

CAT 2021

SLOT

2

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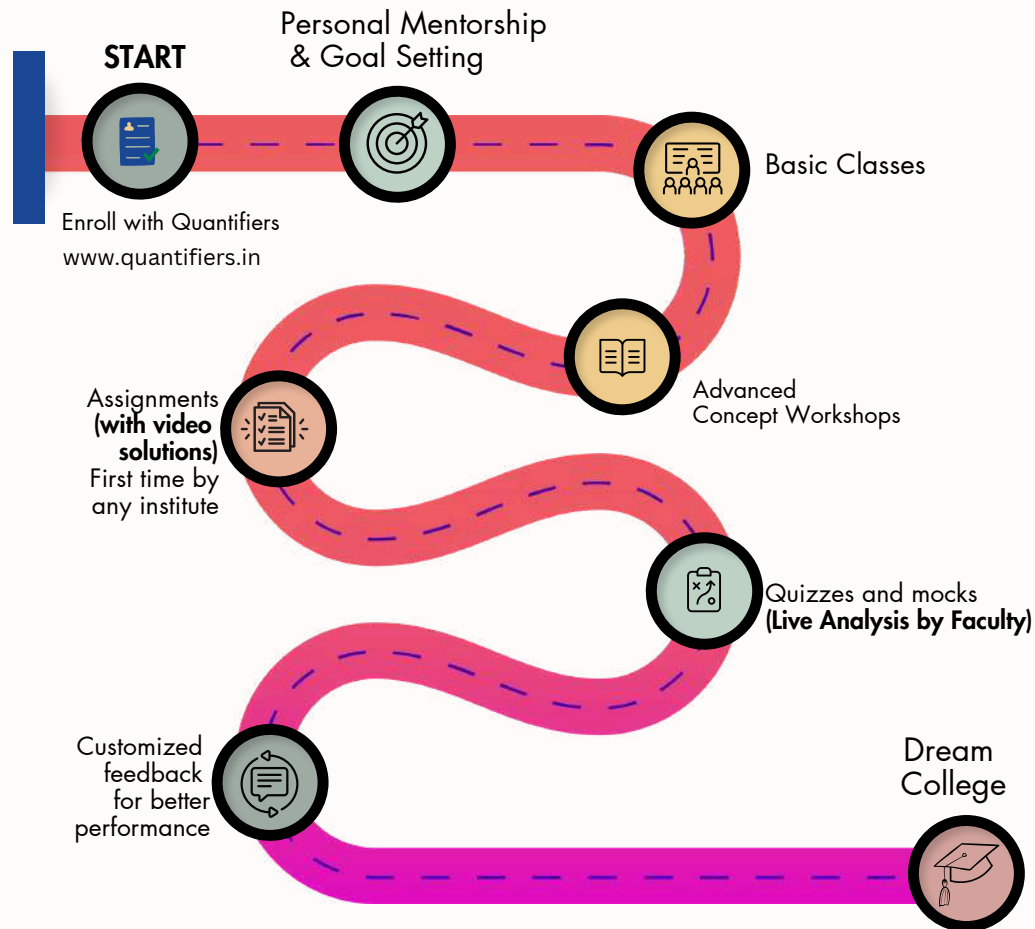
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CAT 2021 Slot – 2 VARC

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

I have elaborated..... a framework for analyzing the contradictory pulls on [Indian] nationalist ideology in its struggle against the dominance of colonialism and the resolution it offered to those contradictions. Briefly, this resolution was built around a separation of the domain of culture into two spheres—the material and the spiritual. It was in the material sphere that the claims of Western civilization were the most powerful. Science, technology, rational forms of economic organization, modern methods of statecraft—these had given the European countries the strength to subjugate the non-European people..... To overcome this domination, the colonized people had to learn those superior techniques of organizing material life and incorporate them within their own cultures..... But this could not mean the imitation of the West in every aspect of life, for then the very distinction between the West and the East would vanish—the self-identity of national culture would itself be threatened.....

The discourse of nationalism shows that the material/spiritual distinction was condensed into an analogous, but ideologically far more powerful, dichotomy: that between the outer and the inner. Applying the inner/outer distinction to the matter of concrete day-to-day living separates the social space into *ghar* and *bāhir*, the home and the world. The world is the external, the domain of the material; the home represents one's inner spiritual self, one's true identity. The world is a treacherous terrain of the pursuit of material interests, where practical considerations reign supreme. It is also typically the domain of the male. The home in its essence must remain unaffected by the profane activities of the material world—and woman is its representation. And so one gets an identification of social roles by gender to correspond with the separation of the social space into *ghar* and *bāhir*.....

The colonial situation, and the ideological response of nationalism to the critique of Indian tradition, introduced an entirely new substance to [these dichotomies] and effected their transformation. The material/spiritual dichotomy, to which the terms world and home corresponded, had acquired.... a very special significance in the nationalist mind. The world was where the European power had challenged the non-European peoples and, by virtue of its superior material culture, had subjugated them. But, the nationalists asserted, it had failed to colonize the inner, essential, identity of the East which lay in its distinctive, and superior, spiritual culture..... [I]n the entire phase of the national struggle, the crucial need was to protect, preserve and strengthen the inner core of the national culture, its spiritual essence. . .

Once we match this new meaning of the home/world dichotomy with the identification of social roles by gender, we get the ideological framework within which nationalism answered the women's question. It would be a grave error to see in this, as liberals are apt to in their despair at the many marks of social conservatism in nationalist practice, a total rejection of the West. Quite the contrary: the nationalist paradigm in fact supplied an ideological principle of selection.

Q.1) On the basis of the information in the passage, all of the following are true about the spiritual/material dichotomy of Indian nationalism EXCEPT that it:

- A) helped in safeguarding the identity of Indian nationalism.
- B) was not as ideologically powerful as the inner/outer dichotomy
- C) represented a continuation of age-old oppositions in Indian culture
- D) constituted the premise of the ghar/bāhir dichotomy

Q.2) Which one of the following explains the “contradictory pulls” on Indian nationalism?

- A) Despite its spiritual superiority, Indian nationalism had to fight against colonial domination.
- B) Despite its scientific and technological inferiority, Indian nationalism had to fight against colonial domination.
- C) Despite its fight against colonial domination, Indian nationalism had to borrow from the coloniser in the spiritual sphere.
- D) Despite its fight against colonial domination, Indian nationalism had to borrow from the coloniser in the material sphere

Q.3) Which one of the following, if true, would weaken the author’s claims in the passage?

- A) The colonial period saw the hybridisation of Indian culture in all realms as it came in contact with British/European culture.
- B) Forces of colonial modernity played an important role in shaping anti-colonial Indian nationalism.
- C) The Industrial Revolution played a crucial role in shaping the economic prowess of Britain in the eighteenth century.
- D) Indian nationalists rejected the cause of English education for women during the colonial period.

Q.4) Which one of the following best describes the liberal perception of Indian nationalism?

- A) Indian nationalist discourses provided an ideological principle of selection.
- B) Indian nationalism’s sophistication resided in its distinction of the material from the spiritual spheres.
- C) Indian nationalist discourses reaffirmed traditional gender roles for Indian women.
- D) Indian nationalism embraced the changes brought about by colonialism in Indian women’s traditional gender roles.

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

It has been said that knowledge, or the problem of knowledge, is the scandal of philosophy. The scandal is philosophy’s apparent inability to show how, when and why we can be sure that we know something or, indeed, that we know anything. Philosopher Michael Williams writes: ‘Is it possible to obtain knowledge at all? This problem is pressing because there are powerful arguments, some very ancient, for the conclusion that it is not . . . Scepticism is the skeleton in Western rationalism’s closet’. While it is not clear that the scandal matters to anyone but philosophers, philosophers point out that it should matter to everyone, at least given a certain conception of knowledge. For, they explain, unless we can ground our claims to knowledge as

such, which is to say, distinguish it from mere opinion, superstition, fantasy, wishful thinking, ideology, illusion or delusion, then the actions we take on the basis of presumed knowledge – boarding an airplane, swallowing a pill, finding someone guilty of a crime – will be irrational and unjustifiable.

That is all quite serious-sounding but so also are the rattlings of the skeleton: that is, the sceptic's contention that we cannot be sure that we know anything – at least not if we think of knowledge as something like having a correct mental representation of reality, and not if we think of reality as something like things-as-they-are-in-themselves, independent of our perceptions, ideas or descriptions. For, the sceptic will note, since reality, under that conception of it, is outside our ken (we cannot catch a glimpse of things-in-themselves around the corner of our own eyes; we cannot form an idea of reality that floats above the processes of our conceiving it), we have no way to compare our mental representations with things-as-they-are-in-themselves and therefore no way to determine whether they are correct or incorrect. Thus the sceptic may repeat (rattling loudly), you cannot be sure you 'know' something or anything at all – at least not, he may add (rattling softly before disappearing), if that is the way you conceive 'knowledge'.

There are a number of ways to handle this situation. The most common is to ignore it. Most people outside the academy – and, indeed, most of us inside it – are unaware of or unperturbed by the philosophical scandal of knowledge and go about our lives without too many epistemic anxieties. We hold our beliefs and presumptive knowledges more or less confidently, usually depending on how we acquired them (I saw it with my own eyes; I heard it on Fox News; a guy at the office told me) and how broadly and strenuously they seem to be shared or endorsed by various relevant people: experts and authorities, friends and family members, colleagues and associates. And we examine our convictions more or less closely, explain them more or less extensively, and defend them more or less vigorously, usually depending on what seems to be at stake for ourselves and/or other people and what resources are available for reassuring ourselves or making our beliefs credible to others (look, it's right here on the page; add up the figures yourself; I happen to be a heart specialist).

Q.5) The author of the passage is most likely to support which one of the following statements?

- A) The scandal of philosophy is that we might not know anything at all about reality if we think of reality as independent of our perceptions, ideas or descriptions.
- B) The confidence with which we maintain something to be true is usually independent of the source of the alleged truth.
- C) For the sceptic, if we think of reality as independent of our perceptions, ideas or descriptions, we should aim to know that reality independently too.
- D) The actions taken on the basis of presumed knowledge are rational and justifiable if we are confident that that knowledge is widely held.

Q.6) “. . . we cannot catch a glimpse of things-in-themselves around the corner of our own eyes; we cannot form an idea of reality that floats above the processes of our conceiving it . . .” Which one of the following statements best reflects the argument being made in this sentence?

- A) Our knowledge of reality cannot be merged with our process of conceiving it.
- B) Our knowledge of reality floats above our subjective perception of it.
- C) If the reality of things is independent of our perception, logically we cannot perceive that reality.
- D) If the reality of things is independent of our eyesight, logically we cannot perceive our perception

Q.7) According to the last paragraph of the passage, “We hold our beliefs and presumptive knowledges more or less confidently, usually depending on” something. Which one of the following most broadly captures what we depend on?

- A) All of the options listed here.
- B) How much of a stake we have in them; what resources there are to support them
- C) Remaining outside the academy; ignoring epistemic anxieties
- D) How we come to hold them; how widely they are held in our social circles

Q.8) The author discusses all of the following arguments in the passage, EXCEPT:

- A) sceptics believe that we can never fully know anything, if by “knowing” we mean knowledge of a reality that is independent of the knower.
- B) if we cannot distinguish knowledge from opinion or delusion, we will not be able to justify our actions
- C) philosophers maintain that the scandal of philosophy should be of concern to everyone
- D) the best way to deal with scepticism about the veracity of knowledge is to ignore it

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

It’s easy to forget that most of the world’s languages are still transmitted orally with no widely established written form. While speech communities are increasingly involved in projects to protect their languages – in print, on air and online – orality is fragile and contributes to linguistic vulnerability. But indigenous languages are about much more than unusual words and intriguing grammar: They function as vehicles for the transmission of cultural traditions, environmental understandings and knowledge about medicinal plants, all at risk when elders die and livelihoods are disrupted.

Both push and pull factors lead to the decline of languages. Through war, famine and natural disasters, whole communities can be destroyed, taking their language with them to the grave, such as the indigenous populations of Tasmania who were wiped out by colonists. More commonly, speakers live on but abandon their language in favor of another vernacular, a widespread process that linguists refer to as “language shift” from which few languages are immune. Such trading up and out of a speech form occurs for complex political, cultural and economic reasons – sometimes voluntary for economic and educational reasons, although often amplified by state coercion or neglect. Welsh, long stigmatized and disparaged by the British state, has rebounded with vigor.

Many speakers of endangered, poorly documented languages have embraced new digital media with excitement. Speakers of previously exclusively oral tongues are turning to the web as a virtual space for languages to live on. Internet technology offers powerful ways for oral traditions and cultural practices to survive, even thrive, among increasingly mobile communities. I have watched as videos of traditional wedding ceremonies and songs are recorded on smartphones in London by Nepali migrants, then uploaded to YouTube and watched an hour later by relatives in remote Himalayan villages . . .

Globalization is regularly, and often uncritically, pilloried as a major threat to linguistic diversity. But in fact, globalization is as much process as it is ideology, certainly when it comes to language. The real forces behind cultural homogenization are unbending beliefs, exchanged through a globalized delivery system, reinforced by the historical monolingualism prevalent in much of the West.

Monolingualism – the condition of being able to speak only one language – is regularly accompanied by a deep-seated conviction in the value of that language over all others. Across the largest economies that make up the G8, being monolingual is still often the norm, with multilingualism appearing unusual and even somewhat exotic. The monolingual mindset stands in sharp contrast to the lived reality of most the world, which throughout its history has been more multilingual than unilingual. Monolingualism, then, not globalization, should be our primary concern.

Multilingualism can help us live in a more connected and more interdependent world. By widening access to technology, globalization can support indigenous and scholarly communities engaged in documenting and protecting our shared linguistic heritage. For the last 5,000 years, the rise and fall of languages was intimately tied to the plow, sword and book. In our digital age, the keyboard, screen and web will play a decisive role in shaping the future linguistic diversity of our species.

Q.9) The author mentions the Welsh language to show that:

- A) while often pilloried, globalisation can, in fact, support linguistic revival.
- B) efforts to integrate Welsh speakers in the English-speaking fold have been fruitless.
- C) vulnerable languages can rebound with state effort.
- D) languages can revive even after their speakers have gone through a “language shift”.

Q.10) From the passage, we can infer that the author is in favour of:

- A) an expanded state role in the preservation of languages
- B) cultural homogenisation
- C) greater multilingualism
- D) “language shifts” across languages

Q.11) We can infer all of the following about indigenous languages from the passage EXCEPT that:

- A) they are repositories of traditional knowledge about the environment and culture.
- B) people are increasingly working on documenting these languages.

- C) their vocabulary and grammatical constructs have been challenging to document.
- D) they are in danger of being wiped out as most can only be transmitted orally.

