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AIMCAT 2006

VARC

DIRECTIONS *for questions 1 to 4:* The passage given below is accompanied by a set of four questions. Choose the best answer to each question.

... [Back in the 70s] West Germany and France, Europe's two central powers, looked out for each other. They sorted out their differences in private, and then used their combined weight to set the agenda for the European Union (EU) club. Today things work differently. On many policy subjects, France and Germany are now openly divided. The former wants to cut short the endless Brexit negotiations; the latter is willing to prolong them... France wants to integrate the euro zone further, to prepare it for the next crisis; Germany frets about moral hazard.

The more the EU gains members, shrinks in relative global weight, and faces ever-tougher circumstances, the more it struggles to present a common front...In these circumstances, and with the Franco-German engine stalling, three smaller countries are becoming more influential: Spain, the Netherlands and Austria.

Spain under Pedro Sánchez, the recently elected centre-left prime minister, is a natural ally to Emmanuel Macron's France. He hopes to make Spain a new third partner in the Franco-German alliance. Madrid has particularly good relations with other southern European countries like Italy and Greece, but also makes a good interlocutor for Mrs. Merkel's Germany... The Netherlands under Mark Rutte, meanwhile, has close links with both Mrs Merkel and with Mr Macron. The Netherlands

has made itself influential by marshalling a “Hanseatic” alliance against the fiscal integration that the likes of Mr Macron and Mr Sánchez want. In this, it has allies across Scandinavian and Baltic Europe. Lastly, there is Austria. ... Under Sebastian Kurz’s leadership, the small Alpine republic has become a potent voice in European debates on immigration and a broker of compromises between the EU’s liberal western states and its conservative-dominated eastern ones.

The three countries have similarities. All have close links with France and Germany; all can marshal coalitions of like-minded states in their parts of Europe: all have modernising leaders with experiences of arduous coalition-building at home. One could call them “the Habsburgs”, as all were at one time controlled by that dynasty which, like its successors in Madrid, The Hague and Vienna, played off other powers at Europe’s core against each another.

One illustration of the new mechanics came with the recent debate in the EU about cutting carbon emissions to zero by 2050. Germany was at first unwilling, but the Netherlands and Spain formed an alliance with France. That pushed Germany towards the goal. Austria then swung in, followed by some central European states like Slovenia. Together, the Habsburg states spread a measure initially backed by just eight EU states to at least 18 of them.

Spain, the Netherlands, and Austria are too disparate to act as a bloc. Instead, individually or in various combinations, they can help the French and the Germans build new coalitions...A political scientist, Gilles Finchelstein argues that, once, European politics was made up of “solid” power blocs. Then after the fall of the Berlin Wall they became “liquid” with a less predictable European political landscape. Today, he concludes, is the “gaseous era” in which political coalitions come together for brief periods like clouds of smoke, then are blown apart again. Such gaseous constellations will define Europe’s politics in the coming years.

Q1. The main idea of the passage is to demonstrate how

- a) European politics is driven by temporary and myopic interests.
- b) the two power blocs of Europe do not hold clout anymore.
- c) the future of European politics looks as temporary as wisps of smoke.
- d) **European politics is now dominated by temporary coalitions rather than permanent blocs.**

Number of words and Explanatory notes for RC:

Number of words: 530

Option A: While Europe is driven by short-lived coalitions and gaseous alliances, the author does not indicate anywhere that their interests are myopic and temporary. It is more about different coalitions supporting different issues. Hence, Option A is not the answer.

Option B: The author didn't entirely discuss France and Germany losing clout. In fact, they haven't. The focus was on how they don't necessarily act as one force now, thus allowing other players to come in and influence the politics. Hence, Option B is not the answer.

Option C: The future of European politics is not temporary, leave alone something as dramatic and rhetorical as 'wisps of smoke'. It is the coalitions which are temporary in the gaseous phase. So, Option C is not the answer.

Option D: This aptly represents the point the author was trying to drive home, which is that the EU is now dominated by ever-changing coalitions instead of the permanent blocs which called the shots earlier. Hence, Option D is the answer. Choice (D)

Q2. All of the following have been listed out as similarities between Spain, the Netherlands and Austria EXCEPT:

- a) all of them share an amicable relationship with the two central powers of Europe.
- b) all of them are led by leaders who are experienced at consensus-building.
- c) **all of them are desperate to present a united front.**
- d) **all of them have a certain degree of geopolitical clout.**

Number of words and Explanatory notes for RC:

Number of words: 530

Option A: This can be understood from 'all have close links with France and Germany.' Hence, Option A is not the answer.

Option B: This can be understood from 'all can marshal coalitions of like-minded states in their parts of Europe: all have modernising leaders with experiences of arduous coalition-building at home.' Hence, Option B is not the answer.

Option C: These three countries are too disparate (unequal) to make a common bloc according to the author. Hence, it cannot be inferred that they are 'desperate' to present a united front. Hence, Option C is not a similarity. Option C is the answer.

Option D: This has been mentioned partly in 'all can marshal coalitions of like-minded states in their parts of Europe'. More importantly, the author talks about the Netherlands' influence on Scandinavian and Baltic Ocean neighbors with regard to fiscal integration issues, Spain's friendships with Greece and Italy, and Austria's role as a mediator. So, it can be said that they have geopolitical clout to a certain degree. So, Option D is not the answer.

Choice (C)

Q3. Which of the following is not part of the author's portrayal of the changing dynamics of European politics?

- a) The more the EU gains in members, the more it is shrinking in global weight.
- b) **Austria has become a broker of compromises between the EU's liberal western states and its conservative-dominated eastern ones. ✗ Your answer is incorrect**
- c) The Habsburg states are too disparate to act as a bloc.
- d) France wants to cut short the endless Brexit negotiations whereas Germany is willing to prolong them.

Number of words and Explanatory notes for RC:

Number of words: 530

Option A: While this points to how the EU is not as powerful and dominating on the global scene as it used to be, this was not mentioned to discuss EU's changing political dynamics, which is more about internal coalitions and politics than EU's external standing. So, Option A is the answer.

Option B: This shows that Austria is becoming an important power in Europe, which was mentioned as part of the author's argument that the EU is not just dominated by two power blocks anymore; rather, it is a gaseous political alliance with shifting dynamics. Hence, Option B is not the answer.

Option C: This was mentioned by the author to prove that the Habsburg states (the Netherlands, Spain and Austria) are incapable of becoming a bloc on their own but could fluidly move and change political alliances based on issues. This was part of the author's argument that gaseous politics will define European politics based on coalitions on various issues. Hence, Option C is not the answer.

Option D: This proves that Germany and France aren't running the show together anymore, as they used to have each other's back previously. This was also part of the author's argument that European politics is shifting from the solid two-power landscape to one that is dominated by shifting alliances and coalitions on an issue-based consensus. Option D is not the answer.

Choice (A)

Q4. The author mentions the Hanseatic alliance to show that the Netherlands

- a) is as influential as Spain and Austria if not more.
- b) can marshal a coalition of like-minded states in some parts of Europe.
- c) has closer links to Germany than to France and Spain.
- d) has allies across Scandinavian and Baltic Europe.

Number of words and Explanatory notes for RC:

Number of words: 530

Consider the sentences: 'The Netherlands under Mark Rutte, meanwhile, has close links with both Mrs Merkel (Germany) and with Mr Macron. The Netherlands has made itself influential by marshalling a "Hanseatic" alliance against the fiscal integration that the likes of Mr Macron and Mr Sánchez want. In this it has allies across Scandinavian and Baltic Europe.'

Option A: The author wanted to demonstrate how the Netherlands is gaining clout in Europe, but there is no sense of comparison with the other two countries discussed here. Hence, Option A is not the answer.

Option B: The author clearly mentions that the Netherlands has made itself influential by marshalling the alliance. So, the alliance was mentioned to show that the Netherlands is transforming into a European power that can influence policy and politics. Hence, Option B is the answer.

Option C: While the Netherlands did oppose France and Spain in the issue of fiscal integration, it shares a good rapport with both France and Germany as mentioned in the passage. So, Option B is not the answer.

Option D: Firstly, this is not factually accurate. The allies across Scandinavian and Baltic Europe are only in the one issue of fiscal integration. We are not sure about their general relationship. Secondly, even if they were all-weather allies, the author mentioned the alliance not to inform the reader about the alliance in a matter-of-fact manner, but to show that the Netherlands has influence in the region and it can drum up consensus on important issues. Hence, Option D is not the answer.

Choice (B)

DIRECTIONS for questions 5 to 10: The passage given below is accompanied by a set of six questions. Choose the best answer to each question.

Transhumanism is a philosophical movement which advocates for technology not only enhancing human life but taking over human life, merging human and machine. The idea is that in one future day, humans will be vastly more intelligent, healthy, and physically powerful. In fact, much of this movement is based upon the notion that death is not an option, with a focus to improve the somatic body and make humans immortal.

Certainly, there are those in the movement who espouse the most extreme virtues of transhumanism such as replacing perfectly healthy body parts with artificial limbs. But medical ethicists raise this and other issues as the reason why transhumanism is so dangerous to humans when what is considered acceptable life-enhancement has virtually no checks and balances over who gets a say when we “go too far.” ... There is, after all, a difference between placing a pacemaker or performing laser eye surgery on the body to prolong human life and lend a greater degree of quality to human life, and that of treating the human body as a tabula rasa upon which to rewrite what is, effectively, the natural course of human life.

A largely intellectual movement whose aim is to transform humanity through the development of a panoply of technologies which ostensibly enhance human intellect, physiology, and the very legal status of what being human means, transhumanism is a social project whose inspiration can be dated back to 19th century continental European philosophy and later through the writings of J. B. S. Haldane, a British scientist and Marxist, who in 1923 delivered a speech at the Heretics Society, an intellectual club at Cambridge University, which foretold the future of the end of coal for power generation in Britain while proposing a network of windmills which would “be used for the electrolytic decomposition of water into oxygen and hydrogen.” According to many transhumanists, this is one of the founding projects of the movement. To read this one might think this was a precursor to the contemporary ecological movement.

The philosophical tenets, academic theories, and institutional practices of transhumanism are well-known. Max More, a British philosopher and leader of the extropian movement claims that transhumanism is the “continuation and acceleration of the evolution of intelligent life beyond its currently human form and human limitations by means of science and technology, guided by life-promoting principles and values.” This very definition, however, is a paradox since the ethos of this movement is to promote life through that which is not life, even by removing pieces of life, to create something billed as meta-life. Indeed, it is clear that transhumanism banks on its own

contradiction: that life is deficient as is, yet, can be bettered by prolonging life even to the detriment of life.

... In fact, much of the writings on transhumanism take a radical approach to technology: anyone who dares question cutting off healthy limbs to make way for a super-Olympian sportsperson would be called a Luddite, anti-technology. But that is a false dichotomy since most critics of transhumanism are not against all technology but question the ethics of any technology that interferes with the human rights of humans.

Q5. The paradox at the heart of transhumanism is the contradiction that

- a) the line between human and machine is no longer clearly drawn.
- b) **life is enhanced by something that isn't essentially animate.**
- c) **technology can only enhance the quality of life by replacing pieces of it.**
- d) **humans are trading parts of themselves to attain immortality.**

Number of words and Explanatory notes for RC:

Number of words: 526

Option A: A paradox has to point out some contradiction, and this statement doesn't represent a contradiction in any way. There aren't two opposing or contrary views here. Hence, Option A is not the answer.

Option B: Consider this: 'This very definition, however, is a paradox since the ethos of this movement is to promote life through that which is not life, even by removing pieces of life, to create something billed as meta-life.' This is the paradox that life is promoted by replacing pieces of life with something inanimate (without life). Hence, Option B is the answer.

Option C: While this has two seemingly opposing views, the second half (technology is replacing pieces of life) isn't accurately describing the paradox at the heart of transhumanism. Technology was designed to enhance the quality of life - and go about it by replacing parts of life. The paradox is that technology, which is replacing pieces of life, is doing so to promote life. The paradox is not that this (replacing parts of life) is the only way to enhance the quality of life. Hence, Option C is not the answer.

Option D: Once again, there is no contradiction here, since the option directly points out to the human desire for immortality even if it comes at a cost. There is no opposing view here. Hence, Option D is not the answer.

Choice (B)

Q6. The author calls referring to opponents of transhumanism as Luddites 'false dichotomy', in the last para of the passage, because

- a) calling out the ethical flaws in transhumanism doesn't necessarily reflect an aversion to technology.
- b) **all those who oppose transhumanism are critics of technology.**
- c) **one has to take a radical approach in order to question the ethics of any technology.**
- d) **questioning transhumanism is the same as questioning the impact of technology on human rights.**

Number of words and Explanatory notes for RC:

Number of words: 526

Consider the sentences: 'Anyone who dares question cutting off healthy limbs to make way for a super-Olympian sportsperson would be called a Luddite, anti-technology. But that is a false dichotomy since most critics of transhumanism are not against all technology but question the ethics of any technology that interferes with the human rights of humans.'

Option A: The author calls it false dichotomy because it is not a dichotomy (just two options). Critics of transhumanism are called Luddites (those who are against new technology) by the advocates of transhumanism. Their assumption is that there are just two options. Either one is a Luddite or one supports transhumanism. However, the author doesn't agree with this. The author believes that one need not be a Luddite and could rather be pro-technology, while still questioning transhumanism. In other words, there are not two but three approaches. One could be pro-transhumanism. One could be anti-technology. One could be pro-technology but anti-transhumanism. Hence, Option A is the answer.

Option B: This option represents the false dichotomy used by advocates of transhumanism. However, the question asks why the author calls such an accusation false dichotomy. Hence, Option B is not the answer.

Option C: The kind of approach one has to take to discuss the ethics of a technology is outside the purview of the question, and has got nothing to do with what the author dubs a false dichotomy. In fact, the author calls criticism of the critics of transhumanism radical. Hence, Option C is easy to eliminate.

Option D: Questioning transhumanism has been equated to being a Luddite by proponents of transhumanism. This is the false dichotomy, although the author says, questioning transhumanism is not the same as questioning technology. Rather it is about questioning the ethics of one particular technology and how it impacts human rights. So, Option D doesn't correctly address why the author talks about false dichotomy. Option D is not the answer.

Choice (A)

Q7. The argument of medical ethicists against transhumanism is refuted by which of the following statements?

- a) Individuals have a right to choose for themselves when it comes to the limits of life-enhancement they want to undergo.
- b) Any scientific mode of life-enhancement beyond the immediate need of saving a life undermines the degree of quality of human life.

c) Rewriting the natural course of human life beyond the need to fix issues could have adverse consequences.

d) It is hard to surmise how many perfectly healthy body parts can be replaced with artificial limbs while still retaining the human quotient in a human being.

Number of words and Explanatory notes for RC:

Number of words: 526

The argument made by medical ethicists can be understood from this: '*Certainly, there are those in the movement who espouse the most extreme virtues of transhumanism such as replacing perfectly healthy body parts with artificial limbs. But medical ethicists raise this and other issues as the reason why transhumanism is so dangerous to humans when what is considered acceptable life-enhancement has virtually no checks and balances over who gets a say when we "go too far."*' The underlined portion is the argument of medical ethicists – that there is no way to draw a line. We need to refute this.

Option A: If individuals have a right to choose then the question of where to draw the line doesn't arise at all. So, this refutes/weakens the argument made by medical ethicists who debate that there is no way to know when something has gone too far. Hence, Option A is the answer.

Option B: 'Beyond the need' undermines the quality of life according to the option. This clearly doesn't refute the argument of the medical ethicists who believe there need to be acceptable checks and balances as to what is life-enhancement and what is going beyond life enhancement. This option goes on a tangential note and doesn't really contradict the medical ethicists. Hence, Option B is not the answer.

Option C: This doesn't refute the argument of medical ethicists. By pointing out that redrawing the lines/rewriting the natural course through transhumanism will have negative (adverse) consequences, it goes against transhumanism (whereas the argument of medical ethicists is that there needs to be checks and balances on the extent to which transhumanism can be accommodated). Hence, Option C is not the answer.

Option D: If it is difficult to surmise what is the ideal ratio of parts to be replaced, then it strengthens the argument of the medical ethicists, that there is no clear line that can be drawn to be objective. Option D is not the answer.

Choice (A)

Q8. Treating the human body as a tabula rasa will

a) change the entire direction of a human life.

- b) will artificially prolong human life.
- c) will enhance the quality of human life
- d) lead to an acceptable life-enhancement.

Number of words and Explanatory notes for RC:

Number of words: 526

Consider the sentences: 'There is, after all, a difference between placing a pacemaker or performing laser eye surgery on the body to prolong human life and lend a greater degree of quality to human life, and that of treating the human body as a tabula rasa upon which to rewrite what is, effectively, the natural course of human life.' Tabula rasa means blank slate.

Option A: This is what the author means by rewriting what is, treating the human body as a tabula rasa. When one starts with a blank slate, one obviously alters the entire course of life, does not just make enhancements (since there is nothing to make enhancements, it is a clean slate). Option A is the answer.

Option B: Human life can artificially be prolonged through technical enhancements without really treating the human body as a blank slate. Therefore, the author clearly highlights that there is a difference between prolonging human life and lending a greater degree of quality to human life as opposed to treating it like tabula rasa. Hence, Option B is not the answer.

Option C: It will change the natural course of human life. That is not the same as saying it will change the quality of life. The quality of life can change without the direction being changed. But, treating the human body like a tabula rasa is not just about an enhancement, like placing a pacemaker. It is not just about lending greater quality to human life. It is about changing the life completely. Option C is not the answer.

Option D: Treating the human body like a tabula rasa is not about making minor enhancements. It is about completely rewiring or reinventing the system.
Hence, Option D is easy to eliminate. Choice (A)

Q9. The proponents of the philosophy of transhumanism are likely to agree with all the following EXCEPT

- a) human immortality is a viable and achievable goal.

- b) enhancement of human intelligence, physical power and health with the help of technology more than compensates for probable side-effects.
- c) replacing body parts with artificial limbs can enhance human ability only up to a particular point.
- d) merging man and machine may alter the legal definition of being a human.

Number of words and Explanatory notes for RC:

Number of words: 526

Consider the sentences: 'Transhumanism is a philosophical movement which advocates for technology not only enhancing human life, but to take over human life by merging human and machine. The idea is that in one future day, humans will be vastly more intelligent, healthy, and physically powerful. In fact, much of this movement is based upon the notion that death is not an option, with a focus to improve the somatic body and make humans immortal.'

Option A: Transhumanism, according to the definition, is based upon the notion that death is not an option. So, the underlying assumption of such a movement is that human immortality is a viable goal, an achievable one. Hence, Option A is not the answer, since proponents of transhumanism will definitely agree with this statement.

Option B: Consider this: 'The idea is that in one future day, humans will be vastly more intelligent, healthy, and physically powerful.' From this it can be understood that if the net result is positive (more intelligent, healthy and powerful), it means that the benefits outweigh (far outweigh, since humans will be 'vastly more' intelligent) whatever negative effects there could be. So, the benefits more than compensate for the side-effects. Proponents of transhumanism will most likely agree to this. Option B is not the answer.

Option C: Transhumanists would probably believe that replacing body parts with artificial limbs can enhance human ability. They don't doubt technology since they focus on immortality. Hence, the expression 'only up to a particular point' is not really justified. This is not an option transhumanism would necessarily agree to. Option C is the answer.

Option D: Consider this: 'The philosophical tenets, academic theories, and institutional practices of transhumanism are well-known. Max More, a British philosopher and leader of the extropian movement claims that transhumanism is the "continuation and acceleration of the evolution of intelligent life beyond its currently human form and human limitations by means of science and technology, guided by life-promoting principles and values." This shows that some proponents of transhumanism do believe that merging of man and machine may alter the legal definition of being human, as intelligent life will go beyond its current human form and human limitations. It is also justified in the lines 'A largely intellectual movement whose aim is to transform humanity through the development of a panoply of technologies which ostensibly enhance human intellect, physiology, and the very legal status of what being human means...' Hence, Option D is not the answer.

Choice (C)

Q10. The scope of transhumanism doesn't involve which of the following end results?

- a) Vastly superior humans in every aspect
- b) A delineation and also modification of the idea of being a human
- c) Machines taking over humanity to create a super-efficient hybrid
- d) Eliminate the currently known limitations of human physiology

Number of words and Explanatory notes for RC:

Number of words: 526

Option A: This can be justified from the lines '*The idea is that in one future day, humans will be vastly more intelligent, healthy, and physically powerful*'. So, one of the goals of transhumanism is indeed to enhance the human life by improving the capabilities. Option A is not the answer.

Option B: A precise definition (delineation) of what it means to be a human, after probably redefining the term, is indeed the agenda of transhumanism. This can be understood from '*A largely intellectual movement whose aim is to transform humanity through the development of a panoply of technologies which ostensibly enhance human intellect, physiology, and the very legal status of what being human means, transhumanism is a social project...*' Hence, Option B is not the answer.

Option C: While this may be possible, it is not implied in the passage as an end goal of transhumanism. Machines can help humans become super-efficient and superior. Yet, they still remain humans. It is not the objective of transhumanism to allow machines to take over humanity to create something new. According to the passage, the machine and human hybrid would still be called a human because we are looking at changing the legal definitions of what it means to be a human. Hence, Option C is the answer.

Option D: This can be understood from '*Max More, a British philosopher and leader of the extropian movement claims that transhumanism is the "continuation and acceleration of the evolution of intelligent life beyond its currently human form and human limitations by means of science and technology, guided by life-promoting principles and values."*' So, transhumanism aims to help humans evolve beyond the limitations using science. Hence, Option D is not the answer.

Choice (C)

Q11. According to the passage, explaining which of the following phenomena would be examples of easy problems of consciousness?

- a. The ability of a system to monitor its own internal states.
- b. The ability to categorize and react to environmental stimuli.
- c. The deliberate control of behaviour after integration of information.

d. The understanding of why a system has its own feelings and emotions.

a) a, b, d

b) **a, b, c**

c) **b, c, d**

d) **a, c**

Number of words and Explanatory notes for RC:

Number of words: 623

(a) – One says that a mental state is conscious when it is verbally reportable, or when it is internally accessible. So the explanation of the ability of a system to access and monitor its own internal states is an easy problem of consciousness. Hence (a) is correct and is the answer.

(b) – The ability to discriminate and react to environmental stimuli is also an easy problem.

(c) – One can say that a mental state is conscious when it can integrate that information and exploit it in the sophisticated control of behavior. So (c) applies and is the answer.

(d) – The hard problem of consciousness is the problem of experience. When we think, there is information-processing and a subjective aspect called experience. Organisms are subjects of experience. But the question of how these systems are subjects of experience is perplexing. *Why is the performance of these functions accompanied by experience?* So (d) represents a hard problem of consciousness and is not the answer.

The correct answer is option B.

Choice (B)

Q12. Which of the following statements best captures the essence of the passage?

- a) Conscious experience has no function.
- b) **The strange intangibility and ineffability of subjectivity compounds the hard problem of experience.**
- c) Consciousness and science should be segregated.
- d) **The hard problem of consciousness is intractable to the existing methods in science.**

Number of words and Explanatory notes for RC:

Number of words: 623

Option A: What makes the **hard problem** unique is that it **goes beyond problems about the performance of functions**. Even when one has explained the performance of all the cognitive and behavioral functions in the vicinity of experience – perceptual discrimination, categorization, internal access, verbal report – there remains a further question: *Why is the performance of these functions accompanied by experience?* This does not imply that experience has no function. Option A is distorted and is not the answer.

Option B: When we think, there is information-processing and a subjective aspect called experience. Organisms are subjects of experience. But the question of how these systems are subjects of experience is perplexing. What has been discussed in the passage is the 'hard problem of consciousness'. What further complicates the 'hard problem' has not been suggested in the passage. So option B may be partly true but it is not the central idea of the passage.

Option C: **Consciousness presents a hard problem for science. Explaining why consciousness occurs can be contrasted with so-called "easy problems" of consciousness that are susceptible to standard methods of cognitive science, where phenomena are explained through computational and neural mechanisms.** Yes, the hard problem is unique in that it goes beyond problems about the performance of functions. Even when one has explained the performance of all the cognitive and behavioral functions in the vicinity of experience, there remains a further question: *Why is the performance of these functions accompanied by experience?* Chalmers explains the persistence of this question by arguing against the possibility of a "reductive explanation" for consciousness which cannot be functionally analysed...But the suggestion that

consciousness and science should be segregated is not a viewpoint endorsed by the author. Option C is not specific to the 'hard problem' discussed in the passage.

Option D: **Even after one has explained the functional, dynamical, and structural properties of the conscious mind, one can still meaningfully ask a further question, Why is it conscious? Consciousness presents a hard problem for science. Why is the performance of these functions accompanied by experience?** Chalmers explains the persistence of this question by arguing **against the possibility of a "reductive explanation"** for consciousness which cannot be functionally analysed...This view is shared by Joseph Levine when he explains in the last para: there is an explanatory gap between the physical and consciousness, the hard problem. Option D is the correct answer.

Choice (D)

Q13. Which of the following can be extrapolated from the arguments of Joseph Levine in the passage?

- a) There is a bridgeable gap between the physical and the consciousness.
- b) Once the laws, mechanisms and proper conditions are in place and one adjusts for probability, one can substantially explain the hard problem.
- c) Even with detailed specification of mechanisms and laws, even after adjusting for stochastic behaviour, there is an open question about how consciousness exists in a system.
- ✓ Your answer is correct**
- d) There is no cognitive function such that we can say in advance that the explanation of that function will automatically explain experience.

Number of words and Explanatory notes for RC:

Number of words: 623

Option A: Option A is not true. But the third possibility is "precisely an admission that we don't have an adequate explanation". And this is the case with consciousness, says Levine. ***One is left with the explanatory gap between the physical and consciousness, the hard problem.*** So there is an **unbridgeable** gap between the physical and the consciousness. Option A is not the answer.

Option B: Joseph Levine argues that a good scientific explanation should *deductively entail* what it explains, allowing one to infer the presence of the target phenomenon from a statement of laws, mechanisms and initial conditions. If one has adequately specified the laws/ mechanisms, and adjusted for stochastic phenomena, then one should possess a deductive conclusion about one's explanatory target, or the third possibility is in effect. ***But the third possibility is "precisely an admission that we don't have an adequate explanation". And this is the case with consciousness, says Levine.*** So option B would be a contradiction.

Option C: ***If one has adequately specified the laws/mechanisms, and adjusted for stochastic phenomena, then one should possess a deductive conclusion about one's explanatory target, or the third possibility is in effect. But the third possibility (i.e. there are unknown factors involved in determining the phenomenon) is "precisely an admission that we don't have an adequate explanation".*** And this is the case with consciousness, says Levine. So option C is the answer.

Option D: Option D can be deduced to be true from another discussion in the passage. What makes the hard problem unique is that it goes beyond problems about the performance of functions. Even when one has explained the performance of all the cognitive and behavioral functions in the vicinity of experience – perceptual discrimination, categorization, internal access, verbal report – there remains a further question: *Why is the performance of these functions accompanied by experience?* It is not specific to the arguments of Joseph Levine in the passage. It is not a complete summary.

