CAT 2017 Slot-2 Question Paper & Solution

SLOT-2 VARC

Direction (Q1-6): Read the following passage carefully and answer the question based on it.

Creativity is at once our most precious resource and our most inexhaustible one. As anyone who has ever spent any time with children knows, every single human being is born creative; every human being is innately endowed with the ability to combine and recombine data, perceptions, materials and ideas, and devise new ways of thinking and doing. What fosters creativity? More than anything else: the presence of other creative people. The big myth is that creativity is the province of great individual geniuses. In fact creativity is a social process. Our biggest creative breakthroughs come when people learn from, compete with, and collaborate with other people.

Cities are the true fonts of creativity... With their diverse populations, dense social networks, and public spaces where people can meet spontaneously and serendipitously, they spark and catalyze new ideas. With their infrastructure for finance, organization and trade, they allow those ideas to be swiftly actualized.

As for what staunches creativity, that's easy, if ironic. It's the very institutions that we build to manage, exploit and perpetuate the fruits of creativity — our big bureaucracies, and sad to say, too many of our schools. Creativity is disruptive; schools and organizations are regimented, standardized and stultifying.

The education expert Sir Ken Robinson points to a 1968 study reporting on a group of 1,600 children who were tested over time for their ability to think in out-of-the-box ways. When the children were between 3 and 5 years old, 98 percent achieved positive scores. When they were 8 to 10, only 32 percent passed the same test, and only 10 percent at 13 to 15. When 280,000 25-year-olds took the test, just 2 percent passed. By the time we are adults, our creativity has been wrung out of us.

I once asked the great urbanist Jane Jacobs what makes some places more creative than others. She said, essentially, that the question was an easy one. All cities, she said, were filled with creative people; that's our default state as people. But some cities had more than their shares of leaders, people and institutions that blocked out that creativity. She called them "squelchers."

Creativity (or the lack of it) follows the same general contours of the great socio-economic divide - our rising inequality - that plagues us. According to my own estimates, roughly a third of us across the United States, and perhaps as much as half of us in our most creative cities - are able to do work which engages our creative faculties to some extent, whether as artists, musicians, writers, techies, innovators, entrepreneurs, doctors, lawyers, journalists or educators - those of us who work with our minds. That leaves a group that I term "the other 66 percent," who toil in low-wage rote and rotten jobs — if they have jobs at all — in which their creativity is subjugated, ignored or wasted.

Creativity itself is not in danger. It's flourishing is all around us, in science and technology, arts and culture, in our rapidly revitalizing cities. But we still have a long way to go if we want to build a truly creative society that supports and rewards the creativity of each and every one of us.

1. In the author's view, cities promote human creativity for all the following reasons EXCEPT that they

A. contain spaces that enable people to meet and share new ideas.
B. expose people to different and novel ideas, because they are home to varied groups of people.
C. provide the financial and institutional networks that enable ideas to become reality.
D. provide access to cultural activities that promote new and creative ways of thinking.

Answer: D

Solution:

Refer to paragraph 2 where the author mentions how cities are the fonts of creativity.'... With their diverse populations, dense social networks, and public spaces where people can meet spontaneously and serendipitously, they spark and catalyze new ideas. With their infrastructure for finance, organization and trade, they allow those ideas to be swiftly actualized.'

A has been mentioned 'public spaces ..new ideas'

B has been mentioned 'diverse populations… new ideas'

C has been mentioned. 'With their infrastructure for finance, organization and trade, they allow those ideas to be swiftly actualized.'

D is the answer as the author has not mentioned cultural activities

2. The author uses 'ironic' in the third paragraph to point out that

A. people need social contact rather than isolation to nurture their creativity.
B. institutions created to promote creativity eventually stifle it.
C. the larger the creative population in a city, the more likely it is to be stifled.
D. large bureaucracies and institutions are the inevitable outcome of successful cities.

Answer: B

Solution:

Refer to the third paragraph where the author uses the term ironic and explains why it is ironic.

'As for what staunches creativity, that's easy, if ironic. It's the very institutions that we build to manage, exploit and perpetuate the fruits of creativity — our big bureaucracies, and sad to say, too many of our schools.'

This means that the institutions which build and nurture creativity are the ones that stop or check it.

This is best explained in option B.

3. The central idea of this passage is that

A. social interaction is necessary to nurture creativity.
B. creativity and ideas are gradually declining in all societies.
C. the creativity divide is widening in societies in line with socio-economic trends.
D. more people should work in jobs that engage their creative faculties.

Answer: A

Solution:

The passage is about creativity. The author says it is a social process and that cities are the fonts of creativity. The institutions that create and build creativity are also the ones that check it. Some places are more creative than others. Creativity follows the same general contours of the socio-economic divide. According to the author those who work with their minds in professions such as artists, musicians, writers etc are creative while creativity is subjugated or wasted in menial labour.

Option A is the correct answer. The author mentions this in the first 2 paragraphs of the passage.

Option B has not been mentioned as the author has not mentioned that it is declining.

Option C only mentions that it follows the lines of the socio-economic divide.

Option D is irrelevant as the author does not say what one should do 'only what is the state … not what ought to be..or what one should do'.

4. Jane Jacobs believed that cities that are more creative

A. have to struggle to retain their creativity.
B. have to 'squelch' unproductive people and promote creative ones.
C. have leaders and institutions that do not block creativity.
D. typically do not start off as creative hubs.

Answer: C

Solution:

Refer to paragraph 5 where Jane Jacobs has been mentioned. 'All cities... were filled with creative people....But some cities had more than their shares of leaders, people and institutions that blocked out that creativity.'

So we can infer that those cities which have fewer squelchers are more creative. In other words, those that have leaders and institutions that do not block creativity.

5. The 1968 study is used here to show that

A. as they get older, children usually learn to be more creative.
B. schooling today does not encourage creative thinking in children.
C. the more children learn, the less creative they become.
D. technology today prevents children from being creative.

Answer: B

Solution:

Refer to paragraph 4 'The education expert Sir Ken Robinson points to a 1968 study reporting on a group of 1,600 children who were tested over time for their ability to think in out-of-the-box ways. When the children were between 3 and 5 years old, 98 percent achieved positive scores. When they were 8 to 10, only 32 percent passed the same test, and only 10 percent at 13 to 15. When 280,000 25-year-olds took the test, just 2 percent passed. By the time we are adults, our creativity has been wrung out of us.

From this we can see,

Option A is incorrect. It contradicts the findings.

Option C is ambiguous. It's too general. The studies were of children of different age groups and their creativity. Learning was not the criterion.

D is not correct as technology has not been mentioned.

Option B is correct as the children got older they were less creative. So, we can infer that schooling does not encourage creativity.

6.The author's conclusions about the most 'creative cities' in the US (paragraph 6) are based on his assumption that

A. people who work with their hands are not doing creative work.
B. more than half the population works in non-creative jobs.
C. only artists, musicians., writers., and so on should be valued in a society.
D. most cities ignore or waste the creativity of low-wage workers

Answer: A

Solution:

The author's statement about the most creative cities has been mentioned in the concluding paragraph. Refer to the lines: '..roughly a third of us across the United States, and perhaps as much as half of us in our most creative cities - are able to do work which engages our creative faculties to some extent those of us who work with our minds'.

In the concluding paragraph the author claims that 'the other 66 percent,' who toil in low-wage rote and rotten jobs in which their creativity is subjugated, ignored or wasted.

This claim is based on his assumption that those who do not work with their mind and work with their hands do not do creative work. So, A is the answer.

Direction (Q7-12): Read the following passage carefully and answer the question based on it.

During the frigid season...it's often necessary to nestle under a blanket to try to stay warm. The temperature difference between the blanket and the air outside is so palpable that we often have trouble leaving our warm refuge. Many plants and animals similarly hunker down, relying on snow cover for safety from winter's harsh conditions. The small area between the snowpack and the ground, called the subnivium...might be the most important ecosystem that you have never heard of.

The subnivium is so well-insulated and stable that its temperature holds steady at around 32 degree Fahrenheit (0 degree Celsius). Although that might still sound cold, a constant temperature of 32 degree Fahrenheit can often be 30 to 40 degrees warmer than the air temperature during the peak of winter. Because of this large temperature difference, a wide variety of species...depend on the subnivium for winter protection.

For many organisms living in temperate and Arctic regions, the difference between being under the snow or outside it is a matter of life and death. Consequently, disruptions to the subnivium brought about by climate change will affect everything from population dynamics to nutrient cycling through the ecosystem.

The formation and stability of the subnivium requires more than a few flurries. Winter ecologists have suggested that eight inches of snow is necessary to develop a stable layer of insulation. Depth is not the only factor, however. More accurately, the stability of the subnivium depends on the interaction between snow depth and snow density. Imagine being under a stack of blankets that are all flattened and pressed together. When compressed, the blankets essentially form one compacted layer. In contrast, when they are lightly placed on top of one another, their insulative capacity increases because the air pockets between them trap heat. Greater depths of low-density snow are therefore better at insulating the ground.

Both depth and density of snow are sensitive to temperature. Scientists are now beginning to explore how climate change will affect the subnivium, as well as the species that depend on it. At first glance, warmer winters seem beneficial for species that have difficulty surviving subzero temperatures; however, as with most ecological phenomena, the consequences are not so straightforward. Research has shown that the snow season (the period when snow is more likely than rain) has become shorter since 1970. When rain falls on snow, it increases the density of the snow and reduces its insulative capacity. Therefore, even though winters are expected to become warmer overall from future climate change, the subnivium will tend to become colder and more variable with less protection from the above-ground temperatures.

The effects of a colder subnivium are complex...For example, shrubs such as crowberry and alpine azalea that grow along the forest floor tend to block the wind and so retain higher depths of snow around them. This captured snow helps to keep soils insulated and in turn increases plant decomposition and nutrient release. In field experiments, researchers removed a portion of the snow cover to investigate the importance of the subnivium's insulation. They found that soil frost in the snow-free area resulted in damage to plant roots and sometimes even the death of the plant.

7. The purpose of this passage is to
A. introduce readers to a relatively unknown ecosystem: the subnivium.
B. explain how the subnivium works to provide shelter and food to several species.
C. outline the effects of climate change on the subnivium.
D. draw an analogy between the effect of blankets on humans and of snow cover on species living in the subnivium.

Answer: C

Solution:

A summary of the passage will help us identify the purpose of the passage easily.

The passage is about the subnivium. The author states that the subnivium or the small area between the snowpack and the ground might be the most important ecosystem. The subnivium's temperature is steady at around 32 degree Fahrenheit and a wide variety of species depend on the subnivium for winter protection. Disruptions to the subnivium brought about by climate change will affect everything from population dynamics to nutrient cycling through the ecosystem.The passage on these changes.

So we can say the purpose of the passage is to emphasize how the subnivium is important and how climate change is affecting it and how disruptions to it can affect the entire ecosystem.

This is best expressed in option C.

8.All of the following statements are true EXCEPT

A. snow depth and snow density both influence the stability of the subnivium.
B. climate change has some positive effects on the subnivium.
C. the subnivium maintains a steady temperature that can be 30 to 40 degrees warmer than the winter air temperature.
D. researchers have established the adverse effects of dwindling snow cover on the subnivium.

Answer: B

Solution:

Option A has been mentioned. Refer to para 5: 'Both depth and density of snow are sensitive to temperature. ...When rain falls on snow, it increases the density of the snow and reduces its insulative capacity.'

Option B is not true according to the passage and therefore our answer. Refer to para 5: 'even though winters are expected to become warmer overall from future climate change, the subnivium will tend to become colder and more variable.'

C is mentioned in para 2 while D is mentioned in the concluding paragraph.

9. Based on this extract, the author would support which one of the following actions?

A. The use of snow machines in winter to ensure snow cover of at least eight inches.
B. Government action to curb climate change.
C. Adding nutrients to the soil in winter.
D. Planting more shrubs in areas of short snow season.

Answer: B

Solution:

The author's main point is that climate change has adverse effects on the subnivium and through it an entire ecosystem.

Hence, B is the action that will be supported. Government action to curb climate change

10. In paragraph 6, the author provides the examples of crowberry and alpine azalea to demonstrate that

A. despite frigid temperatures, several species survive in temperate and Arctic regions.

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B. due to frigid temperatures in the temperate and Arctic regions., plant species that survive tend to be shrubs rather than trees.
C. the crowberry and alpine azalea are abundant in temperate and Arctic regions.
D. the stability of the subnivium depends on several interrelated factors, including shrubs on the forest floor.

Answer: D

Solution:

The author mentions crowberry and alpine azalea in the concluding paragraph to demonstrate the effects of a colder subnivium.

Refer to the following lines '...shrubs such as crowberry and alpine azalea that grow along the forest floor tend to block the wind and so retain higher depths of snow around them. This captured snow helps to keep soils insulated and in turn increases plant decomposition and nutrient release. In field experiments, researchers removed a portion of the snow cover to investigate the importance of the subnivium's insulation. They found that soil frost in the snow-free area resulted in damage to plant roots and sometimes even the death of the plant.'

In simple terms, these shrubs block winds and retain higher depths of snow which helps in insulation and consequently plant decomposition. But if the depth decreases, it damages plant roots and results in the plant dying in some cases.

So, the example has been given to show the importance of various factors including shrubs in maintaining the subnivium. So, the correct answer is D.

11. Which one of the following statements can be inferred from the passage?

A. In an ecosystem, altering any one element has a ripple effect on all others.
B. Climate change affects temperate and Artie regions more than equatorial or arid ones.
C. A compact layer of wool is warmer than a similarly compact layer of goose down.
D. The loss of the subnivium, while tragic, will affect only temperate and Artie regions.

Answer: A

Solution:

Reading all the options it is clear that options B, C, and D can be eliminated and A is the correct answer.

B is incorrect as equatorial arid regions have not been discussed.

C and D are irrelevant to the author's arguments about climate change affecting the subnivium.

12. In paragraph 1, the author uses blankets as a device to

A. evoke the bitter cold of winter in the minds of readers.
B. explain how blankets work to keep us warm.
C. draw an analogy between blankets and the snowpack.
D. alert readers to the fatal effects of excessive exposure to the cold.

Answer: C

Solution:

The author uses the analogy of blankets in paragraph 4 to explain that the stability of the subnivium depends on the connection between depth and density of snow. Greater depths of low-density snow are, therefore, better at insulating the ground.

C expresses this best. Hence, C is the correct answer.

Direction (Q13-18): Read the following passage carefully and answer the question based on it.

The end of the age of the internal combustion engine is in sight. There are small signs everywhere: the shift to hybrid vehicles is already under way among manufacturers. Volvo has announced it will make no purely petrol-engined cars after 2019...and Tesla has just started selling its first electric car aimed squarely at the middle classes: the Tesla 3 sells for $35,000 in the US, and 400,000 people have put down a small, refundable deposit towards one. Several thousand have already taken delivery, and the company hopes to sell half a million more next year. This is a remarkable figure for a machine with a fairly short range and a very limited number of specialised charging stations.

Some of it reflects the remarkable abilities of Elon Musk, the company's founder, as a salesman, engineer, and a man able to get the most out his factory workers and the governments he deals with...Mr Musk is selling a dream that the world wants to believe in.

This last may be the most important factor in the story. The private car is...a device of immense practical help and economic significance, but at the same time a theatre for myths of unattainable self-fulfilment. The one thing you will never see in a car advertisement is traffic, even though that is the element in which drivers spend their lives. Every single driver in a traffic jam is trying to escape from it, yet it is the inevitable consequence of mass car ownership.

The sleek and swift electric car is at one level merely the most contemporary fantasy of autonomy and power. But it might also disrupt our exterior landscapes nearly as much as the fossil fuel-engined car did in the last century. Electrical cars would of course pollute far less than fossil fuel-driven ones; instead of oil reserves, the rarest materials for batteries would make undeserving despots and their dynasties fantastically rich. Petrol stations would disappear. The air in cities would once more be breathable and their streets as quiet as those of Venice. This isn't an

unmixed good. Cars that were as silent as bicycles would still be as dangerous as they are now to anyone they hit without audible warning.

