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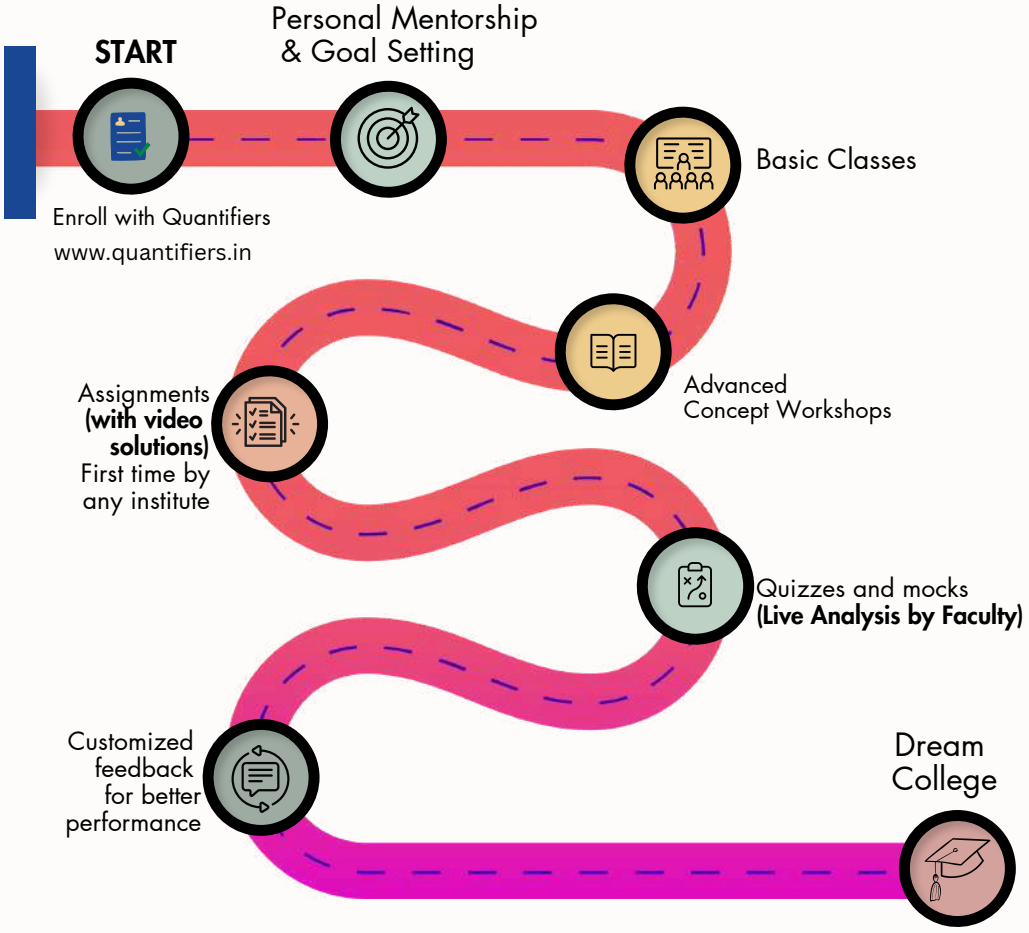

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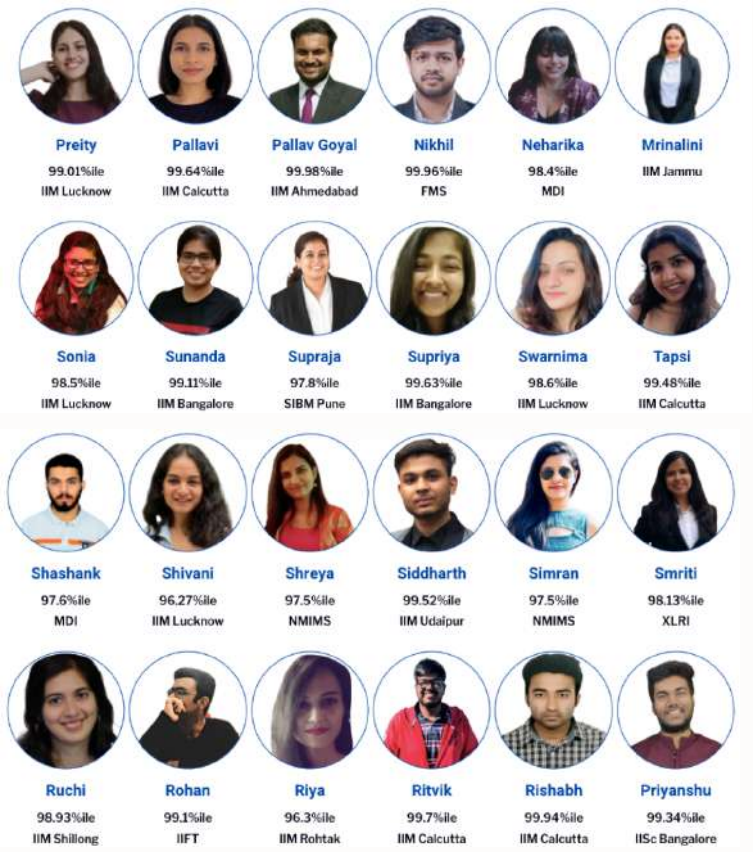


CAT 2024 Slot -3 VARC

DIRECTIONS for the question: Read the passage and answer the question based on it.

Fears of artificial intelligence (AI) have haunted humanity since the very beginning of the computer age. Hitherto these fears focused on machines using physical means to kill, enslave or replace people. But over the past couple of years new AI tools have emerged that threaten the survival of human civilisation from an unexpected direction. AI has gained some remarkable abilities to manipulate and generate language, whether with words, sounds or images. AI has thereby hacked the operating system of our civilisation.

Language is the stuff almost all human culture is made of. Human rights, for example, aren't inscribed in our DNA. Rather, they are cultural artefacts we created by telling stories and writing laws. Gods aren't physical realities. Rather, they are cultural artefacts we created by inventing myths and writing scriptures….What would happen once a non-human intelligence becomes better than the average human at telling stories, composing melodies, drawing images, and writing laws and scriptures? When people think about Chatgpt and other new AI tools, they are often drawn to examples like school children using AI to write their essays. What will happen to the school system when kids do that? But this kind of question misses the big picture. Forget about school essays. Think of the next American presidential race in 2024, and try to imagine the impact of AI tools that can be made to mass-produce political content, fake-news stories and scriptures for new cults…

Through its mastery of language, AI could even form intimate relationships with people, and use the power of intimacy to change our opinions and worldviews. Although there is no indication that AI has any consciousness or feelings of its own, to foster fake intimacy with humans it is enough if the AI can make them feel emotionally attached to it….

What will happen to the course of history when AI takes over culture, and begins producing stories, melodies, laws and religions? Previous tools like the printing press and radio helped spread the cultural ideas of humans, but they never created new cultural ideas of their own.AI is fundamentally different. AI can create completely new ideas, completely new culture….Of course, the new power of AI could be used for good purposes as well. I won't dwell on this, because the people who develop AI talk about it enough….

We can still regulate the new AI tools, but we must act quickly. Whereas nukes cannot invent more powerful nukes, AI can make exponentially more powerful AI.… Unregulated AI deployments would create social chaos, which would benefit autocrats and ruin democracies. Democracy is a conversation, and conversations rely on language. When AI hacks language, it could destroy our ability to have meaningful conversations, thereby destroying democracy….And the first regulation I would suggest is to make it mandatory for AI to disclose that it is an AI. If I am having a conversation with someone, and I cannot tell whether it is a human or an AI—that's the end of democracy. This text has been generated by a human. Or has it?

Q.1) The author identifies all of the following as dire outcomes of the capture of language by AI EXCEPT that it could
[A] apply its mastery of language to create strong emotional ties which could exacerbate the polarization of political views.

[B] spawn a completely new culture through its ability to create new ideas and opinions.
[C] eventually subvert democratic processes through the mass creation and spread of fake political content and news.
[D] out-strip human creativity and endeavours in the spheres such as art and music and, in the formulation of laws.

Q.2) We can infer that the author is most likely to agree with which of the following statements?
[A] Apart from its drawbacks, AI tools have been beneficial in boosting technological and industrial advance worldwide.
[B] The commonly expressed fear that future AI developments will fatally harm humans is unfounded.
[C] One of the biggest casualties from the spread of unregulated AI is likely to be the democratic process.
[D] People's fears of the dangers of students using Chat GPT and other new AI tools are unfounded.

Q.3) The author terms language "the operating system of our civilization" for all the following reasons EXCEPT that it
[A] has laid the foundation for the creation of cultural artefacts through writing and telling of stories.
[B] is fundamental to the articulation and spread of human values and culture in our society.
[C] can influence political views and opinions as it engenders close emotional ties among people.
[D] is the basis of AI tools like ChatGPT which can be used to generate academic content and opinion.

Q.4) The tone of the passage could best be described as
[A] quizzical, as the passage poses several questions, concluding with the question of whether or not the passage content has been generated by AI.
[B] alarmist, because the passage discusses scenarios of the influence of new AI tool son language and human emotions.
[C] prescient, as the author analyses the future impact of the use of new AI tools on crucial areas of our society and culture.
[D] cautionary, because the author lays out some adverse effects of the proliferation of unregulated AI tools.

Q.5) **DIRECTIONS for the question:** The passage given below is followed by four alternate summaries. Choose the option that best captures the essence of the passage.

Lyric poetry is a genre of private meditation rather than public commitment. The impulse in Marxism toward changing a society deemed unacceptable in its basic design would seem to place demands on lyric poetry that such poetry, with its tendency toward the personal, the small scale, and the idiosyncratic, could never answer. There is within Marxism, however, also a strand of thought that would locate in lyric poetry alternative modes of perception and description that call forth a vision of worlds at odds with a repressive reality or that draw attention to the workings of ideology within the hegemonic culture. The poetic imagination may indeed deflect larger social concerns, but it may also be implicitly critical and utopian.

[A] Marxism has internal contradictions due to which one strand of Marxism sees no merit in lyric poetry while another appreciates the alternative modes of perception in poetry.
[B] The focus of lyric poetry as personal may not seem compatible with Marxism. However, it is possible to envisage lyric poetry as a symbol of resistance against an oppressive culture.
[C] The focus of lyric poetry is largely personal while that of Marxism is bringing change in society. Unless the difference is resolved, poetry will remain largely utopian.
[D] Marxism makes unreasonable demands on lyric poetry. However, lyric poetry has its own merits that are largely ignored by Marxism due to its personal nature.

Q.6) **DIRECTIONS for the question:** There is a sentence missing in the paragraph below. Look at the paragraph and decide in which blank (option 1, 2, 3, or 4) the following sentence would best fit.

Sentence: This reality is putting stress on employees who have to pay for transport, desk lunches, more childcare, clothing and that after-work socialisation – costs they haven't incurred for nearly two years.

Paragraph: ___(1)___. Prices are rising at their fastest rate in 40 years, consequently, return-to-office-related costs have shot up – think petrol and food, for instance.___(2)___. Yet wages haven't kept up with inflation – even despite the salary growth many workers have enjoyed during a favorable pandemic labour market. ___(3)___.This is especially jarring for workers who were able to save during remote work, when these expenditures weren't a factor. ___(4)___. In April 2022, Umus, a London university lecturer, told BBC Work life that they were spending nearly a quarter of what they made every day on return-to-work costs.

[A] Option 3
[B] Option 4
[C] Option 1
[D] Option 2

Q.7) **DIRECTIONS for the question:** There is a sentence missing in the paragraph below. Look at the paragraph and decide in which blank (option 1, 2, 3, or 4) the following sentence would best fit.

Sentence: Taken outside the village of Trang Bang on June 8, 1972, the picture captured the trauma and indiscriminate violence of a conflict that claimed, by some estimates, a million or more civilian lives.

Paragraph: The horrifying photograph of children fleeing a deadly napalm attack has become a defining image not only of the Vietnam War but the 20th century. ___(1)___.Dark smoke billowing behind them, the young subjects' faces are painted with a mixture of terror, pain and confusion. ___(2)___. Soldiers from the South Vietnamesearmy's 25th Division follow helplessly behind. ___(3)___. The picture was officially titled "The Terror of War," but the photo is better known by the nickname given to naked 9-year-old at its centre "Napalm Girl". ___(4)___.

[A] Option 1
[B] Option 2

[C] Option 3
[D] Option 4

DIRECTIONS for the question: Read the passage and answer the question based on it.

Moutai has been the global booze sensation of the decade. A bottle of its Flying Fairy which sold in the 1980s for the equivalent of a dollar now retails for $400. Moutai's listed shares have soared by almost 600% in the past five years, outpacing the likes of Amazon. . . .

It does this while disregarding every Western marketing mantra. It is not global, has meagre digital sales and does not appeal to millennials. It scores pitifully on environmental, social and governance measures. In the Boy Scout world of Western business it would leave a bad taste, in more ways than one.

Moutai owes its intoxicating success to three factors—not all of them easy to emulate. First, it profits from Chinese nationalism. Moutai is known as the "national liquor". It was used to raise spirits and disinfect wounds in Mao's Long March. It was Premier Zhou Enlai's favourite tipple, shared with Richard Nixon in 1972. Its centuries-old craftsmanship—it is distilled eight times and stored for years in earthenware jars—is a source of national pride. It also claims to be hangover-proof, which would make it an invention to rival gunpowder....

Second, it chose to serve China's super-rich rather than its middle class. Markets are littered with the corpses of firms that could not compete in the cut-throat battle for Chinese middle-class wallets. And the country's premium market is massive—at 73m-strong, bigger than the population of France, notes Euan McLeish of Bernstein, an investment firm, and still less crowded with prestige brands than advanced economies. Moutai is to these well-heeled drinkers what vintage champagne is to the rest of the world.....

Third, Moutai looks beyond affluent millennials and digital natives. The elderly and the middle-aged, it found, can be just as lucrative. Its biggest market now is (male) drinkers in their mid-30s. Many have no siblings, thanks to four decades of China's one-child policy—which also means their elderly parents can splash out on weddings and banquets. Moutai is often a guest of honour.

Moutai has succeeded thanks to nationalism, elitism and ageism, in other words—not in spite of this unholy trinity. But it faces risks. The government is its largest shareholder—and a meddlesome one. It appears to want prices to remain stable. Exorbitantly priced booze is at odds with its professed socialist ideals. Yet minority investors—including many foreign funds—lament that Moutai's wholesale price is a third of what it sells for in shops. Raising it could boost the company's profits further. Instead, in what some see as a travesty of corporate governance, its majority owner has plans to set up its own sales channel.....

In the long run, its biggest risk may be millennials. As they grow older, health concerns, work-life balance and the desire for more wholesome pursuits than binge-drinking may curb the "Ganbei!" toasting culture [heavy drinking] on which so much of the demand for Moutai rests. For the time being, though, the party goes on.

Q.8) Which one of the following is both a reason for Moutai's success as well as a possible threat to that success?

[A] Its appeal to the rich
[B] Chinese love of liquor filled celebration.
[C] Its appeal to the older age group
[D] Government involvement in its business

Q.9) In the context of the passage, it is most likely that the author refers to Moutai's marketing strategy as "the unholy trinity" because
[A] it profits from Chinese nationalist feelings
[B] it exposes the firm to long term risks.
[C] it contradicts the Western strategy of marketing.
[D] there is nothing holy about marketing techniques for liquor.

Q.10) The phrase "would make it an invention to rival gunpowder" has been used in the passage in a sense that is
[A] metaphorical
[B] literal
[C] substantive
[D] synonymical

Q.11) In the context of the passage we can infer that to succeed in the liquor industry in China, a marketing firm must consider all of the following factors affecting the Chinese liquor market EXCEPT that
[A] the competition for winning over the middle class is very stiff.
[B] there are few competitors to meet the demands of high end liquor consumers.
[C] the government may control the pricing of products.
[D] there is money to be made from marketing to the middle class.