Q.12) The author lists all of the following as reasons for the decline or disappearance of a language EXCEPT:

- A) governments promoting certain languages over others
- B) the focus on only a few languages as a result of widespread internet use
- C) a catastrophic event that entirely eliminates a people and their culture.
- D) people shifting away from their own language to study or work in another language.

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

Many people believe that truth conveys power Hence sticking with the truth is the best strategy for gaining power. Unfortunately, this is just a comforting myth. In fact, truth and power have a far more complicated relationship, because in human society, power met two very different things.

On the one hand, power means having the ability to manipulate objective realities: to hunt animals, to construct bridges, to cure diseases, to build atom bombs. This kind of power is closely tied to truth. If you believe a false physical theory, you won't be able to build an atom bomb. On the other hand, power also means having the ability to manipulate human beliefs, thereby getting lots of people to cooperate effectively. Building atom bombs requires not just a good understanding of physics, but also the coordinated labor of millions of humans. Planet Earth was conquered by Homo sapiens rather than by chimpanzees or elephants, because we are the only mammals that can cooperate in very large numbers. And large-scale cooperation depends on believing common stories. But these stories need not be true. You can unite millions of people by making them believe in completely fictional stories about God, about race or about economics. The dual nature of power and truth results in the curious fact that we human know many more truths than any other animal, but we also believe in much more nonsense. . . .

When it comes to uniting people around a common story, fiction actually enjoys three inherent advantages over the truth. First, whereas the truth is universal, fictions tend to be local. Consequently if we want to distinguish our tribe from foreigners, a fictional story will serve as a far better identity marker than a true story. The second huge advantage of fiction over truth has to do with the handicap principle, which says that reliable signals must be costly to the signaler. Otherwise, they can easily be faked by cheaters.... If political loyalty is signaled by believing a true story, anyone can fake it. But believing ridiculous and outlandish stories exacts greater cost, and is therefore a better signal of loyalty Third, and most important, the truth is often painful and disturbing. Hence if you stick to unalloyed reality, few people will follow you. An American presidential candidate who tells the American public the truth, the whole truth and nothing but the truth about American history has a 100 percent guarantee of losing the elections. An uncompromising adherence to the truth is an admirable spiritual practice, but it is not a winning political strategy. . . .

Even if we need to pay some price for deactivating our rational faculties, the advantages of increased social cohesion are often so big that fictional stories routinely triumph over the truth in human history. Scholars have known this for thousands of years, which is why scholars often had to decide whether they served the truth or social harmony. Should they aim to unite people by making sure everyone believes in the same fiction, or should they let people know the truth even at the price of disunity?

Q.13) The author implies that, like scholars, successful leaders:

- A) today know how to create social cohesion better than in the past.
- B) know how to balance truth and social unity.
- C) use myths to attain the first type of power.
- D) need to leverage both types of power to remain in office.

Q.14) The central theme of the passage is about the choice between:

- A) truth and power
- B) stories that unite people and those that distinguish groups from each other
- C) attaining social cohesion and propagating objective truth
- D) leaders who unknowingly spread fictions and those who intentionally do so

Q.15) Regarding which one of the following quotes could we argue that the author over emphasises the importance of fiction?

- A) "... scholars often had to decide whether they served the truth or social harmony. Should they aim to unite people by making sure everyone believes in the same fiction, or should they let people know the truth?"
- B) "Hence sticking with the truth is the best strategy for gaining power. Unfortunately, this is just a comforting myth."
- C) "In fact, truth and power have a far more complicated relationship, because in human society, power means two very different things."
- D) "On the one hand, power means having the ability to manipulate objective realities: to hunt animals, to construct bridges, to cure diseases, to build atom bombs."

Q.16) The author would support none of the following statements about political power EXCEPT that:

- A) people cannot handle the unvarnished truth, so leaders retain power by deviating from it.
- B) while unalloyed truth is not recommended, leaders should stay as close as possible to it.
- C) there are definite advantages to promoting fiction, but there needs to be some limit to a pervasive belief in myths.
- D) manipulating people's beliefs is politically advantageous, but a leader who propagates only myths is likely to lose power.

Q.17) **DIRECTIONS for the question:** The four sentences (labelled 1,2,3 and 4) given in this question, when properly sequenced, form a coherent paragraph. Decide on the proper order for the sentence and key in this sequence of four numbers as your answer.

1. Look forward a few decades to an invention which can end the energy crisis, change the global economy and curb climate change at a stroke: commercial fusion power.
2. To gain meaningful insights, logic has to be accompanied by asking probing questions of nature through controlled tests, precise observations and clever analysis.
3. The greatest of all inventions is the uber-invention that has provided the insights on which others depend: the modern scientific method.
4. This invention is inconceivable without the scientific method; it will rest on the application of a diverse range of scientific insights, such as the process transforming hydrogen into helium to release huge amounts of energy.

Q.18) 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.

The unlikely alliance of the incumbent industrialist and the distressed unemployed worker is especially powerful amid the debris of corporate bankruptcies and layoffs. In an economic downturn, the capitalist is more likely to focus on costs of the competition emanating from free markets than on the opportunities they create. And the unemployed worker will find many others in a similar condition and with anxieties similar to his, which will make it easier for them to organize together. Using the cover and the political organization provided by the distressed, the capitalist captures the political agenda.

- A) An unlikely alliance of the industrialist and the unemployed happens during an economic downturn in which they come together to unite politically and capture the political agenda.
- B) In an economic downturn, the capitalists use the anxieties of the unemployed and their political organisation to set the political agenda to suit their economic interests.
- C) The purpose of an unlikely alliance between the industrialist and the unemployed during an economic downturn is to stifle competition in free markets.
- D) An economic downturn creates competition because of which the capitalists capture the political agenda created by the political organisation provided by the unemployed.

Q.19) DIRECTIONS for the question: Five jumbled up sentences, related to a topic, are given below. Four of them can be put together to form a coherent paragraph. Identify the odd one out and key in the number of the sentence as your answer:

1. It has taken on a warm, fuzzy glow in the advertising world, where its potential is being widely discussed, and it is being claimed as the undeniable wave of the future.
2. There is little enthusiasm for this in the scientific arena; for them marketing is not a science, and only a handful of studies have been published in scientific journals.
3. The new, growing field of neuromarketing attempts to reveal the inner workings of consumer behaviour and is an extension of the study of how choices and decisions are made.
4. Some see neuromarketing as an attempt to make the "art" of advertising into a science, being used by marketing experts to back up their proposals with some form of real data.

5. The marketing gurus have already started drawing on psychology in developing tests and theories, and advertising people have borrowed the idea of the focus group from social scientists.

Q.20) 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.

Creativity is now viewed as the engine of economic progress. Various organizations are devoted to its study and promotion; there are encyclopedias and handbooks surveying creativity research. But this proliferating success has tended to erode creativity's stable identity: it has become so invested with value that it has become impossible to police its meaning and the practices that supposedly identify and encourage it. Many people and organizations committed to producing original thoughts now feel that undue obsession with the idea of creativity gets in the way of real creativity.

- A) The industry that has built up around researching what comprises and encourages creativity has destroyed the creative process itself.
- B) Creativity has proliferated to the extent that it is no longer a stable process, and its mutating identity has stifled the creative process.
- C) The value assigned to creativity today has assumed such proportions that the concept itself has lost its real meaning and this is hampering the engendering of real creativity.
- D) The obsession with original thought, how it can be promoted and researched, has made it impossible for people and organizations to define the concept anymore.

Q.21) 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.

Biologists who publish their research directly to the Web have been labelled as "rogue", but physicists have been routinely publishing research digitally ("preprints"), prior to submitting in a peer-reviewed journal. Advocates of preprints argue that quick and open dissemination of research speeds up scientific progress and allows for wider access to knowledge. But some journals still don't accept research previously published as a preprint. Even if the idea of preprints is gaining ground, one of the biggest barriers for biologists is how they would be viewed by members of their conservative research community.

- A) While digital publication of research is gaining popularity in many scientific disciplines, almost all peer-reviewed journals are reluctant to accept papers that have been published before.
- B) Compared to biologists, physicists are less conservative in their acceptance of digital pre-publication of research papers, which allows for faster dissemination of knowledge.
- C) One of the advantages of digital preprints of research is they hasten the dissemination process, but these are not accepted by most scientific communities.
- D) Preprints of research are frowned on by some scientific fields as they do not undergo a rigorous reviewing process but are accepted among biologists as a quick way to disseminate information.

Q.22) DIRECTIONS for the question: Five sentences related to a topic are given below. Four of them can be put together to form a meaningful and coherent short paragraph. Identify the odd one out. Choose its number as your answer and key it in.

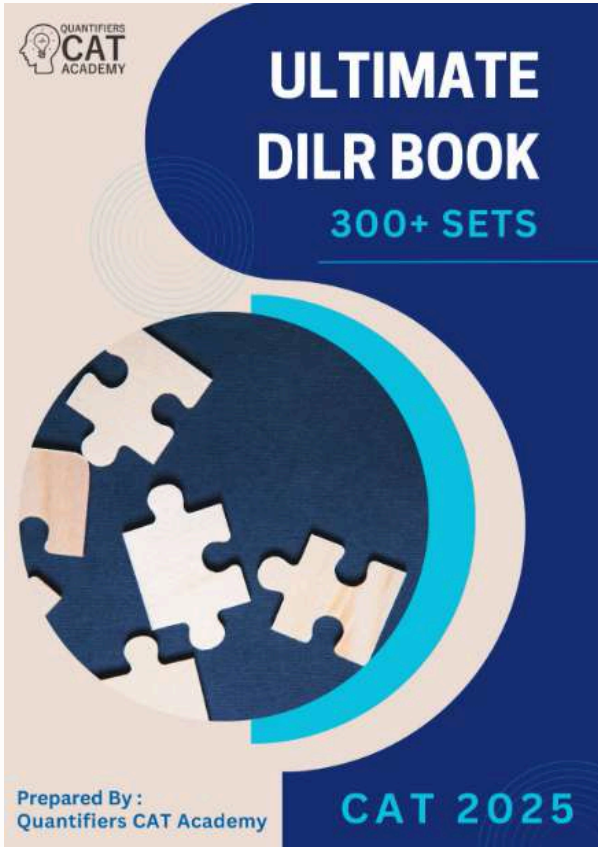
1. The care with which philosophers examine arguments for and against forms of biotechnology makes this an excellent primer on formulating and assessing moral arguments.
2. Although most people find at least some forms of genetic engineering disquieting, it is not easy to articulate why: what is wrong with re-engineering our nature?
3. Breakthroughs in genetics present us with the promise that we will soon be able to prevent a host of debilitating diseases, and the predicament that our newfound genetic knowledge may enable us to enhance our genetic traits.
4. To grapple with the ethics of enhancement, we need to confront questions that verge on theology, which is why modern philosophers and political theorists tend to shrink from them.
5. One argument is that the drive for human perfection through genetics is objectionable as it represents a bid for mastery that fails to appreciate the gifts of human powers and achievements.

Q.23) DIRECTIONS for the question: The four sentences (labelled 1,2,3 and 4) given in this question, when properly sequenced, form a coherent paragraph. Decide on the proper order for the sentence and key in this sequence of four numbers as your answer.

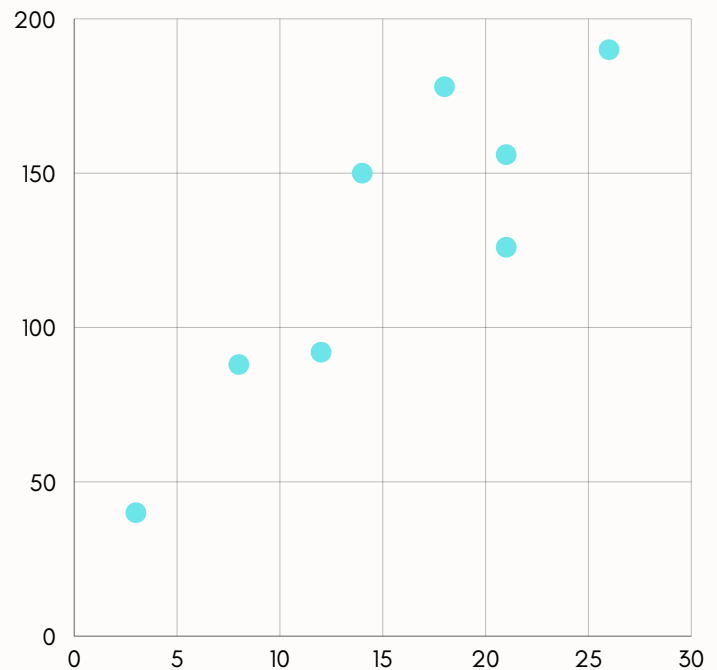
1. But today there is an epochal challenge to rethink and reconstitute the vision and practice of development as a shared responsibility – a sharing which binds both the agent and the audience, the developed world and the developing, in a bond of shared destiny.
2. We are at a crossroads now in our vision and practice of development.
3. This calls for the cultivation of an appropriate ethical mode of being in our lives which enables us to realize this global and planetary situation of shared living and responsibility.
4. Half a century ago, development began as a hope for a better human possibility, but in the last fifty years, this hope has lost itself in the dreary desert of various kinds of hegemonic applications.

Q.24) DIRECTIONS for the question: The four sentences (labelled 1,2,3 and 4) given in this question, when properly sequenced, form a coherent paragraph. Decide on the proper order for the sentence and key in this sequence of four numbers as your answer.

1. The US has long maintained that the Northwest Passage is an international strait through which its commercial and military vessels have the right to pass without seeking Canada's permission.
2. Canada, which officially acquired the group of islands forming the Northwest Passage in 1880, claims sovereignty over all the shipping routes through the Passage.
3. The dispute could be transitory, however, as scientists speculate that the entire Arctic Ocean will soon be ice-free in summer, so ship owners will not have to ask for permission to sail through any of the Northwest Passage routes.
4. The US and Canada have never legally settled the question of access through the Passage, but have an agreement whereby the US needs to seek Canada's consent for any transit.