Choice (C)

Q14. All of the following questions would most likely characterize the hard problem of consciousness EXCEPT?

- a) How does a bat feel what it feels when it hunts by echolocation on a dark night?
- b) **When electromagnetic waveforms impinge on a retina, why is their discrimination and categorization by the visual system experienced as a sensation of vivid red?**

c) Why aren't we just brilliant robots, capable of retaining information, of responding to smells and noises and heat, but dark inside, lacking an inner life?

d) Which neural mechanisms are triggered when we are asleep as opposed to when we are awake?

Number of words and Explanatory notes for RC:

Number of words: 623

Option A: The hard problem of consciousness [termed by David Chalmers] is the problem of explaining why any physical state is conscious rather than nonconscious, why there is "something it is like" for a subject in conscious experience, why conscious mental states "light up" and directly appear to the subject. Organisms are subjects of experience. But the question of how these systems are subjects of experience is perplexing. ... **Why is the performance of these functions accompanied by experience?** So option A would pertain to the 'hard problem of consciousness' and is not the answer.

Option B: *When our cognitive systems engage in visual and auditory information-processing, why do we have visual or auditory experience: the quality of deep blue, the sensation of middle C? How can we explain why there is something it is like to entertain a mental image, or to experience an emotion?... Even when one has explained the performance of all the cognitive and behavioral functions in the vicinity of experience – perceptual discrimination, categorization, internal access, verbal report – there remains a further question: Why is the performance of these functions accompanied by experience?* Now, the discrimination and categorization of the electromagnetic waveforms by the visual system is an easy problem of consciousness (The ability to discriminate and react to environmental stimuli is an easy problem) but how the process is experienced as a sensation of vivid red would be a hard problem. So option B exemplifies the hard problem of consciousness and is not the answer.

Option C: The hard problem of consciousness is the problem of experience. *When we think, there is information-processing and a subjective aspect called experience. Organisms are subjects of experience. But the question of how these systems are subjects of experience is perplexing.* Option C is another way of asking: Why do we have a conscious, inner life? Why do all those complicated brain processes (that a human being experiences) feel like anything from the inside? So this is related to the hard problem of consciousness and is not the answer.

Option D: From 'Explaining why consciousness occurs can be contrasted with so-called "easy problems" of consciousness that are susceptible to standard methods of cognitive science, where **phenomena are explained through computational and neural mechanisms**', we can understand that finding the difference between wakefulness and sleep and the neural mechanisms triggered thereby is an easy problem. So, option D is not correct and is the answer.

Choice (D)

Q15. Which of the following best suggests the style in which the passage has been authored?

a)

Exploratory

b) **Discursive**

c) **Narrative**

d) **Argumentative**

Number of words and Explanatory notes for RC:

Number of words: 623

Option A: Throughout the course of the passage, the author delves into what s/he thinks about consciousness, what s/he has arrived upon using the facts and observations of other researchers. S/he explains each one of their views in detail. Option A is the best answer that reflects the style in which the passage has been authored. The passage is abstract or philosophical in style. Choice A is the answer.

Option B: The author of the passage has stuck to one train of thought without any digression. This eliminates option B which has the word "discursive" meaning "passing aimlessly from one subject to another".

Option C: A narrative passage tells a story, usually from one person's viewpoint based on his personal experience. A narrative passage has details which relate in some way to the main point the writer is making. This passage is not narrative. Hence choice C is not the answer.

Option D: The passage is not argumentative. There is no debate i.e. the passage does not present arguments and counterarguments for any idea or concept. The author refrains from delivering an argument; neither does he try to convince people of an argument. Hence choice D is incorrect. Choice (A)

DIRECTIONS *for questions 11 to 16*: The passage given below is accompanied by a set of six questions. Choose the best answer to each question.

The hard problem of consciousness [termed by David Chalmers] is the problem of explaining why any physical state is conscious rather than nonconscious, why there is “something it is like” for a subject in conscious experience, why conscious mental states “light up” and directly appear to the subject. Even after one has explained the functional, dynamical, and structural properties of the conscious mind, one can still meaningfully ask a further question, *Why is it conscious?* Consciousness presents a hard problem for science.

Explaining why consciousness occurs can be contrasted with so-called “easy problems” of consciousness that are susceptible to standard methods of cognitive science, where phenomena are explained through computational and neural mechanisms. For example, one says that a mental state is conscious when it is verbally reportable, or when it is internally accessible. A system is said to be conscious of some information when it attends to that information and reacts to it, or when it can integrate that information and exploit it in the sophisticated control of behaviour. An organism is said to be conscious when it is awake. The ability to discriminate and react to environmental stimuli is also an easy problem. ... The easy problems can be explained scientifically. For example, to explain ‘access’ and ‘reportability’, one need only specify the mechanism by which information about internal states is retrieved and made available for verbal report.

The hard problem of consciousness is the problem of experience. When we think, there is information-processing and a subjective aspect called experience. Organisms are subjects of experience. But the question of how these systems are subjects of experience is perplexing. When our cognitive systems engage in visual and auditory information-processing, why do we have visual or auditory experience: the quality of deep blue, the sensation of a musical note? How can we explain why there is something it is like to entertain a mental image, or to experience an emotion?...

What makes the hard problem unique is that it goes beyond problems [and is] about the performance of functions. Even when one has explained the performance of all the cognitive and behavioural functions – perceptual discrimination, categorization, internal access, verbal report – in the vicinity of experience, there remains a further question: *Why is the performance of these functions accompanied by experience?*

Chalmers explains the persistence of this question by arguing against the possibility of a “reductive explanation” for consciousness which cannot be functionally analysed... [A reductive explanation in Chalmers’ sense provides a form of deductive argument concluding with an identity statement between the target explanandum (the thing we are trying to explain) and a lower-level phenomenon that is physical in nature or more obviously reducible to the physical] ...

Joseph Levine argues that a good scientific explanation should *deductively entail* what it explains, allowing one to infer the presence of the target phenomenon from a statement of laws, mechanisms and initial conditions. Deductive entailment is a logical relation where if the premises of an argument are true, the conclusion *must* be true. If such a deduction is impossible, then one has either a) not fully specified the laws/ mechanisms, or b) the target phenomenon is stochastic in nature, that is one can only infer the *probability* of the occurrence of the explanatory target or c) there are unknown factors involved in determining the phenomenon. If one has adequately specified the laws/ mechanisms, and adjusted for stochastic phenomena, then one should possess a deductive conclusion about one’s explanatory target, or the third possibility is in effect. But the third possibility is “precisely an admission that we don’t have an adequate explanation”. And this is the case with consciousness, says Levine. One is left with the explanatory gap between the physical and consciousness, the hard problem.

Q16. All of the following can be understood from the passage EXCEPT?

- a) The methods of cognitive science are well-suited to the easy problems of consciousness.
- b) The term ‘stochastic’ means that the occurrence of an event is probabilistic and may not be predicted precisely.
- c) David Chalmers is the first scientist to ponder the subject of the hard problem of consciousness. ✓ Your answer is correct
- d) Perceptual discrimination, categorization, internal access, and verbal report are examples of cognitive and behavioural functions.

Number of words and Explanatory notes for RC:

Number of words: 623

Option A: *So-called “easy problems” of consciousness are susceptible to standard methods of cognitive science, where phenomena are explained through computational and neural mechanisms.* Hence option A is true and is not the answer.

Option B: Consider ‘the target phenomenon is stochastic in nature, that is one can only infer the probability of the occurrence of the explanatory target.’ The meaning of the term ‘stochastic’ has been explained here. Hence option B is not the answer.

Option C: *The hard problem of consciousness [termed by David Chalmers] is the problem of explaining why any physical state is conscious rather than nonconscious, why there is “something it is like” for a subject in conscious experience* We are only told that David Chalmers named the problem “the hard problem of consciousness”. We cannot ascertain whether he was the first person to ponder the hard problem of consciousness. Other scientists/ philosophers could have done so in the past. Hence option C cannot be understood from the passage and is the answer.

Option D: Even when one has explained the performance of all the cognitive and behavioral functions in the vicinity of experience – perceptual discrimination, categorization, internal access, verbal report – there remains a further question. This implies that perceptual discrimination, categorization, internal access, verbal report are examples of cognitive and behavioral functions. Hence option D is true and is not the answer.

Choice (C)

DIRECTIONS *for questions 17 to 21:* The passage given below is accompanied by a set of five questions. Choose the best answer to each question.

...In the face of doubts and many difficulties, the revival of indigenous languages is a growing movement among Native American groups ...

But [...] some scholars outside of linguistics are questioning whether people should try to save endangered languages at all. "Languages have died throughout human history – our own language bears little resemblance to the English of the 15th century. It is not immediately clear to me why we should try to preserve them," said Michael Blake, a professor of philosophy at Harvard University, who recently published a broadside attack on the movement to protect endangered cultures in Civilization magazine.

One reason, Akira Yamamoto, a professor of linguistics at the University of Kansas, who works each summer at the University of Arizona's language reclamation institute, said, is aesthetic: languages, like animal species, contribute to the richness and diversity of the world: "If you speak English, you have one world; if you speak Navajo, you have another world." For example, Mr. Yamamoto points out, in the Algonquin family of languages, noun endings are divided into two basic categories: animate and inanimate. So, while Romance languages separate nouns by gender, the Algonquin sees the world in terms of things that have spirit and things that do not. And, Mr. Yamamoto adds, "This is reflected in their culture."

Mr. Blake said it might be sad to lose languages but that sometimes it is a necessary price to pay for progress and freedom of choice in society [and that] there are reasons that these languages are dying out, that members of these communities have decided to assimilate, and those reasons have to be respected, too. But supporters of language revival respond that the idea of "freedom of choice" is highly problematic, especially in the case of American Indian languages, which were frequently aggressively suppressed. "As an Indian, to hear about languages 'dying' or becoming 'extinct' hits at our core," said Mr. Baldwin. "The federal government has always wanted Indian people either to become extinct or to assimilate."

The Hawaiian language is an example, spoken almost universally in Hawaii until the islands were annexed by the United States in 1898...With annexation, Hawaiian was suppressed, dwindling to about 1,500 fluent native speakers by the 1980's, when a group of professors at the University of Hawaii at Hilo [...] set up a preschool in which elderly Hawaiian speakers taught the language to the

children... [B]y adding a new grade each year, they succeeded in creating a preschool-to-high school system in which Hawaiian is the primary language of instruction.

But wouldn't it be more useful for young Hawaiians to learn languages like Spanish or French, which are spoken by millions of people, rather than a language used by only a few thousand? And are language revival programs holding youngsters back from acquiring the skills they need to succeed in mainstream society? Mr. Blake said that the children "are going to lose some of the opportunity that English education gives them."

Advocates answer that [...] the program's first graduates to enter college all passed their English composition tests. Diane Ravitch, a professor of education at New York University, has a strongly positive view of language revival. "The language sustains their culture and their link with the past, which is an important aspect of who we are," she said. [...] "Otherwise, we are just left with mass culture, pop culture and the whims of the marketplace."

Q17. It can be inferred from the last para of the passage that

- a) the marketplace may impede the linguistic diversity of the world.
- b) the propagation of mass and pop culture hinders language revival.
- c) language is a significant parameter that separates our identity from the rest.
- d) diversity in languages can arrest the spread of mass and pop culture.

Number of words and Explanatory notes for RC:

Number of words: 565

Option A: If languages are not revived all we are left with are the whims of the marketplace. So, it can be inferred that minus the language that links us to the past, what is left is influenced by the marketplace – only if we cannot revive the languages. So, this option discusses the aftermath of the extinction of languages. Hence, it is not implied that the marketplace impedes linguistic diversity. Option A is not the answer.

Option B: The focus is on preservation of the linguistic diversity, and not on the propagation of mass and pop culture. It is only mentioned that if these indigenous languages are not revived all that will be left is pop/mass culture. So, it is not clear whether the extinction of the languages helps propagate mass and pop culture or the propagation of mass and pop culture hinders language revival. All we know is that language that links us to the past and pop and mass culture are two unique entities. Hence, Option B is not the answer.

Option C: Language sustains a culture's link to its past, according to the last para of the passage. So, language sustains or keeps alive our culture and thus an important aspect of our identity (who we are). Without that important aspect, all that is left is pop culture – homogenous. Which means language is an important aspect of our identity. Hence, Option C is the answer.

Option D: Arresting the spread of mass and pop culture is not the focus of the author's conclusions. In fact, the last line states that if languages are not preserved then we will be left only with mass and pop culture. This doesn't imply that mass and pop culture are spreading. They exist. Languages can coexist along with them. So, 'arresting their spread' is not something that can be inferred from the para. Option D is not the answer.

Choice (C)

Q18. Mr. Yamamoto mentions the Algonquin family of languages to elucidate that

- a) Native American languages like the Algonquin family of languages are quite similar to each other.
- b) languages help in enhancing the diversity of the world.
- c) the extinction of any language leads to the extinction of the culture associated with it.
- d) the Algonquin family of languages does not discriminate between genders.

Number of words and Explanatory notes for RC:

Number of words: 565

Consider the following sentences: 'One reason, Akira Yamamoto, a professor of linguistics at the University of Kansas, who works each summer at the University of Arizona's language reclamation institute, said, is aesthetic: languages, like animal species, contribute to the richness and diversity of the world: "If you speak English, you have one world; if you speak Navajo, you have another world." For example, Mr. Yamamoto points out, in the Algonquin family of languages, noun endings are divided into two basic categories: animate and inanimate. So, while Romance languages separate nouns by gender, the Algonquin sees the world in terms of things that have spirit and things that do not. And, Mr. Yamamoto adds, "This is reflected in their culture."'

Option A: The similarity between the Algonquin family of languages has neither been mentioned nor discussed, since all of them have been mentioned in the same breath and compared to the Romance languages. Hence, Option A is easy to eliminate.

Option B: Languages represent entirely different worlds and are reflected in their cultures. This difference in worlds facilitated by different languages is what the author is trying to highlight or elucidate. The author quotes Yamamoto by saying 'aesthetic' is a reason to keep these languages alive – they contribute to the richness and diversity of the world. Hence, Option B is the answer.

Option C: The language used by indigenous groups is reflected in the culture such groups practice/follow. While this has been mentioned, the example in itself doesn't in anyway highlight anything about the extinction of a language and how that would subsequently affect the culture associated with it. Hence, Option C is not the answer.

Option D: While this may be true, the focus is not really on gender discrimination. The point made was more with respect to the diversity – how different languages classify things based on different parameters. Hence, Option D is not the answer.

Choice (B)

Q19. The assumption in the idea of 'freedom of choice' which is countered by the supporters of language revival is that

- a) aggressively suppressing a language is the federal government's way of annexing their territories.
- b) communities are not given the freedom to practice speaking their own language.
- c) assimilation of American Indian language speakers leads to the extinction of the less dominant languages spoken by them.

- d) the chances of extinction of a language are tightly coupled with the disinclination of its speakers to continue using it.

Number of words and Explanatory notes for RC:

Number of words: 565

Option A: This is partially an accusation levelled by the supporters of the language revival. While they didn't mention the annexing of territories, they bemoaned the intentions of the federal government which wants their assimilation or the extinction of their languages. We are looking for an assumption countered by the supporters of language revival. Hence, Option A is not the answer.

Option B: The freedom to practice a particular language has not been discussed in the passage. The passage largely discusses the disappearance of indigenous languages not because of force or coercion but because of the younger speakers drifting away from their native languages (or assimilating). Hence, Option B is not the answer.

Option C: Assimilation of American Indian language speakers does lead to the disappearance of some of their languages. This is true. It is the less dominant languages which disappear and the more dominant ones that survive – this is not a discussion point, and not even a factually correct opinion. The dominance of one indigenous language over the other has not been discussed in the passage. Option C is not the answer.

Option D: The fact that the disappearance/extinction of languages has been attributed to freedom of choice means that those who made such a connection believe that the only factor responsible for the extinction of these languages is the lack of inclination of native speakers to use it/propagate it. This assumption has been countered by the language revival supporters who point out that it is not lack of interest but active suppression, by the government, of some of the communities and their languages. Hence, Option D is the answer.

Choice (D)

Q20. Which of the following, if true, least weakens Mr. Blake's criticism against using native languages as the primary language of instruction?

- a) The niche skills of those schooled in a native language spoken by only a few people help them succeed because of their uniqueness.
- b) Competence of students in skills required to adapt to the demands of mainstream society depends on the primary language of instruction adopted by schools.
- c) Those trained in indigenous languages as primary language of instruction still have the opportunity to learn other mainstream languages.

- d) Those from schools where the primary language of instruction was an indigenous language can prove their proficiency in mainstream languages through standardized tests.

Number of words and Explanatory notes for RC:

Number of words: 565

Consider the sentences: '*But wouldn't it be more useful for young Hawaiians to learn languages like Spanish or French, which are spoken by millions of people, rather than a language used by only a few thousand? And are language revival programs holding youngsters back from acquiring the skills they need to succeed in mainstream society?*

Mr. Blake said that the children "are going to lose some of the opportunity that English education gives them." There are two ways of looking at this argument.

Mr. Blake could mean that English has to be the primary language of instruction for students to pick up certain important skills. It could also mean that students will learn English better if it is the primary language of instruction, a skill that will help them succeed in mainstream society. The latter is the more apt argument given the author also mentions French and Spanish, highlighting that they are spoken by a lot many more people.

Option A: This shows that schooling in an indigenous language as primary language of instruction helps students succeed. This is contrary to what Mr. Blake points out as the main disadvantage of not being schooled in languages like English – the inability to succeed in mainstream society. Hence, Option A is not the answer, as it weakens Mr. Blake's criticism.

Option B: If this is true, it means that the primary language of instruction is important for success of students. While this is not a vote of confidence for English, it definitely doesn't weaken the argument of Mr. Blake (and may subtly strengthen it too). Hence, Option B is the answer.

Option C: If true, this proves that students can learn other languages which are not the primary language of instruction in their schools. So, the main argument about learning languages that are more suited to mainstream society is weakened by this option. Hence, Option C is not the answer.

Option D: If true, this option proves that those schooled in an indigenous language can be competent in other languages as well. Hence, the primary language of instruction doesn't prove an impediment for them to succeed. Hence, Option D weakens the argument made by Mr. Blake. Option D is not the answer.

Choice (B)

Q21. All of the following can be understood from the passage about the importance of reviving indigenous languages EXCEPT that they

- a) contribute to the heterogeneity of the human population.
- b) prevent the homogenization of culture.
- c) allow one to view the world from a different perspective.
- d) ensure languages such as English, Spanish and French don't dominate the human culture.

Number of words and Explanatory notes for RC:

Number of words: 565

Option A: Consider the following sentences: 'One reason, Akira Yamamoto, a professor of linguistics at the University of Kansas, who works each summer at the University of Arizona's language reclamation institute, said, is aesthetic: languages, like animal species, contribute to the richness and diversity of the world: "If you speak English, you have one world; if you speak Navajo, you have another world.'" The author quotes Yamamoto who believes that languages, like animal species, add to the diversity of the world. So, it can be implied from the passage that languages contribute to the heterogeneity (dissimilarity/diversity) of the humans. Hence, Option A is not the answer.

Option B: The passage is predominantly about propagation of indigenous languages which are going extinct. Revival of such languages ensures we are not left with mass culture. So, it can be understood from the passage that revival of these languages ensures culture is not homogenized. Hence, Option B is not the answer.

Option C: Every language has its own world according to the passage which helps us view the culture associated with that language. So, it can be understood from the passage that each language gives us a different perspective. Hence, Option C is not the answer.

Option D: The author hasn't expressed any opinions against the propagation of any mainstream languages (assuming French/English/Spanish are the mainstream ones). The passage talks largely about the survival of indigenous languages and not about domination of mainstream languages. Hence, Option D is the answer. Choice (D)

DIRECTIONS *for questions 22 to 24:* The passage given below is accompanied by a set of three questions. Choose the best answer to each question.

...There's growing interest in cultivating forests that absorb planet-warming carbon emissions but that are fireproof. That's because these forests are underwater. An increasing body of research is documenting the potential of seaweed farming to counter climate change as deforestation decimates rainforests and other crucial carbon sinks. Fast-growing oceanic jungles of kelp and other macroalgae are highly efficient at storing carbon. Seaweed also ameliorates acidification, deoxygenation, and other marine impacts of global warming that threaten the biodiversity of the seas and the source of food and livelihoods for hundreds of millions of people.

"Seaweed is finally having its moment in the spotlight," says Halley Froehlich, a marine scientist [and] the lead author of a new study that for the first time quantifies the global capacity of large-scale seaweed farming to offset terrestrial carbon emissions and maps areas of the ocean suitable for macroalgae cultivation... The scientists propose the establishment of industrial-size farms to grow seaweed to maturity, harvest it, and then sink it in the deep ocean where the captured carbon dioxide would be entombed for hundreds to thousands of years.

... [But] Carlos Duarte, a leading seaweed scientist [...] opposes sinking seaweed. "Seaweed is a very valuable material and there are better ways of using this material..." he says. Indeed, Froehlich and other marine ecologists dub seaweed "charismatic carbon" for the macroalgae's Swiss army knife-like ability to address a variety of environmental ills, in the ocean and on land. Beyond seaweed's potential to counteract acidification and deoxygenation, absorb excess nutrients and provide habitat for marine life, seaweed can be processed into biofuel ... Seaweed can also be used as an agricultural soil supplement, replacing petroleum-based fertilizers.

Farming seaweed just for carbon sequestration is not a viable business case at this time as there's barely a carbon market that's willing to accept seaweed offset credits...The science and the demand is already there; the bottleneck is a catalyst that makes the production meet the demand... We need carbon credit protocols that can be used to claim carbon credits from seaweed aquaculture and also regulatory environments that facilitate concessions and licenses for seaweed aquaculture.

Q22. Which of the following cannot be inferred from the last para of the passage?

- a) It is possible to encourage environment-friendly initiatives through carbon credits.
- b) An approach for absorbing carbon emissions exists.
- c) Existing regulations impede seaweed aquaculture as a viable business.
- d) Production of seaweed at the moment exceeds the demand for it.

Number of words and Explanatory notes for RC:

Number of words: 351

Option A: The author mentions that carbon credit protocols are needed to encourage seaweed aquaculture. From this we could infer that environment-friendly initiatives (like seaweed farming) can be incentivized by offering carbon credits. Hence, Option A is not the answer.

Option B: Consider the sentences: '*Farming seaweed just for carbon sequestration is not a viable business case at this time as there's barely a carbon market that's willing to accept seaweed offset credits... The science and the demand is already there...*' This shows that the science is there to farm seaweed for carbon sequestration. Hence, Option B is not the answer.

Option C: It is mentioned in the last para that 'regulatory environments that facilitate concessions and licenses for seaweed aquaculture' are needed. Since concessions are what the author feels are needed, we could infer that regulations do impede its turning into a viable business. Hence, Option C is not the answer.

Option D: The author mentions that the demand is already there but what we are missing is a catalyst that can bring in the feasibility, the incentives that will make someone produce it. Hence, Option D is contrary to what the author expresses.

Option D is the answer.

Choice (D)

Q23. All of the following justify the 'Swiss army knife-like ability' metaphor used for seaweed EXCEPT:

- a) Seaweed counteracts absorption of excess nutrients caused by acidification and deoxygenation.
- b) Seaweed can replace petroleum-based fertilizers to enhance the quality of soil.
- c) Seaweed can be converted to biofuel.
- d) Seaweed can help entrap carbon dioxide.

Number of words and Explanatory notes for RC:

Number of words: 351

Consider the sentences: "Seaweed is a very valuable material and there are better ways of using this material..." he says. Indeed, Froelich and other marine ecologists dub seaweed "charismatic carbon" for the macroalgae's Swiss army knife-like ability to address a variety of environmental ills, in the ocean and on land. Beyond seaweed's potential to counteract acidification and deoxygenation, absorb excess nutrients and provide habitat for marine life, seaweed can be processed into biofuel ... Seaweed can also be used as an agricultural soil supplement, replacing petroleum-based fertilizers.' So, any benefit provided by seaweed will justify the metaphor as the Swiss army knife-like ability here refers to 'addressing a variety of environmental ills'.

Option A: Seaweed doesn't counteract absorption of excess nutrients. It absorbs excess nutrients, a benefit it offers along with counteracting acidification and deoxygenation. So, this option doesn't justify the metaphor. Hence, Option A is the answer.

Option B: This benefit has been mentioned in the para (seaweed can be used as an agricultural soil supplement). So, it justifies the metaphor. Option B is not the answer.

Option C: It has been mentioned clearly that seaweed can be processed as a biofuel. So, this option does justify the metaphor Swiss army knife used to describe seaweed. Option C is not the answer.

Option D: From 'The scientists propose the establishment of industrial-size farms to grow seaweed to maturity, harvest it, and then sink it in the deep ocean where the captured carbon dioxide would be entombed for hundreds to thousands of years' and 'Fast-growing oceanic jungles of kelp and other macroalgae (equated to seaweed in the first para) are highly efficient at storing carbon', we can understand that seaweed does help in entrapment of carbon dioxide. Option D justifies the metaphor.

Choice (A)

Q24. Which of the following, when analysed, widens the scope of the study mentioned in the second para of the passage?

- a) The efficiency of seaweed in storing carbon
- b) The time required for growing seaweed to maturity and harvesting it
- c) The economic feasibility of seaweed cultivation on an industrial scale
- d) The regulations and licences which can influence the economic viability of seaweed farming

Number of words and Explanatory notes for RC:

Number of words: 351

Option A: This has already been established in the passage. Quantifying the efficiency doesn't further the argument in anyway, since it is accepted that seaweed has environmental benefits. It is the economic feasibility that is the bottleneck, not its efficiency. Hence, Option A is not the answer.

Option B: Time for harvesting seaweed has not been considered as a factor in the decision-making process of using seaweed. In other words, it is not the 'catalyzer' that makes production meet the demand. Also, there is no way to infer whether time is even a bottleneck for seaweed harvesting in the first place. Hence, Option B is not the answer.

Option C: While the science is there, it is the economic feasibility that is the bottleneck as understood from '*Farming seaweed just for carbon sequestration is not a viable business case at this time as there's barely a carbon market that's willing to accept seaweed offset credits.*' So, analysis of this won't add further depth since the passage already conveys that in the present state it is not economically feasible. Option C is not the answer.

Option D: The passage suggests that we could encourage seaweed farming through carbon credit protocols or through changing regulatory environments which could permit concessions and licenses. Analysis of this can help in making seaweed farming economically feasible. So, Option D is the answer.

Choice (D)

Q25. DIRECTIONS for question 25: Four sentences (labelled a, b, c, d) are given in the following question out of which one sentence is highlighted in bold. Figure out the most logical order of the sentences that constructs a coherent paragraph and then enter, in the input box given below the question, the number corresponding to the sequential position of the highlighted sentence in the coherent paragraph. (For example, if the highlighted sentence is placed fourth in the paragraph after the sentences have been rearranged, then enter 4 as your answer in the input box.)