Q.12) **DIRECTIONS for the question**: The passage given below is followed by four alternate summaries. Choose the option that best captures the essence of the passage.

When the tradwife puts on that georgic, pinstriped dress, she is not just admiring the visual cues of a fantastical past. She takes these dreams of storybook bliss literally, tracing them backward in time until she reaches a logical conclusion that satisfies her. And by doing so, she ends up delivering an unhappy reminder of just how much our lives consist of artifice and playacting. The tradwife outrages people because of herdeliberately regressive ideals. And yet her behaviour is, on some level, indistinguishable from the nontradwife's. The tradwife's trollish genius is to beat us at our own dress-up game. By insisting that the idyllic cottage daydream should be real, right down to the primitive gender roles, she leaves others feeling hollow, cheated. The hullabaloo and headaches she causes may be the price we pay for taking too many things at face value: our just deserts, served Instagram-perfect by a manicuredh and on a gorgeous ceramic dish, with fat, mouthwatering maraschino cherries on op.

[A] The tradwife's commitment to outdated gender roles and retro fashion critiques the superficiality of today's societal ideals.

[B] The tradwife's vintage dress and adherence to traditional roles reveal the artificial nature of modern life and its superficial values.
[C] By promoting an idealized past, the tradwife exposes the artifice of contemporary values and mocks societal norms.
[D] The tradwife, with her vintage dress and traditional roles, highlights the superficiality of modern life and challenges current societal norms.

Q.13) **DIRECTIONS for the question:** There is a sentence missing in the paragraph below. Look at the paragraph and decide in which blank (option 1, 2, 3, or 4) the following sentence would best fit.

Sentence: Many have had to leave their homes behind, with more than 1.3 million people being displaced due to the drought.

Passage: Somalia has been dealing with an enormous humanitarian catastrophe, driven by the longest and most severe drought the country has experienced in at least 40 years. ___(1)___. Five consecutive rainy seasons have failed, causing more than 8million people - almost half of the country's population – to experience acute food insecurity. ___(2)___. More than 43,000 people are believed to have lost their lives, with half of the lives lost likely being children under five. The damage the drought has caused is far-reaching. ___(3)___. Farmers have lost all their agricultural income, while pastoralists have lost more than 3 million livestock, impoverishing entire communities, and leaving them on the brink of famine. ___(4)___. Some, like the pastoralists, may never be able to go back as their livelihoods have been irreversibly wiped out.

[A] Option 4
[B] Option 1
[C] Option 3
[D] Option 2

Q.14) **DIRECTIONS for the question:** Five jumbled up sentences (labelled 1, 2, 3, 4 and 5), related to a topic, are given below. Four of them can be put together to form a coherent paragraph. Identify the odd sentence and key in the number of that sentence as your answer.

1. Part of the appeal of forecasting is not just that it seems to work, but that you don't seem to need specialized expertise to succeed at it.

2. The tight connection between forecasting and building a model of the world helps explain why so much of the early interest in the idea came from the intelligence community.

3. This was true even though the latter had access to classified intelligence.

4. One frequently cited study found that accurate forecasters' predictions of geopolitical events, when aggregated using standard scientific methods, were more accurate than the forecasts of members of the US intelligence community who answered the same questions in a confidential prediction market.

5. The aggregated opinions of non-experts doing forecasting have proven to be a better guide to the future than the aggregated opinions of experts.

Q.15) **DIRECTIONS for the question:** Five jumbled up sentences (labelled 1, 2, 3, 4 and 5), related to a topic, are given below. Four of them can be put together to form a coherent paragraph. Identify the odd sentence and key in the number of that sentence as your answer.

1. To create a synapse, the neuron has specialized structures, often seen as tiny swellings, at its terminal end of the axon where it stores the chemicals that are emitted to transmit a signal to the next neuron.

2. This fetal warm-up act—the soldering of neural connections before the eyes actually function—is crucial to the performance of the visual system.

3. The reasons for this paring back of synapses is a mystery, but synaptic pruning is thought to sharpen and reinforce the "correct" synapses, while removing the weak and unnecessary ones.

4. Neural connections between the eyes and the brain are formed long before birth, establishing the wiring and the circuitry that allow a child to begin visualizing the world the minute she emerges from the womb.

5. During this rehearsal period, synapses—points of chemical connection—between nerve cells are generated in great excess, only to be pruned back during later development.

DIRECTIONS for the question: Read the passage and answer the question based on it.

There is a group in the space community who view the solar system not as an opportunity to expand human potential but as a nature preserve, forever the provenance of an elite group of scientists and their sanitary robotic probes. These planetary protection advocates [call] for avoiding "harmful contamination" of celestial bodies. Under this regime, NASA incurs great expense sterilizing robotic probes in order to prevent the contamination of entirely theoretical biospheres. . . .

Transporting bacteria would matter if Mars were the vital world once imagined by astronomers who mistook optical illusions for canals. Nobody wants to expose Martians to measles, but sadly, robotic exploration reveals a bleak, rusted landscape, lacking oxygen and flooded with radiation ready to sterilize any Earthly microbes. Simple life might exist underground, or down at the bottom of a deep canyon, but it has been very hard to find with robots. . . . The upsides from human exploration and development of Mars clearly outweigh the welfare of purely speculative Martian fungi. . . .

The other likely targets of human exploration, development, and settlement, our moon and the asteroids, exist in a desiccated, radiation-soaked realm of hard vacuum and extreme temperature variations that would kill nearly anything. It's also important to note that many international competitors will ignore the demands of these protection extremists in any case. For example, China recently sent a terrarium to the moon and germinated a plant seed—with, unsurprisingly, no protest from its own scientific community. In contrast, when it was recently revealed that a researcher had surreptitiously smuggled super-resilient microscopic tardigrades

aboard the ill-fated Israeli Beresheet lunar probe, a firestorm was unleashed within the space community. . . .

NASA's previous human exploration efforts made no serious attempt at sterility, with little notice. As the Mars expert Robert Zubrin noted in the National Review, U.S. lunar landings did not leave the campsites cleaner than they found it. Apollo's bacteria-infested litter included bags of feces. Forcing NASA's proposed Mars exploration to do better, scrubbing everything and hauling out all the trash, would destroy NASA's human exploration budget and encroach on the agency's other directorates, too. Getting future astronauts off Mars is enough of a challenge, without trying to tote weeks of waste along as well.

A reasonable compromise is to continue on the course laid out by the U.S. government and the National Research Council, which proposed a system of zones on Mars, some for science only, some for habitation, and some for resource exploitation. This approach minimizes contamination, maximizes scientific exploration . . . Mars presents a stark choice of diverging human futures. We can turn inward, pursuing ever more limited futures while we await whichever natural or manmade disaster will eradicate our species and life on Earth. Alternatively, we can choose to propel our biosphere further into the solar system, simultaneously protecting our home planet and providing a backup plan for the only life we know exists in the universe. Are the lives on Earth worth less than some hypothetical microbe lurking under Martian rocks?

Q.16) The author mentions all of the following reasons to dismiss concerns about contaminating Mars EXCEPT:

[A] the lack of evidence of living organisms on Mars makes possible contamination from earthly microbes a moot point.
[B] the use of similar probes on astronomical bodies like the moon have had little effect on the environment.
[C] efforts to contain contamination on Mars are likely to be derailed as competitor countries may not follow similar restrictions.
[D] earlier explorations have already contaminated pristine space environments.

Q.17) The author's overall tone in the first paragraph can be described as
[A] approving of the amount of money NASA spends to restrict the spread of contamination in space.
[B] sceptical about the excessive efforts to sanitise planets where life has not yet been proven to exist.
[C] indifferent to the elitism of a few scientists aiming to corner space exploration.
[D] equivocal about the reasons extended by the group of scientists seeking to limit space exploration.

Q.18) The contrasting reactions to the Chinese and Israeli "contaminations" of lunar space
[A] are valid as the contamination of the lunar environment from animal sources is far greater than from plants.
[B] reveal global biases prevalent in attitudes towards different countries.
[C] indicate that national scientists may have different sensitivities to issues of biosphere protection.
[D] are evidence of China's reasonable approach towards space contamination.

Q.19) The author is unlikely to disagree with any of the following EXCEPT:
[A] the proposal for a zonal segregation of the Martian landscape into regions for different purposes.
[B] that while NASA's earlier missions were not ideal in their approach to space contamination, they likely did no grave damage.
[C] the exorbitant costs of continuing to keep the space environment pristine may be unsustainable.
[D] space contamination should be minimised until the possibility of life on the astronomical body being explored is ruled out.

DIRECTIONS for the question: Read the passage and answer the question based on it.

Languages become endangered and die out for many reasons. Sadly, the physical annihilation of communities of native speakers of a language is all too often the cause of language extinction. In North America, European colonists brought death and destruction to many Native American communities. This was followed by US federal policies restricting the use of indigenous languages, including the removal of native children from their communities to federal boarding schools where native languages and cultural practices were prohibited. As many as 75 percent of the languages spoken in the territories that became the United States have gone extinct, with slightly better language survival rates in Central and South America . ..

Even without physical annihilation and prohibitions against language use, the language of the "dominant" cultures may drive other languages into extinction; young people see education, jobs, culture and technology associated with the dominant language and focus their attention on that language. The largest language "killers" are English, Spanish, Portuguese, French, Russian, Hindi, and Chinese, all of which have privileged status as dominant languages threatening minority languages.

When we lose a language, we lose the worldview, culture and knowledge of the people who spoke it, constituting a loss to all humanity. People around the world live in direct contact with their native environment, their habitat. When the language they speak goes extinct, the rest of humanity loses their knowledge of that environment, their wisdom about the relationship between local plants and illness, their philosophical and religious beliefs as well as their native cultural expression (in music, visual art and poetry) that has enriched both the speakers of that language and others who would have encountered that culture. . . .

As educators deeply immersed in the liberal arts, we believe that educating students broadly in all facets of language and culture . . . yields immense rewards. Some individuals educated in the liberal arts tradition will pursue advanced study in linguistics and become actively engaged in language preservation, setting out for the Amazon, for example, with video recording equipment to interview the last surviving elders in a community to record and document a language spoken by no children.

Certainly, though, the vast majority of students will not pursue this kind of activity. For these students, a liberal arts education is absolutely critical from the twin perspectives of language extinction and global citizenship. When students study languages other than their own, they

are sensitized to the existence of different cultural perspectives and practices. With such an education, students are more likely to be able to articulate insights into their own cultural biases, be more empathetic to individuals of other cultures, communicate successfully across linguistic and cultural differences, consider and resolve questions in a way that reflects multiple cultural perspectives, and, ultimately extend support to people, programs, practices, and policies that support the preservation of endangered languages.

There is ample evidence that such preservation can work in languages spiraling toward extinction. For example, Navajo, Cree and Inuit communities have established schools in which these languages are the language of instruction and the number of speakers of each has increased.

Q.20) It can be inferred from the passage that it is likely South America had a slightly better language survival rate than North America for all of the following reasons EXCEPT:
[A] European colonists allowed children of native speakers to stay at home with their families.
[B] the colonial government was unable to mainstream the locals.
[C] locals were provided job opportunities in the colonial administration.
[D] not many native speakers were killed by European colonists.

Q.21) Which one of the following hypothetical scenarios, if true, would most strongly undermine the central ideas of the passage?
[A] Most liberal arts students will pursue jobs in publishing and human resource management rather than doctorates in linguistics.
[B] A liberal arts education requires that, in addition to being fluent in English, students gain fluency in two of the top five most spoken languages globally.
[C] Schools that teach endangered languages can preserve the language only for a generation.
[D] Recording a dying language that has only a few remaining speakers freezes it in time: it stops evolving further.

Q.22) In the context of the passage, which one of the following hypothetical scenarios, if true, is NOT an example of the kind of loss that occurs when a language becomes extinct?
[A] The Inuits of Alaska have 35 different words to describe the texture of snow. When the language becomes extinct, we will lose that understanding of nature.
[B] The Lamkangs of Manipur have only 3 remaining native speakers of the language. When they die, we will lose one more group from the government list of indigenous tribes.
[C] The Andamanese language has a word to describe someone who has lost a step-sister. When the language dies, we will lose the concept of the word and the emotions it evokes.
[D] The Nicobarese language describes 20 different moods of the ocean. By the time the last speaker is educated in a Central Board school, they will have forgotten their language.

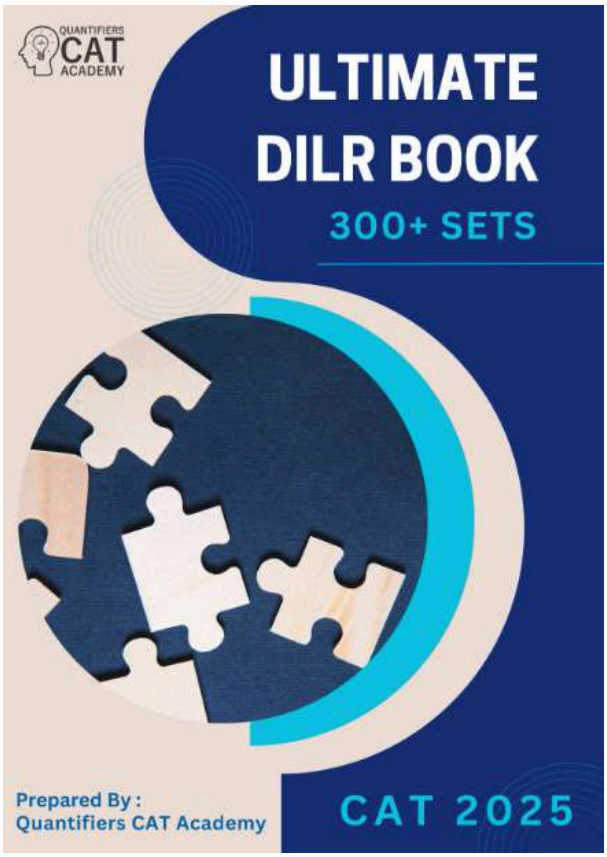
Q.23) The author believes that a liberal arts education combined with participation in language preservation empower students in all of the following ways EXCEPT that they will
[A] develop a better understanding of their own culture.
[B] establish schools to preserve languages spiralling towards extinction.
[C] overcome cultural barriers to communication.
[D] learn different languages.

Q.24) **DIRECTIONS for the question:** The passage given below is followed by four alternate summaries. Choose the option that best captures the essence of the passage.

Humans have managed to tweak the underlying biology of various plants and animals to produce high-tech crops and microbes. But regulating these entities is complicated, as the framework of policies and procedures are outdated and not flexible enough to adapt to emerging technology. The question is whether regulation will ever be able to keep up with human innovation, to regulate living things, which are apt to be unpredictable and unique; to capture all the potential risks when new biological entities are introduced, or when they pass on variations of their genes?

[A] The problem with formulating regulation for innovation in the scientific arena it that it is impossible to imagine the outcomes or risks related to the outcomes of all the research.

[B] A new framework of rules and procedures for regulating the most recent research emerging from biotechnology is urgently needed, to keep up with this rapidly changing discipline.
[C] Current regulation of biotechnology is outdated, but it is debatable if we can create a framework, imaginative and flexible, to cover all contingencies in this fast-changing area.
[D] The mercurial nature of biological entities calls for scientists to shape the regulations governing emerging technology, with regular calibration to handle variations in the field.