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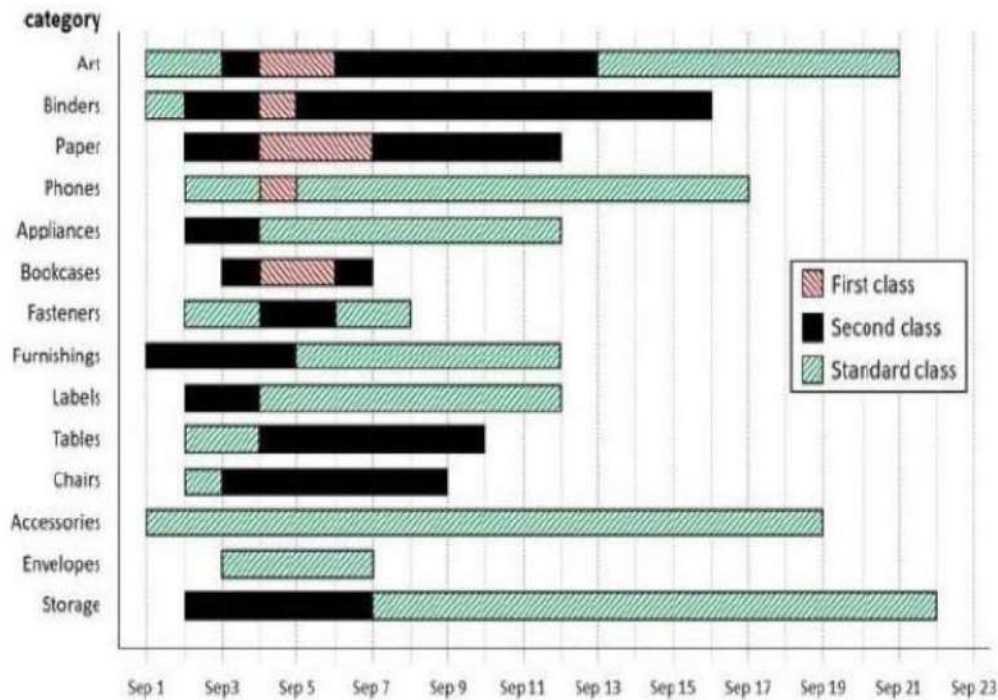
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CAT 2021 Slot 2 DILR

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



The different bars in the diagram above provide information about different orders in various categories (Art, Binders,) that were booked in the first two weeks of September of a store for one client. The colour and pattern of a bar denotes the ship mode (First Class / Second Class / Standard Class). The left end point of a bar indicates the booking day of the order, while the right end point indicates the dispatch day of the order. The difference between the dispatch day and the booking day (measured in terms of the number of days) is called the processing time of the order. For the same category, an order is considered for booking only after the previous order of the same category is dispatched. No two consecutive orders of the same category had identical ship mode during this period.

For example, there were only two orders in the furnishing category during this period. The first one was shipped in the Second Class. It was booked on Sep 1 and dispatched on Sep 5. The second order was shipped in the Standard class. It was booked on Sep 5 (although the order might have been placed before that) and dispatched on Sep 12. So the processing times were 4 and 7 days respectively for these orders.

Q.1) How many days between Sep 1 and Sep 14 (both inclusive) had no booking from this client considering all the above categories? (in numerical value)

Q.2) What was the average processing time of all orders in the categories which had only one type of ship mode? (in numerical value)

Q.3) The sequence of categories -- Art, Binders, Paper and Phones -- in decreasing order of average processing time of their orders in this period is:

- A) Paper, Binders, Art, Phones
- B) Phones, Art, Binders, Paper
- C) Art, Binders, Paper, Phones
- D) Phones, Binders, Art, Paper

Q.4) Approximately what percentage of orders had a processing time of one day during the period Sep 1 to Sep 22 (both dates inclusive)?

- A) 16%
- B) 22%
- C) 20%
- D) 25%

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

The game of Chango is a game where two people play against each other; one of them wins and the other loses, i.e., there are no drawn Chango games. 12 players participated in a Chango championship. They were divided into four groups: Group A consisted of Aruna, Azul, and Arif; Group B consisted of Brinda, Brij, and Biju; Group C consisted of Chitra, Chetan, and Chhavi; and Group D consisted of Dipen, Donna, and Deb.

Players within each group had a distinct rank going into the championship. The players have NOT been listed necessarily according to their ranks. In the group stage of the game, the second and third ranked players play against each other, and the winner of that game plays against the first ranked player of the group. The winner of this second game is considered as the winner of the group and enters a semi-final.

The winners from Groups A and B play against each other in one semi-final, while the winners from Groups C and D play against each other in the other semi-final. The winners of the two semi-finals play against each other in the final to decide the winner of the championship.

It is known that:

1. Chitra did not win the championship.
2. Aruna did not play against Arif. Brij did not play against Brinda.
3. Aruna, Biju, Chitra, and Dipen played three games each, Azul and Chetan played two games each, and the remaining players played one game each.

Q.5) Who among the following was DEFINITELY NOT ranked first in his/her group?

- A) Brij
- B) Aruna

- C) Dipen
- D) Chitra

Q.6) Which of the following pairs must have played against each other in the championship?

- A) Donna, Chetan
- B) Azul, Biju
- C) Deb, Donna
- D) Chitra, Dipen

Q.7) Who won the championship?

- A) Brij
- B) Cannot be determined
- C) Aruna
- D) Chitra

Q.8) Who among the following did NOT play against Chitra in the championship?

- A) Biju
- B) Aruna
- C) Dipen
- D) Chetan

DIRECTIONS for the question: Study the following information carefully and answer the given question.

Ravi works in an online food-delivery company. After each delivery, customers rate Ravi on each of four parameters – Behaviour, Packaging, Hygiene, and Timeliness, on a scale from 1 to 9. If the total of the four rating points is 25 or more, then Ravi gets a bonus of Rs. 20 for that delivery. Additionally, a customer may or may not give Ravi a tip. If the customer gives a tip, it is either Rs. 30 or Rs. 50.

One day, Ravi made four deliveries - one to each of Atal, Bihari, Chirag and Deepak, and received a total of Rs. 120 in bonus and tips. He did not get both a bonus and a tip from the same customer.

The following additional facts are also known.

1. In Timeliness, Ravi received a total of 21 points, and three of the customers gave him the same rating points in this parameter. Atal gave higher rating points than Bihari and Chirag in this parameter.
2. Ravi received distinct rating points in Packaging from the four customers adding up to 29 points. Similarly, Ravi received distinct rating points in Hygiene from the four customers adding up to 26 points.
3. Chirag gave the same rating points for Packaging and Hygiene.
4. Among the four customers, Bihari gave the highest rating points in Packaging, and Chirag gave the highest rating points in Hygiene.

5. Everyone rated Ravi between 5 and 7 in Behaviour. Unique maximum and minimum ratings in this parameter were given by Atal and Deepak respectively.

6. If the customers are ranked based on ratings given by them in individual parameters, then Atal's rank based on Packaging is the same as that based on Hygiene. This is also true for Deepak.

Q.9) What was the minimum rating that Ravi received from any customer in any parameter? (in numerical value)

Q.10) The COMPLETE list of customers who gave the maximum total rating points to Ravi is

- A) Atal and Bihari
- B) Bihari
- C) Atal
- D) Bihari and Chirag

Q.11) What rating did Atal give on Timeliness? (in numerical value)

Q.12) What BEST can be concluded about the tip amount given by Deepak?

- A) Either Rs. 0 or Rs. 30 or Rs. 50
- B) Rs. 50
- C) Either Rs. 30 or Rs. 50
- D) Rs. 30

Q.13) In which parameter did Atal give the maximum rating points to Ravi?

- A) Hygiene
- B) Packaging
- C) Timeliness
- D) Behaviour

Q.14) What rating did Deepak give on Packaging?

- A) 7
- B) 5
- C) 6
- D) 8

DIRECTIONS for the question: Study the following information carefully and answer the given question.

Ten objects o1, o2, ..., o10 were distributed among Amar, Barat, Charles, Disha, and Elise. Each item went to exactly one person. Each person got exactly two of the items, and this pair of objects is called her/his bundle.

The following table shows how each person values each object.

	o1	o2	o3	o4	o5	o6	o7	o8	o9	o10
Amar	4	9	9	3	7	3	8	7	9	5
Barat	5	9	7	5	5	3	6	8	10	8
Charles	8	8	8	3	6	4	5	8	9	6
Disha	8	8	8	5	5	3	6	4	9	8
Elise	6	8	9	5	6	5	6	3	7	10

The value of any bundle by a person is the sum of that person's values of the objects in that bundle. A person X envies another person Y if X values Y's bundle more than X's own bundle.

For example, hypothetically suppose Amar's bundle consists of o1 and o2, and Barat's bundle consists of o3 and o4. Then Amar values his own bundle at $4 + 9 = 13$ and Barat's bundle at $9 + 3 = 12$. Hence Amar does not envy Barat. On the other hand, Barat values his own bundle at $7 + 5 = 12$ and Amar's bundle at $5 + 9 = 14$. Hence Barat envies Amar.

The following facts are known about the actual distribution of the objects among the five people.

1. If someone's value for an object is 10, then she/he received that object.
2. Objects o1, o2, and o3 were given to three different people.
3. Objects o1 and o8 were given to different people.
4. Three people value their own bundles at 16. No one values her/his own bundle at a number higher than 16.
5. Disha values her own bundle at an odd number. All others value their own bundles at an even number.
6. Some people who value their own bundles less than 16 envy some other people who value their own bundle at 16. No one else envies others.

Q.15) What BEST can be said about object o8?

- A) o8 was given to Amar, Charles, or Disha
- B) o8 was given to Charles
- C) o8 was given to Disha
- D) o8 was given to Charles or Disha

Q.16) Who among the following envies someone else?

- A) Barat
- B) Elise
- C) Charles
- D) Amar

Q.17) What is Amar's value for his own bundle? (in numerical value)

Q.18) Object o4 was given to

- A) Elise
- B) Charles
- C) Barat

D) Disha

Q.19) Object o5 was given to

- A) Disha
- B) Elise
- C) Charles
- D) Amar

Q.20) What BEST can be said about the distribution of object o1?

- A) o1 was given to Charles
- B) o1 was given to Charles or Disha
- C) o1 was given to Disha
- D) o1 was given to Charles, Disha, or Elise



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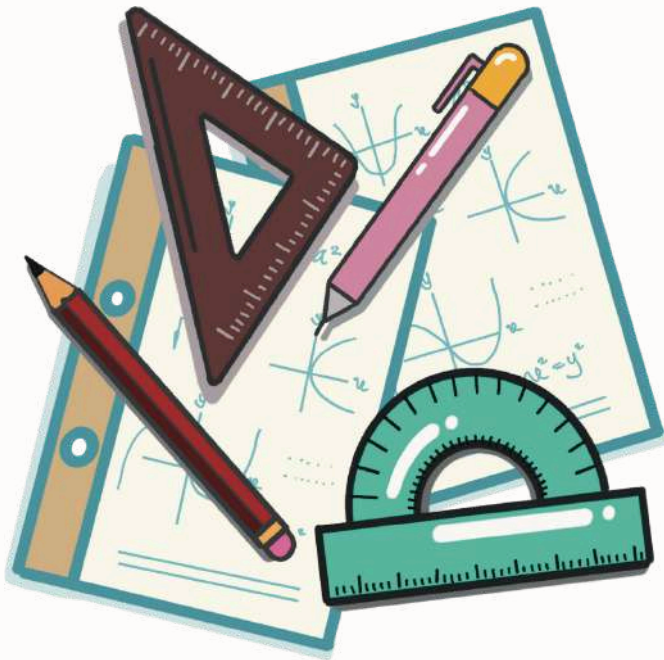
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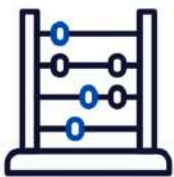
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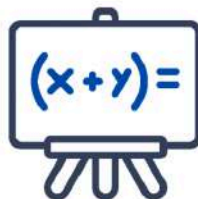
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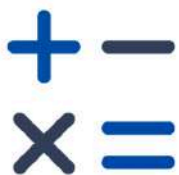


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DIRECTIONS for the question: Solve the following question and mark the best possible option.

Q.1) Let D and E be points on sides AB and AC, respectively, of a triangle ABC, such that $AD : BD = 2 : 1$ and $AE : CE = 2 : 3$. If the area of the triangle ADE is 8 sq cm, then the area of the triangle ABC, in sq cm, is (in numerical value)

Q.2) Two trains A and B were moving in opposite DIRECTIONSs, their speeds being in the ratio 5 : 3. The front end of A crossed the rear end of B 46 seconds after the front ends of the trains had crossed each other. It took another 69 seconds for the rear ends of the trains to cross each other. The ratio of length of train A to that of train B is

- A) 3 : 2
- B) 2 : 1
- C) 5 : 3
- D) 2 : 3

Q.3) Anil, Bobby and Chintu jointly invest in a business and agree to share the overall profit in proportion to their investments. Anil's share of investment is 70%. His share of profit decreases by Rs. 420 if the overall profit goes down from 18% to 15%. Chintu's share of profit increases by Rs. 80 if the overall profit goes up from 15% to 17%. The amount, in INR, invested by Bobby is

- A) 2200
- B) 2400
- C) 2000
- D) 1800

Q.4) The sides AB and CD of a trapezium ABCD are parallel, with AB being the smaller side. P is the midpoint of CD and ABPD is a parallelogram. If the difference between the areas of the parallelogram ABPD and the triangle BPC is 10 sq cm, then the area, in sq cm, of the trapezium ABCD is

- A) 40
- B) 25
- C) 20
- D) 30

Q.5) A person buys tea of three different qualities at Rs. 800, Rs. 500, and Rs. 300 per kg, respectively, and the amounts bought are in the proportion 2 : 3 : 5. She mixes all the tea and sells one-sixth of the mixture at Rs. 700 per kg. The price, in INR per kg, at which she should sell the remaining tea, to make an overall profit of 50%, is

- A) 688
- B) 675
- C) 653
- D) 692

Q.6) If a rhombus has area 12 sq cm and side length 5 cm, then the length, in cm, of its longer diagonal is

- A) $\sqrt{13} + \sqrt{12}$
- B) $\sqrt{37} + \sqrt{13}$
- C) $\frac{\sqrt{13} + \sqrt{12}}{2}$
- D) $\frac{\sqrt{37} + \sqrt{13}}{2}$

Q.7) Three positive integers x, y and z are in arithmetic progression. If $y - x > 2$ and $xyz = 5(x + y + z)$, then $z - x$ equals

- A) 14
- B) 10
- C) 8
- D) 12

Q.8) For a 4-digit number, the sum of its digits in the thousands, hundreds and tens places is 14, the sum of its digits in the hundreds, tens and units places is 15, and the tens place digit is 4 more than the units place digit. Then the highest possible 4- digit number satisfying the above conditions is (in numerical value)

Q.9) The number of ways of distributing 15 identical balloons, 6 identical pencils and 3 identical erasers among 3 children, such that each child gets at least four balloons and one pencil, is (in numerical value)

Q.10) For all possible integers n satisfying $2.25 \leq 2 + 2^{n+2} \leq 202$, the number of integer values of $3 + 3^{n+1}$ is (in numerical value)