- a. This book is a story of nature, including man.
- b. Yet, people are part of the awesome continuum of nature, and you cannot encounter them except in the tangle of their environments and the mesh of the ecosystems of which they form part.
- c. This is more a humane pursuit, rather than a scientific one, in the conventional sense, because the past is not present to our senses: we can only know other people's impressions or perceptions of it.
- d. Unlike previous attempts to write the comparative history of civilizations, it is arranged environment by environment, rather than period by period or society by society.

Number of words and Explanatory notes for RC:

Number of words: 351

Option A: The author mentions that carbon credit protocols are needed to encourage seaweed aquaculture. From this we could infer that environment-friendly initiatives (like seaweed farming) can be incentivized by offering carbon credits. Hence, Option A is not the answer.

Option B: Consider the sentences: '*Farming seaweed just for carbon sequestration is not a viable business case at this time as there's barely a carbon market that's willing to accept seaweed offset credits... The science and the demand is already there...*' This shows that the science is there to farm seaweed for carbon sequestration. Hence, Option B is not the answer.

Option C: It is mentioned in the last para that 'regulatory environments that facilitate concessions and licenses for seaweed aquaculture' are needed. Since concessions are what the author feels are needed, we could infer that regulations do impede its turning into a viable business. Hence, Option C is not the answer.

Option D: The author mentions that the demand is already there but what we are missing is a catalyst that can bring in the feasibility, the incentives that will make someone produce it. Hence, Option D is contrary to what the author expresses. Option D is the answer.

Choice (D)

Q26. DIRECTIONS for question 26: The paragraph given below is followed by four summaries.

Choose the option that best represents the author's primary position in the paragraph.

In the modern era, politics has given human societies control over their fate, by creating a political realm in which to seek answers to the fundamental questions of politics – who we are, how we should live. Politics understood in this way, involves identity and allegiance, power and resources, order and rules. It signals the constant clash of interests, ideologies, and values, generating rival parties and movements, alternative principles of social and economic order, and competition to realise them. It is about the formation of public will and public purpose, the determination of the public interest, what should be conserved and what reformed, what should be public and what private, and the rules by which societies should be governed. Underpinning all these notions, however, is the belief that what becomes of us and our societies is in our own hands.

- a) It is politics that lends benefits to the public by giving it identity, ideologies, and order and rules formed in the public interest.**
- b) Politics catalyses formation of public will and helps form order and rules for the public, a public which decides the direction society should adopt.**
- c) Human societies can control their own fate as long as politics is restricted to identity and allegiance and doesn't generate an alternative social order.**
- d) The fate of our society lies in our own hands but only with the right political ideologies can we give it a shape and order, and drive public will, purpose and opinion.**

Option A: The option gives complete credit to politics for giving a shape to reform and order but the para clearly offers a far more important bottomline – that our societies are in our own hands. This is the author's main argument. This can be understood from the last line of the para – '**Underpinning all these notions**, however, is the belief that what becomes of us and our societies is in our own hands.' Option A is not the answer.

Option B: This option elucidates the two central ideas of the para – that the public decides the direction society should take and that politics helps form the order. Option B represents the author's position and essence of the para well. Option B is the answer.

Option C: While this option makes an important point about human societies controlling their own fate, it is incorrect in the para that says '**as long as politics is restricted to identity and allegiance**' which is something the para doesn't mention at all, far from it. Nothing has been mentioned about restricting politics. Hence, Option C is not the answer.

Option D: This option is largely right except for our one digression – **only with the right political ideologies** we can give it shape and order. This is not the author's central position in the para as it has not been discussed what constitutes a right ideology and what doesn't. Option D is not the answer.

Choice (B)

Q27. DIRECTIONS for questions 27 and 28: Four sentences (labelled a, b, c, d) are given in the following question out of which one sentence is highlighted in bold. Figure out the most logical order of the sentences that constructs a coherent paragraph and then enter, in the input box given below the question, the number corresponding to the sequential position of the highlighted sentence in the coherent paragraph. (For example, if the highlighted sentence is placed fourth in the paragraph after the sentences have been rearranged, then enter 4 as your answer in the input box.)

- a. That's because philosophy and jokes proceed from the same impulse: to confound our sense of the way things are, to flip our worlds upside down, and to ferret out hidden, often uncomfortable, truths about life.
- b. The construction and payoff of jokes and the construction and payoff of philosophical concepts are made out of the same stuff.
- c. Only, what the philosopher calls an insight, the gagster calls a zinger.
- d. They tease the mind in similar ways.

Q28. DIRECTIONS for questions 27 and 28: Four sentences (labelled a, b, c, d) are given in the following question out of which one sentence is highlighted in bold. Figure out the most logical order of the sentences that constructs a coherent paragraph and then enter, in the input box given below the question, the number corresponding to the sequential position of the highlighted sentence in the coherent paragraph. (For example, if the highlighted sentence is placed fourth in the paragraph after the sentences have been rearranged, then enter 4 as your answer in the input box.)

- a. What researchers are beginning to discover is that singing is like an infusion of the perfect tranquilizer, the kind that both soothes your nerves and elevates your spirits.
- b. Oxytocin, a hormone released during singing, could be a reason as well, as oxytocin has been found to alleviate anxiety and stress.
- c. Science has been hard at work trying to explain why singing has such a calming yet energizing effect on people.
- d. The elation may come from endorphins, a hormone released by singing, which is associated with feelings of pleasure.

Sentence a: Sentence a sounds explanatory in tone. It mentions the reason for something.

Sentence b: Sentence b brings in a similarity between the construction and payoff (result) of jokes with that of jokes.

Sentence c: Sentence c attempts to close the idea of the similarity between jokes and philosophy. A philosopher and a gagster (joker, comedian) have a different vocabulary for similar ideas.

Sentence d: Sentence d has the demonstrative pronoun 'they'.

Sentence b introduces the background of the para. Philosophical concepts and jokes involve similar construction and payoffs. Sentences b and d form a logical block. "made out of the same stuff" in sentence b links with "in similar ways" in sentence d. "tease the mind in similar ways. Sentence b is followed by sentence d. The demonstrative pronoun 'they' in sentence d points to "jokes and philosophy" in sentence b.

Sentence d links with sentence a and follows sentence a. "proceed from the same impulse" in sentence a links with "tease the mind in similar ways" Hence bda. Also, explanation of the event ('That's because') should come after the event – bd.

Sentence c concludes the para. A gagster (comedian) calls a zinger (Striking, amusing remark) what a philosopher calls an insight. "insight" in sentence c points to "our sense of the way things are" in sentence a. 'Only' to start C tells us it will follow the other block. Hence bdac.

Now, sentence 'c' which is the highlighted sentence comes last in sequence in the coherent paragraph. So, the required answer is 4. Ans: (4)

Sentence a is an independent sentence about the benefits of singing.

Sentence b is about oxytocin, but it needs a preceding sentence that gives us a reason – something that performs the same function as oxytocin. This is because of the 'as well' in this sentence.

Sentence c is an independent sentence that is upstream to a and b because it talks about how science is trying to explain the calming effect of singing.

Sentence d is logically dependent on a. This is because 'the elation' d talks about is a continuation of the 'elevates your spirits' in a. So, ad is a block. b follows d because d talks about endorphins, while b talks about oxytocin and uses the connector 'as well'. c precedes a because c talks about science explaining the benefits of singing, while a talks about researchers (generic to specific).

So, the order of the para is cadb. So, the position of the bold statement a is 2.

Ans: (2)

Q29. DIRECTIONS for questions 29 to 31: Five sentences related to a topic are given in the question 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. This invisible mystery at the heart of [the] creature now attains cosmic significance by affirming its connection with the invisible mystery at the heart of creation.
2. This, then, is what we might call good faith, not a flight into some immortality system.
3. He links his secret inner self, his authentic talent, his deepest feelings of uniqueness to the very ground of creation.
4. Out of the ruins of the broken cultural self there remains the mystery of the private, invisible, inner self which yearned for ultimate significance.
5. Man breaks through the bounds of merely cultural heroism; he destroys the character lie that had him perform as a hero in the everyday social scheme of things; and by doing so he opens himself up to infinity, to the possibility of cosmic heroism.

Sentence 1: Sentence 1 has the demonstrative adjective 'this invisible mystery'. It mentions that cosmic significance is attained by the invisible inner self.

Sentence 2: Sentence 2 sounds like a concluding sentence. It has the demonstrative pronoun 'this'.

Sentence 3: Sentence 3 has the pronoun 'he' and 'his'. Sentence 3 mentions some steps taken by man as part of a process. It has some key words 'link secret inner self'.

Sentence 4: Sentence 4 mentions 'broken cultural self' and the 'private, invisible inner self that emerges'.

Sentence 5: This sentence is a general sentence that talks about man transcending the bounds of cultural heroism to achieve cosmic heroism.

So sentence 5 is a general sentence that can begin the paragraph. It talks about the central character in the story 'man'. It introduces the background: Man breaks through the bounds of cultural heroism ... to reach upto the possibility of cosmic heroism.

Sentences 5 and 3 form a logical block. 3 follows 5 in the sequence of events/ tasks accomplished. "Man breaks through the bounds" in sentence 5 links with "He links his secret inner self" in sentence 3. "links his secret inner self, his authentic talent, his deepest feelings of uniqueness" in sentence 3 is connected to "opens himself up to infinity, to the possibility of cosmic heroism" in sentence 5.

Sentence 3 is followed by sentence 4. "Out of the ruins of the broken cultural self" in sentence 4 links with "Man breaks through the bounds of merely cultural heroism; he destroys the character lie" given earlier in sentence 5. "mystery of the private, invisible, inner self which yearned for ultimate significance" in sentence 4 links with "He links his secret inner self" given in sentence 3.

Sentences 4 and 1 form a logical block. "This invisible mystery at the heart of [the] creature" in sentence 1 links with "mystery of the private, invisible, inner self" in sentence 4. "by affirming its connection with the invisible mystery at the heart of creation" in sentence 1 links with "mystery of the private, invisible, inner self which yearned for ultimate significance" in sentence 4 and also to "to the very ground of creation" in sentence 3. "now attains cosmic significance" in the concluding sentence 1 mirrors "he opens himself up to infinity, to the possibility of cosmic heroism" in the introduction sentence 5. So, 5341.

Sentence 2 is the odd one out. 'good faith' has not been described or introduced or likened to anything else in any of the remaining sentences. Sentence 2 needs a precedent and more substantiation.

Ans: (2)

Q30. DIRECTIONS for questions 29 to 31: Five sentences related to a topic are given in the question 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. But he has also accelerated the transference of phosphorus from plant and animal life to the sea, thus speeding up its cyclical migration in a two-fold manner.
2. With the development of agriculture in historic times, however, the phosphorus cycle has been seriously upset, for systematic cropping reduces the reserves in the soil more quickly than they can be renewed from fresh sources.
3. For some time after the earth's formation, the phosphorus cycle in the sea was simple, phosphate ions built up into the earliest forms of organic life and released again at their death.

4. Furthermore, the emergence of life from the sea and the colonization of dry land led to a soil-plant-animal-soil cycle, from which phosphorus was removed in negligible quantities in the formation of bone beds, fossil fish or guano deposits.
5. In the past few centuries man has attempted to restore the phosphorus balance by the use of fertilizers, derived largely from natural deposits.

Sentence 1 talks about 'he' accelerating the transference of phosphorus from plant and animal life to the sea. This pairs up with the only other sentence that mentions a noun that can assume 'he' – sentence 5, which talks about 'man' attempting to restore the phosphorus balance by using fertilizers. So, 51 is a block. The 51 block talks about man trying to restore the balance, but causing other adverse consequences. (So, the 51 block can only follow the discussion of balance getting upset).

Similarly, Sentence 3 talks about the phosphorus cycle in the sea that was simple. Sentence 3 is contrasted by Sentence 2 which talks about development of agriculture in historic times, upsetting the phosphorus cycle. So, 3 and 2 precede the 51 block.

4 stands out as odd one out in two ways. The 'furthermore' doesn't resonate with either blocks, since furthermore is a positive connector. Secondly, it talks about negligible quantities of phosphorus being removed which deviates from the tone of the other four sentences which talk about substantial depletion of phosphorus.

Ans: (4)

Q31. DIRECTIONS for questions 29 to 31: Five sentences related to a topic are given in the question 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. But many scientists disagree with this anthropomorphism, and they discourage it.
2. Among the many quirks of human nature, one that has always struck me as particularly worthwhile is the tendency to project our own feelings onto other animals.
3. But at other times – and they occur more often than science would care to admit – perceiving ourselves in these others is exactly the right response.
4. There are a number of very valid arguments against anthropomorphizing the creatures with whom we share this world, not least of which is that their inner lives deserve to be evaluated on their terms – not ours.
5. This seems to me like a fast route to empathy, a way to bring us closer to different species.

Note: anthropomorphism refers to the attribution of human characteristics or behaviour to a god, animal, or object.

Sentence 1: Sentence 1 has the contrast conjunction 'but' and the reference 'this anthropomorphism'. It talks about the disagreement of scientists.

Sentence 2: Sentence 2 is a general sentence that can begin the paragraph. It introduces the tendency of man to project his own feelings onto other animals.

Sentence 3: Sentence 3 begins with 'at the other times'. It mentions a contrary view of science.

Sentence 4: Sentence 4 mentions the reasons for disagreeing with anthropomorphism.

Sentence 5: Sentence 5 has the demonstrative pronoun 'this'. Something is compared to a fast route to empathy.

So sentence 2 is a general sentence that can begin the para. It has some introductory phrases: Among the many quirks ..., one that has always struck me.... Sentences 2 and 5 form a logical block. "tendency to project our own **feelings** onto other animals" in sentence 2 links with "a fast route to **empathy**, a way to bring us closer to different species" in sentence 5.

Sentence 5 is followed by the sentence 1 which has the contrast conjunction 'but'.

"scientists disagree and discourage" in sentence 1 contrasts "**seems to me a fast route to empathy**, a way to bring us closer to different species" in sentence 5.

Sentences 1 and 4 form a logical block. "**disagree** with this anthropomorphism, and they **discourage it**" in sentence 1 is supported by "**arguments against** anthropomorphizing the creatures with whom we share this world ..." in sentence 4. So 4 follows 1 and concludes the para. Hence 2514.

Sentence 3 is the odd sentence out. 'But at other times' in sentence 3 needs to be preceded by a sentence that begins along the lines of 'At some times'. The viewpoint in 3 runs contrary to what has been mentioned in sentence 3. Sentence 3 can be a part of another para.

Ans: (3)

Q32. DIRECTIONS for question 32: Four sentences (labelled a, b, c, d) are given in the following question out of which one sentence is highlighted in bold. Figure out the most logical order of the sentences that constructs a coherent paragraph and then enter, in the input box given below the question, the number corresponding to the sequential position of the highlighted sentence in the coherent paragraph. (For example, if the highlighted sentence is placed fourth in the paragraph after the sentences have been rearranged, then enter 4 as your answer in the input box.)

- a. While postcolonialism shares some common ground with other critical theories in this regard, it also offers a distinctive approach.
- b. Whether it has to do with the threat of nuclear weapons or the deaths of workers in factories churning out goods for Western markets, postcolonialism is a critical theory that asks us to analyse these issues from the perspectives of those who lack power.
- c. By paying close attention to how these aspects play out in specific contexts, postcolonialism gives us an important and alternative conceptual lens that provides us with a different set of theoretical tools to unpack the complexities of this world.
- d. It brings together a deep concern with histories of colonialism and imperialism, how these are carried through to the present – and how inequalities and oppressions embedded in

race, class and gender relations on a global scale matter for our understanding of international relations.

Sentence a is a dependent sentence, which talks about postcolonialism and refers to a previous context – 'in this regard'.

Sentence b introduces postcolonialism as a critical theory and talks about how postcolonialism helps us analyse specific issues from different perspectives. It is an independent sentence without connectors.

Sentence c is a dependent sentence that talks about 'these aspects' (preceding sentence must have plural aspects) and gives us an alternative theory.

Sentence d starts with a personal pronoun 'it' (probably postcolonialism). The sentence talks about inequalities and oppressions embedded in race, class and gender relations. This is what was referred to as 'these aspects' in c. The plural nouns in b – threat of nuclear weapons/deaths of workers cannot be referred to as aspects playing out in specific contexts – there are no other specific contexts for such events. So, dc is a logical block. d needs a reference for 'it', which could be a or b. However, it is a which talks about a distinctive approach – the approach elucidated in d and c. b doesn't talk about an approach. It just talks about postcolonialism helping us analyse issues. So, a precedes dc. Sentence a talks about a context – 'in this regard' which points to b – 'to analyse these issues from the perspectives of those who lack power.'

So, the order is badc. So, the position of the bold statement is 1.

Ans: (1)

Q33. DIRECTIONS for questions 33 and 34: The paragraph given below is followed by four summaries. Choose the option that best represents the author's primary position in the paragraph.

Beware the curse of knowledge. Once we have learned something, or reached a conclusion, we seem to lose the ability to put ourselves in the mind-set of someone who has not yet had that realization – even though we were that person not so long ago. The curse can derail even the best efforts of those who are in the right and well-intentioned: parents who are trying to motivate, teachers who are trying to educate, leaders who are trying to inspire and negotiators who are trying to persuade. In all of these domains, we do ourselves no favors when we forget that what is obvious to us will not be so obvious to the other side, and that it does not mean there is something wrong with them. We need to think about what the other side needs to have seen, felt, experienced, or understood before they will even be receptive to the merits of our arguments and perspective.

- a) How can we expect someone else to understand something, on day one, when it took us so many days to know it?
- b) The curse of knowledge reminds us that we ought not to simply walk into the negotiation with a set of prepared arguments that we hope will win the day.
- c) By exploring the other side's perspective, we expand the set of options for de-escalating conflict and achieving mutually acceptable outcomes; so we should focus on preparing our audience for our arguments than on preparing our arguments.
- d) While it is difficult for us to understand what it feels like not to know what we know, we need to remember what it felt like not to know.

Important sentences in the para that can help us arrive at the author's position:

- (i) Beware the curse of knowledge. We seem to lose the ability to put ourselves in the mind-set of someone who has not yet had the realization (that we have reached).
- (ii) We need to think about what the other side needs to have seen, felt, experienced, or understood before they will even be receptive to the merits of our arguments and perspective

Option A: Option A can be one of the author's assumption in the para when he says: We lose the ability to put ourselves in the mind-set of someone who has not yet had that realization – even though we were that person not so long ago. But option A does not capture points (i) and (ii) mentioned above.

Option B: Option B is partly complete. It tells us what the curse of knowledge is and what we should not do. However, it does not focus on what we should do. Points (i) and (ii) are missing here.

Option C: The first part of option C is correct. However, the second part "focus on preparing our audience for our arguments than on preparing our arguments" is a comparison which has not been mentioned in the para. It is distorted and out of scope. So option C is not the correct answer.

Option D: Option D correctly captures the main points of the argument, that although we lose the ability to understand the position of someone who doesn't know what we have learned. Hence option D is the correct answer.

Choice (D)

Q34. DIRECTIONS for questions 33 and 34: The paragraph given below is followed by four summaries. Choose the option that best represents the author's primary position in the paragraph.

Climate change acts as an accelerant to many of our social ills – inequality, wars, racism – but it can also be an accelerant for the opposite, for the forces working for economic and social justice and against militarism. Indeed the climate crisis – by presenting our species with an existential threat and putting us on a firm and unyielding science-based deadline – might just be the catalyst we need to knit together a great many powerful movements, bound together by a belief in the inherent worth and value of all people. We face so many overlapping and intersecting crises that we can't afford to fix them one at a time. We need integrated solutions, solutions that radically bring down emissions, while creating huge numbers of good, unionised jobs and delivering meaningful justice to those who have been most abused and excluded under the current extractive economy.

- a) While climate change accelerates many social ills, the deadline for the climate crisis could motivate us to put the environment ahead of our short-term interests.**
- b) Integrated solutions are needed to fix several problems at once with many overlapping and intersecting crises setting a rigid deadline for us.**
- c) Climate change has placed a hard deadline for us, even as we struggle to find integrated solutions to other imminent crises.**
- d) Climate change could be viewed as a motivating factor, rather than as an accelerant for social ills, to incentivize timely solutions for environmental and social problems.**

Option A: This option doesn't exactly demonstrate the dichotomy in the para – that climate change exacerbates some issues but also pushes good things across. The latter is missing in this option. The option also brings in another alien parameter called 'short-term interests' that has not been discussed in the para anywhere. Option A is not the answer.

Option B: While this option partially offers what the para discusses by mentioning the need for integrated solutions to fix several overlapping problems, climate change the main catalyst has not been mentioned at all. Hence, Option B is not the answer.

Option C: While the first half of the option about climate change placing a hard deadline for us is true, two deviations make this an incorrect option. Firstly, the para doesn't indicate that 'we are struggling' to find integrated solutions. We need to, is what the para says. Secondly, there are overlapping and intersecting crises, true. But the para doesn't indicate their being 'imminent'. This would be an extrapolation. Most importantly, climate change being both villain and possible driver of positive changes has not been mentioned, although it is one of the central ideas of the para. Option C is not the answer.

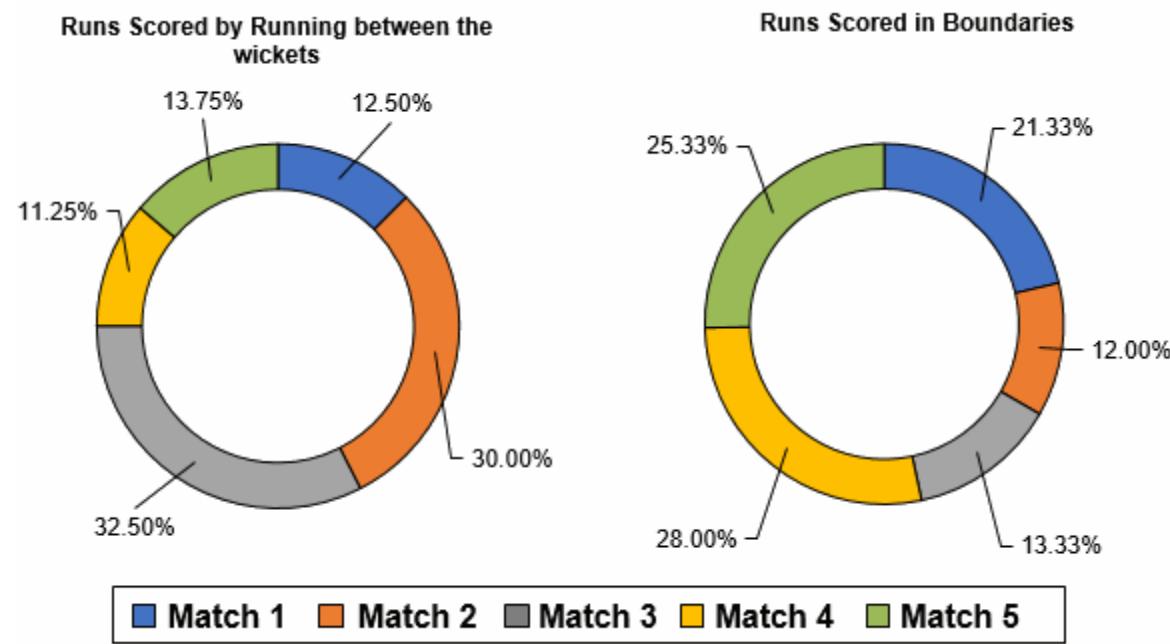
Option D: This option mentions all the main ideas – the paradox of climate change being a motivating factor rather than an accelerant of a crisis/the need for integrated solutions for social problems apart from environmental issues. Hence, Option D is the

Choice (D)

DIRECTIONS for questions 1 to 4: Answer the questions on the basis of the information given below.

In a cricket tournament, India played exactly five matches against Australia. Any team can score runs in each ball of a match in one of two ways – by running between the wickets or in boundaries. In any ball, the number of runs scored by running between the wickets can be one, two or three, which are referred to as a single, a double and a triple respectively, while the number of runs scored in boundaries in any ball can be four or six.

The pie charts below give the percentage breakup of the runs scored by India in each of the five matches. The pie chart on the left gives the percentage breakup of the runs scored by running between the wickets, while the pie chart on the right gives the percentage breakup of the runs scored in boundaries.



The following information is known about the runs scored by India:

- i. The total number of runs scored by running between the wickets and in boundaries in all the five matches put together is 400 and 300, respectively.
- ii. In four of the five matches, the number of doubles is more than twice the number of triples but less than half the number of singles, while in the other match, no singles or doubles were scored.
- iii. In any match where singles were scored, the number of doubles scored was at least 10.
- iv. In any match, the number of fours is greater than thrice the number of sixes.

- v. No sixes were scored in exactly one match, which is not the same as the match in which no singles or doubles were scored.

Q1. DIRECTIONS *for questions 1 to 4*: Select the correct alternative from the given choices.
In which match were the highest number of triples scored?

- a) **Match 5**
- b) **Match 2**
- c) **Match 4**
- d) **Cannot be determined**

From the charts, the following information can be calculated:

	Runs Scored by Running Between the Wickets	Runs Scored in Boundaries
Match 1	50	64
Match 2	120	36
Match 3	130	40
Match 4	45	84
Match 5	55	76

In Match 2, a total of 36 runs were scored in boundaries. If the number of fours and sixes is p and q respectively, $4p + 6q = 36$. It is given that $p > 3q$. This implies that $4p > 12q$.

Therefore, $4p + 6q > 18q$, i.e. $18q < 36 \Rightarrow q < 2$.

If $q = 1$, p will not be an integer. Therefore, q has to be zero.

Hence, the number of fours scored in Match 2 is 9. Match 2 is the match in which no sixes were scored.

In Match 3, if the number of fours and sixes scored is r and s respectively, then $40 > 18s$. Therefore, the number of sixes scored in Match 3 is either 1 or 2.

If $s = 1$, r will not be an integer.

If $s = 2$, $r = 7$.

Therefore, the number of fours and sixes scored in Match 3 are 7 and 2 respectively.

It is given that there is exactly one other match in which no singles or doubles were scored. Hence, in that match, the number of runs scored by running between the wickets must be a multiple of 3. It is either Match 2 or Match 4. But since in Match 2, no sixes were scored, it has to be Match 4 in which no singles or doubles were scored. Therefore, 15 triples were scored in Match 4.

From the above, we know that in Match 4, 15 threes were scored.

In Match 1, if the number of triples is 15 or more, the condition that the number of doubles is more than twice the number of triples and less than half the number of singles, will be violated. Therefore, the maximum number of triples were not scored in Match 1.

In Match 2, if the number of triples is 15 or more, the condition that the number of doubles is more than twice the number of triples and less than half the number of singles, will be violated. Therefore, the maximum number of triples were not scored in Match 2.

In Match 3, if the number of triples is 15 or more, the condition that the number of doubles is more than twice the number of triples and less than half the number of singles, will be violated. Therefore, the maximum number of triples were not scored in Match 3.

In Match 5, if the number of triples is 15 or more, the condition that the number of doubles is more than twice the number of triples and less than half the number of singles, will be violated. Therefore, the maximum number of triples were not scored in Match 5.