The dream goes further than that. The electric cars of the future will be so thoroughly equipped with sensors and reaction mechanisms that they will never hit anyone. Just as brakes don't let you skid today, the steering wheel of tomorrow will swerve you away from danger before you have even noticed it...

This is where the fantasy of autonomy comes full circle. The logical outcome of cars which need no driver is that they will become cars which need no owner either. Instead, they will work as taxis do, summoned at will but only for the journeys we actually need. This the future towards which Uber...is working. The ultimate development of the private car will be to reinvent public transport. Traffic jams will be abolished only when the private car becomes a public utility. What then will happen to our fantasies of independence? We'll all have to take to electrically powered bicycles.

13. Which of the following statements best reflects the author's argument?
A. Hybrid and electric vehicles signal the end of the age of internal combustion engines.
B. Elon Musk is a remarkably gifted salesman.
C. The private car represents an unattainable myth of independence.
D. The future Uber car will be environmentally friendlier than even the Tesla.

Answer: C

Solution:

The author's main point is best captured in paragraphs in the last lines of paragraph 2 and the first lines of paragraph 3.

.'...Mr Musk is selling a dream that the world wants to believe in.'

This last may be the most important factor in the story. The private car is...a device of immense practical help and economic significance, but at the same time a theatre for myths of unattainable self-fulfilment.

The option that best expresses this idea is option C.

14. The author points out all of the following about electric cars EXCEPT

A. their reliance on rare materials for batteries will support despotic rule.
B. they will reduce air and noise pollution.
C. they will not decrease the number of traffic jams.
D. they will ultimately undermine rather than further driver autonomy.

Answer: D

Solution:

We have to look for an option that has not been mentioned about electric cars.

Refer to paragraph 4.

The point about despotic rule mentioned in option A has been mentioned in the following lines: 'the rarest materials for batteries would make undeserving despots and their dynasties fantastically rich.'

Option B has also been mentioned. Refer to the lines: '...Electrical cars would of course pollute far less than fossil fuel-driven ones.'

Option C has been mentioned in the following lines '...Traffic jams will be abolished only when the private car becomes a public utility.'

Hence, the answer is option D. Refer to the lines in the concluding paragraph:'have even noticed it...

This is where the fantasy of autonomy comes full circle. The logical outcome of cars which need no driver is that they will become cars which need no owner either.

This does not state or mean it will undermine or weaken driver autonomy.'

15. According to the author, the main reason for Tesla's remarkable sales is that

A. in the long run, the Tesla is more cost effective than fossil fuel-driven cars.
B. the US government has announced a tax subsidy for Tesla buyers.
C. the company is rapidly upscaling the number of specialised charging stations for customer convenience.
D. people believe in the autonomy represented by private cars.

Answer: D

Solution:

The author mentions that one reason for the remarkable figures is that Musk is selling a dream that the world wants to believe in. 'The sleek and swift electric car is at one level merely the most contemporary fantasy of autonomy and power.'

So, people believe that private cars symbolize autonomy. Hence, D is the answer.

 16. The author comes to the conclusion that

A. car drivers will no longer own cars but will have to use public transport.
B. cars will be controlled by technology that is more efficient than car drivers.
C. car drivers dream of autonomy but the future may be public transport.
D. electrically powered bicycles are the only way to achieve autonomy in transportation.

Answer: C

Solution:

The author's conclusion about private cars is given in the lines of the concluding paragraph: 'The ultimate development of the private car will be to reinvent public transport.'

Hence, C is the answer.

A is incorrect as it misrepresents the author's point about driverless cars.

B is incorrect as the author does not compare efficiency of drivers and technology driven cars.

D expresses an extreme view.

Hence, C is the correct answer.

17. In paragraphs 5 and 6, the author provides the example of Uber to argue that

A. in the future, electric cars will be equipped with mechanisms that prevent collisions.
B. in the future, traffic jams will not exist.
C. in the future, the private car will be transformed into a form of public transport.
D. in the future, Uber rides will outstrip Tesla sales.

Answer: C

Solution:

In the concluding paragraph the author states: 'The logical outcome of cars which need no driver is that they will become cars which need no owner either. Instead, they will work as taxis do, summoned at will but only for the journeys we actually need. This the future towards which Uber...is working'

So, the example of Uber has been given to emphasize that the future of the private car is public transport.

This is expressed in option C.

18. In paragraph 6, the author mentions electrically powered bicycles to argue that

A. if Elon Musk were a true visionary, he would invest funds in developing electric bicycles.
B. our fantasies of autonomy might unexpectedly require us to consider electric bicycles.
C. in terms of environmental friendliness and safety, electric bicycles rather than electric cars are the future.
D. electric buses are the best form of public transport.

Answer: B

Solution:

The author's argument in the concluding lines is that 'The ultimate development of the private car will be to reinvent public transport. Traffic jams will be abolished only when the private car becomes a public utility. What then will happen to our fantasies of independence? We'll all have to take to electrically powered bicycles.'

So the author says we will be rid of traffic jams only if we are rid of private cars or when private cars become public utility vehicles. When that happens we will not have autonomy since we won't own private cars. If we want autonomy , we would have to take to bicycles.

Our dream of autonomy might end up with us not having cars.

This point is best expressed in option B.

Direction (Q19-21): Read the following passage carefully and answer the question based on it.

Typewriters are the epitome of a technology that has been comprehensively rendered obsolete by the digital age. The ink comes off the ribbon, they weigh a ton, and second thoughts are a disaster. But they are also personal, portable and, above all, private. Type a document and lock it away and more or less the only way anyone else can get it is if you give it to them. That is why the Russians have decided to go back to typewriters in some government offices, and why in the US, some departments have never abandoned them. Yet it is not just their resistance to algorithms and secret surveillance that keeps typewriter production lines - well one, at least - in business (the last British one closed a year ago). Nor is it only the nostalgic appeal of the metal body and the stout well-defined keys that make them popular on eBay. A typewriter demands something particular: attentiveness. By the time the paper is loaded, the ribbon tightened, the carriage returned, the spacing and the margins set, there's a big premium on hitting the right key. That means sorting out ideas, pulling together a kind of order and organising details before actually striking off. There can be no thinking on screen with a typewriter. Nor are there any easy distractions. No online shopping. No urgent emails. No Twitter. No need even for electricity - perfect for writing in a remote hideaway. The thinking process is accompanied by the encouraging clack of keys, and the ratchet of the carriage return. Ping!

19. Which one of the following best describes what the passage is trying to do?

1. It describes why people continue to use typewriters even in the digital age.
2. It argues that typewriters will continue to be used even though they are an obsolete technology.
3. It highlights the personal benefits of using typewriters.
4. It shows that computers offer fewer options than typewriters.

.

Answer: A

Solution:

The main contention of the author is that typewriters continue to be used in today's digital age and the reasons for it.

This point has been best expressed in option A.

20. According to the passage, some governments still use typewriters because:

A. they do not want to abandon old technologies that may be useful in the future.
B. they want to ensure that typewriter production lines remain in business.
C. they like the nostalgic appeal of typewriter.
D. they can control who reads the document.

Answer: D

Solution:

Refer to the following lines in paragraph 1: 'Type a document and lock it away and more or less the only way anyone else can get it is if you give it to them. That is why the Russians have decided to go back to typewriters in some government offices, and why in the US, some departments have never abandoned them.'

So, the reason can be inferred as security. Governments can control who reads the document.

Hence, D is the correct answer.

21. The writer praises typewriters for all the following reasons EXCEPT

A. unlike computers, they can only be used for typing.
B. you cannot revise what you have typed on a typewriter.
C. typewriters are noisier than computers.
D. typewriters are messier to use than computers.

Answer: D

Solution:

The author praises the computer for many reasons.

The author mentions A, B and C as advantages. Even the noise is expressed as a positive point. The thinking process is accompanied by the encouraging clack of keys, and the ratchet of the carriage return. Ping!

Option D mentions a disadvantage. Hence, it is the answer.

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Direction (Q22-24): Read the following passage carefully and answer the question based on it

Despite their fierce reputation. Vikings may not have always been the plunderers and pillagers popular culture imagines them to be. In fact, they got their start trading in northern European markets, researchers suggest.

Combs carved from animal antlers, as well as comb manufacturing waste and raw antler material has turned up at three archaeological sites in Denmark, including a medieval marketplace in the city of Ribe. A team of researchers from Denmark and the U.K. hoped to identify the species of animal to which the antlers once belonged by analyzing collagen proteins in the samples and comparing them across the animal kingdom, Laura Geggel reports for LiveScience. Somewhat surprisingly, molecular analysis of the artifacts revealed that some combs and other material had been carved from reindeer antlers.... Given that reindeer (Rangifer tarandus) don't live in Denmark, the researchers posit that it arrived on Viking ships from Norway. Antler craftsmanship, in the form of decorative combs, was part of Viking culture. Such combs served as symbols of good health, Geggel writes. The fact that the animals shed their antlers also made them easy to collect from the large herds that inhabited Norway.

Since the artifacts were found in marketplace areas at each site it's more likely that the Norsemen came to trade rather than pillage. Most of the artifacts also date to the 780s, but some are as old as 725. That predates the beginning of Viking raids on Great Britain by about 70 years. (Traditionally, the so-called "Viking Age" began with these raids in 793 and ended with the Norman conquest of Great Britain in 1066.) Archaeologists had suspected that the Vikings had experience with long maritime voyages [that] might have preceded their raiding days. Beyond Norway, these combs would have been a popular industry in Scandinavia as well. It's possible that the antler combs represent a larger trade network, where the Norsemen supplied raw material to craftsmen in Denmark and elsewhere.

22. The primary purpose of the passage is:
A. to explain the presence of reindeer antler combs in Denmark.
B. to contradict the widely-accepted beginning date for the Viking Age in Britain, and propose an alternate one.
C. to challenge the popular perception of Vikings as raiders by using evidence that suggests their early trade relations with Europe.
D. to argue that besides being violent pillagers, Vikings were also skilled craftsmen and efficient traders.

Answer: C

Solution:

A quick reading of the passage will give you an understanding of the main point and purpose of the author. He starts by stating that despite their fierce reputation, Vikings may not have always been the plunderers and pillagers popular culture

imagines them to be. In fact, they got their start trading in northern European markets. He substantiates the point that they were traders before they turned plunderers with evidence.

This point is best expressed in option C.

23.The evidence - 'Most of the artifacts also date to the 780s, but some are as old as 725' - has been used in the passage to argue that:

A. the beginning date of the Viking Age should be changed from 793 to 725.
B. the Viking raids started as early as 725.
C. some of the antler artifacts found in Denmark and Great Britain could have come from Scandinavia.
D. the Vikings' trade relations with Europe pre-dates the Viking raids.

Answer: D

Solution:

Refer to the lines in the third paragraph: 'Most of the artifacts also date to the 780s, but some are as old as 725. That predates the beginning of Viking raids on Great Britain by about 70 years.'

The author uses the dates of the artifacts to justify his claim that the artifact poredate the raids by 70 years. So they prove that the Vikings had trade relations with Europe earlier.

Hence, D is the correct answer.

24. All of the following hold true for Vikings EXCEPT

A. Vikings brought reindeer from Norway to Denmark for trade purposes.
B. Before becoming the raiders of northern Europe, Vikings had trade relations with European nations.
C. Antler combs, regarded by the Vikings as a symbol of good health, were part of the Viking culture.
D. Vikings, once upon a time, had trade relations with Denmark and Scandinavia.

Answer: A

Solution:

Option A is the answer. Read the lines of the second paragraph carefully. 'It arrived on Viking ships from Norway.' The author says reindeer antlers arrived on ships from Norway not reindeer.

Hence, A is the correct answer.

25. **Direction:** Identify the most appropriate summary for the paragraph.

North American walnut sphinx moth caterpillars (Amorpha juglandis) look like easy meals for birds, but they have a trick up their sleeves—they produce whistles that sound like bird alarm calls, scaring potential predators away. At first, scientists suspected birds were simply startled by the loud noise. But a new study suggests a more sophisticated mechanism: the caterpillar's whistle appears to mimic a bird alarm call, sending avian predators scrambling for cover. When pecked by a bird, the caterpillars whistle by compressing their bodies like an accordion and forcing air out through specialized holes in their sides. The whistles are impressively loud - they have been measured at over 80 dB from 5 cm away from the caterpillar - considering they are made by a two-inch long insect.

A. North American walnut sphinx moth caterpillars will whistle periodically to ward off predator birds - they have a specialized vocal tract that helps them whistle.
B. North American walnut sphinx moth caterpillars can whistle very loudly; the loudness of their whistles is shocking as they are very small insects.
C. North American walnut sphinx moth caterpillars, in a case of acoustic deception, produce whistles that mimic bird alarm calls to defend themselves.
D. North American walnut sphinx moth caterpillars, in a case of deception and camouflage, produce whistles that mimic bird alarm calls to defend themselves.

Answer: C

Solution:

The main point of the paragraph is to describe how the North American walnut sphinx moth caterpillars scare off predators. They produce loud whistles that sound like bird alarm calls, scaring potential bird predators away.

Option A is incorrect as it mentions a 'specialized vocal tract' which is not mentioned in the paragraph.

Option B is also incorrect as it mentions only the loudness of the whistle while what scares the birds is the fact that the whistle sounds like a bird alarm call.

Option D mentions 'camouflage' which has not been mentioned in the original paragraph. The deception is the sound produced by the whistle.

Option C expresses the main point of the passage correctly by mentioning that the caterpillars use acoustic deception and produce whistles that mimic bird alarm calls to defend themselves.

Hence, C is the correct answer.

26. **Direction:** Identify the most appropriate summary for the paragraph.

Both Socrates and Bacon were very good at asking useful questions. In fact, Socrates is largely credited with coming up with a way of asking questions, 'the Socratic method/ which itself is at the core of the 'scientific method, 'popularised by Bacon. The Socratic method disproves arguments by finding exceptions to them,

and can, therefore, lead your opponent to a point where they admit something that contradicts their original position. In common with Socrates, Bacon stressed it was as important to disprove a theory as it was to prove one - and real-world observation and experimentation were key to achieving both aims. Bacon also saw science as a collaborative affair, with scientists working together, challenging each other.

A. Both Socrates and Bacon advocated clever questioning of the opponents to disprove their arguments and theories.
B. Both Socrates and Bacon advocated challenging arguments and theories by observation and experimentation.
C. Both Socrates and Bacon advocated confirming arguments and theories by finding exceptions.
D. Both Socrates and Bacon advocated examining arguments and theories from both sides to prove them.

Answer: D

Solution:

The Socratic method was popularised by Bacon. Both Socrates and Bacon stressed it was as important to disprove a theory as it was to prove one and real-world observation and experimentation were key to achieving both aims.

This point has been best expressed in option D.

The other options mention only one aspect. Not all the main points or twist the meaning of the original passage.

27. **Direction:** Identify the most appropriate summary for the paragraph.

A fundamental property of language is that it is slippery and messy and more liquid than solid, a gelatinous mass that changes shape to fit. As Wittgenstein would remind us, "usage has no sharp boundary." Oftentimes, the only way to determine the meaning of a word is to examine how it is used. This insight is often described as the "meaning is use" doctrine. There are differences between the "meaning is use" doctrine and a dictionary-first theory of meaning. "The dictionary's careful fixing of words to definitions, like butterflies pinned under glass, can suggest that this is how language works. The definitions can seem to ensure and fix the meaning of words, just as the gold standard can back a country's currency." What Wittgenstein found in the circulation of ordinary language, however, was a free-floating currency of meaning. The value of each word arises out of the exchange. The lexicographer abstracts a meaning from that exchange, which is then set within the conventions of the dictionary definition.

A. Dictionary definitions are like 'gold standards' - artificial, theoretical and dogmatic. Actual meaning of words is their free- exchange value.
B. Language is already slippery; given this, accounting for 'meaning in use' will only exasperate the problem. That is why lexicographers 'fix' meanings

C. Meaning is dynamic; definitions are static. The 'meaning in use' theory helps us understand that definitions of words are culled from their meaning in exchange and use and not vice versa.