Q.11) Raj invested Rs. 10000 in a fund. At the end of first year, he incurred a loss but his balance was more than Rs. 5000. This balance, when invested for another year, grew and the percentage of growth in the second year was five times the percentage of loss in the first year. If the gain of Raj from the initial investment over the two year period is 35%, then the percentage of loss in the first year is

- A) 10
- B) 15
- C) 70
- D) 5

Q.12) Two pipes A and B are attached to an empty water tank. Pipe A fills the tank while pipe B drains it. If pipe A is opened at 2 pm and pipe B is opened at 3 pm, then the tank becomes full at 10 pm. Instead, if pipe A is opened at 2 pm and pipe B is opened at 4 pm, then the tank becomes full at 6 pm. If pipe B is not opened at all, then the time, in minutes, taken to fill the tank is

- A) 264
- B) 144

- C) 140
D) 120

Q.13) A box has 450 balls, each either white or black, there being as many metallic white balls as metallic black balls. If 40% of the white balls and 50% of the black balls are metallic, then the number of non-metallic balls in the box is (in numerical value)

Q.14) For all real values of x , the range of the function $f(x) = \frac{x^2+2x+4}{2x^2+4x+9}$ is

- A) $(\frac{3}{7}, \frac{1}{2})$
B) $[\frac{3}{7}, \frac{1}{2})$
C) $[\frac{3}{7}, \frac{8}{9})$
D) $[\frac{4}{9}, \frac{8}{9}]$

Q.15) If $\log_2 [3 + \log_3 \{4 + \log_4 (x - 1)\}] - 2 = 0$, then $4x$ equals (in numerical value)

Q.16) Consider the pair of equations: $x^2 - xy - x = 22$ and $y^2 - xy + y = 34$. If $x > y$, then $x - y$ equals

- A) 8
B) 6
C) 4
D) 7

Q.17) For a sequence of real numbers x_1, x_2, \dots, x_n , if $x_1 - x_2 + x_3 - \dots + (-1)^{n+1} x_n = n^2 + 2n$ for all natural numbers n , then the sum $x_{49} + x_{50}$ equals

- A) 200
B) -2
C) 2
D) -200

Q.18) From a container filled with milk, 9 litres of milk are drawn and replaced with water. Next, from the same container, 9 litres are drawn and again replaced with water. If the volumes of milk and water in the container are now in the ratio of 16 : 9, then the capacity of the container, in litres, is (in numerical value)

Q.19) For a real number x the condition $|3x - 20| + |3x - 40| = 20$ necessarily holds if

- A) $7 < x < 12$
B) $9 < x < 14$
C) $10 < x < 15$
D) $6 < x < 11$

Q.20) In a football tournament, a player has played a certain number of matches and 10 more matches are to be played. If he scores a total of one goal over the next 10 matches, his overall average will be 0.15 goals per match. On the other hand, if he scores a total of two goals over

the next 10 matches, his overall average will be 0.2 goals per match. The number of matches he has played is (in numerical value)

Q.21) Suppose one of the roots of the equation $ax^2 - bx + c = 0$ is $2 + \sqrt{3}$ where a , b and c are rational numbers and $a \neq 0$. If $b = c^3$ then $|a|$ equals

- A) 4
- B) 2
- C) 1
- D) 3

Q.22) Anil can paint a house in 60 days while Bimal can paint it in 84 days. Anil starts painting and after 10 days, Bimal and Charu join him. Together, they complete the painting in 14 more days. If they are paid a total of Rs. 21000 for the job, then the share of Charu, in INR, proportionate to the work done by him, is

- A) 9100
- B) 9150
- C) 9000
- D) 9200





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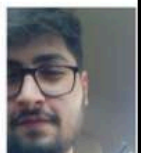






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1. Correct Answer – C

Explanation: Q is all of the following are true, EXCEPT For option 1, refer lines “a framework for analyzing the contradictory pulls on [Indian] nationalist ideology in its struggle against the dominance of colonialism and the resolution it offered to those contradictions. Briefly, this resolution was built around a separation of the domain of culture into two spheres—the material and the spiritual.”

For option 2, refer lines “The discourse of nationalism shows that the material/spiritual distinction was condensed into an analogous, but ideologically far more powerful, dichotomy: that between the outer and the inner.”

For option 4, refer lines “The discourse of nationalism shows that the material/spiritual distinction was condensed into an analogous, but ideologically far more powerful, dichotomy: that between the outer and the inner. . . . Applying the inner/outer distinction to the matter of concrete day-to-day living separates the social space into ghar and bāhir, the home and the world. The world is the external, the domain of the material; the home represents one’s inner spiritual self, one’s true identity.”

2. Correct Answer – D

Explanation: Refer lines “It was in the material sphere that the claims of Western civilization were the most powerful. Science, technology, rational forms of economic organization, modern methods of statecraft—these had given the European countries the strength to subjugate the non-European people . . . To overcome this domination, the colonized people had to learn those superior techniques of organizing material life and incorporate them within their own cultures. . . . But this could not mean the imitation of the West in every aspect of life, for then the very distinction between the West and the East would vanish—the self-identity of national culture would itself be threatened. . . .”

3. Correct Answer – A

Explanation: Option 1 goes against lines “But this could not mean the imitation of the West in every aspect of life, for then the very distinction between the West and the East would vanish—the self-identity of national culture would itself be threatened.”

Here the author talks about distinction, while the option talks about hybridization in all realms

4. Correct Answer – C

Explanation: Q is about liberals’ perception. Refer lines

“as liberals are apt to in their despair at the many marks of social conservatism in nationalist practice, a total rejection of the West.”

5. Correct Answer – A

Explanation: Option1 is supported by paras 1 and 2

Option2 is incorrect Refer lines “We hold our beliefs and presumptive knowledges more or less confidently, usually depending on how we acquired them (I saw it with my own eyes; I heard it on Fox News; a guy at the office told me)”

Option 3 is incorrect as sceptic says “we should aim to know that reality independently” isn’t supported by the passage

6. Correct Answer – C

Explanation: Refer to lines preceding the line in Q and we reach option 3 as the answer “we cannot be sure that we know anything – at least not if we think of knowledge as something like having a correct mental representation of reality, and not if we think of reality as something like things-as-they-are-in-themselves, independent of our perceptions, ideas or descriptions. For, the sceptic will note, since reality, under that conception of it, is outside our ken (we cannot catch a glimpse of things-in-themselves around the corner of our own eyes; we cannot form an idea of reality that floats above the processes of our conceiving it), we have no way to compare our mental representations with things-as they-are-in-themselves and therefore no way to determine whether they are correct or incorrect”

7. Correct Answer – D

Explanation: Refer lines “We hold our beliefs and presumptive knowledge’s more or less confidently, usually depending on how we acquired them (I saw it with my own eyes; I heard it on Fox News; a guy at the office told me) and how broadly and strenuously they seem to be shared or endorsed by various relevant people: experts and authorities, friends and family members, colleagues and associates”

8. Correct Answer – D

Explanation: Q is all of the following, EXCEPT

For option 1 refer lines “sceptic’s contention that we cannot be sure that we know anything – at least not if we think of knowledge as something like having a correct mental representation of reality, and not if we think of reality as something like things-as-they-are-in-themselves, independent of our perceptions, ideas or descriptions.”

For option2 refer lines “unless we can ground our claims to knowledge as such, which is to say, distinguish it from mere opinion, superstition, fantasy, wishful thinking, ideology, illusion or delusion, then the actions we take on the basis of presumed knowledge – boarding an airplane, swallowing a pill, finding someone guilty of a crime – will be irrational and unjustifiable.”

For option 3 refer lines “While it is not clear that the scandal matters to anyone but philosophers, philosophers point out that it should matter to everyone”

9. Correct Answer – D

Explanation: Option 4 is correct as it’s supported by lines “Both push and pull factors lead to the decline of languages. More commonly, speakers live on but abandon their language in favor of another vernacular, a widespread process that linguists refer to as “language shift” from which few languages are immune. Such trading up and out of a speech form occurs for complex political, cultural and economic reasons – sometimes voluntary for economic and educational reasons, although often amplified by state coercion or neglect. Welsh, long

stigmatized and disparaged by the British state, has rebounded with vigor.” where author talks about language shift in previous lines

Option 1 is incorrect as author doesn’t state globalization as reason for Welsh language

Option 2 is incorrect as it’s not about people but about the language

Option 3 is incorrect as it gives credit to state opposite to what the author states “Such trading up and out of a speech form occurs for complex political, cultural and economic reasons – sometimes voluntary for economic and educational reasons, although often amplified by state coercion or neglect. Welsh, long stigmatized and disparaged by the British state, has rebounded with vigor.”

10. Correct Answer – C

Explanation: Refer last paragraph

11. Correct Answer – C

Explanation: Q is all of the following EXCEPT

Option 3 is incorrect because of words ‘challenging to document’ which isn’t supported by the passage

Option 1 is supported by lines “But indigenous languages are about much more than unusual words and intriguing grammar: They function as vehicles for the transmission of cultural traditions, environmental understandings and knowledge about medicinal plants, all at risk when elders die and livelihoods are disrupted.”

Option 2 is supported by lines “While speech communities are increasingly involved in projects to protect their languages – in print, on air and online – orality is fragile and contributes to linguistic vulnerability.”

Option 4 is supported throughout the passage especially by lines “It’s easy to forget that most of the world’s languages are still transmitted orally with no widely established written form. While speech communities are increasingly involved in projects to protect their languages – in print, on air and online – orality is fragile and contributes to linguistic vulnerability.”

12. Correct Answer – B

Explanation: Q is all of the following EXCEPT

Option 2 is opposite of what author states Refer lines:

“Speakers of previously exclusively oral tongues are turning to the web as a virtual space for languages to live on. Internet technology offers powerful ways for oral traditions and cultural practices to survive, even thrive, among increasingly mobile communities”

“By widening access to technology, globalization can support indigenous and scholarly communities engaged in documenting and protecting our shared linguistic heritage”

13. Correct Answer – B

Explanation: Q is about ‘successful’ leaders

Option 1 is incorrect because of the word ‘better’ which isn’t supported by the passage

Option 3 is incorrect as it isn’t first but second type of power

Option 4 is extreme owing to its meaning and use of words ‘need’ and ‘both’ and ‘to remain’

14. Correct Answer – C

Explanation: 2 Main points to be covered are 'truth' and 'unity' Refer lines "Should they aim to unite people by making sure everyone believes in the same fiction, or should they let people know the truth even at the price of disunity?"

15. Correct Answer – A

Explanation: None of the other options actually talks about fiction

16. Correct Answer – A

Explanation: Option 2 is not correct as author doesn't recommend staying close to unalloyed truth Refer line "Hence if you stick to unalloyed reality, few (i.e. hardly anyone) people will follow you."

Option 3 is incorrect as author doesn't talk about limits

Option 4 is incorrect as author doesn't talk about "a leader who propagates only myths"

17. Correct Answer – 3214

Explanation: 1-4 1-4 is an obvious pair as 'this invention' in 1 is referring to 'commercial fusion power' in 1

3-2 2 tells why the modern scientific method is the greatest as the method (including controlled tests, precise observations and clever analysis) provides meaningful insights

32-14 14 add to the why the method is the greatest by providing an example (commercial fusion power is inconceivable without it)

18. Correct Answer – B

Explanation: Option 1 is incorrect as the industrialist and the unemployed don't capture the political agenda, the capitalist does

Option 3 is incorrect as 'stifle competition in free markets' isn't talked about in the paragraph

Option 4 is incorrect as 'the capitalists capture the political agenda' because of competition isn't implied by the paragraph

Option 2 summarizes the paragraph without committing any of the mistakes in other options

19. Correct Answer – 5

Explanation: Statement 1 to 4 talk about marketing and neuro marketing while Statement 5 talks about social scientists, who haven't been talked about in any other Statement Hence 5 is the odd one out

20. Correct Answer – C

Explanation: Option 1 is incorrect as it's the undue obsession not the industry that is hampering creativity. Also, 'destroyed' is too strong a word

Option 2 is incorrect as it's not proliferation of creativity that is negative but undue obsession with it. Also, the paragraph never implied that there ever was a stable process for creativity

Option 4 is incorrect as it focuses on defining creativity while paragraph is talking about real creativity

Option 3 summarizes the paragraph without committing any of the mistakes in other options

21. Correct Answer – B

Explanation: Option 1 is factually incorrect because of use of words ‘almost all’

Option 3 is incorrect as it leaves out biologists and physicists completely and also because of use of word ‘most’

Option 4 is factually incorrect as preprints aren’t accepted by biologists

22. Correct Answer – 1

Explanation: Statement 2 and 3 both talk about genetics

Statement 3, 4 and 5 talk about enhancement through genetics

Statement 4 talks about philosophers shrinking from/shying away while Statement 1 talks about ‘The care with which philosophers examine’ Hence Statement 1 and 4 are conceptually opposing

23. Correct Answer – 2413

Explanation: Statement 2 at the beginning states that we are at crossroads

2-41 41 state why we are at crossroads comparing situations ‘half a century ago’ and ‘today’

1-3 ‘This’ in 3 is referring to initial part of Statement 1

24. Correct Answer – 2143

Explanation: 2 starts the paragraph as it states what the northwest passage is composed of

4-3 ‘the dispute’ in 3 is referring to Statement 4

Also, 3 concludes by stating the dispute is transitory

21--3 the basis of ‘the dispute’ in 3 is given in Statement 2 and 1 so 2 and 1 come before Statement 3 though not immediately before statement 3

DILR

1. Correct Answer – 6

Explanation: From the given information, we can make the following table. The numbers here are the dates on which the orders are booked (B) and dispatched (D).

	Order									
	I		II		III		IV		V	
	B	D	B	D	B	D	B	D	B	D
Art	1	3	3	4	4	6	6	13	13	21
Binders	1	2	2	4	4	5	5	16		
Paper	2	4	4	7	7	12				
Phones	2	4	4	5	5	17				
Appliances	2	4	4	12						
Book cases	3	4	4	6	6	7				
Fasteners	2	4	4	6	6	8				
Furnishing	1	5	5	12						
Labels	2	4	4	12						
Tables	2	4	4	10						
Chairs	2	3	3	9						
Accessories	1	19								
Envelopes	3	7								
Storage	2	7	7	22						

From the above table, we can see that no booking was done on 8th, 9th, 10th, 11th, 12th and 14th Sept. Therefore, for 6 days there was no booking.

2. Correct Answer – 11

Explanation: From the given information, we can make the following table. The numbers here are the dates on which the orders are booked (B) and dispatched (D).