Therefore, the maximum number of triples were scored in Match 4. Choice (C)

Q2. DIRECTIONS for questions 1 to 4: Select the correct alternative from the given choices.
If a total of 36 boundaries were scored in Match 4 and Match 5 together, what is the difference between the number of sixes scored in the two matches?

a) **0**

b) **1**

c) **2**

d) **3**

From the charts, the following information can be calculated:

	Runs Scored by Running Between the Wickets	Runs Scored in Boundaries
Match 1	50	64
Match 2	120	36
Match 3	130	40
Match 4	45	84
Match 5	55	76

In Match 2, a total of 36 runs were scored in boundaries. If the number of fours and sixes is p and q respectively, $4p + 6q = 36$. It is given that $p > 3q$. This implies that $4p > 12q$.

Therefore, $4p + 6q > 18q$, i.e. $18q < 36 \Rightarrow q < 2$.

If $q = 1$, p will not be an integer. Therefore, q has to be zero.

Hence, the number of fours scored in Match 2 is 9. Match 2 is the match in which no sixes were scored.

In Match 3, if the number of fours and sixes scored is r and s respectively, then $40 > 18s$. Therefore, the number of sixes scored in Match 3 is either 1 or 2.

If $s = 1$, r will not be an integer.

If $s = 2$, $r = 7$.

Therefore, the number of fours and sixes scored in Match 3 are 7 and 2 respectively.

It is given that there is exactly one other match in which no singles or doubles were scored. Hence, in that match, the number of runs scored by running between the wickets must be a multiple of 3. It is either Match 2 or Match 4. But since in Match 2, no sixes were scored, it has to be Match 4 in which no singles or doubles were scored. Therefore, 15 triples were scored in Match 4.

Match 4:

If the number of fours and sixes scored in Match 4 is t and u respectively, then $84 > 18u$. Therefore, the number of sixes scored in Match 4 is either 1, 2, 3 or 4.

If $u = 1$, t will not be an integer.

If $u = 2$, $t = 18$.

If $u = 3$, t will not be an integer.

If $u = 4$, $t = 15$.

Match 5:

If the number of fours and sixes scored in Match 5 is v and w respectively, then $76 > 18w$. Therefore, the number of sixes scored in Match 5 is either 1, 2, 3 or 4.

If $w = 1$, v will not be an integer.

If $w = 2$, $v = 16$

If $w = 3$, v will not be an integer.

If $w = 4$, $v = 13$.

It is given that the total number of boundaries scored in both these matches together is 36. This is possible when the number of fours and sixes scored in Match 4 is 15 and 4 respectively and that scored in Match 5 is 13 and 4 respectively.

Therefore, difference between the number of sixes scored in both the matches is 0.

Choice (A)

Q3. DIRECTIONS for questions 1 to 4: Select the correct alternative from the given choices.

What is the maximum number of doubles that could have been scored in Match 1?

a) **12**

b) **13**

c) **11**

d) **10**

From the charts, the following information can be calculated:

	Runs Scored by Running Between the Wickets	Runs Scored in Boundaries
Match 1	50	64
Match 2	120	36
Match 3	130	40
Match 4	45	84
Match 5	55	76

In Match 2, a total of 36 runs were scored in boundaries. If the number of fours and sixes is p and q respectively, $4p + 6q = 36$. It is given that $p > 3q$. This implies that $4p > 12q$.

Therefore, $4p + 6q > 18q$, i.e. $18q < 36 \Rightarrow q < 2$.

If $q = 1$, p will not be an integer. Therefore, q has to be zero.

Hence, the number of fours scored in Match 2 is 9. Match 2 is the match in which no sixes were scored.

In Match 3, if the number of fours and sixes scored is r and s respectively, then $40 > 18s$. Therefore, the number of sixes scored in Match 3 is either 1 or 2.

If $s = 1$, r will not be an integer.

If $s = 2$, $r = 7$.

Therefore, the number of fours and sixes scored in Match 3 are 7 and 2 respectively.

It is given that there is exactly one other match in which no singles or doubles were scored. Hence, in that match, the number of runs scored by running between the wickets must be a multiple of 3. It is either Match 2 or Match 4. But since in Match 2, no sixes were scored, it has to be Match 4 in which no singles or doubles were scored. Therefore, 15 triples were scored in Match 4.

Let the number of singles, doubles and triples scored in Match 1 be a , b and c respectively.

$$a + 2b + 3c = 50.$$

We know that b is at least 10 and $a/2 > b > 2c$.

If $b = 10$, a can be 21, 24, 27 or 30, while c can take values from 0 to 3.

If $b = 11$, a can be 25 or 28, while c can be 0 or 1.

If $b = 12$, a will be 26, while c will be 0.

If $b = 13$, there are no values of a and c that will satisfy the above inequality.

Therefore, the maximum number of doubles that can be scored in Match 1 is 12.

Choice (A)

Q4. DIRECTIONS for questions 1 to 4: Select the correct alternative from the given choices.
If the number of doubles scored in Match 5 is 12, what is the maximum number of runs that could have been scored in triples in that match?

a) **2**

b) **3**

c) **6**

d) **9**

From the charts, the following information can be calculated:

	Runs Scored by Running Between the Wickets	Runs Scored in Boundaries
Match 1	50	64
Match 2	120	36
Match 3	130	40
Match 4	45	84
Match 5	55	76

In Match 2, a total of 36 runs were scored in boundaries. If the number of fours and sixes is p and q respectively, $4p + 6q = 36$. It is given that $p > 3q$. This implies that $4p > 12q$.

Therefore, $4p + 6q > 18q$, i.e. $18q < 36 \Rightarrow q < 2$.

If $q = 1$, p will not be an integer. Therefore, q has to be zero.

Hence, the number of fours scored in Match 2 is 9. Match 2 is the match in which no sixes were scored.

In Match 3, if the number of fours and sixes scored is r and s respectively, then $40 > 18s$. Therefore, the number of sixes scored in Match 3 is either 1 or 2.

If $s = 1$, r will not be an integer.

If $s = 2$, $r = 7$.

Therefore, the number of fours and sixes scored in Match 3 are 7 and 2 respectively.

It is given that there is exactly one other match in which no singles or doubles were scored. Hence, in that match, the number of runs scored by running between the wickets must be a multiple of 3. It is either Match 2 or Match 4. But since in Match 2, no sixes were scored, it has to be Match 4 in which no singles or doubles were scored. Therefore, 15 triples were scored in Match 4.

The number of doubles scored in Match 5 is 12. Let the number of singles and triples scored in the match be x and y respectively.

$x > 24$ and $y < 6$.

Also, $x + 3y = 55 - 24 = 31$.

$y = (31 - x)/3$

The possible values for (x, y) are (25, 2), (28, 1) and (31, 0). The maximum number of runs scored in triples will be 6 when $x = 25$ and $y = 2$. Choice (C)

DIRECTIONS for questions 5 to 8: Answer the questions on the basis of the information given below.

Ismail, a postal delivery executive, collects and delivers couriers between six places – Sadala, Namek, Kaishin, Tuffle, Yadrat and Eros. Over a course of 15 days, from April 1st to April 15th, on each day, Ismail collected a courier from exactly one place and delivered this courier at exactly one other place on the same day. During the given period, he did not visit the same pair of places on any two days. Also, on any day, Ismail did not visit any of the places that he had visited the previous day. During the given period, Ismail collected couriers from each of the six places at least once and delivered couriers to each of the six places at least once.

The following information is also known about the couriers that he collected and delivered during the given period:

- i. On April 1st, he collected a courier from Sadala and delivered it at Eros. He collected couriers from Eros on exactly three days, of which the dates of two days were prime numbers.
- ii. During the last seven days, he collected couriers from Yadrat on four days, but none of these couriers were delivered at Namek.
- iii. During the first five days, he collected couriers from five different places and delivered these at five different places. Each of Yadrat and Tuffle was visited only once in these five days, while each of the other four places was visited twice by Ismail during these five days.
- iv. On each of April 5th, 12th and 14th, Ismail collected couriers from the same place, which was not Kaishin. However, Ismail visited Kaishin on April 9th.
- v. The place at which Ismail delivered a courier on each of April 6th, April 10th and April 13th was the same as the place from which he collected a courier on April 8th.

Q5. DIRECTIONS for questions 5 to 8: Select the correct alternative from the given choices.

Which of the following was the last place that Ismail visited?

- a) **Yadrat**
- b) **Eros**
- c) **Sadala**
- d) **Namek**

Ismail did not visit the same pair of places on any two days. Since there are six places, there are a total of 15 possible pairs of places and because there are 15 days in total, Ismail visited every possible pair of places. This implies that each place was visited by Ismail exactly five times.

Ismail did not visit any of the places that he had visited the previous day. Hence, from (ii), we can say that Ismail collected couriers from Yadrat on April 9th, 11th, 13th and 15th. It is given that couriers were delivered to and collected from a particular place at least once. Therefore, the other day apart from the given dates on which Ismail visited Yadrat, it was to deliver a courier. That courier was collected from Namek because on the four dates mentioned, no exchange happened between Namek (from (ii)).

From (v), we can say that the place that had been on the given dates was Tuffle or Yadrat, because all the other places except Yadrat were already visited twice during the first five days and each place was visited exactly five times during the given time period. Also, Ismail visited Yadrat on other dates as well. Therefore, the place he delivered a courier on each of April 6th, April 10th and April 13th and collected a courier on April 8th was Tuffle.

Let the place Ismail collected couriers from on April 5th, 12th and 14th be x. x cannot be Sadala because in the first five days, a courier was already collected from Sadala. It is given that it is not Kaishin. It cannot be Eros because two of the three dates on which couriers were collected from Eros are prime numbered dates. It cannot be Yadrat because all couriers collected from Yadrat were on different days. It cannot be Tuffle because the visits made to Tuffle were on other dates. Therefore, that place has to be Namek.

From (iii), Yadrat was visited once during the first five days. That is the date on which Namek was also visited to collect a courier from. Since a courier was collected from Namek on 5th, it must have been delivered to Yadrat on April 5th.

From (i), couriers were collected thrice from Eros and two of those dates were prime numbers. The possible prime numbered dates available are 2nd, 3rd and 7th. But Eros was already visited on 1st. Therefore, Eros cannot be visited on 2nd. Hence, couriers were collected from Eros on 3rd and 7th.

From (iii), Sadala was visited twice by Ismail. One visit was on April 1st. The other visit cannot be on April 2nd because the same place cannot be visited on two consecutive days and it cannot be on April 3rd because Eros and Sadala were already visited on the 1st. Hence, it has to be on April 4th.

Since Yadrat was already visited once during the first five days, the two remaining places from which couriers were collected from have to be Kaishin and Tuffle. If couriers are collected from Kaishin on 2nd, then couriers have to be delivered to Kaishin on 3rd, which is not possible because they are consecutive days. Therefore, couriers were collected from Tuffle and Kaishin on April 2nd and 4th respectively. Hence, couriers were delivered to Kaishin and Namek on April 2nd and 3rd respectively. The place from which a courier was collected from on April 6th cannot be Namek, Yadrat and Eros, since they were visited on the immediate days. It cannot be Kaishin because a delivery already happened between Tuffle and Kaishin. Therefore, a courier was collected from Sadala on April 6th.

On April 7th, the courier was not delivered at Sadala and Namek because couriers were already delivered between Eros and these places. It cannot be Yadrat or Tuffle because they were visited on other dates. Therefore, a courier was delivered at Kaishin on April 7th.

On April 8th, couriers can be delivered to Namek or Eros (every other visit to a pair of places that includes Tuffle was not on this date). Since Eros was visited on 7th, a courier was delivered to Namek. Since couriers were collected from Eros on three days, it can be inferred that on April 10th, a courier was collected from Eros.

On April 11th, couriers can be delivered to either Eros or Sadala (every other visit to a pair of places that includes Tuffle was not on this date). Since Eros was visited on 11th, couriers were delivered to Sadala. This implies that on April 15th, couriers were delivered to Eros.

On April 12th, couriers can be delivered to either Sadala or Kaishin (every other visit to a pair of places that includes Namek was not on this date). Since Sadala was visited on 11th, it can be inferred that couriers were delivered to Kaishin and Sadala on 12th and 14th respectively.

The following table shows the places from which couriers were collected from and delivered to on the respective dates:

Date	Collected from	Delivered at
1	Eros	Tuffle
2	Eros	Kaishin
3	Eros	Sadala
4	Sadala	Tuffle
5	Namek	Yadrat
6	Yadrat	Tuffle
7	Yadrat	Kaishin
8	Eros	Namek
9	Yadrat	Tuffle
10	Eros	Namek
11	Yadrat	Sadala
12	Sadala	Kaishin
13	Yadrat	Tuffle
14	Yadrat	Kaishin
15	Eros	Eros

Q6. DIRECTIONS for questions 5 to 8: Select the correct alternative from the given choices.
Which of the following places was not visited by Ismail during the first four days?

- a) **Yadrat**
- b) **Namek**
- c) **Kaishin**
- d) **More than one of the above**

Ismail did not visit the same pair of places on any two days. Since there are six places, there are a total of 15 possible pairs of places and because there are 15 days in total, Ismail visited every possible pair of places. This implies that each place was visited by Ismail exactly five times.

Ismail did not visit any of the places that he had visited the previous day. Hence, from (ii), we can say that Ismail collected couriers from Yadrat on April 9th, 11th, 13th and 15th. It is given that couriers were delivered to and collected from a particular place at least once. Therefore, the other day apart from the given dates on which Ismail visited Yadrat, it was to deliver a courier. That courier was collected from Namek because on the four dates mentioned, no exchange happened between Namek (from (ii)).

From (v), we can say that the place that had been on the given dates was Tuffle or Yadrat, because all the other places except Yadrat were already visited twice during the first five days and each place was visited exactly five times during the given time period. Also, Ismail visited Yadrat on other dates as well. Therefore, the place he delivered a courier on each of April 6th, April 10th and April 13th and collected a courier on April 8th was Tuffle.

Let the place Ismail collected couriers from on April 5th, 12th and 14th be x. x cannot be Sadala because in the first five days, a courier was already collected from Sadala. It is given that it is not Kaishin. It cannot be Eros because two of the three dates on which couriers were collected from Eros are prime numbered dates. It cannot be Yadrat because all couriers collected from Yadrat were on different days. It cannot be Tuffle because the visits made to Tuffle were on other dates. Therefore, that place has to be Namek.

From (iii), Yadrat was visited once during the first five days. That is the date on which Namek was also visited to collect a courier from. Since a courier was collected from Namek on 5th, it must have been delivered to Yadrat on April 5th.

From (i), couriers were collected thrice from Eros and two of those dates were prime numbers. The possible prime numbered dates available are 2nd, 3rd and 7th. But Eros was already visited on 1st. Therefore, Eros cannot be visited on 2nd. Hence, couriers were collected from Eros on 3rd and 7th.

From (iii), Sadala was visited twice by Ismail. One visit was on April 1st. The other visit cannot be on April 2nd because the same place cannot be visited on two consecutive days and it cannot be on April 3rd because Eros and Sadala were already visited on the 1st. Hence, it has to be on April 4th.

Since Yadrat was already visited once during the first five days, the two remaining places from which couriers were collected from have to be Kaishin and Tuffle. If couriers are collected from Kaishin on 2nd, then couriers have to be delivered to Kaishin on 3rd, which is not possible because they are consecutive days. Therefore, couriers were collected from Tuffle and Kaishin on April 2nd and 4th respectively. Hence, couriers were delivered to Kaishin and Namek on April 2nd and 3rd respectively. The place from which a courier was collected from on April 6th cannot be Namek, Yadrat and Eros, since they were visited on the immediate days. It cannot be Kaishin because a delivery already happened between Tuffle and Kaishin. Therefore, a courier was collected from Sadala on April 6th.

On April 7th, the courier was not delivered at Sadala and Namek because couriers were already delivered between Eros and these places. It cannot be Yadrat or Tuffle because they were visited on other dates. Therefore, a courier was delivered at Kaishin on April 7th.

On April 8th, couriers can be delivered to Namek or Eros (every other visit to a pair of places that includes Tuffle was not on this date). Since Eros was visited on 7th, a courier was delivered to Namek. Since couriers were collected from Eros on three days, it can be inferred that on April 10th, a courier was collected from Eros.

On April 11th, couriers can be delivered to either Eros or Sadala (every other visit to a pair of places that includes Tuffle was not on this date). Since Eros was visited on 11th, couriers were delivered to Sadala. This implies that on April 15th, couriers were delivered to Eros.

On April 12th, couriers can be delivered to either Sadala or Kaishin (every other visit to a pair of places that includes Namek was not on this date). Since Sadala was visited on 11th, it can be inferred that couriers were delivered to Kaishin and Sadala on 12th and 14th respectively.

The following table shows the places from which couriers were collected from and delivered to on the respective dates:

Date	Collected from	Delivered at
1		
2	Eros	
3		Eros
4	Sadala	
5		Namek
6		Tuffle
7		Kaishin
8		Eros
9		
10		Eros
11		Sadala
12		Kaishin
13		
14		
15		Eros

Q7. DIRECTIONS *for questions 5 to 8*: Select the correct alternative from the given choices.

How many times did Ismail visit Tuffle on or before April 8th?

a) 1

b) 2

c) 3

d) 4

Ismail did not visit the same pair of places on any two days. Since there are six places, there are a total of 15 possible pairs of places and because there are 15 days in total, Ismail visited every possible pair of places. This implies that each place was visited by Ismail exactly five times.

Ismail did not visit any of the places that he had visited the previous day. Hence, from (ii), we can say that Ismail collected couriers from Yadrat on April 9th, 11th, 13th and 15th. It is given that couriers were delivered to and collected from a particular place at least once. Therefore, the other day apart from the given dates on which Ismail visited Yadrat, it was to deliver a courier. That courier was collected from Namek because on the four dates mentioned, no exchange happened between Namek (from (ii)).

From (v), we can say that the place that had been on the given dates was Tuffle or Yadrat, because all the other places except Yadrat were already visited twice during the first five days and each place was visited exactly five times during the given time period. Also, Ismail visited Yadrat on other dates as well. Therefore, the place he delivered a courier on each of April 6th, April 10th and April 13th and collected a courier on April 8th was Tuffle.

Let the place Ismail collected couriers from on April 5th, 12th and 14th be x. x cannot be Sadala because in the first five days, a courier was already collected from Sadala. It is given that it is not Kaishin. It cannot be Eros because two of the three dates on which couriers were collected from Eros are prime numbered dates. It cannot be Yadrat because all couriers collected from Yadrat were on different days. It cannot be Tuffle because the visits made to Tuffle were on other dates. Therefore, that place has to be Namek.

From (iii), Yadrat was visited once during the first five days. That is the date on which Namek was also visited to collect a courier from. Since a courier was collected from Namek on 5th, it must have been delivered to Yadrat on April 5th.

From (i), couriers were collected thrice from Eros and two of those dates were prime numbers. The possible prime numbered dates available are 2nd, 3rd and 7th. But Eros was already visited on 1st. Therefore, Eros cannot be visited on 2nd. Hence, couriers were collected from Eros on 3rd and 7th.

From (iii), Sadala was visited twice by Ismail. One visit was on April 1st. The other visit cannot be on April 2nd because the same place cannot be visited on two consecutive days and it cannot be on April 3rd because Eros and Sadala were already visited on the 1st. Hence, it has to be on April 4th.

Since Yadrat was already visited once during the first five days, the two remaining places from which couriers were collected from have to be Kaishin and Tuffle. If couriers are collected from Kaishin on 2nd, then couriers have to be delivered to Kaishin on 3rd, which is not possible because they are consecutive days. Therefore, couriers were collected from Tuffle and Kaishin on April 2nd and 4th respectively. Hence, couriers were delivered to Kaishin and Namek on April 2nd and 3rd respectively. The place from which a courier was collected from on April 6th cannot be Namek, Yadrat and Eros, since they were visited on the immediate days. It cannot be Kaishin

because a delivery already happened between Tuffle and Kaishin. Therefore, a courier was collected from Sadala on April 6th.

On April 7th, the courier was not delivered at Sadala and Namek because couriers were already delivered between Eros and these places. It cannot be Yadrat or Tuffle because they were visited on other dates. Therefore, a courier was delivered at Kaishin on April 7th.

On April 8th, couriers can be delivered to Namek or Eros (every other visit to a pair of places that includes Tuffle was not on this date). Since Eros was visited on 7th, a courier was delivered to Namek. Since couriers were collected from Eros on three days, it can be inferred that on April 10th, a courier was collected from Eros.

On April 12th, couriers can be delivered to either Sadala or Kaishin (every other visit to a pair of places that includes Namek was not on this date). Since Sadala was visited on 11th, it can be inferred that couriers were delivered to Kaishin and Sadala on 12th and 14th respectively.

The following table shows the places from which couriers were collected from and delivered to on the respective dates:

Date	Collected from	Delivered at
April 1 st	Sadala	Eros
April 2 nd	Tuffle	Kaishin
April 3 rd	Eros	Namek
April 4 th	Kaishin	Sadala
April 5 th	Namek	Yadrat
April 6 th	Sadala	Tuffle
April 7 th	Eros	Kaishin
April 8 th	Tuffle	Namek
April 9 th	Yadrat	Kaishin
April 10 th	Eros	Tuffle
April 11 th	Yadrat	Sadala
April 12 th	Namek	Kaishin
April 13 th	Yadrat	Tuffle
April 14 th	Namek	Sadala
April 15 th	Yadrat	Eros

Ismail visited Tuffle on April 2nd, 6th and 8th.

Choice (C)

Q8. DIRECTIONS for questions 5 to 8: Select the correct alternative from the given choices.

On what day did Ismail make his last visit to Sadala?

a) April 14th

b) April 13th

c) April 12th

d) April 11th

Ismail made his last visit to Sadala on April 14th.

Choice (A)

DIRECTIONS for questions 9 to 12: Answer the questions on the basis of the information given below.

A single – screen theatre has a capacity of 320 seats. To attend any screening in the theatre, one has to purchase tickets either online or at the ticket counter. Once any person purchases a ticket, either online or at the ticket counter, he can further sell the ticket to any other person, and the tickets thus sold are called black tickets. No person who purchases a black ticket further sells the ticket to any other person. Any person who purchases a ticket and does not further sell it definitely attends the screening. Further, the *occupancy* for any screening is defined as the number of seats occupied for that screening as a percentage of the total number of seats in the theatre. The *occupancy* for any screening is at least 25%.

For a particular screening, it was found that the number of tickets purchased online was six less than that purchased at the counter. Further, the number of black tickets sold accounted for at least 20% of the total number of occupied seats for that screening and is less than half the total number of tickets purchased online. The number of tickets purchased at the counter and sold as black tickets is a positive even multiple of the number of tickets purchased online and sold as black tickets.

Q9. DIRECTIONS for question 9: Select the correct alternative from the given choices.

If the *occupancy* for the screening was 70%, what is the maximum difference between the number of tickets purchased at the counter and sold as black tickets and the number of tickets purchased online and sold as black tickets?

a) 52

b) 51

c) 50

d) 49

The occupancy for a screening is 70%. Therefore, the total number of occupied seats will be 70% of 320 = 224. The tickets for all of these 224 seats were either purchased online or purchased at the counter.

Let us say that the number of tickets purchased online is k . Then the number of tickets purchased at the counter will be $k + 6$.

$$k + k + 6 = 224 \Rightarrow k = 109.$$

Hence, the number of tickets purchased online and at the counter are 109 and 115 respectively.

It is given that the number of black tickets sold for any screening accounts for at least 20% of the total number of occupied seats for that screening and is less than half the total number of tickets purchased online.

If the number of black tickets is x , from the above condition, $44.8 \leq x \leq 54.5$.

The minimum value of x is 45 and the maximum value of x is 54.

The number of tickets purchased at the counter and sold as black tickets should be maximum.

So we will start with the maximum value of x .

When x is 54, the number of tickets purchased at the counter and sold as black tickets and that purchased online and sold as black tickets will be 52 and 2 respectively. The difference is 50.

When x is 53, the number of tickets purchased at the counter and sold as black tickets and that purchased online and sold as black tickets will be 52 and 1 respectively. The difference is 51.

For any other value of x , the difference will be less than 51.

Therefore, the maximum difference is 51.

Choice (B)

Q10. DIRECTIONS for questions 10 and 11: Type in your answer in the input box provided below the question.

If the occupancy for the screening was 65% and the number of black tickets sold for that screening was the maximum possible, then what is the maximum number of tickets purchased at the counter and sold as black tickets?

The occupancy for a screening is 65%. Therefore, the total number of occupied seats will be 65% of 320 = 208. The tickets for all of these 208 seats were either purchased online or purchased at the counter.

Let us say that the number of tickets purchased online is k . Therefore, number of tickets purchased at the counter will be $k + 6$.

$$k + k + 6 = 208 \Rightarrow k = 101.$$

Hence, the number of tickets purchased online and at the counter are 101 and 107 respectively.

It is given that the number of people who purchased black tickets for any screening accounts for at least 20% of the total number of occupied seats for that screening and is less than half the total number of tickets purchased online.

If the number of black tickets is x , from the above condition, $41.6 \leq x \leq 50.5$

Since the number of black tickets sold for the screening is maximum, x will be 50.

From the information given, the number of tickets purchased at the counter and sold as black tickets and the number of tickets purchased online and sold as black tickets will be in the ratio $2p : 1$.

To maximize the number of tickets purchased at the counter and sold as black tickets, we have to minimize the number of tickets purchased online and sold as black tickets.

The number of tickets purchased online and sold as black tickets will be $\frac{1}{2p+1} \times x$,

$$\text{i.e., } \frac{50}{2p+1}$$

This will be minimum when p is maximum. Also, this number has to be an integer.

The maximum value of p in this case will be 12. Therefore, the minimum number of tickets purchased online and sold as black tickets will be $50/25 = 2$. Hence, the maximum number of tickets purchased at the counter and sold as black tickets will be

48.

Ans: (48)

Q11. DIRECTIONS for questions 10 and 11: Type in your answer in the input box provided below the question.

If a total of 52 black tickets were purchased and the *occupancy* for the screening was the maximum possible, what is the number of tickets that were purchased online that were not sold as black tickets?

The number of black tickets purchased is 52. It is given that the number of black tickets purchased accounts for at least 20% of the total occupied seats. Therefore, the occupancy will be maximum when the number of black tickets purchased accounts for exactly 20% of the total number of occupied seats. Therefore, the maximum number of seats occupied will be $52/2 = 260$.

If k is the number of tickets purchased online, $k + 6$ will be the number of tickets purchased at the counter. Hence, $k + k + 6 = 260 \Rightarrow k = 127$.

The number of tickets purchased online and sold as black tickets is $\frac{52}{2p+1}$. The only possible integer value for this will be 4 when $p = 6$. Therefore, the number of tickets purchased online but not sold as black tickets will be $127 - 4 = 123$. Ans: (123)

Q12. DIRECTIONS for question 12: Select the correct alternative from the given choices.

