Solutions of Mock CAT – 4 2017

Scorecard (procreview.jsp?qsetId=8KAGC/nWHI8=&qsetName=Mock CAT – 4 2017)	Accuracy (AccSelectGraph.jsp?qsetId=8KAGC/nWHI8=&qsetName=Mock CAT – 4 2017)	Qs Analysis (QsAnalysis.jsp?qsetId=8KAGC/nWHI8=&qsetName=Mock CAT – 4 2017)	Video Attempt (VideoAn qsetId=8KAGC/nWHI8=&qse CAT – 4 2017)

VRC	DILR	QA

Sec 1

Q.1

Directions for question 1: The following question contains a paragraph from which the last sentence has been deleted. From the given options, choose the one which most logically completes the paragraph.

In early 1942, a slim book appeared in London under the title *Underground Europe Calling.* Its author was the Austrian refugee Oscar Pollak. 'Underground', the introduction begins, *"has become a catchword, handled by the tabloid press, flashed by the films. In actual fact, underground work is quite different. It is terribly slow and wary. The catacombs are romantic only when you look down into them from the bright day above: inside they are dark, narrow and chilly – and very uncomfortable to live in. Yet their oppressive gloom holds the hope of future light."* Pollak was trying to pinpoint where the antifascist resistance was playing out across Europe during the Second World War.

1. The symbol of the underground has very deep roots in European and US culture.
2. The notion of the underground has come full circle, back to its origins as a space of conspiratorial activity that corrodes the public good.
3. His vision combined physical areas under the earth – basements and bunkers and bolt-holes – with the secret social spaces that resisters occupied abov ground.
4. In our own time, the idea of resistance has a renewed urgency and appeal.

Solution:
Correct Answer : 3
The last but one sentence talks about what Pollak was trying to achieve through his narrative. It creates a mandatory pair with option 3 as the option expands the idea mentioned in the passage. 1 talks about a different idea and it may come before this paragraph. 2 is too generic and vague. 4 is a new idea. Hence, 3 is the answer.

Bookmark

Answer key/Solution

FeedBack

Directions for questions 2-7: The following passage consists of a set of six questions. Read the passage and answer the questions that follow.

Thus, the solution to employing more women, at least for now, is to have an all-female office. This is an important step toward true equality. "If history is any guide, getting more women into the workplace in Saudi Arabia will be necessary before gender equality measures are put in place," says Janice Bellace Wharton professor of legal studies and business ethics. "But the speed at which this will happen is impossible to predict."

While gender equality goes far further than offering more jobs to women, at least the current steps mute criticism from religious authorities on the mingling of men and women. And when foreign companies such as TCS and Wipro change their employment practices to cater to a country's culture, it can speak volumes. "I think it does have an effect when a foreign company does something in response to the peculiarities of a home country's culture or laws. If nothing else, it helps point out the absurdity of those practices," says Wharton management professor Peter Cappelli. Economic realities are prompting Saudi Arabia's leaders to rethink their financial strategies, which has spilled over to cultural practices around women. "The citizens of Saudi Arabia have become accustomed to generously subsidized health care, education and other key items such as gasoline," Bellace says. "One way for the government to trim expenditure is to reduce the extent of subsidization. Another way is to increase the productivity of its adult population. At present, the labour force participation rate of women is extremely low, only 10%. Yet, females are well-educated, comprising 60% of university students."

Ironically, TCS and Wipro are promoting equality by hiring women into a women-only unit in Saudi Arabia when India itself could improve its own gender parity performance. India's Bharatiya Mahila Bank was set up in 2013 to cater to female account holders and it was run by female staff. But the bank failed mounting losses led to its proposed merger with the State Bank of India. In 2007, British banking giant Standard Chartered opened an all-female branch in Kolkata, India to much fanfare, but there has been no news about it since then.

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Cappelli adds that there is a "continuum of issues" in equality. "A century ago, it was about getting the right to vote, then about getting the right to certain jobs. The bigger issues come first, and in countries with more inequality, those issues are already dealt with, so they move onto other issues." He notes tha IBM once operated in Japan with a workforce that was heavily female, "in part because discrimination against women in Japan at the time made it easier t attract top-flight talent to a foreign company."

The big question is whether women-only workplaces cause more divisions rather than break down walls. "Probably not, if the experience of other countrie is any guide," says Bellace. "Women have to be in the labour force before there is a widespread movement complaining about the lack of gender equality. This is the experience of Western countries. In many, the widespread movement for women to be granted voting rights occurred during or after major war as women went to work and took men's places in factories."

Bellace adds that in most countries, including the U.S. and U.K., the first demand by women was for equal pay, not for equal opportunity. "Women in factories, where jobs were sex-segregated, realized they were earning a lot less than equally skilled men. Once the pay issue is settled, women's attention turns to the issue of access to higher-paying 'male' jobs."

Q.2

Based on the passage, one of the first initiatives taken up towards better equality regarding workplace issues between the two genders was:

1 by the Indian government which, in 2012, set up the Bhartiya Mahila Bank to serve families through an all-female staff

2 by the Saudi government which set up an all-women office with an aim to muting religious criticism regarding the mingling of women and men.

3 by women who, in most countries, demanded equal compensation, before turning to the question of equal opportunity.

4 by women who decided to move ahead, starting with enfranchisement, on the "continuum of issues" in equality.

Bookmark

Answer key/Solution

Solution:
Correct Answer : 3
3 is clear from the last paragraph, ". . . .in most countries, including the U.S. and U.K., the first demand by women was for equal pay [*compensation*], not for equal opportunity." and "Once the pay issue is settled, women's attention turns to the issue of access to higher-paying 'male' jobs.[*equal opportunity*]". 1 is wrong because the this bank was set up in 2013 and not 2012. It was also for female account holders and not families. 2 is wrong because the passage doesn't credit the Saudi government for the all women office. TCS and Wipro have been credited with this. 4 is mentioned in the passage. However, it doesn't answer the question. It is a vague option.

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Q.3

According to the passage, which of the following can be inferred as a current feature in the practice of hiring employees?

1 TCS and Wipro in Saudi Arabia and IBM in Japan have selfish motives behind hiring female staff members.

2 TCS and Wipro in Saudi Arabia and IBM in Japan are tapping into an otherwise underutilized labour pool.

3 TCS and Wipro in Saudi Arabia and Bhartiya Mahila Bank in India are making profits at the cost of established cultural norms.

4 Both TCS and Wipro are trying to mute religious criticism in their home countries by setting up all-female offices in off-shore locations.

Solution:
Correct Answer : 2
2 can be inferred from the last lines "in part because discrimination against women in Japan at the time made it easier to attract top-flight talent to a foreign company" and "At present, the labour force participation rate of women is extremely low, only 10%. Yet, females are well-educated, comprising 60% of university students." This makes both companies able to tap into an underutilized labour pool. 1 is not supported by the data given in the passage. 3 is wrong because of the tone and the fact that the Bhartiya Mahila bank suffered huge losses which led to its merger with SBI. 4 is wrong because the issue of religious criticism in India (home country o TCS and Wipro) has not been raised in this passage.

Bookmark

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Q.4
Which of the following does not correspond to an opinion stated in the passage?

1 Women need to be in the labour force before there is a widespread movement against the lack of gender equality.

2 The demands of women tend to centre on equal pay before it focuses on equal opportunities.

3 Getting more women into the workplace in Saudi Arabia will be necessary before gender equality measures are executed.

4 The Saudi government needs to increase the labour force participation of uneducated workers in order to increase productivity.

Solution:
Correct Answer : 4
4 is wrong because the passage talks about women in workforce. "Uneducated workers" makes this option out of the scope of the passage. 1, 2, and 3 are stated in the second-last paragraph, the last paragraph, and the first paragraph respectively.

Bookmark

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Q.5
According to the passage, the reason for Saudi Arabia's leaders to rethink their cultural practices is based on:

1 **catering to a company's culture by changing their employment practices.**

2 **criticism from religious authorities on the mingling of men and women.**

3 **the need to rethink their financial strategies based on economic realities.**

4 **the need to employ more women as a step towards true equality.**

Solution:
Correct Answer : 3
Refer to the lines "Economic realities are prompting Saudi Arabia's leaders to rethink their financial strategies, which has spilled over to cultural practices around women." This makes 3 the correct answer. 1 is wrong because the passage talks about catering to a country's culture, not to that of a company. 2 and 4 are not mentioned in the passage as a reason behind the issue asked in the question.

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Q.6
One of the reasons cited in the passage supporting the creation of an all-female office is:

1 to shield employees whose background prohibits them from wearing uniforms.

2 to eradicate workplace discrimination in developed nations which have top-notch talents.

3 to respect the religious restrictions that bar the intermingling of men and women in the gulf countries.

4 to attract more women into the fold of productive work force.

Solution:
Correct Answer : 4
1 is wrong because the passage talks about wearing uniform in public and not wearing uniform in general. 2 is wrong because the passage talks about Japan in particular and not all developed nations in general while talking about workplace discrimination." 3 is wrong because the passage talks about Saudi Arabia and not all gulf countries. 4 is true according to the first line of the passage.

FeedBack

Bookmark

Answer key/Solution

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Q.7
The author of the passage calls which of the following statements ironic?

1 ○ TCS and Wipro are promoting equality in Saudi Arabia when their home country needs to improve its gender parity performance.

2 ○ The labour force participation rate of women in gulf countries is extremely low (10%) while 60% of university students are female.

3 ○ An important step toward true equality is to employ more women by having all-female offices.

4 ○ The widespread movement for women to be granted voting rights occurred during or after major wars.

Solution:
Correct Answer : 1
1 is the correct answer. Refer to the line "Ironically, TCS and Wipro are promoting equality by hiring women into a women-only unit in Saudi Arabia when India itself could improve its own gender parity performance." 2 is wrong because Saudi Arabia is not "gulf countries". 3 and 4 are statements mentioned in the passage but the author has not called these events ironic.

Bookmark
Answer key/Solution

FeedBack

Directions for question 8: The following question has a sentence with two blanks. Given below the question are four pairs of words. Choose the pair that best completes the sentence.

Q.8
It was certainly a wonderful _____ of people - gorgeous peeresses chatted affably to violent radicals, popular preachers brushed coat-tails with eminent _____, a perfect bevy of bishops kept following a stout prima- donna from room to room.

1. confluence, academicians
2. sea, missionaries
3. medley, sceptics
4. mixture, scholars

Solution:
Correct Answer : 3
The impression given in the statement is that this gathering had people of opposite characters and backgrounds mingling with each other. 'Gorgeous peeresses' are contrasted with 'violent radicals'. Similarly, we need a contrast for 'preachers'. This contrast is provided only by 'sceptics'. Hence, 3 is the answer.

Bookmark
Answer key/Solution

FeedBack

Directions for question 9: The following question has a sentence with two blanks. Given below the question are four pairs of words. Choose the pair that best completes the sentence.

Q.9
The realisation that NO_2 emissions are out of control has coincided with the growing _____of their toxicity; _____ research had concentrated only on the particle pollution from exhausts.

1. level, present
2. realisation, earlier
3. fear, recent
4. awareness, further

Solution:
Correct Answer : 2
The statement deals with present realisation and the shortcomings of research done previously. This makes option 2 the best fit.

Bookmark
Answer key/Solution

FeedBack

Directions for questions 10 - 15: The following passage consists of a set of six questions. Read the passage and answer the questions that follow.

Demonstrating God's omnipotence required theologians to describe all the ways that God could miraculously interfere with the ordinary course of nature. As it turned out, miraculous interference proved hard to distinguish from deception. Early in the 14th century, William of Ockham, known to posterity for his razor, asked his readers to carry out a simple thought experiment. Imagine you are looking at a star. Now, imagine that God, who can do anything, destroys the star while maintaining your vision of it. What you now see is a non-existent star.

From theological thought experiments to the daily life of the Church, the possibility of divine deception seemed to crop up everywhere. Robert Holkot asked his readers to think about the celebration of the Eucharist. At the moment of consecration, God miraculously transforms a piece of bread that never ceases to look like anything but a piece of bread into the very body of Christ. For these Christian thinkers committed to limiting the implications of Aristotle's philosophy, God's omnipotence required that he be able to deceive.

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Q.10
A central theme running throughout this passage is:

1 **the possibility that God has deceived us and the universe does not actually exist.**

2 **the incorporation of the views of natural philosophers about God as reflected in their theories.**

3 **the thought experiments of theologians in order to determine God's capabilities.**

4 **the discussion on the manner, extent and purpose of God's deceptions, if any.**

Solution:
Correct Answer : 4
This is a main idea question. The focus of the passage is on deception. This makes 4 correct. 1 is too narrow and 3 is a supporting idea. 2 is vague. It is mentioned in the passage but not as the central idea. Hence, 4 is the answer.

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Answer key/Solution

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Q.11
Which of the following is not true according to the passage?

1 **Events of miraculous interference by God proved hard to distinguish from those deemed as deceptions.**

2 **Concerns about God's deceptions proved central to the Scientific Revolution and the modern world.**

3 **The case of a man with dropsy proves the deceptive nature of the divine creator.**

4 **The notion that God is a simplistic and anthropomorphic being is prone to derision.**

Solution:
Correct Answer : 3
Refer to the lines "Descartes maintains that thinking about the problem this way *misleads us to imagine God in simplistic and anthropomorphised terms*, as if he were involved with the world, *intentionally deceiving this suffering man* while leaving all the rest of us alone." Hence, the passage contradicts the option by saying that it is incorrect to think that God deceives man. This makes 3 the correct answer. 1 (first paragraph), 2 (third paragraph), and 4 (last paragraph) are mentioned in the passage.

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Answer key/Solution

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Q.12

It can be inferred from the passage that:

1 most of the authors discussed in the passage wished to ascribe good intentions to God, even in the face of his capability to deceive.

2 a non-existent star is one that God has destroyed while maintaining your vision of it.

3 the great 17th century scientists believed more in God, and less in Science.

4 God's nature is complex, but the consequences of his actions are uncomplicated.

Solution:
Correct Answer : 1
Most of the authors (excepting Robert Holkot) wish to ascribe good intentions to God, as per the passage. This makes 1 correct. 2 converts a thought experiment into a specific example. 3 is not supported by the passage. 4 is a twisted option as the passage calls these actions complex.

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Answer key/Solution

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Q.13

If Descartes were to be asked whether God asking Abraham to sacrifice his son was a matter of deception, his most likely response would be which of the following?

1 ◯ **One must leave the questions one can't answer due to one's lack of comprehension of the divine scheme of things.**

2 ◯ **While, on the surface, a divine action may seem deceptive, it may not be the reality.**

3 ◯ **The mysterious nature of God's workings is not to be probed beyond a certain level.**

4 ◯ **God indeed is a deceptive being and His nature must not be analyzed out of context.**

Solution:
Correct Answer : 2
Refer to Descartes opinion in the last paragraph. "Rather we must ask how God created the world so that while it may appear as if he occasionally deceives us we know in fact he does nothing of the sort." Only 2 reflects this tone behind Descartes's analysis. 1 doesn't support Descartes's tone as he is not against the inquiry. Similarly, 3 can be eliminated. 4 is contrary to the facts given in the passage.

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Answer key/Solution

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Q.14

Of all the examples of deception in the passage, which of the following has not been explained at all by the author?

1 ◯ **A man with dropsy whose body deceives him.**

2 ◯ **The moment of consecration in the celebration of the Eucharist.**

3 ◯ **The passages in the Bible where God seems to deceive humans.**

4 ◯ **Deceiving about the existence of the entire universe and everything in it.**

Solution:
Correct Answer : 2

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Answer key/Solution

The passage does not provide an explanation for 2. 1 is rationalised in paragraph seven, by saying that we should not think in such terms. 3 is rationalised in paragraph five, "The Bible was written for a simpler people incapable of understanding God's true and truly abstract nature. When the Bible tells us that God is angry or sad, that he lies and deceives, *we can be sure he did nothing of the sort."* 4 is rationalised in paragraph four, ". . . raises the possibility that God (or at least an 'evil genius') has deceived him about the existence of the entire universe and everything in it. Although Descartes *would quickly dismiss these fears ..."*

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Q.15

Which of the following is not a response to the possibility of God's deception, as per the author?

1 Descartes's response that we must read passages allegorically rather than literally

2 Descartes's arguing that it would go against God's very nature to deceive

3 Descartes incorporating God into his theories as a concession to authorities

4 Descartes's reasoning that God created the best possible world

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Answer key/Solution

Solution:
Correct Answer : 3
From paragraph three, "Kepler and Galileo, Descartes, Boyle and Newton – wrote about God and incorporated God into their theories, *not as a mere concession to authorities,* but as central to their conceptions of the universe." Thus, 3 is correct. The other responses are discussed in the passage. 1 is discussed at the beginning of paragraph five, "Descartes responds (as others had before him) that we must read these passages allegorically." 2 is discussed in paragraph four, "Although Descartes would quickly dismiss these fears, *arguing that it would go against God's very nature to deceive. . . "* 4 is discussed in the last paragraph, "If God is omnipotent, just and wise, Descartes reasons, *it must follow that God created the best possible world, using the simplest set of laws."*

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Q.16

Direction for question 16: In the following question, four sentences (1), (2), (3) and (4) are given. Of these, three sentences need to be arranged in a logica order to make a coherent paragraph. From the given options, choose the one that does not fit the sequence.

1. He caused Messalina, his third wife, to be executed and was in turn supposedly poisoned by her successor, Agrippina the Younger.
2. This act offended the senators, who never forgave Claudius.
3. They hauled him forth, and the Praetorians proclaimed him emperor.
4. When Caligula was murdered (AD 41), the soldiers found Claudius, who had been of little importance, hiding in abject terror behind a curtain in the palace.

Solution:
Correct Answer : 1
The correct answer is Option 1. The correct sequence is 432. Option 1 is an odd sentence because "him" in Option 3 refers to 'hiding Claudius behind a curtain', and 'this act' in Option 2 refers to 'hauled him forth' in Option 3, making a series 432. Option 1 is the odd sentence.

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Answer key/Solution

Q.17
Directions for question 17: The following question contains a paragraph from which the last sentence has been deleted. From the given options, choose th one which most logically completes the paragraph.

Although certain mysteries were probably part of the initiatory ceremony of the priests of ancient Egypt, we are ignorant of their exact nature, and the term is usually used in connection with certain semi-religious ceremonies held by various cults in ancient Greece. The mysteries were secret cults, to whic only certain initiated people were admitted after a period of preliminary preparation. After this initial period of purification came the mystic communication or exhortation, then the revelation to the neophyte of certain holy things, the crowning with the garlands, and lastly the communion with the deity.

1. The candidates were questioned about their purification, especially regarding the food they had eaten.
2. Mythological science suggests that such nameless gods are merely those whose higher names are hidden and unspoken.
3. We find a number of them associated with the realm of the dead.
4. The mysteries appear to have revolved around the semi-dramatic representation of the life of a deity.

Solution:
Correct Answer : 4
Option 4 is the best answer because it is the only answer option that continues with the idea of "mystery".

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Answer key/Solution

Directions for questions 18-23: The following passage consists of a set of six questions. Read the passage and answer the questions that follow.