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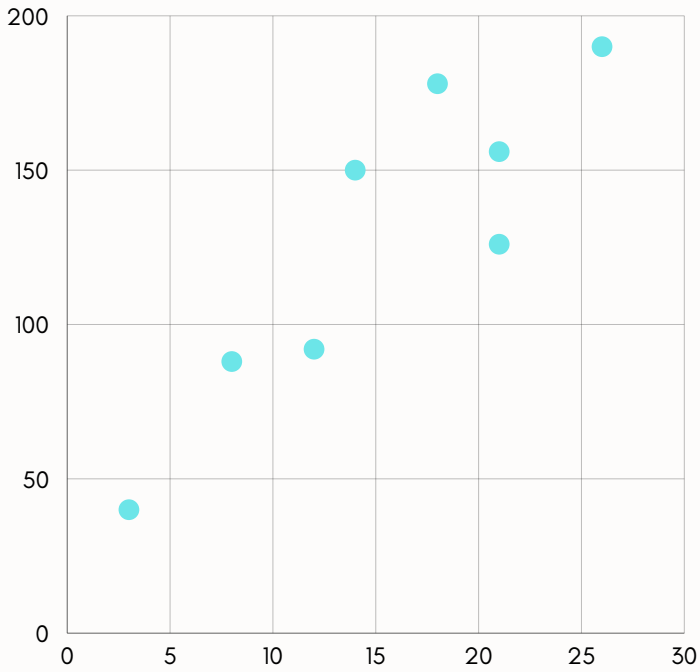

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CAT 2024 Slot -3 DILR

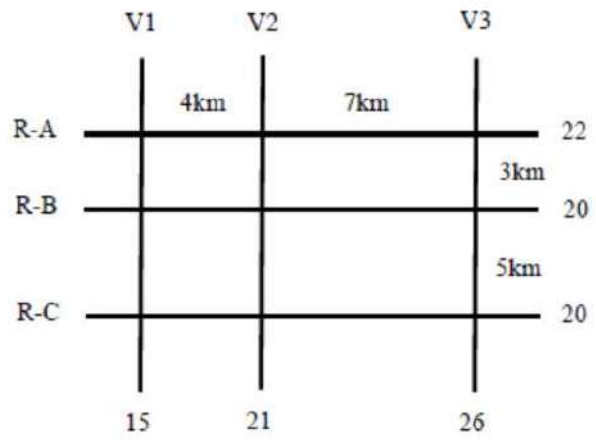
DIRECTIONS for the question: Read the information given below and answer the question that follows.

The figure below shows a network with three parallel roads represented by horizontal lines R-A, R-B, and R-C and another three parallel roads represented by vertical lines V1, V2, and V3. The figure also shows the distance (in km) between two adjacent intersections. Six ATMs are placed at six of the nine road intersections. Each ATM has a distinct integer cash requirement (in Rs. Lakhs), and the numbers at the end of each line in the figure indicate the total cash requirements of all ATMs placed on the corresponding road. For example, the total cash requirement of the ATM(s) placed on road R-A is Rs. 22 Lakhs.

The following additional information is known.

1. The ATMs with the minimum and maximum cash requirements of Rs. 7 Lakhs and Rs. 15 Lakhs are placed on the same road.

2. The road distance between the ATM with the second highest cash requirement and the ATM located at the intersection of R-C and V3 is12 km.



Q.1) Which of the following statements is correct?

[A] The ATM placed at the (R-C, V2) intersection has a cash requirement of Rs. 9 Lakhs.
[B] The cash requirement of the ATM placed at the (R-C, V2) intersection cannot be uniquely determined.
[C] The ATM placed at the (R-C, V2) intersection has a cash requirement of Rs. 8 Lakhs.
[D] There is no ATM placed at the (R-C, V2) intersection.

Q.2) How many ATMs have cash requirements of Rs. 10 Lakhs or more?

Q.3) Which of the following two statements is/are DEFINITELY true?

Statement A: Each of R-A, R-B, and R-C has two ATMs.

Statement B: Each of V1, V2, and V3 has two ATMs.

[A] Only Statement B
[B] Neither Statement A nor Statement B
[C] Both Statement A and Statement B
[D] Only Statement A

Q.4) What is the number of ATMs whose locations and cash requirements can both be uniquely determined?

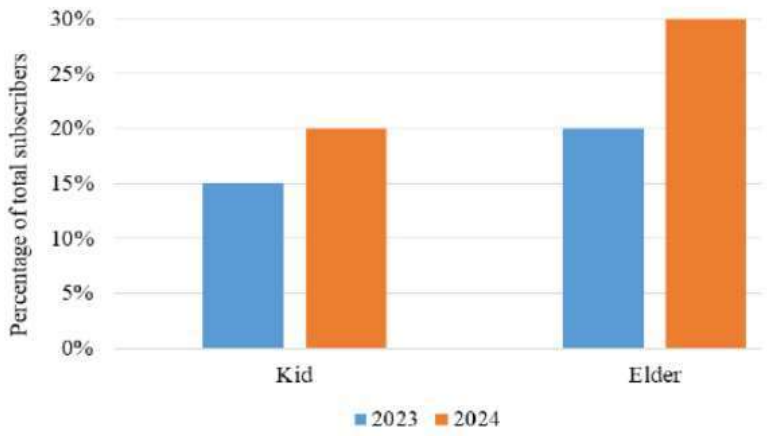
Q.5) What best can be said about the road distance (in km) between the ATMs having the second highest and the second lowest cash requirements?
[A] 4 km
[B] 5 km
[C] Either 4 km or 7 km
[D] 7 km

DIRECTIONS for the question: Analyse the graph/s given below and answer the question that follows.

Over the top (OTT) subscribers of a platform are segregated into three categories:

i) Kid, ii) Elder, and iii) Others.

Some of the subscribers used one app and the others used multiple apps to access the platform. The figure below shows the percentage of the total number of subscribers in 2023 and 2024 who belong to the 'Kid' and 'Elder' categories.



The following additional facts are known about the numbers of subscribers.

1. The total number of subscribers increased by 10% from 2023 to 2024.

2. In 2024, 1/2 of the subscribers from the 'Kid' category and 2/3 of the subscribers from the 'Elder' category subscribers use one app.

3. In 2023, the number of subscribers from the 'Kid' category who used multiple apps was the same as the number of subscribers from the 'Elder' category who used one app.

4. 10,000 subscribers from the 'Kid' category used one app and 15,000 subscribers from the 'Elder' category used multiple apps in 2023.

Q.6) How many subscribers belonged to the 'Others' category in 2024?

[A] 45000
[B] 55000
[C] Cannot be determined
[D] 65000

Q.7) What percentage of subscribers in the 'Kid' category used multiple apps in 2023?
[A] 50.00%
[B] 5.00%
[C] 33.33%
[D] 25.50%

Q.8) What was the percentage increase in the number of subscribers in the 'Elder' category from 2023 to 2024?
[A] 50%
[B] 65%
[C] 60%
[D] 40%

Q.9) What could be the minimum percentage of subscribers who used multiple apps in2024?
[A] 20.0%
[B] 10.0%
[C] 22.00%
[D] 16.5%

DIRECTIONS for the question: Study the table below and answer the following question.

Out of 10 countries -- Country 1 through Country 10 -- Country 9 has the highest gross domestic product (GDP), and Country 10 has the highest GDP per capita. GDP per capita is the GDP of a country divided by its population. The table below provides the following data about Country 1 through Country 8 for the year 2024.

- Column 1 gives the country's identity.
- Column 2 gives the country's GDP as a fraction of the GDP of Country 9.
- Column 3 gives the country's GDP per capita as a fraction of the GDP per capita of Country10.
- Column 4 gives the country's annual GDP growth rate.
- Column 5 gives the country's annual population growth rate.

Country	GDP	GDP per capita	GDF growth rate	Population growth rage
Country 1	0.15	0.41	0.2%	–0.12%
Country 2	0.14	0.25	0.9%	–0.41%
Country 3	0.13	0.02	6.5%	0.70%
Country 4	0.12	0.38	0.5%	0.49%
Country 5	0.10	0.36	0.7%	0.31%
Country 6	0.08	0.08	3.2%	0.61%
Country 7	0.08	0.30	0.7%	–0.11%
Country 8	0.07	0.41	1.2%	0.71%

Assume that the GDP growth rates and population growth rates of the countries will remain constant for the next three years.

Q.10) Which one among the countries 1 through 8, has the smallest population in 2024?
[A] Country 8
[B] Country 5
[C] Country 3
[D] Country 7

Q.11) The ratio of Country 4's GDP to Country 5's GDP in 2026 will be closest to
[A] 1.032
[B] 1.195
[C] 1.314
[D] 0.963

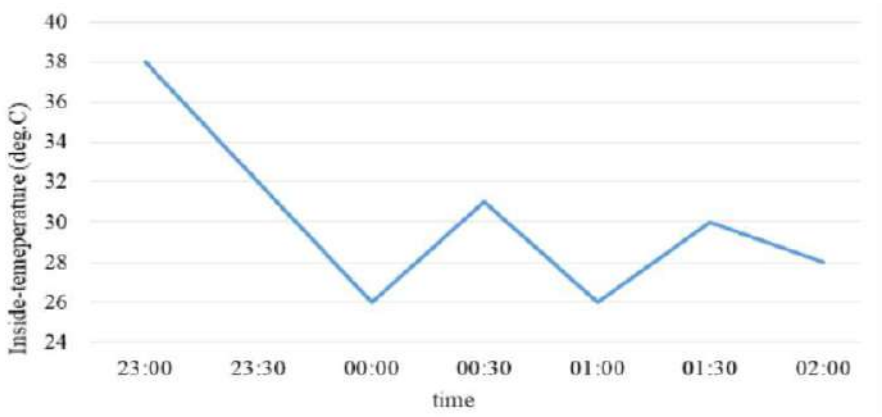
Q.12) Which one among the countries 1, 4, 5, and 7 will have the largest population in 2027?
[A] Country 7
[B] Country 4
[C] Country 5
[D] Country 1

Q.13) **DIRECTIONS for the question**: Analyse the graph/s given below and answer the question that follows.

The air-conditioner (AC) in a large room can be operated either in REGULAR mode or in POWER mode to reduce the temperature.

If the AC operates in REGULAR mode, then it brings down the temperature inside the room (called inside temperature) at a constant rate to the set temperature in 1 hour. If it operates in POWER mode, then this is achieved in 30 minutes.

If the AC is switched off, then the inside temperature rises at a constant rate so as to reach the temperature outside at the time of switching off in 1 hour. The temperature outside has been falling at a constant rate from 7 pm onward until 3 am on a particular night. The following graph shows the inside temperature between 11 pm (23:00) and 2 am (2:00) that night.



The following facts are known about the AC operation that night.

- The AC was turned on for the first time that night at 11 pm (23:00).
- The AC setting was changed (including turning it on/off, and/or setting different temperatures) only at the beginning of the hour or at 30 minutes after the hour.
- The AC was used in POWER mode for longer duration than in REGULAR mode during this3-hour period.

How many times the AC must have been turned off between 11:01 pm and 1:59 am?

[A] 0
[B] 2
[C] 1
[D] cannot be determined

Q.14) **DIRECTIONS for the question**: Study the table below and answer the following question.

Out of 10 countries -- Country 1 through Country 10 -- Country 9 has the highest gross domestic product (GDP), and Country 10 has the highest GDP per capita. GDP per capita is the GDP of a country divided by its population. The table below provides the following data about Country 1 through Country 8 for the year 2024.

- Column 1 gives the country's identity.
- Column 2 gives the country’s GDP as a fraction of the GDP of Country 9.
- Column 3 gives the country’s GDP per capita as a fraction of the GDP per capita of Country10.
- Column 4 gives the country’s annual GDP growth rate.
- Column 5 gives the country’s annual population growth rate.

Country	GDP	GDP per capita	GDF growth rate	Population growth rage
Country 1	0.15	0.41	0.2%	–0.12%
Country 2	0.14	0.25	0.9%	–0.41%
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Country 5	0.10	0.36	0.7%	0.31%
Country 6	0.08	0.08	3.2%	0.61%
Country 7	0.08	0.30	0.7%	–0.11%
Country 8	0.07	0.41	1.2%	0.71%

Assume that the GDP growth rates and population growth rates of the countries will remain constant for the next three years.

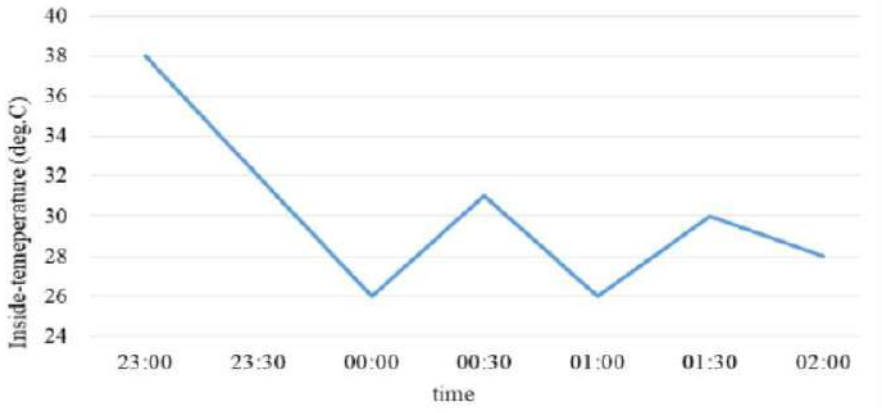
For how many countries among Country 1 through Country 8 will the GDP per capita in 2027 be lower than that in 2024?

DIRECTIONS for the question: Analyse the graph/s given below and answer the question that follows.

The air-conditioner (AC) in a large room can be operated either in REGULAR mode or in POWER mode to reduce the temperature.

If the AC operates in REGULAR mode, then it brings down the temperature inside the room (called inside temperature) at a constant rate to the set temperature in 1 hour. If it operates in POWER mode, then this is achieved in 30 minutes.

If the AC is switched off, then the inside temperature rises at a constant rate so as to reach the temperature outside at the time of switching off in 1 hour. The temperature outside has been falling at a constant rate from 7 pm onward until 3 am on a particular night. The following graph shows the inside temperature between 11 pm (23:00) and 2 am (2:00) that night.



The following facts are known about the AC operation that night.

- The AC was turned on for the first time that night at 11 pm (23:00).
- The AC setting was changed (including turning it on/off, and/or setting different temperatures) only at the beginning of the hour or at 30 minutes after the hour.

- The AC was used in POWER mode for longer duration than in REGULAR mode during this3-hour period.

Q.15) What was the temperature outside, in degree Celsius, at 1 am?

Q.16) What was the temperature outside, in degree Celsius, at 9 pm?

Q.17) What best can be concluded about the number of times the AC must have either been turned on or the AC temperature setting been altered between 11:01 pm and 1:59 am?
[A] Exactly 2
[B] Either 2 or 3
[C] More than 3
[D] Exactly 3

Q.18) What was the maximum difference between temperature outside and inside temperature, in degree Celsius, between 11:01 pm and 1:59 am?

DIRECTIONS for the question: Read the information given below and answer the question that follows.

The table given below shows the amount, in grams, of carbohydrate, protein, fat and all other nutrients, per 100 grams of nutrients in seven food grains. The first column shows the foodgrain category and the second column its codename. The table has some missing values.

Food grain category	Codename of the food grain	Composition per hundred grams of nutrients in the food grains			
		Carbohydrate	Protein	Fat	Other nutrients
Cereal	C1			0	12
	C2			3	10
Millet	M1	62	10		
	M2			7	16
	M3	56		12	
Pseudo-cereal	P1	66			10
	P2		14		8

The following additional facts are known.

1. Both the pseudo-cereals had higher amounts of carbohydrate as well as higher amounts of protein than any millet.
2. Both the cereals had higher amounts of carbohydrate than any pseudo-cereal.
3. All the missing values of carbohydrate amounts (in grams) for all the foodgrains are non-zero multiples of 5.
4. All the missing values of protein, fat and other nutrients amounts (in grams) for all the foodgrains are non-zero multiples of 4.
5. P1 contained double the amount of protein that M3 contains.

