Solutions of XAT2016 held on 03.01.2016 (Booklet Code: A)

SECTION-A

VERBAL AND LOGICAL ABILITY

1. Which of the following options best captures the relationship similar to INSPECT : VIVISECT?
(A) Enquire : Observe
(B) Inquire : Explore
(C) Investigate : Interrogate
(D) Query : Survey
(E) Question : Respond

Solution:
To "inspect" is to look carefully at or over; view closely and critically; "vivisect" is minute or pitiless examination or criticism. The relationship is an increasing degree of detail. In the given options the nearest are Options B and C.
Inquire means to put a question, to seek information by questioning *or to* conduct an investigation. Explore means to look at (something) in a careful way to learn more about it: to study or analyze (something) or to learn about (something) by trying it .
Investigate and Inquire (choice C) mean the same, but interrogate - to ask (someone) questions in a thorough and often forceful way - is a rigorous form of investigation. The sense of 'rigour" comes only in choice C. Choice (C)

2. Read the following poem and answer the question that follows:
I sought a soul in the sea
And found a coral there
Beneath the foam for me
An ocean was all laid bare.

Into my heart's night
Along a narrow way
I groped; and lo! The light,
An infinite land of day.

Which of the following would best capture the ESSENCE of the poem above?
(A) What lies 'outside' is always deceptive.
(B) Pursue the narrow path and avoid the broadways.
(C) External search is futile; explore the inner space for answers.
(D) Heart's pathways are broad and clear to find the destination.
(E) Light offers sight and insight.

Solution:
The stanzas are a translation of quartrains from Sufi poet Rumi. In short, it means that deep inside the sea, he found the spirit of the sea (soul, "all laid bare"), and deep inside his heart, he found light. This could also mean that if you go deep into the caverns of your ignorance (darkness), you will find enlightenment.
Choice A is close, but there is no analogy to deceptiveness in the given stanzas. Choice (C)

3. "Assumptions are analogous to the basic ingredients in a gourmet recipe. Only the final product of the recipe dictates whether the ingredients suffice……."

Which of the following is ANALOGOUS to the statement above?
(A) Good wine needs no advertisement!
(B) The apple never falls far from the tree!
(C) All is well that ends well!
(D) As you sow, so shall you reap!
(E) The proof of the pudding is in the eating!

Solution:
The question statement means that assumptions are similar to the ingredients of a recipe; and only the final product will tell whether the ingredients were sufficient. Choice A is originally "Good wine needs no bush". Ancient Greek wine sellers used to hang a branch of ivy outside to advertise their wine shop, hence the word "bush" for advertisement. Choice B is similar to saying "Like father, like son, a figurative way of saying that children inherit characteristics of their parents. Choice C means that an event that has a good ending is good even if some things went wrong along the way. (This is the name of a play by Shakespeare.) . Choice D has originated from the Bible, and it means that one's deeds, good or evil, will repay in kind.
Only Choice E has a meaning similar to the question statement. Choice (E)

4. The FIRST and the LAST sentences of the paragraph are numbered 1 & 6. The others, labelled as P, Q, R and S are given below:
1. Suppose I know someone, Smith.
   P. One day you come to me and say: "Smith is in Cambridge."
   Q. I inquire, and find you stood at Guildhall and saw at the other end a man and said: "That was Smith."
   R. I'd say: "Listen. This isn't sufficient evidence."
   S. I've heard that he has been killed in a battle in this war.

6. If we had a fair amount of evidence he was killed I would try to make you say that you're being credulous.

Which of the following combinations is the MOST LOGICALLY ORDERED?