The younger of two daughters, Nightingale was part of an affluent British clan that belonged to elite social circles. Her mother, Frances Nightingale, hailed from a family of merchants and took pride in socializing with people of prominent standing. Despite her mother's interests, Nightingale herself was reportedly awkward in social situations and preferred to avoid being the center of attention whenever possible. Strong-willed, she often butted heads wit her mother, whom she viewed as overly controlling.

From a young age, Nightingale was active in philanthropy, ministering to the ill and poor people in the village neighboring her family's estate. Nightingale eventually came to the conclusion that nursing was her calling; she believed the vocation to be her divine purpose. Determined to pursue her true calling despite her parents' objections, Nightingale eventually enrolled as a nursing student in 1850 and '51 at the Institution of Protestant Deaconesses in Kaiserswerth, Germany.

In the early 1850s, Nightingale returned to London, where she took a nursing job in a Harley Street hospital for ailing governesses. Her performance there so impressed her employer that Nightingale was promoted to superintendent. Nightingale also volunteered at a Middlesex hospital around this time, grappling with a cholera outbreak and unsanitary conditions conducive to the rapid spread of the disease. Nightingale made it her mission to improve hygiene practices, significantly lowering the death rate at the hospital in the process.

In October of 1853, the Crimean War broke out. At the time, there were no female nurses stationed at hospitals in the Crimea. After the Battle of Alma, England was in an uproar about the neglect of their ill and injured soldiers, who not only lacked sufficient medical attention due to hospitals being horribly understaffed but also languished in appallingly unsanitary conditions. In late 1854, Nightingale received a letter from Secretary of War Sidney Herbert, asking her to organize a corps of nurses to tend to the sick and fallen soldiers in the Crimea. Given full control of the operation, she quickly assembled a team of almost three dozen nurses from a variety of religious orders and sailed with them to the Crimea just a few days later.

Although they had been warned of the horrid conditions there, nothing could have prepared Nightingale and her nurses for what they saw when they arrived at Scutari, the British base hospital in Constantinople. The hospital sat on top of a large cesspool, which contaminated the water and the building itself. Patients lay in their own excrement on stretchers strewn throughout the hallways. Rodents and bugs scurried past them. The most basic supplies, such as bandages and soap, grew increasingly scarce as the number of ill and wounded steadily increased. Even water needed to be rationed. More soldier were dying from infectious diseases like typhoid and cholera than from injuries incurred in battle.

The no-nonsense Nightingale quickly set to work. She procured hundreds of scrub brushes and asked the least infirm patients to scrub the inside of the hospital from floor to ceiling. Nightingale herself spent every waking minute caring for the soldiers. In the evenings she moved through the dark hallways

carrying a lamp while making her rounds, ministering to patient after patient. The soldiers, who were both moved and comforted by her endless supply of compassion, took to calling her "the Lady with the Lamp." Others simply called her "the Angel of the Crimea." Her work reduced the hospital's death rate b two-thirds.

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Q.18

One of the reasons due to which Nightingale was able to reduce mortality rates in the London hospital where she worked is:

1 her establishing a laundry enabling patients to have clean linens.

2 her mission to improve hygiene.

3 her instituting an "invalid's kitchen" enabling patients to have healthy food.

4 her endless supply of compassion which led to the moniker "the Lady with the Lamp".

Solution:
Correct Answer : 2
The only answer option common to both hospitals in London is 2 (paragraphs three and seven). The other options are mentioned in the passage only in the context of the Scutari hospital which was in Constantinople.

Bookmark

Answer key/Solution

FeedBack

Directions for questions 18-23: The following passage consists of a set of six questions. Read the passage and answer the questions that follow.

The younger of two daughters, Nightingale was part of an affluent British clan that belonged to elite social circles. Her mother, Frances Nightingale, hailed from a family of merchants and took pride in socializing with people of prominent standing. Despite her mother's interests, Nightingale herself was reportedly awkward in social situations and preferred to avoid being the center of attention whenever possible. Strong-willed, she often butted heads wit her mother, whom she viewed as overly controlling.

From a young age, Nightingale was active in philanthropy, ministering to the ill and poor people in the village neighboring her family's estate. Nightingale eventually came to the conclusion that nursing was her calling; she believed the vocation to be her divine purpose. Determined to pursue her true calling despite her parents' objections, Nightingale eventually enrolled as a nursing student in 1850 and '51 at the Institution of Protestant Deaconesses in Kaiserswerth, Germany.

In the early 1850s, Nightingale returned to London, where she took a nursing job in a Harley Street hospital for ailing governesses. Her performance there so impressed her employer that Nightingale was promoted to superintendent. Nightingale also volunteered at a Middlesex hospital around this time, grappling with a cholera outbreak and unsanitary conditions conducive to the rapid spread of the disease. Nightingale made it her mission to improve hygiene practices, significantly lowering the death rate at the hospital in the process.

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Q.19

It can be inferred that one of the reasons that the humble nurse did her best to avoid a hero's welcome is:

1 her endless supply of compassion, which refused to let her accept credit.

2 her focus on her patients, who still needed her help.

3 her focus on her calling - she believed nursing to be her divine vocation.

4 her preference to avoid being the centre of attention whenever possible.

Solution:
Correct Answer : 4
Paragraph 1 mentions, " Despite her mother's interests, Nightingale herself was reportedly awkward in social situations *and preferred to avoid being the center of attention whenever possible.* " This makes 4 correct. 1 and 3 are mentioned in the passage, but do not logically connect with the question. Compassion does not prevent one from accepting credit for work done. Similarly logic applies to divine vocation. 2 mentions patients. However, we have no reason to believe she had any patient when she reached home.

Bookmark

Answer key/Solution

FeedBack

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Q.20
As per the passage, which of the following actions helped Nightingale fulfil her divine calling?

1 **Nightingale asking her patients to help improve the condition of a hospital by cleaning it, even though it could have adversely affected her health.**

2 **Receiving of a letter from Secretary of War, Sidney Herbert by Nightingale, asking her to take care of the hospitalized soldiers in the Crimean location via a corps of organized nurses.**

3 **Enrolling as a nursing student at the beginning of the 1850's at the Institution of Protestant Deaconesses in Kaiserswerth, Germany.**

4 **Nightingale actively impressing her employer by working hard and volunteering in order to get better opportunities for fulfilling her vocation of nurse.**

Solution:
Correct Answer : 3

Bookmark

Refer to the first and second paragraph. It clearly mentions 3 as an action. 1 is wrong because her focus was on "their" and not "her" health. 2 is a result of her calling, not a method of fulfilling it. Similarly 4 is also eliminated.

Answer key/Solution

FeedBack

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Q.21
After reading the passage, it becomes clear that:

1 the least likely objective for writing it is to foreshadow how gender disparity is a catalyst for social cohesiveness in post-agrarian but pre-feminist societies.

2 the least likely objective for writing it is to foreshadow the emancipation of women in the context of assessing progress using social recognition as a metric.

3 the most likely objective for writing it is to foreshadow how leadership techniques considered "new" such as motivation, human resource management and leading from the front, were actually in use even earlier.

4 the most likely objective for writing it is to foreshadow how management techniques considered "new" such as optimum utilisation of labour and management by objective, were actually in use even earlier.

Solution:
Correct Answer : 1
3 and 4 cover aspects that have been addressed in the passage, but not directly. Nor are these the main objective of writing the passage. Between 1 and 2, 2 is a better objective for the passage compared to 1. Hence, 1 is correct.

Bookmark

Answer key/Solution

FeedBack

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Q.22

The next paragraph in the passage is most likely to:

1 ◯ **expound on Nightingale's personal and professional activities after receiving a hero's welcome.**

2 ◯ **elucidate the sequence of actions through which Nightingale managed to avoid receiving a hero's welcome.**

3 ◯ **illustrate the effects of receiving a hero's welcome on Nightingale's personal and professional life.**

4 ◯ **explain why receiving a hero's welcome was professionally a success, but personally a failure.**

Solution:
Correct Answer : 1
The last passage talks about her return to her home, where she met a hero's welcome. The next paragraph, then logically talks about her activities at home. This makes 1 correct. The other options talk about minor aspects which are not likely to be focused on, given the broad coverage of the passage.

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Answer key/Solution

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Q.23

We can infer from the passage that:

1 Nightingale was someone who believed not just in physical hygiene, but also mental stimulation to improve patients' well-being.

2 Nightingale joined the nursing course in order to avoid being married since she was uncomfortable in social situations.

3 The Crimean War broke out since the enemy was aware of the lack of female nurses at hospitals in the Crimea.

4 Nightingale had a divine vision informing her that the nursing was her true calling, leading her to join a nursing course.

Solution:
Correct Answer : 1
The entire passage makes the focus of Nightingale on hygiene clear. "She also established a laundry so that patients would have clean linens, as well as a classroom and library for intellectual stimulation and entertainment." In the second last paragraph lets us infer the second part of 1, making it correct. The other options are far-fetched given the context of the passage. 4 is eliminated because of the phrase "divine vision".

Bookmark

Answer key/Solution

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Q.24

Direction for question 24: The following question has a sentence with two blanks. Given below the question are four pairs of words. Choose the pair that best completes the sentence.

They feel that drunkenness, stupidity, and _____ should be their own special property, and that if any one of us makes a fool of himself, he is _____or their preserves.

1. immorality, poaching
2. disrespecting, trespassing
3. drudgery, claiming
4. morality, snatching

Solution:
Correct Answer : 1
We need a negative word for the first blank. For the second blank, the work should indicate making a claim on. Option 1 best fits the blank.

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Answer key/Solution

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Q.25

Direction for question 25: In the following question, four sentences (1), (2), (3) and (4) are given. Of these, three sentences need to be arranged in a logica order to make a coherent paragraph. From the given options, choose the one that does not fit the sequence.

1. Donna Karan can be considered the designer who has made it fashionable to be voluptuous.
2. She has based her corporate philosophy on clothes designed to hug a woman but also hide bodily imperfections.
3. "You've gotta accent your positive, delete your negative," she declared in a press release, emphasizing the fact that if you're pulled together underneath you can build on top of that.
4. Fashion icon and humanitarian Donna Karan believes through creativity, collaboration, connection and community you can scale any mountain.

Solution:
Correct Answer : 4
Option 4 is the best option because this statement is not related to Donna Karan's creations meant for voluptuous people. The correct series is 123 because Option 2 elaborates what it means to be 'fashionable even after being voluptuous'. Option 3 is also an extension of why she feels so. Option 4 is the odd sentence.

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Answer key/Solution

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Directions for questions 26 - 28: The following passage consists of a set of three questions. Read the passage and answer the questions that follow.

"I've always wanted to kind of break off and do my own thing, just 'cause I feel I enjoy independence very much," Paris says. And so, while Paris Jackson famously grew up in Neverland, she now lives in Nowheresville. Her base of operations is located in some part of the Valley in Los Angeles, near a freeway. The city here is not unlike the desert just beyond, monotonous and endless. Block after block of little houses, bisected by six-lane roads of strip mall after strip mall. It's the type of neighbourhood that people generally go into showbiz to escape.

Comparing the address on my phone with the one on the gate next door, I decide that even though the numbers don't match, I'm going to have to take my chances that this is the place. Rusted cameras peer at me through the foliage. The intercom is a piece of slick metal, as if the numbers had been rubbed off by a million fingerprints from the past. The gate creaks open, and I walk cautiously up a rutted asphalt driveway, past a large Tudor-style house with turret A little farther on, I pass a laconic man wearing the pants of a security guard. He barely glances my way as he strolls by.

And not for the first time I think, "Who here is minding the store?" Literally! I have reached what appears to be an English village square, complete with a dusty florist next to a cobwebbed sweets shop. At a right angle is a sort of firehouse garage with four bays dominated by a giant old-fashioned clock.

Then it clicks: I know I'm in the right place. This is the old Jackson family estate, where her father Michael lived in the 1970s and '80s. Hidden behind the shops is the studio where Michael recorded the demos for some of his biggest early-'80s hits. At some point he redid the place as something of a practice run for Neverland.

Then, as if I were in an alternate version of Neverland, a roly-poly dog, big enough to be menacing if she wanted to be, waggles toward me. Nana? I wonder A handsome guy with a man bun walks over. One of the Lost Boys, perhaps? No, it's Paris's manager, Tom. "Oh, don't mind her," he says casually. "That's jus Kenya. She was Michael's dog."

And suddenly Paris appears. She looks exactly the same as her Instagram photos, a little grungy, her face unmade up. Her top is a mustard colour; her jeans a pair she wears a lot, slightly faded.

Q.26
It can be inferred that the author finds the kind of neighbourhood that Paris Jackson lives in surprising because:

1 as someone in showbiz, she lives in the kind of neighbourhood that people want to escape from.

2 the numbers on the gates don't match with the address that the author has on her phone.

3 there is no inkling as to who is minding the neighbourhood store in the neighbourhood.

4 the neighbourhood looks like an alternate version of Neverland.

Solution:
Correct Answer : 1
The first paragraph talks about how Paris grew up famously, but now lives in Nowheresville. It continues by describing the monotonous, drab nature of the area, and ends by saying, " It's the type of neighbourhood that people generally go into showbiz to escape." This makes 1correct. Options 2, 3, and 4 refer to the house, not the neighbourhood.

Bookmark
Answer key/Solution

FeedBack

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Q.27
What Paris says and what Paris does are contradictory in the sense that:

1 ◯ **she looks exactly the same as does on her Instagram photos, with a lot of necklaces and no makeup.**

2 ◯ **she grows up in Neverland, but lives in Nowheresville.**

3 ◯ **while she wants to break off and do her own thing, she actually stays in the family estate.**

4 ◯ **she enjoys independence very much, and lives alone.**

Solution:
Correct Answer : 3
3 is correct, since staying in her father's estate (third last paragraph) is contradictory to breaking off and doing her own thing. Options 1 and 2 do not involve something that Paris has said. 4 is not contradictory.

Bookmark

Answer key/Solution

FeedBack

Directions for questions 26 - 28: The following passage consists of a set of three questions. Read the passage and answer the questions that follow.

"I've always wanted to kind of break off and do my own thing, just 'cause I feel I enjoy independence very much," Paris says. And so, while Paris Jackson famously grew up in Neverland, she now lives in Nowheresville. Her base of operations is located in some part of the Valley in Los Angeles, near a freeway. The city here is not unlike the desert just beyond, monotonous and endless. Block after block of little houses, bisected by six-lane roads of strip mall after strip mall. It's the type of neighbourhood that people generally go into showbiz to escape.

Comparing the address on my phone with the one on the gate next door, I decide that even though the numbers don't match, I'm going to have to take my chances that this is the place. Rusted cameras peer at me through the foliage. The intercom is a piece of slick metal, as if the numbers had been rubbed off by a million fingerprints from the past. The gate creaks open, and I walk cautiously up a rutted asphalt driveway, past a large Tudor-style house with turret A little farther on, I pass a laconic man wearing the pants of a security guard. He barely glances my way as he strolls by.

And not for the first time I think, "Who here is minding the store?" Literally! I have reached what appears to be an English village square, complete with a dusty florist next to a cobwebbed sweets shop. At a right angle is a sort of firehouse garage with four bays dominated by a giant old-fashioned clock.

Then it clicks: I know I'm in the right place. This is the old Jackson family estate, where her father Michael lived in the 1970s and '80s. Hidden behind the shops is the studio where Michael recorded the demos for some of his biggest early-'80s hits. At some point he redid the place as something of a practice run for Neverland.

Then, as if I were in an alternate version of Neverland, a roly-poly dog, big enough to be menacing if she wanted to be, waggles toward me. Nana? I wonder A handsome guy with a man bun walks over. One of the Lost Boys, perhaps? No, it's Paris's manager, Tom. "Oh, don't mind her," he says casually. "That's jus Kenya. She was Michael's dog."

And suddenly Paris appears. She looks exactly the same as her Instagram photos, a little grungy, her face unmade up. Her top is a mustard colour; her jeans a pair she wears a lot, slightly faded.

Q.28
The reason that the author knows that she is in the right place:

1 ◯ **is based on the fact that even though the numbers don't match, she has decided to take her chances.**

2 ◯ **is due to the fact that she knows that Paris' base of operations is located in some part of the Valley in Los Angeles, near a freeway.**

3 ◯ **comes from the fact that she is in an alternate version of Neverland, complete with a roly-poly dog.**

4 ◯ **is because she realises she is in the Jackson family estate, which belonged to Paris's father.**

Solution:
Correct Answer : 4
"Then it clicks: I know I'm in the right place. This is the old Jackson family estate, where her father Michael lived in the 1970s and '80s." in the third last paragraph makes 4 correct. The other options, while mentioned in the passage, don't relate to the

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Answer key/Solution

context of the question - right place.

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Q.29

Directions for question 29: The following question contains a paragraph from which the last sentence has been deleted. From the given options, choose th one which most logically completes the paragraph.

It was a muggy summer night in South Side, Chicago in 1979. In and around Comiskey Park, home to the long-struggling White Sox baseball team, the scen was one of total chaos. Thousands of working- and middle-class young men, predominately white, predominately angry, went riot. Seats were ripped out o the stadium, urinals were kicked from the walls, and the opposing baseball teams were shut in the locker rooms for their own protection. Through it all, th rioters shouted a mantra. It wasn't about inequality, lingering recession woes or the high-paying industrial jobs slowly seeping out of the Midwest.

1. That summer, disco music was everywhere, saturating pop culture at the expense of almost all other genres of music.
2. Disco hadn't always been so main-stream.
3. The slogan they chanted over and over, until their voices were raw, was: 'Disco sucks!'
4. These targeted antics were not isolated to the radio booth.

Solution:
Correct Answer : 3
Option 3 is the right answer because in the sentence, *"Thousands of working- and middle-class young men, predominately white, predominately angry, went riot."* and the phrase, *"the rioters shouted a mantra"* it becomes clear that they were chanting a slogan. Options 1, 2, and 4 though show some relation with the text, do not continue with the same idea as discussed in the passage.

Bookmark

Answer key/Solution

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Q.30

Direction for question 30: In the following question, four sentences (1), (2), (3) and (4) are given. Of these, three sentences need to be arranged in a logica order to make a coherent paragraph. From the given options, choose the one that does not fit the sequence.

1. The large roughly spherical fruits of this species have a yellow or orange sweet interior that can be eaten fresh.
2. The melon, muskmelon, winter melon, cantaloupe, or honeydew (*Cucumis melo*) is a climbing or spreading annual plant with many cultivated varieties.
3. The species was probably originally native to southern Africa, or possibly to south-eastern Asia.
4. Variegated ivy varieties come in a range of colours and often have mottled leaves.

Solution:
Correct Answer : 4
Option 4 is the correct answer because the correct series is 231. Option 2 introduces the subject, which is a fruit and the natural progression is where is it found, therefore 2 and 3 become a pair. The description of the same subject is given in Option 1. Only Option 4 talks about something that does not go with the general description of the subject.