If, for the screening, a total of 72 black tickets were purchased and the *occupancy* for the screening is the minimum possible, what is the maximum number of tickets purchased at the counter that were not sold as black tickets?

- a) 87
- b) 92
- c) 98

d) 103

Since the number of black tickets purchased is less than half the total number of tickets purchased online, the number of tickets purchased online is at least 145. Since the occupancy is minimum, the number of tickets purchased online will be 145 and the number of tickets purchased at the counter will be 151. Therefore, total number of occupied seats = 296.

To maximize the number of tickets purchased at the counter and not sold as black tickets, we have to minimize the number of tickets purchased at the counter and sold as black tickets. To do this, we have to maximize the number of tickets purchased online and sold as black tickets.

The number of tickets purchased online and sold as black tickets is $\frac{72}{2p+1}$.

This is maximum when p is minimum. Minimum value of p is 1. In that case the number of tickets purchased online and sold as black tickets will be 24. Hence, the number of tickets purchased at the counter and sold as black tickets will be 48. Therefore, the maximum number of tickets purchased at the counter and not sold as black tickets will be $151 - 48 = 103$.
Choice (D)

DIRECTIONS for questions 13 to 16: Answer the questions on the basis of the information given below.

Six players – A through F – are playing a tournament of Rock-Paper-Scissors, in which each player plays exactly one game of Rock-Paper-Scissors against every other player. Each game is played between two players in the following manner:

- In each game, each of the two players simultaneously chooses exactly one sign among Rock, Paper and Scissors.
- In any game, a player who chooses Rock will win against a player who chooses Scissors; a player who chooses Scissors will win against a player who chooses Paper and a player who chooses Paper will win against a player who chooses Rock.
- In any game, if both players choose the same sign, then the game is said to have ended in a draw.

The following table provides the number of games in which each person chose each sign in the tournament:

Player	Rock	Paper	Scissors
A	5	0	0
B	0	4	1
C	4	0	1
D	0	5	0
E	1	1	3
F	1	0	4

It is known that there were no draws in the tournament and B won all the games he played.

Q13. DIRECTIONS for questions 13 to 16: Select the correct alternative from the given choices.
In the game played between E and F, which sign did F choose?

- a) Rock
- b) Paper

c) Scissors

d) Cannot be determined

From the information given, we can say that Rock beats Scissors, Scissors beats Paper, and Paper beats Rock.

Let us consider the games played by A.

A chose Rock in all his games.

In his game against B, B chose Paper because B won all his games.

In his game against C, C chose either Rock or Scissors. But since there were no draws, C chose Scissors. Since Rock beats Scissors, A won his game against C. From the table, C chose Scissors only once. Therefore, in every other game, C chose Rock.

In his game against D, D chose Paper and since Paper beats Rock, D won the game.

In his game against E, E chose either Paper or Scissors.

In his game against F, F chose Scissors. Since Rock beats Scissors, A won the game.

Let us consider the remaining games played by B.

B has won all his games.

In his game against C, C chose Rock. Since B won, B chose Paper.

In his game against D, D chose Paper. Since B won, B chose Scissors. B chose Scissors only once. Therefore, in his remaining games, B chose Paper.

In his game against E, B chose Paper. Since B won, E chose Rock. E chose Rock only once in the tournament. Therefore, in all his remaining games, he chose either Paper or Scissors.

In his game against F, B chose Paper. Since B won, F chose Rock. F chose Rock only once. Therefore, in all the other games he played, he chose Scissors.

Let us consider the remaining games played by C.

C chose Rock in all of his remaining games.

In his game against D, C chose Rock and D chose Paper. Hence, D won the game.

In his game against E, C chose Rock and E chose either Paper or Scissors.

In his game against F, C chose Rock and F chose Scissors. Hence, C won the game.

Let us consider the remaining games played by D.

In his game against E, D chose Rock and E chose either Paper or Scissors.

In his game against F, D chose Paper and F chose Scissors. Hence, F won the game.

In the game between E and F, F chose Scissors. E chose Paper because there were no draws. Hence, F won the game.

E chose Paper only once and it was in his game against F. Therefore, in his games against A, C and D, he chose Scissors.

In his game against A, since A chose Rock and E chose Scissors, A won the game.

In his game against C, since C chose Rock and E chose Scissors, C won the game.

In his game against D, since D chose Paper and E chose Scissors, E won the game.

The results of the tournament were as follows:

A(Rock) lost to B(Paper)	B(Paper) beat C(Rock)	C(Rock) lost to D(Paper)	D(Paper) lost to E(Scissors)	E (Paper) lost to F(Scissor)
A(Rock) beat C(Scissors)	B(Scissors) beat D(Paper)	C(Rock) beat E(Scissors)	D(Paper) lost to F(Scissors)	
A(Rock) lost to D(Paper)	B(Paper) beat E(Rock)	C(Rock) beat F(Scissors)		
A(Rock) beat E(Scissors)	B(Paper) beat F(Rock)			
A(Rock) beat F(Scissors)				

In the game played between E and F, F chose Scissors.

Choice (C)

Q14. DIRECTIONS for questions 13 to 16: Select the correct alternative from the given choices.
Who among the following won the second highest number of games?

- a) **A**
- b) **C**
- c) **D**
- d) **F**

From the information given, we can say that Rock beats Scissors, Scissors beats Paper, and Paper beats Rock.

Let us consider the games played by A.

A chose Rock in all his games.

In his game against B, B chose Paper because B won all his games.

In his game against C, C chose either Rock or Scissors. But since there were no draws, C chose Scissors. Since Rock beats Scissors, A won his game against C. From the table, C chose Scissors only once. Therefore, in every other game, C chose Rock.

In his game against D, D chose Paper and since Paper beats Rock, D won the game.

In his game against E, E chose either Paper or Scissors.

In his game against F, F chose Scissors. Since Rock beats Scissors, A won the game.

Let us consider the remaining games played by B.

B has won all his games.

In his game against C, C chose Rock. Since B won, B chose Paper.

In his game against D, D chose Paper. Since B won, B chose Scissors. B chose Scissors only once. Therefore, in his remaining games, B chose Paper.

In his game against E, B chose Paper. Since B won, E chose Rock. E chose Rock only once in the tournament. Therefore, in all his remaining games, he chose either Paper or Scissors.

In his game against F, B chose Paper. Since B won, F chose Rock. F chose Rock only once. Therefore, in all the other games he played, he chose Scissors.

Let us consider the remaining games played by C.

C chose Rock in all of his remaining games.

In his game against D, C chose Rock and D chose Paper. Hence, D won the game.

In his game against E, C chose Rock and E chose either Paper or Scissors.

In his game against F, C chose Rock and F chose Scissors. Hence, C won the game.

Let us consider the remaining games played by D.

In his game against E, D chose Rock and E chose either Paper or Scissors.

In his game against F, D chose Paper and F chose Scissors. Hence, F won the game.

In the game between E and F, F chose Scissors. E chose Paper because there were no draws. Hence, F won the game.

E chose Paper only once and it was in his game against F. Therefore, in his games against A, C and D, he chose Scissors.

In his game against A, since A chose Rock and E chose Scissors, A won the game.

In his game against C, since C chose Rock and E chose Scissors, C won the game.

In his game against D, since D chose Paper and E chose Scissors, E won the game.

The results of the tournament were as follows:

A(Rock) lost to B(Paper)	B(Paper) beat C(Rock)	C(Rock) lost to D(Paper)	D(Paper) lost to E(Scissors)	E (Paper) lost to F(Scissor)
A(Rock) beat C(Scissors)	B(Scissors) beat D(Paper)	C(Rock) beat E(Scissors)	D(Paper) lost to F(Scissors)	
A(Rock) lost to D(Paper)	B(Paper) beat E(Rock)	C(Rock) beat F(Scissors)		
A(Rock) beat E(Scissors)	B(Paper) beat F(Rock)			
A(Rock) beat F(Scissors)				

A won three games, which is the second highest number of games won. C, D and F won two games each and E won only one game.

Choice (A)

Q15. DIRECTIONS for questions 13 to 16: Select the correct alternative from the given choices.
B chose Scissors against who among the following?

- a) C
- b) D ✓ Your answer is correct
- c) F
- d) E

From the information given, we can say that Rock beats Scissors, Scissors beats Paper, and Paper beats Rock.

Let us consider the games played by A.

A chose Rock in all his games.

In his game against B, B chose Paper because B won all his games.

In his game against C, C chose either Rock or Scissors. But since there were no draws, C chose Scissors. Since Rock beats Scissors, A won his game against C. From the table, C chose Scissors only once. Therefore, in every other game, C chose Rock.

In his game against D, D chose Paper and since Paper beats Rock, D won the game.

In his game against E, E chose either Paper or Scissors.

In his game against F, F chose Scissors. Since Rock beats Scissors, A won the game.

Let us consider the remaining games played by B.

B has won all his games.

In his game against C, C chose Rock. Since B won, B chose Paper.

In his game against D, D chose Paper. Since B won, B chose Scissors. B chose Scissors only once. Therefore, in his remaining games, B chose Paper.

In his game against E, B chose Paper. Since B won, E chose Rock. E chose Rock only once in the tournament. Therefore, in all his remaining games, he chose either Paper or Scissors.

In his game against F, B chose Paper. Since B won, F chose Rock. F chose Rock only once. Therefore, in all the other games he played, he chose Scissors.

Let us consider the remaining games played by C.

C chose Rock in all of his remaining games.

In his game against D, C chose Rock and D chose Paper. Hence, D won the game.

In his game against E, C chose Rock and E chose either Paper or Scissors.

In his game against F, C chose Rock and F chose Scissors. Hence, C won the game.

Let us consider the remaining games played by D.

In his game against E, D chose Rock and E chose either Paper or Scissors.

In his game against F, D chose Paper and F chose Scissors. Hence, F won the game.

In the game between E and F, F chose Scissors. E chose Paper because there were no draws. Hence, F won the game.

E chose Paper only once and it was in his game against F. Therefore, in his games against A, C and D, he chose Scissors.

In his game against A, since A chose Rock and E chose Scissors, A won the game.

In his game against C, since C chose Rock and E chose Scissors, C won the game.

In his game against D, since D chose Paper and E chose Scissors, E won the game.

The results of the tournament were as follows:

A(Rock) lost to B(Paper)	B(Paper) beat C(Rock)	C(Rock) lost to D(Paper)	D(Paper) lost to E(Scissors)	E (Paper) lost to F(Scissor)
A(Rock) beat C(Scissors)	B(Scissors) beat D(Paper)	C(Rock) beat E(Scissors)	D(Paper) lost to F(Scissors)	
A(Rock) lost to D(Paper)	B(Paper) beat E(Rock)	C(Rock) beat F(Scissors)		
A(Rock) beat E(Scissors)	B(Paper) beat F(Rock)			
A(Rock) beat F(Scissors)				

B chose Scissors against D.

Choice (B)

Q16. DIRECTIONS for questions 13 to 16: Select the correct alternative from the given choices.
What is the difference between the number of games won by D and the number of games lost by C?

- a) 0
- b) 1
- c) 2
- d) 3

From the information given, we can say that Rock beats Scissors, Scissors beats Paper, and Paper beats Rock.

Let us consider the games played by A.

A chose Rock in all his games.

In his game against B, B chose Paper because B won all his games.

In his game against C, C chose either Rock or Scissors. But since there were no draws, C chose Scissors. Since Rock beats Scissors, A won his game against C. From the table, C chose Scissors only once. Therefore, in every other game, C chose Rock.

In his game against D, D chose Paper and since Paper beats Rock, D won the game.

In his game against E, E chose either Paper or Scissors.

In his game against F, F chose Scissors. Since Rock beats Scissors, A won the game.

Let us consider the remaining games played by B.

B has won all his games.

In his game against C, C chose Rock. Since B won, B chose Paper.

In his game against D, D chose Paper. Since B won, B chose Scissors. B chose Scissors only once. Therefore, in his remaining games, B chose Paper.

In his game against E, B chose Paper. Since B won, E chose Rock. E chose Rock only once in the tournament. Therefore, in all his remaining games, he chose either Paper or Scissors.

In his game against F, B chose Paper. Since B won, F chose Rock. F chose Rock only once. Therefore, in all the other games he played, he chose Scissors.

Let us consider the remaining games played by C.

C chose Rock in all of his remaining games.

In his game against D, C chose Rock and D chose Paper. Hence, D won the game.

In his game against E, C chose Rock and E chose either Paper or Scissors.

In his game against F, C chose Rock and F chose Scissors. Hence, C won the game.

Let us consider the remaining games played by D.

In his game against E, D chose Rock and E chose either Paper or Scissors.

In his game against F, D chose Paper and F chose Scissors. Hence, F won the game.

In the game between E and F, F chose Scissors. E chose Paper because there were no draws. Hence, F won the game.

E chose Paper only once and it was in his game against F. Therefore, in his games against A, C and D, he chose Scissors.

In his game against A, since A chose Rock and E chose Scissors, A won the game.

In his game against C, since C chose Rock and E chose Scissors, C won the game.

In his game against D, since D chose Paper and E chose Scissors, E won the game.

The results of the tournament were as follows:

A(Rock) lost to B(Paper)	B(Paper) beat C(Rock)	C(Rock) lost to D(Paper)	D(Paper) lost to E(Scissors)	E (Paper) lost to F(Scissor)
A(Rock) beat B(Scissors)		C(Rock) beat E(Scissors)	D(Paper) lost to F(Scissors)	
C(Scissors) beat D(Paper)		C(Rock) beat F(Scissors)		
A(Rock) lost to D(Paper)	B(Paper) beat E(Rock)			
A(Rock) beat E(Scissors)	B(Paper) beat F(Rock)			
A(Rock) beat F(Scissors)				

D won 2 games and C lost 3 games. Difference = 1

Choice (B)

DIRECTIONS for questions 17 to 20: Answer the questions on the basis of the information given below.

There is a certain communication device that lets people exchange messages in an encoded manner. Any message sent or received through the device comprises only three types of inputs – dots, spaces and dashes.

Each of five women – A through E – has one such device and on a certain day, the five women used the devices to transmit messages amongst themselves. The five women transmitted a total of four messages amongst themselves on that day, in the following manner:

- The first woman generated a message and transmitted it to the second woman.
- After receiving the message, the second woman modified it and transmitted it to the third woman.
- The third woman also modified the message that she received and transmitted it to the fourth woman, who then further modified it and transmitted it to the fifth woman.

The first message took one minute to be transmitted. Each of the subsequent messages took one minute more than what the previous message took to be transmitted.

The following information is also known about the messages:

- i. The times taken for each dot, space and dash to be transmitted are 2 seconds, 6 seconds and 8 seconds, not necessarily in the same order.
- ii. Each type of input was used by exactly two women while sending the messages. The number of dots, the number of dashes and the number of spaces used by any woman are all multiples of 5.
- iii. The number of women who received a message before B transmitted a message is one less than the number of women who transmitted a message after D did.
- iv. C used only 60 spaces and no other types of input in the message she transmitted. The message that D transmitted comprised only dots and she used more than 15 dots.
- v. A did not transmit any messages.

Q17. DIRECTIONS for question 17: Select the correct alternative from the given choices.

Who was the third woman to receive a message?

a) **B**

b) **C**

c) **D**

d) **E**

From (v), since A did not transmit any messages, A was the last one to receive a message.

From (iii), if B was the first person to transmit a message, then nobody would have received a message before B did. From (iii), only one person transmitted a message after D did. Hence, D must be the third person to send a message. This case is possible.

If B is the second person to transmit a message, then one person would have transmitted her message before B did. In that case, D must be the second person to transmit a message. This is not possible.

If B is the third person to transmit a message, then two persons would have transmitted their messages before B did and so, three persons transmitted their messages after D did. Hence, D must be the first one to transmit a message. This case is possible.

If the B is the fourth person to transmit a message, then four persons must have transmitted their messages after D transmitted hers. This is not possible since there were only four messages that were transmitted.

Only two cases are possible. In both the cases, C was either the second or the fourth person to transmit a message. If C was the fourth person, from (iv), each space should last for 4 seconds. But each space is either 2, 6 or 8 seconds long. Therefore, C had to be the second person to transmit her message and E was the fourth one to do so.

The second message took 120 seconds to be transmitted and C used only 60 spaces in her message. This means that each space took two seconds to be transmitted.

Let us examine the cases.

Case 1: B was the first one to transmit a message.

The order here will be $B \rightarrow C \rightarrow D \rightarrow E \rightarrow A$

D's message contained only dots.

Since D's is the third message to be transmitted, it will take 180 seconds to be transmitted. D's message contained only dots. Therefore, the number of dots used by D will either be $180/6$ or $180/8$. The number of dots has to be an integer. Therefore, each dot takes 6 seconds to be transmitted and each dash takes 8 seconds to be transmitted. D's message contained 30 dots.

Let us say that B used a dots, b dashes and c spaces. This implies that $6a + 8b + 2c = 60$.

From (ii), each type of input is used by exactly two persons. From the above, C, D and A did not use any dashes. Therefore, B and E definitely used dashes. B's message takes 60 seconds to be transmitted.

Hence, b cannot be zero. The minimum value of b is 5. In that case, $6a + 2c = 20$. From (i), a and c are multiples of 5 and the only possible values a and c are 0 and 10 respectively.

Therefore, B used 5 dashes and 10 spaces in her message.

From (ii), it can be said that E used only dots and dashes. Let us say E used p dots and q dashes.

$$6p + 8q = 240 \text{ i.e. } q = \frac{120 - 3p}{4}$$

The only possible values of p and q such that they are multiples of 5 are $p = 20$ and $q = 15$.

The overall distribution is as follows:

	B	C	D	E	A
Dots	-	-	30	20	-
Dashes	5	-	-	15	-
Spaces	10	60	-	-	-

Case 2: D was the first one to send a message.

The order here will be $D \rightarrow C \rightarrow B \rightarrow E \rightarrow A$

What is the time interval (in minutes) between the moment the first woman began transmitting her message and the moment D received a message

D's message contained only dots.

Since D's is the first message to be transmitted, it will take 60 seconds to be transmitted. D's message contained only dots. Therefore, the number of dots used by D will either be $60/6$ or $60/8$. The number of dots has to be an integer. Therefore, each dot takes 6 seconds to be transmitted and each dash takes 8 seconds to be transmitted. D's message contained 10 dots. From (iv), this is not valid.

Hence, only the first case is valid.

Q18. DIRECTIONS for question 18: Type in your answer in the input box provided below the question.

What is the difference between the number of spaces used by B in the message that she transmitted and the number of dashes used by E in the message that she transmitted?

From (v), since A did not transmit any messages, A was the last one to receive a message.

From (iii), if B was the first person to transmit a message, then nobody would have received a message before B did. From (iii), only one person transmitted a message after D did. Hence, D must be the third person to send a message. This case is possible.

If B is the second person to transmit a message, then one person would have transmitted her message before B did. In that case, D must be the second person to transmit a message. This is not possible.

If B is the third person to transmit a message, then two persons would have transmitted their messages before B did and so, three persons transmitted their messages after D did. Hence, D must be the first one to transmit a message. This case is possible.

If B is the fourth person to transmit a message, then four persons must have transmitted their messages after D transmitted hers. This is not possible since there were only four messages that were transmitted.

Only two cases are possible. In both the cases, C was either the second or the fourth person to transmit a message. If C was the fourth person, from (iv), each space should last for 4 seconds. But each space is either 2, 6 or 8 seconds long. Therefore, C had to be the second person to transmit her message and E was the fourth one to do so.

The second message took 120 seconds to be transmitted and C used only 60 spaces in her message. This means that each space took two seconds to be transmitted.

Let us examine the cases.

Case 1: B was the first one to transmit a message.

The order here will be $B \rightarrow C \rightarrow D \rightarrow E \rightarrow A$

D's message contained only dots.

Since D's is the third message to be transmitted, it will take 180 seconds to be transmitted. D's message contained only dots. Therefore, the number of dots used by D will either be $180/6$ or $180/8$. The number of dots has to be an integer. Therefore, each dot takes 6 seconds to be transmitted and each dash takes 8 seconds to be transmitted. D's message contained 30 dots.

Let us say that B used a dots, b dashes and c spaces. This implies that $6a + 8b + 2c = 60$.

From (ii), each type of input is used by exactly two persons. From the above, C, D and A did not use any dashes. Therefore, B and E definitely used dashes. B's message takes 60 seconds to be transmitted.

Hence, b cannot be zero. The minimum value of b is 5. In that case, $6a + 2c = 20$. From (i), a and c are multiples of 5 and the only possible values a and c are 0 and 10 respectively.

Therefore, B used 5 dashes and 10 spaces in her message.

From (ii), it can be said that E used only dots and dashes. Let us say E used p dots and q dashes.

$$6p + 8q = 240 \text{ i.e. } q = \frac{120 - 3p}{4}$$

The only possible values of p and q such that they are multiples of 5 are $p = 20$ and $q = 15$.

The overall distribution is as follows:

	B	C	D	E	A
Dots	-	-	30	20	-
Dashes	5	-	-	15	-
Spaces	10	60	-	-	-

Case 2: D was the first one to send a message.

The order here will be $D \rightarrow C \rightarrow B \rightarrow E \rightarrow A$

What is the time interval (in minutes) between the moment the first woman began transmitting her message and the moment D received a message

D's message contained only dots.

Since D's is the first message to be transmitted, it will take 60 seconds to be transmitted. D's message contained only dots. Therefore, the number of dots used by D will either be $60/6$ or $60/8$. The number of dots has to be an integer. Therefore, each dot takes 6 seconds to be transmitted and each dash takes 8 seconds to be transmitted. D's message contained 10 dots. From (iv), this is not valid.

Hence, only the first case is valid.

B used 10 spaces in her message and E used 15 dashes in her message. Difference

Q19. DIRECTIONS for question 19: Select the correct alternative from the given choices.

How many women received messages before D did?

a) 0

b) 1

c) 2

d) 3

From (v), since A did not transmit any messages, A was the last one to receive a message.

From (iii), if B was the first person to transmit a message, then nobody would have received a message before B did. From (iii), only one person transmitted a message after D did. Hence, D must be the third person to send a message. This case is possible.

If B is the second person to transmit a message, then one person would have transmitted her message before B did. In that case, D must be the second person to transmit a message. This is not possible.

If B is the third person to transmit a message, then two persons would have transmitted their messages before B did and so, three persons transmitted their messages after D did. Hence, D must be the first one to transmit a message. This case is possible.

If the B is the fourth person to transmit a message, then four persons must have transmitted their messages after D transmitted hers. This is not possible since there were only four messages that were transmitted.

Only two cases are possible. In both the cases, C was either the second or the fourth person to transmit a message. If C was the fourth person, from (iv), each space should last for 4 seconds. But each space is either 2, 6 or 8 seconds long. Therefore, C had to be the second person to transmit her message and E was the fourth one to do so.

The second message took 120 seconds to be transmitted and C used only 60 spaces in her message. This means that each space took two seconds to be transmitted.

Let us examine the cases.

Case 1: B was the first one to transmit a message.

The order here will be $B \rightarrow C \rightarrow D \rightarrow E \rightarrow A$

D's message contained only dots.

Since D's is the third message to be transmitted, it will take 180 seconds to be transmitted. D's message contained only dots. Therefore, the number of dots used by D will either be $180/6$ or $180/8$. The number of dots has to be an integer. Therefore, each dot takes 6 seconds to be transmitted and each dash takes 8 seconds to be transmitted. D's message contained 30 dots.

Let us say that B used a dots, b dashes and c spaces. This implies that $6a + 8b + 2c = 60$.

From (ii), each type of input is used by exactly two persons. From the above, C, D and A did not use any dashes. Therefore, B and E definitely used dashes. B's message takes 60 seconds to be transmitted.

Hence, b cannot be zero. The minimum value of b is 5. In that case, $6a + 2c = 20$.

From (i), a and c are multiples of 5 and the only possible values a and c are 0 and 10 respectively.

Therefore, B used 5 dashes and 10 spaces in her message.

From (ii), it can be said that E used only dots and dashes. Let us say E used p dots and q dashes.

$$6p + 8q = 240 \text{ i.e. } q = \frac{120 - 3p}{4}$$

The only possible values of p and q such that they are multiples of 5 are $p = 20$ and $q = 15$.

The overall distribution is as follows:

	B	C	D	E	A
Dots	-	-	30	20	-
Dashes	5	-	-	15	-
Spaces	10	60	-	-	-

Case 2: D was the first one to send a message.

The order here will be $D \rightarrow C \rightarrow B \rightarrow E \rightarrow A$

What is the time interval (in minutes) between the moment the first woman began transmitting her message and the moment D received a message

D's message contained only dots.

Since D's is the first message to be transmitted, it will take 60 seconds to be transmitted. D's message contained only dots. Therefore, the number of dots used by D will either be $60/6$ or $60/8$. The number of dots has to be an integer. Therefore, each dot takes 6 seconds to be transmitted and each dash takes 8 seconds to be transmitted. D's message contained 10 dots. From (iv), this is not valid.

Hence, only the first case is valid.

Q20. DIRECTIONS for question 20: Type in your answer in the input box provided below the question.

What is the total number of dots used in all the four messages combined?

From (v), since A did not transmit any messages, A was the last one to receive a message.

From (iii), if B was the first person to transmit a message, then nobody would have received a message before B did. From (iii), only one person transmitted a message after D did. Hence, D must be the third person to send a message. This case is possible.

If B is the second person to transmit a message, then one person would have transmitted her message before B did. In that case, D must be the second person to transmit a message. This is not possible.

If B is the third person to transmit a message, then two persons would have transmitted their messages before B did and so, three persons transmitted their messages after D did. Hence, D must be the first one to transmit a message. This case is possible.

If the B is the fourth person to transmit a message, then four persons must have transmitted their messages after D transmitted hers. This is not possible since there were only four messages that were transmitted.

Only two cases are possible. In both the cases, C was either the second or the fourth person to transmit a message. If C was the fourth person, from (iv), each space should last for 4 seconds. But each space is either 2, 6 or 8 seconds long. Therefore, C had to be the second person to transmit her message and E was the fourth one to do so.

The second message took 120 seconds to be transmitted and C used only 60 spaces in her message. This means that each space took two seconds to be transmitted.

Let us examine the cases.

Case 1: B was the first one to transmit a message.

The order here will be $B \rightarrow C \rightarrow D \rightarrow E \rightarrow A$

D's message contained only dots.

Since D's is the third message to be transmitted, it will take 180 seconds to be transmitted. D's message contained only dots. Therefore, the number of dots used by D will either be $180/6$ or $180/8$. The number of dots has to be an integer. Therefore, each dot takes 6 seconds to be transmitted and each dash takes 8 seconds to be transmitted. D's message contained 30 dots.

Let us say that B used a dots, b dashes and c spaces. This implies that $6a + 8b + 2c = 60$.

From (ii), each type of input is used by exactly two persons. From the above, C, D and A did not use any dashes. Therefore, B and E definitely used dashes. B's message takes 60 seconds to be transmitted.

Hence, b cannot be zero. The minimum value of b is 5. In that case, $6a + 2c = 20$. From (i), a and c are multiples of 5 and the only possible values a and c are 0 and 10 respectively.