Q.19) How many foodgrains had a higher amount of carbohydrate per 100 grams of nutrients than M1?

Q.20) How many grams of protein were there in 100 grams of nutrients in M2?

Q.21) How many grams of other nutrients were there in 100 grams of nutrients in M3?

Q.22) What is the median of the number of grams of protein in 100 grams of nutrients among these food grains?

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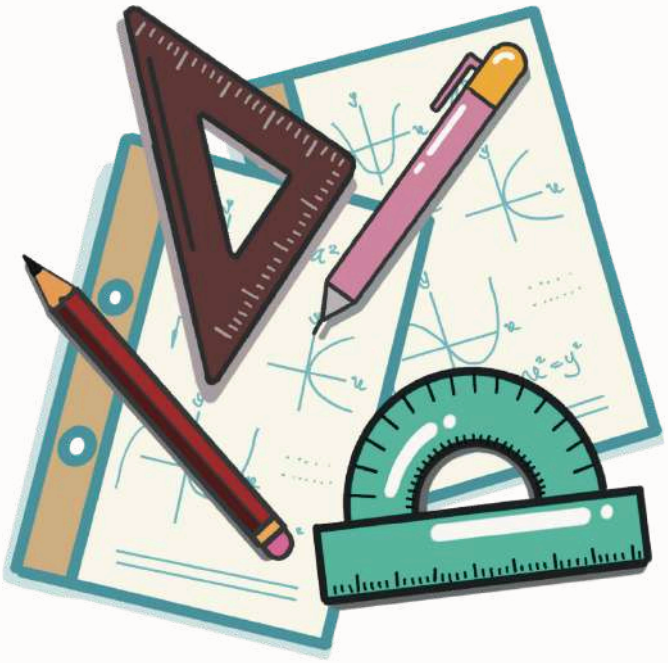

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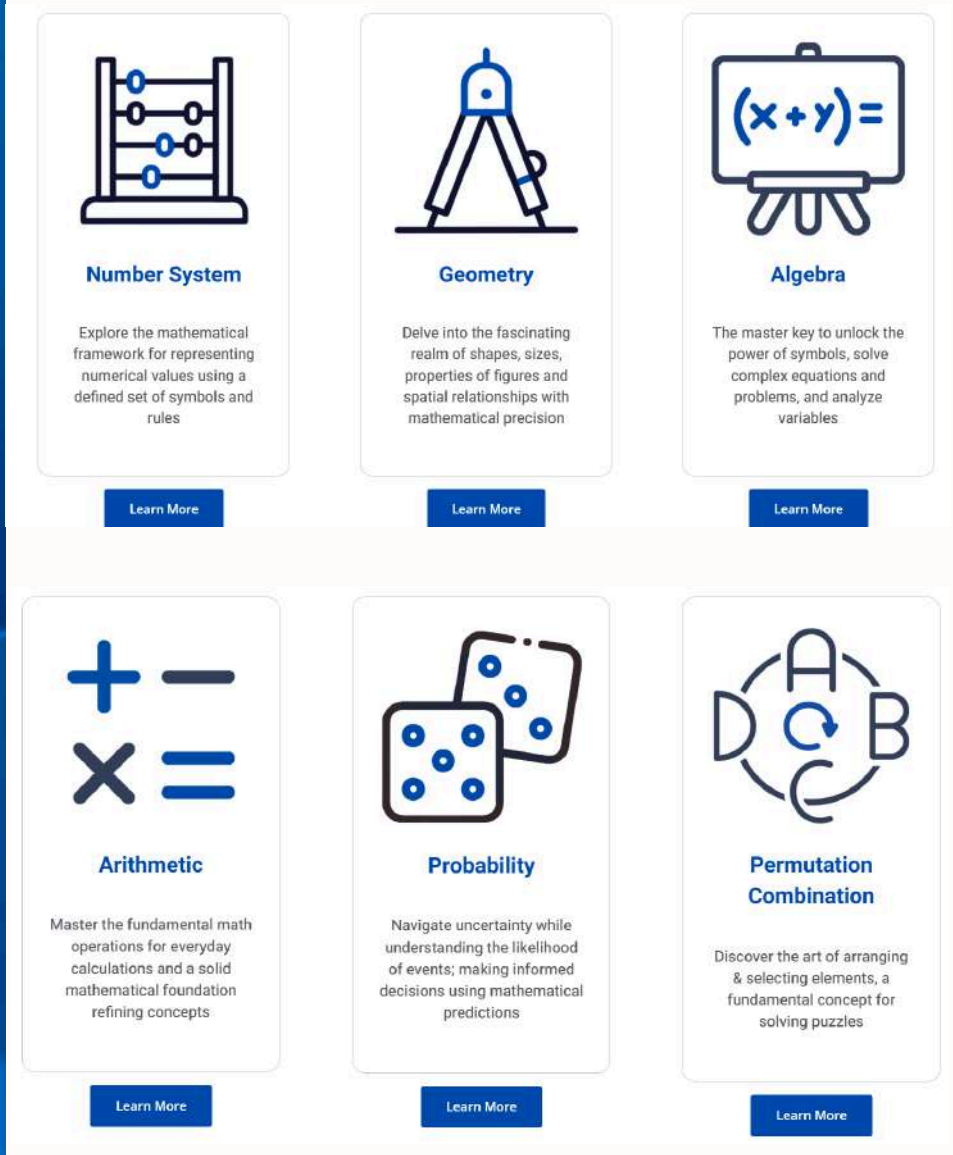

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CAT 2024 Slot -3 Quant

DIRECTIONS *for the question:* Solve the following question and mark the best possible option.

Q.1)

If $3^a = 4$, $4^b = 5$, $5^c = 6$, $6^d = 7$, $7^e = 8$ and $8^f = 9$, then the value of the product *abcdef* is

Q.2) The number of distinct integer solutions (x, y) of the equation $|x + y| + |x - y| = 2$, is

Q.3)

A circular plot of land is divided into two regions by a chord of length $10\sqrt{3}$ meters such that the chord subtends an angle of 120° at the center. Then, the area, in square meters, of the smaller region is

[A] $20\left(\frac{4\pi}{3}+\sqrt{3}\right)$

[B] $20\left(\frac{4\pi}{3}-\sqrt{3}\right)$

[C] $25\left(\frac{4\pi}{3}-\sqrt{3}\right)$

[D] $25\left(\frac{4\pi}{3}+\sqrt{3}\right)$

Q.4) A train travelled a certain distance at a uniform speed. Had the speed been 6 km per hour more, it would have needed 4 hours less. Had the speed been 6 km per hour less, it would have needed 6 hours more. The distance, in km, travelled by the train is

[A] 800
[B] 720
[C] 780
[D] 640

Q.5) Rajesh and Vimal own 20 hectares and 30 hectares of agricultural land, respectively, which are entirely covered by wheat and mustard crops. The cultivation area of wheat and mustard in the land owned by Vimal are in the ratio of 5 : 3. If the total cultivation area of wheat and mustard are in the ratio 11 : 9, then the ratio of cultivation area of wheat and mustard in the land owned by Rajesh is

[A] 4 : 3
[B] 3 : 7
[C] 1 : 1
[D] 7 : 9

Q.6) Aman invests Rs 4000 in a bank at a certain rate of interest, compounded annually. If the ratio of the value of the investment after 3 years to the value of the investment after 5 years is 25 : 36, then the minimum number of years required for the value of the investment to exceed Rs 20000 is

Q.7) If 10^{68} is divided by 13, the remainder is

[A] 9
[B] 5

[C] 8
[D] 4

Q.8) The average of three distinct real numbers is 28. If the smallest number is increased by 7 and the largest number is reduced by 10, the order of the numbers remains unchanged, and the new arithmetic mean becomes 2 more than the middle number, while the difference between the largest and the smallest numbers becomes 64.Then, the largest number in the original set of three numbers is

Q.9) In a group of 250 students, the percentage of girls was at least 44% and at most 60%.The rest of the students were boys. Each student opted for either swimming or running or both. If 50% of the boys and 80% of the girls opted for swimming while 70%of the boys and 60% of the girls opted for running, then the minimum and maximum possible number of students who opted for both swimming and running, are
[A] 75 and 96, respectively
[B] 75 and 90, respectively
[C] 72 and 88, respectively
[D] 72 and 80, respectively

Q.10)

If $\left(a+b\sqrt{3}\right)^2 = 52+30\sqrt{3}$, where a and b are natural numbers, then $a+b$ equals

[A] 8
[B] 10
[C] 7
[D] 9

Q.11) The midpoints of sides AB, BC, and AC in ΔABC are M, N, and P, respectively. The medians drawn from A, B, and C intersect the line segments MP, MN and NP at X, Y, and Z, respectively. If the area of ΔABC is 1440 sq cm, then the area, in sq cm, of ΔXYZ is

Q.12)

The sum of all distinct real values of x that satisfy the equation $10^x + \frac{4}{10^x} = \frac{91}{2}$, is

[A] $\log_{10} 2$
[B] $3\log_{10} 2$
[C] $2\log_{10} 2$
[D] $4\log_{10} 2$

Q.13)

The number of distinct real values of x, satisfying the equation.
$\max\{x, 2\} - \min\{x, 2\} = |x+2| - |x-2|$, is

Q.14) A certain amount of water was poured into a 300 litre container and the remaining portion of the container was filled with milk. Then an amount of this solution was taken out from the container which was twice the volume of water that was earlier poured into it, and water was poured to refill the container again. If the resulting solution contains 72% milk, then the amount of water, in litres, that was initially poured into the container was

Q.15)

For any non–zero real number x,

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

Then, the sum of all possible values of x for which $f(x) = 3$, is

[A] -2
[B] 3
[C] 2
[D] -3

Q.16) Gopi marks a price on a product in order to make 20% profit. Ravi gets 10% discount on this marked price, and thus saves Rs 15. Then, the profit, in rupees, made by Gopi by selling the product to Ravi, is

[A] 10
[B] 20
[C] 15
[D] 25

Q.17)

Consider the sequence $t_1 = 1$, $t_2 = -1$ and $t_n = \left(\frac{n-3}{n-1}\right) t_{n-2}$ for $n \geq 3$. The, the value of the sum

$\frac{1}{t_2} + \frac{1}{t_4} + \frac{1}{t_6} + \ldots\ldots + \frac{1}{t_{2022}} + \frac{1}{t_{2024}}$, is

[A] –1022121
[B] –1026169
[C] –1024144
[D] –1023132

Q.18) The number of all positive integers up to 500 with non-repeating digits is

Q.19) After two successive increments, Gopal's salary became 187.5% of his initial salary. If the percentage of salary increase in the second increment was twice of that in the first increment, then the percentage of salary increase in the first increment was

[A] 20
[B] 25
[C] 27.5
[D] 30

Q.20)

Sam can complete a job in 20 days when working alone. Mohit is twice as fast as Sam and thrice as fast as Ayna is the same job. The undertake a job with an arrangement where Sam and Mohit work together on the first day, Sam and Ayna on the second day, Mohit and Ayna on the third day, and this three–day pattern is repeated till the work gets completed. Then, the fraction of total work done by Sam is

[A] 3/20
[B] 3/10
[C] 1/5
[D] 1/20

Q.21) A regular octagon ABCDEFGH has sides on length 6 cm each. Then the area, in sq. cm, of the square ACEG is

[A] $36(2+\sqrt{2})$

[B] $72(1+\sqrt{2})$

[C] $36(1+\sqrt{2})$

[D] $72(2+\sqrt{2})$

Q.22)

For some constant real numbers p, k and a consider the following system of linear equations in x and y:

$px - 4y = 2$

$3x + ky = a$

A necessary condition for the system to have no solution for (x, y) is

[A] $ap - 6 = 0$

[B] 2

[C] $2a + k \neq 0$

[D] $kp + 12 \neq 0$

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Solutions

VARC

1. Correct Answer – A
Explanation: The line “Through its mastery of language, AI could even form intimate relationships with people, and use the power of intimacy to change our opinions and worldviews” clearly suggests that the author thinks AI can use the power of intimacy to shape people's worldviews. There is no implication that this emotional manipulation could exacerbate the polarization of world views.
Option B is wrong as the lines “AI can create completely new ideas, completely new culture..." clearly indicate that AI has the ability to create completely new ideas and, therefore, new cultures which is a significant threat to human civilization.
Option C is wrong as the author expresses a clear concern about AI's role in potentially subverting democratic processes, particularly through the generation of fake news and political content… Refer to the lines “Think of the next American presidential race in 2024, …….. mass-produce political content, fake-news stories and scriptures for the new cult." “ Democracy is a conversation……, thereby destroying democracy.”
Option D is wrong. Refer to the lines "What would happen once a non-human intelligence becomes better than the average human at telling stories, composing melodies, drawing images, and writing laws and scriptures?"

2. Correct Answer – C
Explanation: Refer the lines, “Unregulated AI…. which would benefit autocrats and ruin democracies. Democracy is a conversation ….. When AI hacks language, ……..thereby destroying democracy..."
This clearly indicates that the author believes one of the greatest dangers posed by AI is its ability to disrupt the democratic process, making Option C the correct choice.
Option A: The passage discusses the risks and dangers of unregulated AI, particularly its potential to manipulate culture, language, and democracy. The author does not discuss the positive impacts of AI making Option A incorrect.
Option B: The author does not dismiss the fears about AI harming humanity. In fact, they highlight the significant dangers AI could pose, particularly in terms of language manipulation and its effects on society and democracy. The passage mentions that AI could form intimate relationships with humans and manipulate opinions, which implies real concerns about its negative impact. Therefore, Option B is also incorrect.
Option D: The passage does mention concerns about AI being used by students (such as ChatGPT writing essays), however the author shifts the focus to much broader, more significant issues, such as the potential for AI to influence political processes and subvert democracy. The author does not argue that fears about AI in schools are unfounded; rather, they suggest that these concerns are a distraction from the larger issues. Therefore, Option D is incorrect as well.

3. Correct Answer – D
Explanation: Option D is correct as the author highlights how language is crucial in creating cultural artefacts, conveying human values, and influencing opinions, but does not suggest that language is the basis for AI tools like ChatGPT. While AI tools use language, the primary focus of the author is on how language underpins human society and culture and how its manipulation by AI can have terrible consequences for human civilization.

Option A: Refer to the line, “Human rights, for example, aren’t inscribed in our DNA. Rather, they are cultural artefacts we created by telling stories and writing laws."
Option B: This is correct because the passage underscores how language is the key to expressing and spreading human values, culture, and societal norms. The author writes: "Language is the stuff almost all human culture is made of."
Option C: Refer to line, "AI could even form intimate relationships with people, and use the power of intimacy to change our opinions and worldviews."

4. Correct Answer – D
Explanation: The author raises significant concerns over AI’s potential to disrupt language, culture, democracy, and human relationships. The overall tone of the passage warns readers about the risks of these tools and calls for quick regulation. The author writes:
"We can still regulate the new AI tools, but we must act quickly... Unregulated AI deployments would create social chaos, which would benefit autocrats and ruin democracies."
This tone of caution about the future impacts of AI is a defining characteristic of the passage.
Option A: While the passage does contain a rhetorical question at the end, this is not the dominant tone of the passage. The focus is not on curiosity or uncertainty but on the dangers of AI and the need for regulation.
Option B: The author raises significant concerns but does so with reason and logic, aiming to provoke thought and call for regulation, rather than inducing panic. The focus is on the adverse consequences and their implications, not on sensationalizing the threat.
Option C: While the passage does discuss the future impact of AI tools, the tone is more focused on warning about the immediate need for regulation and action to avoid negative consequences. The author is not primarily forecasting the future but urging preventive measures against potential harms.