(A) 1 SPQR6 (B) 1 RSPQ6
(C) 1 PRSQ6 (D) 1 QSRP6
(E) 1 RQPS6

Solution:
Statement S is in logical continuity after statement 1. 1 and S speak of what the author knows.
P, Q and R are about someone telling him that what he knows isnt true. R states that what the other person tells the author isnt sufficient evidence to the fact that Smith is alive, followed by Statement 6. Hence, Choice (A). Choice (A)

5. The FIRST and the LAST sentences of the paragraph are numbered 1 & 6. The others, labelled as P, Q, R and S are given below:

1. The word "symmetry" is used here with a special meaning, and therefore needs to be defined.
   P. For instances, if we look at a vase that is left-and-right symmetrical, then turn it 180° around the vertical axis, it looks the same.
   Q. When we have a picture symmetrical, one side is somehow the same as the other side.
   R. When is a thing symmetrical – how can we define it?
   S. Professor Hermann Wely has given this definition of symmetry: a thing is symmetrical if one can subject it to a certain operation and it appears exactly the same after operation.
6. We shall adopt the definition of symmetry in Weyl's more general form, and in that form we shall discuss symmetry of physical laws.

Which of the following combinations is the MOST LOGICALLY ORDERD?
(A) 1 PQRS6 (B) 1 QRSP6 (C) 1 RQPS6
(D) 1 RQSP6 (E) 1 SPQR6

Solution:
While Statement 1 says that the term symmetry needs to be defined, Statement R asks a rhetorical question about how symmetry can be defined when something is 'symmetrical'. Statements S and P are a mandatory pair. So we look at options B,D and E. Q answers R, so has to follow R. Hence only choice (D).
Choice (D)

6. In recent past, Indian football team has lost most of the matches in international football tournaments. The most successful coaches in Indian club football tournaments are from Latin American countries. In most of the Latin American countries, football is more popular sport than cricket.

From the passage above, choose the correct option:

(A) It can be DEFINITELY concluded that "In India, cricket is more popular than football"
(B) It can be DEFINITELY concluded that "Most Latin American countries are successful at football".
(C) It can be DEFINITELY concluded that "In recent past, coaches of Indian football teams are not from Latin America".
(D) It can be DEFINITELY concluded that "European football coaches are less successful than their Latin American counterparts for Indian national team".
(E) It cannnot be DEFINITELY concluded that "The more popular a sport the better the chance of producing a successful coach in that sport".

Solution:
Statement A cannot be inferred . Statement B also cannot be concluded as the paragraph only sates that football is popular in Latin American countries. It doesnt say whether it is successful or not. As for Statement C, we have information about LA coaches in india only for Club football. There is no reference to the nationality of the coaches for the national team. D is clearly extraneous. Choice (E)

7. Choose the best pronunciation of the word, *Sobriquet,* from the following options:
(A) soh-bruh-key (B) suub-rry-ka
(C) sob-bee-ri-kwet (D) soub-rick-kaat
(E) Sobb-rik-kwet

Solution:
The word sobriquet, (a descriptive name or epithet, a nickname) is pronounced as shown in choice (A). Choice (A)

8. Consider the two related statements below:
Statement I: Offices and positions for the marginalized sections should be open to those with greater savings among them.
Statement II: Offices and positions must be open to everyone based on the principle of *fair opportunity.*

Which of the following is true?
(A) Statement I assumes that the marginalized sections are incapable of saving.
(B) Statement II assumes that all citizens are equally exposed to all opportunities.
(C) Statement II contradicts meritocracy.
(D) Statement II assumes that all citizens are equally intelligent.
(E) Statement I assumes that the marginalized sections always depend on subsidies.

Solution:
Statement I does not assume that marginalised sections are incapable of savings, or that they depend on subsidies. (A and E).Since II supports fair opportunity, it doesnt contradict meritocracy. So, C is also incorrect. If Statement II has assumed that all are exposed to all opportunities, there is no need to suggest the same. Hence, B is also incorrect. Only D is correct. When the suggestion is to open all opportunities to everyone on the principle of fairplay, the inherent assumption is that everyone is equally intelligent to take up the opportunities. Choice (D)

9. This season will pass. The Prime Minister may not win Lok Sabha elections, or she may; she may not continue as Prime Minister, or she may. The country will survive whatever the texture of politics in this decade or the next.

Which of the following, IF TRUE, will BEST reinforce the author's view?

