2022.

Thus, total sales in 2022 = $1.6 \times 315 = 504$



Laptops and earphones constituted 50% of the sales.

Thus, the total sales of Smartphones, tablets, and smartwatches combined = $0.5 \times 504 = 252$

Since we have to calculate the maximum percentage increase in the sales of smartwatches, and the sales of smartphones and tablets did not decrease, we will take the sales of smartphones and tablets to be same as in 2021.

Thus, the total sales of smartwatches = $252 - 160 - 15 = 77$

Percentage increase in the sales of smartwatches = $\frac{77-40}{40} \times 100 = 92.5\%$

Hence, the answer is option A.

45. How many isosceles triangles with integer sides are possible that have a perimeter of 250 units?

Sol. Let the sides be a, a, and b.

Now, if $a < b$, then $2a > b$

$$2a + b > 2b$$

$$250 > 2b$$

$$125 > b$$

$$b < 125$$

b can take values less than 125.

And a can take as large values as possible, since $a - a = 0$ is always less than b

However since they are integers, b can take a minimum value of 2.

Hence, triangles possible:

$$2, 124, 124$$

$$4, 123, 123$$

.....

$$124, 63, 63$$

Hence a total of 62 triangles are possible.

46. The cost price of a table is Rs 314. Find the marked price (in rupees) of the table if it is known that the shop owner receives 12.5% profit after providing a 25% discount on the table

Sol. Let marked price be x% more than C.P.

$$M.P = \frac{100+x}{100} C.P$$

$$S.P = \frac{3}{4} \left(\frac{100+x}{100} \right) C.P$$

As it is mentioned, shop owner earned 12.5% profit, i.e.

$$S.P = \frac{9}{8} C.P$$

$$\frac{9}{8} C.P = \frac{3}{4} \left(\frac{100+x}{100} \right) C.P$$

$$\frac{x}{100} = \frac{1}{2}$$



$$x = 50\%$$

$$\text{Marked price} = \frac{150}{100} \times 314 = \frac{3}{2} \times 314 = \text{Rs } 471$$

47. From a solid right cylinder with a height of 10cm and base diameter of 8cm, a cone of the height of 6cm and similar base diameter is cut. The remaining figure is melted and cast into solid spheres of radius 2cm. How many such spheres can be made?

Sol. The volume of given solid cylinder = $\pi r^2 h = \pi * 4^2 * 10 = 160\pi \text{ cm}^3$

The volume of the cone = $(1/3) * \pi r^2 h = (1/3) * \pi * 4^2 * 6 = 32\pi \text{ cm}^3$

The volume of the remaining figure = $160\pi - 32\pi = 128\pi \text{ cm}^3$

Volume of the spheres = $(4/3) * \pi * r^3 = (4/3) * \pi * 8$

The remaining figure is cast into the spheres of radius 2cm. Let 'n' be the number of spheres that can be made. Thus,

$$128\pi = n * (4/3) * \pi * 8$$

$$n = 12 \text{ spheres}$$

48. Fifty customers bought the same dining table sets from a furniture shop. Customers can purchase furniture both online and offline. The product's online price(excluding convenience fees and delivery charges) is 25% more than the offline price(excluding delivery charges). The convenience charge on online purchase is Rs. 50. The delivery charges for online and offline purchases are Rs. 25 and Rs. 30 respectively. The number of customers who bought offline is 50% more than customers who bought online. If it is known that company received an equal amount of money from both online and offline purchases, what is the money saved by a offline customer?

- A. Rs 25
- B. Rs 45
- C. Rs 50
- D. Rs 75

Sol. Total number of customers = 50

Let the number of online customers be x

Number of offline customers = $\frac{3}{2} x$

$$x + \frac{3}{2} x = 50$$

$$x = 20$$

Online customers = 20 and offline customers = 30

Let the actual selling price of the sofa set be S.P



Selling price of online customer = $1.25S.P + 50 + 25$

Selling price of offline customer = $S.P. + 30$

It is given,

$$20(1.25S.P + 50 + 25) = 30(S.P. + 30)$$

$$5S.P = 600$$

$$S.P = 120$$

Money saved by a offline customer = $0.25S.P + 45 = 0.25(120) + 45 = \text{Rs } 75$

Answer is option D.