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Answer key/Solution

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Q.31

Direction for question 31: In the following question, four sentences (1), (2), (3) and (4) are given. Of these, three sentences need to be arranged in a logica order to make a coherent paragraph. From the given options, choose the one that does not fit the sequence.

1. These initiatives were truly revolutionary in terms of their impact on the Indian Ocean trading networks.
2. . The two most important of these second-wave initiatives were the transplantation of a novel form of business organization (the joint stock company) into Asia and the fusion of private merchant interests and state policy.
3. Two facets of the early modern history of European empire building in the Indian Ocean deserve to be emphasized.
4. Over a two-century period (1600–1800) they fundamentally transformed the Asian trading system.

Solution:
Correct Answer : 3
Option 3 is the correct answer because the correct series is 142. Option 1 is the opening sentence because it mentions the subject 'these initiatives', and the word 'they' in Option 4 refers to 'these initiatives'. Option 2 follows the pair 14 because now the detailing of the two most important initiatives. Hence, Option 3 is the odd sentence.

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Answer key/Solution

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Directions for questions 32 - 34: The following passage consists of a set of three questions. Read the passage and answer the questions that follow.

The rescued negatives mouldered in Bassman's coal room for more than twenty years, until an acquaintance persuaded her to give them another look. Bassman dug through the bags and found delicate, friable films. Time had changed them, and she exacerbated the ruin. She warped her old photographs by enlarging and printing the negatives using Photoshop technology that created extreme versions of her previous diffusions. These resurrected pictures radiated with heavy, sometimes distortive contrast, and struck the viewer with their ink-black washes and flashbulb whites. The image of the sunglass-wearing, diamond-laden Barbara Mullen now showed a radioactively pale spectre against a pitch-dark background. The headshot of the unnamed model with her head thrown back and her eyes closed proved so altered by white highlighting that the subject looked as disembodied as a monochrome Gerard Richter.

Was Bassman recycling, or, as Ezra Pound exhorted artists to do, "making it new?" In one interview, Bassman said that her use of Photoshop to create vivid contrasts reminded her of her early painterly experiments. But whereas Bassman's original Harper's Bazaar iterations used blurring and chiaroscuro to imagine the unbound beauty of a woman in her 20s or 30s, her revisited images' magnitude and almost Kabuki-style *sfmuato* displayed the unshackled grandeur and emotional intensity that can arrive with middle age. Bassman's employment of hyper-contrast and nonpictorial, fragmented depiction create works conveying numinous power and even rapture, a state of affairs we might dream of women reaching as they age out of old gendered scripts. And unlil the images of her previous career, Bassman's new prints were large—a quality that speaks to a desire to be seen. Again, as Bassman once admitted, "I project what I'm not, but what I'd like to be."

The re-printed negatives had a grand reception in 2009, with shows at KMR Arts in Connecticut and New York's Staley-Wise. In the late 1940s, *Harper's Bazaar* editor Carmel Snow had chided Bassman: "I didn't bring you to Paris to make art; I brought you here to do the buttons and bows." But now Bassman work was embraced as high art. In *The New Yorker*, Judith Thurman wrote: "She manipulates the pictures to blur or burn out the detail, transforming a literal image into a painterly abstraction." And GiniaBellafante wrote an adoring profile of Bassman, praising her for making her photographs "seem even more ethereal than they did in their original form, and immune to the beholder's efforts to carbon-date them." Meanwhile, Bassman had grown energized enough to start taking fashion photography again. She covered Christian Lacroix's millinery for the *New York Times Magazine* in 1996 and did an art deco-themed shoot for *German Vogue* in 2004. The publishing house Abrams issued two monographs of her work.

Q.32
The state of rapture conveyed in Bassman's works is:

1 **because of the use of heavy contrast and their ink-black washes.**

2 **due to employment of hyper contrast and nonpictorial depiction.**

3 **due to the use of vivid contrasts which remind people of early painterly experiments.**

4 **manipulation to blur or burn out, transforming a literal image into a painterly abstraction.**

Solution:
Correct Answer : 2
"Bassman's employment of *hyper-contrast and nonpictorial, fragmented depiction* created works conveying numinous power and even rapture, a state of affairs we might dream of women reaching as they age out of old gendered scripts." from paragraph two makes 2 correct. The other options are mentioned in the passage, but not in this context.

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Answer key/Solution

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Directions for questions 32 - 34: The following passage consists of a set of three questions. Read the passage and answer the questions that follow.

The rescued negatives mouldered in Bassman's coal room for more than twenty years, until an acquaintance persuaded her to give them another look. Bassman dug through the bags and found delicate, friable films. Time had changed them, and she exacerbated the ruin. She warped her old photographs by enlarging and printing the negatives using Photoshop technology that created extreme versions of her previous diffusions. These resurrected pictures radiated with heavy, sometimes distortive contrast, and struck the viewer with their ink-black washes and flashbulb whites. The image of the sunglass-wearing, diamond-laden Barbara Mullen now showed a radioactively pale spectre against a pitch-dark background. The headshot of the unnamed model with her head thrown back and her eyes closed proved so altered by white highlighting that the subject looked as disembodied as a monochrome Gerard Richter.

Was Bassman recycling, or, as Ezra Pound exhorted artists to do, "making it new?" In one interview, Bassman said that her use of Photoshop to create vivid contrasts reminded her of her early painterly experiments. But whereas Bassman's original Harper's Bazaar iterations used blurring and chiaroscuro to imagine the unbound beauty of a woman in her 20s or 30s, her revisited images' magnitude and almost Kabuki-style *sfmuato* displayed the unshackled grandeur and emotional intensity that can arrive with middle age. Bassman's employment of hyper-contrast and nonpictorial, fragmented depiction create works conveying numinous power and even rapture, a state of affairs we might dream of women reaching as they age out of old gendered scripts. And unlil the images of her previous career, Bassman's new prints were large—a quality that speaks to a desire to be seen. Again, as Bassman once admitted, "I project what I'm not, but what I'd like to be."

The re-printed negatives had a grand reception in 2009, with shows at KMR Arts in Connecticut and New York's Staley-Wise. In the late 1940s, *Harper's Bazaar* editor Carmel Snow had chided Bassman: "I didn't bring you to Paris to make art; I brought you here to do the buttons and bows." But now Bassman work was embraced as high art. In *The New Yorker*, Judith Thurman wrote: "She manipulates the pictures to blur or burn out the detail, transforming a literal image into a painterly abstraction." And GiniaBellafante wrote an adoring profile of Bassman, praising her for making her photographs "seem even more ethereal than they did in their original form, and immune to the beholder's efforts to carbon-date them." Meanwhile, Bassman had grown energized enough to start taking fashion photography again. She covered Christian Lacroix's millinery for the *New York Times Magazine* in 1996 and did an art deco-themed shoot for *German Vogue* in 2004. The publishing house Abrams issued two monographs of her work.

Q.33
Which of the following can be inferred from the passage?

1 **Both the Barbara Mullen shot and the shot of the sunglass-wearing Gerard Richter used similar background colours.**

2 Mouldering negatives is now a scientific art form based on Bassman's efforts.

3 Giving another look to the mouldering rescued negatives helped improve Bassman's career for the better.

4 The Kabuki-style *sfmuato* of the works displayed the emotional intensity that arrived with the 20's and 30's.

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Answer key/Solution

Solution:
Correct Answer : 3
Reading the entire passage tells us that the works were appreciated as art. Specifically, paragraph three tells us, "The re-printed negatives had a grand reception in 2009.... Meanwhile, Bassman had grown energized enough to start taking fashion photography again." This makes 3 correct.The passage does not support 2. 1 says sunglass-wearing Gerard Richter, when it should apply to Barbara Mullen. 4 talks about 20's and 30's when it should say middle ages.

FeedBack

Directions for questions 32 - 34: The following passage consists of a set of three questions. Read the passage and answer the questions that follow.

The rescued negatives mouldered in Bassman's coal room for more than twenty years, until an acquaintance persuaded her to give them another look. Bassman dug through the bags and found delicate, friable films. Time had changed them, and she exacerbated the ruin. She warped her old photographs by enlarging and printing the negatives using Photoshop technology that created extreme versions of her previous diffusions. These resurrected pictures radiated with heavy, sometimes distortive contrast, and struck the viewer with their ink-black washes and flashbulb whites. The image of the sunglass-wearing, diamond-laden Barbara Mullen now showed a radioactively pale spectre against a pitch-dark background. The headshot of the unnamed model with her head thrown back and her eyes closed proved so altered by white highlighting that the subject looked as disembodied as a monochrome Gerard Richter.

Was Bassman recycling, or, as Ezra Pound exhorted artists to do, "making it new?" In one interview, Bassman said that her use of Photoshop to create vivid contrasts reminded her of her early painterly experiments. But whereas Bassman's original Harper's Bazaar iterations used blurring and chiaroscuro to imagine the unbound beauty of a woman in her 20s or 30s, her revisited images' magnitude and almost Kabuki-style *sfmuato* displayed the unshackled grandeur and emotional intensity that can arrive with middle age. Bassman's employment of hyper-contrast and nonpictorial, fragmented depiction create works conveying numinous power and even rapture, a state of affairs we might dream of women reaching as they age out of old gendered scripts. And unlil the images of her previous career, Bassman's new prints were large—a quality that speaks to a desire to be seen. Again, as Bassman once admitted, "I project what I'm not, but what I'd like to be."

The re-printed negatives had a grand reception in 2009, with shows at KMR Arts in Connecticut and New York's Staley-Wise. In the late 1940s, *Harper's Bazaar* editor Carmel Snow had chided Bassman: "I didn't bring you to Paris to make art; I brought you here to do the buttons and bows." But now Bassman work was embraced as high art. In *The New Yorker*, Judith Thurman wrote: "She manipulates the pictures to blur or burn out the detail, transforming a literal image into a painterly abstraction." And GiniaBellafante wrote an adoring profile of Bassman, praising her for making her photographs "seem even more ethereal than they did in their original form, and immune to the beholder's efforts to carbon-date them." Meanwhile, Bassman had grown energized enough to start taking fashion photography again. She covered Christian Lacroix's millinery for the *New York Times Magazine* in 1996 and did an art deco-themed shoot for *German Vogue* in 2004. The publishing house Abrams issued two monographs of her work.

Q.34
One of the ways in which Bassman did not change the negatives in her revisited images is:

1 by exacerbating the ruin by warping her old photographs to create extreme versions of her previous diffusions.

2 by using blurring and chiaroscuro to imagine the unbound beauty of a woman in her 20s or 30s.

3 by using heavy, sometimes distortive contrast, which struck the viewer with flashbulb whites.

4 by making use of Photoshop to enlarge the negatives, partly because of her desire to be seen.

Bookmark

Answer key/Solution

Solution:
Correct Answer : 2
2 is correct from paragraph two, " But whereas Bassman's *original Harper's Bazaar iterations* used blurring and chiaroscuro to imagine the unbound beauty of a woman in her 20s or 30s....". This means that these techniques were used in the original images, not the revisited ones.
1 (Paragraph two: "Time had changed them, and she *exacerbated the ruin*. She warped her old photographs by enlarging and printing the negatives using Photoshop technology that created *extreme versions* of her previous diffusions."), 3 ("These resurrected pictures radiated wit *heavy, sometimes distortive contrast*, and struck the viewer with their ink-black washes and *flashbulb whites*.") and 4("And unlike the images of her previous career, Bassman's new prints were large—a quality that speaks to a desire to be seen.", and also see the text reference for 1 for Photoshop) are mentioned in the passage with reference to the re-visited images.

FeedBack

Sec 2

Directions for questions 35 to 38: Answer the questions on the basis of the information given below.

Twenty seven identical cubes of edges 1 cm each are labeled with the squares of the first twenty seven natural numbers. Each cube is labeled with a distinc number. These cubes are assembled to form a bigger cube of edge 3 cm. The following pattern is followed in arranging the smaller cubes in order to make the bigger cube. The bottom layer contains three rows with three cubes each. The cubes in the first, or frontmost, row in the first layer are labeled with the squares of first three natural numbers in ascending order from left to right. The cubes in second, or middle, row are labeled with the squares of numbers from 4 to 6 in ascending order from right to left. The cubes in the third row are labeled with the squares of numbers from 7 to 9 in ascending order from le to right. The identical pattern is followed in 2nd and 3rd layers of the bigger cubes. Now, one pair of opposite faces are coloured with Red and the other two pairs of opposite faces with Blue and Pink.

Q.35
The sum of numbers on the cubes that have exactly two colours on them is

Solution:
Correct Answer : 3080
The three layer (from bottom to top) of the bigger cube can be drawn as:

Layer – 1		
7^2	8^2	9^2
6^2	5^2	4^2
1^2	2^2	3^2

Layer – 2		
16^2	17^2	18^2
15^2	14^2	13^2
10^2	11^2	12^2

Layer – 3		
25^2	26^2	27^2
24^2	23^2	22^2
19^2	20^2	21^2

Sum of numbers on the cubes that have exactly two colours on them = $2^2 + 4^2 + 6^2 + 8^2 + 10^2 + 12^2 + 16^2 + 18^2 + 20^2 + 22^2 + 24^2 + 26^2$
$= 4 + 16 + 36 + 64 + 100 + 144 + 256 + 324 + 400 + 484 + 576 + 676 = 3080.$

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Answer key/Solution

Directions for questions 35 to 38: Answer the questions on the basis of the information given below.

Twenty seven identical cubes of edges 1 cm each are labeled with the squares of the first twenty seven natural numbers. Each cube is labeled with a distinc number. These cubes are assembled to form a bigger cube of edge 3 cm. The following pattern is followed in arranging the smaller cubes in order to make the bigger cube. The bottom layer contains three rows with three cubes each. The cubes in the first, or frontmost, row in the first layer are labeled with the squares of first three natural numbers in ascending order from left to right. The cubes in second, or middle, row are labeled with the squares of numbers from 4 to 6 in ascending order from right to left. The cubes in the third row are labeled with the squares of numbers from 7 to 9 in ascending order from le to right. The identical pattern is followed in 2nd and 3rd layers of the bigger cubes. Now, one pair of opposite faces are coloured with Red and the other two pairs of opposite faces with Blue and Pink.

Q.36
The sum of numbers on the cubes that have exactly three colours on them is

Solution:
Correct Answer : 2296
The three layer (from bottom to top) of the bigger cube can be drawn as:

Layer – 1		
7^2	8^2	9^2
6^2	5^2	4^2
1^2	2^2	3^2

Layer – 2		
16^2	17^2	18^2
15^2	14^2	13^2
10^2	11^2	12^2

Layer – 3		
25^2	26^2	27^2
24^2	23^2	22^2
19^2	20^2	21^2

Sum of numbers on the cubes that have exactly three colours on them = $1^2 + 3^2 + 9^2 + 7^2 + 19^2 + 21^2 + 27^2 + 25^2$
$= 1 + 9 + 81 + 49 + 361 + 441 + 729 + 625 = 2296.$

FeedBack

Bookmark

Answer key/Solution

Directions for questions 35 to 38: Answer the questions on the basis of the information given below.

Twenty seven identical cubes of edges 1 cm each are labeled with the squares of the first twenty seven natural numbers. Each cube is labeled with a distinc number. These cubes are assembled to form a bigger cube of edge 3 cm. The following pattern is followed in arranging the smaller cubes in order to make the bigger cube. The bottom layer contains three rows with three cubes each. The cubes in the first, or frontmost, row in the first layer are labeled with the squares of first three natural numbers in ascending order from left to right. The cubes in second, or middle, row are labeled with the squares of numbers from 4 to 6 in ascending order from right to left. The cubes in the third row are labeled with the squares of numbers from 7 to 9 in ascending order from le to right. The identical pattern is followed in 2nd and 3rd layers of the bigger cubes. Now, one pair of opposite faces are coloured with Red and the other two pairs of opposite faces with Blue and Pink.

Q.37
The sum of numbers on the cubes that have exactly one colour on them is

Solution:

Bookmark

Correct Answer : 1358

Answer key/Solution

The three layer (from bottom to top) of the bigger cube can be drawn as:

Layer – 1			Layer – 2			Layer – 3		
7^2	8^2	9^2	16^2	17^2	18^2	25^2	26^2	27^2
6^2	5^2	4^2	15^2	14^2	13^2	24^2	23^2	22^2
1^2	2^2	3^2	10^2	11^2	12^2	19^2	20^2	21^2

The required sum = $5^2 + 11^2 + 13^2 + 15^2 + 17^2 + 23^2$
= 25 + 121 + 169 + 225 + 289 + 529 = 1358.

FeedBack

Directions for questions 35 to 38: Answer the questions on the basis of the information given below.

Twenty seven identical cubes of edges 1 cm each are labeled with the squares of the first twenty seven natural numbers. Each cube is labeled with a distinc number. These cubes are assembled to form a bigger cube of edge 3 cm. The following pattern is followed in arranging the smaller cubes in order to make the bigger cube. The bottom layer contains three rows with three cubes each. The cubes in the first, or frontmost, row in the first layer are labeled with the squares of first three natural numbers in ascending order from left to right. The cubes in second, or middle, row are labeled with the squares of numbers from 4 to 6 in ascending order from right to left. The cubes in the third row are labeled with the squares of numbers from 7 to 9 in ascending order from le to right. The identical pattern is followed in 2nd and 3rd layers of the bigger cubes. Now, one pair of opposite faces are coloured with Red and the other two pairs of opposite faces with Blue and Pink.

Q.38

The product of the digits of the number on the cube that has no colour on it is

Solution:

Correct Answer : 54

Bookmark

Answer key/Solution

The three layer (from bottom to top) of the bigger cube can be drawn as:

Layer – 1			Layer – 2			Layer – 3		
7^2	8^2	9^2	16^2	17^2	18^2	25^2	26^2	27^2
6^2	5^2	4^2	15^2	14^2	13^2	24^2	23^2	22^2
1^2	2^2	3^2	10^2	11^2	12^2	19^2	20^2	21^2

The number on the cube that has no colour on it
= 14^2 = 196.
The required product = 1 × 9 × 6 = 54.

FeedBack

Directions for questions 39 to 42: Answer the questions on the basis of the information given below.

A project comprises four stages – S1, S2, S3 and S4. Four persons – P1, P2, P3 and P4 – are employed to work on the project. The following table gives the information regarding the number of days taken by each of the four to complete the various stages of the project.

Stage / Person	S1	S2	S3	S4
P1	10	7	8	13
P2	8	16	14	28
P3	12	24	5	11
P4	22	6	9	6

The project manager divides the projects in two assignments – A1 and A2. A1 comprises S1 and S4 and A2 comprises S2 and S3. The work of A1 is assigned to P1 and P3 and that of A2 to P2 and P4. P1 and P4 started working on their respective assignments on 2nd January, 2017, and P2 and P3 started working on their respective assignment on 5th January, 2017. P1 and P2 take off every third day and P3 and P4 on every second day. Each person works only on one project in a day. Stages can be completed in any order.