D. The meaning of words in dictionaries is clear, fixed and less dangerous and ambiguous than the meaning that arises when words are exchanged between people.

Answer: C

Solution:

The paragraph is about language. There are differences between two theories about language and meaning: the 'meaning is use' doctrine and a dictionary-first theory of meaning. Wiittgenstein and others argue that the meanings of words are not fixed, but arise out of the way they are used (exchanged). The lexicographer abstracts a meaning from that exchange and sets it down in the dictionary. The dictionary-first theory of meaning is, thus, limited.

These points are best expressed in C.

Options B and D contradict the main point of the paragraph. Option A does not bring out the essence of the passage.

Hence, C is the answer.

28. **Direction:** The five sentences (labelled 1,2,3,4, and 5) given in this question, when properly sequenced, form a coherent paragraph. Decide on the proper order for the sentence and key in this sequence of five numbers as your answer.

1) The implications of retelling of Indian stories, hence, takes on new meaning in a modern India.

2) The stories we tell reflect the world around us.

3) We cannot help but retell the stories that we value - after all, they are never quite right for us - in our time.

4) And even if we manage to get them quite right, they are only right for us - other people living around us will have different reasons for telling similar stories.

5) As soon as we capture a story, the world we were trying to capture has changed.

Answer: 25341

Solution:

Reading all the sentences in the jumble, it is clear that 2 is the starting sentence as it is a general stand alone sentence in the set.

5 follows 2 as it talks about what happens when we capture a story

2 is followed by the mandatory pair 3-4. 3 talks about why we retell stories 'they are not quite right for us' and 4 continues this argument by stating that ' even if we get them right, it is right only for us'.

1 follows 4 by carrying on the thread of retelling in 4: the implications of retelling.

Hence, 25341 is the correct order.

29.

Direction: The five sentences (labelled 1,2,3,4, and 5) given in this question, when properly sequenced, form a coherent paragraph. Decide on the proper order for the sentence and key in this sequence of five numbers as your answer.

1) Before plants can take life from atmosphere, nitrogen must undergo transformations similar to ones that food undergoes in our digestive machinery.

2) In its aerial form nitrogen is insoluble, unusable and is in need of transformation.

3) Lightning starts the series of chemical reactions that need to happen to nitrogen, ultimately helping it nourish our earth.

4) Nitrogen - an essential food for plants - is an abundant resource, with about 22 million tons of it floating over each square mile of earth.

5) One of the most dramatic examples in nature of ill wind that blows goodness is lightning.

Answer: 53421

Solution:

The theme of the paragraph is natural phenomena and nitrogen fixation.

Reading all the sentences in the jumble, it is clear that the stand alone statement which can start the sequence is 5.

5-3 is the mandatory pair as 3 continues with the theme of lightning and how it is good.

4-2 pair follow 3 as they continue the thread about nitrogen introduced by sentence 3.

1 follows 2 as it elaborates on how plants transform unusable aerial nitrogen (mentioned in 2).

Hence, the correct order is 53421.

30.**Direction:** The five sentences (labelled 1,2,3,4, and 5) given in this question, when properly sequenced, form a coherent paragraph. Decide on the proper order for the sentence and key in this sequence of five numbers as your answer.

1) This has huge implications for the health care system as it operates today, where depleted resources and time lead to patients rotating in and out of doctor's offices, oftentimes receiving minimal care or concern (what is commonly referred to as "bed side manner") from doctors.

2) The placebo effect is when an individual's medical condition or pain shows signs of improvement based on a fake intervention that has been presented to them as a real one and used to be regularly dismissed by researchers as a psychological effect.

3) The placebo effect is not solely based on believing in treatment, however, as the clinical setting in which treatments are administered is also paramount.

4) That the mind has the power to trigger biochemical changes because the individual believes that a given drug or intervention will be effective could empower chronic patients through the notion of our bodies' capacity for self-healing.

5) Placebo effects are now studied not just as foils for "real" interventions but as a potential portal into the self-healing powers of the body.

Answer: 25431

Solution:

Reading the jumbled sentences it is clear that 2 is the starting sentence as it introduces the topic that is the placebo effect and describes it.

5 elaborates on this by stating how they are regarded and studied now-not just as foils for 'real' interventions but as a potential portal into the self-healing powers of the body.

4 follows 5 as it continues with the theme of self-healing.

The pair 3-1 follow this. 3 states that the placebo effect is not solely based on believing in treatment, ... the clinical setting in which treatments are administered is also paramount.

1 explains the idea started in 3 by explaining why clinical settings are important

Hence, 25431 is the correct answer.

31. **Direction:** The five sentences (labelled 1,2,3,4, and 5) given in this question, when properly sequenced, form a coherent paragraph. Decide on the proper order for the sentence and key in this sequence of five numbers as your answer.

1) Johnson treated English very practically, as a living language, with many different shades of meaning and adopted his definitions on the principle of English common law - according to precedent.

2) Masking a profound inner torment, Johnson found solace in compiling the words of a language that was, in its coarse complexity and comprehensive genius, the precise analogue of his character.

3) Samuel Johnson was a pioneer who raised common sense to heights of genius, and a man of robust popular instincts whose watchwords were clarity, precision and simplicity.

4) The 18th century English reader, in the new world of global trade and global warfare, needed a dictionary with authoritative acts of definition of words of a language that was becoming seeded throughout the first British empire by a vigorous and practical champion.

5) The Johnson who challenged Bishop Berkeley's solipsist theory of the non-existence of matter by kicking a large stone ("I refute it thus") is the same Johnson for whom language must have a daily practical use.

Answer: 43512

Solution:

Sentence 4 starts the sequence by mentioning the need of a dictionary in 18th century England 3-5 -1 follow this as they describe the lexicographer Samuel Johnson and how he treated language. 2 follows this description with a concluding remark on why Johson compiled a dictionary. Johnson found solace in compiling the words of a language that was, in its coarse complexity and comprehensive genius, the precise analogue of his character.

Hence, 43512 is the correct order.

32.

Direction: 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. Choose its number as your answer and key it in.

1) Although we are born with the gift of language, research shows that we are surprisingly unskilled when it comes to communicating with others.

2) We must carefully orchestrate our speech if we want to achieve our goals and bring our dreams to fruition.

3) We often choose our words without thought, oblivious of the emotional effects they can have on others.

4) We talk more than we need to, ignoring the effect we are having on those listening to us.

5) We listen poorly, without realizing it, and we often fail to pay attention to the subtle meanings conveyed by facial expressions, body gestures, and the tone and cadence of our voice.

Answer: 2

Solution:

Reading the sentences of the jumble, it is clear that all the sentences relate to language and communication. 1, 3, 4, and 5 are on the same theme, i.e., how we are unskilled in communicating with others. But 2 mentions something different. It tells us that we have to orchestrate our speech if we want to achieve goals.

Hence, 2 is the odd one out.

33.

Direction: 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. Choose its number as your answer and key it in.

1) Over the past fortnight, one of its finest champions managed to pull off a similar impression.

2) Wimbledon's greatest illusion is the sense of timelessness it evokes.

3) At 35 years and 342 days, Roger Federer became the oldest man to win the singles title in the Open Era - a full 14 years after he first claimed the title as a scruffy, pony-tailed upstart.

4) Once he had survived the opening week, the second week witnessed the range of a rested Federer's genius.

5) Given that his method isn't reliant on explosive athleticism or muscular ball-striking, both vulnerable to decay, there is cause to believe that Federer will continue to enchant for a while longer.

Answer: 4

Solution:

Since all the sentences seem to be on the same theme, we need to read them carefully and arrange them in a logical order to identify the odd one out.

2 starts the sequence. 2-1 is a mandatory pair as 2 talks of the 'sense of timelessness' Wimbledon evokes and 1 says that 'Over the past fortnight, one of its finest champions managed to pull off a similar impression.' The similar impression of 1 refers to the sense of timelessness in 2.

3 follows as it mentions the name of the champion mentioned in 1. It explains what Roger Federrer did.

5 speaks of why he can be expected to continue in the same vein, why Federer will continue to enchant for a while longer.

2135 is the order while the odd one out is 4 since it mentions a specific match.

Hence, 4 is the correct answer.

34.

Direction: 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. Choose its number as your answer and key it in.

1) Those geometric symbols and aerodynamic swooshes are more than just skin deep.

2) The Commonwealth Bank logo - a yellow diamond, with a black chunk sliced out in one corner - is so recognisable that the bank doesn't even use its full name in its advertising.

3) It's not just logos with hidden shapes; sometimes brands will have meanings or stories within them that are deliberately vague or lost in time, urging you to delve deeper to solve the riddle.

4) Graphic designers embed cryptic references because it adds a story to the brand; they want people to spend more time with a brand and have that idea that they are an insider if they can understand the hidden message.

5) But the Comm Bank logo has more to it than meets the eye, as squirrelled away in that diamond is the Southern Cross constellation.

Answer: 1

Solution:

All the sentences seem to be on the same theme, so we have to read the sentences carefully and find pairs and arrange them in a sequence to identify the odd one out.

Reading the sentences in the jumble it is clear that 4 is the starting sentence. 4-3 is a pair as 4 talks of cryptic references and hidden messages embedded by Graphic designers and 3 continues with references to hidden shapes in logos and stories in brands.

This is followed by the pair 2-5, both giving an example of the Commonwealth bank logo.

Hence, the order of sentences is 4325 and 1 is the odd one out.

Hence, 1 is the answer.

SLOT-2 DILR

|||Common|||

Direction: Study the following information carefully and answer the questions that follow.

Funky Pizzaria was required to supply pizzas to three different parties. The total number of pizzas it had to deliver was 800, 70% of which were to be delivered to Party 3 and the rest were equally divided between Party 1 and Party 2.

Pizzas could be of the Thin Crust (T) or Deep Dish (D) variety and come in either Normal Cheese (NC) or Extra Cheese (EC) versions. Hence, there are four types of pizzas: T-NC, T-EC, D-NC, and D-EC. Partial information about proportions of T and NC pizzas ordered by the three parties is given below:

	Thin Crust (T)	Normal Cheese (C)
Party 1	0.6	
Party 2	0.55	0.3
Party 3		0.65
	0.375	0.52

|||End|||
How many Thin Crust pizzas were to be delivered to Party 3?
A. 398
B. 162
C. 196
D. 364

Answer: B

Solution:

	T		D		
Party	NC	EC	NC	EC	
1	a	72 – a	d	48 – d	120

2	b	66 - b	36 – b	18 + b	120
3	c	162 - c	364 – c	34 + c	560
	300		500		800

Therefore, Thin Crust pizzas delivered to Party 3 = c + 162 − c = 162.

2. How many Normal Cheese pizzas were required to be delivered to Party 1?

A. 104
B. 84
C. 16
D. 196

Answer: C

Solution:

	T		D		
Party	NC	EC	NC	EC	
1	a	72 – a	d	48 – d	120
2	b	66 - b	36 – b	18 + b	120
3	c	162 - c	364 – c	34 + c	560
	300		500		800

Total Normal Cheese pizzas delivered to the three parties = 52% (800) = 416
 From the table,

416 = (a + b + c) + (d +36 −b + 364 − c)

416 = 400 + a + d

⇒ a + d = 16

So, Party 1 ordered 16 Normal Cheese pizzas.

3. For Party 2, if 50% of the Normal Cheese pizzas were of Thin Crust variety, what was the difference between the numbers of T- EC and D-EC pizzas to be delivered to Party 2?

A. 18
B. 12
C. 30
D. 24

Answer: B

Solution:

Party	T		D		
	NC	EC	NC	EC	
1	a	72 – a	d	48 – d	120
2	b	66 - b	36 – b	18 + b	120
3	c	162 - c	364 – c	34 + c	560
	300		500		800

It is given that

Of the 36 NC pizzas delivered to Party 2, 50%, i.e., 18 were Thin Crust.

∴ b = 18.

Difference between 66 – b and 18 + b = 48 –2b = 48 – 36 = 12

4. Suppose that a T-NC pizza cost as much as a D-NC pizza, but 3/5th of the price of a D-EC pizza. A D-EC pizza costs Rs. 50 more than a T-EC pizza, and the latter costs Rs. 500.

If 25% of the Normal Cheese pizzas delivered to Party 1 were of the Deep-Dish variety, then what was the total bill for Party 1?

A. Rs. 59480
B. Rs. 59840
C. Rs. 42520
D. Rs. 45240

Answer: A

Solution:

Party	T		D		
	NC	EC	NC	EC	
1	a	72 – a	d	48 – d	120
2	b	66 - b	36 – b	18 + b	120
3	c	162 - c	364 – c	34 + c	560
	300		500		800

a + d = 16

Further, we're told that of the 16 NC pizzas delivered to party 1, 25% are of the Deep-Dish variety.

Hence, d = 4 and a = 12. The following gives the cost of each type of pizza.

T-EC pizza = Rs. 500

D-EC pizza = Rs. 550

T-NC pizza = Rs. 330

D-NC pizza = Rs. 330

Total pizza bill for Party 1 = 12 (330) + 60(500) + 4(330) + 44(550) = 59,480

5.

|||Common|||

Direction: Study the following information carefully and answer the questions that follow.

There were seven elective courses – E1 to E7 - running in a specific term in a college. Each of the 300 students enrolled had chosen just one elective from among these seven. However, before the start of the term, E7 was withdrawn as the instructor concerned had left the college. The students who had opted for E7 were allowed to join any of the remaining electives. Also, the students who had chosen other electives were given one chance to change their choice. The table below captures the movement of the students from one elective to another during this process. Movement from one elective to the same elective simply means no movement. Some numbers in the table got accidentally erased; however, it is known that these were either 0 or 1

		To Elective					
		E1	E2	E3	E4	E5	E6
From Elective	E1	9	5	10	1	4	2
	E2		34	8		2	2
	E3	2	6	25			2
	E4		3	2	14		4
	E5		5			30	
	E6		7	3		2	9
	E7	4	16	30	5	5	41

Further, the following are known:

1) Before the change process there were 6 more students in E1 than in E4, but after the reshuffle, the number of students in E4 was 3 more than that in E1.

2) The number of students in E2 increased by 30 after the change process.

3) Before the change process, E4 had 2 more students than E6, while E2 had 10 more students than E3.

|||End|||
How many elective courses among E1 to E6 had a decrease in their enrollments after the change process?
A. 4
B. 1
C. 2
D. 3

Answer: C

Solution:

From 2,
E2 after shifting = 76. So, E2, before the change process, must have been 76 – 30, i.e., 46. Hence, the two empty cells can be filled with 0 each across the row E2.

		To Elective						
		E1	E2	E3	E4	E5	E6	Total
From Elective	E1	9	5	10	1	4	2	31
	E2	0	34	8	0	2	2	46
	E3	2	6	25				2	
	E4		3	2	14		4	
	E5		5			30		
	E6		7	3		2	9	
	E7	4	16	30	5	5	41	101
	Total		76					300

From 1, before change E1 = E4 + 6. Now, E1 (before) = 31.
E4 (before) must be more than 3 + 2 + 14 + 4, i.e., 23. This indicates that the two empty cells across E4 must be 1 and 1.

		To Elective						
		E1	E2	E3	E4	E5	E6	Total
From Elective	E1	9	5	10	1	4	2	31
	E2	0	34	8	0	2	2	46
	E3	2	6	25			2	
	E4	1	3	2	14	1	4	25
	E5		5			30		
	E6		7	3		2	9	
	E7	4	16	30	5	5	41	101
	Total		76					300

From 1, E1 = E4 - 3 (after the change).
E1 (afterwards) can be 16 or 17 or 18. If E4 (column) = 20, the total number of zeroes will cross 4. Hence, this is not possible.
E4 must be 21. Hence, E1 (afterwards) will be 18. Therefore, there must be 3 zeroes in E4 and one "1" in column E4. All the remaining entries will be "1".