5. Correct Answer – B
Explanation: The paragraph highlights the tension between lyric poetry's personal focus and Marxism’s societal focus, while also suggesting that lyric poetry could still serve a critical purpose. It acknowledges that although lyric poetry is personal and often focused on the small scale, it can function as a form of resistance against a repressive culture — something the passage hints at when it discusses how poetry may be implicitly critical or utopian. Option B captures this idea.
Option A: The focus of the passage is more on the possibility of lyric poetry serving a role in resisting oppression, rather than solely highlighting Marxism’s internal contradictions.
Option C: This option is not entirely correct because it suggests that the resolution of the tension between Marxism and lyric poetry is necessary for poetry to avoid being utopian. The passage does not argue that a resolution is required for poetry to be utopian; rather, it suggests that lyric poetry may inherently be utopian but can still serve a critical function.
Option D: The passage does not suggest that Marxism makes "unreasonable demands" on lyric poetry. Neither does it argue that Marxism "ignores" the merits of poetry.

6. Correct Answer – C
Explanation: The sentence describes financial stress due to new and previously unincurred costs, which is directly related to the idea of workers experiencing increased expenses after a period of remote work. Blank 3 is the best fit as it discusses how workers were able to save during remote work, when the additional costs (like transportation, lunches, etc.) were absent, which aligns well with the sentence that talks about the stress of these newly incurred costs.

Option A introduces the rising costs (petrol, food) but doesn't immediately connect with the stress of the added costs workers are now facing.
Option B talks about wage stagnation, but it's not as directly related to the personal stress caused by the new return-to-office costs.
Option D is about a specific example of spending return-to-office costs, but it's more about individual cases rather than the general sentiment about the costs employees are now facing.

7. Correct Answer – C
Explanation: Option C: This option works best because it connects directly to the earlier sentence about the horrifying photograph and gives more historical context and significance to the image, specifically about the title and nickname of the photograph.
Option A: It's more focused on the children's reaction (terror, pain, confusion) and the visual details the sentence would break the flow of the narrative if it were placed right after the opening sentence.
Option B: This too would break the flow in describing the terrifying visual of children fleeing from the ravages of destruction and weary soldiers following after them.
Option D: The focus here is on the nickname of the 9-year-old girl at the center of the photo, which should come after the paragraph has discussed the photograph's historical and emotional impact.

8. Correct Answer – C
Explanation: Moutai's biggest market is drinkers in their mid-30s…... "Its biggest market now is (male) drinkers in their mid-30s. Many….. which also means…….splash out on weddings and banquets. Moutai is often a guest of honor." At the same time the author also says, "In the long run, its biggest risk may be millennials. As they grow older…..the desire for more wholesome pursuits than binge-drinking……..curb heavy drinking….. on which so much of the demand for Moutai rests." Thus, Option C is the correct choice.
Option A: While appealing to the rich is a reason for success, it is not portrayed as a future threat. The passage suggests that targeting the wealthy market remains a good strategy for Moutai.
Option B: This cultural factor contributes to Moutai's success, but it is not a threat. In fact, it is described as a strong foundation for Moutai's continued sales in the present and near future.
Option D: While government involvement can pose risks, it is not both a reason for success and a threat in the same way the appeal to the older demographic is. The passage mainly discusses the government's control over pricing, which is presented as a risk, but not an immediate factor of success in the way the appeal to older consumers is.

9. Correct Answer – C
Explanation: Option C: The author contrasts Moutai's marketing strategy with typical Western business practices, such as digital marketing, environmental sustainability, and appeal to millennials. Moutai's marketing strategy is unconventional, ignoring Western business mantras in favor of appealing to Chinese nationalism, the super-rich, and older generations. The author refers to this combination as an "unholy trinity" because it contradicts the Western approach to business.
Option A: While nationalism is a key factor in Moutai's success, it alone doesn't explain the term.
Option B: The main focus of the passage is the contradiction between Moutai's strategy and Western practices, not the long-term risks directly.

Option D: The author does not make any moral judgments on the marketing techniques of Moutai.

10. Correct Answer – A
Explanation: The author implies that Moutai's claimed ability to be hangover-proof is so remarkable that it could be considered revolutionary—much like gunpowder was a revolutionary invention. Thus, the lines has been used in a metaphorical sense.
Option B: Moutai is not actually a chemical or invention like gunpowder, but a liquor with a claimed quality (hangover-proof), which is an exaggeration for effect.
Option C: The phrase is not focusing on the actual substance of Moutai or comparing its intrinsic properties to gunpowder. It is a figurative comparison, not a focus on tangible substance.
Option D: Moutai and gun powder do not mean the same.

11. Correct Answer – D
Explanation: The author emphasizes that Moutai focuses on serving China's super-rich and not its middle class, as many firms have failed in the highly competitive market targeting the middle class… "Second, it chose…. rather than its middle class. Markets…..could not compete ……cut-throat battle for Chinese middle-class wallets…….and still less crowded with prestige brands than advanced economies." Option D contradicts the passage and hence is the correct answer.
Option A: This is directly supported by the passage, which notes that many firms have failed in the middle-class market due to the competitive nature of that segment.
Option B: Option is consistent with the passage. It mentions that the premium market for liquor in China, catering to the super-rich, is massive and less crowded compared to the middle-class market, making it a lucrative target for Moutai.
Option C: The passage mentions that the Chinese government is involved in Moutai's pricing, with the government being the largest shareholder and trying to keep prices stable, which could be seen as controlling the pricing.

12. Correct Answer – D
Explanation: Option D best summarises how the tradwife's actions, such as her commitment to vintage fashion and traditional roles, are depicted as exposing the superficial nature of modern life. The passage emphasizes how she challenges current societal norms by insisting on an idealized, seemingly "primitive" way of life, which contrasts sharply with modern, artificial values.
Option A: The passage highlights how the tradwife's actions aren't just critiques of modern ideals, but are also a deliberate challenge to societal norms. It's more than just a critique; it's a direct confrontation with and mockery of those norms. This option misses the crucial idea of the tradwife "highlighting" and "challenging" those norms in a way that makes others feel "hollow" and "cheated."
Option B: This option doesn't fully capture the idea of "challenging" or "mocking" societal norms, which is a key part of the passage. The word "reveal" here is too passive compared to the active, more confrontational role the tradwife plays in making others feel "hollow" and "cheated" by exposing the contradictions in modern values.
Options 3: Option C is not the correct answer because it uses the passive term "exposes," which fails to capture the active confrontation central to the passage. The tradwife's behavior is not just about revealing superficiality, but about challenging and forcing others to confront the

hollow nature of modern values. The passage emphasizes her role as a "troll," actively beating society at its own game, which is better captured by the word "challenges" in Option D.

13. Correct Answer – A
Explanation: The sentence talks about displacement, which ties in well with the context of "pastoralists" (people who rely on livestock for their livelihood) never being able to return home, which comes after blank 4. Hence Option A is correct.
Option B: Inserting the sentence in blank 1 would break the continuity of describing the drought's severity.
Option C: Blank 2 introduces the effects of the drought too early, while the displacement sentence works better after the broader context of food insecurity.
Option D: The sentence before blank 3 discusses the far-reaching consequences of the drought, which logically flows into the next sentence about farmers and pastoralists. Inserting the sentence in blank 3 will break this continuity.

14. Correct Answer – 2
Explanation: Sentence 2 talks about the early interest in forecasting from the intelligence community. While it's related to forecasting, it introduces historical context that doesn't fit smoothly with the focus of the other sentences, which deal more with the effectiveness and accuracy of forecasting.
Sentence 1 introduces the idea of forecasting and how it doesn't require specialized expertise, making it accessible to a broader group.
Sentence 5 adds to that idea by emphasizing that non-experts have performed better in forecasting than experts, aligning with the notion that forecasting can be effective even without specialized knowledge.
Sentence 4 supports this idea by citing a study where non-experts performed better than experts in predicting geopolitical events.
Sentence 3 fits as it contrasts the performance of non-experts with that of intelligence experts, even though experts had access to classified intelligence, further highlighting the surprising accuracy of non-expert predictions.

15. Correct Answer – 1
Explanation: Sentence 1 introduces the creation of synapses and the role of the axon terminal, which describes how synapses are formed at a technical, biological level. However, it focuses more on the process of synapse creation rather than the developmental process of synapses which is the focus of the other sentences.
Sentence 2: Talks about the importance of early neural connections and their role before the eyes begin functioning, which sets the stage for understanding the developmental process.
Sentence 5: Explains how synapses are generated excessively in a "rehearsal period", aligning with the developmental focus.
Sentence 4: Continues the idea of neural connections forming before birth, which contributes to the process of a child being able to visualize immediately after birth.
Sentence 3: Explains synaptic pruning, which is the process of refining these connections, removing weak ones, and reinforcing the important ones.

16. Correct Answer – B
Explanation: Option B is not mentioned in the passage. Instead, the author mentions how other countries (like China) have already sent probes to the Moon and experimented with growing

plants, without the same level of protest seen in the U.S. There is no claim that probes have had little effect on the environment in the passage.
Option A: Refer to paragraph 2.
Option C: Refer to para 3…"It's important…….many international competitors will ignore….China recently sent…."
Option D: Refer to para 4…. "U.S. lunar landings did not leave the campsites cleaner than they found it…"

17. Correct Answer – B
Explanation: In the first paragraph, the author seems to be questioning and doubting the planetary protection advocates who push for sterilizing robotic probes to avoid contaminating possible, but not proven, biospheres. The author points out how much money NASA spends on cleaning these probes, and suggests that these efforts might be a bit over the top, especially since there's no solid evidence that life exists on Mars or any other planets yet.
Option A: The author does not approve of the significant expenses involved in these efforts, but instead suggests that the costs are perhaps too high for uncertain benefits.
Option C: The author is not indifferent. In fact, there is an implied critique of the elitist perspective of the planetary protection advocates, but the main focus is on the excessive efforts to sterilize space missions, not indifference to elitism.
Option D: The tone is not equivocal (uncertain); the author is clear in their skepticism about these efforts and is questioning them, not presenting a balanced or indecisive view.

18. Correct Answer – C
Explanation: The passage highlights how the scientific communities in different countries (China and Israel) react differently to space contamination. While China's actions (sending a terrarium to the moon) sparked no protest, Israel's actions (smuggling tardigrades) led to a significant uproar. This suggests that national scientists may have varying sensitivities or approaches to issues like biosphere protection.
Option A: The passage doesn't discuss the type of contamination (animal vs. plant) or its relative importance. The focus is on the reactions to the actions, not the severity of the contamination.
Option B: While the reactions to China and Israel are different, the passage doesn't emphasize global biases. The focus is more on the scientific communities in each country, rather than on general global biases.
Option D: The passage does not claim that China's actions are particularly reasonable. It contrasts the lack of protest over China's actions with the strong reaction to Israel's, but it doesn't suggest one is more reasonable than the other.

19. Correct Answer – D
Explanation: On simplifying, the question is asking what point the author is likely to disagree with. The author disagrees with the idea of placing heavy emphasis on minimizing contamination until life is ruled out. The author argues that life on Mars or other bodies has not been conclusively proven, and the emphasis on contamination should not outweigh the need for exploration and development.
Option A: The author agrees with the idea of a compromise approach, where Mars is divided into different zones for science, habitation, and resource exploitation.
Option B: The author acknowledges that earlier NASA missions, such as the Apollo missions, did not focus on sterility, but they also did not cause significant harm. The author suggests that the concerns about contamination in previous missions were somewhat exaggerated.

Option C: The author argues that the costs of sterilizing probes and maintaining a pristine environment are unsustainable and that focusing too much on contamination could limit human exploration. "….scrubbing everything and hauling out all the trash, would destroy NASA's human exploration budget and encroach on the agency's other directorates, too. Getting future astronauts off Mars is enough of a challenge, without trying to tote weeks of waste along as well."

20. Correct Answer – C
Explanation: The passage doesn't mention anything about jobs or economic opportunities helping to save languages. It's more about physical destruction and forced cultural changes, not giving jobs to locals to help them survive.
Option A: This could be true because in North America, European colonists took native children away from their families to boarding schools to erase their cultures. If this didn't happen as much in South America, it might explain why languages there survived a bit better.
Option B: In North America, colonists were really successful in pushing their own culture and language onto the locals. If South American colonists weren't as successful at forcing locals to adopt their ways, it might have helped the local languages survive longer.
Option D: The passage talks about how many Native American communities were wiped out, which led to many languages disappearing. If fewer people were killed in South America, that could explain why their languages stuck around longer.

21. Correct Answer – B
Explanation: Option B goes against the main idea of the passage because it suggests that a liberal arts education should focus on mastering the top global languages, like English or Spanish. But the passage is all about valuing and preserving endangered languages, not just learning widely spoken ones. The idea is to encourage a deeper understanding of diverse cultures and languages, especially those at risk of disappearing, which wouldn't happen if the focus was only on the most common languages.
Option A: The fact that most liberal arts students will pursue jobs in fields like publishing or HR instead of linguistics doesn't contradict the passage. The author is clear that even students who don't become linguistics experts can still play a role in preserving endangered languages through cultural awareness and empathy.
Option C: The idea that schools teaching endangered languages might only preserve them for a generation doesn't go against the passage's central theme. The passage acknowledges that some endangered languages are hard to save, but it also shows that efforts, like teaching endangered languages in schools, can make a difference, even if it's only for one generation.
Option D: The statement that recording a dying language freezes it in time doesn't directly challenge the passage's message. While the passage emphasizes the importance of actively preserving and revitalizing languages, it also notes the value of documenting them, even if that's just to capture a snapshot of the language before it's lost.

22. Correct Answer – B
Explanation: The passage focuses on the loss of cultural knowledge, worldview, and unique perspectives when a language becomes extinct. Option B discusses the loss of a group from a government list of indigenous tribes, which is more about legal or administrative status rather than the cultural and intellectual loss emphasized in the passage.
Option A: This is exactly the kind of loss the passage talks about. The extinction of a language can lead to the loss of unique cultural knowledge, including how a group perceives and interacts with their environment.

Option C: The passage stresses that languages carry with them unique cultural and emotional expressions that are tied to the way people think and experience the world. The passage highlights that when a language disappears, it doesn't just take the words with it, but also the feelings and meanings those words represent.
Option D: This is another example of the kind of cultural and environmental knowledge the passage describes. The Nicobarese language, with its descriptions of 20 different moods of the ocean, reflects a unique way of understanding and interpreting the natural world.

23. Correct Answer – B
Explanation: While the passage mentions that some students may engage in language preservation (like recording dying languages), it does not suggest that the primary role of liberal arts students is to establish schools specifically for preserving languages. This is more of an extreme, specialized activity that only a few students might pursue.
Option A: A liberal arts education helps students recognize and understand their own cultural biases and practices. By learning about other languages and cultures, they gain insights into their own. This is aligned with the passage's idea that students can become more empathetic and culturally aware.
Option C: The passage discusses how studying different languages and cultures helps students navigate cultural differences and communicate more effectively across cultural lines. This is a clear benefit of a liberal arts education.
Option D: The passage emphasizes the importance of learning languages, particularly those at risk of extinction, to understand and preserve different worldviews.

24. Correct Answer – C
Explanation: The passage discusses the outdated nature of the current regulatory framework for biotechnology, particularly in the context of regulating living organisms, which are unpredictable and unique. It questions whether regulation can ever keep up with the pace of innovation, particularly when it comes to the risks and variations that emerge when new biological entities are introduced.
Option A: The option focuses too much on the impossibility of imagining all risks, which the passage does not emphasize. The passage discusses outdated regulation and the challenge of adapting to unpredictability, rather than the sheer impossibility of imagining outcomes.
Option B: Doesn't capture the essence of the passage, which raises doubts about whether regulation can actually keep up with rapid innovation in biotechnology, especially considering the unpredictability of biological entities.
Option D: It introduces the idea that scientists should shape the regulations, which is not directly suggested in the passage.