Therefore, B used 5 dashes and 10 spaces in her message.

From (ii), it can be said that E used only dots and dashes. Let us say E used p dots and q dashes.

$$6p + 8q = 240 \text{ i.e. } q = \frac{120 - 3p}{4}$$

The only possible values of p and q such that they are multiples of 5 are $p = 20$ and $q = 15$.

The overall distribution is as follows:

	B	C	D	E	A
Dots	-	-	30	20	-
Dashes	5	-	-	15	-
Spaces	10	60	-	-	-

Case 2: D was the first one to send a message.

The order here will be $D \rightarrow C \rightarrow B \rightarrow E \rightarrow A$

What is the time interval (in minutes) between the moment the first woman began transmitting her message and the moment D received a message

D's message contained only dots.

Since D's is the first message to be transmitted, it will take 60 seconds to be transmitted. D's message contained only dots. Therefore, the number of dots used by D will either be $60/6$ or $60/8$. The number of dots has to be an integer. Therefore, each dot takes 6 seconds to be transmitted and each dash takes 8 seconds to be transmitted. D's message contained 10 dots. From (iv), this is not valid.

Hence, only the first case is valid.

D used 30 dots and E used 20 dots. Therefore, the total number of dots in all the four

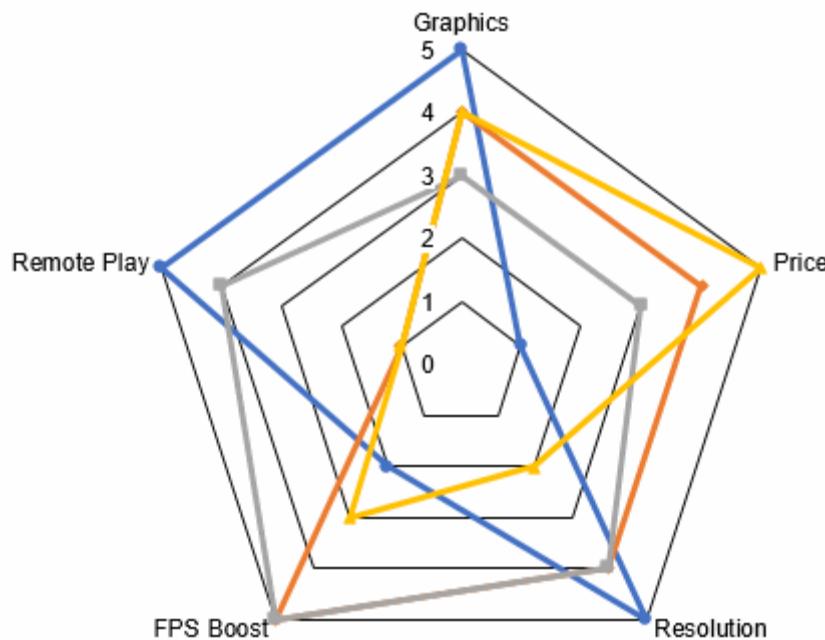
DIRECTIONS for questions 21 to 24: Answer the questions on the basis of the information given below.

Gautam was planning to purchase a gaming console and he decided to purchase one among SlayStation, MixBox, Bentendo Vee and Pega Genesis. He compared the four gaming consoles on five parameters – Graphics, Price, Resolution, FPS Boost and Remote Play – and rated the consoles on each of the parameters on a scale from 0 to 5. Further, he planned to calculate the overall rating for each of the consoles in the following manner:

$$\text{Overall Rating of any console} = \frac{\text{Sum of the five ratings for that console}}{\text{Difference between the highest and lowest ratings in any parameter for that console}}$$

He decided to purchase the console with the highest overall rating.

He also plotted a chart, which is given below, based on his ratings on each parameter, but he deleted the legend of the chart by mistake.



However, he knows the following information about the ratings:

- i. Pega Gen's overall rating is not more than that of Bentendo Vee's.

- ii. The average of the lowest and the second lowest ratings (on any parameters) is the same for both MixBox and Bentendo Vee.

Q21. DIRECTIONS *for questions 21 to 24*: Select the correct alternative from the given choices.
Which of the following consoles would Gautam purchase?

a) **Slaystation**

b) **MixBox**

c) **Pega Gen**

d) **Bentendo Vee**

From the given chart, the following information can be obtained:

	Console 1	Console 2	Console 3	Console 4
Graphics	5	4	3	4
Price	1	4	3	5
Resolution	5	4	4	2
FPS Boost	2	5	5	3
Remote Play	5	1	4	1

The average of the lowest and the second lowest rating for Console 1 = $\frac{1+2}{2} = 1.5$

Average of the lowest and the second lowest rating for Console 2 = $\frac{1+4}{2} = 2.5$

Average of the lowest and the second lowest rating for Console 3 = $\frac{3+4}{2} = 3.5$

Average of the lowest and the second lowest rating for Console 4 = $\frac{1+2}{2} = 1.5$

From (ii), we can infer that MixBox and Bentendo are Consoles 1 and 4, not necessarily in that order.

Overall Rating for Console 1 (MixBox/Bentendo) = $\frac{5 + 1 + 5 + 2 + 5}{5 - 1} = 4.5$

Overall Rating for Console 2 = $\frac{4 + 4 + 4 + 5 + 1}{5 - 1} = 4.5$

Overall Rating for Console 3 = $\frac{3 + 3 + 4 + 5 + 4}{5 - 3} = 9.5$

Overall Rating for Console 4 (Bentendo/ MixBox) = $\frac{4 + 5 + 2 + 3 + 1}{5 - 1} = 3.75$

From the above, we can say that Pega Gen's rating is either 4.5 or 9.5. But from (i), Pega Gen cannot have the highest overall rating. Hence, its overall rating has to be 4.5. This implies that Pega Gen is Console 2 and Slaystation is Console 3.

Also, from (i), Console 4 cannot be Bentendo because its overall rating is less than that of Pega Gen's. Therefore, Console 4 is MixBox and Console 1 is Bentendo.

Slaystation had the highest overall rating. Therefore, Gautam would purchase Slaystation.
Choice (A)

Q22. DIRECTIONS for questions 21 to 24: Select the correct alternative from the given choices.
What was the overall rating of Bentendo Vee?

a) 4.5

b) 9.5

c) 3.75

d) Cannot be determined

From the given chart, the following information can be obtained:

	Console 1	Console 2	Console 3	Console 4
Graphics	5	4	3	4
Price	1	4	3	5
Resolution	5	4	4	2
FPS Boost	2	5	5	3
Remote Play	5	1	4	1

The average of the lowest and the second lowest rating for Console 1 = $\frac{1+2}{2} = 1.5$

Average of the lowest and the second lowest rating for Console 2 = $\frac{1+4}{2} = 2.5$

Average of the lowest and the second lowest rating for Console 3 = $\frac{3+3}{2} = 3$

Average of the lowest and the second lowest rating for Console 4 = $\frac{1+2}{2} = 1.5$

From (ii), we can infer that MixBox and Bentendo are Consoles 1 and 4, not necessarily in that order.

Overall Rating for Console 1 (MixBox/Bentendo) = $\frac{5 + 1 + 5 + 2 + 5}{5 - 1} = 4.5$

Overall Rating for Console 2 = $\frac{4 + 4 + 4 + 5 + 1}{5 - 1} = 4.5$

Overall Rating for Console 3 = $\frac{3 + 3 + 4 + 5 + 4}{5 - 3} = 9.5$

Overall Rating for Console 4 (Bentendo/ MixBox) = $\frac{4 + 5 + 2 + 3 + 1}{5 - 1} = 3.75$

From the above, we can say that Pega Gen's rating is either 4.5 or 9.5. But from (i), Pega Gen cannot have the highest overall rating. Hence, its overall rating has to be 4.5. This implies that Pega Gen is Console 2 and Slaystation is Console 3.

Also, from (i), Console 4 cannot be Bentendo because its overall rating is less than that of Pega Gen's. Therefore, Console 4 is MixBox and Console 1 is Bentendo.

The overall rating of Bentendo Vee was 4.5.

Choice (A)

Q23. DIRECTIONS for questions 21 to 24: Select the correct alternative from the given choices.

What is the difference between the ratings that Slaystation and MixBox received in Remote Play?

a) 0

b) 1

c) **2**

d) **3**

From the given chart, the following information can be obtained:

	Console 1	Console 2	Console 3	Console 4
Graphics	5	4	3	4
Price	1	4	3	5
Resolution	5	4	4	2
FPS Boost	2	5	5	3
Remote Play	5	1	4	1

$$\text{The average of the lowest and the second lowest rating for Console 1} = \frac{1+2}{2} = 1.5$$

$$\text{Average of the lowest and the second lowest rating for Console 2} = \frac{1+4}{2} = 2.5$$

$$\text{Average of the lowest and the second lowest rating for Console 3} = \frac{3+3}{2} = 3$$

$$\text{Average of the lowest and the second lowest rating for Console 4} = \frac{1+2}{2} = 1.5$$

From (ii), we can infer that MixBox and Bentendo are Consoles 1 and 4, not necessarily in that order.

$$\text{Overall Rating for Console 1 (MixBox/Bentendo)} = \frac{5 + 1 + 5 + 2 + 5}{5 - 1} = 4.5$$

$$\text{Overall Rating for Console 2} = \frac{4 + 4 + 4 + 5 + 1}{5 - 1} = 4.5$$

$$\text{Overall Rating for Console 3} = \frac{3 + 3 + 4 + 5 + 4}{5 - 3} = 9.5$$

$$\text{Overall Rating for Console 4 (Bentendo/ MixBox)} = \frac{4 + 5 + 2 + 3 + 1}{5 - 1} = 3.75$$

From the above, we can say that Pega Gen's rating is either 4.5 or 9.5. But from (i), Pega Gen cannot have the highest overall rating. Hence, its overall rating has to be 4.5. This implies that Pega Gen is Console 2 and Slaystation is Console 3.

Also, from (i), Console 4 cannot be Bentendo because its overall rating is less than that of Pega Gen's. Therefore, Console 4 is MixBox and Console 1 is Bentendo.

Slaystation's rating in Remote Play = 4.

MixBox's rating in Remote Play = 1

Difference = 3.

Choice (D)

Q24. DIRECTIONS for questions 21 to 24: Select the correct alternative from the given choices.

What is the sum of the ratings of Pega Gen in Remote Play, Slaystation in FPS Boost and Mixbox in Resolution?

a) 7

b) **8**

c) **9**

d) **10**

From the given chart, the following information can be obtained:

	Console 1	Console 2	Console 3	Console 4
Graphics	5	4	3	4
Price	1	4	3	5
Resolution	5	4	4	2
FPS Boost	2	5	5	3
Remote Play	5	1	4	1

$$\text{The average of the lowest and the second lowest rating for Console 1} = \frac{1+2}{2} = 1.5$$

$$\text{Average of the lowest and the second lowest rating for Console 2} = \frac{1+4}{2} = 2.5$$

$$\text{Average of the lowest and the second lowest rating for Console 3} = \frac{3+4}{2} = 3.5$$

$$\text{Average of the lowest and the second lowest rating for Console 4} = \frac{1+2}{2} = 1.5$$

From (ii), we can infer that MixBox and Bentendo are Consoles 1 and 4, not necessarily in that order.

$$\text{Overall Rating for Console 1 (MixBox/Bentendo)} = \frac{5 + 1 + 5 + 2 + 5}{5 - 1} = 4.5$$

$$\text{Overall Rating for Console 2} = \frac{4 + 4 + 4 + 5 + 1}{5 - 1} = 4.5$$

$$\text{Overall Rating for Console 3} = \frac{3 + 3 + 4 + 5 + 4}{5 - 3} = 9.5$$

$$\text{Overall Rating for Console 4 (Bentendo/ MixBox)} = \frac{4 + 5 + 2 + 3 + 1}{5 - 1} = 3.75$$

From the above, we can say that Pega Gen's rating is either 4.5 or 9.5. But from (i), Pega Gen cannot have the highest overall rating. Hence, its overall rating has to be 4.5. This implies that Pega Gen is Console 2 and Slaystation is Console 3.

Also, from (i), Console 4 cannot be Bentendo because its overall rating is less than that of Pega Gen's. Therefore, Console 4 is MixBox and Console 1 is Bentendo.

The sum of the ratings of Pega Gen in Remote Play, Slaystation in FPS Boost and Mixbox in Resolution = 1 + 5 + 2 = 8.
Choice (B)

DIRECTIONS for questions 25 to 28: Answer the questions on the basis of the information given below.

There are three people – Loki, Canary and Selina – living in a building that has four floors. Each person lives on a different floor and one floor is empty. The floors are numbered 1 to 4, from bottom to top, i.e., the floor numbered 1 is at the bottom, while the floor numbered 4 is at the top. Each person belongs to a different category among truthtellers, who always speak the truth, liars, who always lie, and alternators, who alternate between making a true statement and a false statement, in any order.

Each of them made three statements which are given below.

Loki: *Only if I am a truthteller, Canary can be a liar.*
 I am not a liar.
 I live on the floor numbered 4.

Canary: *If Selina is not a liar, I am an alternator.*
 I live on the floor numbered 1 and Loki does not live on the floor numbered 2.
 I am an alternator.

Selina: *I am a liar or I am not a truthteller.*
 The floor numbered 1 is empty.
 Loki is a truthteller.

Q25. DIRECTIONS for questions 25 and 26: Select the correct alternative from the given choices.
Who lives on the floor numbered 1?

- a) Selina
- b) Loki
- c) Canary
- d) Cannot be determined

The statements 'I am a liar' and 'I am not a truthteller' cannot be made by a truthteller because in that case, they would be false statements. Also, they cannot be made by a liar because in that case, they would be true statements and a liar cannot make true statements. Therefore, the statements can only be made by an alternator.

Consider Selina's first statement. If it is a true statement, then at least one of the two statements has to be true. In that case, Selina will be an alternator.

If it is a false statement, then both the statements, "I am a liar" and "I am not a truthteller" will be false. This implies that Selina is a truthteller. But this will not be valid because a truthteller cannot make false statements. Therefore, Selina is definitely an alternator.

Since her first statement is true, her second and third statements will be false and true respectively.

Her second statement is false. Hence, the floor numbered 1 is not empty. Since her third statement is true, Loki is the truthteller.

Since each person belongs to a different category, Canary is a liar.

Let us consider Loki's statements. All three statements have to be true.

Loki lives on the floor numbered 4.

Let us consider Canary's statements. All three statements have to be false.

If Selina is not a liar, Canary should be an alternator. But Canary is not. This statement is consistent.

For Canary's second statement to be false, at least one of the two statements, "I live on the third floor" and "Loki does not live on the second floor", has to be false. Since the latter is true, the former has to be false. Therefore, Canary does not live on the first floor.

Since the floor numbered 1 is not empty and neither Loki nor Canary are on the floor numbered 1, Selina is the one living on the floor numbered 1. Canary lives on either the floor numbered 2 or 3.

Selina lives on the floor numbered 1.

Choice (A)

Q26. DIRECTIONS for questions 25 and 26: Select the correct alternative from the given choices.
Who among the following is the liar?

a) Selina

- b) Loki
- c) Canary
- d) Cannot be determined

The statements 'I am a liar' and 'I am not a truthteller' cannot be made by a truthteller because in that case, they would be false statements. Also, they cannot be made by a liar because in that case, they would be true statements and a liar cannot make true statements. Therefore, the statements can only be made by an alternator.

Consider Selina's first statement. If it is a true statement, then at least one of the two statements has to be true. In that case, Selina will be an alternator.

If it is a false statement, then both the statements, "I am a liar" and "I am not a truthteller" will be false. This implies that Selina is a truthteller. But this will not be valid because a truthteller cannot make false statements. Therefore, Selina is definitely an alternator.

Since her first statement is true, her second and third statements will be false and true respectively.

Her second statement is false. Hence, the floor numbered 1 is not empty. Since her third statement is true, Loki is the truthteller.

Since each person belongs to a different category, Canary is a liar.

Let us consider Loki's statements. All three statements have to be true.

Loki lives on the floor numbered 4.

Let us consider Canary's statements. All three statements have to be false.

If Selina is not a liar, Canary should be an alternator. But Canary is not. This statement is consistent.

For Canary's second statement to be false, at least one of the two statements, "I live on the third floor" and "Loki does not live on the second floor", has to be false. Since the latter is true, the former has to be false. Therefore, Canary does not live on the first floor.

Since the floor numbered 1 is not empty and neither Loki nor Canary are on the floor numbered 1, Selina is the one living on the floor numbered 1. Canary lives on either the floor numbered 2 or 3.

Canary is the liar.

Choice (C)

Q27. DIRECTIONS for question 27: Type in your answer in the input box provided below the question.

What is the sum of the numbers of the floors on which Loki and Selina live?

The statements 'I am a liar' and 'I am not a truthteller' cannot be made by a truthteller because in that case, they would be false statements. Also, they cannot be made by a liar because in that case, they would be true statements and a liar cannot make true statements. Therefore, the statements can only be made by an alternator.

Consider Selina's first statement. If it is a true statement, then at least one of the two statements has to be true. In that case, Selina will be an alternator.

If it is a false statement, then both the statements, "I am a liar" and "I am not a truthteller" will be false. This implies that Selina is a truthteller. But this will not be valid because a truthteller cannot make false statements. Therefore, Selina is definitely an alternator.

Since her first statement is true, her second and third statements will be false and true respectively.

Her second statement is false. Hence, the floor numbered 1 is not empty. Since her third statement is true, Loki is the truthteller.

Since each person belongs to a different category, Canary is a liar.

Let us consider Loki's statements. All three statements have to be true.

Loki lives on the floor numbered 4.

Let us consider Canary's statements. All three statements have to be false.

If Selina is not a liar, Canary should be an alternator. But Canary is not. This statement is consistent.

For Canary's second statement to be false, at least one of the two statements, "I live on the third floor" and "Loki does not live on the second floor", has to be false. Since the latter is true, the former has to be false. Therefore, Canary does not live on the first floor.

Since the floor numbered 1 is not empty and neither Loki nor Canary are on the floor numbered 1, Selina is the one living on the floor numbered 1. Canary lives on either the floor numbered 2 or 3.

Loki's floor number is 4. Selina's floor number is 1. Sum of the floor numbers will be 5.

Ans: (5)

Q28. DIRECTIONS for question 28: Select the correct alternative from the given choices.

If Canary lives on an even numbered floor, which of the following floors is the empty floor?

a) 1

b) 2

c) 3

d) 4

The statements 'I am a liar' and 'I am not a truthteller' cannot be made by a truthteller because in that case, they would be false statements. Also, they cannot be made by a liar because in that case, they would be true statements and a liar cannot make true statements. Therefore, the statements can only be made by an alternator.

Consider Selina's first statement. If it is a true statement, then at least one of the two statements has to be true. In that case, Selina will be an alternator.

If it is a false statement, then both the statements, "I am a liar" and "I am not a truthteller" will be false. This implies that Selina is a truthteller. But this will not be valid because a truthteller cannot make false statements. Therefore, Selina is definitely an alternator.

Since her first statement is true, her second and third statements will be false and true respectively.

Her second statement is false. Hence, the floor numbered 1 is not empty. Since her third statement is true, Loki is the truthteller.

Since each person belongs to a different category, Canary is a liar.

Let us consider Loki's statements. All three statements have to be true.

Loki lives on the floor numbered 4.

Let us consider Canary's statements. All three statements have to be false.

If Selina is not a liar, Canary should be an alternator. But Canary is not. This statement is consistent.

For Canary's second statement to be false, at least one of the two statements, "I live on the third floor" and "Loki does not live on the second floor", has to be false. Since the latter is true, the former has to be false. Therefore, Canary does not live on the first floor.

Since the floor numbered 1 is not empty and neither Loki nor Canary are on the floor numbered 1, Selina is the one living on the floor numbered 1. Canary lives on either the floor numbered 2 or 3.

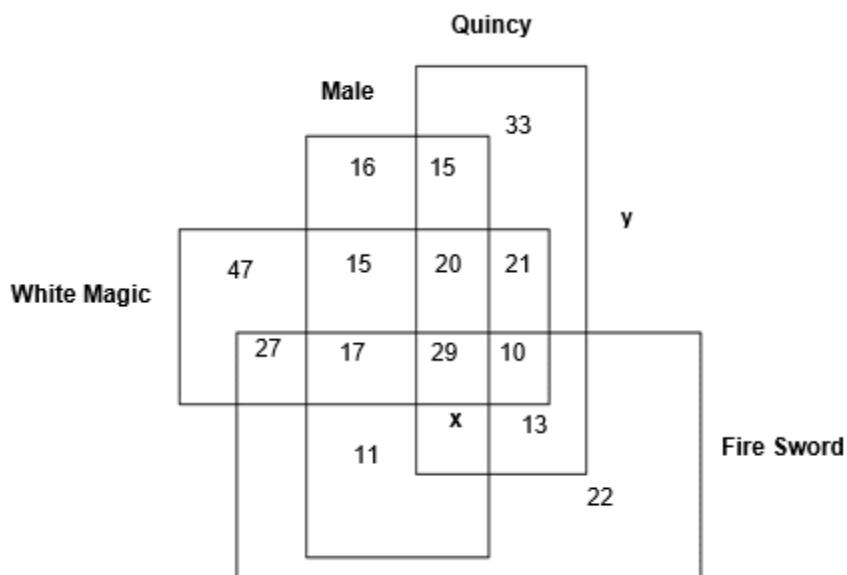
If Canary lives on an even numbered floor, then it will be the floor numbered 2. In that case, floor numbered 3 will be the empty floor.

Choice (C)

DIRECTIONS for questions 29 to 32: Answer the questions on the basis of the information given below.

On the magical island of Gumpville, there are a total of 360 islanders, such that for every two male islanders, there are three female islanders. Every islander belongs to exactly one of the two tribes, Shinigami and Quincy. Each islander practises exactly one of the two types of magic prevalent on the island, Dark Arts and White Magic. Further, each islander owns exactly one mystic weapon between an Ice Shield and a Fire Sword.

The following Venn Diagram illustrates the number of islanders belonging to different categories:



Q29. DIRECTIONS for question 29: Type in your answer in the input box provided below the question.

How many islanders practice Dark Arts and own a Fire Sword?

Here, we have four categories – Gender, Tribe, Practice, and Mystical Weapon. In each category, there are two types, and any islander belongs to exactly one of these types.

In the figure given below, any islander inside the region represented by 'Male' is a male and any islander outside of it is female.

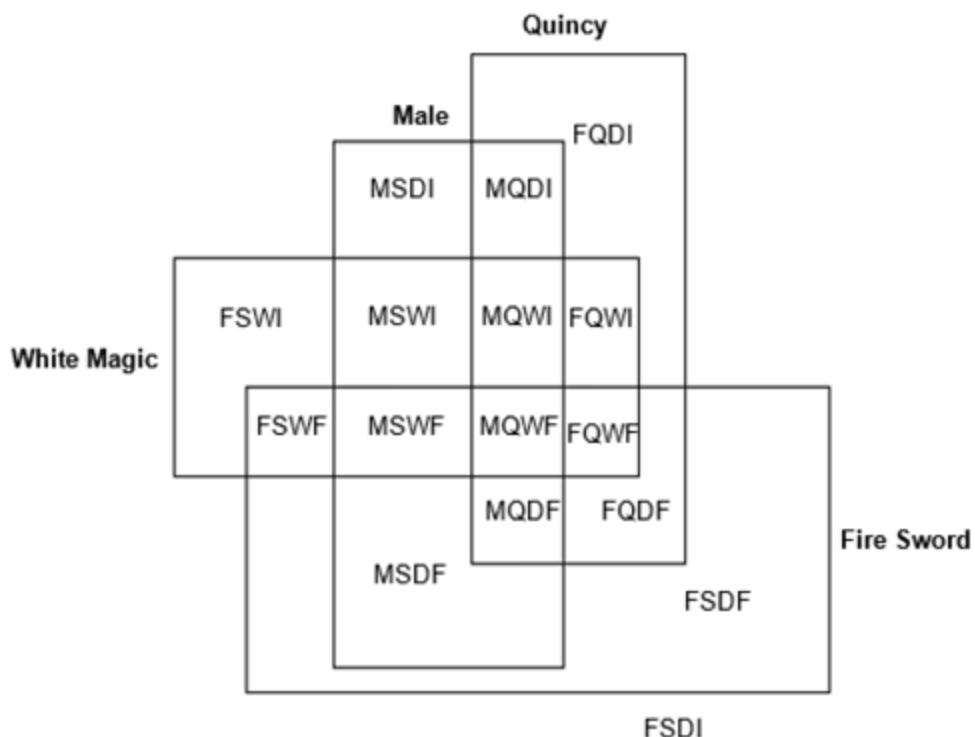
Any islander inside the region represented by 'Quincy' belongs to the Quincy tribe and any islander outside of it belongs to the Shinigami tribe.

Any islander inside the region represented by 'White Magic' practises White Magic and any islander outside of it practises Dark Arts.

Any islander inside the region represented by 'Fire Sword' owns a Fire Sword and any islander outside of it owns an Ice Shield.

Let us represent each region in the following sequence – Gender(M/F)-Tribe(Q/S)-Practice(W/D)-Weapon(I/F). For example, in the figure shown below, **MSWF** represents Males belonging to Shinigami tribe practicing White Magic and owning a Fire Sword.

Therefore, what each region in the Venn Diagram represents is shown in the figure below:



It is given that the ratio of males and females on the island is 2 : 3. Therefore, the total number of males on the island will be $\frac{2}{5} \times 360 = 144$.

Hence, the value of x in the given figure will be $144 - 123 = 21$.

Also, there are a total number of 360 inhabitants on the island. From this, we can calculate the value of y as $y = 360 - 317 = 43$.

- The number of islanders who practice Dark Arts and own a Fire Sword can be found out by adding the numbers in the region outside of 'White Magic' and inside 'Fire Sword', i.e. **MQDF + MSDF + FQDF + FSDF = 21 + 11 + 13 + 22 = 67**.

Ans: (67)

Q30. DIRECTIONS *for question 30*: Select the correct alternative from the given choices.
How many islanders belonging to the Shinigami tribe either own an Ice Shield or practice White Magic but not both?

a) **103**

b) **69**

c) **96**

d) **107**

Here, we have four categories – Gender, Tribe, Practice, and Mystical Weapon. In each category, there are two types, and any islander belongs to exactly one of these types.

In the figure given below, any islander inside the region represented by 'Male' is a male and any islander outside of it is female.