		To Elective						
		E1	E2	E3	E4	E5	E6	Total
From Elective	E1	9	5	10	1	4	2	31
	E2	0	34	8	0	2	2	46
	E3	2	6	25	0	1	2	36
	E4	1	3	2	14	1	4	25
	E5	1	5	1	0	30	1	38
	E6	1	7	3	1	2	9	23
	E7	4	16	30	5	5	41	101
	Total	18	76	79	21	45	61	300

A total of 2 electives (E1, E4) among E1 to E6 had a decrease in their enrollments after the change process.

6. After the change process, which of the following is the correct sequence of number of students in the six electives E1 to E6?

A. 19, 76, 79, 21, 45, 60
B. 19, 76, 78, 22, 45, 60
C. 18, 76, 79, 23, 43, 61
D. 18, 76, 79, 21, 45, 61

Answer: D

Solution:

From 2,
E2 after shifting = 76. So, E2 before the change process must have been 76 – 30, i.e., 46. Hence, the two empty cells can be filled with 0 each across the row E2.

		To Elective						
		E1	E2	E3	E4	E5	E6	Total
From Elective	E1	9	5	10	1	4	2	31
	E2	0	34	8	0	2	2	46
	E3	2	6	25			2	
	E4		3	2	14		4	
	E5		5			30		
	E6		7	3		2	9	
	E7	4	16	30	5	5	41	101
	Total		76					300

From 1, before change E1 = E4 + 6. Now, E1 (before) = 31.
E4 (before) must be more than 3 + 2 + 14 + 4, i.e., 23. This indicates that the two empty cells across E4 must be 1 and 1.

		To Elective						
		E1	E2	E3	E4	E5	E6	Total
From Elective	E1	9	5	10	1	4	2	31
	E2	0	34	8	0	2	2	46
	E3	2	6	25			2	
	E4	1	3	2	14	1	4	25
	E5		5			30		
	E6		7	3		2	9	
	E7	4	16	30	5	5	41	101
	Total		76					300

From 1, E1 = E4 - 3 (after the change).
E1 (afterwards) can be 16 or 17 or 18. If E4 (column) = 20, the total number of zeroes will cross 4. Hence, this is not possible.
E4 must be 21. Hence, E1 (afterwards) will be 18. Therefore, there must be 3 zeroes in E4 and one "1" in column E4. All the remaining entries will be "1".

		To Elective						
		E1	E2	E3	E4	E5	E6	Total
From Elective	E1	9	5	10	1	4	2	31
	E2	0	34	8	0	2	2	46
	E3	2	6	25	0	1	2	36
	E4	1	3	2	14	1	4	25
	E5	1	5	1	0	30	1	38
	E6	1	7	3	1	2	9	23
	E7	4	16	30	5	5	41	101
	Total	18	76	79	21	45	61	300

After the change process, the correct sequence of number of students in the six electives E1 to E6

⇒ 18, 76, 79, 21, 45 and 61.

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7. After the change process, which course among E1 to E6 had the largest change in its enrollment as a percentage of its original enrollment?

A. E1
B. E2
C. E3
D. E6

Answer: D

Solution:

From 2,
E2 after shifting = 76. So, E2 before the change process must have been 76 – 30, i.e., 46. Hence, the two empty cells can be filled with 0 each across the row E2.

		To Elective						Total
		E1	E2	E3	E4	E5	E6	
From Elective	E1	9	5	10	1	4	2	31
	E2	0	34	8	0	2	2	46
	E3	2	6	25			2	
	E4		3	2	14		4	
	E5		5		30			
	E6		7	3		2	9	
	E7	4	16	30	5	5	41	101
	Total		76					300

From 1, before change E1 = E4 + 6. Now, E1 (before) = 31.
E4 (before) must be more than 3 + 2 + 14 + 4, i.e., 23. This indicates that the two empty cells across E4 must be 1 and 1.

		To Elective						Total
		E1	E2	E3	E4	E5	E6	
From Elective	E1	9	5	10	1	4	2	31
	E2	0	34	8	0	2	2	46
	E3	2	6	25			2	
	E4	1	3	2	14	1	4	25
	E5		5			30		
	E6		7	3		2	9	
	E7	4	16	30	5	5	41	101
	Total		76					300

From 1, E1 = E4 - 3 (after the change).
E1 (afterwards) can be 16 or 17 or 18. If E4 (column) = 20, the total number of zeroes will cross 4. Hence, this is not possible.
E4 must be 21. Hence, E1 (afterwards) will be 18. Therefore, there must be 3 zeroes in E4 and one "1" in column E4. All the remaining entries will be "1".

		To Elective	
		E1	E2	E3	E4	E5	E6	Total
From Elective	E1	9	5	10	1	4	2	31
	E2	0	34	8	0	2	2	46
	E3	2	6	25	0	1	2	36
	E4	1	3	2	14	1	4	25
	E5	1	5	1	0	30	1	38
	E6	1	7	3	1	2	9	23
	E7	4	16	30	5	5	41	101
	Total	18	76	79	21	45	61	300

The maximum change occurs in E6, i.e., from 23 to 61, approximately 165%.

8. Later, the college imposed a condition that if after the change of electives, the enrollment in any elective (other than E7) dropped to less than 20 students, all the students who had left that course will be required to re-enroll for that elective.

Which of the following is a correct sequence of electives in the decreasing order of their final enrollments?

A. E2, E3, E6, E5, E1, E4
B. E3, E2, E6, E5, E4, E1
C. E2, E5, E3, E1, E4, E6
D. E2, E3, E5, E6, E1, E3

Answer: A

Solution:

From 2,
E2 after shifting = 76. So, E2 before the change process must have been 76 – 30, i.e., 46. Hence, the two empty cells can be filled with 0 each across the row E2.

		To Elective	
		E1	E2	E3	E4	E5	E6	Total
From Elective	E1	9	5	10	1	4	2	31
	E2	0	34	8	0	2	2	46
	E3	2	6	25			2	
	E4		3	2	14		4	
	E5		5			30		
	E6		7	3		2	9	
	E7	4	16	30	5	5	41	101
	Total		76					300

From 1, before change E1 = E4 + 6. Now, E1 (before) = 31.
E4 (before) must be more than 3 + 2 + 14 + 4, i.e., 23. This indicates that the two empty cells across E4 must be 1 and 1.

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		To Elective						
		E1	E2	E3	E4	E5	E6	Total
From Elective	E1	9	5	10	1	4	2	31
	E2	0	34	8	0	2	2	46
	E3	2	6	25			2	
	E4	1	3	2	14	1	4	25
	E5		5			30		
	E6		7	3		2	9	
	E7	4	16	30	5	5	41	101
	Total		76					300

From 1, E1 = E4 -3 (after the change).
E1 (afterwards) can be 16 or 17 or 18. If E4 (column) = 20, the total number of zeroes will cross 4. Hence, this is not possible.
E4 must be 21. Hence, E1 (afterwards) will be 18. Therefore, there must be 3 zeroes in E4 and one "1" in column E4. All the remaining entries will be "1".

		To Elective						
		E1	E2	E3	E4	E5	E6	Total
From Elective	E1	9	5	10	1	4	2	31
	E2	0	34	8	0	2	2	46
	E3	2	6	25	0	1	2	36
	E4	1	3	2	14	1	4	25
	E5	1	5	1	0	30	1	38
	E6	1	7	3	1	2	9	23
	E7	4	16	30	5	5	41	101
	Total	18	76	79	21	45	61	300

Total number of persons in E1 after shifting is at most 19. All 31 people stayed back in E1. Hence, no one shifted to E2, E3, E4, E5 and E6. In this scenario, the total number of persons is as shown below.

		To Elective						
		E1	E2	E3	E4	E5	E6	Total
From Elective	E1	31	0	0	0	0	0	31
	E2	0	34	8	0	2	2	46
	E3	2	6	25	0	1	2	36
	E4	1	3	2	14	1	4	25
	E5	1	5	1	0	30	1	38
	E6	1	7	3	1	2	9	23
	E7	4	16	30	5	5	41	101
	Total	40	71	69	20	41	59	300

The correct sequence of electives in decreasing order of their final enrollments is E2, E3, E6, E5, E1, E4.

9.

|||Common|||

Direction: Study the following information carefully and answer the questions that follow.

An old woman had the following assets:

(a) Rs. 70 lakh in bank deposits

(b) 1 house worth Rs. 50 lakh

(c) 3 flats, each worth Rs. 30 lakh

(d) Certain number of gold coins, each worth Rs. 1 lakh

She wanted to distribute her assets among her three children: Neeta, Seeta, and Geeta.

The house, any of the flats, or any of the coins were not to be split. That is, the house went entirely to one child; a flat went to one child and similarly, a gold coin went to one child.

|||End|||
Among the three, Neeta received the least amount in bank deposits, while Geeta received the highest. The value of the assets was distributed equally among the children, as were the gold coins.

How much did Seeta receive in bank deposits (in lakhs of rupees)?

A. 30
B. 40
C. 20
D. 10

Answer: C

Solution:

Total amount (in lakh Rs.) distributed by the old woman = 70 + 50 + 90, i.e., 210 + Gold coins worth Rs.1 lakh each

Each one should get Rs.70 lakh.
Neeta - 2 flats (Rs. 60 lakh) + Rs. 10 lakh (bank deposit)

Seetha – House (Rs. 50 lakh) + Rs. 20 lakh (bank deposit)
Geeta - 1 flat (Rs. 30 lakh) + Rs 40. lakh (bank deposit)

10. Among the three, Neeta received the least amount in bank deposits, while Geeta received the highest. The value of the assets was distributed equally among the children, as were the gold coins.

How many flats did Neeta receive?

Answer:

Solution:

Total amount (in lakh Rs.) distributed by the old woman = 70 + 50 + 90, i.e., 210 + Gold coins worth Rs.1 lakh each

Each one should get Rs.70 lakh.
Neeta - 2 flats (Rs. 60 lakh) + Rs. 10 lakh (bank deposit)
Seetha – House (Rs. 50 lakh) + Rs. 20 lakh (bank deposit)
Geeta - 1 flat (Rs. 30 lakh) + Rs. 40 lakh (bank deposit)

11. The value of the assets distributed among Neeta, Seeta, and Geeta was in the ratio of 1:2:3, while the gold coins were distributed among them in the ratio of 2:3:4 . One child got all three flats and she did not get the house. One child, other than Geeta, got Rs. 30 lakh in bank deposits.

How many gold coins did the old woman have?

A. 72
B. 90
C. 180
D. 216

Answer: B

Solution:

Total amount (in lakh Rs.) distributed by the old woman = 70 + 50 + 90, i.e., 210 + Gold coins worth Rs.1 lakh each.

The gold coins were distributed in the ratio 2:3:4.
Let the number of gold coins received by Neeta, Seeta, and Geeta be 2a, 3a, and 4a, respectively.
The total assets were distributed in the ratio 1:2:3.

Hence, Seeta received one-third of the total property and one-third of the gold coins.

Hence, $\frac{1}{3}$ (Bank deposits + house + flats) = Rs.70 lakhs

One child got all the three flats, and she did not get the house. One child other than Geeta got Rs.30 lakhs in bank deposits.

Hence, Seeta cannot get all the three flats, because her share is Rs.70 lakhs + $\frac{1}{3}$ (gold coins).

Therefore, Seeta should receive one house and bank deposits of Rs.20 lakhs.
Neeta should get Rs.30 lakhs in bank deposits.
Hence, Geeta should get Rs.20 lakhs in bank deposits.
All the three flats should be received by Geeta.

$$\frac{3a+2a}{70+3a} = \frac{1}{2}$$

a = 10
Number of gold coins = 90

12. The value of the assets distributed among Neeta, Seeta, and Geeta was in the ratio of 1:2:3, while the gold coins were distributed among them in the ratio of 2:3:4. One child got all three flats and she did not get the house. One child, other than Geeta, got Rs. 30 lakh in bank deposits.

How much did Geeta get in bank deposits (in lakhs of rupees)?

Answer: 20

Solution:

Total amount (in lakh Rs.) distributed by the old woman = 70 + 50 + 90, i.e., 210 + Gold coins worth Rs.1 lakh each.

The gold coins were distributed in the ratio 2 : 3 : 4.
Let the number of gold coins received by Neeta, Seeta, and Geeta be 2a, 3a, and 4a, respectively.
The total assets were distributed in the ratio 1:2:3.
Hence, Seeta received one-third of the total property and one-third of the gold coins.

Hence, $\frac{1}{3}$ (Bank deposits + house + flats) = Rs.70 lakhs

One child got all the three flats, and she did not get the house. One child other than Geeta got Rs. 30 lakhs in bank deposits.

Hence, Seeta cannot get all the three flats, because her share is Rs. 70 lakhs + $\frac{1}{3}$ (gold coins).

Therefore, Seeta should receive one house and bank deposits of Rs. 20 lakhs.
Neeta should get Rs. 30 lakhs in bank deposits.
Hence, Geeta should get Rs.20 lakhs in bank deposits.

13.

|||Common|||

Direction: Analyse the graph/s given below and answer the questions that follow.

At a management school, the oldest 10 dorms, numbered 1 to 10, need to be repaired urgently, The following diagram represents the estimated repair costs (in Rs. crores) for the 10 dorms. For any dorm, the estimated repair cost (in Rs. crores) is an integer. Repairs with estimated cost Rs. 1 or 2 crores are considered light repairs, repairs with estimated cost Rs. 3 or 4 crores are considered moderate repairs and repairs with estimated cost Rs. 5 or 6 crores are considered extensive repairs.
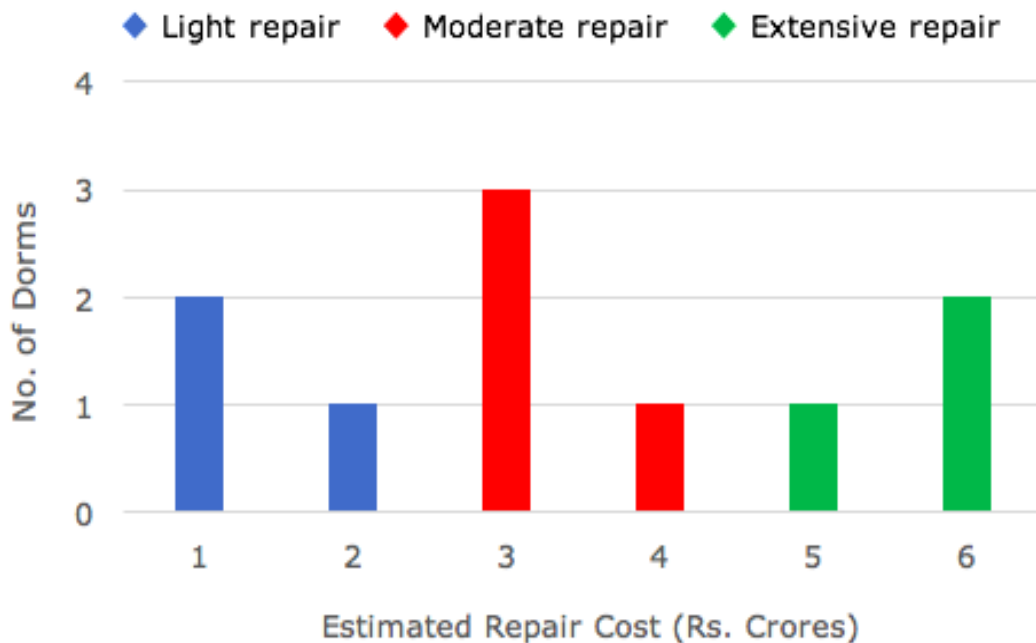
Further, the following are known:

1) Odd-numbered dorms do not need light repair; even-numbered dorms do not need moderate repair and dorms, whose numbers are divisible by 3, do not need extensive repair.

2) Dorms 4 to 9 all need different repair costs, with Dorm 7 needing the maximum and Dorm 8 needing the minimum.

Which of the following is NOT necessarily true?
A. Dorm 1 needs a moderate repair.
B. Repairs for Dorm 5 will cost no more than Rs. 4 crores.
C. Dorm 7 needs extensive repairs.
D. Repairs for Dorm 10 will cost no more than Rs. 4 crores.