Q.39

Due to health issues, if P1 works at 75% of his actual efficiency, S1 can earliest be completed by

1 ◯ **13th January, 2017**

2 ◯ **14th January, 2017**

3 ◯ **15th January, 2017**

4 ◯ **16th January, 2017**

Solution:
Correct Answer : 1

Bookmark

Answer key/Solution

Assignment	A1	A2
Stage	S1, S4	S2, S3
Person	P1, P3	P2, P4

Both P1 and P3 can work on stage S1.
Also, efficiency of P1 is decreased to 75% of his actual efficiency.

The amount of work done on S1 per day by P1 and P3 can be depicted as shown below:

Day	Person	
	P1	P3
Jan 2	3/40	
Jan 3	3/40	
Jan 4	X	
Jan 5	3/40	1/12
Jan 6	3/40	X
Jan 7	X	1/12
Jan 8	3/40	X
Jan 9	3/40	1/12
Jan 10	X	X
Jan 11	3/40	1/12
Jan 12	3/40	X
Jan 13	X	1/12

S1 can earliest be completed by 13th January 2017.

FeedBack

Directions for questions 39 to 42: Answer the questions on the basis of the information given below.

A project comprises four stages – S1, S2, S3 and S4. Four persons – P1, P2, P3 and P4 – are employed to work on the project. The following table gives the information regarding the number of days taken by each of the four to complete the various stages of the project.

Stage / Person	S1	S2	S3	S4
P1	10	7	8	13
P2	8	16	14	28
P3	12	24	5	11
P4	22	6	9	6

The project manager divides the projects in two assignments – A1 and A2. A1 comprises S1 and S4 and A2 comprises S2 and S3. The work of A1 is assigned to P1 and P3 and that of A2 to P2 and P4. P1 and P4 started working on their respective assignments on 2nd January, 2017, and P2 and P3 started working on their respective assignment on 5th January, 2017. P1 and P2 take off every third day and P3 and P4 on every second day. Each person works only on one project in a day. Stages can be completed in any order.

Q.40
Assignment A2 can earliest be completed by

1 ◯ **15th January, 2017**

2 ◯ **17th January, 2017**

3 ◯ **18th January, 2017**

4 ◯ **20th January, 2017**

Solution:
Correct Answer : 3

Bookmark

Answer key/Solution

Assignment	A1	A2
Stage	S1, S4	S2, S3
Person	P1, P3	P2, P4

Assignment A2 comprises stages S2 and S3. Persons working on A2 are P2 and P4.
The amount of work done on A2 per day by P2 and P4 can be depicted as shown below:

Day	Person	
	P2	P4
Jan 2		S2, 1/6
Jan 3		X
Jan 4		S2, 1/6
Jan 5	S3, 1/14	X
Jan 6	S3, 1/14	S2, 1/6
Jan 7	X	X
Jan 8	S3, 1/14	S2, 1/6
Jan 9	S3, 1/14	X
Jan 10	X	S2, 1/6
Jan 11	S3, 1/14	X
Jan 12	S3, 1/14	S2, 1/6
Jan 13	X	X
Jan 14	S3, 1/14	S3, 1/9
Jan 15	S3, 1/14	X
Jan 16	X	S3, 1/9
Jan 17	S3, 1/14	X
Jan 18	S3, 1/14	S3, 1/9

A2 can earliest be completed by 18th January 2017.

FeedBack

Directions for questions 39 to 42: Answer the questions on the basis of the information given below.

A project comprises four stages – S1, S2, S3 and S4. Four persons – P1, P2, P3 and P4 – are employed to work on the project. The following table gives the information regarding the number of days taken by each of the four to complete the various stages of the project.

Stage / Person	S1	S2	S3	S4
P1	10	7	8	13
P2	8	16	14	28
P3	12	24	5	11
P4	22	6	9	6

The project manager divides the projects in two assignments – A1 and A2. A1 comprises S1 and S4 and A2 comprises S2 and S3. The work of A1 is assigned to P1 and P3 and that of A2 to P2 and P4. P1 and P4 started working on their respective assignments on 2nd January, 2017, and P2 and P3 started working on their respective assignment on 5th January, 2017. P1 and P2 take off every third day and P3 and P4 on every second day. Each person works only on one project in a day. Stages can be completed in any order.

Q.41
Stage S4 can earliest be completed by

1 ◯ **10th January, 2017**

2 ◯ **13th January, 2017**

3 ◯ **15th January, 2017**

4 ◯ **16th January, 2017**

Solution:
Correct Answer : 2

Bookmark

Answer key/Solution

Assignment	A1	A2
Stage	S1, S4	S2, S3
Person	P1, P3	P2, P4

P1 and P3 can work on stage S4.
The amount of work done on stage S4 per day by P1 and P3 can be depicted as below.

Day	Person	
	P1	P3
Jan 2	1/13	
Jan 3	1/13	
Jan 4	X	
Jan 5	1/13	1/11
Jan 6	1/13	X
Jan 7	X	1/11
Jan 8	1/13	X
Jan 9	1/13	1/11
Jan 10	X	X
Jan 11	1/13	1/11
Jan 12	1/13	X
Jan 13	X	1/11

Hence, stage S4 can earliest be completed by 13th January, 2017

FeedBack

Directions for questions 39 to 42: Answer the questions on the basis of the information given below.

A project comprises four stages – S1, S2, S3 and S4. Four persons – P1, P2, P3 and P4 – are employed to work on the project. The following table gives the information regarding the number of days taken by each of the four to complete the various stages of the project.

Stage / Person	S1	S2	S3	S4
P1	10	7	8	13
P2	8	16	14	28
P3	12	24	5	11
P4	22	6	9	6

The project manager divides the projects in two assignments – A1 and A2. A1 comprises S1 and S4 and A2 comprises S2 and S3. The work of A1 is assigned to P1 and P3 and that of A2 to P2 and P4. P1 and P4 started working on their respective assignments on 2nd January, 2017, and P2 and P3 started working on their respective assignment on 5th January, 2017. P1 and P2 take off every third day and P3 and P4 on every second day. Each person works only on one project in a day. Stages can be completed in any order.

Q.42
The project can earliest be completed by

1 ◯ **15th January, 2017**

2 ◯ **16th January, 2017**

3 ◯ **18th January, 2017**

4 ◯ **21st January, 2017**

Solution:
Correct Answer : 4

Bookmark

Answer key/Solution

Assignment	A1	A2
Stage	S1, S4	S2, S3
Person	P1, P3	P2, P4

If the two assignments A1 and A2 comprising four stages S1, S2, S3 and S4 are completed, then we can say the project is completed.
A2 can earliest be completed by 18th January, 2017.
So, we need to find out the time taken to complete A1.
Assignment A1 comprises stages S1 and S4. P1 and P3 work on A1.
The amount of work done by P1 and P3 per day on S1 and S4 can be depicted as below:

Day	Person	
	P1	P3
Jan 2	S1, 1/10	
Jan 3	S1, 1/10	
Jan 4	X	
Jan 5	S1, 1/10	S4, 1/11
Jan 6	S1, 1/10	X
Jan 7	X	S4, 1/11
Jan 8	S1, 1/10	X
Jan 9	S1, 1/10	S4, 1/11
Jan 10	X	X
Jan 11	S1, 1/10	S4, 1/11
Jan 12	S1, 1/10	X
Jan 13	X	S4, 1/11
Jan 14	S1, 1/10	X
Jan 15	S1, 1/10	S4, 1/11
Jan 16	X	X
Jan 17	S4, 1/13	S4, 1/11
Jan 18	S4, 1/13	X
Jan 19	X	S4, 1/11
Jan 20	S4, 1/13	X
Jan 21	S4, 1/13	S4, 1/11

Hence, P1 and P3 will complete the assignment A1 earliest by 21st January, 2017.
So, the whole project will be completed by 21st January, 2017.

FeedBack

Directions for questions 43 to 46: Answer the questions on the basis of the information given below.

Five shooters – Ekta, Chanka, Abibhuti, Ania and Akira – participated in a shooting competition, in which every participant has to hit five targets – T1, T2, T3, T4 and T5. The following table gives the probability of hitting each of the five targets by the five participants.

Target / Name	T1	T2	T3	T4	T5
Ekta	0.5	0.7	0.35	0.4	0.85
Chanka	0.6	0.85	0.75	0.6	0.45
Abibhuti	0.2	0.45	0.95	0.25	0.2
Ania	0.7	0.65	0.15	0.8	0.3
Akira	0.4	0.55	0.95	0.45	0.7

Q.43
If Ekta hits target T3, what is the probability that at least one of the other shooters also hits T3?

1 $\frac{31983}{32000}$

2 $\frac{29983}{32000}$

3 $\frac{14963}{16000}$

4 $\frac{15}{16}$

Solution:
Correct Answer : 1

Bookmark

Answer key/Solution

The probability that at least one of the other shooters also hits T3 if Ekta hits T3
= 1 – (1 – 0.75) (1 – 0.95) (1 – 0.15) (1 – 0.95)
= 1 – (0.25) (0.05) (0.85) (0.05)

$= \frac{31983}{32000}$.

FeedBack

Directions for questions 43 to 46: Answer the questions on the basis of the information given below.

Five shooters – Ekta, Chanka, Abibhuti, Ania and Akira – participated in a shooting competition, in which every participant has to hit five targets – T1, T2, T3, T4 and T5. The following table gives the probability of hitting each of the five targets by the five participants.

Target / Name	T1	T2	T3	T4	T5
Ekta	0.5	0.7	0.35	0.4	0.85
Chanka	0.6	0.85	0.75	0.6	0.45
Abibhuti	0.2	0.45	0.95	0.25	0.2
Ania	0.7	0.65	0.15	0.8	0.3
Akira	0.4	0.55	0.95	0.45	0.7

Q.44
If Abibhuti does not hit targets T3 and T4, what is the approximate value of the probability that at most three of the other four shooters hit these two targets?

1 **0.924**

2 **0.967**

3 **0.997**

4 **0.825**

Solution:
Correct Answer : 3

The required probability
= 1 – (0.35) (0.40) (0.75) (0.6) (0.15) (0.80) (0.95) (0.45)
= 0.997.

FeedBack

Bookmark

Answer key/Solution

Directions for questions 43 to 46: Answer the questions on the basis of the information given below.

Five shooters – Ekta, Chanka, Abibhuti, Ania and Akira – participated in a shooting competition, in which every participant has to hit five targets – T1, T2, T3, T4 and T5. The following table gives the probability of hitting each of the five targets by the five participants.

Target / Name	T1	T2	T3	T4	T5
Ekta	0.5	0.7	0.35	0.4	0.85
Chanka	0.6	0.85	0.75	0.6	0.45
Abibhuti	0.2	0.45	0.95	0.25	0.2
Ania	0.7	0.65	0.15	0.8	0.3
Akira	0.4	0.55	0.95	0.45	0.7

Q.45
If target T2 is hit by exactly one shooter, what is the approximate value of the probability that the one who hits the targets is Ekta?

1 **0.279**

2 **0.196**

3 **0.354**

4 **0.176**

Solution:
Correct Answer : 2

Bookmark

Answer key/Solution

The probability that target T2 is hit by exactly one shooter
= (0.70) (0.15) (0.55) (0.35) (0.45) + (0.30) (0.85) (0.55) (0.35) (0.45) + (0.30) (0.15) (0.45) (0.35) (0.45) + (0.30) (0.15) (0.55) (0.65) (0.45) + (0.30) (0.15) (0.55) (0.35) (0.55)
= 0.009095625 + 0.022089375 + 0.003189375 + 0.007239375 + 0.004764375
= 0.046378125
The probability that only Ekta hits the target T2 = (0.70) (0.15) (0.55) (0.35) (0.45)
= 0.009095625

Required probability $= \frac{0.009095625}{0.046378125} \approx 0.196$.

FeedBack

Directions for questions 43 to 46: Answer the questions on the basis of the information given below.

Five shooters – Ekta, Chanka, Abibhuti, Ania and Akira – participated in a shooting competition, in which every participant has to hit five targets – T1, T2, T3, T4 and T5. The following table gives the probability of hitting each of the five targets by the five participants.

Target / Name	T1	T2	T3	T4	T5
Ekta	0.5	0.7	0.35	0.4	0.85
Chanka	0.6	0.85	0.75	0.6	0.45
Abibhuti	0.2	0.45	0.95	0.25	0.2
Ania	0.7	0.65	0.15	0.8	0.3
Akira	0.4	0.55	0.95	0.45	0.7

Q.46

If the amount (in Rs.) given to the participants on hitting targets T1, T2, T3, T4 and T5 is 20, 30, 40, 60 and 80 respectively, what is the absolute difference (in Rs.) between the expected amount to be earned by Ekta and Chanka together and that by Ania and Akira together?

1 **19.5**

2 **19**

3 **20**

4 **20.5**

Solution:

Correct Answer : 1

The expected amount to be earned by Ekta and Chanka together
= 20(0.5 + 0.6) + 30(0.7 + 0.85) + 40(0.35 + 0.75) + 60(0.4 + 0.6) + 80(0.85 + 0.45)
= 20(1.1) + 30(1.55) + 40(1.1) + 60(1) + 80(1.3)
= 22 + 46.5 + 44 + 60 + 104 = Rs. 276.5
The expected amount to be earned by Ania and Akira together
= 20(0.7 + 0.4) + 30(0.65 + 0.55) + 40(0.15 + 0.95) + 60(0.8 + 0.45) + 80(0.3 + 0.7)
= 20(1.1) + 30(1.2) + 40(1.1) + 60(1.25) + 80(1)
= 22 + 36 + 44 + 75 + 80 = Rs. 257
The required difference = Rs. (276.5 – 257)
= Rs. 19.5.

FeedBack

Bookmark

Answer key/Solution

Directions for questions 47 to 50: Answer the questions on the basis of the information given below.

In a six day workshop – starting on Monday and ending on Saturday – four sessions were held on each day. On each of the six days, the time slots for sessions were 10 am to 12 noon, 12 noon to 2 pm, 3 pm to 5 pm and 5 pm to 7 pm. The subjects that were taught in the workshop were Economics, Finance Law, and Management. The sessions were taken by four professors namely Ella, Folly, Lolly and Madan. Each professor can teach at most two of the four aforementioned subjects. Not more than two sessions on the same subject were held on any of the given days. It is also known that:

(i) For each professor, the initial of his name and that of the subject taught by him/her were not the same.

(ii) The number of sessions on Management was $33\frac{1}{3}\%$ more the number of session of on Economics.

(iii) No subject was taught on three consecutive days and also no subject was taught in two consecutive slots on the same day.
(iv) The professor who took exactly four sessions in the workshop cannot teach the subjects that were taught on Wednesday and did not take any session on Monday and Tuesday.
(v) The last session on Thursday was on Economics. The first session on Wednesday was on Finance.
(vi) Three different subjects were taught on Monday as well as on Wednesday, and on each of the remaining days exactly two subjects were taught.
(vii) The number of sessions held on Management was the maximum. Law was not taught on Monday.

(viii) Management was not taught on Wednesday. On Friday, the first session was on Finance and the last one was on Law.
(ix) The number of sessions held on one of the subjects was 5. The second session on Saturday was on Economics.
(x) No subject taught in the same slot on two consecutive days. Only Ella, who took 6 sessions, can teach Law.
(xi) Madan, who did not take the minimum number of sessions, cannot teach the subjects that were taught on Friday and the number of session taken by hi was an even number.
(xii) All the sessions on Finance were taken by the same professor.

Q.47
The number of sessions taken by any professor could not be more than

1 ◯ **8**

2 ◯ **9**

3 ◯ **10**

4 ◯ **11**

Bookmark

Answer key/Solution

Solution:
Correct Answer : 1
Total number of sessions held in the workshop = 6 × 4 = 24.
Using statement (ii), (vii) and (ix), it can be deduced that:
Number of sessions on Management = 8
Number of sessions on Economics = 6
Number of sessions on Finance = 5
Number of sessions on Law = 5

Using statements (x), (vi), (iii), (vii), (ix), (viii), in the given order, the following conclusions can be drawn:

Slot / Day	10 am -12 pm	12 pm -2 pm	3 pm - 5 pm	5 pm - 7 pm
Mon	Management	Economics/ Finance	Management	Finance/ Economics
Tues	Law	Management	Law	Management
Wed	Finance	Law	Economics	Finance
Thur	Management	Economics	Management	Economics
Fri	Finance	Law	Finance	Law
Sat	Management	Economics	Management	Economics

Using statements (i), (iv), (x), (xi) and (xii), the following can be concluded:

Professor / Subject	Ella	Lolly	Folly	Madan
Economics	0	0	0	6
Law	5	0	0	0
Finance	0	5	0	0
Management	1	3	4	0

Lolly took the maximum number of sessions, which was 8.

FeedBack

Directions for questions 47 to 50: Answer the questions on the basis of the information given below.

In a six day workshop – starting on Monday and ending on Saturday – four sessions were held on each day. On each of the six days, the time slots for sessions were 10 am to 12 noon, 12 noon to 2 pm, 3 pm to 5 pm and 5 pm to 7 pm. The subjects that were taught in the workshop were Economics, Finance Law, and Management. The sessions were taken by four professors namely Ella, Folly, Lolly and Madan. Each professor can teach at most two of the four aforementioned subjects. Not more than two sessions on the same subject were held on any of the given days. It is also known that:

(i) For each professor, the initial of his name and that of the subject taught by him/her were not the same.
(ii) The number of sessions on Management was $33\frac{1}{3}\%$ more the number of session of on Economics.
(iii) No subject was taught on three consecutive days and also no subject was taught in two consecutive slots on the same day.
(iv) The professor who took exactly four sessions in the workshop cannot teach the subjects that were taught on Wednesday and did not take any session on Monday and Tuesday.
(v) The last session on Thursday was on Economics. The first session on Wednesday was on Finance.
(vi) Three different subjects were taught on Monday as well as on Wednesday, and on each of the remaining days exactly two subjects were taught.
(vii) The number of sessions held on Management was the maximum. Law was not taught on Monday.
(viii) Management was not taught on Wednesday. On Friday, the first session was on Finance and the last one was on Law.
(ix) The number of sessions held on one of the subjects was 5. The second session on Saturday was on Economics.
(x) No subject taught in the same slot on two consecutive days. Only Ella, who took 6 sessions, can teach Law.
(xi) Madan, who did not take the minimum number of sessions, cannot teach the subjects that were taught on Friday and the number of session taken by hi was an even number.
(xii) All the sessions on Finance were taken by the same professor.

Q.48

The subjects taught on Tuesday were

1 **Law and Management**

2 **Finance and Management**

3 **Law and Economics**

4 **Economics and Finance**

Solution:
Correct Answer : 1
Total number of sessions held in the workshop = 6 × 4 = 24.
Using statement (ii), (vii) and (ix), it can be deduced that:
Number of sessions on Management = 8
Number of sessions on Economics = 6
Number of sessions on Finance = 5
Number of sessions on Law = 5

Using statements (x), (vi), (iii), (vii), (ix), (viii), in the given order, the following conclusions can be drawn:

Slot / Day	10 am -12 pm	12 pm -2 pm	3 pm - 5 pm	5 pm - 7 pm
Mon	Management	Economics/ Finance	Management	Finance/ Economics
Tues	Law	Management	Law	Management
Wed	Finance	Law	Economics	Finance
Thur	Management	Economics	Management	Economics
Fri	Finance	Law	Finance	Law
Sat	Management	Economics	Management	Economics

Using statements (i), (iv), (x), (xi) and (xii), the following can be concluded:

Professor / Subject	Ella	Lolly	Folly	Madan
Economics	0	0	0	6
Law	5	0	0	0
Finance	0	5	0	0
Management	1	3	4	0

Law and Management

FeedBack

Bookmark

Answer key/Solution

Directions for questions 47 to 50: Answer the questions on the basis of the information given below.