49. If a 37% alcohol solution is mixed with a 45% alcohol solution in the ratio a:b to form a 40% alcohol solution, what is the concentration of the solution formed if the 40% alcohol solution and the 45% alcohol solution are mixed in the same ratio respectively?

- A. 41.875%
- B. 43.125%
- C. 42.5%
- D. 43.375%

Sol. a:b = $(45-40)/(40-37) = 5:3$ - by alligations

Now, if 40% and 45% solution is mixed in the ratio of 5:3, then the final concentration = $40 + 3/8 * 5 = 41.875\%$.

50. $f(x) = x^2 + 8x + 16$ and $g(x) = x^2 - 16$. Find the quadratic equation whose roots are sum and product of $\frac{f(6)}{g(6)}$ and $\frac{g(8)}{f(8)}$?

- A. $x^2 - 23x + 120 = 0$
- B. $9x^2 - 21x + 80 = 0$
- C. $9x^2 - 63x + 80 = 0$
- D. $3x^2 - 16x + 5 = 0$

Sol. $f(x) = x^2 + 8x + 16 = (x+4)^2$

$g(x) = x^2 - 16 = (x+4)(x-4)$

Thus,

$$\frac{f(x)}{g(x)} = \frac{(x+4)}{(x-4)}$$

Thus, $\frac{f(6)}{g(6)} = \frac{(6+4)}{(6-4)} = \frac{10}{2} = 5$

And $\frac{g(8)}{f(8)} = \frac{(8-4)}{(8+4)} = \frac{4}{12} = \frac{1}{3}$



Thus, the roots of required quadratic equation are $5 + \frac{1}{3} = \frac{16}{3}$ and $5 \times \frac{1}{3} = \frac{5}{3}$. Thus, the required quadratic equation is $x^2 - (\frac{16}{3} + \frac{5}{3})x + (\frac{16}{3} \times \frac{5}{3})$

--> $9x^2 - 63x + 80 = 0$.

Hence, option C is the answer.

51. Abhinav has bought a fridge for Rs 50,000. Due to a shortage of money, he paid the total amount in three installments in three years at the rate of 10% per annum. He has paid Rs 15,730 in the last installment to clear all the dues. If the amount paid by Abhinav in the first two installments is equal, find the amount paid by him in the second installment

- A. Rs 20,000
- B. Rs 22,000
- C. Rs 24,000
- D. Rs 26,000

Sol. Let the amount paid by Abhinav in first installment be 'x'
 $50,000 (1.1)^3 = x(1.1)^2 + x(1.1) + 15,730$

$66,550 = 1.21x + 1.1x + 15,730$

$2.31x = 50820$

$x = 22,000$

Amount paid by Abhinav in second installment = Rs 22,000

Answer is option B.

52. Find out the number of possible values of x, x is an integer, for which $[\log_x x!] = 2$

$x! = 1*2*3*... *x-1*x$

$[x]$ = greatest integer less than or equal to x

Sol. $[\log_x x!] = 2$

x can not be 1.

If x = 2,

$[\log_2 2] = 1$

If x = 3,

$[\log_3 6] = 1$

If x = 4,

$[\log_4 24] = 2$

If x = 5,

$[\log_5 120] = 2$

If $x = 6$,

$$[\log_6 720] = 3$$

For numbers greater than 6, the value is either 3 or greater than 3.

This value keeps increasing.

Hence, for $x = 4$ and 5 , we can get the value as 2.

Hence, only two values are possible.

53. Find out the number of integral values of x satisfying the following inequality:

$$\frac{x^2 - 6x + 5 - |x + 4|}{x^2 - 6x + 5} > 1$$

Enter -1 if infinite values exist.

Sol. $\frac{|x+4|}{x^2-6x+5} < 0, \frac{(x^2-6x+5-|x+4|)}{x^2-6x+5} > 1$

$$1 - \frac{|x+4|}{x^2-6x+5} > 1$$

$$-\frac{|x+4|}{x^2-6x+5} > 0$$

$$\frac{|x+4|}{x^2-6x+5} < 0$$

The value of $|y|$ is always positive.