Answer: D

Solution:

No. of dorms	Cost of repair for each dorm (in Rs. crore)	Total cost
2	1	2
1	2	2
3	3	9
1	4	4
1	5	5
2	6	12

Hence, the total amount needed is Rs. 34 crore.

Dorms 4 to 9 have different repair costs.
Dorm 7 needs the maximum repair cost and Dorm 8 needs the minimum repair cost. From the other conditions given, we have the following table with partial data.

Dorm Number	1	2	3	4	5	6	7	8	9	10
Repair Type	H/M	L /H	M	L/H	M/H	L	M/H	L/H	M	L /H
Conclusion (Rs. in Crores)	3	1/6	3	5	3/4	2	6	1	4/3	6/1

L = Light repair

M = Moderate repair

H = Extensive repair

If Dorm 5 needs Rs. 3 crore then Dorm 9 needs Rs.4 crore, while if Dorm 5 needs Rs. 4 crore then Dorm 9 needs Rs. 3 crore for repairs.
If Dorm 2 needs Rs.1 crore then Dorm 10 needs 6 Crore, while if dorm 2 needs Rs.6 crore then dorm 10 needs Rs.1 crore to repair.

From the options, Dorm 1 needing a moderate repair is possibly true.
Dorm 5 not needing more than Rs. 4 crore is true.
Hence, repairs for Dorm 10 not costing more than Rs. 4 crore is not necessarily true as it may require Rs. 6 crore or Rs. 1 crore.

Choice (4)

14. What is the total cost of repairing the odd-numbered dorms (in Rs. crores)?

Answer: 19

Solution:

Solution:

No. of dorms	Cost of repair for each dorm (in Rs. crore)	Total cost
2	1	2
1	2	2
3	3	9
1	4	4
1	5	5
2	6	12

Hence, the total amount needed is Rs. 34 crore.

Dorms 4 to 9 have different repair costs.
Dorm 7 needs the maximum repair cost and Dorm 8 needs the minimum repair cost. From the other conditions given, we have the following table with partial data.

Dorm Number	1	2	3	4	5	6	7	8	9	10
Repair Type	H/M	L /H	M	L/H	M/H	L	M/H	L/H	M	L /H
Conclusion (Rs. in Crores)	3	1/6	3	5	3/4	2	6	1	4/3	6/1

L = Light repair

M = Moderate repair

H = Extensive repair

The total cost for the odd-numbered dorms are 3 + 3 + 3 + 6 + 4 or 3 + 3 + 4 + 6 + 3, i.e., Rs.19 crore.

15. Suppose that:

1) 4 of the 10 dorms needing repairs are women's dorms and need a total of Rs. 20 crores for repair.

2) Only one dorm out of dorms 1 to 5 is a women's dorm.

What is the cost for repairing Dorm 9 (in Rs. crores)?

Answer: 3

Solution:

No. of dorms	Cost of repair for each dorm (in Rs. crore)	Total cost
2	1	2
1	2	2
3	3	9
1	4	4
1	5	5
2	6	12

Hence, the total amount needed is Rs. 34 crore.

Dorms 4 to 9 have different repair costs.
Dorm 7 needs the maximum repair cost and Dorm 8 needs the minimum repair cost. From the other conditions given, we have the following table with partial data.

Dorm Number	1	2	3	4	5	6	7	8	9	10
Repair Type	H/M	L /H	M	L/H	M/H	L	M/H	L/H	M	L /H
Conclusion (Rs. in Crores)	3	1/6	3	5	3/4	2	6	1	4/3	6/1

L = Light repair

M = Moderate repair

H = Extensive repair

Given that, 4 of the 10 dorms are women's dorms which need Rs. 20 crore for repairs. From dorms 1 to 5, there is only one women's dorm.

This is possible with repairing costs of Rs. 6, Rs. 6, Rs. 5 and Rs. 3 crore.
Among the first 5 dorms, dorm 4 should be a women's dorm.
Dorms 7 and Dorm 10 can be repaired for Rs. 6 crores.
Dorms 1, 3, 5 or 9 can be repaired for Rs. 3 crores. But dorms 1, 3 or 5 are not women's dorms. So, it must be Dorm 9.

Hence, the repair cost for Dorm 9 is Rs. 3 crore.

16. Suppose that:

1) 4 of the 10 dorms needing repair are women's dorms and need a total of Rs. 20 crores for repair.

2) Only one dorm out of dorms 1 to 5 is a women's dorm.

Which of the following is a women's dorm?

A. Dorm 2
B. Dorm 5
C. Dorm 8
D. Dorm 10

Answer: D

Solution:

No. of dorms	Cost of repair for each dorm (in Rs. crore)	Total cost
2	1	2
1	2	2
3	3	9
1	4	4
1	5	5
2	6	12

Hence, the total amount needed is Rs. 34 crore.

Dorms 4 to 9 have different repair costs.
Dorm 7 needs the maximum repair cost and Dorm 8 needs the minimum repair cost. From the other conditions given, we have the following table with partial data.

Dorm Number	1	2	3	4	5	6	7	8	9	10
Repair Type	H/M	L /H	M	L/H	M/H	L	M/H	L/H	M	L /H
Conclusion (Rs. in Crores)	3	1/6	3	5	3/4	2	6	1	4/3	6/1

L = Light repair

M = Moderate repair

H = Extensive repair

Given that, 4 of the 10 dorms are women's dorms which need Rs. 20 crore for repairs. From dorms 1 to 5, there is only one women's dorm.

This is possible with repairing costs of Rs. 6 crore, Rs. 6 crore, Rs. 5 crore and Rs. 3 crore.
Among the first 5 dorms, Dorm 4 should be a women's dorm.
Dorms 7 and 10 can be Rs. 6 crores.
Dorms 1, 3, 5 or 9 can be Rs. 3 crores. But 1, 3 or 5 are not women's dorms. So, it must be dorm 9.
So women's dorms are Dorm 4 (Rs. 5 crore), 7 (Rs. 6 crore), 9 (Rs. 3 crore) and 10 (Rs. 6 crore).

Hence, Dorm 10 should be a women's dorm.

17.

|||Common|||

Direction: Study the following information carefully and answer the questions that follow.

A tea taster was assigned to rate teas from six different locations - Munnar, Wayanad, Ooty, Darjeeling, Assam, and Himachal. These teas were placed in six cups, numbered 1 to 6, not necessarily in the same order. The tea taster was asked to rate these teas on the strength of their flavour on a scale of 1 to 10. He gave a unique integer rating to each tea. Some other information is given below:

1) Cup 6 contained the tea from Himachal.

2) The tea from Ooty got the highest rating, but it was not in Cup 3.

3) The rating of the tea in Cup 3 was double the rating of the tea in Cup 5.

4) Only two cups got ratings in even numbers.

5) Cup 2 got the minimum rating and this rating was an even number.

6) The tea in Cup 3 got a higher rating than that in Cup 1.

7) The rating of the tea from Wayanad was more than the rating of tea from Munnar, but less than that of the tea from Assam.

|||End|||
What was the second highest rating given?

Answer: 7

Solution:

The tea with the highest rating is ranked 1 and the tea with the lowest rating is ranked 6.
From (2) and (5),

Ranking	Place	Cup No	Rating
1	Ooty		
2			
3			
4			
5			
6		Cup 2	

From 4, only two cups have been given even-numbered ratings and from 5, one of them is Cup 2.
From 3, the rating of the tea in Cup 3, is an even number.
Therefore, the rating of the tea in Cup 5 must be an odd number.

From 6, Cup 3's rating is more than that of the tea in Cup 5, Cup 2, and Cup 1.
Hence, the tea in Cup 3 is either ranked 2 or 3.
It cannot be 1 since the tea from Ooty is not in Cup 3 and it has the highest rating.

From 5, the rating for the tea in Cup 2 can either be 2 or 4. No other even number can be assigned to the tea in Cup 2.

If the tea in Cup 2 has a rating of 4, the minimum possible rating for the tea in Cup 5 = 5.
The tea in Cup 3 has a rating of 10. This is not possible as the highest rating is not given to the tea in Cup 3.

Hence, the tea in Cup 2 has a rating of 2.

The tea in Cup 5 has a rating of 3 (odd number less than 5).
Therefore, the rank of the tea in Cup 5 = 5 and the tea in Cup 3's rating = 6.

There are only two even ratings that are given to the tea in Cup 3 and Cup 2.
Hence, between the ratings 3 and 6, only one rating, i.e., 5 is possible.
Tea in Cup 1's rating < Cup 3's rating.
Hence, the only possibility is that tea in Cup 1's rating = 5 and the tea in Cup 3's rating = 6.

From (1), Cup 6 contained the tea from Himachal, and it got the second highest rating. The rating must be an odd number greater than 6 and less than 10. Hence, 7 is the only possible number. It cannot be 9 because the tea from Ooty must be given a rating of 10 but there are only two even ratings.

Cup 4 has the tea from Ooty, whose rating should be an odd number greater than 7 and less than 10, i.e., 9.

The final table will be as follows:

Ranking	Place	Cup No	Rating
1	Ooty	Cup 4	9
2	Himachal	Cup 6	7
3		Cup 3	6
4		Cup 1	5
5		Cup 5	3
6		Cup 2	2

The second highest rating is given to the tea from Himachal which is 7.

18. Which cup contained the tea from Ooty?

Answer: 4

Solution:

The tea with the highest rating is ranked 1 and the tea with the lowest rating is ranked 6.
From (2) and (5),

Ranking	Place	Cup No	Rating
1	Ooty		
2			
3			
4			
5			
6		Cup 2	

From (4), only two cups have been given even-numbered ratings and from (5) one of them is Cup 2.
From 3, the rating of the tea in Cup 3, is an even number.
Therefore, the rating of the tea in Cup 5 must be an odd number.

From 6, Cup 3's rating is more than those in Cup 5, Cup 2 and Cup 1.
Hence, the ranking of Cup 3 is either 2 or 3.
It cannot be 1 since the tea from Ooty is not in Cup 3 and it has the highest rating.

From 5, Cup 2's rating can either be 2 or 4. No other even number can be assigned to the tea in Cup 2.

If the tea in Cup 2's rating is 4, the minimum possible rating for the tea in Cup 5 = 5.
The tea in Cup 3's rating = 10. This is not possible as the highest rating is not given to the tea in Cup 3.

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Hence, the tea in Cup 2 has a rating of 2.

The tea in Cup 5 has a rating of 3 (odd number less than 5).
Therefore, the rank of the tea in Cup 5 = 5 and the tea in Cup 3's rating = 6.

There are only two even ratings that are given to the tea in Cup 3 and Cup 2.
Hence, between the ratings 3 and 6, only one rating, i.e., 5 is possible.
Tea in Cup 1's rating < Cup 3's rating.
Hence, the only possibility is that the tea in Cup 1's rating = 5 and the tea in Cup 3's rating = 6.

From (1), Cup 6 contained tea from Himachal, and it got the second highest rating. The rating must be an odd number greater than 6 and less than 10. Hence, 7 is the only possible number. It cannot be 9 because the tea from Ooty must be given a rating of 10 but there are only two even ratings.

Cup 4 has the tea from Ooty, whose rating should be an odd number greater than 7 and less than 10, i.e., 9.

The final table will be as follows:

Ranking	Place	Cup No	Rating
1	Ooty	Cup 4	9
2	Himachal	Cup 6	7
3		Cup 3	6
4		Cup 1	5
5		Cup 5	3
6		Cup 2	2

The number of the cup that contained the tea from Ooty is Cup 4.

19. If the tea from Munnar did not get the minimum rating, what was the rating of the tea from Wayanad?

A. 3
B. 5
C. 1
D. 6

Answer: B

Solution:

The tea with the highest rating is ranked 1 and the tea with the lowest rating is ranked 6.
From (2) and (5),

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Ranking	Place	Cup No	Rating
1	Ooty		
2			
3			
4			
5			
6		Cup 2	

From (4), only two cups have been given even numbered ratings and from (5) one of them is Cup 2.
From 3, the rating for the tea in Cup 3 is an even number.
Therefore, the rating for the tea in Cup 5 must be an odd number.

From 6, the rating for the tea in Cup 3 is more than the ratings for the teas in Cup 5, Cup 2, and Cup 1.
Hence, the ranking of the tea in Cup 3 is either 2 or 3.
It cannot be 1 since the tea from Ooty is not in Cup 3 and it has the highest rating.

From 5, the rating for the tea in Cup 2is either 2 or 4. No other even number can be assigned to the tea in Cup 2.

If the rating for the tea in Cup 2 is 4, then the minimum possible rating for the tea in Cup 5 = 5.
 The rating for the tea in Cup 3 = 10. This is not possible as the highest rating is not given to the tea in Cup 3.

Hence, the tea in Cup 2 has a rating of 2.

The tea in Cup 5 has a rating of 3 (odd number less than 5).
Therefore, the rank of the tea in Cup 5 = 5 and the tea in Cup 3's rating = 6.

There are only two even ratings that are given to the tea in Cup 3 and Cup 2.
Hence, between the ratings 3 and 6, only one rating, i.e., 5 is possible.
Tea in Cup 1's rating < Cup 3's rating.
Hence, the only possibility is that tea in Cup 1's rating = 5 and the tea in Cup 3's rating = 6.

From (1), Cup 6 contained the tea from Himachal, and it got the second highest rating. The rating must be an odd number greater than 6 and less than 10. Hence, 7 is the only possible number. It cannot be 9 because the tea from Ooty must be given a rating of 10 but there are only two even ratings.

Cup 4 has the tea from Ooty, whose rating should be an odd number greater than 7 and less than 10, i.e., 9.

The final table will be as follows:

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Ranking	Place	Cup No	Rating
1	Ooty	Cup 4	9
2	Himachal	Cup 6	7
3		Cup 3	6
4		Cup 1	5
5		Cup 5	3
6		Cup 2	2

It is given that the rating of the tea from Munnar is less than that of the teas from Wayanad and Assam. Hence, it must be ranked either fifth or sixth.
If the tea from Munnar did not get the minimum rating, it will be ranked fifth whose rating is 3. Therefore, the teas from Assam and Wayanad will be ranked 3 and 4, respectively. Hence, the rating of the tea from Wayanad will be 5.

20. If cups containing teas from Wayanad and Ooty had consecutive numbers, which of the following statements may be true?

A. Cup 5 contains the tea from Assam.
B. Cup 1 contains the tea from Darjeeling.
C. The tea from Wayanad has got a rating of 6.
D. The tea from Darjeeling has got the minimum rating.

Answer: B

Solution:

The tea with the highest rating is ranked 1 and the tea with the lowest rating is ranked 6.
From (2) and (5),

Ranking	Place	Cup No	Rating
1	Ooty		
2			
3			
4			
5			
6		Cup 2	

From (4), only two cups have been given even-numbered ratings and from (5) one of them is Cup 2.
From 3, the rating of the tea in Cup 3 is an even number.
Therefore, the rating of the tea in Cup 5 must be an odd number.

From 6, Cup 3's rating is more than the ratings of the teas in Cup 5, Cup 2 and Cup 1.

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Hence, the ranking of Cup 3 is either 2 or 3.
It cannot be 1 since the tea from Ooty is not in Cup 3 and it has the highest rating.

From 5, the rating for the tea in Cup 2 can either be 2 or 4. No other even number can be assigned to the tea in Cup 2.

If the tea in Cup 2's rating is 4, the minimum possible rating for the tea in Cup 5 = 5
The tea in Cup 3's rating = 10. This is not possible as the highest rating is not given to the tea in Cup 3.

Hence, the tea in Cup 2 has a rating of 2.

The tea in Cup 5 has a rating of 3 (odd number less than 5).
Therefore, the rank of the tea in Cup 5 = 5 and the rating for the tea in Cup 3= 6.

There are only two even ratings that are given to the tea in Cup 3 and Cup 2.
Hence, between the ratings 3 and 6, only one rating, i.e., 5 is possible.
Rating of the tea in Cup 1 < Rating of the tea in Cup 3
Hence, the only possibility is that the rating of the tea in Cup 1 = 5 and the rating of the tea in Cup 3 = 6

From (1), Cup 6 contained the tea from Himachal, and it got the second highest rating. The rating must be an odd number greater than 6 and less than 10. Hence, 7 is the only possible number. It cannot be 9 because the tea from Ooty must be given a rating of 10 but there are only two even ratings.