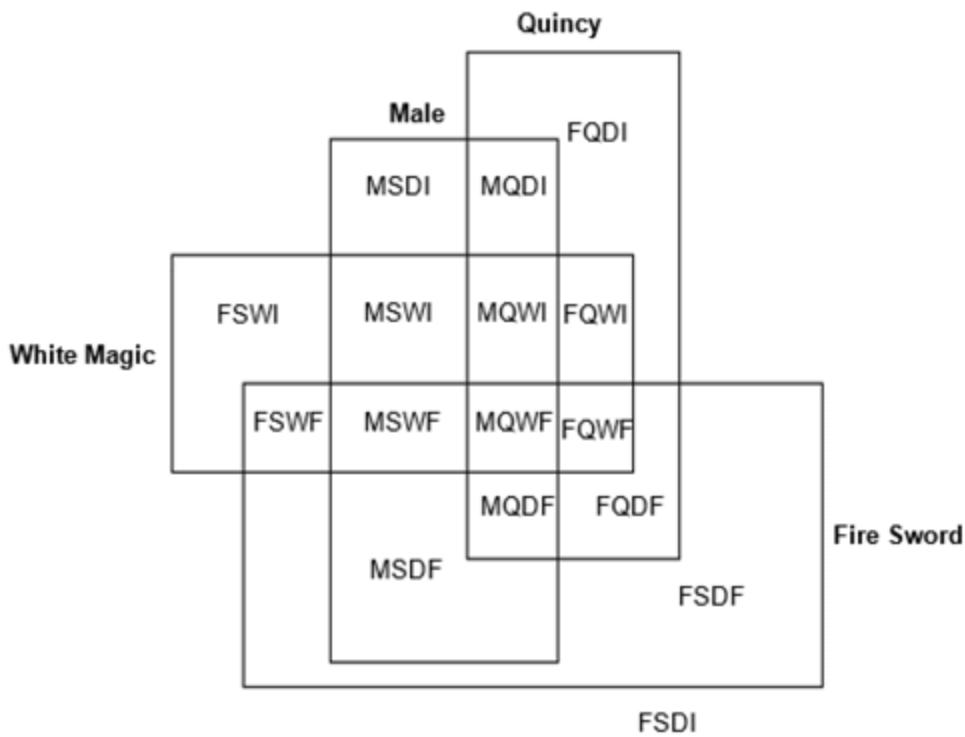
Any islander inside the region represented by 'Quincy' belongs to the Quincy tribe and any islander outside of it belongs to the Shinigami tribe.

Any islander inside the region represented by 'White Magic' practises White Magic and any islander outside of it practises Dark Arts.

Any islander inside the region represented by 'Fire Sword' owns a Fire Sword and any islander outside of it owns an Ice Shield.

Let us represent each region in the following sequence – Gender(M/F)-Tribe(Q/S)-Practice(W/D)-Weapon(I/F). For example, in the figure shown below, **MSWF** represents Males belonging to Shinigami tribe practicing White Magic and owning a Fire Sword.

Therefore, what each region in the Venn Diagram represents is shown in the figure below:



It is given that the ratio of males and females on the island is 2 : 3. Therefore, the total number of males on the island will be $\frac{2}{5} \times 360 = 144$.

Hence, the value of x in the given figure will be $144 - 123 = 21$.

Also, there are a total number of 360 inhabitants on the island. From this, we can calculate the value of y as $y = 360 - 317 = 43$.

The number of islanders who belong to the Shinigami tribe and own an Ice Shield will be **MSWI + FSWI + MSDI + FSDI**. Since we are not including those who belong to the Shinigami tribe, practice White Magic and own an Ice Shield, we are only adding **MSDI + FSDI = 16 + 43 = 59**.

The number of islanders who belong to the Shinigami tribe and practice White Magic will be **MSWI + MSWF + FSWI + FSWF**. Since we are not including those who belong to the Shinigami tribe, practice White Magic and own an Ice Shield, we are only adding **MSWF + FSWF = 17 + 27 = 44**.

Therefore, the number of islanders belonging to the Shinigami tribe who either own an Ice Shield or practice White Magic but not both is $59 + 44 = 103$. Choice (A)

Q31. DIRECTIONS *for question 31*: Type in your answer in the input box provided below the question.

What is the difference between the number of females belonging to the Shinigami tribe and owning Ice Shields and the number of males belonging to the Quincy tribe and practicing White Magic?

Here, we have four categories – Gender, Tribe, Practice, and Mystical Weapon. In each category, there are two types, and any islander belongs to exactly one of these types.

In the figure given below, any islander inside the region represented by 'Male' is a male and any islander outside of it is female.

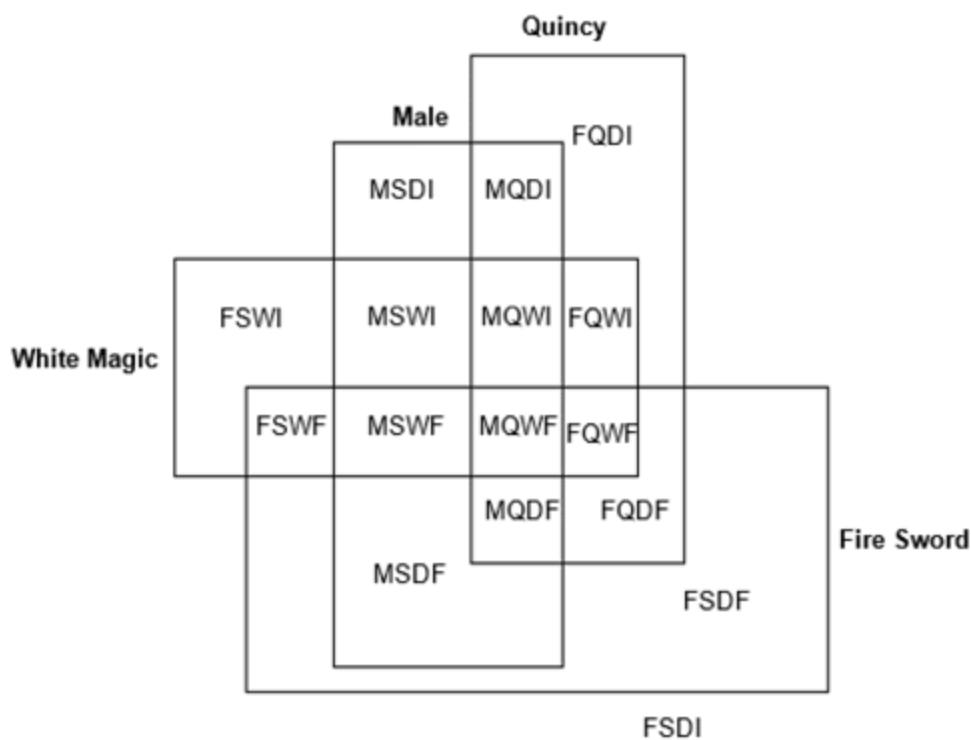
Any islander inside the region represented by 'Quincy' belongs to the Quincy tribe and any islander outside of it belongs to the Shinigami tribe.

Any islander inside the region represented by 'White Magic' practises White Magic and any islander outside of it practises Dark Arts.

Any islander inside the region represented by 'Fire Sword' owns a Fire Sword and any islander outside of it owns an Ice Shield.

Let us represent each region in the following sequence – Gender(**M/F**)-Tribe(**Q/S**)-Practice(**W/D**)-Weapon(**I/F**). For example, in the figure shown below, **MSWF** represents Males belonging to Shinigami tribe practicing White Magic and owning a Fire Sword.

Therefore, what each region in the Venn Diagram represents is shown in the figure below:



It is given that the ratio of males and females on the island is 2 : 3. Therefore, the total number of males on the island will be $\frac{2}{5} \times 360 = 144$.

Hence, the value of x in the given figure will be $144 - 123 = 21$.

Also, there are a total number of 360 inhabitants on the island. From this, we can calculate the value of y as $y = 360 - 317 = 43$.

The number of females belonging to the Shinigami tribe and owning Ice Shields = $FSWI + FSDI = 47 + 43 = 90$.

The number of males belonging to the Quincy tribe and practicing White Magic = $MQWI + MQWF = 20 + 29 = 49$.

Difference = $90 - 49 = 41$.

Ans: (41)

Q32. DIRECTIONS for question 32: Select the correct alternative from the given choices.
What is the total number of females who neither own an Ice Shield nor belong to the Quincy tribe?

a) **49**

b) **22**

c) **72**

d) **57**

Here, we have four categories – Gender, Tribe, Practice, and Mystical Weapon.

In each category, there are two types, and any islander belongs to exactly one of these types.

In the figure given below, any islander inside the region represented by 'Male' is a male and any islander outside of it is female.

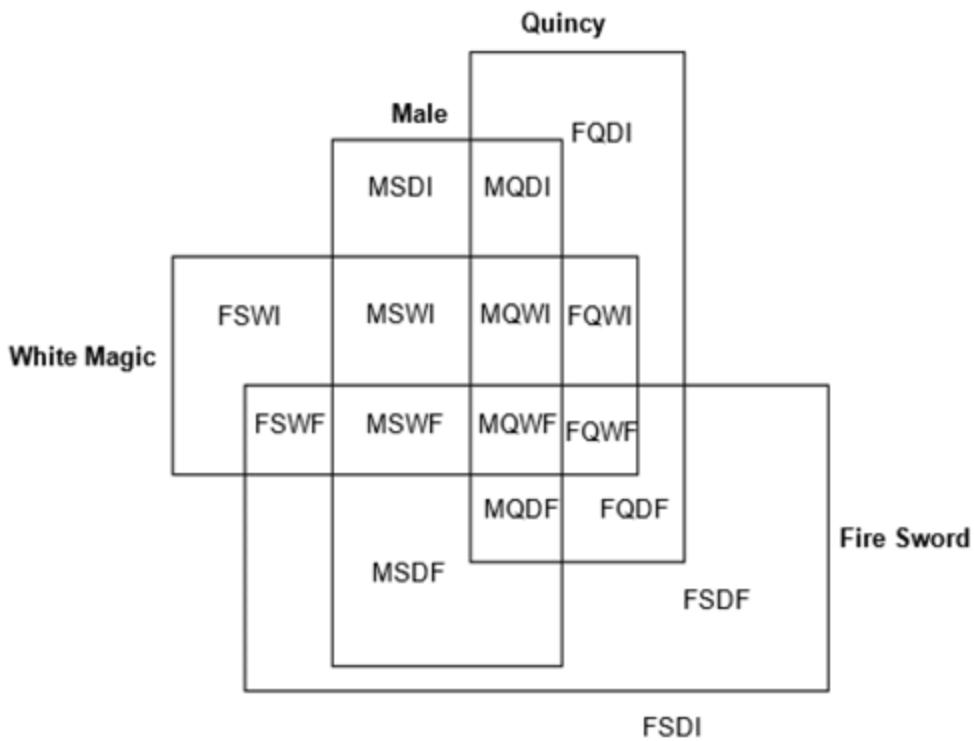
Any islander inside the region represented by 'Quincy' belongs to the Quincy tribe and any islander outside of it belongs to the Shinigami tribe.

Any islander inside the region represented by 'White Magic' practises White Magic and any islander outside of it practises Dark Arts.

Any islander inside the region represented by 'Fire Sword' owns a Fire Sword and any islander outside of it owns an Ice Shield.

Let us represent each region in the following sequence – Gender(**M/F**)-Tribe(**Q/S**)-Practice(**W/D**)-Weapon(**I/F**). For example, in the figure shown below, **MSWF** represents Males belonging to Shinigami tribe practicing White Magic and owning a Fire Sword.

Therefore, what each region in the Venn Diagram represents is shown in the figure below:



It is given that the ratio of males and females on the island is 2 : 3. Therefore, the total number of males on the island will be $\frac{2}{5} \times 360 = 144$.

Hence, the value of x in the given figure will be $144 - 123 = 21$.

Also, there are a total number of 360 inhabitants on the island. From this, we can calculate the value of y as $y = 360 - 317 = 43$.

- The total number of females who neither own an Ice Shield nor belong to the Quincy tribe = **FSDF + FSWF** = $22 + 27 = 49$. Choice (A)

Q1. DIRECTIONS for question 1: Select the correct alternative from the given choices.

A goat is tied at the corner of a rectangular compound wall, of dimensions $14\text{ m} \times 7\text{ m}$, with a rope 21 m long. If the goat is tied outside the wall such that it can graze on the ground around and outside the compound wall, but not inside, as far as it is permitted by the rope, find the area (in sq.m.) on which it can graze.

a) 1232

b) 1560.5

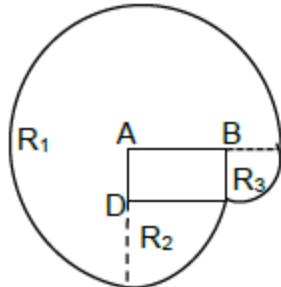
c) 1260

d) 1543.5

Let the compound wall be ABCD

Let the goat be tied to corner A.

Let $AB = 14\text{ m}$ and $BC = 7\text{ m}$



In the figure above, R_1 , R_2 and R_3 denote the area on which the goat can graze. R_1 is $\frac{3}{4}$ of a circle of radius 21 m . R_2 and R_3 are $\frac{1}{4}$ of circles of radii 14 m and 7 m respectively.

\therefore The area on which the goat can graze

$$= \pi \left[\frac{3}{4}(21^2) + \frac{1}{4}(14^2 + 7^2) \right]$$

$$= \frac{\pi}{4} (1323 + 196 + 49) \text{ m}^2 = \frac{22}{7} \left(\frac{1}{4} \right) 1568 \text{ m}^2 = 1232 \text{ m}^2$$

Choice (A)

Q2. DIRECTIONS for question 2: Type in your answer in the input box provided below the question.
How many factors of 4800 are divisible by 40?

Given $N = 4800 = (40)(120)$

Clearly, the number of factors of N which are divisible by 40 are nothing but the
number of factors of 120, which is 16.

Ans: (16)

Q3. DIRECTIONS for question 3: Select the correct alternative from the given choices.

If the non-reflex angle between the hour-hand and the minute-hand of a clock 10 minutes from now
will be the same as what it was 30 minutes ago, what is the non-reflex angle between the hands of
the clock now?

Note: Any angle that is less than 180° is called a non-reflex angle.

- a) 60° or 120°
- b) 55° or 125°
- c) 55° or 155°
- d) 110° or 70°

Let the present time be t . Then, it is given that the angle between the minute hand and
the hour hand was the same at $(t - 30)$ minutes and $(t + 10)$ minutes. Hence exactly
midway between these two times, i.e., at $(t - 10)$ minutes, the two hands of the clock
must have either coincided or must have been at 180° to each other.

Hence, angle between the hands of the clock now, i.e., 10 minutes after
 $(t - 10)$ minutes, would be either $(0^\circ + 5\frac{1}{2}^\circ \text{ per min} \times 10 \text{ min}) = 55^\circ$ (in case the hands
coincide at $(t - 10 \text{ min})$ OR $(180^\circ - 5\frac{1}{2}^\circ \text{ per min} \times 10 \text{ min}) = 125^\circ$ (in case the two
hands were at 180° to each other at $(t - 10) \text{ min}$). Choice (B)

Q4. DIRECTIONS for question 4: Type in your answer in the input box provided below the question.
If $x = 8 + 8^{1/3} + 8^{2/3}$, then the value of $x^3 - 24x^2 + 168x - 381$ is

$$x = 8 + 8^{1/3} + 8^{2/3}$$

$$\Rightarrow x = 8 + 2 + 4 \Rightarrow x = 14$$

Now substituting $x = 14$ in the given equation we get $(14)^3 - 24(14)^2 + 168(14) - 381 = 2744 - 4704 + 2352 - 381 = 5096 - 5085 = 11$. Ans: (11)

Q5. DIRECTIONS for questions 5 to 10: Select the correct alternative from the given choices.
If $S = \{3, 7, 11, 15, 19, \dots, 103\}$, and A is a non-empty proper subset of S such that all elements of A are multiples of 3, find the number of such subsets.

- a) 511 ✓ Your answer is correct
- b) 255
- c) 1023
- d) None of the above

The numbers are of the form $4k + 3$, $k = 0, 1, 2, \dots$

Total number of terms in S

$$\Rightarrow 3 + (n - 1)4 = 103 \Rightarrow n = 26$$

There will be a multiple of 3 for every three numbers from the second number onwards

$$\Rightarrow \text{Total multiples} = 1 + \frac{25}{3} = 9$$

The number of non-empty subsets of this set which are non-empty proper subsets of S of 9 elements = $2^9 - 1 = 511$ Choice (A)

Q6. DIRECTIONS for questions 5 to 10: Select the correct alternative from the given choices.
Mr. Ram formed the greatest possible natural number using four 2's. If no mathematical operation except exponentiation was used, what is the remainder when that number is divided by 9?

- a) 1
- b) 2
- c) 5
- d) 7

The greatest number (N) that can be formed using four 2's and only exponentiation is

$2^{2^{2^2}}$. Consider $N = 2^{2^2}$

Since 2^{2^2} leaves a remainder 1 when divided by 3, $2^{2^2} = 3K + 1$, where K is odd

$$\text{Now } N = 2^{2^{2^2}} \Rightarrow N = 2^{3K+1}$$

$$\Rightarrow N = (2^3)^K \times 2^1$$

Now if N is divided by 9, the remainder will be $(-1)^K \times 2 = -2$, i.e., 7 (since K is odd).

Choice (D)

Two circles are drawn in a rectangle such that each circle touches three sides of the rectangle and passes through the center of the other circle. If the area of the rectangle is 384 sq.cm., find the area that lies outside the circles but inside the rectangle.

a)

$$64 \left[6 - \frac{3\pi}{4} - \frac{\sqrt{3}}{2} \right] \text{ sq.cm.}$$

b)

$$64 \left[6 - \frac{4\pi}{3} - \frac{\sqrt{3}}{2} \right] \text{ sq.cm.}$$

c)

$$64 \left[6 - \frac{2\pi}{3} - \frac{\sqrt{3}}{4} \right] \text{ sq.cm.}$$

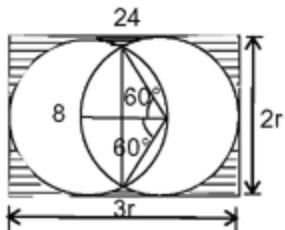
d)

$$64 \left[6 - \frac{3\pi}{4} - \frac{2}{\sqrt{3}} \right] \text{ sq.cm.}$$

From the figure, the length = $3r$ and height = $2r$, and Area = 384

$$\therefore 3r \times 2r = 384$$

$$\Rightarrow r = 8$$



The area that is common to the two circles

$$\begin{aligned} &= 2 \left(\frac{120^\circ}{360^\circ} \pi r^2 - \frac{\sqrt{3}}{4} r^2 \right) = \frac{2}{3} \pi r^2 - \frac{\sqrt{3}}{2} r^2 \\ &= \left[\frac{2\pi}{3} - \frac{\sqrt{3}}{2} \right] 8^2 \text{ cm}^2. \end{aligned}$$

The area of the unshaded region = The area of the two circles – The area common to the two circles

$$\begin{aligned} &= 2\pi(8)^2 - \left[\frac{2\pi}{3} - \frac{\sqrt{3}}{2} \right] 8^2 \text{ cm}^2 \\ &= 8^2 \left[2\pi - \frac{2\pi}{3} + \frac{\sqrt{3}}{2} \right] \text{ cm}^2 = 64 \left(\frac{4\pi}{3} + \frac{\sqrt{3}}{2} \right) \text{ cm}^2 \\ \therefore & \text{The area outside the circles} \\ &= \text{The area of the rectangle} - \text{the unshaded area} \\ &= 384 - 64 \left[\frac{4\pi}{3} + \frac{\sqrt{3}}{2} \right] = 64 \left[6 - \frac{4\pi}{3} - \frac{\sqrt{3}}{2} \right] \text{ cm}^2. \end{aligned}$$

Choice (B)

Q8. DIRECTIONS for questions 5 to 10: Select the correct alternative from the given choices.

Find the distance between the parallel lines $2x - 5y - 9 = 0$ and $10y = 4x - 93$.

a)

$$\frac{75}{2} \text{ units}$$

b)

$$\frac{75}{\sqrt{29}} \text{ units}$$

c) c)

$$\frac{75}{2\sqrt{29}} \text{ units}$$

d)

$$\frac{75}{4\sqrt{29}} \text{ units}$$

The equations can be written as $2x - 5y - 9 = 0$ and $4x - 10y - 93 = 0$ or
 $2x - 5y - 93/2 = 0$

The distance between the two parallel lines is

$$\frac{\left| -9 + \frac{93}{2} \right|}{\sqrt{2^2 + (-5)^2}} = \frac{75}{2\sqrt{29}} \text{ units}$$

Choice (C)

Q9. DIRECTIONS for questions 5 to 10: Select the correct alternative from the given choices.
I went to a wholesale fruit market to buy apples, bananas, chikkoos and mangoes. If three apples cost as much as 10 bananas, four bananas cost as much as 5 chikkoos and 9 chikkoos cost as much as 2 mangoes, which of the following combinations of fruits costs the most?

- a) 4 apples, 5 bananas, 6 chikkoos and 7 mangoes
- b) 7 apples, 6 bananas, 5 chikkoos and 4 mangoes
- c) 5 apples, 12 bananas, 14 chikkoos and 5 mangoes
- d) 5 apples, 5 bananas, 10 chikkoos and 10 mangoes

Let the cost per fruit for apples, bananas, chikkoos and mangoes be a , b , c and m respectively.

Given $3a = 10b$

$4b = 5c$ and $9c = 2m$

For ease of calculations assume $a = 50 \Rightarrow b = 15$, $c = 12$ and $m = 54$.

By observation, the combination given in the 4th choice will cost the maximum.

Choice (D)

Q10. DIRECTIONS for questions 5 to 10: Select the correct alternative from the given choices.

Find the value of $\log_7 125 \times \log_5 49$. Assume $\log_{10} 5 = 0.6990$ and $\log_{10} 7 = 0.8451$.

- a) 5
- b) 6
- c) 7
- d) **None of these**

$$\begin{aligned}\log_7 125 \times \log_5 49 \\ &= \frac{\log 125}{\log 7} \times \frac{\log 49}{\log 5} \quad \left[\because \log_b a = \frac{\log a}{\log b} \right] \\ &= \frac{3 \log 5}{\log 7} \times \frac{2 \log 7}{\log 5} = 3 \times 2 = 6.\end{aligned}$$

Choice (B)

Note: The values of $\log_{10} 5$ and $\log_{10} 7$ (given in the question) are not required in this case to arrive at the answer.

Q11. DIRECTIONS for question 11: Type in your answer in the input box provided below the question.

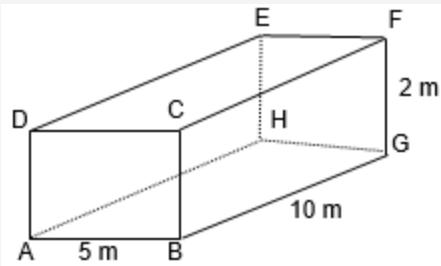
The number of integral values k can take, where $2 \leq k \leq 30$, such that the product $(k - 1).(k - 2) \dots (3).(2).(1)$ is not divisible by k , is

$(n - 1)!$ is not divisible n , if n is prime. There are 10 prime numbers in the given range. In addition to above 10 numbers, the given condition is also satisfied for $n = 4$. i.e., a total of 11 numbers.

Ans: (11)

Q12. DIRECTIONS for questions 12 and 13: Select the correct alternative from the given choices.

A lazy insect sitting at the corner A of a cuboidal room (shown below) wishes to crawl to the corner F of the room. Assuming that it cannot fly, the shortest distance it can traverse to reach F is



a)

$\sqrt{229}$ m

b)

$$(10 + \sqrt{29}) \text{ m}$$

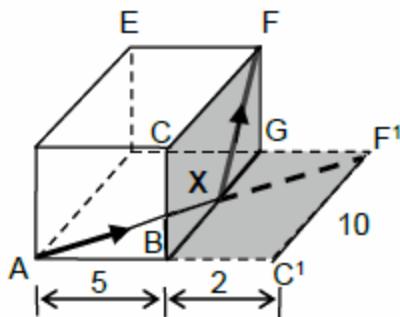
c)

$$\sqrt{129} \text{ m}$$

d)

$$\sqrt{149} \text{ m}$$

Let the face BCFG be opened and folded out as shown below.

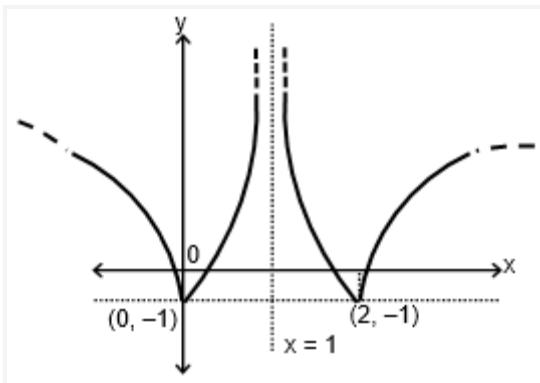


The shortest distance could be from A to X and X to F. To find AX + XF, imagine that the face BCFG is opened up, so the shortest distance will be

$$AF^1 = \sqrt{(5+2)^2 + 10^2} = \sqrt{149}$$

Choice (D)

Q13. DIRECTIONS for questions 12 and 13: Select the correct alternative from the given choices.
Which of the given functions best describes the following graph?



a)

$$\log \left| \frac{1}{x} - 1 \right|$$

b)

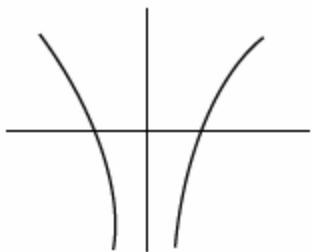
$$\left| \log |x-1| - 1 \right|$$

c)

$$\left| \log |x-1| \right| - 1$$

d)

$$\left| \log |x+1| \right| - 1$$



The graph of $\log|x|$ is shown in the figure above. If we take the mod, the parts below the x-axis would be reflected in the x-axis and we would get two curves like the ones shown in the question. But this entire graph has to be shifted 1 unit to the right and one unit downwards.

$\therefore y = |\log|x - 1|| - 1$ is the function that describes the given graph.

Note : Since the given graph assumes negative values, Choice (B) can clearly be eliminated (as it is non-negative), further $\log\left|\frac{1}{x} - 1\right|$, is not always greater than -1

(whereas the given graph is), for example $\log\left|\frac{1}{x} - 1\right| < -3$ for $0.9999 < x < 1$

(assuming the base as 10). Hence, only choices (C) and (D) are possible.

Choice (C)

Q14. DIRECTIONS for questions 14 and 15: Type in your answer in the input box provided below the question.

Rajat draws a 10×10 grid on the ground, comprising 100 identical squares and numbers the squares from 1 to 100. If he now wants to place two identical stones on any two separate squares in the grid, in how many distinct ways can he do it?

The number of ways of picking two squares out of 100 (numbered) squares = ${}^{100}C_2$
= 4950
Ans: (4950)

Q15. DIRECTIONS for questions 14 and 15: Type in your answer in the input box provided below the question.