DILR

1. Correct Answer – A
Explanation: By keeping all conditions in mind, We can see There should be an ATM placed at intersection of V3 and R-C.
Also, By condition (2), we can judge there is only one possibility to place ATM with second highest cash requirement at intersection of V2 and R-B.
Because this is the only place which is 12 km away.
Also, we cannot use distinct integers ranging from 7 to 15.
So, By hit and trial, there are only two cases to arrange all 6 ATM's in following manner:

Case 1:

	V1	V2	V3	Row total
R-A	15	0	7	22
R-B	0	12	8	20
R-C	0	9	11	20
column total	15	21	26	62

Case 2:

	V1	V2	V3	Row total
R-A	7	0	15	22
R-B	8	12	0	20
R-C	0	9	11	20
column total	15	21	26	62

Option (A) is correct as The ATM placed at the (R-C, V2) intersection has a cash requirement of Rs. 9 Lakh.

2. Correct Answer – 3
Explanation: By keeping all conditions in mind, We can see There should be an ATM placed at intersection of V3 and R-C.
Also, By condition (2), we can judge there is only one possibility to place ATM with second highest cash requirement at intersection of V2 and R-B.
Because this is the only place which is 12 km away.
Also, we cannot use distinct integers ranging from 7 to 15.
So, By hit and trial, there are only two cases to arrange all 6 ATM's in following manner:

Case 1:

	V1	V2	V3	Row total
R-A	15	0	7	22
R-B	0	12	8	20
R-C	0	9	11	20
column total	15	21	26	62

Case 2:

	V1	V2	V3	Row total
R-A	7	0	15	22
R-B	8	12	0	20
R-C	0	9	11	20
column total	15	21	26	62

In Case 1, ATMs with cash requirement of 15 L, 12 L, 11L are more than 10 L.
In case (2), ATMs with cash requirement of 15 L, 12 L, 11L are more than 10 L.
Hence there are 3 ATMs with cash requirements of Rs. 10 Lakh or more.

3. Correct Answer – D
Explanation: By keeping all conditions in mind, We can see There should be an ATM placed at intersection of V3 and R-C.
Also, By condition (2), we can judge there is only one possibility to place ATM with second highest cash requirement at intersection of V2 and R-B.
Because this is the only place which is 12 km away.
Also, we cannot use distinct integers ranging from 7 to 15.
So, By hit and trial, there are only two cases to arrange all 6 ATM's in following manner:

Case 1:

	V1	V2	V3	Row total
R-A	15	0	7	22
R-B	0	12	8	20
R-C	0	9	11	20
column total	15	21	26	62

Case 2:

	V1	V2	V3	Row total
R-A	7	0	15	22
R-B	8	12	0	20
R-C	0	9	11	20
column total	15	21	26	62

As we can see in both cases only statement (1) is right but statement (2) is wrong in case (1).
Hence option (D) is the answer.

4. Correct Answer – 3
Explanation: By keeping all conditions in mind, We can see There should be an ATM placed at intersection of V3 and R-C.
Also, By condition (2), we can judge there is only one possibility to place ATM with second highest cash requirement at intersection of V2 and R-B.
Because this is the only place which is 12 km away.
Also, we cannot use distinct integers ranging from 7 to 15.
So, By hit and trial, there are only two cases to arrange all 6 ATM's in following manner:

Case 1:

	V1	V2	V3	Row total
R-A	15	0	7	22
R-B	0	12	8	20
R-C	0	9	11	20
column total	15	21	26	62

Case 2:

	V1	V2	V3	Row total
R-A	7	0	15	22
R-B	8	12	0	20
R-C	0	9	11	20
column total	15	21	26	62

We can determine only 3 ATMs' locations uniquely and they are (V2, R-B), (V2, R-C) and (V3, R-C).

5. Correct Answer – C

Explanation: By keeping all conditions in mind, We can see There should be an ATM placed at intersection of V3 and R-C.
Also, By condition (2), we can judge there is only one possibility to place ATM with second highest cash requirement at intersection of V2 and R-B.
Because this is the only place which is 12 km away.
Also, we cannot use distinct integers ranging from 7 to 15.
So, By hit and trial, there are only two cases to arrange all 6 ATM's in following manner:

Case 1:

	V1	V2	V3	Row total
R-A	15	0	7	22
R-B	0	12	8	20
R-C	0	9	11	20
column total	15	21	26	62

Case 2:

	V1	V2	V3	Row total
R-A	7	0	15	22
R-B	8	12	0	20
R-C	0	9	11	20
column total	15	21	26	62

In case (1), ATMs (V2, R-B) and (V3, R-B) are the ATMs with second highest and second lowest requirements.
Hence distance between them is 7 KM.
In case (2), ATMs ((V1, R-B) and (V2, R-B) are the ATMs with second lowest and second highest requirements.
Hence distance between them is 4 KM.
So ans is either D or 7 KM.

6. Correct Answer – B
Explanation: Let the total number of subscribers in 2023 = 100x
From point 1, the total number of subscribers in 2024 = 100x + 10% of 100x = 110x
In 2023,
Total number of subscribers from Kid category = 15% of 100x = 15x
From point 3 and 4, in 2023
Number of subscribers from Kid category using one app = 10000.
So, number of subscribers from Kid category using multiple apps = 15x – 10000 = number of subscribers from Elder category using one app.
Also, number of subscribers from Elder category using multiple apps = 15000
So, total number of subscribers from Elder category = 15x – 10000 + 15000 = 20% of 100x = 20x
Solving, x = 1000
So, the total number of subscribers in 2023 = 100000 and in 2024 = 110000

The rest of the information can be gathered as follows-

Category	App(s)	2023	2024	Total
Kid	One	10000	11000	21000
	Multiple	5000	11000	16000
	Total	**15000**	**22000**	**37000**
Elder	One	5000	22000	27000
	Multiple	15000	11000	26000
	Total	**20000**	**33000**	**53000**
Others	One			
	Multiple			
	Total	**65000**	**55000**	**120000**
Total		100000	110000	210000

Number of subscribers belonged to the Others category in 2024 = 55000

7. Correct Answer – C
Explanation: Let the total number of subscribers in 2023 = 100x
From point 1, the total number of subscribers in 2024 = 100x + 10% of 100x = 110x
In 2023,
Total number of subscribers from Kid category = 15% of 100x = 15x
From point 3 and 4, in 2023
Number of subscribers from Kid category using one app = 10000.
So, number of subscribers from Kid category using multiple apps = 15x – 10000 = number of subscribers from Elder category using one app.
Also, number of subscribers from Elder category using multiple apps = 15000
So, total number of subscribers from Elder category = 15x – 10000 + 15000 = 20% of 100x = 20x
Solving, x = 1000
So, the total number of subscribers in 2023 = 100000 and in 2024 = 110000

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Category	App(s)	2023	2024	Total
Kid	One	10000	11000	21000
	Multiple	5000	11000	16000
	Total	**15000**	**22000**	**37000**
Elder	One	5000	22000	27000
	Multiple	15000	11000	26000
	Total	**20000**	**33000**	**53000**
Others	One			
	Multiple			
	Total	**65000**	**55000**	**120000**
Total		100000	110000	210000

Percentage of subscribers in the Kid category using multiple apps in 2023

$$= \frac{5000}{15000} \times 100 = 33.33\%$$

8. Correct Answer – B

Explanation: Let the total number of subscribers in 2023 = 100x
From point 1, the total number of subscribers in 2024 = 100x + 10% of 100x = 110x
In 2023,
Total number of subscribers from Kid category = 15% of 100x = 15x
From point 3 and 4, in 2023
Number of subscribers from Kid category using one app = 10000.
So, number of subscribers from Kid category using multiple apps = 15x – 10000 = number of subscribers from Elder category using one app.
Also, number of subscribers from Elder category using multiple apps = 15000
So, total number of subscribers from Elder category = 15x – 10000 + 15000 = 20% of 100x = 20x
Solving, x = 1000
So, the total number of subscribers in 2023 = 100000 and in 2024 = 110000

The rest of the information can be gathered as follows-

Category	**App(s)**	**2023**	**2024**	**Total**
Kid	One	10000	11000	21000
	Multiple	5000	11000	16000
	Total	**15000**	**22000**	**37000**
Elder	One	5000	22000	27000
	Multiple	15000	11000	26000
	Total	**20000**	**33000**	**53000**
Others	One			
	Multiple			
	Total	**65000**	**55000**	**120000**
Total		100000	110000	210000

Percentage increase in the number of subscribers in the Elder category from 2023 to 2024

$$= \frac{(33000 - 20000)}{20000} \times 100 = 65\%$$

9. Correct Answer – A
Explanation: Let the total number of subscribers in 2023 = 100x
From point 1, the total number of subscribers in 2024 = 100x + 10% of 100x = 110x
In 2023,
Total number of subscribers from Kid category = 15% of 100x = 15x
From point 3 and 4, in 2023
Number of subscribers from Kid category using one app = 10000.
So, number of subscribers from Kid category using multiple apps = 15x – 10000 = number of subscribers from Elder category using one app.
Also, number of subscribers from Elder category using multiple apps = 15000
So, total number of subscribers from Elder category = 15x – 10000 + 15000 = 20% of 100x = 20x
Solving, x = 1000
So, the total number of subscribers in 2023 = 100000 and in 2024 = 110000

The rest of the information can be gathered as follows-

Category	App(s)	2023	2024	Total
Kid	One	10000	11000	21000
	Multiple	5000	11000	16000
	Total	**15000**	**22000**	**37000**
Elder	One	5000	22000	27000
	Multiple	15000	11000	26000
	Total	**20000**	**33000**	**53000**
Others	One			
	Multiple			
	Total	**65000**	**55000**	**120000**
Total		100000	110000	210000

To minimize, let the number of subscribers in Others category using multiple apps in 2024 = 0
So, the minimum percentage of subscribers who used multiple apps in 2024

$$= \frac{(11000 + 11000 + 0)}{110000} \times 100 = 20\%$$

10. Correct Answer – A
Explanation:

Country	GDP	GDP/CAPITA	Population	GDP growth rate(in %)	Population growth rate(in %)
C1	15x	41y	$\frac{15x}{41y}$	0.2	-0.12
C2	14x	25y	$\frac{14x}{25y}$	0.9	-0.41
C3	13x	2y	$\frac{13x}{2y}$	6.5	0.7
C4	12x	38y	$\frac{12x}{38y}$	0.5	0.49
C5	10x	36y	$\frac{10x}{36y}$	0.7	0.31
C6	8x	8y	$\frac{8x}{8y}$	3.2	0.61
C7	8x	30y	$\frac{8x}{30y}$	0.7	-0.11
C8	7x	41y	$\frac{7x}{41y}$	1.2	0.71
C9	100x	?			
C10	?	100y			

As is given GDP per capita = GDP/Population
That implies population = GDP/GDP per capita
Hence we can calculate population for each country.
It's always time saving if we check only for given options

For C8: $\frac{7x}{41y}$

For C5: $\frac{10x}{36y}$

For C3: $\frac{13x}{2y}$

For C7: $\frac{8x}{30y}$

Since $\frac{x}{y}$ is a common expression, So, we can compare $\frac{7}{41}, \frac{10}{36}, \frac{13}{2}, \frac{8}{30}$.
Out of these, C8 has the smallest population.

11. Correct Answer – B
Explanation:

Country	GDP	GDP/CAPITA	Population	GDP growth rate(in %)	Population growth rate(in %)
C1	15x	41y	$\frac{15x}{41y}$	0.2	-0.12
C2	14x	25y	$\frac{14x}{25y}$	0.9	-0.41
C3	13x	2y	$\frac{13x}{2y}$	6.5	0.7
C4	12x	38y	$\frac{12x}{38y}$	0.5	0.49
C5	10x	36y	$\frac{10x}{36y}$	0.7	0.31
C6	8x	8y	$\frac{8x}{8y}$	3.2	0.61
C7	8x	30y	$\frac{8x}{30y}$	0.7	-0.11
C8	7x	41y	$\frac{7x}{41y}$	1.2	0.71
C9	100x	?			
C10	?	100y			

Required ratio = $12x(1+\frac{0.5}{100})^2 : 10x(1+\frac{0.7}{100})^2 = 1.195$

12. Correct Answer – D
Explanation:

Country	GDP	GDP/CAPITA	Population	GDP growth rate(in %)	Population growth rate(in %)
C1	15x	41y	$\frac{15x}{41y}$	0.2	-0.12
C2	14x	25y	$\frac{14x}{25y}$	0.9	-0.41
C3	13x	2y	$\frac{13x}{2y}$	6.5	0.7
C4	12x	38y	$\frac{12x}{38y}$	0.5	0.49
C5	10x	36y	$\frac{10x}{36y}$	0.7	0.31
C6	8x	8y	$\frac{8x}{8y}$	3.2	0.61
C7	8x	30y	$\frac{8x}{30y}$	0.7	-0.11
C8	7x	41y	$\frac{7x}{41y}$	1.2	0.71
C9	100x	?			
C10	?	100y			

For C1, Population is $\frac{15x}{41y}\left(1-\frac{0.12}{100}\right)^3 = \frac{365268x}{10^6 y}$

For C4, Population is $\frac{12x}{38y}\left(1+\frac{0.49}{100}\right)^3 = \frac{547x}{10^6.y}$

For C5, Population is $\frac{10x}{36y}\left(1+\frac{0.31}{100}\right)^3 = \frac{280369x}{10^6.y}$

For C7, Population is $\frac{8x}{30y}\left(1-\frac{0.11}{100}\right)^3 = \frac{265787x}{10^6.y}$

So, for C1, population is maximum in 2027.

13. Correct Answer – B
Explanation: As per the graph, the AC must have been turned off 2 times (12 am and 1 pm, when the inside temperature started rising) between 11:01 pm and 1:59 am

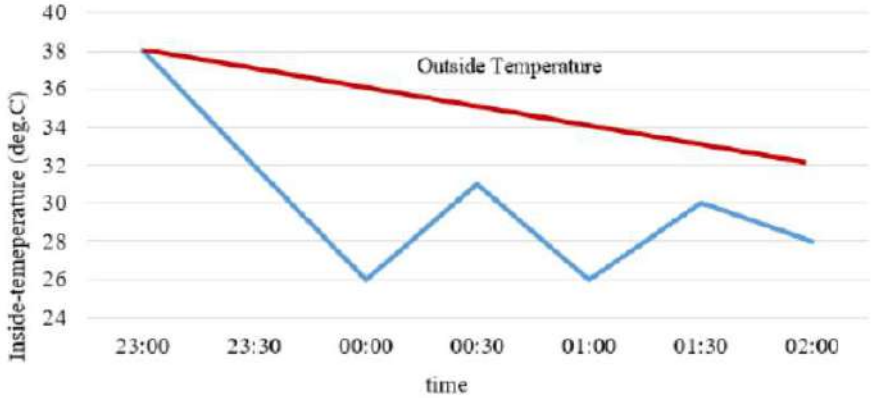
14. Correct Answer – 0
Explanation:

Country	GDP	GDP/CAPITA	Population	GDP growth rate(in %)	Population growth rate(in %)
C1	15x	41y	$\frac{15x}{41y}$	0.2	-0.12
C2	14x	25y	$\frac{14x}{25y}$	0.9	-0.41
C3	13x	2y	$\frac{13x}{2y}$	6.5	0.7
C4	12x	38y	$\frac{12x}{38y}$	0.5	0.49
C5	10x	36y	$\frac{10x}{36y}$	0.7	0.31
C6	8x	8y	$\frac{8x}{8y}$	3.2	0.61
C7	8x	30y	$\frac{8x}{30y}$	0.7	-0.11
C8	7x	41y	$\frac{7x}{41y}$	1.2	0.71
C9	100x	?			
C10	?	100y			

Since all the GDP growth rates are positive i.e., GDP is increasing. So, there is no country among C1 through C8 whose GDP per capita in 2027 be lower than that in 2024.