Cup 4 has the tea from Ooty, whose rating should be an odd number greater than 7 and less than 10, i.e., 9.

The final table will be as follows:

Ranking	Place	Cup No	Rating
1	Ooty	Cup 4	9
2	Himachal	Cup 6	7
3		Cup 3	6
4		Cup 1	5
5		Cup 5	3
6		Cup 2	2

If the cups containing teas from Wayanad and Ooty have consecutive numbers, then the cup containing the tea from Wayanad can either be Cup 5 or Cup 3.
But the tea from Wayanad cannot be in Cup 3 because the tea from Assam got a higher rating than the tea from Wayanad. Hence, the tea from Wayanad should be in Cup 5, the tea from Munnar will be in Cup 2, and the tea from Darjeeling can either be in Cup 1 or Cup 3.

21.

|||Common|||

Direction: Study the following information carefully and answer the questions that follow.

In an 8 × 8 chessboard, a queen placed anywhere can attack another piece if the piece is present in the same row, or in the same column or in a diagonal position in any of the 4 possible directions, provided there is no other piece in between the path from the queen to that piece.

The columns are labelled from a to h (left to right) and the rows are numbered from 1 to 8 (bottom to top). The position of a piece is given by the combination of column and row labels. For example, position c5 means that the piece is in the cth column and 5th row.

|||End|||
If the queen is at c5, and the other pieces are in the positions c2, g1, g3, g5, and a3, how many are under attack by the queen? There are no other pieces on the board.
A. 2
B. 3
C. 4
D. 5

Answer: C

Solution:

Queen is at c5.
The pieces which are under attack are a3, c2, g1, g5. So, a total of 4 pieces are under attack.

		Queen				(G5) Piece	
(A3) Piece						(G3) Piece	
		(C2) Piece					
A	B	C	D	E	F	(G1) Piece	H

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22. If the other pieces are only at positions a1, a3, b4, d7, h7, and h8, then which of the following positions of the queen results in the maximum number of pieces being under attack?

A. f8
B. a7
C. c1
D. d3

Answer: D

Solution:

The pieces are at a1, a3, b4, d7, h7, and h8.

Option (1): If the queen is at f8, it will attack h8 and b4, a total of 2 pieces.

Option (2): If the queen is at a7, it will attack a3 and d7, a total of 2 pieces.

Option (3): If the queen is at c1, it will attack a1 and a3, a total of 2 pieces.

Option (4): If the queen is at d3, it will attack a3, d7 and h7, a total of 3 pieces.

So, the queen being at D3 means a maximum of 3 pieces will be under attack.

							Piece (H8)
			Piece (D7)				Piece (H7)
						(G5)Piece	
	Piece (B4)						
(A3) Piece						(G3)Piece	
Piece (A1)	B	C	D	E	F	G	H

23. If the other pieces are only at positions a1, a3, b4, d7, h7, and h8, then from how many positions can the queen not attack any of the pieces?

A. 0
B. 3
C. 4
D. 6

Answer: C

Solution:

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The queen cannot be placed in the columns: a, b, d, and h. From the remaining columns, it must be assessed.
If the queen is placed on C2, it will attack H7.
Queen can be placed on E2, F2, G2, G5. There are a total of 4 such squares for the Queen.

							Piece (H8)
			Piece (D7)				Piece (H7)
						(G5)Piece	
	Piece (B4)						
(A3) Piece						(G3)Piece	
Piece (A1)	B	C	D	E	F	G	H

24. Suppose the queen is the only piece on the board and it is at position d5. In how many positions can another piece be placed on the board such that it is safe from the queen's attack?

A. 32
B. 35

C. 36
D. 37

Answer: C

Solution:

Given that the queen is at d5. The squares are either diagonal, or in the same row or in the same column.

Under Attack			Under Attack			Under Attack	
	Under Attack		Under Attack		Under Attack		
		Under Attack	Under Attack	Under Attack			
Under Attack	Under Attack	Under Attack	QUEEN	Under Attack	Under Attack	Under Attack	Under Attack
		Under Attack	Under Attack	Under Attack			
	Under Attack		Under Attack		Under Attack		
Under Attack			Under Attack			Under Attack	
			Under Attack				Under Attack

Hence, it can be concluded that a total of 36 such squares are safe from attack.

25. **Direction :** Study the following information carefully and answer the question that follow.

Eight friends: Ajit, Byomkesh, Gargi, Jayanta, Kikira, Manik, Prodosh and Tapesh are going to Delhi from Kolkata by a flight operated by Cheap Air. In the flight, sitting is arranged in 30 rows, numbered 1 to 30, each consisting of 6 seats, marked by letters A to F from left to right, respectively. Seats A to C are on the left of the aisle (the passage running from the front of the aircraft to the back), and seats D to F are on the right of the aisle. Seats A and F are by the windows and referred to as window seats, C and D are by the aisle and are referred to as aisle seats while B and E are referred to as middle seats. Seats marked by consecutive letters are called consecutive seats (or seats next to each other). A seat number is a combination of the row number, followed by the letter indicating the position in the row; e.g., 1A is the left window seat in the first row, while 12E is the right middle seat in the 12th row.

Cheap Air charges Rs. 1000 extra for any seats in Rows 1, 12 and 13 as those have extra legroom. For Rows 2-10, it charges Rs. 300 extra for window seats and Rs. 500 extra for aisle seats. For Rows 11 and 14 to 20, it charges Rs. 200 extra for window seats and Rs. 400 extra for aisle seats. All other seats are available at no extra charge.

The following are known:

1) The eight friends were seated in six different rows.

2) They occupied 3 window seats, 4 aisle seats and 1 middle seat.

3) Seven of them had to pay extra amounts, totaling up to Rs. 4600, for their choices of seat. One of them did not pay any additional amount for his/her choice of seat.

4) Jayanta, Ajit and Byomkesh were sitting in seats marked by the same letter, in consecutive rows in increasing order of row numbers; but all of them paid different amounts for their choices of seat. One of these amounts may be zero.

5) Gargi was sitting next to Kikira, and Manik was sitting next to Jayanta.

6) Prodosh and Tapesh were sitting in seats marked by the same letter, in consecutive rows in increasing order of row numbers; but they paid different amounts for their choices of seat. One of these amounts may be zero.

|||End|||
In which row was Manik sitting?
A. 10
B. 11

C. 12
D. 13

Answer: A

Solution:

Let us take the initial letter of each friend.

For seats in row numbers 1 to 20, extra charges are applicable for all the seats except for the middle seats.

J, A, B must be in the aisle seats to get the sum of the charges they paid 4600. Given that, J, A, B paid different amounts. Therefore,

Row/No	A	B	C	D	E	F	Remarks
10			J	M			500 × 2 = 1000
11			A				400 × 1 = 400
12			B				1000 × 1 = 1000
13					G	K	1000 × 2 = 2000 (6 persons = 4400)
20						P	200 × 1 = 200 (7 persons = 4600)
21						T	No extra charge

G, K and K, G can be interchanged. They can be placed in rows 1 to 0.

The right window positions and the aisle seats can also be interchanged.

From the table, Manik sits in Row 10.

26. How much extra charge did Jayanta have to pay for his choice of seat?

A. Rs. 300
B. Rs. 400

C. Rs. 500
D. Rs. 1000

Answer: C

Solution:

Let us take the initial letter of each friend.

From row numbers 1 to 20, extra charges are applicable for all the seats except the middle seat.

J, A, B must be in the aisle seats to get the sum as 4600.
Given that, J, A, B paid different amounts. Therefore,

Row/No	A	B	C	D	E	F	Remarks
10			J	M			500 × 2 = 1000
11			A				400 × 1 = 400
12			B				1000 × 1 = 1000
13					G	K	1000 × 2 = 2000 (6 persons = 4400)
20						P	200 × 1 = 200 (7 persons = 4600)
21						T	No extra charge

G, K and K, G can be interchanged. They can be placed in row 1 to 0.

The right window positions and the aisle seats can also be interchanged.

Therefore, Jayanta paid Rs. 500 extra for his choice of seat.

27. How much extra did Gargi pay for her choice of seat?

A. 0
B. Rs. 300

C. Rs. 500
D. Rs. 1000

Answer: D

Solution:

Let us take the initial letter of each friend.

From row numbers 1 to 20, extra charges are applicable for all seats except the middle seat.

J, A, B must be in the aisle seats to get the sum as 4600.
Given that, J, A, B paid different amounts. Therefore,

Row/No	A	B	C	D	E	F	Remarks
10			J	M			500 × 2 = 1000
11			A				400 × 1 = 400
12			B				1000 × 1 = 1000
13					G	K	1000 × 2 = 2000 (6 persons = 4400)
20						P	200 × 1 = 200 (7 persons = 4600)
21						T	No extra charge

G, K and K, G can be interchanged. They can be placed in row 1 to 0.

The right window positions and the aisle seats can also be interchanged.

Hence, Gargi paid Rs. 1000 for her choice of seat.

28. Who among the following did not pay any extra amount for his/her choice of seat?

A. Kikira
B. Manik
C. Gargi
D. Tapesh

Question

Answer: D

Solution:

Let us take the initial letter of each friend.

From row numbers 1 to 20, extra charges are applicable for all seats except the middle seat.

J, A, B must be in the aisle seats to get the sum as 4600.
Given that, J, A, B paid different amounts. Therefore,

Row/No	A	B	C	D	E	F	Remarks
10			J	M			500 × 2 = 1000
11			A				400 × 1 = 400
12			B				1000 × 1 = 1000
13					G	K	1000 × 2 = 2000 (6 persons = 4400)
20						P	200 × 1 = 200 (7 persons = 4600)
21						T	No extra charge

G, K and K, G can be interchanged. They can be placed in row 1 to 0.

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The right window positions and the aisle seats can also be interchanged.

Tapesh did not pay any extra amount for his/her choice of seat.

29.

|||Common|||

Direction : Study the following information carefully and answer the question that follow.

A high security research lab requires the researchers to set a pass key sequence based on the scan of the five fingers of their left hands. When an employee first joins the lab, her fingers are scanned in an order of her choice, and then when she wants to re-enter the facility, she has to scan the five fingers in the same sequence.

The lab authorities are considering some relaxations of the scan order requirements, since it is observed that some employees often get locked-out because they forget the sequence.

|||End|||
The lab has decided to allow a variation in the sequence of scans of the five fingers so that at most two scans (out of five) are out of place. For example, if the original sequence is Thumb (T), index finger (I), middle finger (M), ring finger (R) and little finger (L) then TLMRI is also allowed, but TMRLI is not.

How many different sequences of scans are allowed for any given person's original scan?

Answer: 11

Solution:

If all the scans are in the correct order = 1 way

If exactly two are interchanged:

Any two of the five scans that can be interchanged in $^5C_2$ ways, viz. 10.

Therefore, 11 different sequences of scans are allowed for any given person's original scan.

30. The lab has decided to allow variations of the original sequence so that the input of the scanned sequence of five fingers is allowed to vary from the original sequence by one place for any of the fingers. Thus, for example, if TIMRL is the original sequence, then ITRML is also allowed, but LIMRT is not.
How many different sequences are allowed for any given person's original scan?

A. 7
B. 5
C. 8
D. 13

Answer: C

Solution:

Let the original scan be: TIMRL

So the allowed sequences are:
case a: Original Sequence i.e., TIMRL

case b: Interchanging TI we can get 3 sequences, i.e., ITMRL, ITRML, ITMLR.

case c: Interchanging MI we can get 2 sequences, i.e., TMIRL,TMILR.

case d: Interchanging MR we can get 2 sequences, i.e., TIRML, ITRML (this is a repeated sequence already present in case b) so only 1 extra sequence which is TIRML.

case e: Interchanging RL we can get 3 sequences, i.e., TIMLR, ITMLR, TMILR. But the 2nd and 3rd sequences are already present in case b and c. So, only 1 extra sequence is TIMLR.

Total number of allowed sequences = 1 + 3 + 2 + 1 + 1 = 8

31. The lab has now decided to require six scans in the pass key sequence, where exactly one finger is scanned twice, and the other fingers are scanned exactly once, which can be done in any order. For example, a possible sequence is TIMTRL. Suppose the lab allows a variation of the original sequence (of six inputs) where at most two scans (out of six) are out of place, as long as the finger originally scanned twice is scanned twice and other fingers are scanned once.

How many different sequences of scans are allowed for any given person's original scan?

Answer: 15

Solution:

Let us say original input: TIMTRL.

Case-a: None of them misplaced – 1 way.

Case-b : When exactly two are misplaced. T can be misplaced - 4 ways.

I can be misplaced - 4 ways.

M can be misplaced -3 ways.

T can be misplaced - 2 ways.

R can be misplaced - 1 way.

Total number of ways in Case-b = 4 + 4 + 3 + 2 + 1 = 14 ways.

Therefore, total number of ways = 14 + 1 = 15 ways

32. The lab has now decided to require six scans in the pass key sequence, where exactly one finger is scanned twice, and the other fingers are scanned exactly once, which can be done in any order. For example, a possible sequence is TIMTRL. Suppose the lab allows a variation of the original sequence(of six inputs) so that input in the form of scanned sequence of six fingers is allowed to vary from the original sequence by one place for any of the fingers, as long as the fingers originally scanned twice is scanned twice and other fingers are scanned once.
How many different sequences of scans are allowed if the original scan sequence is LRLTIM?

A. 8
B. 11
C. 13
D. 14

Answer: C

Solution:

Given sequence: LRLTIM

The distinct possibilities are:

Case 1: . No shift = 1 way

(Total 1 ways)

Case 2. (a) LR = 1 way

(b) LR + LT = 1 way

(c) LR + LT + IM = 1 way

(d) LR + IM = 1 way

(e) LR + IT = 1 way

(Total 5 ways)

Case 3. (a) RL = 1 way

(b) RL + TI = 1 way

(c) RL + IM = 1 way

(Total 3 ways)

Case 4. (a) LT = 1 way

(b) LT + IM = 1 way

(Total 2 ways)

Case 5. TI = 1 way

(Total 1 way)

Case 6. IM = 1 way

(Total 1 way)

Total number of ways = 1 + 5 + 3 +2 +1 + 1 = 13 ways.

SLOT-2 QA

1. The numbers 1, 2,...,9 are arranged in a 3 × 3 square grid in such a way that each number occurs once and the entries along each column, each row, and each of the two diagonals add up to the same value. If the top left and the top right entries of the grid are 6 and 2, respectively, then the bottom middle entry is

A) None of the above

B) 1

C) 2

D) 4

Answer: A

Solution:

6	A	2
B	C	D
E	F	G

We get 6 + B + E = 6 + C + G = A + C + F = 2 + D + G = 2 + C + E = B + C + D = E + F + G = 15…. (1)

B + E = C + G = 9…………. (2)
D + G = C + E = 13………. (3)
(B, E) = (1, 8) or (8, 1) or (4, 5) or (5, 4)
Similarly, (C, G) = (1, 8) or (8, 1) or (4, 5) or (5, 4)

On the other hand, (D, G) or (C, E) = (4, 9) or (9, 4) or (5, 8) or (8, 5)

C + G = 9 and C + E = 13

Only possible value of C is 5.

So, we will get,

6	A	2
B	5	D
E	F	G

Now, since 6 + A + 2 = 15, we will get A = 7

So, we will get,

6	7	2
B	5	D
E	F	G

So, F will be 3.

6	7	2
1	5	9
8	3	4

Hence, option (A) is the correct answer.

2. In a 10 km race, A, B, and C each running at uniform speed, get the gold, silver, and bronze medals, respectively. If A beats B by 1 km and B beats C by 1 km, then by how many metres does A beat C?

Answer: 1900

Solution:

By the time A covers 10 km, B covers 9 km

And by the time B covers 10 km, C covers 9 km

So, A:B:C = 100:90:81=10000:9000:8100

So, A will beat C by 10000 – 8100 = 1900 m

Hence, 1900 is the correct answer.