Given a series 1, 2, 5, 10, 17, 26, 37,....., what is the sum of the first 50 terms of the series?

$$\text{Let } S_n = 1 + 2 + 5 + 10 + 17 + 26 + 37 + \dots + t_n$$

$$S_n = 1 + 2 + 5 + 10 + 17 + 26 + \dots + t_{n-1} + t_n$$

$$S_n - S_n = 1 + (1 + 3 + 5 + \dots + (n-1) \text{ terms}) - t_n$$

$$\Rightarrow t_n = 1 + (n-1)^2 = n^2 - 2n + 2$$

$$S_n = \sum t_n = \sum (n^2 - 2n + 2)$$

$$= \frac{n(n+1)(2n+1)}{6} - n(n+1) + 2n$$

$$\Rightarrow S_{50} = \frac{50(51)(101)}{6} - 50(51) + 100$$

$$= 42925 - 2550 + 100 = 40475.$$

Ans: (40475)

Q16. DIRECTIONS for questions 16 to 26: Select the correct alternative from the given choices.

There are 120 boxes, each of which contains any number of tennis balls, from a minimum of 130 to a maximum of 155. The maximum number of boxes containing the same number of tennis balls is at least

a) 4

b) 94

c) 5

d) 93

A box may contain any number of tennis balls from 130 to 155 i.e. a total of 26 possibilities (both 130 and 155 inclusive). Now to get the minimum number of boxes with equal number of balls, we have to distribute the total number of boxes among all the possible totals (i.e., 26)

$$120 = (26 \times 4) + 16$$

∴ When evenly distributed

16 possibilities (for the number of balls in a box i.e., 130 to 155) appear in 5 boxes each and the remaining 10 possibilities appear in only 4 boxes each. So the number of boxes containing the same number of balls is at least 5.

Choice (C)

Q17. DIRECTIONS for questions 16 to 26: Select the correct alternative from the given choices.

X and Y are two types of oils prepared by mixing olive oil and mustard oil in the ratio 11 : 3 and 2 : 5 respectively. If a third type of oil, Z, is prepared by mixing oils X and Y in the ratio $a : b$, such that the percentage of olive oil in the resulting mixture is 50%, find $a : b$.

a) 3 : 8

b) 1 : 1

c) 3 : 4

d) 11 : 5

$$\text{Given, } \frac{11a}{14} + \frac{2b}{7} = \frac{1}{2} (a + b)$$

$$\Rightarrow 11a + 4b = 7a + 7b$$

$$\Rightarrow 4a = 3b$$

$$\Rightarrow a : b = 3 : 4.$$

Choice (C)

Q18. DIRECTIONS for questions 16 to 26: Select the correct alternative from the given choices.

A 50-digit number has all 7's. Find the remainder when the number is divided by 74.

a) 43

b) 3

c) 23

d) 7

Any number of the form $yyy\dots y$, where y is any single digit number is always divisible by $111 = 3 \times 37$.

Hence, 777 is divisible by 37.

Hence, the number formed by repeating the digit 7, 48 times (multiple of 3 just below 50) is divisible by 37.

Hence, the remainder of the number 7..... 50 times divided by 74 = remainder of 100(7..... 48 times) divided by 74 + remainder of 77 divided by 74.

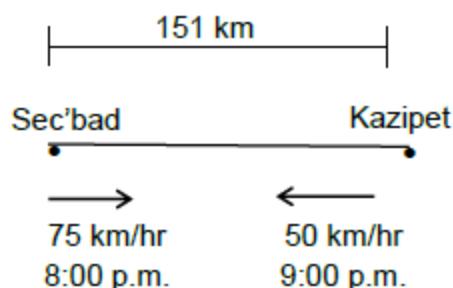
As 100(7..... 48 times) is always divisible by both 37 and 2, it is divisible by 74.

Hence the required remainder = remainder of 77 divided by 74 = 3. Choice (B)

Q19. DIRECTIONS for questions 16 to 26: Select the correct alternative from the given choices.

At 8:00 pm, Secunderabad – Kazipet nonstop express leaves Secunderabad for Kazipet, at a speed of 75 kmph. At 9:00 p.m., Kazipet – Secunderabad nonstop express leaves Kazipet for Secunderabad, at a speed of 50 kmph. At 9:30 p.m., the traffic controller realises that both the trains are on the same track. If the distance between Secunderabad and Kazipet is 151 km and a head on collision between two trains can be averted only when the two trains are at least one km apart, then the time left for the traffic controller to avert a head on collision between the two trains is

- a) **15 minutes.**
- b) **6 minutes.**
- c) **18 minutes.**
- d) **12 minutes.**



In an hour in by 9:00 p.m., Secunderabad-Kazipet Express would be at a distance of 76 (i.e., $151 - 75$) km from Kazipet. When the Kazipet-Secunderabad express also starts at 9:00 p.m., both trains can cover at most $76 - 1 = 75$ km together before a collision can be averted.

\therefore Time taken from 9:00 p.m.

$$= \frac{75}{(75+50)} = \frac{3}{5} \text{ hours} = 36 \text{ minutes}$$

\therefore They would be one km apart at 9:36 p.m. Hence, the traffic controller has only 6 minutes to avert the collision. Choice (B)

Q20. DIRECTIONS for questions 16 to 26: Select the correct alternative from the given choices.

Find the units digit of the sum $1^4 + 2^4 + 3^4 + \dots + 120^4$.

a) 0

b) 4

c) 6

d) 8

The units digit repeats for every 10 numbers.

∴ We need to calculate the units digit of $1^4 + 2^4 + 3^4 + \dots + 10^4$, which is the units digit of $1 + 16 + 81 + \dots + 10000 = 1 + 6 + 1 + 6 + 5 + 6 + 1 + 6 + 1 + 0 = 33$

∴ The units digit is 3.

But there are $\frac{120}{10} = 12$ such sets.

∴ Units digit of the sum = units digit of $(12)(3) = 6$

Choice (C)

Q21. DIRECTIONS for questions 16 to 26: Select the correct alternative from the given choices.

If $\log_m 36 = P$ and $\log_m 72 = Q$, then which of the following statements is true?

a) $\log_m 576 = (Q - P)(2\log_2 3 + 4)$

b) $\log_m 512 = 8(Q - P)$

c) $\log_m 576 = (Q - P)(2\log_2 3 + 6)$

d) $\log_m 128 = 6Q - 4P$

Clearly $\log_m 72 = \log_m 36 + \log_m 2$

$$\Rightarrow \log_m 2 = Q - P$$

$$\Rightarrow \log_m 512 = \log_m (2^9) = 9(Q - P) \text{ and } \log_m 128 = 7(Q - P)$$

Clearly choices (B) and (D) are not true.

Consider $\log_m 576 = \log_m (2^8 \times 3^2)$

$$= 6\log_m 2 + 2\log_m 3$$

$$= 6\log_m 2 + 2\log_2 3 \times \log_2 2$$

$$= \log_m 2 (2\log_2 3 + 6)$$

$$= (Q - P) (2\log_2 3 + 6)$$

Clearly, choice (C) is true.

Choice (C)

Q22. DIRECTIONS for questions 16 to 26: Select the correct alternative from the given choices.

Ben was using the following algorithm:

Step 1: Read p, q . Set $r = 0, s = 0$

Step 2: If $p > q$, then $r = p, p = q, q = r$

Step 3: $q = q - p, s = s + 1$

Step 4: If $p > q$, print s . Stop.

Step 5: Go to step 3.

If p and q are positive integers, what does Ben's algorithm give?

a) HCF of p and q .

b) Remainder after dividing the larger of the two by the smaller.

c) Quotient after dividing the larger of the two by the smaller.

d) None of the above

If $p > q$, then step 2 swaps p into q and q into p .

For example, if $p = 10$ and $q = 3$, then $r = p = 10$

$$p = q = 3$$

$$q = r = 10$$

$$p = 3; q = 10$$

In step 3, q is subtracted by p and s is incremented by 11, which gives the number of times p is subtracted from q .

In step 4, when p is greater than q , s is given as output, which is number of times p is subtracted from q , i.e., quotient, when 10 is divided by 3. Choice (C)

Q23. DIRECTIONS for questions 16 to 26: Select the correct alternative from the given choices.

If $p = (2^{123})(3^{96})(7^{28})$, $q = (2^{120})(3^{95})(7^{32})$, $r = (2^{126})(3^{97})(7^{25})$, $s = (2^{124})(3^{94})(7^{30})$, then the order of p , q , r , s , from the smallest to the largest is:

a) q, s, r, p

b) r, p, q, s

c) p, r, q, s

d) r, p, s, q ✓ Your answer is correct

$$p = 2^{120}(8)(3^{94})(9)(7^{25})(7^3) = (8)(9)(7^3)[(2^{120})(3^{94})(7^{25})]$$

$$q = (2^{120})(3^{94})(3)(7^{25})(7^7) = (3)(7^7)[(2^{120})(3^{94})(7^{25})]$$

$$r = (2^{120})(64)(3^{94})(27)(7^{25}) = (64)(27)[(2^{120})(3^{94})(7^{25})]$$

$$s = (2^{120})(16)(3^{94})(7^{25})(7^5) = (16)(7^5)[(2^{120})(3^{94})(7^{25})]$$

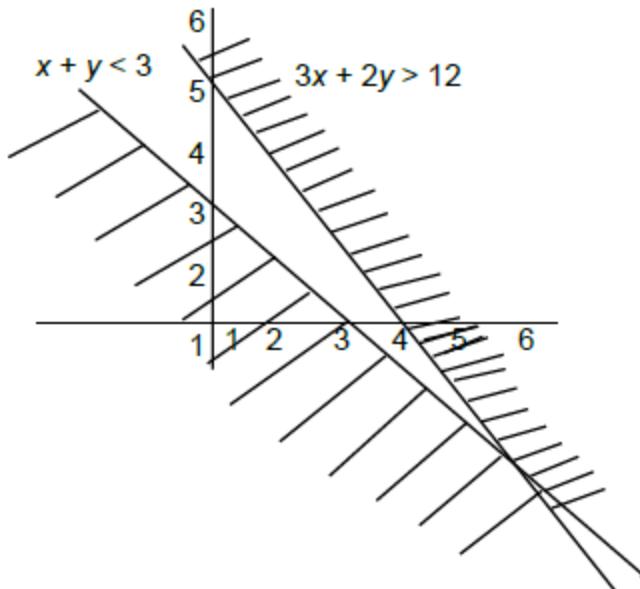
As $3(7^7) > 16(7^5) > 8(9)(7^3) > 64(27)$, $q > s > p > r$.

$$\therefore r < p < s < q$$

Choice (D)

Q24. DIRECTIONS for questions 16 to 26: Select the correct alternative from the given choices.
Which of the following is true of the areas represented by the inequalities $3x + 2y > 12$ and $y + x < 3$ in the co-ordinate plane?

- a) They are overlapping and finite
- b) They are overlapping and infinite
- c) They are non-overlapping and infinite
- d) They are non-overlapping and finite



The lines represented by $3x + 2y = 12$ and $x + y = 3$ are not parallel as the slopes are not equal. Hence, they are intersecting, (i.e., the areas represented definitely overlap).
The way they intersect is shown in the above diagram.

As can be seen from the graph, the areas are infinite with an overlap. Choice (B)

Q25. DIRECTIONS for questions 16 to 26: Select the correct alternative from the given choices.

Two functions, $f(x)$ and $g(x)$, are defined as $f(x) = g(x - 1)$ and $g(x) = \frac{1}{x^2 - 1}$. How many times do the graphs of these two functions intersect in the coordinate plane?

- a) 0
- b) 1
- c) 2
- d) 3

Since $g(x) = \frac{1}{x^2 - 1}$ and $f(x) = g(x - 1)$.

We get $f(x)$ by finding $g(x - 1)$, which is obtained by simply substituting $(x - 1)$ in the place of x in $g(x)$.

$$\Rightarrow f(x) = g(x - 1) = \frac{1}{(x-1)^2 - 1} = \frac{1}{x^2 - 2x}$$

Now if $f(x)$ and $g(x)$ intersect, then $f(x) = g(x)$.

$$\Rightarrow \frac{1}{x^2 - 2x} = \frac{1}{x^2 - 1}$$

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

This is the only solution of $f(x) = g(x)$.

Hence, the graphs intersect at only one point.

Choice (B)

Q26. DIRECTIONS for questions 16 to 26: Select the correct alternative from the given choices.

A function $f(x)$ is defined for a real variable x , as $f(x) = \max\{3x + 8, 25 - 4x, 12 - x\}$. The minimum possible value of $f(x)$ is

- a) $-\infty$

b) **11**

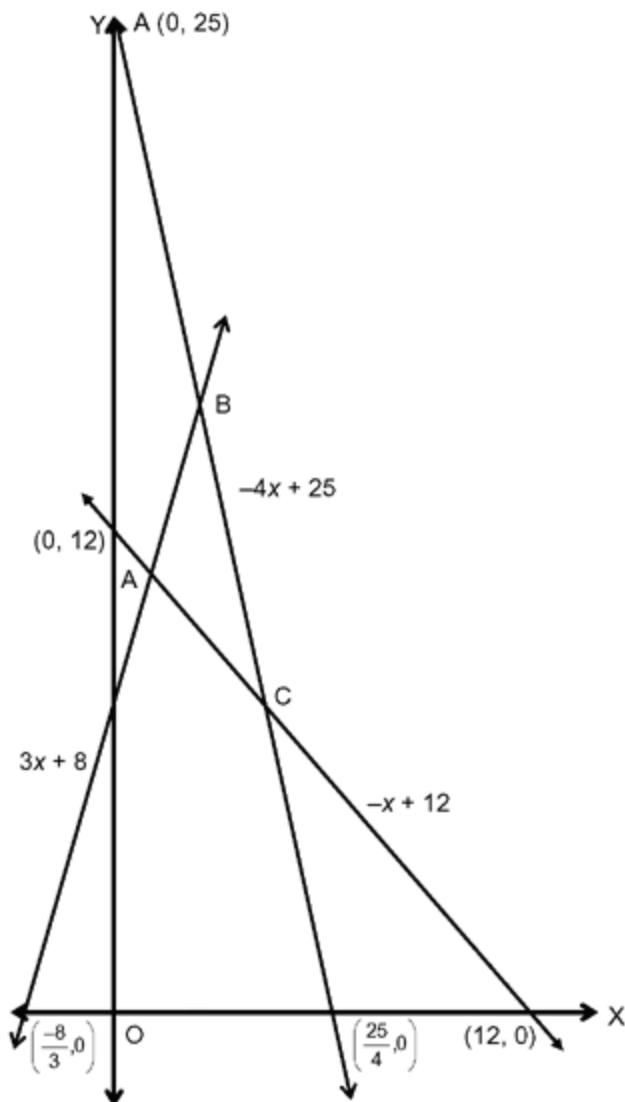
c) $\frac{23}{3}$

d) $\frac{107}{7}$

The question can be solved by considering the three expressions as three straight lines. Therefore, we will have three points where any two lines intersect each other. The required minimum (or maximum) will pertain to one of the three points of intersection.

The graph of the three lines can be drawn as below.

(Note: Drawing the graph is not essential to solving the question. The figure given below is only for better visualization and understanding)



From the graph, we see that the minimum value of $f(x)$ corresponds to B.

Solving for B, $3x + 8 = -4x + 25$

$$\Rightarrow x = \frac{17}{7} \text{ and } f(x) = \frac{51}{7} + \frac{56}{7} = \frac{107}{7}$$

Choice (D)

Q27. DIRECTIONS for questions 27 to 30: Type in your answer in the input box provided below the question.

Praful went to the market and bought apples, bananas and oranges. He purchased at least 25 fruits of each variety and calculated that if the cost of each orange was Rs.1 more and the cost of each banana was Rs.4 more, then his total expenditure on the fruits would have gone up by Rs.136. If he bought a total of 80 fruits, find the number of bananas he purchased.

Let the number of apples, bananas and oranges bought be a , b and g .

Given that $a + b + g = 80$; $a \geq 25$, $b \geq 25$, $g \geq 25$

$$\Rightarrow 25 \leq (a, b, g) \leq 30$$

As the increase in cost per orange by ₹1 and the increase in cost per banana by ₹4 increases the overall bill by ₹136, $g + 4b = 136$

In order to satisfy, the above condition, g must be a multiple of 4. Hence, it has to be 28.

Hence, b is 27 and a is 25.

Hence, Arjun purchased 27 bananas.

Ans: (27)

Q28. DIRECTIONS for questions 27 to 30: Type in your answer in the input box provided below the question.

A teacher asked Raju to write the cubes of the first $(2m + 1)$ natural numbers on the board and sum them. Raju missed out the cubes of two numbers. The sum of these two numbers was $(2m + 1)$. Raju added all the other $2m - 1$ cubes and gave his answer to his teacher. Not knowing that Raju had missed out the cubes of two numbers, she found the average of the sum and it turned out to be less than 6750. Find the greatest possible value of m .

$$1^3 + 2^3 + \dots + (2m+1)^3 = (2m+1)^2(m+1)^2$$

Two of the cubes were left out. Since we have been asked to find the maximum value of m, for which the 'average' is less than 6750, we assume that 1^3 and $(2m)^3$ have been left out (The sum of the numbers has to be $2m+1$. We assume that largest possible quantity has been left out).

$$\begin{aligned}\therefore \text{'Average'} &= \frac{(2m+1)^2(m+1)^2 - (8m^3 + 1)}{2m+1} \\&= (2m+1)(m+1)^2 - (4m^2 - 2m + 1) \\&= 2m^3 + 5m^2 + 4m + 1 - 4m^2 + 2m - 1 = 2m^3 + m^2 + 6m = E \text{ (say)}\end{aligned}$$

We can construct the following table

M	m^2	m^3	$2m^3$	$6m$	E
14	196	2744	5488	84	5768
15	225	3375	6750		6750+

We see that the greatest value of m for which $E < 6750$ is 14.

Ans: (14)

Q29. DIRECTIONS for questions 27 to 30: Type in your answer in the input box provided below the question.

A fruit shop sells apples in boxes of different sizes. The selling price of each apple is Rs.5 per fruit. The minimum number of apples in a box is 100 and for every additional 25 apples added to the box, the price of the entire box goes down by 25 paise per apple. What should be the number of apples in the box that would maximise the selling price of the box?

Price of each apple till the first 124 apples will be ₹5 per fruit.
(As adding one more apple will lead to the box containing 125 apples and the price reduces by 25 paise per apple)

Now, when there are 125 to 149 apples in the box, the price per apple will remain same (at ₹4.75). But, the selling price of the box will increase with each apple added and it will be the highest when there are 149 apples.

Similar case holds for every batch of 25 apples added thereafter.

Hence, we start from 124 and try to find the maximum selling price of the box by adding apples in batches of 25.

Say, we add x lots of 25 apples to our initial lot of 124:

The selling price of the box = $(124 + 25x)(500 - 25x)$

Maximum selling price occurs when both the terms are equal (since their sum is a constant)

$$\text{i.e., } 124 + 25x = 500 - 2x$$

$$\Rightarrow x = 7.52$$

Now, since x is not an integer, we need to check for $x = 7$ and $x = 8$.

$$\begin{aligned}\text{For } x = 7, \text{ the selling price} &= (124 + 175)(500 - 175) \\ &= 97175 \text{ paise} = ₹971.75\end{aligned}$$

$$\begin{aligned}\text{For } x = 8, \text{ the selling price} &= (124 + 200)(500 - 200) \\ &= 97200 \text{ paise} = ₹972\end{aligned}$$

Hence, maximum selling price is obtained for $x = 8$.

$$\therefore \text{No. of apples in the box} = (124 + 200) = 324.$$

Ans: (324)

Q30. DIRECTIONS for questions 27 to 30: Type in your answer in the input box provided below the question.

In how many ways can six balls of different colours be put into three identical baskets?

Since the baskets are indistinguishable, we first distribute the six balls into three baskets as (i) $0 + 0 + 6$ (ii) $0 + 1 + 5$ (iii) $0 + 2 + 4$ (iv) $0 + 3 + 3$ (v) $4 + 1 + 1$ (vi) $1 + 2 + 3$ and (vii) $2 + 2 + 2$.

Each of the above cases can again be chosen in

(i) 1 way (ii) 6C_1 ways (iii) 6C_2 ways (iv) ${}^6C_3 \div 2!$ ways (v) 6C_4 ways (vi) $({}^6C_1 \times {}^5C_2)$ ways
(vii) $({}^6C_2 \times {}^4C_2) \div 3!$ ways.

$$\text{Total} = 1 + 6 + 15 + 10 + 15 + 60 + 15 = 122 \text{ ways.}$$

Ans: (122)

Q31. DIRECTIONS for questions 31 to 34: Select the correct alternative from the given choices.

A carton manufacturing company produces two kinds of cartons – standard and deluxe. The profit margin on a standard carton is Rs.60, and that on a deluxe carton is Rs.90. Every carton must be processed on machine A and on machine B. The processing times (in hours per carton) on the two machines are as follows:

Type of carton	Time required (hours/carton)	
	Machine A	Machine B
Standard	12	18
Deluxe	15	30

If the total time available on machine A is 4200 hours and on machine B is 7200 hours, the production plan which maximizes the total profit is

- a) **120 standard cartons, 180 deluxe cartons.**
- b) **100 standard cartons, 200 deluxe cartons.**
- c) **200 standard cartons, 120 deluxe cartons.**
- d) **150 standard cartons, 120 deluxe cartons.**

Let S and D denote, the number of standard cartons and deluxe cartons manufactured.

\therefore The available number of hours on machine A is 4200 hours $\Rightarrow 12S + 15D \leq 4200$

And the available number of hours on machine B is 7200 hours $\Rightarrow 18S + 30D \leq 7200$

Now, going by the choices,

Choice (A) Given, S = 120, D = 180

$$12(120) + 15(180) = 4140 \text{ hours}$$

$$18(120) + 30(180) = 7560 \text{ hrs}$$

The required number of hours cannot be met by the machine B. \therefore Choice (A) is incorrect

Choice (B) Given, S = 100, D = 200

$$12(100) + 15(200) = 4200 \text{ hours}$$

$$18(100) + 30(200) = 7800 \text{ hours}$$

The required number of hours cannot be met by the machine B. \therefore Choice (B) is incorrect.

Choice (C) $12(200) + 15(120) = 4200 \text{ hours}$

$$18(200) + 30(120) = 7200 \text{ hours}$$

Both the machines can meet the required number of hours and Profit = $200(60) + 120(90) = ₹22,800$

Choice (D) $12(150) + 15(120) = 3600 \text{ hours}$

$$18(150) + 30(120) = 6300 \text{ hours}$$

Both the machines can meet the required number of hours and Profit = $150(60) + 120(90) = ₹19,800$

\therefore Choice (C) yields the maximum profit.

Choice (C)

Q32. DIRECTIONS for questions 31 to 34: Select the correct alternative from the given choices.

Which of the following cannot be the sum of the squares of 12 consecutive odd natural numbers?

a) 2300

b) 2924

c) 3644

d) 4356

. Let the 12 odd numbers be $(2k \pm 11), (2k \pm 9), (2k \pm 7), (2k \pm 5), (2k \pm 3)$ and $(2k \pm 1)$, where k is an integer.

$$\begin{aligned} \text{Sum of their squares} &= [(2k+11)^2 + (2k-11)^2] + [(2k+9)^2 + (2k-9)^2] + \dots + \\ &\quad [(2k+1)^2 + (2k-1)^2] \\ &= 2[(4k^2 + 121) + \dots + (4k^2 + 1)] \\ &= 2[6(4k^2) + (1+9+25+49+81+121)] = 48k^2 + 572 \end{aligned}$$

Since all the values are positive (i.e., natural numbers), $2k - 11 > 0$.

$$\Rightarrow k \geq 6$$

Hence, if any number N is equal to the sum of the squares of 12 consecutive odd natural numbers, then N is of the form $48k^2 + 572$, where $k \geq 6$.

$\Rightarrow N - 572$ is not only divisible by 48, but also gives a quotient which is the square of a natural number greater than or equal to 6.

Now, the choices can easily be checked against this condition

$$\frac{2300 - 572}{48} = 36; \quad \frac{2924 - 572}{48} = 49; \quad \frac{3644 - 572}{48} = 64;$$

$$\frac{5372 - 572}{48} = 100, \text{ but } \frac{4356 - 572}{48} \cong 78.3, \text{ which is not a perfect square.}$$

Hence 4356 cannot be the sum of the squares of 12 consecutive odd natural numbers.

Alternate method:

Sum of squares of 1st 12 consecutive odd numbers.

$$\begin{aligned} &= 1^2 + 3^2 + 5^2 + \dots + 23^2 \\ &= 1^2 + 2^2 + 3^2 + 4^2 + \dots + 22^2 + 23^2 - (2^2 + 4^2 + \dots + 22^2) \\ &= \frac{23 \times 24 \times 47}{6} - \frac{4 \times 11 \times 12 \times 23}{6} = 2300 \end{aligned}$$

Now, consider option (B)

$$\begin{aligned} 2924 &= 2300 + 625 - 1 \\ &= 1^2 + 3^2 + 5^2 + \dots + 23^2 + 25^2 - 1^2 = 3^2 + 5^2 + 7^2 + \dots + 25^2 \end{aligned}$$

Consider option (C),

$$3644 = 2924 + 729 - 9 = 5^2 + 7^2 + \dots + 25^2 + 27^2$$

Consider option (D)

$$\begin{aligned} 4356 &= 3644 + 712 = 3644 + 841 - 129 \\ &= 5^2 + 7^2 + \dots + 27^2 + 29^2 - 129 \end{aligned}$$

\therefore 4356 cannot be expressed as a sum of squares of 12 consecutive integers.

Choice (D)

Q33. DIRECTIONS for questions 31 to 34: Select the correct alternative from the given choices.

How many integral solutions does the equation $(n + 4)^2 = 2^n + n^2$ have?

- a) 0
- b) 1
- c) 2
- d) None of these

We have $(n + 4)^2 = 2^n + n^2$

$$\Rightarrow (n + 4)^2 - n^2 = 2^n \Rightarrow 4(2n + 4) = 2^n$$

$$\Rightarrow 8(n + 2) = 2^n \Rightarrow n + 2 = 2^{n-3}$$

By trial, we have

n	$n + 2$	2^{n-3}
4	6	2
5	7	4
6	8	8
7	9	16
8	10	64

We see that $n = 6$ is the only solution.

For $n < 6$, RHS < LHS. For $n > 6$, RHS > LHS

Choice (B)

Q34. DIRECTIONS for questions 31 to 34: Select the correct alternative from the given choices.
Jack, a shop owner, has a regular customer named Krack, who always wants a 10% discount on the marked price and also demands 10% more quantity than what he should get. By how much should Jack mark his cost price up to make a net profit of 10%?

a) 30%

b)

$33\frac{1}{9}\%$

c) 20%

d)

$34\frac{4}{9}\%$

✓ Your answer is correct

Krack pays 90% of the MP of 1 kg and takes 1.1 kg. Jack has to get 1.1 times the CP of 1.1 kg.

Let the MP and CP of 1 kg be m and c respectively.

$$\therefore 0.9 m = (1.1) c \quad \text{or} \quad \frac{m}{c} = \frac{1.21}{0.9} = \frac{121}{90}$$

$$\therefore \text{Jack has to mark up the price by } \frac{31}{90} \text{ or } \frac{3100}{90} \% \quad 34\frac{4}{9}\% \quad \text{Choice (D)}$$