Hence,

$$x^2 - 6x + 5 < 0$$

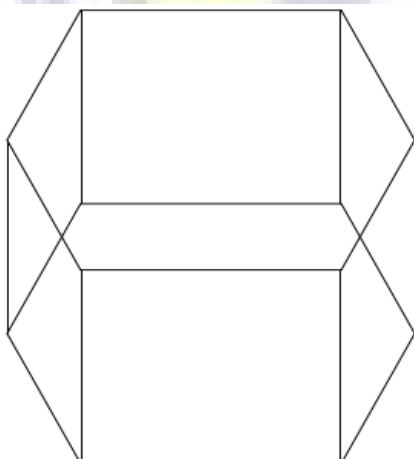
$$x^2 - 5x - x + 5 < 0$$

$$(x - 5)(x - 1) < 0$$

x lies between 1 and 5.

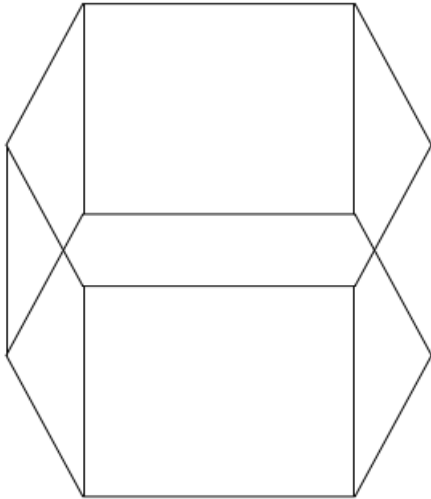
Hence, only three values of x exist.

54. A hexagonal box is shown below such that the base is a regular hexagon. It has a height that is equal to the length of the side of the hexagonal base. If the area of the base is b and that of the walls combined is w , and $w = n \times b$, find the approximate value of n .



- A. 2.3
- B. 2.5
- C. 1.9
- D. 2.7

Sol.



Let the side of the hexagon be x . Hence, the height = x .

$$\text{Now, } b = 6 \times \frac{\sqrt{3}}{4} x^2$$

$$w = 6 \times x^2$$

$$w = n \times b$$

$$6x^2 = n \times 6 \times \frac{\sqrt{3}}{4} x^2$$

$$n = \frac{4}{\sqrt{3}} = \frac{4}{3} \sqrt{3} = 4 \times \frac{1.732}{3} = 4 \times 0.577 = 2.308$$

55. Trains P and Q make a round trip between Delhi and Bhopal, starting simultaneously. Train P starts from Delhi at a speed of 30 km/hr, and Train Q starts from Bhopal at 20 km/hr. Train Q travels 120 km from Delhi to meet train P for the second time. Find the distance between Delhi and Bhopal?

Enter -1 if the answer can't be determined.

Sol. Let the distance between Delhi and Bhopal be 'D.'

$$\text{P's speed} : \text{Q's speed} = 30:20 = 3:2$$

$$\text{Distance travelled by P to meet for the first time} = \frac{3D}{5}.$$

$$\text{Distance travelled by Q to meet for the first time} = \frac{2D}{5}.$$



Before meeting for the second time, Train P travels from Delhi to Bhopal and Train Q travels from Bhopal to Delhi.

Time taken by Train P to travel from Delhi to Bhopal is $\frac{D}{30}$.

Time taken by Train Q to travel from Bhopal to Delhi is $\frac{D}{20}$.

Train Q take $\frac{D}{60}$ more time to complete a trip. During this time, Train P travels half of the distance between Delhi and Bhopal. Train P and Q have to cover $\frac{D}{2}$ distance to meet for the second time. Distance travelled by P and Q will be in the ratio of 3 : 2.

Distance travelled by P to meet for the second time = $\frac{3}{5} \times \frac{D}{2} = \frac{2D}{10}$.

Distance travelled by Q to meet for the second time from Delhi = $\frac{2}{5} \times \frac{D}{2} = \frac{2D}{10}$

It is given, $\frac{2D}{10} = 120$

D = 600 km

The distance between Delhi and Bhopal is 600 km.

56. If 40 men with work efficiency of 0.6 working for 8 hours a day can complete a work in 10 days, how many days will 30 men with work efficiency of 0.8 working for 12 hours a day finish thrice the work?