3. Bottle 1 contains a mixture of milk and water in 7:2 ratio and Bottle 2 contains a mixture of milk and water in 9:4 ratio. In what ratio of volumes should the liquids in Bottle 1 and Bottle 2 be combined to obtain a mixture of milk and water in a 3:1 ratio?

   A. 27:14
   B. 27:13
   C. 27:16
   D. 27:18

Answer:

Solution:

Let us consider milk

In the first bottle, proportional part of milk = 7/9

And in the second bottle, proportional part of milk = 9/13

In the mixed case, proportional part of milk = ¾

LCM of the denominators = LCM (9, 13, 4) = 468

So, for the first bottle, we will get $\frac{7}{9} \times 468 = 7 \times 52 = 364$

Similarly, for the second bottle, we will get, $\frac{9}{13} \times 468 = 9 \times 36 = 324$

And for the mixed final solution, we will get, $\frac{3}{4} \times 468 = 3 \times 117 = 351$

Now, using alligation:
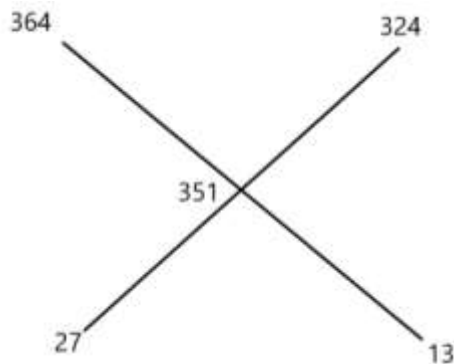
So, the required ratio = 27:13

Hence, option (B) is the correct answer.

4. Arun drove from home to his hostel at 60 miles per hour. While returning home, he drove halfway along the same route at a speed of 25 miles per hour and then took a bypass road which increased his driving distance by 5 miles, but allowed him to drive at 50 miles per hour along this bypass road. If his return journey took 30 minutes more than his onward journey, then the total distance travelled by him is:

A. 55 miles.

B. 60 miles.

C. 65 miles.

D. 70 miles.

Answer: C

Solution:

As the speeds are 60, 25 and 50, half of the distance is the LCM of 60, 25, 50, that is 300D. So, the full distance is 600D.

Case	Time (H)	Speed (Mile/H)	Distance (miles)
Home to Hostel	10D	60	600D
Returning first half	12D	25	300D

| Returning bypass | 6D+0.1 | 50 | 300D+5 |
| Returning total | 18D+0.1 | | 600D+5 |

So, 18D + 0.1 = 10D + 0.5
8D = 0.4
D = 0.05
600D = 30
Total distance = 600D + 600D + 5 = 30 + 30 + 5 = 65 km
Hence, option (C) is the correct answer.

5. Out of the shirts produced in a factory, 15% are defective, while 20% of the rest are sold in the domestic market. If the remaining 8840 shirts are left for export, then the number of shirts produced in the factory is

    A. 13600

    B. 13000

    C. 13400

    D. 14000

Answer: B

Solution:
Let the total number of shirts produced in the factory be 100S.
So, defective shirts = 15S
Remaining shirts = 85S
Domestic = 20% 0f 85S = 17S
Export = 85S – 17S = 68S = 8840 (given)
S = 8840/68 = 130
100S = 13000
Hence, option (B) is the correct answer.

6. The average height of 22 toddlers increases by 2 inches when two of them leave this group. If the average height of these two toddlers is one-third the average height of the original 22, then the average height, in inches, of the remaining 20 toddlers is

    A. 30

    B. 28

    C. 32

    D. 26

Answer: C

Solution:

Let the average of the two toddlers be A

So, the average of the total number of 22 toddlers will be 3A.

Sum of the heights of the group of remaining 20 toddlers will be 66A – 2A = 64A

But, as the average increases by 2 inches, the average of the 20 remaining toddlers will be (3A + 2).

Group	Number	Average	Total
First	20	3A + 2	64A
Second	2	A	2A
Overall	22	3A	66A

So, 20(3A + 2) = 64A

60A + 40 = 64A

A = 10
3A + 2 = 32
The average height of the remaining 20 toddlers will be 32 inches.
Hence, option (C) is the correct answer.

7. The manufacturer of a table sells it to a wholesale dealer at a profit of 10%. The wholesale dealer sells the table to a retailer at a profit of 30%. Finally, the retailer sells it to a customer at a profit of 50%. If the customer pays Rs 4290 for the table, then its manufacturing cost (in Rs) is

 A. 1500

 B. 2000

 C. 2500

 D. 3000

Answer: B

Solution:

Let the manufacturing cost be Rs. 100C.

So, 100C x 1.1 x 1.3 x 1.5 = 4290

C = 20
100C = 2000

Hence, option (B) is the correct answer.

8. A tank has an inlet pipe and an outlet pipe. If the outlet pipe is closed, then the inlet pipe fills the empty tank in 8 hours. If the outlet pipe is open, then the inlet pipe fills the empty tank in 10 hours. If only the outlet pipe is open, then in how many hours the full tank becomes half-full?

    A. 20

    B. 30

    C. 40

    D. 45

Answer: A
Solution:
Given the inlet pipe can fill the empty tank in 8 hours if that is the only tap working.
Let the outlet pipe can empty the full tank in A hours if that is the only pipe working.
So, they together can fill the tank in $\frac{8A}{8-A}$ hours, which is given to be 10 hours.
So, $\frac{8A}{A-8} = 10$

$$8A = 10A - 80$$

-2A = -80
A = 40
The outlet pipe can empty the full tank in 40 hours.
The outlet pipe can empty half the tank in 20 hours.

9. Mayank buys some candies for Rs.15 a dozen and an equal number of different candies for Rs. 12 a dozen. He sells all for Rs. 16.50 a dozen and makes a profit of Rs 150. How many dozens of candies did he buy altogether?

    A. 50

    B. 30

    C. 25

    D. 45

Answer: A

Solution:

Mayank has bought 'n' dozens of candies of each type.

Total cost price of the candies = Rs. (15n + 12n) = Rs. 27n

Total selling price of 2n price = Rs. $16.50 \times 2n$ = Rs. 33n

According to the question,

$$33n - 27n = 150$$

$$6n = 150$$

n = 25

Therefore, the total number of dozens of candies bought by Mayank = 2n = 50.

Hence, option (A) is the correct answer.

10. In a village, the production of food grains increased by 40% and the per capita production of food grains increased by 27% during a certain period. The percentage by which the population of the village increased during the same period is nearest to

    A. 16

    B. 13

    C. 10

    D. 7

Answer: C
Solution:
We get the following table with appropriate assumptions.

Case	Food	Population	Food/popu
Initial	100F	100P	100R
Final	140F	$(100 + x)P$	127R

So, we can write, $\frac{100F}{100P} = 100R \ldots\ldots\ldots\ldots\ldots(1)$

$$\frac{140F}{(100 + x)P} = 127R \ldots\ldots\ldots\ldots.(2)$$

Dividing (1) by (2), we get,

$$\frac{\frac{100F}{100P}}{\frac{140F}{(100 + x)P}} = \frac{127R}{100R}$$

$$\frac{\frac{1}{140}}{(100 + x)} = \frac{127}{100}$$

$$\frac{127}{100} = \frac{140}{100 + x}$$

12700 + 127x = 14000
127x = 1300
X = 10.23
X = 10 (approx.)
Hence, option (C) is the correct answer.

11. If a, b, c are three positive integers such that a and b are in the ratio 3:4 while b and c are in the ratio 2:1, then which one of the following is a possible value of (a + b + c)?

    A. 201

    B. 205

    C. 207

    D. 210

Answer: C

Solution:

Given, a:b = 3:4 and b:c = 2:1

On combining the ratios we get, a:b:c = 3:4:2.

Now, a + b + c = 3 + 4 + 2 = 9

Since all these are positive integers, the value of a + b + c will be a multiple of 9.

Among the options, only C is a multiple of 9.

Hence, option (C) is the correct answer.

12. A motorbike leaves point A at 1 pm and moves towards point B at a uniform speed. A car leaves point B at 2 pm and moves towards point A at a uniform speed which is double that of the motorbike. They meet at 3:40 pm at a point which is 168 km away from A. What is the distance, in km, between A and B?

    A. 364

    B. 378

    C. 380

    D. 388

Answer: B
Solution:
Let the meeting point be M.

                                      M

A   B
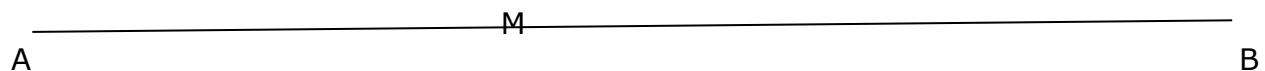
AM = 168 km
Let AB be D km. So, MB = (D − 168) km
Let the speed of the motorbike be S. So, speed of the car = 2S
Time taken by the motorbike = $\frac{168}{S}$= 2 h 40 min= $\frac{8}{3}h$….(1)

And, time taken by the car $= \frac{D - 168}{2s} = $ 1 h 40 min $= \frac{5}{3}h$...(2)

From (1), we get $\frac{168}{S} = \frac{8}{3}$, S = 63

Substituting this value of S in (2), we will get the following:

$$\frac{D - 168}{126} = \frac{5}{3}$$

$$\frac{D - 168}{42} = 5$$

$$D - 168 = 210$$

D = 378

Hence, option (B) is the correct answer.

13. Amal can complete a job in 10 days and Bimal can complete it in 8 days. Amal, Bimal, and Kamal together complete the job in 4 days and are paid a total amount of Rs 1000 as remuneration. If this amount is shared by them in proportion to their work, then Kamal's share, in rupees, is

    A. 100

    B. 200

    C. 300

    D. 400

Answer: A
Solution:
Let's assume that Kamal can finish the work in K days while working alone.
Amal can complete the job in 10 days.
Bimal can complete it in 8 days.
Amal, Bimal and Kamal can complete in 4 days while working alone.
LCM(10, 8, 4) = 40
So, let the total work be 40w.
So, in 1 day,
Amal can do $\frac{40w}{10} = 4w$
Bimal can do $\frac{40w}{8} = 5w$

All three together can do $\frac{40w}{4} = 10w$

Kamal in 1 day can do 10w – 4w – 5w = w
The ratio of work done by Amal, Bimal and Kamal is 4w:5w:w = 4:5:1
Kamal will have the share $\frac{1}{4+5+1} = \frac{1}{10}$
So, out of Rs. 1000, Kamal will get Rs. 100.
Hence, option (A) is the correct answer.

14. Consider three mixtures: the first having water and liquid A in the ratio 1:2, the second having water and liquid B in the ratio 1:3, and the third having water and liquid C in the ratio 1:4. These three mixtures of A, B, and C, respectively, are further mixed in the proportion 4:3:2. Then the resulting mixture has

      A. the same amount of water and liquid B.

      B. the same amount of liquids B and C.

      C. more water than liquid B.

      D. more water than liquid A.

Answer: C
Solution:
The volumes taken from the three mixtures as 4k, 3k, and 2k, respectively.

Mixture	Ratio	Proportional part of		Volume
		Water	Liquid	Taken
First	1:2	$\frac{1}{3}$	$\frac{2}{3}$	4k
Second	1:3	$\frac{1}{4}$	$\frac{3}{4}$	3k
Third	1:4	$\frac{1}{5}$	$\frac{4}{5}$	2k

Now, as the LCM of the denominators is LCM (3, 4, 5) = 60 = k

Mixture	Ratio	Proportional part of		Volume	Volume of	
		Water	Liquid	Taken	Water	Liquid
First	1:2	$\frac{1}{3}$	$\frac{2}{3}$	240	80	160
Second	1:3	$\frac{1}{4}$	$\frac{3}{4}$	180	45	135
Third	1:4	$\frac{1}{5}$	$\frac{4}{5}$	120	24	96
Total	149:391	$\frac{149}{540}$	$\frac{391}{540}$	540	149	

We can see that only option C is correct. That is, there is more water than liquid B (from the second mixture).
Hence, option (C) is the correct answer.

15. Let ABCDEF be a regular hexagon with each side of length 1 cm. The area (in sq. cm) of a square with AC as one side is

    A. 3√2.

    B. 3.

    C. 4.

    D. √3.

Answer: B

Solution:
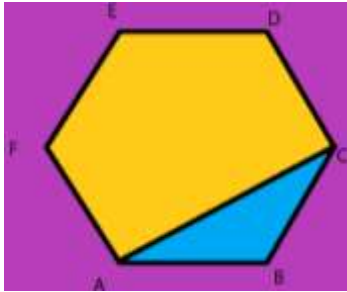
In the isosceles triangle ABC, AB = AC = 1
Angle ABC = 120 degrees
So, angles BAC and BCA each = 30 degrees
So, AC = BC cos 30 + AB cos 30 = $\sqrt{3}$
So, the area of the square will be 3.
Hence, option (B) is the correct answer.

16. The base of a vertical pillar with uniform cross-section is a trapezium whose parallel sides are of lengths 10 cm and 20 cm while the other two sides are of equal length. The perpendicular distance between the parallel sides of the trapezium is 12 cm. If the height of the pillar is 20 cm, then the total area, in sq. cm, of all six surfaces of the pillar is

    A. 1300

    B. 1340

    C. 1480

    D. 1520

Answer: C

Solution:
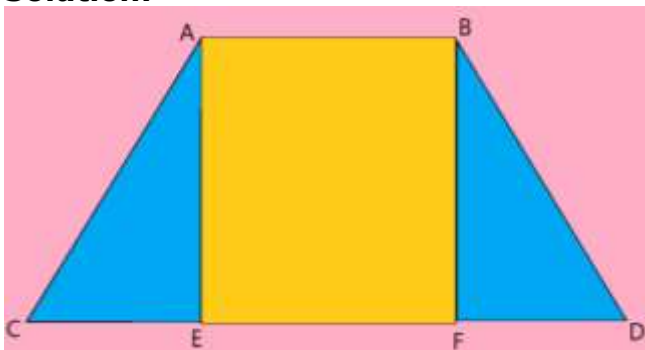
AB = 10 = EF and CD = 20
AE = BF = 12
Let, AC = BD = x
So, in the right-angled triangle AEC, using Pythagoras Theorem.
$AC^2 = AE^2 + CE^2$
$x^2 = 12^2 + CE^2$

$CE^2 = x^2 − 144$
Similarly, in right-angled triangle BFD, we can write, $FD^2 = x^2 − 144$
So, CE = FD = y (let)
Since CD = 20, we can write, y + 10 + y = 20 or y = 5
So, AC = BD = 13 [using Pythagorean Triplets]
So, the perimeter of the trapezium = 10 + 20 + 13 + 13 = 56
So, the lateral surface area = perimeter of the base x height = 56 x 20 = 1120
Area of the base = area of the roof = area of the trapezium = ½ x (10 + 20) × 12 = 180
So, total surface area = 1120 + 2 × 180 = 1120 + 360 = 1480
Hence, option (B) is the correct answer.

17. The points (2, 5) and (6, 3) are two end points of a diagonal of a rectangle. If the other diagonal has the equation y = 3x + c, then c is

    A. - 5

    B. - 6

    C. - 7

    D. – 8

Answer: D
Solution:
For any parallelogram, the diagonals bisect each other.
So, the midpoint of (2, 5) and (6, 3) will also lie on y = 3x + c
So, the midpoint of (2, 5) and (6, 3) is (4, 4).
So, putting x = y = 4 in y = 3x + c, we get, 4 = 12 + c or c = (-8)
Hence, option (D) is the correct answer.

18. ABCD is a quadrilateral inscribed in a circle with centre O. If ∠COD = 120 degrees and ∠BAC = 30 degrees, then the value of ∠BCD (in degrees) is

Answer: 60.
Solution:
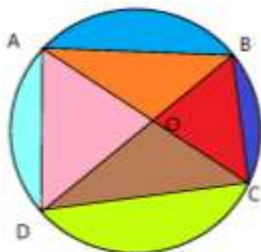
In the diagram,
Angle DOC = 120 degrees
In triangle ODC, OD = OC = radius of the circle
So, ODC is an isosceles triangle.