	Order									
	I		II		III		IV		V	
	B	D	B	D	B	D	B	D	B	D
Art	1	3	3	4	4	6	6	13	13	21
Binders	1	2	2	4	4	5	5	16		
Paper	2	4	4	7	7	12				
Phones	2	4	4	5	5	17				
Appliances	2	4	4	12						
Book cases	3	4	4	6	6	7				
Fasteners	2	4	4	6	6	8				
Furnishing	1	5	5	12						
Labels	2	4	4	12						
Tables	2	4	4	10						
Chairs	2	3	3	9						
Accessories	1	19								
Envelopes	3	7								
Storage	2	7	7	22						

Accessories and Envelopes have only one type of shipping mode.

Processing time for Accessories = $(19 - 1) = 18$ days

Processing time for Envelopes = $(7 - 3) = 4$ days

Therefore, average time = $\frac{18+4}{2} = 11$ days

3. Correct Answer – B

Explanation: From the given information, we can make the following table. The numbers here are the dates on which the orders are booked (B) and dispatched (D).

	Order									
	I		II		III		IV		V	
	B	D	B	D	B	D	B	D	B	D
Art	1	3	3	4	4	6	6	13	13	21
Binders	1	2	2	4	4	5	5	16		
Paper	2	4	4	7	7	12				
Phones	2	4	4	5	5	17				
Appliances	2	4	4	12						
Book cases	3	4	4	6	6	7				
Fasteners	2	4	4	6	6	8				
Furnishing	1	5	5	12						
Labels	2	4	4	12						
Tables	2	4	4	10						
Chairs	2	3	3	9						
Accessories	1	19								
Envelopes	3	7								
Storage	2	7	7	22						

Average processing time for Arts

$$= \frac{(3-1) + (4-3) + (6-4) + (13-6) + (21-13)}{5} = \frac{2+1+2+7+8}{5} = \frac{20}{5} = 4 \text{ days}$$

Average processing time for Binders

$$= \frac{(2-1) + (4-2) + (5-4) + (16-5)}{4} = \frac{1+2+1+11}{4} = \frac{15}{4} = 3.75$$

$$\text{Average processing time for Paper} = \frac{(4-2) + (7-4) + (12-7)}{3} = \frac{2+3+5}{3} = \frac{10}{3} = 3.33$$

$$\text{Average processing time for Phones} = \frac{(4-2) + (5-4) + (17-5)}{3} = \frac{2+1+12}{3} = \frac{15}{3} = 5$$

Therefore, the decreasing order is Phones, Art, Binders, Paper

4. Correct Answer – C

Explanation: From the given information, we can make the following table. The numbers here are the dates on which the orders are booked (B) and dispatched (D).

	Order									
	I		II		III		IV		V	
	B	D	B	D	B	D	B	D	B	D
Art	1	3	3	4	4	6	6	13	13	21
Binders	1	2	2	4	4	5	5	16		
Paper	2	4	4	7	7	12				
Phones	2	4	4	5	5	17				
Appliances	2	4	4	12						
Book cases	3	4	4	6	6	7				
Fasteners	2	4	4	6	6	8				
Furnishing	1	5	5	12						
Labels	2	4	4	12						
Tables	2	4	4	10						
Chairs	2	3	3	9						
Accessories	1	19								
Envelopes	3	7								
Storage	2	7	7	22						

Total orders = 35

Orders with processing time of one day = 7

$$\therefore \text{Required \% age} = \frac{7}{35} \times 100 = 20\%$$

5. Correct Answer – C

Explanation: 3 games:- Aruna, Biju, Chira, Dipen

2 games:- Azul, Chetan

1 game:- Arif, Brinda, Brij, Chhavi, Donna, Deb

Group A:- Arif played one game & Azul played 2 games

\therefore 1st match \rightarrow Arif vs Azul \rightarrow Azul won

2nd match \rightarrow Azul vs Aruna \rightarrow Aruna won

\therefore Aruna is Rank 1 player of group A.

As Aruna played 3 matches and she played only one match in group 1, so the remaining two matches of Aruna are semifinal & final.

\Rightarrow Aruna played final

Group B:- Brinda & Brij played 1 match each, so Biju cannot be rank one player in Group B. This is because, if Biju is rank 1, then Brinda & Brij will play first match and winner of that match will play against Biju, so that person will play 2 matches, which is not possible.

If Brinda is rank 1 player, then

I match \rightarrow Biju vs Brij \Rightarrow Biju won

II match \rightarrow Biju vs Brinda \Rightarrow Biju won

If Brij is rank 1 player, then

I match \rightarrow Biju vs Brinda \Rightarrow Biju won

II match \rightarrow Biju vs Brij \Rightarrow Biju won

So either Brij or Brinda is rank 1 player in group B and Biju played 2 matches in group.

So the third match which Biju will play is semifinal.

Group C:- Here Chhavi played one match and Chetan played 2 matches.

So match I:- Chhavi vs Chetan \Rightarrow Chetan won

match II:- Chitra vs Chetan \Rightarrow Chitra won

if Chhavi plays with Chitra & Chitra beats her, then Chitra will beat Chetan also. In that case Chetan has played only one game which is not possible.

Here Chitra had played one match in group and her remaining matches are semifinal & final. So Chitra played final.

Group D:- Here Donna & Deb played one match each. So as discussed in Group B, Dipen cannot be rank 1 player.

\therefore In group D, either Donna & Deb are rank 1 player & Dipen played 2 matches in group and his one match will be semifinal.

Dipen is definitely not ranked first in his group.

6. Correct Answer – D

Explanation: 3 games:- Aruna, Biju, Chira, Dipen

2 games:- Azul, Chetan

1 game:- Arif, Brinda, Brij, Chhavi, Donna, Deb

Group A:- Arif played one game & Azul played 2 games

\therefore 1st match \rightarrow Arif vs Azul \rightarrow Azul won

2nd match \rightarrow Azul vs Aruna \rightarrow Aruna won

\therefore Aruna is Rank 1 player of group A.

As Aruna played 3 matches and she played only one match in group 1, so the remaining two matches of Aruna are semifinal & final.

\Rightarrow Aruna played final

Group B:- Brinda & Brij played 1 match each, so Biju cannot be rank one player in Group B. This is because, if Biju is rank 1, then Brinda & Brij will play first match and winner of that match will play against Biju, so that person will play 2 matches, which is not possible.

If Brinda is rank 1 player, then

I match \rightarrow Biju vs Brij \Rightarrow Biju won

II match \rightarrow Biju vs Brinda \Rightarrow Biju won

If Brij is rank 1 player, then

I match \rightarrow Biju vs Brinda \Rightarrow Biju won

II match \rightarrow Biju vs Brij \Rightarrow Biju won

So either Brij or Brinda is rank 1 player in group B and Biju played 2 matches in group.

So the third match which Biju will play is semifinal.

Group C:- Here Chhavi played one match and Chetan played 2 matches.

So match I:- Chhavi vs Chetan \Rightarrow Chetan won

match II:- Chitra vs Chetan \Rightarrow Chitra won

if Chhavi plays with Chitra & Chitra beats her, then Chitra will beat Chetan also. In that case Chetan has played only one game which is not possible.

Here Chitra had played one match in group and her remaining matches are semifinal & final.
So Chitra played final.

Group D:- Here Donna & Deb played one match each. So as discussed in Group B, Dipen cannot be rank 1 player.

∴ In group D, either Donna & Deb are rank 1 player & Dipen played 2 matches in group and his one match will be semifinal.

Chitra, Dipen

7. Correct Answer – C

Explanation: 3 games:- Aruna, Biju, Chira, Dipen

2 games:- Azul, Chetan

1 game:- Arif, Brinda, Brij, Chhavi, Donna, Deb

Group A:- Arif played one game & Azul played 2 games

∴ 1st match → Arif vs Azul → Azul won

2nd match → Azul vs Aruna → Aruna won

∴ Aruna is Rank 1 player of group A.

As Aruna played 3 matches and she played only one match in group 1, so the remaining two matches of Aruna are semifinal & final.

⇒ Aruna played final

Group B:- Brinda & Brij played 1 match each, so Biju cannot be rank one player in Group B. This is because, if Biju is rank 1, then Brinda & Brij will play first match and winner of that match will play against Biju, so that person will play 2 matches, which is not possible.

If Brinda is rank 1 player, then

I match → Biju vs Brij ⇒ Biju won

II match → Biju vs Brinda ⇒ Biju won

If Brij is rank 1 player, then

I match → Biju vs Brinda ⇒ Biju won

II match → Biju vs Brij ⇒ Biju won

So either Brij or Brinda is rank 1 player in group B and Biju played 2 matches in group.

So the third match which Biju will play is semifinal.

Group C:- Here Chhavi played one match and Chetan played 2 matches.

So match I:- Chhavi vs Chetan ⇒ Chetan won

match II:- Chitra vs Chetan ⇒ Chitra won

if Chhavi plays with Chitra & Chitra beats her, then Chitra will beat Chetan also. In that case Chetan has played only one game which is not possible.

Here Chitra had played one match in group and her remaining matches are semifinal & final.
So Chitra played final.

Group D:- Here Donna & Deb played one match each. So as discussed in Group B, Dipen cannot be rank 1 player.

∴ In group D, either Donna & Deb are rank 1 player & Dipen played 2 matches in group and his one match will be semifinal.

Aruna & Chitra reached the final. As Chitra did not win final, so Aruna must have won it.

8. Correct Answer – A

Explanation: 3 games:- Aruna, Biju, Chira, Dipen

2 games:- Azul, Chetan

1 game:- Arif, Brinda, Brij, Chhavi, Donna, Deb

Group A:- Arif played one game & Azul played 2 games

∴ 1st match → Arif vs Azul → Azul won

2nd match → Azul vs Aruna → Aruna won

∴ Aruna is Rank 1 player of group A.

As Aruna played 3 matches and she played only one match in group 1, so the remaining two matches of Aruna are semifinal & final.

⇒ Aruna played final

Group B:- Brinda & Brij played 1 match each, so Biju cannot be rank one player in Group B. This is because, if Biju is rank 1, then Brinda & Brij will play first match and winner of that match will play against Biju, so that person will play 2 matches, which is not possible.

If Brinda is rank 1 player, then

I match → Biju vs Brij ⇒ Biju won

II match → Biju vs Brinda ⇒ Biju won

If Brij is rank 1 player, then

I match → Biju vs Brinda ⇒ Biju won

II match → Biju vs Brij ⇒ Biju won

So either Brij or Brinda is rank 1 player in group B and Biju played 2 matches in group.

So the third match which Biju will play is semifinal.

Group C:- Here Chhavi played one match and Chetan played 2 matches.

So match I:- Chhavi vs Chetan ⇒ Chetan won

match II:- Chitra vs Chetan ⇒ Chitra won

if Chhavi plays with Chitra & Chitra beats her, then Chitra will beat Chetan also. In that case Chetan has played only one game which is not possible.

Here Chitra had played one match in group and her remaining matches are semifinal & final.

So Chitra played final.

Group D:- Here Donna & Deb played one match each. So as discussed in Group B, Dipen cannot be rank 1 player.

∴ In group D, either Donna & Deb are rank 1 player & Dipen played 2 matches in group and his one match will be semifinal.

Biju played semifinal against Aruna and lost it. So he cannot play against Chitra.

9. Correct Answer – 6

Explanation: The total tip received is Rs. 120

Now $120 = 20 + 20 + 30 + 50$ or $20 + 50 + 50 + 0$ or $30 + 30 + 30 + 30$

It is given that in Timeliness, Ravi received a total of 21 points. As per point 1, let Atal gave x points then Bihari, Chirag and Deepak will give y each, s.t. $x > y$ & $x + 3y = 21$

$\Rightarrow (x, y)$ are $(6, 5)$ or $(9, 4)$

Total of Packaging is 29 with all distinct ratings $\Rightarrow 29 = 9 + 8 + 7 + 5$

Hygiene also has distinct ratings with a total of 26.

Now $26 = 9 + 8 + 7 + 2$ or $9 + 8 + 6 + 3$ or $9 + 8 + 5 + 4$ or $8 + 7 + 6 + 5$

Point 4 says that Chirag gave highest rating to hygiene, and also rating of Chirag as per point 3 is same for packaging & hygiene. So Chirag cannot give rating 9 to packaging as Bihari is the one giving highest rating to packaging.

\therefore Chirag will give highest rating of 8 to hygiene and therefore $26 = 8 + 7 + 6 + 5$

Using the point 5, the partial table can be as follows:

	Behaviour	Packaging	Hygiene	Timeliness	Total
Atal	7			x	
Bihari	6	9		y	
Chirag	6	8	8	y	
Deepak	5			y	
Total		9	26	21	

Point 6 says that Atal's Rank in Packaging & hygiene is same. So it can be rank 3 or 4 and the same is true for Deepak also.

Two cases arise here:

Case I:- If Atal's rank is 3rd in packaging and hygiene.

In this case Atal's rating in packaging will be 7 and in hygiene will be 6 Deepak will be ranked 4 in these parameters with ratings 5 each.

Also taking the possible values of timeliness, the table will look like as follows

	Behaviour	Packaging	Hygiene	Timeliness	Total
Atal	7	7	6	6/9	26/29
Bihari	6	9	7	5/4	27/26
Chirag	6	8	8	5/4	27/26
Deepak	5	5	5	5/4	20/19
Total		29	26	21	

In this case Ravi will get bonus of Rs 20 each from Atal, Bihari & Chirag. From Deepak he can get maximum Rs 50 as tip. So his total will not be Rs 120 therefore, this case is wrong.

Case II:- If Atal's rank is 4th in packaging and hygiene. In this case Atal's ratings in these two parameters will be 5 each and Deepak's rank will be third with ratings of 7 & 6 respectively in packaging and hygiene respect.

We get the first table as follows:

	Behaviour	Packaging	Hygiene	Timeliness	Total
Atal	7	5	5	9	26
Bihari	6	9	7	4	26
Chirag	6	8	8	4	26
Deepak	5	7	6	4	22

In this case again he will get Rs 20 bonus from Atal, Bihari & Chirag, so his total cannot be Rs 120. Hence this case is not valid.

If we take the second case of timeliness, then the table will be

	Behaviour	Packaging	Hygiene	Timeliness	Total
Atal	7	5	5	6	23
Bihari	6	9	7	5	27
Chirag	6	8	8	5	27
Deepak	5	7	6	5	23
Total		29	26		

In this case Ravi can get tip from Atal & Deepak & will get bonus from Bihari & Chirag. Atal & Deepak can give tip of Rs 30 & Rs 50 in any order.

So he will get $120 = 20 + 20 + 30 + 50$.