(A) The survival of any Prime Minister is dependent on the country's economic growth.
(B) The country has a vibrant young working population.
(C) The survival of the country depends on a dynamic, growth-oriented Prime Minister, not on the texture of politics.
(D) The previous season has also witnessed similar political uncertainty.
(E) The survival of the Prime Minister is dependent on the political texture of the country.

Solution:
The gist of the argument is that the country will survive inspite of political uncertainty or certainty ("texture")., which in turn means that political condition is not a determinant of the country's survival. Considering that the given options are true, and that we have to find which of those will "reinforce" (strengthen /support) the author's contention, only B and D are worth considering. Option D,however, says that the previous season was also similar, but it doesnt say what caused the country to survive. When the author states that the political condition does not affect the survival, then it has to be something beyond that which keeps the country moving. Option B points to "economy".
Also, by logical flow of thought, D would only be an assumption based on which the author has arrived at the conclusion.

Choice (B)

10. The subject of this book is *knavery, skulduggery, cheating, betrayal, unfairness, crime, sneakiness, malingering, cutting corner, immorality, dishonesty, betrayal, graft, wickedness, and sin.*

Which of the following options best captures ALL the italicized words above?
(A) Aggressive behaviours
(B) Illegal behaviours
(C) Deviant behaviours
(D) Banned behaviours
(E) Vetoed behaviours

Solution:
All the characteristics mentioned are "deviant behaviours". Deviant behaviour is any behaviour that is contrary to the dominant norms of society.

Choice (C)

11. Read the following conversation:

OINOS: I can comprehend you thus far–that certain operations of what we term Nature, or the natural laws, will, under certain conditions, give rise to that which has all the appearance of ceration. Shortly before the final overthrow of the earth, there were, I well remember, many very successful experiments in what some philosophers were weak enough to denominate the creation of animalculae.
AGATHOS: The cases of which you speak were, in fact, instances of the secondary creation–and of the only species of creation which has ever been, since the first word spoke into existence the first law.

Which of the following options CANNOT be DEFINITELY inferred based on the above conversation?
(A) Agathos was explaining something related to creation to Oinos.
(B) At the time of conversation there was nothing called Earth.
(C) The creations of animalculae is a natural law.
(D) Natural laws are creations of philosophers.
(E) Law is a spoken word.

Solution:
The line which says .. "before the final overthrow of the earth" clearly indicates that at the time of the conversation, there is no earth.

Choice (B)

12. …. there is a degree of convergence in the definition of trust which can be summarized as follows: Trust is a particular level of the subjective probability with which an agent assesses that another agent or group of agents will perform a particular action. When we say we trust someone or that someone is trustworthy, we implicitly mean that the probability that he will perform an action that is beneficial to us…

Which of the following statements BEST COMPLETES the passage above?

(A) is high enough for us to find out if he will cheat us.
(B) is high enough for us to consider engaging in some form of corporation with him.
(C) is low enough for him not to engage in negative behaviour against us.
(D) is high enough for us not to build defences against his possible aggression.
(E) is low enough for us to attack him.

Solution:
"Perform a particular action" is the key phrase. It means that what we call trust is the assumed possibility that another person(s) will do something for us. That cannot be "possible aggression" as mentioned in D. Options A, C and E are extraneous. Choice (B)

Analyse the following passage and provide appropriate answers for the questions 13-16 that follow:

An effective way of describing what interpersonal communication *is* or *is not,* is perhaps to capture the underlying beliefs using specific game analogies.

Communication as Bowling: The bowling model of message delivery is probably the most widely held view of communication. I think that's unfortunate. This model sees the bowler as the sender, who delivers the ball, which is the message. As it rolls down the lane (the channel), clutter on the boards (noise) may deflect the ball (the message). Yet if it is aimed well, the ball strikes the passive pins (the target audience) with a predictable effect. In this one-way model of communication, the speaker (bowler) must take care to select a precisely crafted message (ball) and practice diligently to deliver it the same way every time. Of course, that makes sense only if target listeners are interchangeable, static pins waiting to be bowled over by our words–which they aren't.
This has led some observers to propose an interactive model of interpersonal communication.