- A. 10 days
- B. $13\frac{1}{3}$ days
- C. $16\frac{2}{3}$ days
- D. 20 days

Sol. Number of Men(M) is directly proportional to work done(W). Likewise, time taken(T) and efficiency(E) are also directly proportional to work done(W). Number of Men, time taken and efficiency are inversely proportional to each other, i.e. if efficiency is more, time taken is less, or if the number of men is greater, then the time taken will be less. Accordingly, we can write

$$\frac{MTE}{W} = k$$

$$\frac{M_1 T_1 E_1}{W_1} = \frac{M_2 T_2 E_2}{W_2}$$

$$\frac{(40)(8)(10)(0.6)}{1} = \frac{(30)(12)(d)(0.8)}{3}$$

$$d = 20$$

Therefore, number of days required = 20 days

Answer is option D.



57. In a wedding, the ratio of male guests to female guests is 5:8, and the ratio of female guests to male guests after some guests have left is 23:14. If the ratio of the number of male guests who left to the number of female guests who left is 2:3. What percent of total guests were there at the wedding till the end?

- A. 74%
- B. 68%
- C. 71%
- D. 66%

Sol.

	Total Guests	Guests Left	Remaining Guests
Male	5x	2y	14z
Female	8x	3y	23z
Total	13x = 52z	5y = 15z	37z

$$\frac{5x - 2y}{8x - 3y} = \frac{14}{23}$$

$$115x - 46y = 112x - 42y$$

$$3x = 4y$$

Also we know that,

$$13x - 5y = 37z$$

$$13x - 5\left(\frac{3x}{4}\right) = 37z$$

$$\frac{37x}{4} = 37z$$

$$x = 4z$$

$$3x = 4y = 12z$$

$$\text{Remaining guests} = \frac{37z}{52z} \times 100 = 71.1 \approx 71\%$$

Answer is option C.

58. If the cube of a natural number has 40 factors, how many factors does the number have?

- A. 8
- B. 14
- C. 12
- D. Cannot be determined



Sol. If the cube has 40 factors, then we have to write 40 as a product of terms that can be represented as $3a + 1$.

$3a + 1$ can take 4, 7, 10, 13, 16, 19, 22,.....

Now, $40 = 4 \times 10$, where $4 = 3 + 1$ and $10 = 3 \times 3 + 1$

Hence, the number has $(1 + 1)(3 + 1) = 2 \times 4 = 8$ factors.

However, the cube can be in the form of a^{39} .

In this case, there are $13 + 1 = 14$ factors.

Hence, we cannot determine the number of factors uniquely.

59. If $3f(x) + 2f\left(\frac{1}{x}\right) = x - \frac{1}{x}$, then what is the value of $6f(6) - f(1)$?

Sol. We are given,

$$3f(x) + 2f\left(\frac{1}{x}\right) = x - \frac{1}{x} \dots(1)$$

Replacing x by $\frac{1}{x}$

$$3f\left(\frac{1}{x}\right) + 2f(x) = \frac{1}{x} - x \dots(2)$$

Adding (1) and (2) we get

$$5\left[f(x) + f\left(\frac{1}{x}\right)\right] = 0$$

$$f(x) + f\left(\frac{1}{x}\right) = 0 \dots(3)$$

Putting $x = 6$ in (1)

$$3f(6) + 2f\left(\frac{1}{6}\right) = 6 - \frac{1}{6} = \frac{35}{6}$$

$$f(6) + 2\left[f(6) + f\left(\frac{1}{6}\right)\right] = \frac{35}{6}$$

Using equation (3) the above equation becomes

$$f(6) + 2(0) = \frac{35}{6}$$

$$\text{Thus, } f(6) = \frac{35}{6}$$

Putting $x = 1$ in (3)

$$f(1) + f(1) = 0$$

$$\text{Thus, } f(1) = 0$$

$$6f(6) - f(1) = 6 \times \frac{35}{6} - 0 = 35 - 0 = 35$$

Thus, the required answer is **35**.

Alternate Solution:

$$3f(x) + 2f\left(\frac{1}{x}\right) = x - \frac{1}{x}$$

For $x = 1$,



$$3f(1) + 2f\left(\frac{1}{6}\right) = 1 - \frac{1}{6}$$

$$5f(1) = 0$$

$$f(1) = 0$$

for $x = 6$

$$3f(6) + 2f\left(\frac{1}{6}\right) = 6 - \frac{1}{6} = \frac{35}{6}$$

Multiplying the equation by 3, we get

$$9f(6) + 6f\left(\frac{1}{6}\right) = \frac{35}{2} \dots(1)$$

$$\text{For } x = \frac{1}{6}$$

$$3f\left(\frac{1}{6}\right) + 2f(6) = \frac{1}{6} - 6 = \frac{-35}{6}$$

Multiplying the equation by 2, we get

$$6f\left(\frac{1}{6}\right) + 4f(6) = \frac{-35}{3} \dots(2)$$

Subtracting (2) from (1), we get

$$5f(6) = \frac{35}{2} + \frac{35}{3} = \frac{175}{6}$$

$$f(6) = \frac{35}{6}$$

$$\text{Thus, } 6f(6) - f(1) = 6 \times \frac{35}{6} - 0 = 35$$

60. Two circular tracks, P and Q, of radii 70m and 140m, respectively, are connected at point O. A and B start running simultaneously from point O on tracks P and Q, respectively. They both meet again at point O after completing one round of the individual tracks after 11minutes. If now A and B have switched tracks, find the difference between the time taken by A and B to complete a round of the tracks.

- A. 22 min
- B. 11 min
- C. 16.5 min
- D. 0 min

Sol. The circumference of track P = $2 \times \frac{22}{7} \times 70 = 440\text{m}$

The circumference of track Q = $2 \times \frac{22}{7} \times 140 = 880\text{m}$

They both complete a round of their tracks in 11 minutes.

Thus, speed of A = $\frac{440}{11} = 40\text{m/min}$

Speed of B = $\frac{880}{11} = 80\text{m/min}$

Now, both have switched their tracks.



Time taken by A to complete a round of track Q = $\frac{880}{40} = 22\text{min}$

Time taken by B to complete a round of track P = $\frac{440}{80} = 5.5\text{min}$

Thus, the difference in time taken to complete a round of tracks = $22 - 5.5 = 16.5\text{minutes}$.

Thus, option C is the answer.

Alternatively,

Time taken by A to complete a round of track Q, which is twice the size of P = $2 \times 11 = 22\text{min}$

Time taken by B to complete a round of track P, which is half the size of Q = $11/2 = 5.5\text{min}$

61. Two dice, one in the shape of a cube with numbers 1-6 on its sides and the other in the form of a pyramid with numbers 1-4 on its four faces, are rolled together. What is the probability that the product of numbers appearing on the top sides of the dice is a perfect square?

- A. $5/24$
- B. $1/6$
- C. $1/4$
- D. $1/2$

Sol. The possible outcomes of the cube-shaped die are $\{1, 2, 3, 4, 5, 6\}$ and of the pyramid-shaped dice is $\{1, 2, 3, 4\}$.

When both the dice are rolled together, the possible outcomes are $\{(1,1), (1, 2), (1, 3), (1, 4), (1, 5), (1, 6), (2,1), \dots, (4, 1), (4, 2), (4, 3), (4, 4), (4, 5), (4, 6)\}$. Thus, a total of 24 outcomes.

The event that the product of numbers on both dice is a perfect square has the following outcomes: $\{(1,1), (2, 2), (1, 4), (4, 1), (3, 3), (4, 4)\}$. Thus, a total of 6 outcomes.

Thus, the probability of getting the product of numbers as a perfect square = $6/24 = 1/4$

Hence, option C is the answer.

62. A special die used in the game “Dragons & Dungeons” is in the shape of a pyramid with its four sides numbered 1-4, in which the number on the downward-facing side is taken as the outcome. Two such dice are rolled together; one is biased, and the other is unbiased. The unbiased die has an equal probability of getting any number, whereas the biased one has a probability of $\frac{1}{2}$ for getting the number 4 and equal probabilities for getting other numbers as outcomes. What is the probability that both the dice have an even number as their outcomes?

- A. $\frac{1}{6}$
- B. $\frac{1}{4}$
- C. $\frac{1}{2}$
- D. $\frac{1}{3}$



Sol. Four possible numbers can appear as outcomes: 1, 2, 3, 4.

The event where both the dice have an even number is given by $\{(2,2), (2, 4), (4,2), (4,4)\}$

We have that the unbiased die has an equal probability of getting any number. Thus, the probability of getting any number in the unbiased die $= \frac{1}{4}$

In the biased die, getting '4' has a probability of $\frac{1}{2}$ and others have equal probability. Thus, the probability of getting a number other than 4 $= \frac{1}{3} * \left(1 - \frac{1}{2}\right) = \frac{1}{6}$

Thus, the probability of getting both the numbers as even $= \frac{1}{4} \times \frac{1}{6} + \frac{1}{4} \times \frac{1}{2} + \frac{1}{4} \times \frac{1}{6} + \frac{1}{4} \times \frac{1}{2} = \frac{1}{3}$.