15. Correct Answer – 34

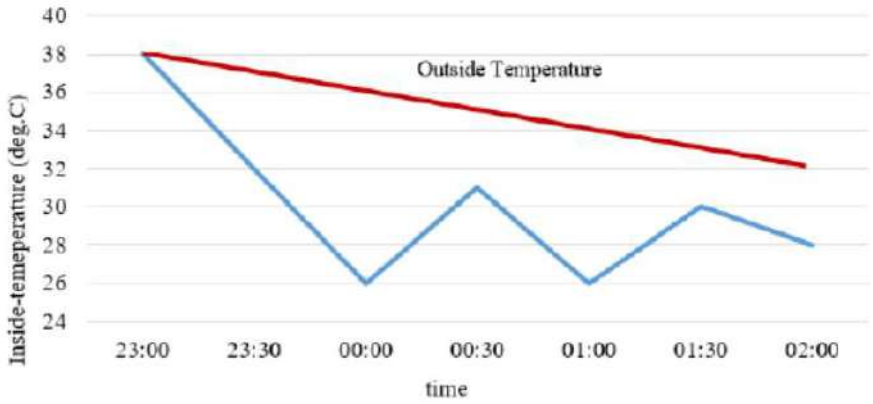
Explanation: Given that the AC was turned on for the first time that night at 11 pm.
So the temperature inside the room = 38 °C = the temperature outside the room.
Let the falling rate of temperature outside the room per hour = x °C
So, at 1 am (after 2 hours), the outside temperature = (38 – 2x) °C
Also given that it takes 1 hour to reach the temperature outside while AC was switched off.
Now, from 12 am to 12:30 pm, the temperature reached from 26 °C to 31 °C while AC was switched off, so it should have been reached from 31 °C to 36 °C from 12:30 pm to 1 pm (as per the constant rise in the rate), but along with that outside temperature is also falling at x °C per hour.
So, at 1 pm, the outside temperature should be = (36 – x) °C
Equating, (38 – 2x) °C = (36 – x) °C => x = 2 °C per hour



So, the temperature outside at 1 pm = 36 – 2 = 34 °C

16. Correct Answer – 42

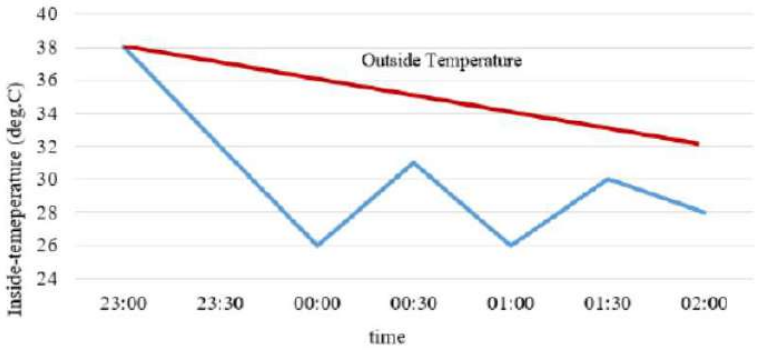
Explanation: Given that the AC was turned on for the first time that night at 11 pm.
So the temperature inside the room = 38 °C = the temperature outside the room.
Let the falling rate of temperature outside the room per hour = x °C
So, at 1 am (after 2 hours), the outside temperature = (38 – 2x) °C
Also given that it takes 1 hour to reach the temperature outside while AC was switched off.
Now, from 12 am to 12:30 pm, the temperature reached from 26 °C to 31 °C while AC was switched off, so it should have been reached from 31 °C to 36 °C from 12:30 pm to 1 pm (as per the constant rise in the rate), but along with that outside temperature is also falling at x °C per hour.
So, at 1 pm, the outside temperature should be = (36 – x) °C
Equating, (38 – 2x) °C = (36 – x) °C => x = 2 °C per hour



At 9 pm (2 hours prior to 11 pm), the temperature outside = 38 + 2x = 42 °C

17. Correct Answer – D
Explanation: Between 11:01 pm and 1:59 pm, the AC have been turned on at 12:30 am and 1:30 am, when the inside temperature starts falling.
Along with that it is given that the AC used in POWER mode is for longer duration that in REGULAR mode during 11 pm to 2 am and this alteration can be done after every 30 minutes.
This is possible as follows-
From 11 pm to 11:30 pm – REGULAR mode
From 11:30 pm to 12 pm – POWER mode
From 12:30 pm to 1 pm – POWER mode
From 1:30 pm to 2 pm – POWER mode
So, there must be an alteration at 11:30 pm
Hence, the number of time the AC must have been turned on or settings altered = 2 + 1 = 3 (exactly)

18. Correct Answer – 10
Explanation:



Between 11:01 pm and 11:59 am, the maximum difference between temperature outside and inside was at 12 am = 36 – 26 = 10 °C

19. Correct Answer – 5
Explanation: From point 1, 2 and 3, for all categories, Carbohydrate (Cereal) > Carbohydrate (Pseudo-cereal) > Carbohydrate (Millet) and all of these missing values are non-zero multiples of 5.

Let C1 (carbohydrate) = A, C2 (carbohydrate) = B, M2 (carbohydrate) = C and P2 (carbohydrate) = D such that A, B > 66, D > 62, C, 56
From point 4 and 5, all missing values of protein, fat and other nutrients are non-zero multiples of 4 such that P1 (protein) = 2 × M3 (protein)

Let C1 (protein) = P, C2 (protein) Q, M2 (protein) = R, M3 (protein) = S and P1 (protein = 2S such that 2S, 14 > 10, R, S (point 1)
Let M1 (fat) = E, P1 (fat) = F and P2 (fat) = G
Let M1 (other nutrients) = X and M3 (other nutrients) = Y
Solving, A + P + 0 + 12 = 100 => A + P = 88
Possible values of A (> 66 and multiple of 5) = 70, 75, 80 or 85
But considering P is a multiple of 4, so A = 80 and P = 8 is the only possibility
Solving, B + Q + 3 + 10 = 100 => B + Q = 87

Possible values of B (> 66 and multiple of 5) = 70, 75, 80 or 85
But considering Q is a multiple of 4, so B = 75 and Q = 12 is the only possibility
Solving, 62 + 10 + E + X = 100 => E + X = 28
Solving, C + R + 7 + 16 = 100 => C + R = 77

Possible values of R (< 14) = 12, 8 or 4, but considering C is a multiple of 5, only possible value of C = 65 and R = 12
Solving, 56 + S + 12 + Y = 100 => S + Y = 32
Solving, 66 + 2S + F + 10 = 100 => 2S + F = 24

Considering, S is a multiple of 4, 2S must be a multiple of 8 and > 10
The only possible values of 2S = 16 and F = 8
So, S = 8 and Y = 24
Solving, D + 14 + G + 8 = 100 => D + G = 78
Possible values of D (> 62 and multiple of 5) = 65, 70, 75
But considering G is a multiple of 4, so D = 70 and G = 8

The rest of the information can be gathered as follows-

Food grain Category	Code name of the food grain	Composition per hundred grams of nutrients in the food grains				
		Carbohydrate	Protein	Fat	Other nutrients	Total
Cereal	C1	A = 80	P = 8	0	12	100
	C2	B = 75	Q = 12	3	10	100
Millet	M1	62	10	E	X	100
	M2	C = 65	R = 12	7	16	100
	M3	56	S = 8	12	Y = 24	100
Pseudo-cereal	P1	66	2S = 16	F = 8	10	100
	P2	D = 70	14	G = 8	8	100

The number of food grains having a higher amount of carbohydrate per 100 grams of nutrients that M1 = 5 (C1, C2, M2, P1 and P2)

20. Correct Answer – 12
Explanation: From point 1, 2 and 3, for all categories, Carbohydrate (Cereal) > Carbohydrate (Pseudo-cereal) > Carbohydrate (Millet) and all of these missing values are non-zero multiples of 5.

Let C1 (carbohydrate) = A, C2 (carbohydrate) = B, M2 (carbohydrate) = C and P2 (carbohydrate) = D such that A, B > 66, D > 62, C, 56
From point 4 and 5, all missing values of protein, fat and other nutrients are non-zero multiples of 4 such that P1 (protein) = 2 × M3 (protein)

Let C1 (protein) = P, C2 (protein) Q, M2 (protein) = R, M3 (protein) = S and P1 (protein = 2S such that 2S, 14 > 10, R, S (point 1)
Let M1 (fat) = E, P1 (fat) = F and P2 (fat) = G
Let M1 (other nutrients) = X and M3 (other nutrients) = Y
Solving, A + P + 0 + 12 = 100 => A + P = 88
Possible values of A (> 66 and multiple of 5) = 70, 75, 80 or 85
But considering P is a multiple of 4, so A = 80 and P = 8 is the only possibility

Solving, B + Q + 3 + 10 = 100 => B + Q = 87
Possible values of B (> 66 and multiple of 5) = 70, 75, 80 or 85
But considering Q is a multiple of 4, so B = 75 and Q = 12 is the only possibility
Solving, 62 + 10 + E + X = 100 => E + X = 28
Solving, C + R + 7 + 16 = 100 => C + R = 77

Possible values of R (< 14) = 12, 8 or 4, but considering C is a multiple of 5, only possible value of C = 65 and R = 12
Solving, 56 + S + 12 + Y = 100 => S + Y = 32
Solving, 66 + 2S + F + 10 = 100 => 2S + F = 24

Considering, S is a multiple of 4, 2S must be a multiple of 8 and > 10
The only possible values of 2S = 16 and F = 8
So, S = 8 and Y = 24
Solving, D + 14 + G + 8 = 100 => D + G = 78
Possible values of D (> 62 and multiple of 5) = 65, 70, 75

But considering G is a multiple of 4, so D = 70 and G = 8

The rest of the information can be gathered as follows-

Food grain Category	Code name of the food grain	Composition per hundred grams of nutrients in the food grains				
		Carbohydrate	Protein	Fat	Other nutrients	Total
Cereal	C1	A = 80	P = 8	0	12	100
	C2	B = 75	Q = 12	3	10	100
Millet	M1	62	10	E	X	100
	M2	C = 65	R = 12	7	16	100
	M3	56	S = 8	12	Y = 24	100
Pseudo-cereal	P1	66	2S = 16	F = 8	10	100
	P2	D = 70	14	G = 8	8	100

The amount of protein in 100 grams of nutrients in M2 = 12 grams

21. Correct Answer – 24
Explanation: From point 1, 2 and 3, for all categories, Carbohydrate (Cereal) > Carbohydrate (Pseudo-cereal) > Carbohydrate (Millet) and all of these missing values are non-zero multiples of 5.

Let C1 (carbohydrate) = A, C2 (carbohydrate) = B, M2 (carbohydrate) = C and P2 (carbohydrate) = D such that A, B > 66, D > 62, C, 56
From point 4 and 5, all missing values of protein, fat and other nutrients are non-zero multiples of 4 such that P1 (protein) = 2 × M3 (protein)

Let C1 (protein) = P, C2 (protein) Q, M2 (protein) = R, M3 (protein) = S and P1 (protein = 2S such that 2S, 14 > 10, R, S (point 1)
Let M1 (fat) = E, P1 (fat) = F and P2 (fat) = G
Let M1 (other nutrients) = X and M3 (other nutrients) = Y
Solving, A + P + 0 + 12 = 100 => A + P = 88
Possible values of A (> 66 and multiple of 5) = 70, 75, 80 or 85
But considering P is a multiple of 4, so A = 80 and P = 8 is the only possibility

Solving, B + Q + 3 + 10 = 100 => B + Q = 87
Possible values of B (> 66 and multiple of 5) = 70, 75, 80 or 85
But considering Q is a multiple of 4, so B = 75 and Q = 12 is the only possibility
Solving, 62 + 10 + E + X = 100 => E + X = 28
Solving, C + R + 7 + 16 = 100 => C + R = 77

Possible values of R (< 14) = 12, 8 or 4, but considering C is a multiple of 5, only possible value of C = 65 and R = 12
Solving, 56 + S + 12 + Y = 100 => S + Y = 32
Solving, 66 + 2S + F + 10 = 100 => 2S + F = 24

Considering, S is a multiple of 4, 2S must be a multiple of 8 and > 10
The only possible values of 2S = 16 and F = 8
So, S = 8 and Y = 24
Solving, D + 14 + G + 8 = 100 => D + G = 78

Possible values of D (> 62 and multiple of 5) = 65, 70, 75
But considering G is a multiple of 4, so D = 70 and G = 8

The rest of the information can be gathered as follows-

Food grain Category	Code name of the food grain	Composition per hundred grams of nutrients in the food grains				
		Carbohydrate	Protein	Fat	Other nutrients	Total
Cereal	C1	A = 80	P = 8	0	12	100
	C2	B = 75	Q = 12	3	10	100
Millet	M1	62	10	E	X	100
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	M3	56	S = 8	12	Y = 24	100
Pseudo-cereal	P1	66	2S = 16	F = 8	10	100
	P2	D = 70	14	G = 8	8	100

The amount of other nutrients in 100 grams of nutrients in M3 = 24 grams

22. Correct Answer – 12
Explanation: From point 1, 2 and 3, for all categories, Carbohydrate (Cereal) > Carbohydrate (Pseudo-cereal) > Carbohydrate (Millet) and all of these missing values are non-zero multiples of 5.