In a six day workshop – starting on Monday and ending on Saturday – four sessions were held on each day. On each of the six days, the time slots for sessions were 10 am to 12 noon, 12 noon to 2 pm, 3 pm to 5 pm and 5 pm to 7 pm. The subjects that were taught in the workshop were Economics, Finance Law, and Management. The sessions were taken by four professors namely Ella, Folly, Lolly and Madan. Each professor can teach at most two of the four aforementioned subjects. Not more than two sessions on the same subject were held on any of the given days. It is also known that:

(i) For each professor, the initial of his name and that of the subject taught by him/her were not the same.
(ii) The number of sessions on Management was $33\frac{1}{3}\%$ more the number of session of on Economics.
(iii) No subject was taught on three consecutive days and also no subject was taught in two consecutive slots on the same day.
(iv) The professor who took exactly four sessions in the workshop cannot teach the subjects that were taught on Wednesday and did not take any session on Monday and Tuesday.
(v) The last session on Thursday was on Economics. The first session on Wednesday was on Finance.
(vi) Three different subjects were taught on Monday as well as on Wednesday, and on each of the remaining days exactly two subjects were taught.
(vii) The number of sessions held on Management was the maximum. Law was not taught on Monday.
(viii) Management was not taught on Wednesday. On Friday, the first session was on Finance and the last one was on Law.
(ix) The number of sessions held on one of the subjects was 5. The second session on Saturday was on Economics.
(x) No subject taught in the same slot on two consecutive days. Only Ella, who took 6 sessions, can teach Law.
(xi) Madan, who did not take the minimum number of sessions, cannot teach the subjects that were taught on Friday and the number of session taken by hi was an even number.
(xii) All the sessions on Finance were taken by the same professor.

Q.49
The subject taught in the second slot on Monday was

1 **Management**

2 **Economics**

3 **Finance**

4 Cannot be determined

Solution:
Correct Answer : 4

Bookmark

Answer key/Solution

Total number of sessions held in the workshop = 6 × 4 = 24.
Using statement (ii), (vii) and (ix), it can be deduced that:
Number of sessions on Management = 8
Number of sessions on Economics = 6
Number of sessions on Finance = 5
Number of sessions on Law = 5

Using statements (x), (vi), (iii), (vii), (ix), (viii), in the given order, the following conclusions can be drawn:

Slot / Day	10 am -12 pm	12 pm -2 pm	3 pm - 5 pm	5 pm - 7 pm
Mon	Management	Economics/ Finance	Management	Finance/ Economics
Tues	Law	Management	Law	Management
Wed	Finance	Law	Economics	Finance
Thur	Management	Economics	Management	Economics
Fri	Finance	Law	Finance	Law
Sat	Management	Economics	Management	Economics

Using statements (i), (iv), (x), (xi) and (xii), the following can be concluded:

Professor / Subject	Ella	Lolly	Folly	Madan
Economics	0	0	0	6
Law	5	0	0	0
Finance	0	5	0	0
Management	1	3	4	0

The subject taught in the second slot on Monday was either Economics or Finance. Hence, the question can not be answered.

FeedBack

Directions for questions 47 to 50: Answer the questions on the basis of the information given below.

In a six day workshop – starting on Monday and ending on Saturday – four sessions were held on each day. On each of the six days, the time slots for sessions were 10 am to 12 noon, 12 noon to 2 pm, 3 pm to 5 pm and 5 pm to 7 pm. The subjects that were taught in the workshop were Economics, Finance Law, and Management. The sessions were taken by four professors namely Ella, Folly, Lolly and Madan. Each professor can teach at most two of the four aforementioned subjects. Not more than two sessions on the same subject were held on any of the given days. It is also known that:

(i) For each professor, the initial of his name and that of the subject taught by him/her were not the same.
(ii) The number of sessions on Management was $33\frac{1}{3}\%$ more the number of session of on Economics.
(iii) No subject was taught on three consecutive days and also no subject was taught in two consecutive slots on the same day.
(iv) The professor who took exactly four sessions in the workshop cannot teach the subjects that were taught on Wednesday and did not take any session on Monday and Tuesday.
(v) The last session on Thursday was on Economics. The first session on Wednesday was on Finance.
(vi) Three different subjects were taught on Monday as well as on Wednesday, and on each of the remaining days exactly two subjects were taught.
(vii) The number of sessions held on Management was the maximum. Law was not taught on Monday.
(viii) Management was not taught on Wednesday. On Friday, the first session was on Finance and the last one was on Law.
(ix) The number of sessions held on one of the subjects was 5. The second session on Saturday was on Economics.
(x) No subject taught in the same slot on two consecutive days. Only Ella, who took 6 sessions, can teach Law.
(xi) Madan, who did not take the minimum number of sessions, cannot teach the subjects that were taught on Friday and the number of session taken by hi was an even number.
(xii) All the sessions on Finance were taken by the same professor.

Q.50
Who took the last session on Wednesday?

1 Ella

2 Folly

3 Lolly

4 Madan

Solution:
Correct Answer : 3

Bookmark

Answer key/Solution

Total number of sessions held in the workshop = 6 × 4 = 24.
Using statement (ii), (vii) and (ix), it can be deduced that:
Number of sessions on Management = 8
Number of sessions on Economics = 6
Number of sessions on Finance = 5
Number of sessions on Law = 5

Using statements (x), (vi), (iii), (vii), (ix), (viii), in the given order, the following conclusions can be drawn:

Slot / Day	10 am -12 pm	12 pm -2 pm	3 pm - 5 pm	5 pm - 7 pm
Mon	Management	Economics/ Finance	Management	Finance/ Economics
Tues	Law	Management	Law	Management
Wed	Finance	Law	Economics	Finance
Thur	Management	Economics	Management	Economics
Fri	Finance	Law	Finance	Law
Sat	Management	Economics	Management	Economics

Using statements (i), (iv), (x), (xi) and (xii), the following can be concluded:

Professor / Subject	Ella	Lolly	Folly	Madan
Economics	0	0	0	6
Law	5	0	0	0
Finance	0	5	0	0
Management	1	3	4	0

Lolly took the last session of Finance on Wednesday.

FeedBack

Directions for questions 51 to 54: Answer the questions on the basis of the information given below.

Five chess players – F1, F2, F3, F4 and F5 – participated in a chess tournament. The tournament comprises two stages. In the first stage, each player playe a match against each of the other players. In this stage, each match could last for a maximum of two hours. The points awarded to the winner of a match is given by [60 + (120 – P) × 0.2] and the points awarded to the loser of a match is given by [20 + (P – 120) × 0.2], where P is the time (in min) for which the match lasted; in case of a draw, which lasts for two hours, both the players were awarded 40 points each. On the basis of points, top three players advance to the next round; in case two or more players ended up with the same number of points, age criteria was adopted for getting top three players. In the second round, each player played three chess matches against computer. In this round, each win fetched 40 points and no point was awarded in case of a loss. In this round, each match resulted in a win/loss. The player with the highest number of points in the two stages put together announced as the winner of the tournament. Also, exactly one player became the winner. It is also known that:

(i) Despite winning three matches in stage one, and one match in stage two, F1 did not win the tournament.
(ii) In the first round, F5 won the match it played against F1, and match between F2 and F3 ended in a draw.
(iii) F2 and F3 each won two matches each in the first round.
(iv) In the first round, the total number of points of each of the five players was an integer.
(v) In the first round, each match lasted for an integral number of minutes, which was not less than 60.
(vi) Five matches collectively were won in the second stage by the three players who made to this stage.

Q.51
If there were two draws in the first stage, the total numbers of points of the winner, in the two stages taken together, could not be less than

1 ◯ **260**

2 ◯ **251**

3 ◯ **249**

4 ◯ **250**

Solution:
Correct Answer : 2

Bookmark

Answer key/Solution

Using the given information, in first stage, points awarded to the winner of a match is given by [60 + (120 – P) × 0.2] and that to the loser is given by [20 + (P – 120) × 0.2], where P is the time (in min) for which the match lasted. No match in first stage lasted for less than 60 minutes. So, winner of a match can score a maximum of 72 points and minimum of 60 points. Similarly, loser can score a minimum of 8 points and a maximum of 20 points.

In the first stage, since each player played a match against each of the other players, total number of matches 10 and each player played 4 matches in total. Using (i), number of matches F1 won in the first stage was 3 and he lost a match which he played with F5. Using statements (i), (ii) and (iii), F2 and F3 both won matches that they played against F4 and F5.

The following table shows the winner/loser and drawn status of each game in the first stage:

Player	F1	F2	F3	F4	F5
F1		√	√	√	×
F2	×		°	√	√
F3	×	°		√	√
F4	×	×	×		
F5	√	×	×		

On the basis of the given information, it can be concluded that the match played between F4 and F5 ended in a draw. The players who made it to the second stage were F1, F2 and F3. Since F1 was not the winner, either F2 or F3 won the tournament.
Let us consider F2 be the winner of the tournament, then we have to minimize the score of F2 such that he remains the winner. Using (i) and (vi), in second stage, F2 won at least 2 games.
The following score table can be formed for stage 1 such that no condition is violated and F2 emerged the winner of the tournament:

Player	F1	F2	F3	F4	F5	Total score
F1	×	69	72	60	8	209
F2	11	×	40	60	60	171
F3	8	40	×	60	60	168
F4	20	20	20	×	40	100
F5	72	20	20	40	×	152

In order to emerge as the winner F2 had to win at least two matches in stage 2. The following table gives scores of the players round for the required purpose:

Player	Score
F1	40
F2	80
F3	80

The total score of the three players at the end of second stage is given below:

Player	Score
F1	209 + 40 = 249
F2	171 + 80 = 251
F3	168 + 80 = 248

Hence, the score of the winner in the two rounds taken together could not be less than 251.

FeedBack

Directions for questions 51 to 54: Answer the questions on the basis of the information given below.

Five chess players – F1, F2, F3, F4 and F5 – participated in a chess tournament. The tournament comprises two stages. In the first stage, each player played a match against each of the other players. In this stage, each match could last for a maximum of two hours. The points awarded to the winner of a match is given by [60 + (120 – P) × 0.2] and the points awarded to the loser of a match is given by [20 + (P – 120) × 0.2], where P is the time (in min) for which the match lasted; in case of a draw, which lasts for two hours, both the players were awarded 40 points each. On the basis of points, top three players advance to the next round; in case two or more players ended up with the same number of points, age criteria was adopted for getting top three players. In the second round, each player played three chess matches against computer. In this round, each win fetched 40 points and no point was awarded in case of a loss. In this round, each match resulted in a win/loss. The player with the highest number of points in the two stages put together announced as the winner of the tournament. Also, exactly one player became the winner. It is also known that:

(i) Despite winning three matches in stage one, and one match in stage two, F1 did not win the tournament.
(ii) In the first round, F5 won the match it played against F1, and match between F2 and F3 ended in a draw.
(iii) F2 and F3 each won two matches each in the first round.
(iv) In the first round, the total number of points of each of the five players was an integer.
(v) In the first round, each match lasted for an integral number of minutes, which was not less than 60.
(vi) Five matches collectively were won in the second stage by the three players who made to this stage.

Q.52

The difference between points of the winner and the player who got second highest number of points could not be more than

1 **96**

2 **100**

3 **101**

4 **Cannot be determined**

Bookmark

Answer key/Solution

Solution:

Correct Answer : 1

Using the given information, in first stage, points awarded to the winner of a match is given by [60 + (120 – P) × 0.2] and that to the loser is given by [20 + (P – 120) × 0.2], where P is the time (in min) for which the match lasted. No match in first stage lasted for less than 60 minutes. So, winner of a match can score a maximum of 72 points and minimum of 60 points. Similarly, loser can score a minimum of 8 points and a maximum of 20 points.

In the first stage, since each player played a match against each of the other players, total number of matches 10 and each player played 4 matches in total. Using (i), number of matches F1 won in the first stage was 3 and he lost a match which he played with F5. Using statements (i), (ii) and (iii), F2 and F3 both won matches that they played against F4 and F5.

The following table shows the winner/loser and drawn status of each game in the first stage:

Player	F1	F2	F3	F4	F5
F1		√	√	√	×
F2	×		°	√	√
F3	×	°		√	√
F4	×	×	×		
F5	√	×	×		

To maximize the difference between points of the winner and the player who got second highest number of points, we have to maximize the score of the winner and minimize the score of the player who got second highest number of points.

If we consider F2 be the winner, then we have to maximize the score of F2 in the two stages. The result of the match played between F4 and F5 in stage 1 does not affect the final result. The following table can be formed to fulfill our requirements:

Stage - 1

Player	F1	F2	F3	F4	F5	Total score
F1	×	60	60	60	8	188
F2	20	×	40	72	72	204
F3	20	40	×	–	–	<188
F4	20	8	–	×	–	–
F5	72	8	–	–	×	–

In order to maximise required difference, F2 must have won 3 matches in the second round. The final scores of F1 and F2 are given below.

Final score

Player	Score
F1	188 + 40 = 228
F2	204 + 120 = 324

Hence, the required difference = 324 – 228 = 96.

FeedBack

Directions for questions 51 to 54: Answer the questions on the basis of the information given below.

Five chess players – F1, F2, F3, F4 and F5 – participated in a chess tournament. The tournament comprises two stages. In the first stage, each player playe a match against each of the other players. In this stage, each match could last for a maximum of two hours. The points awarded to the winner of a match is given by [60 + (120 – P) × 0.2] and the points awarded to the loser of a match is given by [20 + (P – 120) × 0.2], where P is the time (in min) for which the match lasted; in case of a draw, which lasts for two hours, both the players were awarded 40 points each. On the basis of points, top three players advance to the next round; in case two or more players ended up with the same number of points, age criteria was adopted for getting top three players. In the second round, each player played three chess matches against computer. In this round, each win fetched 40 points and no point was awarded in case of a loss. In this round, each match resulted in a win/loss. The player with the highest number of points in the two stages put together announced as the winne of the tournament. Also, exactly one player became the winner. It is also known that:

(i) Despite winning three matches in stage one, and one match in stage two, F1 did not win the tournament.
(ii) In the first round, F5 won the match it played against F1, and match between F2 and F3 ended in a draw.
(iii) F2 and F3 each won two matches each in the first round.
(iv) In the first round, the total number of points of each of the five players was an integer.
(v) In the first round, each match lasted for an integral number of minutes, which was not less than 60.
(vi) Five matches collectively were won in the second stage by the three players who made to this stage.

Q.53
If two of the players in stage 2 won the same number of matches, the score of F1 at the end of the tournament could not be more than

1 ◯ **265**

2 ◯ **272**

3 ◯ **273**

4 ◯ **275**

Bookmark

Answer key/Solution

Solution:
Correct Answer : 3

Using the given information, in first stage, points awarded to the winner of a match is given by [60 + (120 – P) × 0.2] and that to the loser is given by [20 + (P – 120) × 0.2], where P is the time (in min) for which the match lasted. No match in first stage lasted for less than 60 minutes. So, winner of a match can score a maximum of 72 points and minimum of 60 points. Similarly, loser can score a minimum of 8 points and a maximum of 20 points.

In the first stage, since each player played a match against each of the other players, total number of matches 10 and each player played 4 matches in total. Using (i), number of matches F1 won in the first stage was 3 and he lost a match which he played with F5. Using statements (i), (ii) and (iii), F2 and F3 both won matches that they played against F4 and F5.

The following table shows the winner/loser and drawn status of each game in the first stage:

Player	F1	F2	F3	F4	F5
F1		√	√	√	×
F2	×		°	√	√
F3	×	°		√	√
F4	×	×	×		
F5	√	×	×		

The following schemes of scores give maximum possible score for F1:

For stage - 1

Player	F1	F2	F3	F4	F5	Total score
F1	×	69	72	72	20	233
F2	11	×	40	72	72	195
F3	8	40	×	–	–	–
F4	8	8	–	×	–	–
F5	60	8	–	–	×	–

For stage - 2

Player	Score
F1	40
F2	80
F3	80

Maximum score of F1 = 233 + 40 = 273.

FeedBack

Directions for questions 51 to 54: Answer the questions on the basis of the information given below.

Five chess players – F1, F2, F3, F4 and F5 – participated in a chess tournament. The tournament comprises two stages. In the first stage, each player played a match against each of the other players. In this stage, each match could last for a maximum of two hours. The points awarded to the winner of a match is given by [60 + (120 – P) × 0.2] and the points awarded to the loser of a match is given by [20 + (P – 120) × 0.2], where P is the time (in min) for which the match lasted; in case of a draw, which lasts for two hours, both the players were awarded 40 points each. On the basis of points, top three players advance to the next round; in case two or more players ended up with the same number of points, age criteria was adopted for getting top three players. In the second round, each player played three chess matches against computer. In this round, each win fetched 40 points and no point was awarded in case of a loss. In this round, each match resulted in a win/loss. The player with the highest number of points in the two stages put together announced as the winner of the tournament. Also, exactly one player became the winner. It is also known that:

(i) Despite winning three matches in stage one, and one match in stage two, F1 did not win the tournament.
(ii) In the first round, F5 won the match it played against F1, and match between F2 and F3 ended in a draw.

(iii) F2 and F3 each won two matches each in the first round.
(iv) In the first round, the total number of points of each of the five players was an integer.
(v) In the first round, each match lasted for an integral number of minutes, which was not less than 60.
(vi) Five matches collectively were won in the second stage by the three players who made to this stage.

Q.54
If there were two draws in the first stage, find the maximum number of points that a player who did not make it to the second stage scored.

1 **152**

2 **160**

3 **154**

4 **153**

Solution:
Correct Answer : 1

Bookmark

Answer key/Solution

Using the given information, in first stage, points awarded to the winner of a match is given by [60 + (120 – P) × 0.2] and that to the loser is given by [20 + (P – 120) × 0.2], where P is the time (in min) for which the match lasted. No match in first stage lasted for less than 60 minutes. So, winner of a match can score a maximum of 72 points and minimum of 60 points. Similarly, loser can score a minimum of 8 points and a maximum of 20 points.

In the first stage, since each player played a match against each of the other players, total number of matches 10 and each player played 4 matches in total. Using (i), number of matches F1 won in the first stage was 3 and he lost a match which he played with F5. Using statements (i), (ii) and (iii), F2 and F3 both won matches that they played against F4 and F5.

The following table shows the winner/loser and drawn status of each game in the first stage:

Player	F1	F2	F3	F4	F5
F1		√	√	√	×
F2	×		°	√	√
F3	×	°		√	√
F4	×	×	×		
F5	√	×	×		

On the basis of the given information, it can be concluded that the match played between F4 and F5 ended in a draw. Both F4 and F5 did not reach to the second stage. In order to maximise the points of either F4 or F5, the points scored by him in each of the matches that he played in the first round must be maximum. Following table shows the possible scores in the first stage.