Hence, option D is the answer.

63. There are three friends, A, B and C, in a twenty-seven storeyed building. All of them live on different floors. The number of floors above A to the number of floors below B is in the ratio 2 : 3, and the number of floors below A to the number of floors above B is in the ratio 9 : 7. On which floor does C live if it is known that C lives between A and B on a prime numbered floor?

- A. 17
- B. 13
- C. 19
- D. 11

Sol. Let the number of floors above A be $2x$

Number of floors below B $= 3x$

Let the number of floors below A be $9y$

Number of floors above B $= 7y$

Number of floors above A + number of floors below B + 1(floor in which A lives) = Total number of floors (same applies for B as well)

$$2x + 9y + 1 = 3x + 7y + 1 = 27$$

$$x = 2y$$

$$2x + 9y + 1 = 27$$

$$4y + 9y = 26$$

$$13y = 26$$

$$y = 2$$

On solving we get,

$$x = 4$$

Number of floors below A $= 9y = 9(2) = 18$

This implies A lives on 19th floor

Number of floors below B $= 3x = 3(4) = 12$

This implies B lives on 13th floor

It is mentioned that C lives between A and B on a prime numbered floor. The only prime number between 13 and 19 is 17. Therefore, C lives on the 17th floor.

Answer is option A.

64. If it is known that a 1000 cm^3 tank can be filled by fifteen inlet and five outlet pipes in 100 days, how much time is taken for three inlet and one outlet pipe to fill a 1000 mm^3 tank?

- A. 12 hours
- B. 6 hours
- C. 18 hours
- D. 24 hours

Sol. 15 inlet and 5 outlet pipes can fill a 1000 cm^3 tank in 100 days

3 inlet and 1 outlet pipe can fill a 1000 cm^3 tank in $(100)(5) = 500$ days

$1 \text{ cm} = 10 \text{ mm}$

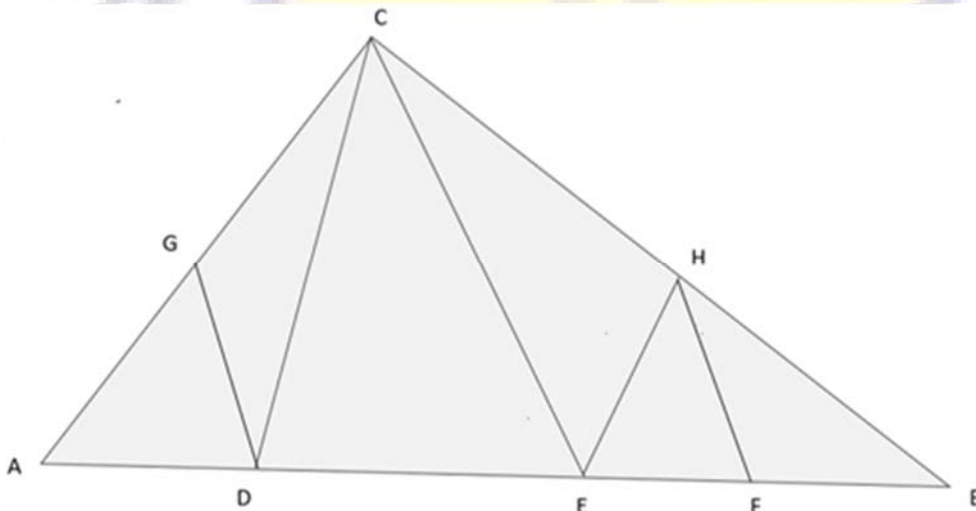
$1 \text{ cm}^3 = 1000 \text{ mm}^3$

3 inlet and 1 outlet pipe can fill a $1000(1000 \text{ mm}^3)$ tank in 500 days

3 inlet and 1 outlet pipe can fill a 1000 mm^3 tank in $\frac{500}{1000}$ days, i.e. $\frac{1}{2}$ day = 12 hours

Answer is option A.

65. In the given figure, not drawn to a scale, $AG = DG = CD = CE = HE = HF = BF$. What is the ratio of angle A to angle B?