Minimum rating given is 5

10. Correct Answer – D

Explanation: The total tip received is Rs. 120

Now $120 = 20 + 20 + 30 + 50$ or $20 + 50 + 50 + 0$ or $30 + 30 + 30 + 30$

It is given that in Timeliness, Ravi received a total of 21 points. As per point 1, let Atal gave x points then Bihari, Chirag and Deepak will give y each, s.t. $x > y$ & $x + 3y = 21$

$\Rightarrow (x, y)$ are (6, 5) or (9, 4)

Total of Packaging is 29 with all distinct ratings $\Rightarrow 29 = 9 + 8 + 7 + 5$

Hygiene also has distinct ratings with a total of 26.

Now $26 = 9 + 8 + 7 + 2$ or $9 + 8 + 6 + 3$ or $9 + 8 + 5 + 4$ or $8 + 7 + 6 + 5$

Point 4 says that Chirag gave highest rating to hygiene, and also rating of Chirag as per point 3 is same for packaging & hygiene. So Chirag cannot give rating 9 to packaging as Bihari is the one giving highest rating to packaging.

\therefore Chirag will give highest rating of 8 to hygiene and therefore $26 = 8 + 7 + 6 + 5$

Using the point 5, the partial table can be as follows:

	Behaviour	Packaging	Hygiene	Timeliness	Total
Atal	7			x	
Bihari	6	9		y	
Chirag	6	8	8	y	
Deepak	5			y	
Total		9	26	21	

Point 6 says that Atal's Rank in Packaging & hygiene is same. So it can be rank 3 or 4 and the same is true for Deepak also.

Two cases arise here:

Case I:- If Atal's rank is 3rd in packaging and hygiene.

In this case Atal's rating in packaging will be 7 and in hygiene will be 6 Deepak will be ranked 4 in these parameters with ratings 5 each.

Also taking the possible values of timeliness, the table will look like as follows

	Behaviour	Packaging	Hygiene	Timeliness	Total
Atal	7	7	6	6/9	26/29
Bihari	6	9	7	5/4	27/26
Chirag	6	8	8	5/4	27/26
Deepak	5	5	5	5/4	20/19
Total		29	26	21	

In this case Ravi will get bonus of Rs 20 each from Atal, Bihari & Chirag. From Deepak he can get maximum Rs 50 as tip. So his total will not be Rs 120 therefore, this case is wrong.

Case II:- If Atal's rank is 4th in packaging and hygiene. In this case Atal's ratings in these two parameters will be 5 each and Deepak's rank will be third with ratings of 7 & 6 respectively in packaging and hygiene respect.

We get the first table as follows:

	Behaviour	Packaging	Hygiene	Timeliness	Total
Atal	7	5	5	9	26
Bihari	6	9	7	4	26
Chirag	6	8	8	4	26
Deepak	5	7	6	4	22

In this case again he will get Rs 20 bonus from Atal, Bihari & Chirag, so his total cannot be Rs 120. Hence this case is not valid.

If we take the second case of timeliness, then the table will be

	Behaviour	Packaging	Hygiene	Timeliness	Total
Atal	7	5	5	6	23
Bihari	6	9	7	5	27
Chirag	6	8	8	5	27
Deepak	5	7	6	5	23
Total		29	26		

In this case Ravi can get tip from Atal & Deepak & will get bonus from Bihari & Chirag. Atal & Deepak can give tip of Rs 30 & Rs 50 in any order.

So he will get $120 = 20 + 20 + 30 + 50$.

Bihari & Chirag gave maximum 27 points

11. Correct Answer – 6

Explanation: The total tip received is Rs. 120

Now $120 = 20 + 20 + 30 + 50$ or $20 + 50 + 50 + 0$ or $30 + 30 + 30 + 30$

It is given that in Timeliness, Ravi received a total of 21 points. As per point 1, let Atal gave x points then Bihari, Chirag and Deepak will give y each, s.t. $x > y$ & $x + 3y = 21$

$\Rightarrow (x, y)$ are $(6, 5)$ or $(9, 4)$

Total of Packaging is 29 with all distinct ratings $\Rightarrow 29 = 9 + 8 + 7 + 5$

Hygiene also has distinct ratings with a total of 26.

Now $26 = 9 + 8 + 7 + 2$ or $9 + 8 + 6 + 3$ or $9 + 8 + 5 + 4$ or $8 + 7 + 6 + 5$

Point 4 says that Chirag gave highest rating to hygiene, and also rating of Chirag as per point 3 is same for packaging & hygiene. So Chirag cannot give rating 9 to packaging as Bihari is the one giving highest rating to packaging.

\therefore Chirag will give highest rating of 8 to hygiene and therefore $26 = 8 + 7 + 6 + 5$

Using the point 5, the partial table can be as follows:

	Behaviour	Packaging	Hygiene	Timeliness	Total
Atal	7			x	
Bihari	6	9		y	
Chirag	6	8	8	y	
Deepak	5			y	
Total		9	26	21	

Point 6 says that Atal's Rank in Packaging & hygiene is same. So it can be rank 3 or 4 and the same is true for Deepak also.

Two cases arise here:

Case I:- If Atal's rank is 3rd in packaging and hygiene.

In this case Atal's rating in packaging will be 7 and in hygiene will be 6 Deepak will be ranked 4 in these parameters with ratings 5 each.

Also taking the possible values of timeliness, the table will look like as follows

	Behaviour	Packaging	Hygiene	Timeliness	Total
Atal	7	7	6	6/9	26/29
Bihari	6	9	7	5/4	27/26
Chirag	6	8	8	5/4	27/26
Deepak	5	5	5	5/4	20/19
Total		29	26	21	

In this case Ravi will get bonus of Rs 20 each from Atal, Bihari & Chirag. From Deepak he can get maximum Rs 50 as tip. So his total will not be Rs 120 therefore, this case is wrong.

Case II:- If Atal's rank is 4th in packaging and hygiene. In this case Atal's ratings in these two parameters will be 5 each and Deepak's rank will be third with ratings of 7 & 6 respectively in packaging and hygiene respect.

We get the first table as follows:

	Behaviour	Packaging	Hygiene	Timeliness	Total
Atal	7	5	5	9	26
Bihari	6	9	7	4	26
Chirag	6	8	8	4	26
Deepak	5	7	6	4	22

In this case again he will get Rs 20 bonus from Atal, Bihari & Chirag, so his total cannot be Rs 120. Hence this case is not valid.

If we take the second case of timeliness, then the table will be

	Behaviour	Packaging	Hygiene	Timeliness	Total
Atal	7	5	5	6	23
Bihari	6	9	7	5	27
Chirag	6	8	8	5	27
Deepak	5	7	6	5	23
Total		29	26		

In this case Ravi can get tip from Atal & Deepak & will get bonus from Bihari & Chirag. Atal & Deepak can give tip of Rs 30 & Rs 50 in any order.

So he will get $120 = 20 + 20 + 30 + 50$.

Atal gave rating of 6 on timeliness

12. Correct Answer – C

Explanation: The total tip received is Rs. 120

Now $120 = 20 + 20 + 30 + 50$ or $20 + 50 + 50 + 0$ or $30 + 30 + 30 + 30$

It is given that in Timeliness, Ravi received a total of 21 points. As per point 1, let Atal gave x points then Bihari, Chirag and Deepak will give y each, s.t. $x > y$ & $x + 3y = 21$

$\Rightarrow (x, y)$ are (6, 5) or (9, 4)

Total of Packaging is 29 with all distinct ratings $\Rightarrow 29 = 9 + 8 + 7 + 5$

Hygiene also has distinct ratings with a total of 26.

Now $26 = 9 + 8 + 7 + 2$ or $9 + 8 + 6 + 3$ or $9 + 8 + 5 + 4$ or $8 + 7 + 6 + 5$

Point 4 says that Chirag gave highest rating to hygiene, and also rating of Chirag as per point 3 is same for packaging & hygiene. So Chirag cannot give rating 9 to packaging as Bihari is the one giving highest rating to packaging.

\therefore Chirag will give highest rating of 8 to hygiene and therefore $26 = 8 + 7 + 6 + 5$

Using the point 5, the partial table can be as follows:

	Behaviour	Packaging	Hygiene	Timeliness	Total
Atal	7			x	
Bihari	6	9		y	
Chirag	6	8	8	y	
Deepak	5			y	
Total		9	26	21	

Point 6 says that Atal's Rank in Packaging & hygiene is same. So it can be rank 3 or 4 and the same is true for Deepak also.

Two cases arise here:

Case I:- If Atal's rank is 3rd in packaging and hygiene.

In this case Atal's rating in packaging will be 7 and in hygiene will be 6 Deepak will be ranked 4 in these parameters with ratings 5 each.

Also taking the possible values of timeliness, the table will look like as follows

	Behaviour	Packaging	Hygiene	Timeliness	Total
Atal	7	7	6	6/9	26/29
Bihari	6	9	7	5/4	27/26
Chirag	6	8	8	5/4	27/26
Deepak	5	5	5	5/4	20/19
Total		29	26	21	

In this case Ravi will get bonus of Rs 20 each from Atal, Bihari & Chirag. From Deepak he can get maximum Rs 50 as tip. So his total will not be Rs 120 therefore, this case is wrong.

Case II:- If Atal's rank is 4th in packaging and hygiene. In this case Atal's ratings in these two parameters will be 5 each and Deepak's rank will be third with ratings of 7 & 6 respectively in packaging and hygiene respect.

We get the first table as follows:

	Behaviour	Packaging	Hygiene	Timeliness	Total
Atal	7	5	5	9	26
Bihari	6	9	7	4	26
Chirag	6	8	8	4	26
Deepak	5	7	6	4	22

In this case again he will get Rs 20 bonus from Atal, Bihari & Chirag, so his total cannot be Rs 120. Hence this case is not valid.

If we take the second case of timeliness, then the table will be

	Behaviour	Packaging	Hygiene	Timeliness	Total
Atal	7	5	5	6	23
Bihari	6	9	7	5	27
Chirag	6	8	8	5	27
Deepak	5	7	6	5	23
Total		29	26		

In this case Ravi can get tip from Atal & Deepak & will get bonus from Bihari & Chirag. Atal & Deepak can give tip of Rs 30 & Rs 50 in any order.

So he will get $120 = 20 + 20 + 30 + 50$.

Deepak can give a tip of Rs 30 or 50

13. Correct Answer – D

Explanation: The total tip received is Rs. 120

Now $120 = 20 + 20 + 30 + 50$ or $20 + 50 + 50 + 0$ or $30 + 30 + 30 + 30$

It is given that in Timeliness, Ravi received a total of 21 points. As per point 1, let Atal gave x points then Bihari, Chirag and Deepak will give y each, s.t. $x > y$ & $x + 3y = 21$

$\Rightarrow (x, y)$ are (6, 5) or (9, 4)

Total of Packaging is 29 with all distinct ratings $\Rightarrow 29 = 9 + 8 + 7 + 5$

Hygiene also has distinct ratings with a total of 26.

Now $26 = 9 + 8 + 7 + 2$ or $9 + 8 + 6 + 3$ or $9 + 8 + 5 + 4$ or $8 + 7 + 6 + 5$

Point 4 says that Chirag gave highest rating to hygiene, and also rating of Chirag as per point 3 is same for packaging & hygiene. So Chirag cannot give rating 9 to packaging as Bihari is the one giving highest rating to packaging.

∴ Chirag will give highest rating of 8 to hygiene and therefore $26 = 8 + 7 + 6 + 5$

Using the point 5, the partial table can be as follows:

	Behaviour	Packaging	Hygiene	Timeliness	Total
Atal	7			x	
Bihari	6	9		y	
Chirag	6	8	8	y	
Deepak	5			y	
Total		9	26	21	

Point 6 says that Atal's Rank in Packaging & hygiene is same. So it can be rank 3 or 4 and the same is true for Deepak also.

Two cases arise here:

Case I:- If Atal's rank is 3rd in packaging and hygiene.

In this case Atal's rating in packaging will be 7 and in hygiene will be 6 Deepak will be ranked 4 in these parameters with ratings 5 each.

Also taking the possible values of timeliness, the table will look like as follows

	Behaviour	Packaging	Hygiene	Timeliness	Total
Atal	7	7	6	6/9	26/29
Bihari	6	9	7	5/4	27/26
Chirag	6	8	8	5/4	27/26
Deepak	5	5	5	5/4	20/19
Total		29	26	21	

In this case Ravi will get bonus of Rs 20 each from Atal, Bihari & Chirag. From Deepak he can get maximum Rs 50 as tip. So his total will not be Rs 120 therefore, this case is wrong.

Case II:- If Atal's rank is 4th in packaging and hygiene. In this case Atal's ratings in these two parameters will be 5 each and Deepak's rank will be third with ratings of 7 & 6 respectively in packaging and hygiene respect.

We get the first table as follows:

	Behaviour	Packaging	Hygiene	Timeliness	Total
Atal	7	5	5	9	26
Bihari	6	9	7	4	26
Chirag	6	8	8	4	26
Deepak	5	7	6	4	22

In this case again he will get Rs 20 bonus from Atal, Bihari & Chirag, so his total cannot be Rs 120. Hence this case is not valid.

If we take the second case of timeliness, then the table will be

	Behaviour	Packaging	Hygiene	Timeliness	Total
Atal	7	5	5	6	23
Bihari	6	9	7	5	27
Chirag	6	8	8	5	27
Deepak	5	7	6	5	23
Total		29	26		

In this case Ravi can get tip from Atal & Deepak & will get bonus from Bihari & Chirag. Atal & Deepak can give tip of Rs 30 & Rs 50 in any order.

So he will get $120 = 20 + 20 + 30 + 50$.

Atal gave maximum points in behaviour

14. Correct Answer – A

Explanation: The total tip received is Rs. 120

Now $120 = 20 + 20 + 30 + 50$ or $20 + 50 + 50 + 0$ or $30 + 30 + 30 + 30$

It is given that in Timeliness, Ravi received a total of 21 points. As per point 1, let Atal gave x points then Bihari, Chirag and Deepak will give y each, s.t. $x > y$ & $x + 3y = 21$

$\Rightarrow (x, y)$ are $(6, 5)$ or $(9, 4)$

Total of Packaging is 29 with all distinct ratings $\Rightarrow 29 = 9 + 8 + 7 + 5$

Hygiene also has distinct ratings with a total of 26.

Now $26 = 9 + 8 + 7 + 2$ or $9 + 8 + 6 + 3$ or $9 + 8 + 5 + 4$ or $8 + 7 + 6 + 5$

Point 4 says that Chirag gave highest rating to hygiene, and also rating of Chirag as per point 3 is same for packaging & hygiene. So Chirag cannot give rating 9 to packaging as Bihari is the one giving highest rating to packaging.

\therefore Chirag will give highest rating of 8 to hygiene and therefore $26 = 8 + 7 + 6 + 5$

Using the point 5, the partial table can be as follows:

	Behaviour	Packaging	Hygiene	Timeliness	Total
Atal	7			x	
Bihari	6	9		y	
Chirag	6	8	8	y	
Deepak	5			y	
Total		9	26	21	

Point 6 says that Atal's Rank in Packaging & hygiene is same. So it can be rank 3 or 4 and the same is true for Deepak also.