Player	F1	F2	F3	F4	F5	Total score
F4/F5	72	20	20	40	×	152

Hence, the maximum number of points that a player who did not make it to the second round scored 152.

FeedBack

Directions for questions 55 to 58: Answer the questions on the basis of the information given below.

An entrance exam, conducted by JAT, consists of 3 sections – A, B and C. Section A, B and C consist of 5, 8 and 10 questions respectively, out of which one needs to attempt 3, 6 and 9 questions respectively. Questions in three sections carry 6, 7 and 10 marks, with all the questions of a sections having the sam marks, not necessarily in the given order. Maximum marks for the exam is 150. There is no negative marking in the exam except for the questions that are attempted beyond the specified number of questions to be attempted. For a partially correct answer the test taker awarded 50% of the marks assigned to that question, and 0 marks are awarded for a wrong or un-attempted question.

Q.55
If Aashi attempts maximum number of questions and answers 3 questions incorrectly, find the maximum marks scored by her?

1 **150**

2 **142**

3 **132**

4 **129**

Solution:
Correct Answer : 3

Bookmark

For the maximum marks of the exam to be 150, each question of section A, B and C must be of 6, 7 and 10 marks respectively.

According to the given condition Aashi attempts 3, 6 and 9 questions from sections A, B and C respectively.
Aashi gets 3 answers wrong.
In order to maximise the required marks, the wrongly attempted question must be from section A.
The required marks = (3 × 0) + (6 × 7) + (9 × 10)
= 42 + 90 = 132.

FeedBack

Answer key/Solution

Directions for questions 55 to 58: Answer the questions on the basis of the information given below.

An entrance exam, conducted by JAT, consists of 3 sections – A, B and C. Section A, B and C consist of 5, 8 and 10 questions respectively, out of which one needs to attempt 3, 6 and 9 questions respectively. Questions in three sections carry 6, 7 and 10 marks, with all the questions of a sections having the sam marks, not necessarily in the given order. Maximum marks for the exam is 150. There is no negative marking in the exam except for the questions that are attempted beyond the specified number of questions to be attempted. For a partially correct answer the test taker awarded 50% of the marks assigned to that question, and 0 marks are awarded for a wrong or un-attempted question.

Q.56

In the exam, the candidate gets –1 mark per question for attempting more than the required number of questions. Ashi forgets about the restriction and attempts all the questions given. Her score cannot be more than

1 **145**

2 **140**

3 **135**

4 **130**

Solution:
Correct Answer : 1

For the maximum marks of the exam to be 150, each question of section A, B and C must be of 6, 7 and 10 marks respectively.

For attempting the required number of questions, the maximum marks scored by her
= (3 × 6) + (6 × 7) + (9 × 10) = 18 + 42 + 90 = 150.
For attempting extra questions, the penalty marks
= –1 × ((5 – 3) + (8 – 6) + (10 – 9)) = –(2 + 2 + 1) = –5.
So, her final score = 150 – 5 = 145.

FeedBack

Bookmark

Answer key/Solution

Directions for questions 55 to 58: Answer the questions on the basis of the information given below.

An entrance exam, conducted by JAT, consists of 3 sections – A, B and C. Section A, B and C consist of 5, 8 and 10 questions respectively, out of which one needs to attempt 3, 6 and 9 questions respectively. Questions in three sections carry 6, 7 and 10 marks, with all the questions of a sections having the sam marks, not necessarily in the given order. Maximum marks for the exam is 150. There is no negative marking in the exam except for the questions that are attempted beyond the specified number of questions to be attempted. For a partially correct answer the test taker awarded 50% of the marks assigned to that question, and 0 marks are awarded for a wrong or un-attempted question.

Q.57

Divya attempts the same number of questions from each section. The number of questions attempted by Aashi forms an AP with maximum possible commc difference. If neither of the two got 0 marks for any question, then find the minimum possible value of the absolute difference between the marks scored b Divya and that of Aashi.

1 **1**

2 **0**

3 **7**

4 **0.5**

Solution:
Correct Answer : 2

Bookmark

Answer key/Solution

For the maximum marks of the exam to be 150, each question of section A, B and C must be of 6, 7 and 10 marks respectively.

Our objective is to make the required difference 0, while can be done in various ways. One of the ways is given below:
Divya attempts 3 questions correctly from each section.
Her total score = 3 × 6 + 3 × 7 + 3 × 10 = 18 + 21 + 30 = 69.
The number of questions attempted by Aashi in section A, B and C has to be 1, 5 and 9 respectively to satisfy the given condition. Her total score to attain our objective = 1 × (50% of 6) + [4 × (50% or 7) + 1 × 7] + 9 × (50% of 10)
= 3 + 14 + 7 + 45 = 69.
∴ Required difference is 0.

FeedBack

Directions for questions 55 to 58: Answer the questions on the basis of the information given below.

An entrance exam, conducted by JAT, consists of 3 sections – A, B and C. Section A, B and C consist of 5, 8 and 10 questions respectively, out of which one needs to attempt 3, 6 and 9 questions respectively. Questions in three sections carry 6, 7 and 10 marks, with all the questions of a sections having the sam marks, not necessarily in the given order. Maximum marks for the exam is 150. There is no negative marking in the exam except for the questions that are attempted beyond the specified number of questions to be attempted. For a partially correct answer the test taker awarded 50% of the marks assigned to that question, and 0 marks are awarded for a wrong or un-attempted question.

Q.58
If Divya attempts even number of questions from each section, with a different number of questions from each section, and she does not score 0 marks for any questions, find the minimum marks scored by Divya.

1 **100**

2 **94**

3 **57**

4 **47**

Solution:
Correct Answer : 4

Bookmark

Answer key/Solution

For the maximum marks of the exam to be 150, each question of section A, B and C must be of 6, 7 and 10 marks respectively.

To minimize the score, Divya has to attempt 2 questions from Section A, 6 questions from Section B and 4 questions from Section C. She does not score 0 marks for any of the questions but she can score 50% of the marks assigned to questions.
The minimum marks scored by her in this case
= (2 × 3) + (6 × 3.5) + (4 × 5) = 6 + 21 + 20 = 47.

FeedBack

Directions for questions 59 to 62: Answer the questions on the basis of the information given below.

In an organization the employees are divided into three categories –Manager, skilled labour and unskilled labour. The ratio of the number of manager, skilled labour and unskilled labour in the organization in 2012 was 1 : 10 : 4. The average monthly salary of Manager, skilled labour and unskilled labour was Rs. 45000, Rs. 30000 and Rs. 20000 respectively in 2012. The following table shows the percentage increase in the average salary of the three types employees in the organization in 2013, 2014 and 2015 over the previous year.

	2013	2014	2015
Manager	10	20	20
Skilled labour	10	20	10
Unskilled labour	10	10	20

Q.59
Which type of employees got the least percentage increment in their average salary for the given period?

1 **Manager**

2 **Skilled labour**

3 **Unskilled labour**

4 **Both Skilled and unskilled labour**

Solution:
Correct Answer : 4
Percentage increment in the average salary of employees for the given period can be tabulated as:

	Composite Percentage increase in the salary over the given period
Manager	100 × 1.1 × 1.2 × 1.2 – 100 = 58.4
Skilled labour	45.2
Unskilled labour	45.2

Both skilled and unskilled labour got the least percentage increment in their salary for the given period.

FeedBack

Bookmark

Answer key/Solution

Directions for questions 59 to 62: Answer the questions on the basis of the information given below.

In an organization the employees are divided into three categories –Manager, skilled labour and unskilled labour. The ratio of the number of manager, skilled labour and unskilled labour in the organization in 2012 was 1 : 10 : 4. The average monthly salary of Manager, skilled labour and unskilled labour was Rs. 45000, Rs. 30000 and Rs. 20000 respectively in 2012. The following table shows the percentage increase in the average salary of the three types o employees in the organization in 2013, 2014 and 2015 over the previous year.

	2013	2014	2015
Manager	10	20	20
Skilled labour	10	20	10
Unskilled labour	10	10	20

Q.60
At the end of 2015, it was decided among the employees that the category of employees getting the maximum percentage increase in the average salary during the period 2013-2015 will throw a party to all the employees in the organization, which type of employees threw party?

1 **Manager**

2 **Skilled labour**

3 **Unskilled labour**

4 **Both Skilled and unskilled labour**

Solution:
Correct Answer : 1
Percentage increment in the average salary of employees for the given period can be tabulated as:

	Composite Percentage increase in the salary over the given period
Manager	100 × 1.1 × 1.2 × 1.2 – 100 = 58.4
Skilled labour	45.2
Unskilled labour	45.2

From the table above it can be seen that managers got the highest percentage increment in their average salary over the given period.

FeedBack

Bookmark

Answer key/Solution

Directions for questions 59 to 62: Answer the questions on the basis of the information given below.

In an organization the employees are divided into three categories –Manager, skilled labour and unskilled labour. The ratio of the number of manager, skilled labour and unskilled labour in the organization in 2012 was 1 : 10 : 4. The average monthly salary of Manager, skilled labour and unskilled labour was Rs. 45000, Rs. 30000 and Rs. 20000 respectively in 2012. The following table shows the percentage increase in the average salary of the three types o employees in the organization in 2013, 2014 and 2015 over the previous year.

	2013	2014	2015
Manager	10	20	20
Skilled labour	10	20	10
Unskilled labour	10	10	20

Q.61
In 2016, the company hired 20 skilled labours, 6 unskilled labours and 4 managers, resulting in a change in the proportion of employees in the three categories. There was no increase in the average salary of any employee in 2016 over the previous year and the new employees were also hired at the sam average salaries in their respective categories. Which of the following is true about the average salary per employee in the organisation in 2016 as

compared to that in 2015?

1 **Increased**

2 **Decreased**

3 **Remained unchanged**

4 **Cannot be determined**

Solution:
Correct Answer : 1

Bookmark

Answer key/Solution

Percentage increment in the average salary of employees for the given period can be tabulated as:

	Composite Percentage increase in the salary over the given period
Manager	100 × 1.1 × 1.2 × 1.2 – 100 = 58.4
Skilled labour	45.2
Unskilled labour	45.2

Initial ratio of manager, skilled labour and unskilled labour was 1 : 10 : 4. Now, the number of employees in the given order increased in the ratio 2 : 10 : 3. Since percentage increase in the number of managers is more than the other two types of employees and salary for manager is maximum, the average salary per employee in 2016 as compared to that in 2015 will increase.

FeedBack

Directions for questions 59 to 62: Answer the questions on the basis of the information given below.

In an organization the employees are divided into three categories –Manager, skilled labour and unskilled labour. The ratio of the number of manager, skilled labour and unskilled labour in the organization in 2012 was 1 : 10 : 4. The average monthly salary of Manager, skilled labour and unskilled labour was Rs. 45000, Rs. 30000 and Rs. 20000 respectively in 2012. The following table shows the percentage increase in the average salary of the three types o employees in the organization in 2013, 2014 and 2015 over the previous year.

	2013	2014	2015
Manager	10	20	20
Skilled labour	10	20	10
Unskilled labour	10	10	20

Q.62
If the ratio of the number of three categories of employees in 2015 was the same as that in 2012, then the total salary paid to mangers in 2015 was what percent more or less than that to unskilled labour in the same year?

1 **26.23% more**

2 **32.43% less**

3 **41.63% less**

4 **38.63% less**

Solution:
Correct Answer : 4

Bookmark

Answer key/Solution

Percentage increment in the average salary of employees for the given period can be tabulated as:

	Composite Percentage increase in the salary over the given period
Manager	100 × 1.1 × 1.2 × 1.2 – 100 = 58.4
Skilled labour	45.2
Unskilled labour	45.2

Let the initial number of managers, skilled labours and unskilled labours be x, 10x and 4x respectively
Total salary paid to managers in 2015

$$= \text{Rs.}\left(45000 \times x \times \frac{158.4}{100}\right)$$

= Rs. 71280x.
Total salary paid to unskilled labours in 2015

$$= \text{Rs.}\left(20000 \times 4x \times \frac{145.2}{100}\right)$$

= Rs. 116160x.
Required percentage change

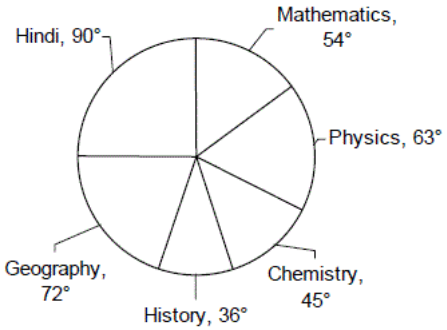
$$= \left(\frac{71280x - 116160x}{116160x}\right) \times 100 = -38.63\%$$

Hence, the total salary paid to managers in 2015 was 38.63% less than that of unskilled labour in the same year.

FeedBack

Directions for questions 63 to 66: Answer the questions on the basis of the information given below:

In a college there are six departments - Mathematics, Physics, Chemistry, History, Geography and Hindi. Each Department has a different number of professors. In each department, the students are divided into two categories- Undergraduate and Postgraduate. The following doughnut chart gives the percentage distribution of the number of professors across the six departments.



The table given below gives the number of students per professor across six departments.

Department	Students/Professor
Mathematics	$6\frac{2}{3}$
Physics	10
Chemistry	6
History	15
Geography	3.75
Hindi	4

No department has more than 20 Professors. No two departments have the same combination of the number of Undergraduate students and that of Postgraduates students. There is only one department that has no Postgraduate students, and each department has at least 10 Undergraduate students. The number of Undergraduate students in each department is a multiple of 10. The number of Postgraduate students in History and Physics is 20 and 40 respectively. No department has more than 90 Undergraduate students.

Q.63
In how many departments is the number of Postgraduate students is definitely more than that of Undergraduate students?
Fill 1 if "your answer is 1"
Fill 2 if "your answer is 2"
Fill 3 if "your answer is 3"
Fill 4 if "your answer is 4"

Bookmark

Answer key/Solution

Solution:

Correct Answer : 1

Let the total number of professors be 40n.
Using the doughnut chart and table given in the questions, the following table can be drawn:

Department	Professors	Students
Mathematics	6n	40n
Physics	7n	70n
Chemistry	5n	30n
History	4n	60n
Geography	8n	30n
Hindi	10n	40n

Now no department has more than 20 Professors. Thus the number of professors in Hindi department ≤ 20
or 10n ≤ 20
or n ≤ 2
Now n = 2 is not feasible as in this case the number of students in Physics department will be 140 which implies that Physics department will 100 Undergraduate. But this is not possible as no department has more than 90 Undergraduate.
So n = 1.

The following table can be drawn we get the following table:

Department	No. of Professors	No. of Students	No. of under-graduates	No. of post-graduates
Mathematics	6	40		
Physics	7	70	30	40
Chemistry	5	30		
History	4	60	40	20
Geography	8	30		
Hindi	10	40		

Now each of Mathematics and Hindi department can have one of the following combination of the number of undergraduate and that of Postgraduate students: (10, 30), (20, 20), (30, 10), (40, 0).

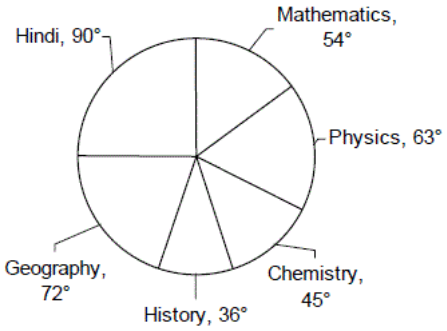
Similarly, each of the Chemistry and Geography department can have one of the following combination of the number of undergraduate and that of Postgraduate students: (10, 20), (20, 10) or (30, 0).

We could be sure only about the Physics department.

FeedBack

Directions for questions 63 to 66: Answer the questions on the basis of the information given below:

In a college there are six departments - Mathematics, Physics, Chemistry, History, Geography and Hindi. Each Department has a different number of professors. In each department, the students are divided into two categories- Undergraduate and Postgraduate. The following doughnut chart gives the percentage distribution of the number of professors across the six departments.



The table given below gives the number of students per professor across six departments.

Department	Students/Professor
Mathematics	$6\frac{2}{3}$
Physics	10
Chemistry	6
History	15
Geography	3.75
Hindi	4

No department has more than 20 Professors. No two departments have the same combination of the number of Undergraduate students and that of Postgraduates students. There is only one department that has no Postgraduate students, and each department has at least 10 Undergraduate students. The number of Undergraduate students in each department is a multiple of 10. The number of Postgraduate students in History and Physics is 20 and 40 respectively. No department has more than 90 Undergraduate students.

Q.64

Which of the following cannot be the ratio of the number of Undergraduates in Chemistry department to that in Hindi department?
Fill 1 if "your answer is 1 : 3"
Fill 2 if "your answer is 2 : 1"
Fill 3 if "your answer is 3 : 2"
Fill 4 if "your answer is 4 : 3"

Solution:
Correct Answer : 4

Bookmark

Answer key/Solution

Let the total number of professors be 40n.
Using the doughnut chart and table given in the questions, the following table can be drawn:

Department	Professors	Students
Mathematics	6n	40n
Physics	7n	70n
Chemistry	5n	30n
History	4n	60n
Geography	8n	30n
Hindi	10n	40n

Now no department has more than 20 Professors. Thus the number of professors in Hindi department ≤ 20
or $10n \leq 20$
or $n \leq 2$
Now n = 2 is not feasible as in this case the number of students in Physics department will be 140 which implies that Physics department will 100 Undergraduate. But this is not possible as no department has more than 90 Undergraduate.
So n = 1.

The following table can be drawn we get the following table:

Department	No. of Professors	No. of Students	No. of under-graduates	No. of post-graduates
Mathematics	6	40		
Physics	7	70	30	40
Chemistry	5	30		
History	4	60	40	20
Geography	8	30		
Hindi	10	40		

Now each of Mathematics and Hindi department can have one of the following combination of the number of undergraduate and that of Postgraduate students: (10, 30), (20, 20), (30, 10), (40, 0).

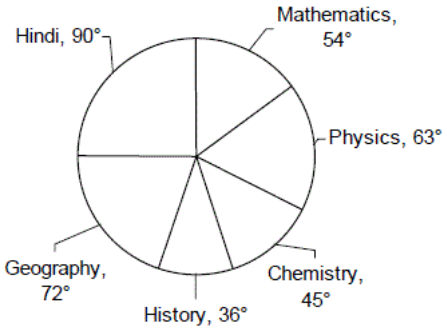
Similarly, each of the Chemistry and Geography department can have one of the following combination of the number of undergraduate and that of Postgraduate students: (10, 20), (20, 10) or (30, 0).

All the ratios except 4 : 3 are possible.

FeedBack

Directions for questions 63 to 66: Answer the questions on the basis of the information given below:

In a college there are six departments - Mathematics, Physics, Chemistry, History, Geography and Hindi. Each Department has a different number of professors. In each department, the students are divided into two categories- Undergraduate and Postgraduate. The following doughnut chart gives the percentage distribution of the number of professors across the six departments.