- A. 3:4
- B. 4:3
- C. 1:2
- D. 4:7

Sol. Let angle $GAD = x$ and angle $HBF = y$

Angle $GAD = \text{angle } GDA = x$

angle $CGD = 2x \dots(\text{exterior angle})$

angle $GCD = \text{angle } CGD = 2x$

angle $CDE = 3x \dots(\text{exterior angle})$

angle $CED = \text{angle } CDE = 3x$

angle $ECD = 180 - 3x - 3x = 180 - 6x$

angle $BHF = \text{angle } HBF = y$

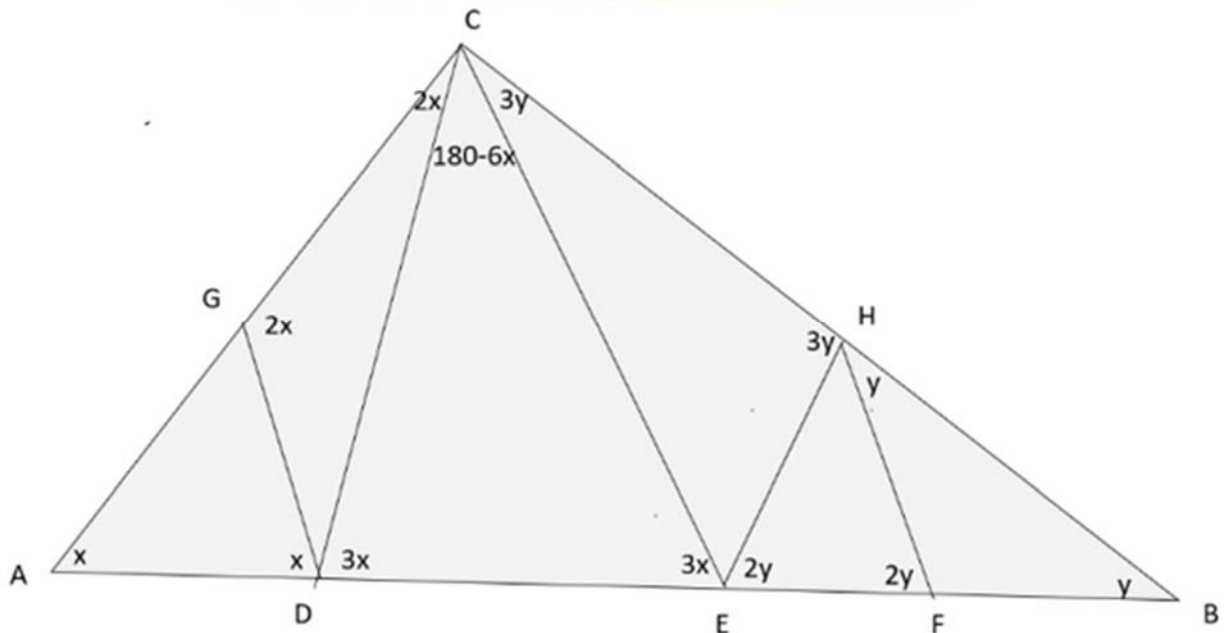
angle $HFE = 2y \dots(\text{exterior angle})$

angle $HEF = \text{angle } HFE = 2y$

angle $CHE = 3y \dots(\text{exterior angle})$

angle $HCE = \text{angle } CHE = 3y$

Thus, the final figure becomes,



In triangle ABC ,

angle $A + \text{angle } B + \text{angle } C = 180$

$x + y + 2x + 3y + 180 - 6x = 180$

$4y - 3x = 180 - 180$

$4y = 3x$

$x/y = 4/3$

Thus, the ratio of angle A to angle $B = 4:3$

Hence, the answer is option B .



66. If $a + 2b = 3c$ and $2a + 3b = 9c$, and $a:c = m:n$ where m and n are coprime, find $m+n$.

- A. 9
- B. 10
- C. 7
- D. 6

Sol. $a + 2b = 3c \rightarrow a - 3c = -2b$

$2a + 3b = 9c \rightarrow 2a - 9c = -3b$

Multiplying the first equation by 2 and subtracting the second equation from the first, we get:

$3c = -b$

$c = -b/3$

$a + 2b = 3c = -b$

$a = -3b$

$a:c = 3:(1/3) = 9:1$

$9 + 1 = 10$