Two cases arise here:

Case I:- If Atal's rank is 3rd in packaging and hygiene.

In this case Atal's rating in packaging will be 7 and in hygiene will be 6 Deepak will be ranked 4 in these parameters with ratings 5 each.

Also taking the possible values of timeliness, the table will look like as follows

	Behaviour	Packaging	Hygiene	Timeliness	Total
Atal	7	7	6	6/9	26/29
Bihari	6	9	7	5/4	27/26
Chirag	6	8	8	5/4	27/26
Deepak	5	5	5	5/4	20/19
Total		29	26	21	

In this case Ravi will get bonus of Rs 20 each from Atal, Bihari & Chirag. From Deepak he can get maximum Rs 50 as tip. So his total will not be Rs 120 therefore, this case is wrong.

Case II:- If Atal's rank is 4th in packaging and hygiene. In this case Atal's ratings in these two parameters will be 5 each and Deepak's rank will be third with ratings of 7 & 6 respectively in packaging and hygiene respect.

We get the first table as follows:

	Behaviour	Packaging	Hygiene	Timeliness	Total
Atal	7	5	5	9	26
Bihari	6	9	7	4	26
Chirag	6	8	8	4	26
Deepak	5	7	6	4	22

In this case again he will get Rs 20 bonus from Atal, Bihari & Chirag, so his total cannot be Rs 120. Hence this case is not valid.

If we take the second case of timeliness, then the table will be

	Behaviour	Packaging	Hygiene	Timeliness	Total
Atal	7	5	5	6	23
Bihari	6	9	7	5	27
Chirag	6	8	8	5	27
Deepak	5	7	6	5	23
Total		29	26		

In this case Ravi can get tip from Atal & Deepak & will get bonus from Bihari & Chirag. Atal & Deepak can give tip of Rs 30 & Rs 50 in any order.

So he will get $120 = 20 + 20 + 30 + 50$.

Deepak gave rating of 7 on packaging

15. Correct Answer – B

Explanation: Since, Bharat value o9 = 10 and Elsie value o10 = 10, they definitely receive so Also, three people value their bundle = 16 and no value could be greater than 16

(Except Disha as she values her bundle as odd, number)

The other object of Bharat must be o7 = 6 to make it total = 16 (even)

And the other object of Elsie must be either o1 or o5

Now if Amar value his bundle = 16, objects received o2 or o3 = 9 and o5 or o8 = 7

Let say combination is o2 and o5, in that case Elsie must get o1

Then Charles get either o3 or o8 along with o6, total value = 12,

But Charles with those objects and score will not envy Amar as his bundle value is either equal or greater than Amar.

Likewise, in other cases as well, Charles bundle value cannot be 12

So, Charles bundle value must be = 16 and Amar bundle value must be = 12

Rest of the information can be gathered as follows

	Amar	Barat	Charles	Disha	Elise
o1	×	×	×	o1 = 8	×
o2	o2/o3 = 9	×	o2/o3 = 8	×	×
o3		×		×	×
o4	×	×	×	o4 = 5	×
o5	×	×	×	×	o5 = 6
o6	o6 = 3	×	×	×	×
o7	×	o7 = 6	×	×	×
o8	×	×	o8 = 8	×	×
o9	×	o9 = 10	×	×	×
o10	×	×	×	×	o10 = 10
Bundle Value	12	16	16	13	16

Now question can be answered using the above table
o8 was given to Charles

16. Correct Answer – D

Explanation: Since, Bharat value o9 = 10 and Elsie value o10 = 10, they definitely receive so
Also, three people value their bundle = 16 and no value could be greater than 16

(Except Disha as she values her bundle as odd, number)

The other object of Bharat must be o7 = 6 to make it total = 16 (even)

And the other object of Elsie must be either o1 or o5

Now if Amar value his bundle = 16, objects received o2 or o3 = 9 and o5 or o8 = 7

Let say combination is o2 and o5, in that case Elsie must get o1

Then Charles get either o3 or o8 along with o6, total value = 12,

But Charles with those objects and score will not envy Amar as his bundle value is either equal or greater than Amar.

Likewise, in other cases as well, Charles bundle value cannot be 12

So, Charles bundle value must be = 16 and Amar bundle value must be = 12

Rest of the information can be gathered as follows

	Amar	Barat	Charles	Disha	Elise
o1	×	×	×	o1 = 8	×
o2	o2/o3 = 9	×	o2/o3 = 8	×	×
o3		×		×	×
o4	×	×	×	o4 = 5	×
o5	×	×	×	×	o5 = 6
o6	o6 = 3	×	×	×	×
o7	×	o7 = 6	×	×	×
o8	×	×	o8 = 8	×	×
o9	×	o9 = 10	×	×	×
o10	×	×	×	×	o10 = 10
Bundle Value	12	16	16	13	16

Now question can be answered using the above table

Amar with 12 bundle value envies others with bundle value 16

17. Correct Answer – 12

Explanation: Since, Bharat value o9 = 10 and Elsie value o10 = 10, they definitely receive so
Also, three people value their bundle = 16 and no value could be greater than 16

(Except Disha as she values her bundle as odd, number)

The other object of Bharat must be o7 = 6 to make it total = 16 (even)

And the other object of Elsie must be either o1 or o5

Now if Amar value his bundle = 16, objects received o2 or o3 = 9 and o5 or o8 = 7

Let say combination is o2 and o5, in that case Elsie must get o1

Then Charles get either o3 or o8 along with o6, total value = 12,

But Charles with those objects and score will not envy Amar as his bundle value is either equal or greater than Amar.

Likewise, in other cases as well, Charles bundle value cannot be 12

So, Charles bundle value must be = 16 and Amar bundle value must be = 12

Rest of the information can be gathered as follows

	Amar	Barat	Charles	Disha	Elise
o1	×	×	×	o1 = 8	×
o2	o2/o3 = 9	×	o2/o3 = 8	×	×
o3		×		×	×
o4	×	×	×	o4 = 5	×
o5	×	×	×	×	o5 = 6
o6	o6 = 3	×	×	×	×
o7	×	o7 = 6	×	×	×
o8	×	×	o8 = 8	×	×
o9	×	o9 = 10	×	×	×
o10	×	×	×	×	o10 = 10
Bundle Value	12	16	16	13	16

Now question can be answered using the above table

Amar's bundle value = 12

18. Correct Answer – D

Explanation: Since, Bharat value $o_9 = 10$ and Elsie value $o_{10} = 10$, they definitely receive so
Also, three people value their bundle = 16 and no value could be greater than 16

(Except Disha as she values her bundle as odd, number)

The other object of Bharat must be $o_7 = 6$ to make it total = 16 (even)

And the other object of Elsie must be either o_1 or o_5

Now if Amar value his bundle = 16, objects received o_2 or $o_3 = 9$ and o_5 or $o_8 = 7$

Let say combination is o_2 and o_5 , in that case Elsie must get o_1

Then Charles get either o_3 or o_8 along with o_6 , total value = 12,

But Charles with those objects and score will not envy Amar as his bundle value is either equal or greater than Amar.

Likewise, in other cases as well, Charles bundle value cannot be 12

So, Charles bundle value must be = 16 and Amar bundle value must be = 12

Rest of the information can be gathered as follows

	Amar	Barat	Charles	Disha	Elsie
o_1	×	×	×	$o_1 = 8$	×
o_2	$o_2/o_3 = 9$	×	$o_2/o_3 = 8$	×	×
o_3		×		×	×
o_4	×	×	×	$o_4 = 5$	×
o_5	×	×	×	×	$o_5 = 6$
o_6	$o_6 = 3$	×	×	×	×
o_7	×	$o_7 = 6$	×	×	×
o_8	×	×	$o_8 = 8$	×	×
o_9	×	$o_9 = 10$	×	×	×
o_{10}	×	×	×	×	$o_{10} = 10$
Bundle Value	12	16	16	13	16

Now question can be answered using the above table
 o_4 was given to Disha

19. Correct Answer – B

Explanation: Since, Bharat value $o_9 = 10$ and Elsie value $o_{10} = 10$, they definitely receive so
Also, three people value their bundle = 16 and no value could be greater than 16

(Except Disha as she values her bundle as odd, number)

The other object of Bharat must be $o_7 = 6$ to make it total = 16 (even)

And the other object of Elsie must be either o_1 or o_5

Now if Amar value his bundle = 16, objects received o_2 or $o_3 = 9$ and o_5 or $o_8 = 7$

Let say combination is o_2 and o_5 , in that case Elsie must get o_1

Then Charles get either o_3 or o_8 along with o_6 , total value = 12,

But Charles with those objects and score will not envy Amar as his bundle value is either equal or greater than Amar.

Likewise, in other cases as well, Charles bundle value cannot be 12

So, Charles bundle value must be = 16 and Amar bundle value must be = 12

Rest of the information can be gathered as follows

	Amar	Barat	Charles	Disha	Elise
o1	×	×	×	o1 = 8	×
o2	o2/o3 = 9	×	o2/o3 = 8	×	×
o3		×		×	×
o4	×	×	×	o4 = 5	×
o5	×	×	×	×	o5 = 6
o6	o6 = 3	×	×	×	×
o7	×	o7 = 6	×	×	×
o8	×	×	o8 = 8	×	×
o9	×	o9 = 10	×	×	×
o10	×	×	×	×	o10 = 10
Bundle Value	12	16	16	13	16

Now question can be answered using the above table

o5 was given to Elise

20. Correct Answer – C

Explanation: Since, Bharat value o9 = 10 and Elsie value o10 = 10, they definitely receive so
Also, three people value their bundle = 16 and no value could be greater than 16

(Except Disha as she values her bundle as odd, number)

The other object of Bharat must be o7 = 6 to make it total = 16 (even)

And the other object of Elsie must be either o1 or o5

Now if Amar value his bundle = 16, objects received o2 or o3 = 9 and o5 or o8 = 7

Let say combination is o2 and o5, in that case Elsie must get o1

Then Charles get either o3 or o8 along with o6, total value = 12,

But Charles with those objects and score will not envy Amar as his bundle value is either equal or greater than Amar.

Likewise, in other cases as well, Charles bundle value cannot be 12

So, Charles bundle value must be = 16 and Amar bundle value must be = 12

Rest of the information can be gathered as follows

	Amar	Barat	Charles	Disha	Elise
o1	×	×	×	o1 = 8	×
o2	o2/o3 = 9	×	o2/o3 = 8	×	×
o3		×		×	×
o4	×	×	×	o4 = 5	×
o5	×	×	×	×	o5 = 6
o6	o6 = 3	×	×	×	×
o7	×	o7 = 6	×	×	×
o8	×	×	o8 = 8	×	×
o9	×	o9 = 10	×	×	×
o10	×	×	×	×	o10 = 10
Bundle Value	12	16	16	13	16

Now question can be answered using the above table

o1 was given to Disha

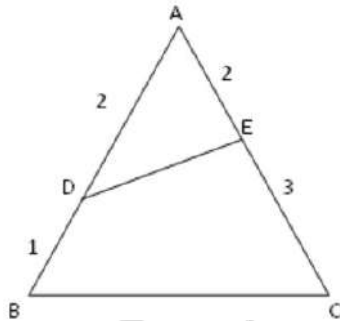
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1. Correct Answer – 30

Explanation: Let $AD = 2x$, $BD = x$

$AE = 2y$, $EC = 3y$

Area of $\triangle AED = 8$



$$\Rightarrow \frac{1}{2} \times 2x \times 2y \times \sin A = 8$$

$$\Rightarrow 2xy \sin A = 8$$

$$\Rightarrow xy \sin A = 4 \quad \text{----(i)}$$

$$\begin{aligned} \text{Area of } \triangle ABC &= \frac{1}{2} \times 3x \times 5y \sin A \\ &= \frac{1}{2} \times 15 \times xy \sin A \\ &= \frac{1}{2} \times 15 \times 4 = 30 \text{ Sq unit} \end{aligned}$$

2. Correct Answer – A

Explanation: Let the speeds of trains A and B is $5x$ & $3x$ respectively and their lengths be l_1 & l_2 respectively.

In the first case, distance travelled will be equal to length of train B

$$\therefore \frac{l_2}{8x} = 46 \Rightarrow l_2 = 46 \times 8x$$

In the second case, distance travelled will be equal to length of train A.

$$\therefore \frac{l_1}{8x} = 69 \Rightarrow l_1 = 8x \times 69$$

$$\therefore \text{Required ratio} = \frac{l_1}{l_2} = \frac{8x \times 69}{46 \times 8x} = \frac{3}{2}$$

3. Correct Answer – C

Explanation: Here the investment of Anil is 70% of the total investment. Now his share of profit decreased by Rs 420 when the profit decreased from 18% to 15%. So 70% of (decreased profit) = 420

$$\Rightarrow \text{Decreased profit} = 420/0.7 = \text{Rs } 600.$$

$$\text{Therefore, } 3\% \text{ of total investment} = 600 \Rightarrow \text{Total investment} = \text{Rs } 20000$$

So, Anil's investment is 70% of 20000 = Rs 14000.

Now Chintu's profit increased by Rs 80 when the profit increases from 15% to 17%.

$$\text{Therefore, } 2\% \text{ of Chintu's investment} = 80 \Rightarrow \text{Chintu's investment} = 80/0.02 = \text{Rs } 4000$$

Hence, Bobby's investment = $20000 - (14000 + 4000) = \text{Rs } 2000$.

4. Correct Answer – D

Explanation: Join AP

Here in $\triangle ADP$ & $\triangle BPC$,

$AD = BP$, $DP = PC$

$\angle BPC = \angle PBA = \angle ADP$

$\Rightarrow \triangle ADP$ & $\triangle BPC$ are congruent

Also AP is diagonal of parallelogram ABPD

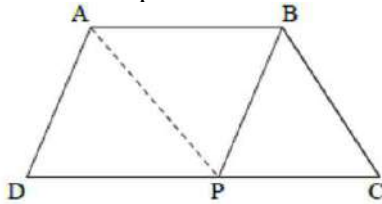
$\therefore \text{Ar}(\triangle ADP) = \text{Ar}(\triangle ABP)$

Let $\text{Ar}(\triangle ADP) = x = \text{Ar}(\triangle ABP) = \text{Ar}(\triangle BPC)$

$\therefore \text{Area of trapezium } ABCD = 3x$

Now given that $2x - x = 10 \Rightarrow x = 10$

$\therefore \text{Area of trapezium} = 10 \times 3 = 30\text{cm}^2$



5. Correct Answer – A

Explanation: Let the quantities bought are 6kg, 9kg & 15kg respectively.