So, angle ODC = angle OCD = x (let)
So, x + x + 120 = 180
x = 30
angle ODC = angle OCD = 30 degrees
It is given that angle BAC = 30 degrees
So, the two angles BAC and ODC must lie on the same segment.
So, DOB must be a straight line. Otherwise, it is not possible to get the angle ODC as 30 degrees.
Since, in any circle, the angle formed on the segment at the opposite arc is half of that formed at the centre, we can say, on segment CD, angle DBC= ½ x central angle COD = ½ x 120= 60
in triangle OBC, OB=OC = radius of the circle
so, angle OCB= angle OBC = 60
Hence, 60 is the correct answer.

19. If three sides of a rectangular park have a total length 400 ft, then the area of the park is maximum when the length (in ft.) of its longer side is

Answer: 200.
Solution:
Let the length of the park be 'L' and the breadth be B, B < L.
So, area = A = LB
So, 400 = 2L + B or 2B + L
So, B = 400 − 2L or 200 − L/2
So, LB = 400L − 2L² or 200L − ½ L²

Case 1:
A = LB = 400L − 2L² = (-2)(L² − 200L) = (-2)(L² − 200L +100² − 100²) = (-2)(L − 100)² + 2(100)²
=20000 − 2(L − 100)²
So, A will be maximum when 2(L − 100)² is minimum.
Since the minimum value of the square of any real quantity is zero and since L is a real number, the minimum value of 2(L − 100)² is zero.
So, L = 100
So, the area will be maximum at L = 100.
Since in this case, 400 = 2L+B, putting L = 100, we will get, B = 200>100=L
Which contradicts our initial assumption that L>B
So, we can NOT accept this case.

Case 2:
A = LB = 200L − ½ L²
$A = -\frac{1}{2} \times (L^2 - 400L)$
$A = -\frac{1}{2} \times \{L^2 - 2.L.200 + 200^2 - 200^2\}$
$$A = -\frac{1}{2} \times \{(L - 200)^2 - 40000\}$$
$$A = -\frac{1}{2}(L - 200)^2 + 20000$$

$$A = 20000 - \frac{1}{2}(L - 200)^2$$

A will be maximum when $\frac{1}{2}(L - 200)^2$ is minimum.

A will be maximum when L = 200

For L = 200, we get, 400 = 2B + L or B = 100

Here, B < L, so, it can be accepted.

20. Let P be an interior point of a right-angled isosceles triangle ABC with hypotenuse AB. If the perpendicular distance of P from each of AB, BC, and CA is 4(√2 - 1) cm, then the area, in sq. cm, of the triangle ABC is

Answer: 16.

Solution:

Let 'r' be the radius, the perpendicular distance is equal to the radius as shown.
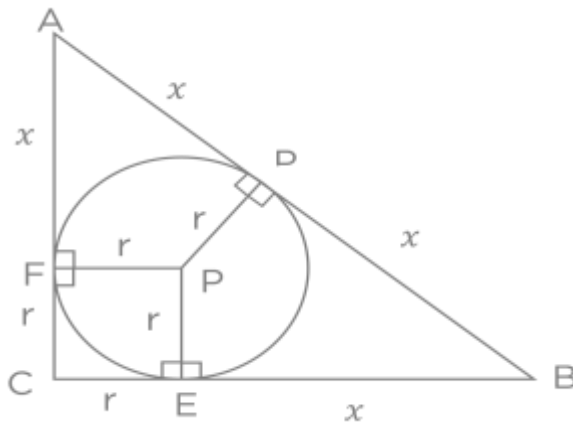
Let 'x' be the length of BE.

Since, B is an exterior point of the circle with centre P, the two tangents drawn from B on that circle must be equal.

So, BD is also x.

Since AC = BC

So, AC = x + r, AF = x and AD = x.

Using Pythagoras' Theorem, we will get, $2(x + r)^2 = (2x)^2$

$(x + r)^2 = 2x^2$

Taking square root of both sides,

x + r = x√2

$$x \left(\sqrt{2} - 1\right) = r$$
$$x \left(\sqrt{2} - 1\right) = 4 \left(\sqrt{2} - 1\right)$$

So, x = 4

So, each equal side of the triangle = r + x = 4√2

So, the area of the triangle = $\frac{1}{2} \times 4\sqrt{2} \times 4\sqrt{2} = 16$

Hence, 16 is the correct answer.

21. If the product of three consecutive positive integers is 15600, then the sum of the squares of these integers is

    A. 1777

    B. 1785

    C. 1875

    D. 1877

Answer: D

Solution:

Let, the numbers be (N - 1), N and (N + 1)

So, (N + 1)(N)(N - 1) = 15600 =12 x 13 x 100 =2 x 2 x 3 x 13 x 2 x 2 x 5 x 5

(N + 1)(N)(N - 1) = (2 x 2 x 2 x 3) × (5 x 5) x (13 x 2) = 24 x 25 x 26

So, the number s are 24, 25, 26

So, sum of the squares = $24^2 + 25^2 + 26^2$ = 576 + 625 + 676 = 1877

Hence, option (D) is the correct answer.

22. If x is a real number such that $\log_3 5 = \log_5(2 + x)$, then which of the following is true?

    A. 0 < x < 3

    B. 23 < x < 30

    C. x > 30

    D. 3 < x < 23

Answer: D

Solution:

$\log_3 3 < \log_3 5 < \log_3 9 = 1 < \log_3 5 < 2$

So, $1 < (x + 2) < 2$

$$5^1 < x + 2 < 5^2$$

$$3 < x < 23$$

Hence, option (D) is the correct answer.

23. Let $f(x) = x^2$ and $g(x) = 2^x$, for all real x. Then the value of $f(f(g(x)) + g(f(x)))$ at x = 1 is

    A. 16

    B. 18

    C. 36

    D. 40

Answer: C

Solution:

Given, $f(x) = x^2$ and $g(x) = 2^x$,

Substituting x = 1, f(1) = 1, g(1) = 2

$f(f(g(x)) + g(f(x))) = f(f(g(1))+g(f(1))) = f(f(2)+g(1))$

$= f(4+2) = f(6) = 6^2 = 36$.

Hence, option (C) is the correct answer.

24. The minimum possible value of the sum of the squares of the roots of the equation $x^2 + (a + 3)x - (a + 5) = 0$ is

    A. 1

    B. 2

    C. 3

    D. 4

Answer: C

Solution:

From the given equation, if the roots are m and n, we can write,

$m + n = (-(a + 3))$ and $mn = -(a + 5)$

So, $m^2 + n^2 = (m + n)^2 - 2mn = (a + 3)^2 + 2(a + 5) = a^2 + 8a + 19 = (a + 4)^2 + 3$

Since any square of real number can not be negative,

so, the minimum value of a + 4 is zero, where a is (-4)

So, the required minimum value will be 3.

Hence, option (C) is the correct answer.

25. If $9^{x - (1/2)} - 2^{2x - 2} = 4^x - 3^{2x - 3}$, then x is

    A. 3/2
    B. 2/5
    C. ¾
    D. 4/9

Answer: A

Solution:

$9^{x - (1/2)} - 2^{2x - 2} = 4^x - 3^{2x - 3}$

$$\frac{9^x}{3} - \frac{4^x}{4} = 4^x - \frac{9^x}{27}$$

$$\frac{9^x}{3} + \frac{9^x}{27} = 4^x + \frac{4^x}{4}$$

$$\frac{10 \times 9^x}{27} = \frac{5 \times 4^x}{4}$$

$$\left(\frac{3}{2}\right)^{2x} = \frac{27}{8}$$

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

Hence, option (A) is the correct answer.

26. If log($2^a \times 3^b \times 5^c$) is the arithmetic mean of log($2^2 \times 3^3 \times 5$), log($2^6 \times 3 \times 5^7$), and log($2 \times 3^2 \times 5^4$), then a equals

Answer: 3

Solution:

$$log(2^a \times 3^b \times 5^c) = \frac{1}{3}[log(2^2 \times 3^3 \times 5) + log(2^6 \times 3 \times 5^7) + log(2 \times 3^2 \times 5^4)]$$

or, $log(2^a \times 3^b \times 5^c) = \frac{1}{3}[log(2^9 \times 3^6 \times 5^{12})]$

or, $log(2^a \times 3^b \times 5^c) = log(2^3 \times 3^2 \times 5^4)$

On comparing both the sides, a=3.

Hence, 3 is the correct answer.

27. Let a_1, a_2, a_3, a_4, a_5 be a sequence of five consecutive odd numbers. Consider a new sequence of five consecutive even numbers ending with $2a_3$. If the sum of the numbers in the new sequence is 450, then a_5 is

Answer: 51

Solution:

In the new sequence of 5 consecutive even numbers, the sum is 450.

So, the middle number is 450/5=90

So, the max number will be 90 + 2 + 2 = 94 = $2a_3$ (given)

We get a_3 = 47 and a_5 = 47 + 2 + 2 = 51

Hence, 51 is the correct answer.

28. How many different pairs (a, b) of positive integers are there such that a ≤ b and 1/a + 1/b = 1/9 ?

Answer: 3
Solution:

From the given equation, we can get, $a = \dfrac{9b}{b-9} = \dfrac{9(b-9)}{b-9} + \dfrac{81}{b-9} = 9 + \dfrac{81}{b-9} \dots (1)$

As a and b are different positive integers

From (1), (b-9) must divide 81 completely.

So, (b – 9) must be a divisor of 81.

81 has these divisors = 1, 3, 9, 27 and 81

So, b – 9 can be 1, 3, 9, 27 and 81

b can be 10, 12, 18, 36 or 90 and a can be 90, 36, 18. 12 or 10

But only the last three are acceptable as a≤ b.

Hence, 3 is the correct answer.

29. In how many ways, can 8 identical pens be distributed among Amal, Bimal, and Kamal so that Amal gets at least 1 pen, Bimal gets at least 2 pens, and Kamal gets at least 3 pens?

Answer: 6
Solution:
After giving Amal 1 pen, Bimal 2 pens and Kamal 3 pens, only 2 pens are left.
As we are distributing the 2 pens among three persons, there are two partitions.
So, the number of ways in which we can distribute the remaining 2 identical pens among the three persons in $^4C_2$ = 6 ways.
Hence, 6 is the correct answer.

30. How many four digit numbers, which are divisible by 6, can be formed using the digits 0, 2, 3, 4, 6, such that no digit is used more than once and 0 does not occur in the left-most position?

Answer: 50
Solution:
If a number is divisible by 2 and 3, it must be divisible by 6.
For a number to be divisible by 2, the rightmost digit or the unit's place must be an even number. Four possibilities are possible 0, 2, 4 or 6.
If a number is divisible by 3, the sum of the digits must be divisible by 3.
That is, the sum of the digits must be 3 or 6 or 9 or 12 and so on.
 Case 1:
 Now, if the last digit is zero, then the sum of the other three digits can be 3 or 6 or 9 or 12 only [as the maximum sum can be 6 + 4 + 3 = 13].
 We can see that 3 or 6 are not possible and 9 or 12 are only two possibilities. So, the other two digits can be (2, 3, 4) or (2, 4, 6).
 In both of these two cases, we can arrange those three digits in 3! = 6 ways.
 So, the total number of ways = 6 x2 = 12

 Case 2:
 If the unit's place digit is 2, then the sum of the other three digits can be 7 or 10 or 13.
 Now, we can get 7 by using (0, 3, 4).
 To get 10, we can use 0, 4, 6 only.
 Here, we can fill in the leftmost place using 4 and 6 only, that is, in two ways.
 Now, the other two places can be filled in 2!= 2 ways.
 So, the total number of ways = 2 x 2 = 4
 Now, we can get 7 by using (0, 3, 4) and we can arrange them in 4 ways as described above.
 Also, we can get 13 by using (3, 4, 6) and we can arrange them in 3!= 6 ways
 So, the total number of ways = 4 + 4 + 6 = 14

 Case 3: The unit's place digit is 4, then the sum of the other three digits can be 2 or 5 or 8 or 11.

Now, we can not get 2.

But, we can get 5 using (0, 2, 3)⇒ we can arrange them in 4 ways as explained above under "case two".

We can get 8 using (0, 2, 6) ⇒ we can arrange them in 4 ways as explained above under "case two".

We can get 11 using (2, 3, 6)⇒ we can arrange them in 3!=6 ways.

So, the total number of cases = 4 + 4 + 6 = 14

Case 4: The unit's place digit is 6, then the sum of the other three digits can be 0 or 3d or 6 or 9 or 12.

We can not get 0 or 3.

But, we can get 6 by using (0, 2, 4) ⇒ we can arrange them in 4 ways as explained above under "case two".

And 9 by using (2, 3, 4) ⇒ we can arrange them in 3! = 6 ways.

So, the total number of cases or ways = 4 + 6 = 10

31. If f(ab) = f(a)f(b) for all positive integers a and b, then the largest possible value of f(1) is

Answer: 1

Solution:

Let, a = 1, f(1 x b) = f(a) f(b)

f(b) = f(a) x f(b)

f(a) = 1 for all values of b

SO, f(a) = 1 is the only value.

32. Let f(x) = 2x – 5 and g(x) = 7 – 2x. Then |f(x) + g(x)| = |f(x)| + |g(x)| if and only if

        A. 5/2 < x < 7/2
        B. x ≤ 5/2 or x ≥ 7/2
        C. x < 5/2 or x ≥ 7/2
        D. 5/2 ≤ x ≤ 7/2

Answer: D

Solution:

|a|+|b| =|a+b| is possible if and only if both a and b are of the same sign or both are zero.

So, here, f(x) x g(x) must be positive

That is, (2x-5)(7-2x) >0

So, x must lie between 5/2 and 7/2.

Let f(x) x g(x) = 0, then the values 5/2 and 7/2 must be included.

33. An infinite geometric progression a_1, a_2, a_3,... has the property that a_n = 3(a_{n+1} + a_{n+2} +....) for every n ≥ 1. If the sum a_1 + a_2 + a_3 +...... = 32, then a_5 is

    A. 1/32
    B. 2/32
    C. 3/32
    D. 4/32

Answer: C

Solution:

Let, for the GP, common ratio = r

So, a_n = 3(a_{n+1} + a_{n+2} +....)

So, $a_n = \frac{3a_{n+1}}{1-r}$.............(1) or $a_1 = \frac{3a_2}{1-r}$ and $\frac{3a_1}{1-r} = 32$ ....(2)

Since a_1 + a_2 + a_3 +...... = 32

We get, $\frac{3a_2}{1-r} + \frac{a_2}{1-r} = 32$

$$\frac{4a_2}{1-r} = 4 \times 8$$

$\frac{a_2}{1-r} = 8$....................(3)

$$\frac{3a_2}{1-r} = 24$$
$$a_1 = 24$$
$$a_2 = 24r$$

Form (3), $\frac{24r}{1-r} = 8$
3r= 1- r
4r = 1
r = ¼

$$a_5 = a_1 \times r^4 = 24 \times \left(\frac{1}{4}\right)^4 = \frac{3}{32}$$

Hence, option (C) is the correct answer.

34. If $a_1 = 1/(2 \times 5)$, $a_2 = 1/(5 \times 8)$, $a_3 = 1/(8 \times 11)$,...., then $a_1 + a_2 + a_3 +$ ...... $+ a_{100}$ is

      A.   25/151
      B.   1/2
      C.   ¼
      D.   111/55

Answer: A

Solution:

$$\frac{1}{2 \times 5} + \frac{1}{5 \times 8} + \frac{1}{8 \times 11} + \cdots + \frac{1}{(3n-1) \times (3n+2)}$$

$$= \frac{1}{3}\left(\frac{1}{2} - \frac{1}{5} + \frac{1}{5} - \frac{1}{8} + \frac{1}{8} - \frac{1}{11} + \cdots + \frac{1}{3n-1} - \frac{1}{3n+2}\right)$$

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

Substituting n = 100, the answer is $\frac{50}{302} = \frac{25}{151}$

Hence, option (A) is the correct answer.