The table given below gives the number of students per professor across six departments.

Department	Students/Professor
Mathematics	$6\frac{2}{3}$
Physics	10
Chemistry	6
History	15
Geography	3.75
Hindi	4

No department has more than 20 Professors. No two departments have the same combination of the number of Undergraduate students and that of Postgraduates students. There is only one department that has no Postgraduate students, and each department has at least 10 Undergraduate students. The number of Undergraduate students in each department is a multiple of 10. The number of Postgraduate students in History and Physics is 20 and 40 respectively. No department has more than 90 Undergraduate students.

Q.65

For which department is the value of the product of the number of professors and the number of students the minimum?
Fill 1 if "your answer is History"
Fill 2 if "your answer is Chemistry"
Fill 3 if "your answer is Physics"
Fill 4 if "your answer is Mathematics"

Bookmark

Answer key/Solution

Solution:

Correct Answer : 2

Let the total number of professors be 40n.
Using the doughnut chart and table given in the questions, the following table can be drawn:

Department	Professors	Students
Mathematics	6n	40n
Physics	7n	70n
Chemistry	5n	30n
History	4n	60n
Geography	8n	30n
Hindi	10n	40n

Now no department has more than 20 Professors. Thus the number of professors in Hindi department ≤ 20
or $10n \leq 20$
or $n \leq 2$
Now n = 2 is not feasible as in this case the number of students in Physics department will be 140 which implies that Physics department will 100 Undergraduate. But this is not possible as no department has more than 90 Undergraduate.
So n = 1.

The following table can be drawn we get the following table:

Department	No. of Professors	No. of Students	No. of under-graduates	No. of post-graduates
Mathematics	6	40		
Physics	7	70	30	40
Chemistry	5	30		
History	4	60	40	20
Geography	8	30		
Hindi	10	40		

Now each of Mathematics and Hindi department can have one of the following combination of the number of undergraduate and that of Postgraduate students: (10, 30), (20, 20), (30, 10), (40, 0).

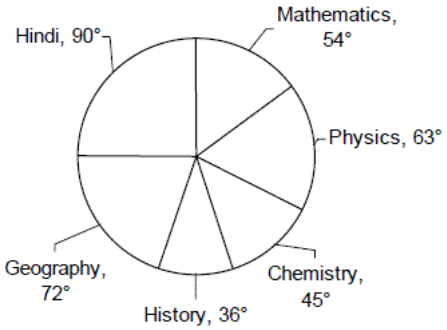
Similarly, each of the Chemistry and Geography department can have one of the following combination of the number of undergraduate and that of Postgraduate students: (10, 20), (20, 10) or (30, 0).

The required product is minimum for the Chemistry department and it is = 5 × 30 = 150.

FeedBack

Directions for questions 63 to 66: Answer the questions on the basis of the information given below:

In a college there are six departments - Mathematics, Physics, Chemistry, History, Geography and Hindi. Each Department has a different number of professors. In each department, the students are divided into two categories- Undergraduate and Postgraduate. The following doughnut chart gives the percentage distribution of the number of professors across the six departments.



The table given below gives the number of students per professor across six departments.

Department	Students/Professor
Mathematics	$6\frac{2}{3}$
Physics	10
Chemistry	6
History	15
Geography	3.75
Hindi	4

No department has more than 20 Professors. No two departments have the same combination of the number of Undergraduate students and that of Postgraduates students. There is only one department that has no Postgraduate students, and each department has at least 10 Undergraduate students. The number of Undergraduate students in each department is a multiple of 10. The number of Postgraduate students in History and Physics is 20 and 40 respectively. No department has more than 90 Undergraduate students.

Q.66
Which department does not have any Postgraduate students?
Fill 1 if "your answer is Mathematics"
Fill 2 if "your answer is Chemistry"
Fill 3 if "your answer is Geography"
Fill 4 if "your answer is Cannot be determined"

Solution:
Correct Answer : 4

Bookmark

Answer key/Solution

Let the total number of professors be 40n.
Using the doughnut chart and table given in the questions, the following table can be drawn:

Department	Professors	Students
Mathematics	6n	40n
Physics	7n	70n
Chemistry	5n	30n
History	4n	60n
Geography	8n	30n
Hindi	10n	40n

Now no department has more than 20 Professors. Thus the number of professors in Hindi department ≤ 20
or 10n ≤ 20
or n ≤ 2
Now n = 2 is not feasible as in this case the number of students in Physics department will be 140 which implies that Physics department will 100 Undergraduate. But this is not possible as no department has more than 90 Undergraduate.
So n = 1.

The following table can be drawn we get the following table:

Department	No. of Professors	No. of Students	No. of under-graduates	No. of post-graduates
Mathematics	6	40		
Physics	7	70	30	40
Chemistry	5	30		
History	4	60	40	20
Geography	8	30		
Hindi	10	40		

Now each of Mathematics and Hindi department can have one of the following combination of the number of undergraduate and that of Postgraduate students: (10, 30), (20, 20), (30, 10), (40, 0).

Similarly, each of the Chemistry and Geography department can have one of the following combination of the number of undergraduate and that of Postgraduate students: (10, 20), (20, 10) or (30, 0).

From the given data, we cannot find the department that does not have any Postgraduate students.

FeedBack

Sec 3

Q.67

Tania plans to prepare for the CAT examination over a span of 100 days, by practicing some questions on each day. Each day she solves at most 20 problem If on any day, she solves more than 12 problems, then she solves at most 6 problems each on the next two days. What is the maximum number of problems that she can solve over the period of 100 days?

1 ◯ **1200**

2 ◯ **1208**

3 ◯ **1220**

4 ◯ **1120**

Solution:
Correct Answer : 2
If Tania solves more than 12 problems on any day then in three days period she can solve a maximum of 20 + 6 + 6 = 32 problems. On the other hand she could have solved 36 problems over this span by solving 12 problems each day.
So to achieve the maximum she must not solve more than 12 problems on any day except possibly the last day.
So, maximum number of problems she could have solved = 99 × 12 + 20 = 1208

Bookmark

Answer key/Solution

FeedBack

Q.68

20% of the students in a class failed in an examination. Out of the students who failed, 75% were males. Male students who failed constitute 90% of the economically poor students in the class. What is the ratio of the number of economically poor students to the total number of students in the class?

1 ◯ **1 : 6**

2 ◯ **1 : 4**

3 ◯ **1 : 5**

4 ◯ **5 : 6**

Solution:
Correct Answer : 1
Let the total number of students in the class be 'x' and the total number of students in the class who are economically poor be 'p'.

Total number of students who failed $= \frac{x}{5}$.

Total number of male students who failed

$\Rightarrow \frac{3}{4} \times \frac{x}{5} = \frac{9}{10} \times p \Rightarrow \frac{p}{x} = \frac{1}{6}$

FeedBack

Bookmark

Answer key/Solution

Q.69
How many 5-digit numbers are there such that digits at hundred's place, unit's place and ten-thousand's place are the first three terms of a geometric progression in any order?

Solution:
Correct Answer : 3300
Number is of the form $a_1 a_2 a_3 a_4 a_5$ where $a_1 \neq 0$
Possible geometric progressions are
(1, 1, 1), (2, 2, 2), (3, 3, 3) ... (9, 9, 9) and
(1, 2, 4), (1, 3, 9), (2, 4, 8), (4, 6, 9)
$\Rightarrow 9 \times (1 \times 10 \times 1 \times 10 \times 1) + 4 \times (3! \times 10 \times 10)$
= 3300 numbers in all.

FeedBack

Bookmark

Answer key/Solution

Q.70
If (a + b + c) (b + c – a) = (c + a – b) (a + b – c), where a, b and c are the sides of a triangle, which of the following represents the area of the triangle?

1 ◯ $\frac{1}{4}$ (a + b – c) (a + b + c)

2 ◯ $\frac{1}{4}$ (a – b + c) (a + b + c)

3 ◯ $\frac{1}{4}$ (b + c – a) (a + b + c)

4 ◯ $\frac{1}{4}$ (b + c – a) (a + b – c)

Solution:
Correct Answer : 3
Semi-perimeter of a triangle is represented as 's' where

$s = \frac{a+b+c}{2}$

Therefore (a + b + c) = 2s,
Also, (b + c – a) = (2s – 2a), (c + a – b) = (2s – 2b) and (a + b – c) = (2s – 2c)
It is given that, (a + b + c) (b + c – a) = (c + a – b) (a + b – c)
Or, 2s(2s – 2a) = (2s – 2b) (2s – 2c)
Or, 4s(s – a) = 4(s – b)(s – c)
Or, s(s – a) = (s – b)(s – c)
We know that area of a triangle $A = \sqrt{s(s-a)(s-b)(s-c)}$
Here, s(s – a) = (s – b) (s – c)

$\therefore A = \sqrt{[s(s-a)]^2} = s(s-a)$

$= \frac{1}{4}[2s(2s-2a)] = \frac{1}{4}(a+b+c)(b+c-a).$

FeedBack

Bookmark

Answer key/Solution

Q.71

The value of the expression $\left(\frac{y^m}{y^n}\right)^{\frac{1}{mn}}.\left(\frac{y^n}{y^p}\right)^{\frac{1}{np}}.\left(\frac{y^p}{y^m}\right)^{\frac{1}{mp}}$ **is**

1 **1**

2 $\frac{1}{y^{mnp}}$

3 $y^{mn + np + pm}$

4 **None of these**

Solution:
Correct Answer : 1

$y^{\left(\frac{m-n}{mn}\right)}.y^{\left(\frac{n-p}{np}\right)}.y^{\left(\frac{p-m}{mp}\right)} = y^{\frac{1}{n}-\frac{1}{m}}.y^{\frac{1}{p}-\frac{1}{n}}.y^{\frac{1}{m}-\frac{1}{p}} = y^0 = 1.$

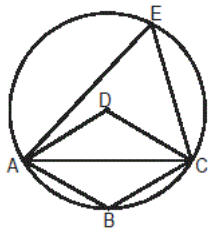
FeedBack

Bookmark

Answer key/Solution

Q.72

In the figure given below, ABCD is a rhombus, and D is the center of the circle. What is the measure of ∠AEC?



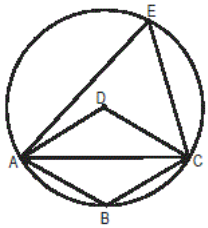
1 **45°**

2 **50°**

3 **60°**

4 **70°**

Solution:
Correct Answer : 3



By the problem, ABCD is a rhombus.
⇒ ∠ADC = ∠ABC.
Let ∠AEX = x°.
⇒ ∠ADC = 2x° …(angle subtended at center = twice angle subtended at circumference)
and ∠ABC = (180 – x)°
…(ABCE is a cyclic quadrilateral)
∴ 2x° = (180 – x)°
⇒ ∠AEC = x° = 60°.

FeedBack

Bookmark

Answer key/Solution

Q.73

Which of the following values of x satisfies the inequality $64^{\left(\frac{2-3x}{6}\right)} - 14\times4^{-x} + 12\times2^{-x} < 0,$ **where 'x' is a real number?**

1 $\log_{0.5}2.2$

2 $\log_{0.5}1.8$

3 $\log_{0.5}1.2$

4 $\log_{0.5}1.4$

Solution:
Correct Answer : 2

Bookmark

Answer key/Solution

$64^{\frac{2-3x}{6}} - 14 \times 4^{-x} + 12 \times 2^{-x} < 0$

$\Rightarrow (64)^{-\frac{x}{2}} \times (64)^{\frac{1}{3}} - 14 \times (4)^{-x} + 12.\left(2^{-x}\right) < 0$

$\Rightarrow (8^{-x}) \times 4 - 14(2^{-2x}) + 12.\left(2^{-x}\right) < 0$

$\Rightarrow 4 \times (2^{-x})^3 - 14 \times (2^{-x})^2 + 12 \times (2^{-x}) < 0$

$\Rightarrow 2^{-x}\left\{4 \times (2^{-x})^2 - 14 \times 2^{-x} + 12\right\} < 0$

2^{-x} is always positive

$\Rightarrow 4 \times (2^{-x})^2 - 14.2^{-x} + 12 < 0$

Let $2^{-x} = t$

$\Rightarrow 4t^2 - 14t + 12 < 0$

or $(t-2)\left(t-\frac{3}{2}\right) < 0 \Rightarrow \frac{3}{2} < t < 2$ or $\frac{3}{2} < 2^{-x} < 2$

$\Rightarrow \frac{3}{2} < \left(\frac{1}{2}\right)^x < 2 \Rightarrow \log_{0.5} 2 < x < \log_{0.5} 1.5$

Only option (2) is correct.

FeedBack

Q.74

Two years ago, the sum of annual incomes of Roshan and his four brothers A, B, C and D was Rs.1,18,000. Two years hence, the sum of annual incomes of Roshan and the two brothers A and D will be Rs.1,00,000. The present annual incomes, in the given order, of A, B, C and D are in an Arithmetic Progressior with a common difference of Rs.2,000. If the annual income of Roshan, along with each of his four brothers, increases by Rs.1,000 every year find the present annual income of A (in Rs.).

Solution:
Correct Answer : 14000

Bookmark

Answer key/Solution

Let us assume the incomes of Roshan and the average income of his 4 brothers A, B, C and D, two years ago were x and y respectively.

$\therefore$ x + 4y = 118000 ...(i)

If I_A, I_B, I_C and I_D denote the incomes of A, B, C and D, two years ago, then,

$I_A + I_D = I_B + I_C = 2y$

It is also given that sum of Roshan's income along with brother A and D will be 100,000 after 2 years from now. As the incomes of the four brothers A, B, C and D are in arithmetic progression with the common difference of Rs.2000, so two years from now the sum of incomes of brothers A and D will be Rs.(2y + 4000 + 4000) as the income increases by Rs.1000 every year.

$\therefore$ (x + 4000) +2(y + 4000) = 100000 ...(ii)

Solving equation (i) and (ii), we get
x = Rs. 58,000 and y = Rs.15,000.

So, the present average income of A, B, C and D is Rs.17,000.

$\Rightarrow$ The present incomes of A, B, C and D are (14,000, 16,000, 18,000, 20,000).

FeedBack

Q.75

In the X-Y plane, what is the area of the region bounded by the following two curves? f(x) = max(x − 1, 1 − x) − 1 and g(x) = min(x + 2, − 2 − x) + 3

1 **2 sq. units**

2 **2.5 sq. units**

3 **3 sq. units**

4 **3.5 sq. units**

Solution:
Correct Answer : 4

Bookmark

Answer key/Solution

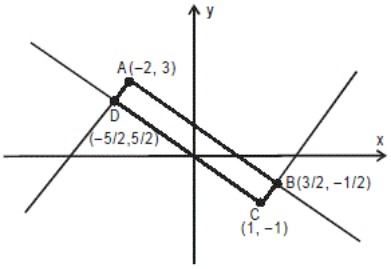
$\max(x-1, 1-x) = |x-1|$

and $\min(x+2, -2-x) = -|x+2|$

Thus, $f(x)+1 = |x-1|$

and $g(x)-3 = -|x+2|$

Drawing the graphs of f(x) and g(x) in the X–Y plane;



The bounded region ABCD, is a rectangle.

$AB = CD = \frac{7}{\sqrt{2}}$ units and $BC = AD = \frac{1}{\sqrt{2}}$ units

Area $= \left(\frac{7}{\sqrt{2}}\right) \times \left(\frac{1}{\sqrt{2}}\right)$ sq.units = 3.5 sq. units.

FeedBack

Q.76

Raman planted two climbers A and B at the same spot at the bottom of a 30 metres high cylindrical pillar, whose radius is 1 metre. When he came back afte a year, he found that the climber A had climbed the pillar by completing 5 uniform spirals in the clockwise direction and climber B did the same in 3 uniforı spirals in the anti-clockwise direction. What is the height (in metres) at which paths of climbers A and B cross each other for the first time?

1 ◯ **3.6**

2 ◯ **3.5**

3 ◯ **4.25**

4 ◯ **3.75**

Solution:
Correct Answer : 4

Bookmark

Answer key/Solution

Climber A, shown in dotted line, has made 5 uniform spirals in the clockwise direction whereas climber B, shown in bold line has made 3 uniform spirals in the anti-clockwise direction.

As given below in the figure the rectangular cross section of the cylindrical pillar. As we can observe, paths of both the climbers cross each other at 7 points.

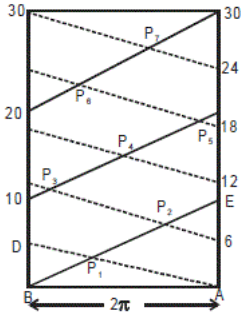
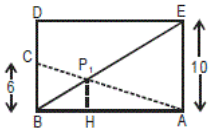


Figure given below shows the first crossing point of the paths of climbers A and B at P_1. The height is P_1H.



Now from right angled triangle ABC,
Triangles BCP_1 and AP_1E are similar.

$\therefore \frac{BC}{EA}=\frac{CP_1}{AP_1}$

$\frac{AP_1}{CP_1}=\frac{10}{6}$

$\frac{AP_1}{AC}=\frac{10}{16}$

Now, triangles AP_1H and ABC are also similar.

$\therefore \frac{P_1H}{BC}=\frac{AP_1}{AC}=\frac{10}{16}$

$P_1H=\frac{10}{16}\times BC$

$\Rightarrow P_1H=\frac{10}{16}\times 6=3.75$ meters.

FeedBack

Q.77

The average of 15 whole numbers is $5\frac{1}{3}$. The minimum number of numbers that get(s) repeated is

1 **1**

2 **2**

3 **5**

4 **Cannot be determined**

Solution:
Correct Answer : 1

To have minimum number of numbers that get(s) repeated, we should take as many distinct and minimum numbers as possible.

$\underset{1st}{0}+\underset{2nd}{1}+\underset{3rd}{2}+\underset{4th}{3}+\underset{5th}{4}+\underset{6th}{5}+\underset{7th}{6}+\underset{8th}{7}+\underset{9th}{8}+\underset{10th}{9}$

$+\underset{11th}{10}+\underset{12th}{11}+\underset{13th}{12}+\underset{14th}{1}+\underset{15th}{1}=80$

and average of these numbers = $5\frac{1}{3}$

So, 2nd = 14th = 15th
Hence minimum 1 number, i.e, 1.

FeedBack

Bookmark

Answer key/Solution

Q.78

Ralph wants to paint the four walls and the ceiling of his room, which is cuboidal in shape. He wants to find out the cost of paint but he is unable to do so as he does not know the exact dimensions of his room. The only thing he knows is that the length, width and height of his room are in the ratio 5 : 3 : 4. Peter, Ralph's best friend, has a room which is 10% longer, 20% wider and 15% lower in height than Ralph's room. Peter's cost of paint was Rs. 4838.37. If the price of the paint per square unit of area to be used by Ralph is same as that used by Peter, then what would be Ralph's approximate cost (in Rs.) of paint fo painting his room?