Total cost = $6 \times 800 + 500 \times 9 + 300 \times 15 = \text{Rs } 13800$

Total SP = $13800 \times 1.5 = \text{Rs } 20700$

SP of 5kg = $5 \times 700 = \text{Rs } 3500$

3500

Remaining SP = $\text{Rs } 17200$

$\therefore \text{SP/kg} = \frac{17200}{25} = \text{Rs. } 688$

6. Correct Answer – B

Explanation:

Area of rhombus = 12

$$\Rightarrow \frac{1}{2} d_1 \times d_2 = 12$$

$$d_1 \times d_2 = 24$$

$$\text{Also } \frac{d_1^2}{4} + \frac{d_2^2}{4} = 25 \Rightarrow d_1^2 + d_2^2 = 100$$

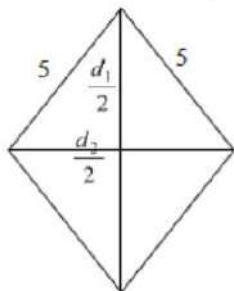
$$\text{Now } (d_1 + d_2)^2 = d_1^2 + d_2^2 + 2d_1d_2 = 100 + 48 = 148$$

$$\Rightarrow d_1 + d_2 = 2\sqrt{37} \quad \text{---(1)}$$

$$\text{Again } (d_1 - d_2)^2 = d_1^2 + d_2^2 - 2d_1d_2 = 100 - 48 = 52$$

$$\Rightarrow d_1 - d_2 = 2\sqrt{13} \quad \text{---(2)}$$

$$(1) + (2) \Rightarrow 2d_1 = 2(\sqrt{37} + \sqrt{13}) \Rightarrow d_1 = \sqrt{37} + \sqrt{13}$$



7. Correct Answer – A

Explanation: Here x, y, 7 are in AP

$$\Rightarrow y = \frac{x+z}{2} \Rightarrow x+z = 2y$$

$$\text{Now, } xyz = 5(x+y+z)$$

$$\Rightarrow xyz = 5 \times (2y + y)$$

$$\Rightarrow xyz = 5 \times 3y$$

$$\Rightarrow xz = 15$$

Now (x, z) can be (3, 5) & (1, 15)

But if x & z are 3 & 5 then y - x is not greater than 2 $\Rightarrow x = 1, z = 15$ and y = 8

$$\Rightarrow z - x = 14.$$

8. Correct Answer – 4195

Explanation: Let the number is abcd

$$\text{Given the } a + b + c = 14 \quad \text{-----(1)}$$

$$b + c + d = 15 \quad \text{-----(2)}$$

$$\& c = d + 4 \quad \text{-----(3)}$$

$$(2) - (1) \Rightarrow d - a = 1 \Rightarrow a = d - 1 \quad \text{-----(4)}$$

As highest number is asked $\Rightarrow a$ should be max. So (4) $\Rightarrow d$ should be maximum, or (3) $\Rightarrow c$ should be maximum $\Rightarrow c = 9 \Rightarrow d = 5$

$$\therefore (4) \Rightarrow a = 4 \& (1) \Rightarrow 4 + b + 9 = 14 \Rightarrow b = 1$$

\therefore Number is 4195.

9. Correct Answer – 1000

Explanation: We have 15 identical balloons, 6 identical pencils and 3 identical erasers. Let the children are A, B and C. Now every child should get four balloons and one pencil. So first

distribute 4 balloons and one pencil to A, B and C. We are left with 3 balloons, 3 pencils and 3 erasers.

3 balloons can be distributed to A, B, C in $3 + 3 - 1C3 - 1$ Or $5C2 = 10$ ways.

Similarly, 3 pencils can & 3 erasers can be distributed in 10 ways each.

\therefore Total ways = $10 \times 10 \times 10 = 1000$

10. Correct Answer – 7

Explanation: Given that $2.25 \leq 2 + 2n+2 \leq 202$

$$\Rightarrow 2 + 0.25 \leq 2 + 2n+2 \leq 2 + 128 < 202$$

$$\Rightarrow 2 + 2-2 \leq 2 + 2n+2 \leq 2 + 27$$

$$\therefore -2 \leq n + 2 \leq 7 \Rightarrow -4 \leq n \leq 5$$

$$\therefore n = -4, -3, -2, -1, 0, 1, 2, 3, 4, 5$$

Now for $n = -1, 0, 1, 2, 3, 4, 5$, $3 + 3n+1$ is an integer.

Therefore, total '7' values of 'n' are possible.

11. Correct Answer –

Explanation: Let the loss incurred in first year is $x\%$

As the balance is more than 5000 $\Rightarrow x < 50\%$

Profit in the next year = $5x$ & overall profit is 35%

$$\Rightarrow 5x - x + \frac{5x(-x)}{100} = 35$$

$$\Rightarrow 4x - \frac{x^2}{20} = 35$$

$$\Rightarrow x^2 - 80x + 700 = 0$$

$$\Rightarrow (x - 70)(x - 10) = 0$$

$$\Rightarrow x = 10, 70$$

As $x < 50\% \Rightarrow x = 10\%$

12. Correct Answer – B

In the first case A worked for 8 hours and B worked for 7 hours.

In the second case A worked for 4 hours and B worked for 2 hours.

\therefore If B worked 5 hours less then time saved for A = 4 hours

B does not work then time saved for A = $4/5 \times 7 = 5.6$ hours

So in this A would have filled the tank in $8 - 5.6 = 2.4$ hours or 144 minutes.

13. Correct Answer – 250

Explanation: Let the metallic white and metallic black balls are x each.

Now 40% of white balls = $x \Rightarrow$ white balls = $2.5x$

& 50% of black balls = $x \Rightarrow$ Total black balls = $2x$

$$\text{Now } 2.5x + 2x = 450 \Rightarrow 4.5x = 450 \Rightarrow x = 100$$

\therefore Number of non-metallic white & non metallic black balls

$$= 1.5x + x = 2.5x = 2.5 \times 100 = 250$$

14. Correct Answer – B

Explanation: Let $\frac{x^2+2x+4}{2x^2+4x+9} = k$

$$\begin{aligned} \Rightarrow x^2 + 2x + 4 &= 2kx^2 + 4kx + 9k \\ \Rightarrow (2k - 1)x^2 + (4k - 2)x + (9k - 4) &= 0 \\ \text{As } x \text{ is real} \Rightarrow D &\geq 0 \\ \Rightarrow (4k - 2)^2 - 4(2k - 1)(9k - 4) &\geq 0 \\ \Rightarrow (2k - 1)^2 - (2k - 1)(9k - 4) &\geq 0 \\ \Rightarrow (2k - 1)[2k - 1 - 9k + 4] &\geq 0 \\ \Rightarrow (2k - 1)(-7k + 3) &\geq 0 \\ \Rightarrow (2k - 1)(7k - 3) &\leq 0 \\ \Rightarrow \frac{3}{7} \leq k &\leq \frac{1}{2} \end{aligned}$$

15. Correct Answer – 5

$$\begin{aligned} \text{Here } \log_2 [3 + \log_3 \{4 + \log_4 (x-1)\}] - 2 &= 0 \\ \Rightarrow \log_2 [3 + \log_3 \{4 + \log_4 (x-1)\}] &= 2 \\ \Rightarrow 3 + \log_3 \{4 + \log_4 (x-1)\} &= 4 \\ \Rightarrow \log_3 [4 + \log_4 (x-1)] &= 1 \\ \Rightarrow 4 + \log_4 (x-1) &= 3 \\ \Rightarrow \log_4 (x-1) &= -1 \Rightarrow x-1 = 1/4 \Rightarrow x = 5/4 \\ \text{Now } 4x &= 4 \times 5/4 = 5 \end{aligned}$$

16. Correct Answer – A

$$\begin{aligned} \text{We have } x^2 - xy - x &= 22 \quad \text{---(1)} \\ y^2 - xy + y &= 34 \quad \text{---(2)} \end{aligned}$$

Add the equation (1) & (2), we get

$$\begin{aligned} x^2 + y^2 - 2xy - (x - y) &= 56 \\ \Rightarrow (x - y)^2 - (x - y) &= 56 \\ \Rightarrow (x - y)(x - y - 1) &= 56 \end{aligned}$$

As $(x - y)$ and $(x - y - 1)$ are consecutive numbers and their product is 56

$$\Rightarrow x - y = 8 \text{ \& } x - y - 1 = 7.$$

$$\therefore x - y = 8$$

17. Correct Answer – B

$$\text{Here } x_1 - x_2 + x_3 - x_4 + \dots + (-1)^{n+1} x_n = n^2 + 2n$$

$$n = 1 \Rightarrow x_1 = 1 + 2 = 3$$

$$n = 2 \Rightarrow x_1 - x_2 = 8 \Rightarrow x_2 = -5$$

$$n = 3 \Rightarrow x_1 - x_2 + x_3 = 15 \Rightarrow x_3 = 7$$

$$n = 4 \Rightarrow x_1 - x_2 + x_3 - x_4 = 24 \Rightarrow x_4 = -9 \text{ and so on}$$

$$\text{Now here } x_1 + x_2 = -2, x_3 + x_4 = -2 \text{ and so on, so } x_{49} + x_{50} = -2$$

18. Correct Answer – 451

$$\text{Here } \frac{\text{milk}}{\text{Total vol}} = \frac{16}{25} = \left(\frac{4}{5}\right)^2$$

$\therefore \frac{1}{5}$ of total mixture is taken out every time

$$\therefore \frac{1}{5} \times T = 9 \Rightarrow T = 45$$

19. Correct Answer – A

$$\text{Here } |3x - 20| + |3x - 40| = 20 \quad \text{---(1)}$$

$$\text{Case I: If } x < \frac{20}{3}, \quad (1) \Rightarrow -(3x - 20) - (3x - 40) = 20$$

$$\Rightarrow -3x + 20 - 3x + 40 = 20$$

$$\Rightarrow -6x = -40 \Rightarrow x = \frac{20}{3}, \text{ but } x = \frac{20}{3}$$

\therefore This is not possible

$$\text{Case II: If } \frac{20}{3} \leq x < \frac{40}{3}, (1) \Rightarrow 3x - 20 - 3x + 40 = 20 \Rightarrow 20 = 20 \text{ which is true}$$

$$\therefore \frac{20}{3} \leq x < \frac{40}{3}$$

$$\text{Case III: If } x \geq \frac{40}{3}, \Rightarrow 3x - 20 + 3x - 40 = 20 \Rightarrow 6x = 80 \Rightarrow x = \frac{40}{3}$$

$$\text{Combining the case II \& III, we have } \frac{20}{3} \leq x \leq \frac{40}{3} \text{ or } 6.67 \leq x \leq 13.33$$

Therefore, option (1) satisfies.

20. Correct Answer – 10

Explanation: Let the original matches be 'n' and original goals be 'x'

$$\text{Now } (n + 10) \times 0.15 = x + 1$$

$$\Rightarrow 0.15n + 1.5 = x + 1 \quad \text{---(1)}$$

$$\& (n + 10) \times 0.2 = x + 2$$

$$\Rightarrow 0.2n + 2 = x + 2 \quad \text{---(2)}$$

$$(2) - (1) \Rightarrow 0.05n + 0.5 = 1 \Rightarrow 0.05n = 0.5 \Rightarrow n = \frac{0.5}{0.05} = 10$$

21. Correct Answer – B

Given equation is $ax^2 - bx + c = 0$

Its one root is $2 + \sqrt{3}$, so second root will be $2 - \sqrt{3}$,

$$\text{Sum of roots} = \frac{b}{a} = 2 + \sqrt{3} + 2 - \sqrt{3} = 4$$

$$\therefore \frac{b}{a} = 4 \quad \text{---(1)}$$

$$\text{Product of roots} = \frac{c}{a} = (2 + \sqrt{3})(2 - \sqrt{3}) = 1$$

$$\Rightarrow \frac{c}{a} = 1 \quad \text{---(2)}$$

$$(1) / (2) \Rightarrow \frac{b}{c} = 4 \Rightarrow b = 4c \quad \text{---(3)}$$

$$\text{Also } b = c^3, (3) \Rightarrow c^3 = 4c \Rightarrow c^2 = 4 \Rightarrow c = 2, -2$$

$$\text{If } c = 2 \Rightarrow b = 8$$

$$\text{Now } \frac{b}{a} = 4 \Rightarrow \frac{8}{a} = 4 \Rightarrow a = 2 \Rightarrow |a| = 2$$

$$\text{If } c = -2, b = -8 \text{ \& } \frac{b}{a} = 4 \Rightarrow -\frac{8}{a} = 4 \Rightarrow a = -2 \Rightarrow |a| = 2$$

22. Correct Answer – A

Explanation: Let the total work is 420 units

A can do 7 units/d, B can do 5 units / day

Let C can do x units/d

$$\therefore 7 \times 24 + 5 \times 14 + x \times 14 = 420 \Rightarrow 14x + 238 = 420 \Rightarrow 14x = 182 \Rightarrow x = 13$$

Work done by A = 168 units

Work done by B = 70 units

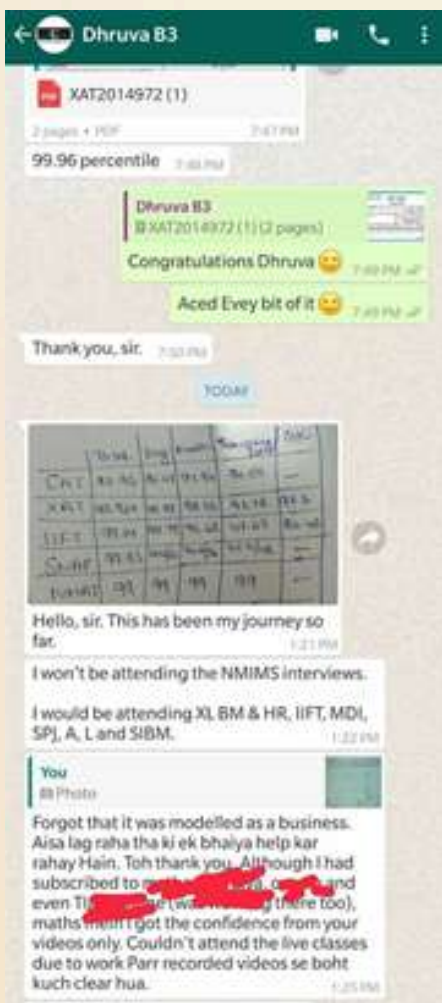
Work done by C = 182 units

\therefore Ratio of work done by A, B & C is 168 : 70 : 182 or 84 : 35 : 91

$$\therefore \text{Amount given to C} = \frac{91}{210} \times 21000 = \text{Rs.}9100$$



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