Let C1 (carbohydrate) = A, C2 (carbohydrate) = B, M2 (carbohydrate) = C and P2 (carbohydrate) = D such that A, B > 66, D > 62, C, 56
From point 4 and 5, all missing values of protein, fat and other nutrients are non-zero multiples of 4 such that P1 (protein) = 2 × M3 (protein)

Let C1 (protein) = P, C2 (protein) Q, M2 (protein) = R, M3 (protein) = S and P1 (protein = 2S such that 2S, 14 > 10, R, S (point 1)
Let M1 (fat) = E, P1 (fat) = F and P2 (fat) = G
Let M1 (other nutrients) = X and M3 (other nutrients) = Y
Solving, A + P + 0 + 12 = 100 => A + P = 88
Possible values of A (> 66 and multiple of 5) = 70, 75, 80 or 85
But considering P is a multiple of 4, so A = 80 and P = 8 is the only possibility

Solving, B + Q + 3 + 10 = 100 => B + Q = 87
Possible values of B (> 66 and multiple of 5) = 70, 75, 80 or 85
But considering Q is a multiple of 4, so B = 75 and Q = 12 is the only possibility
Solving, 62 + 10 + E + X = 100 => E + X = 28
Solving, C + R + 7 + 16 = 100 => C + R = 77

Possible values of R (< 14) = 12, 8 or 4, but considering C is a multiple of 5, only possible value of C = 65 and R = 12
Solving, 56 + S + 12 + Y = 100 => S + Y = 32
Solving, 66 + 2S + F + 10 = 100 => 2S + F = 24

Considering, S is a multiple of 4, 2S must be a multiple of 8 and > 10
The only possible values of 2S = 16 and F = 8
So, S = 8 and Y = 24

Solving, D + 14 + G + 8 = 100 => D + G = 78
Possible values of D (> 62 and multiple of 5) = 65, 70, 75
But considering G is a multiple of 4, so D = 70 and G = 8

The rest of the information can be gathered as follows-

Food grain Category	Code name of the food grain	Composition per hundred grams of nutrients in the food grains				
		Carbohydrate	Protein	Fat	Other nutrients	Total
Cereal	C1	A = 80	P = 8	0	12	100
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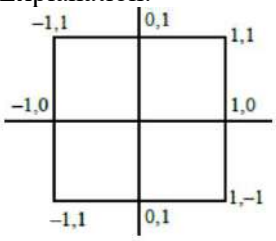
Millet	M1	62	10	E	X	100
	M2	C = 65	R = 12	7	16	100
	M3	56	S = 8	12	Y = 24	100
Pseudo-cereal	P1	66	2S = 16	F = 8	10	100
	P2	D = 70	14	G = 8	8	100

The numbers of grams of proteins in 100 grams of nutrients among given food grains in increasing order are 8, 8, 10, 12, 12, 14 and 16. The median value = 12

Quant

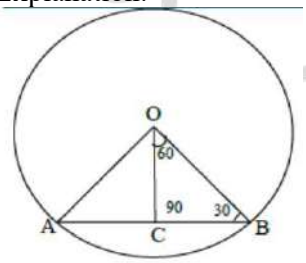
1. Correct Answer – 2
Explanation:
$8^f = 9$
$7^{ef} = 9$
$6^{def} = 9$
$5^{cdef} = 9$
$4^{bcdef} = 9$
$3^{abcdef} = 9 = 3^2$
So abcdef = 2

2. Correct Answer – 8
Explanation:



Putting X = 0, we get y = 1
Putting Y = 0, we get x = 1
Putting X = - 1, we get y = 1/-1
Putting X = 1, we get y = 1 /-1
So, in total there will be 8 integral solutions

3. Correct Answer – C
Explanation:



In triangle OBC,
BC = $5\sqrt{3}$
So OB = 10 = radius
Area of smaller region
= area of sector AOB – Area of triangle AOB
$= \frac{120}{360}\pi \times 10 \times 10 - \frac{1}{2} \times 5 \times 10\sqrt{3}$
$= \frac{1}{3}100\pi - 25\sqrt{3}$

4. Correct Answer – B

Explanation: Let the actual speed of the train be x km/hr and let the actual time taken be y hours.
Distance covered is xy km
If the speed is increased by 6 km/hr, then time of journey is reduced by 4 hours i.e.,
when speed is (x + 6) km/hr, time of journey is (y − 4) hours.
∴ Distance covered = (x + 6) (y − 4)
⇒ xy = (x + 6) (y − 4)
⇒ −4x + 6y − 24 = 0
⇒ −2x + 3y − 12 = 0 ……(i)
Similarly xy = (x − 6) (y + 6)
⇒ 6x − 6y − 36 = 0
⇒ x − y − 6 = 0 ……(ii)
Solving (i) and (ii) we get x = 30 and y = 24
Putting the values of x and y in equation (i), we obtain
Distance = (30 × 24) km = 720 km.
Hence, the length of the journey is 720 km.

5. Correct Answer – D
Explanation: Vimal has total 30 hectares. The cultivation area of wheat and mustard in the land owned by Vimal are in the ratio of 5 : 3.

Means Wheat = $\frac{5}{8} \times 30 = 18.75$ ad mustard = $\frac{3}{8} \times 30 = 11.25$

Total area is 20 + 30 = 50 hectares
the total cultivation area of wheat and mustard are in the ratio 11 : 9

Total Wheat $\frac{11}{20} \times 50 = 27.5$ and mustard = $\frac{9}{20} \times 50 = 22.5$

Subtracting we get cultivation area of wheat and mustard in the land owned by Rajesh is,
Wheat = 27.5 – 18.75 = 8.75
Mustard = 22.5 – 11.25 = 11.25

So the ratio of cultivation area of wheat and mustard in the land owned by Rajesh is = 8.75 : 11.25 = 7 : 9

6. Correct Answer – 9
Explanation:

$$\frac{\text{Amount after 5 years}}{\text{Amount after 3 years}} = \frac{36}{25} = \left(\frac{6}{5}\right)^2$$

Solving it for rate, we get rate = 20%

$$A = P\left(1+\frac{r}{100}\right)^n$$

$$20{,}000 = 4000\left(1+\frac{20}{100}\right)^n$$

Solving it we get n = 9.

7. Correct Answer – A

Here 13 is a prime number, Euler of 13 will be 12, means

$\frac{10^{12}}{13}$ will leave a remainder 1

68 can be broken as $12 \times 5 + 8$

We are left with $= \frac{10^8}{13}$

$= \frac{10^{6+2}}{13}$

$= \frac{(10^6 \times 10^2)}{13}$

$= \frac{(1000-1)^2 \times (91+9)}{13}$

{Because $10^3 = 1000$ and $10^2 = 100$}

$= (-1)^2 \times (9) = 9$

8. Correct Answer – 70

Explanation: Here average of a, b, c is given as 28 where $a < b < c$

$\frac{a+b+c}{3} = 28$

$a + b + c = 84$

If the smallest number is increased by 7 and the largest number is reduced by 10, the order of the numbers remains unchanged, and the new arithmetic mean becomes 2 more than the middle number, means

$(a + 7) + b + (c - 10) = 84$

$a + b + c = 81$

New average = $27 = b + 2$

$b = 2$

Means, $a + c = 59$ ----- {I}

The difference between the largest and the smallest numbers becomes 64

$(c - 10) - (a + 7) = 64$

$c - a = 81$ ----- {II}

Solving I and II, we get $c = 70$

9. Correct Answer – D

Explanation: In a group of 250 students, the percentage of girls was at least 44% and at most 60%.

	Min	Max
Girl =	110	150
Boy =	140	100

Case I = Girl = 110, Boy = 140

	Swim	Run
Girl =	88	66
Boy =	70	98
Total =	158	164

$S + R - S \cap R = 250$

$S \cap R = 72$

Case II = Girl = 150, Boy = 110

	Swim	Run
Girl =	120	90

Boy = 50 70
Total = 170 160
S + R – S ∩ R = 250
S ∩ R = 80

So, the minimum and maximum possible number of students who opted for both swimming and running, are 72 and 80.

10. Correct Answer – A
Explanation: $(a + b\sqrt{3})^2 = 52 + 30\sqrt{3}$
$a^2 + 3b^2 + 2\times \sqrt{3} \times ab = 52 + 30\sqrt{3}$
$a^2 + 3b^2 + 2 \times \sqrt{3} \times ab = 52 + 30\sqrt{3}$
Means a × b must be 15 and $a^2 + 3b^2 = 52$
Rewriting it
$a^2 + 3b^2 + 2 \times \sqrt{3} \times ab = 25 + 27 + 2 \times 5 \times 3\sqrt{3}$
So a = 5 and b = 3
So a + b = 8.

11. Correct Answer – 90
Explanation: In any triangle, the medians divide the triangle into six smaller triangles of equal area. The area of the medial triangle formed by the midpoints of the sides of the original triangle (in this case, △XYZ) is exactly one-fourth of the area of the original triangle. Since the area of △ABC is given as 1440 sq cm, the area of △XYZ, which is the medial triangle, is:
Area of △XYZ = 14 × 1440 = 360 sq cm
However, we must consider the area of the triangle formed by the medians, which is half the area of the medial triangle. Therefore, the area of △XYZ is: {90} sq cm

12. Correct Answer – C
Explanation: Let 10x = A
We get $A + \frac{4}{A} = \frac{81}{2}$

$2A^2 – 81A + 8 = 0$
It's a quadratic equation, means 10x will have 2 values, let it be 10x1 and 10x2
Product of roots = $\frac{8}{2} = 4$
$10^{x1} \times 10^{x2} = 4 = (2)^2$
$(10)^{x1 + x2} = (2)^2$
Taking log base 10 on both sides
$\text{Log}_{10}(10)^{x1 + x2} = \log_{10} (2)^2$
$(x1 + x2)\ \text{Log}_{10}(10) = 2\log_{10} (2)$
$(x1 + x2) = 2\log_{10} (2)$
So, sum of all distinct real values of x that satisfy the equation will be $2\log_{10} (2)$

13. Correct Answer – 2
Explanation: Here we need to check in three ranges
Case 1⇒ x ≥ 2, we get
x – 2 = x + 2 – (x – 2)
x = 6 (Satisfied)

Case 2 ⇒ $-2 \le x < 2$, we get
$2 - x = x + 2 - [-(x - 2)]$
$x = \frac{2}{3}$ (Satisfied)
Case 3 ⇒ $x < -2$, we get
$2 - x = -x - 2 + (x - 2)$
$x = 6$ (Not Satisfied)
Number of distinct real values of x, satisfying the equation will be 2.

14. Correct Answer – 30
Explanation: Here if you think carefully and assume initially the whole container was filled with milk.
Firstly x litre of milk was replaced with water. Second time 2x litre of mixture was replaced with water. Resultant milk left is 72%. So water is 28%.
$(-x) + (-2x) + (-x)\frac{(-2x)}{100} = -28$
$(-3x) + \frac{(2x2)}{100} = -28$

Solving it we get x = 10%
10% of 300 = 30.
The amount of water, in litres, that was initially poured into the container was 30.

15. Correct Answer – D
Explanation:
Given $f(x) + 2f\left(\frac{1}{x}\right) = 3x$ --------- {I}
For $\frac{1}{x}$, we get $f\left(\frac{1}{x}\right) + 2f(x) = \left(\frac{3}{x}\right)$ --------{II}

Putting the value of f(x) = 3 in I , we get
$3 + 2f\left(\frac{1}{x}\right) = 3x$
$f\left(\frac{1}{x}\right) = \frac{(3x-3)}{2}$ ----------{III}

Putting the value of f(x) = 3 in II , we get
$f\left(\frac{1}{x}\right) + 2(3) = \left(\frac{3}{x}\right)$
$f\left(\frac{1}{x}\right) = \frac{(3-6x)}{x}$ --------{IV}

Equating III and IV, we get
$\frac{(3x-3)}{2} = \frac{(3-6x)}{x}$
$x^2 + 3x - 2 = 0$
Sum of roots = $\frac{-(3)}{1} = -3$
The sum of all possible values of x will be -3.

16. Correct Answer – A
Explanation: Ravi gets 10% discount on this marked price, and thus saves Rs 15
Means 10% of MP = 15Rs
MP = 150 Rs.

Discount is 15 Rs,
SP = 150-15 =135
Gopi marks a price on a product in order to make 20% profit
Means 1.2 CP = MP
1.2 CP = 150
CP = 125 Rs

Profit = SP – CP
Profit = 135 – 125
Profit = 10 Rs

17. Correct Answer – C
Explanation:

$\text{The sum} \frac{1}{t2}+\frac{1}{t4}+\frac{1}{t6}+\ldots+\frac{1}{t2022}+\frac{1}{t2024} \text{ is :}$

$\text{At } n=4,\ t4 = \frac{4-3}{4-1}\times t2 = \frac{-1}{3}$

$\text{At } n=6,\ t6 = \frac{6-3}{6-1}\times t4 = \frac{-1}{5}$

And so on.

$t2024 = \frac{-1}{2023}$

$\frac{1}{t2}+\frac{1}{t4}+\frac{1}{t6}+\ldots+\frac{1}{t2022}+\frac{1}{t2024} = (-1-3-5\ldots\ldots-2023)$

$= -(1+3+5+7\ldots\ldots\ldots+2023)$

$\text{Total terms are } \frac{2024}{2} = 1012$

Sum of first n odd natural number = n^2

$-(1+3+5+7\ldots\ldots\ldots+2023) = -(1012)^2 = -1024144$

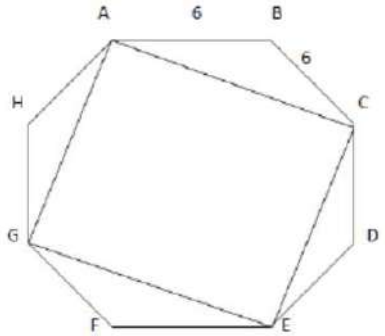
18. Correct Answer – 378
Explanation:
We will consider the cases of 1 digit, 2 digit and 3 digit numbers satisfying the above condition separately.
1 digit numbers with non-repeating digits = 9
2 digit numbers with non-repeating digits = 9 × 9 = 81
3 digit numbers with non-repeating digits = 4 × 9 × 8 = 288
Total 378 such numbers exist

19. Correct Answer – B
Explanation:
If we go by the options using the formula for net % change
$= a + b + \frac{ab}{100}$ i.e, $25 + 50 + 25 \times \frac{50}{100} = 87.5$.
We can see that 25 satisfies the condition properly. Therefore it is the answer.

20. Correct Answer – B
Explanation:
If Mohit is 2 times as efficient as Sam then
Efficiency of Mohit : Efficiency of Sam = 2 : 1 i.e. (M : S = 2 : 1)

If Mohit is 3 times as efficient as Ayna (M : A = 3 : 1)
therefore S : M : A = 3 : 6 : 2
Total work = 3 × 20 = 60
According to the question
Sam & Mohit work on the 1st day (So, S + M will complete 3 + 6 = 9 unit work in one day.)
Sam & Ayna work on the 2nd day (So, S + A will complete 3 + 2 = 5 unit work in one day.)
Mohit & Ayna work on the 2nd day (So, M + A will complete 6 + 2 = 8 unit work in one day.)
So, in 3 days 9 + 5 + 8 = 22 unit work gets finished
& in 6 days 22 × 2 = 44 unit gets completed
On 7th day S + M will complete 9 unit work
On 8th day S + A will do 5 unit work
On 9th day M + A will do 2 unit work.
So, in total the work gets completed on the 9th day but S works on 6 days in total i.e. 1st, 2nd, 4th, 5th, 7th and 8th day
Therefore the fraction of the work done by Sam in those 6 days will be $\frac{6x3}{60} = \frac{3}{10}$

21. Correct Answer – A
Explanation:
As per the given figure below



AC is the shortest diagonal of the octagon and the length of the short diagonal of an octagon is $a\sqrt{(2+\sqrt{2})}$ where a is the side of a regular octagon.
So, the length of AC will be $6\sqrt{(2+\sqrt{2})}$
And, the area of the square ACEG will be $(6\sqrt{(2+\sqrt{2})})^2 = 36(2+\sqrt{2})$

22. Correct Answer – C
Explanation:
The condition for a system of linear equations to have no solution is

$$\frac{a_2}{a_2} = \frac{b_2}{b_2} \neq \frac{c_2}{c_2}$$

Therefore, $\frac{-4}{k} \neq \frac{2}{a}$

$\Rightarrow -4a \neq 2k$
$\Rightarrow 2a + k \neq 0$

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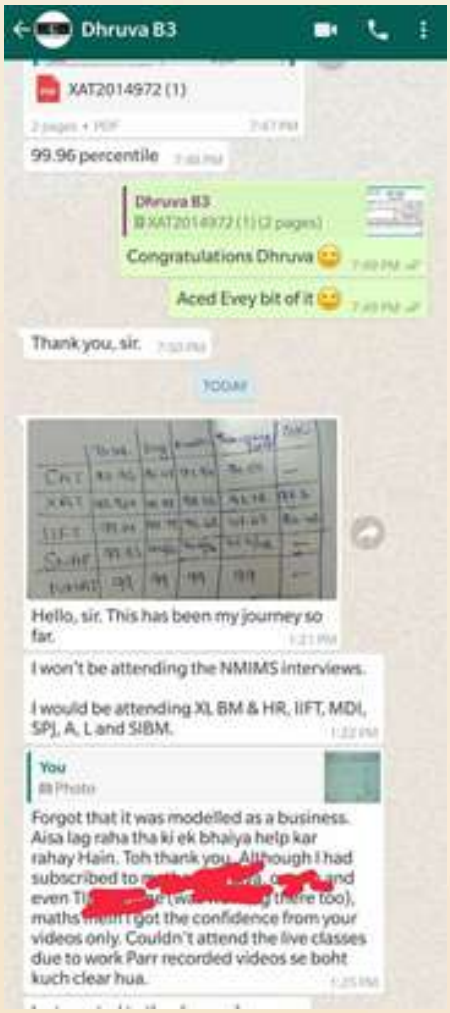

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