1 **4760**

2 **4880**

3 **4250**

4 **4680**

Solution:

Correct Answer : 4

Lateral surface area of the room = 2(l + b)h.
Surface area of the ceiling = l × b
∴ Total area to be painted = 2(l + b)h + lb
l : b : h = 5 : 3 : 4
∴ l = 5x, b = 3x, h = 4x
Area to be painted in Ralph's room
= 2(5x + 3x)4x + 4x(3x) = 79x²
Area to be painted in Peter's room
= 2[1.1(5x) + 1.2(3x)] × 0.85(4x) + [(1.1)5x × (1.2)3x]
= 2 × 9.1x × 3.4x + 19.80x² = 81.68x² sq. units
Cost of paint for an area of 81.68x² sq. units
= Rs. 4838.37
∴ Cost of paint for an area of 79x²

$$= \frac{79x^2 \times 4838.37}{81.68x^2} \approx 4679.6 \approx 4680.$$

FeedBack

Bookmark

Answer key/Solution

Q.79

$$f(x) = \begin{cases} 2^x - 1, & \text{if } x \text{ is an odd natural number} \\ 2^x + 3, & \text{if } x \text{ is an even natural number} \end{cases}$$

What is the remainder when f(1) + f(2) + f(3) + ... + f(73) is divided by 9?

Solution:

Correct Answer : 1

By the problem,
f(1) = 1, f(2) = 7, f(3) = 7, f(4) = 19 and so on.

$$\text{Rem}\left[\frac{f(1)+f(2)}{9}\right] = \text{Rem}\left[\frac{f(3)+f(4)}{9}\right] = \ldots$$

$$= \text{Rem}\left[\frac{f(71)+f(72)}{9}\right] = -1$$

$$\therefore \text{Rem}\left[\frac{f(1)+f(2)+f(3)+\ldots+f(73)}{9}\right]$$

$$= \text{Rem}\left[\frac{(-1)\times 36 + f(73)}{9}\right]$$

$$= \text{Rem}\left[\frac{0+2^{73}-1}{9}\right] = \text{Rem}\left[\frac{(2^3)^{24}\times 2 - 1}{9}\right]$$

$$= \text{Rem}\left[\frac{(9-1)^{24}\times 2 - 1}{9}\right] = \text{Rem}\left[\frac{((-1)^{24}\times 2 - 1)}{9}\right] = 1.$$

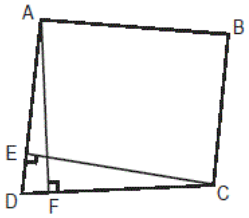
FeedBack

Bookmark

Answer key/Solution

Q.80

In the figure given below, CE ⊥ AD and AF ⊥ DC. If CE = 5.2 cm, AF = 4.8 cm and AD = 7.1 cm, then find the length (in cm) of CD.



1 **6.52**

2 **7.53**

3 **4.98**

4 **7.69**

Solution:
Correct Answer : 4
$\Delta AFD \sim \Delta CED$ (AA similarity)

$\therefore \frac{AF}{CE} = \frac{AD}{CD}$

$\Rightarrow \frac{4.8}{5.2} = \frac{7.1}{CD}$

$\Rightarrow$ CD = 7.69 cm.

FeedBack

Bookmark

Answer key/Solution

Q.81
'x', 'y' and 'z' are real numbers such that x > 6, y < 0 and z > –2. How many of the following statements are definitely true?

(i) x + y + z > 0
(ii) xy + yz + zx = 0
(iii) $x + y^2 + z^4 < 0$

Solution:
Correct Answer : 0
Given, x > 6, y < 0 and z > –2.
(i) x + y + z will not always be greater than zero, since y < 0. Ex: x = 7, y = –9, z = 1.
(ii) xy + yz + zx will always not be zero. Ex: x = 7, y = – 2, z = – 1.
(iii) $x + y^2 + z^4$ will always be greater than zero, since x > 6.
Hence, none of the three statements is true.

FeedBack

Bookmark

Answer key/Solution

Q.82
If x and y are positive real numbers such that $\frac{x^2+3x}{9+3y} = \frac{y+3}{18} = \frac{54}{x^2+3x}$, then find the value of the expression $\frac{y^2-3y}{x^2+3x}$.

1 $\frac{10}{3}$

2 $\frac{13}{3}$

3 $\frac{11}{3}$

4 **Cannot be determined**

Solution:
Correct Answer : 1

Bookmark

Answer key/Solution

By the problem,

$$\frac{x^2+3x}{9+3y}=\frac{y+3}{18}=\frac{54}{x^2+3x}$$

or, $$\frac{x^2+3x}{9+3y}=\frac{3y+9}{54}=\frac{54}{x^2+3x}$$

$\Rightarrow x^2 + 3x = 3y + 9 = 54$

$$\left\{\because \text{ if } \frac{a}{b}=\frac{b}{c}=\frac{c}{a}, \text{then } a=b=c\right\}$$

$\Rightarrow 3y = 45 \Rightarrow y = 15$

$$\Rightarrow \frac{y^2-3y}{x^2+3x}=\frac{180}{54}=\frac{10}{3}$$

Hence, option (1) is correct.

FeedBack

Q.83

Which of the following is true for the equation $x^3 - 2x + 1 = 0$?

1 **All roots of the equation are distinct and real.**

2 **Only one of the roots is real.**

3 **Two of its roots are reciprocal to each other.**

4 **None of these.**

Solution:

Correct Answer : 1

$(x^3 - 2x + 1) = x^3 - x^2 + x^2 - x - x + 1$
or $(x - 1)(x^2 + x - 1) = 0$
Roots are real and distinct.

FeedBack

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Answer key/Solution

Q.84

Find the sum of all the three-digit numbers having atleast one odd digit.

Solution:

Correct Answer : 440150

Sum of all the three-digit numbers

$$=\frac{900(100+999)}{2}=494550$$

Number of three-digit numbers such that there is no odd digit in it = 4 × 5 × 5 = 100.
The sum of all the three-digit numbers such that there is no odd digit = (2 + 4 + 6 + 8) × 25 × 100 + (2 + 4 + 6 + 8) × 20 × 10 + (2 + 4 + 6 + 8) × 20 × 1 = 54400.
∴ The sum of all the three-digit numbers such that there is atleast one odd digit in it = 494550 – 54400 = 440150.

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Answer key/Solution

Q.85

From a point P outside the circle, the tangents PQ and PT are drawn to a circle with centre O and radius 2 units meeting the circle at Q and T respectively. From the centre O, OA and OB are drawn parallel to PQ and PT respectively. Length of the chord TQ is 2 units. Find ∠AOB.

1 **30°**

2 **90°**

3 **60°**

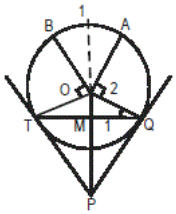
4 **120°**

Solution:

Correct Answer : 4

Bookmark

Answer key/Solution



From the figure,
PQ | | OA and PT | | OB
Also, ∠PTO = ∠PQO = 90°
⇒ ∠BOT = ∠AOQ = 90° (Alternate angles)
OT = OQ = 2 units and TQ = 2 units (given)
∴ ΔTOQ is an equilateral triangle.
⇒ ∠TOQ = 60°
Now, ∠AOB = 360° – (∠TOQ + ∠BOT + ∠AOQ)
= 360° – (60° + 90° + 90°)
= 360° – 240° = 120°.

FeedBack

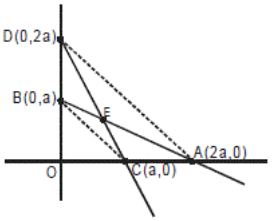
Q.86

In the X – Y plane, a straight line AB cuts the two axes at A(2a, 0) and B(0, a). Another straight line CD cuts the two axes at points C(a, 0) and D(0, 2a). AB and CD intersect each other at point E. If the area of ΔAED is 216 m^2, find the value of 'a' (in m).

Solution:
Correct Answer : 18

Bookmark

Answer key/Solution



In ΔDOA , AB and DC are medians, therefore E is the centroid.

$\therefore \Delta AED = \frac{1}{3}\Delta DOA \Rightarrow 648 = 2a^2$

∴ a = 18 m.

FeedBack

Q.87

In base system 7, the terms a_1, a_2, ...a_6, a_{10}, a_{11}, ..., a_n are in an Arithmetic Progression. If a_3 = 106 and common difference is 5, the value of a_{12} (in base 7)

1 **136**

2 **151**

3 **202**

4 **148**

Solution:
Correct Answer : 2
when all the term converted into decimal then a12 will be 9th term and it will be 30 more than third term.The value of a3 in decimal is 55. Hence value of a12 in decimal will be 55+30 i.e. 85. Value of 85 in base 7 is 151.

Bookmark

Answer key/Solution

FeedBack

Q.88

If a is an odd natural number and b is an even natural number, then what is the total number of solutions of the equation ab + 2 = 2a + b + 600?

1 **16**

2 **12**

3 **5**

4 ◯ **6**

Solution:
Correct Answer : 2
The given equation is ab + 2 = 2a + b + 600.
⇒ ab − 2a − b + 2 = 600 ⇒ (a − 1)(b − 2) = 600
Now, it is given that 'a' is an odd number and 'b' is an even number which implies that both (a − 1) and (b − 2) are even numbers.
Therefore, the possible pairs of values of a − 1 and b − 1 that satisfy the given equation not necessarily in that particular order are (2, 300); (4, 150); (6, 100); (10, 60) (12, 50) and (20, 30).
Therefore, there are 6 × 2 = 12 solutions for the given equation.

Bookmark

Answer key/Solution

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Q.89
Ramu is an intelligent sheep rearer. He observed that the average number of wool pieces produced per sheep is equal to the number of sheep owned by hir in the year 2006. In 2007, he observed that the average number of wool pieces produced per sheep owned by him was 97. The number of wool pieces produced by the sheep owned by him in the year 2007 was 3500 less than the number of wool pieces produced by the sheep owned by him in the year 200 If the total number of sheep owned by Ramu in 2006 and in 2007 was the same, then find the number of sheep owned by Ramu in the year 2006.

Solution:
Correct Answer : 125
Let the number of sheep with Ramu in the year 2006 = n.
Number of wool pieces produced in the year 2006 = n × n = n^2
Number of wool pieces produced in the year 2007 = 97n.
As per the information given in the question, we get that n^2 − 3500 = 97 n.
⇒ n = 125.

Bookmark

Answer key/Solution

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Q.90
In a shoe store, there are 12 pair of highly expensive shoes. One night, thieves break in and steal 4 shoes, not necessarily having a matching pair with them What is the probability that at least one matching pair of shoes was stolen?

1 ◯ **120/161**

2 ◯ **41/161**

3 ◯ **144/165**

4 ◯ **21/165**

Solution:
Correct Answer : 2
Total number of ways to choose 4 shoes

$= \frac{24 \times 23 \times 22 \times 21}{4!}$

Total number of ways in which no pair is selected

$= \frac{24 \times 22 \times 20 \times 18}{4!}$

∴ Probability of not getting a pair

$= \frac{24 \times 22 \times 20 \times 18}{24 \times 23 \times 22 \times 21} = \frac{120}{161}$

Hence, probability of selecting atleast one pair

$= 1 - \frac{120}{161} = \frac{41}{161}.$

Bookmark

Answer key/Solution

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Q.91
Given that $f(x) = x^{[x]} + 1$ and $g(x) = \frac{x^2}{3}$, where [x] denotes the greatest integer less than or equal to 'x'. What is the minimum possible value of f(g(x)) for which both f(x) and g(x) are real numbers?

1 ◯ **1**

2 ◯ **3**

3 ◯ **2**

4 **4**

Solution:
Correct Answer : 3

By the problem, $f(g(x)) = \left(\frac{x^2}{3}\right)^{\left[\frac{x^2}{3}\right]} + 1$

Also, f(g(x)) is an even function.
The value of f(g(x)) will be minimum when the value of 'x' is as small as possible.
For x = 0, f(x) is not defined.
For all values of x such that, $0 < g(x) < 1$, the value of f(g(x)) = 2 and this will be the minimum possible value of f(g(x)).

FeedBack

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Answer key/Solution

Q.92
What is the unit digit of $(37^{68} - 63^{77} + 45^{33} - 76^{99} + 118^{135})$?

1 **1**

2 **3**

3 **7**

4 **None of these**

Solution:
Correct Answer : 4

Unit digit of $37^{68} = 1$
Unit digit of $63^{77} = 3$
Unit digit of $45^{33} = 5$
Unit digit of $76^{99} = 6$
Unit digit of $118^{135} = 2$
Hence, the required unit digit = (1 + 5 + 2) – (3 + 6) = 9.

FeedBack

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Answer key/Solution

Q.93
The coefficient of $a^{12}b^8$ in the expansion of $(a^2 + b)^{13}$ is

1 $\frac{13!}{12!\,6!}$

2 $-\frac{13!}{6!\,8!}$

3 $\frac{13!}{6!\,8!}$

4 **None of these**

Solution:
Correct Answer : 4

The expression $a^{12}b^8$ can be rewritten as $(a^2)^6\,b^8$.
We can observe that the sum of the powers of a^2 and b in $(a^2)^6\,b^8$ is (6 + 8) i.e.14. But in the expansion of $(a^2 + b)^{13}$ the sum of the powers of a^2 and b must be 13 in each of the terms. Hence, the given term does not exist in the expansion i.e. the required coefficient is zero.

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Answer key/Solution

Q.94
Let $f^1(x) = f(x) = \frac{1}{1-x}$ such that $f^n(x) = f(f^{n-1}(x))$, where n is a natural number greater than 1 and $x \neq 1$. If f(x) = 21, find the value of $f^{21}(x)$.

1 **21**

2 $\frac{-1}{20}$

3 $\frac{20}{21}$

4 **None of these**

Solution:
Correct Answer : 3

Given, f(x) = 21

So $f^2(x) = \frac{1}{1-21} = \frac{-1}{20}$,

$f^3(x) = \frac{1}{1-\left(\frac{-1}{20}\right)} = \frac{20}{21}$,

$f^4(x) = \frac{1}{1-\frac{20}{21}} = 21$ and so on...

So $f^{19}(x) = 21$, $f^{20}(x) = \frac{-1}{20}$ and $f^{21}(x) = \frac{20}{21}$.

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Answer key/Solution

Q.95
Bharat, a numismatist, bought two piggy banks of the same capacity on 31st March, 2013. He started putting coins in one of the two piggy banks on 1st April, 2013, and when it was completely full, he started putting coins in the second piggy bank. He put exactly 'n' coins on nth day i.e. he put 1 coin on 1st April, 2013; 2 coins on 2nd April, 2013 and so on. At the end of 28th July, 2013, he found that both the piggy banks were completely full. For how many day did he put coins in the second piggy bank?

Solution:
Correct Answer : 35

The total number of coins put in the piggy banks by Bharat in 119 days = 119 × 120/2 = 7140
Both the piggy banks hold the same number of coins; therefore, the number of coins put in the first piggy bank = 7140/2 = 3570
If we assume that he put the coins in the first one for P days, then P(P + 1)/2 = 3570.
On solving, we get P = 84.
So he put the coins in the second piggy bank for 119 – 84 = 35 days.

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Answer key/Solution

Q.96
The external length, breadth and height of a closed box are 12 cm, 8 cm and 6 cm respectively. The total inner surface area of the box is 174 cm^2. Find the thickness of the walls of this box.

1 **0.5 cm**

2 **1 cm**

3 **1.5 cm**

4 **3 cm**

Solution:
Correct Answer : 3
Let the required thickness be t cm. Then, 2[(12 – 2t)(8 – 2t) + (6 – 2t)(8 – 2t) + (6 – 2t)(12 – 2t)] = 174
Hence, by checking the options, we get t = 1.5 cm.

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Answer key/Solution

Q.97
The height of a cone is 20 cm. A small cone is cut off at the top by a plane parallel to the base. If the ratio of the volumes of the two cones is 1 : 64, then at what height above the base had the cut been made?

1 **16 cm**

2 **15 cm**

3 **4 cm**

4 **5 cm**

Solution:
Correct Answer : 2

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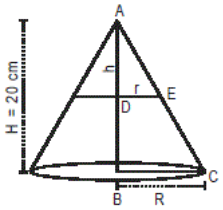
Answer key/Solution



Triangles ADE and ABC are similar.

$\Rightarrow \frac{h}{20}=\frac{r}{R}$

Given that, $\frac{1}{3}\pi R^2H=64\times\frac{1}{3}\pi r^2h$

$\Rightarrow \frac{r^2h}{R^2H}=\frac{1}{64} \Rightarrow \frac{h^2\times h}{H^2\times H}=\frac{1}{64}$

$\Rightarrow \frac{h}{H}=\frac{1}{4}$

$\Rightarrow \frac{h}{20}=\frac{1}{4}\Rightarrow h=5\,cm.$

Hence, h = 5 cm and the required height = 15 cm.

FeedBack

Q.98
Two boats A and B are sailing in a river on the two sides of a lighthouse such that all three are in a straight line. The angles of elevation of the top of the lighthouse when observed from A and B are 30° and 60° respectively. If the horizontal distance between A and the lighthouse is 75√3 m, then the distance between the two boats is

1 **(75√3+25)m**

2 **(75√3+45)m**

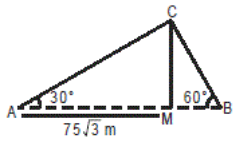
3 **100√3m**

4 **98m**

Solution:
Correct Answer : 3

Bookmark

Answer key/Solution



In ΔAMC, $\tan 30^\circ=\frac{1}{\sqrt{3}}=\frac{CM}{75\sqrt{3}}$

$\Rightarrow CM = 75\,m$

Similarly, in ΔBMC,

$\tan 60^\circ=\sqrt{3}=\frac{75}{MB}\Rightarrow MB=25\sqrt{3}\,m$

Hence, AB = $100\sqrt{3}$ m.

FeedBack

Q.99
The speed of a train is 50% more than a car. Both start simultaneously from point P and reach point Q at the same time, which is 45 km away from P. If the train lost about 12 minutes while stopping at the stations, then find the speed of the car.

1 **60 km/hr**

2 **64 km/hr**

3 **72 km/hr**

4 **75 km/hr**

Solution:
Correct Answer : 4

Let the speed of the car be S km/hr and time taken by it be T hrs.

Speed of the train will be $\frac{3}{2}S$ and time taken = $\frac{2}{3}T$

Now, $\frac{T}{3}$ = 12 minutes

$\Rightarrow T = 12 \times 3 = 36$ min

Speed of the car = $\frac{45}{36} \times 60 = 75$ km/hr.

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Answer key/Solution

Q.100
A sum of money was invested at simple interest at a certain rate for 4.5 years. Had it been invested at 37.5% higher rate, it would have fetched Rs.2,700 more. Find the sum.

1 **Rs.1,450**

2 **Rs.1,200**

3 **Rs.1,800**

4 **Rs.1,600**

Solution:
Correct Answer : 4

Interest for 4.5 years = Rs. 2,700 and for 1 year = Rs. 600
Now, 37.5% = 600

Hence, the sum = $\frac{100 \times 600}{1 \times 37.5}$ = Rs. 1,600.

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Answer key/Solution