Communication as Ping-Pong: Unlike bowling, Ping-Pong is not a solo game. This fact alone makes it a better analogy for interpersonal communication. One party puts the conversational ball in play, and the other gets into position to receive. It takes more concentration and skill to receive than to serve because while the speaker (server) knows where the message is going, the listeners (receiver) doesn't. Like a verbal or nonverbal message, the ball may appear straightforward yet have a deceptive spin.

Ping-Pong is a back-and-forth game; players switch roles continuously. One moment the person holding the paddle is an initiation, the next second the same player is a responder, gauging the effectiveness of his or her shot by the way the ball comes back. The repeated adjustment essential for good play closely parallels the feedback process described in a number of interpersonal communication theories.

Communication as Dumb Charades The game of charades best captures the simultaneous and collaborative nature of interpersonal communication. A charade is neither an action, like bowling a strike, nor an interaction, like a rally in Ping-Pong. It's a *transaction*.

Charades is a mutual game; the actual play is cooperative. One member draws a title or slogan from a batch of possibilities and then tries to act it out visually for teammates in a silent mini drama. The goal is to get at least one partner to say the exact words that are on the slip of paper. Of course, the actor is prohibited from talking out loud.

Suppose you drew the saying "God helps those who help themselves." For *God* you might try folding your hands and gazing upward. For *helps* you could act out offering a helping hand or giving a leg-up boost over a fence. By pointing at a number of real or imaginary people you may elicit a response of *them*, and by this point a partner may shout out, "God helps those who help themselves." Success.

Like charades, interpersonal communication is a mutual, on-going process of sending, receiving and adapting verbal and nonverbal messages with another person to create and alter the images in both of our minds. Communication between us begins when there is some overlap between two images, and is effective to the extent that overlap increases. But even if our mental pictures are congruent, communication will be partial as long as we interpret them differently. The idea that "God helps those who help themselves" could strike one person as a hollow promise, while the other might regard it as a divine stamp of approval for hard work.

Dumb Charade goes beyond the simplistic analogy of bowling and ping pong. It views interpersonal communications as a complex transaction in which overlapping messages simultaneously affect and are affected by the other person and multiple other factors.

13. The meaning CLOSEST to 'interchangeable' in the 'Communication as Bowling' paragraph is:
(A) Complementary
(B) Contiguous
(C) Conforming
(D) Compatible
(E) Comparable

Solution:
Complementary means combining in such a way as to enhance or emphasize the qualities of each other or another. Contiguous means sharing a common border; touching. To conform is to comply with rules, standards, or laws, or behave according to socially acceptable conventions or standards. To be compatible is to be able to exist or occur together without problems or conflict. Comparable can mean 'of equivalent quality' or 'similar'., hence closest to 'interchangeable'.
Choice (E)

14. Which of the following options is the CLOSET to the necessary condition of communication:
(A) Threshold overlap of shared images
(B) Simultaneous exchange
(C) Ability to stimulate affect
(D) Ability to enact a drama
(E) Ability to elicit a response

Solution:
As stated in the second last paragraph, "Communication between us...overlap between two images...". Hence, overlap of images is the primary condition for communication. The word 'threshold' here implies 'necessary'. Choice (A)

15. The two inherent LIMITATIONS of Ping-Pong as a metaphor for communication are:
(A) It is governed by conventions with possibility for appeal; it has clear rules.
(B) The operating model is win-lose because only one individual or team can win; the receiver can always predict the spin.
(C) The number of players is limited as very few can be meaningfully engaged at a time; the rules of the game are fixed by the regulators.
(D) It demands more skills of the receiver than of the speaker; it is as passive as bowling.
(E) Real life communication is like Dumb Charade with multiple players; there are multiple balls used in Dumb charade.

Solution:
'Possibility for appeal' as given in statement A is extraneous. The paragraph on Ping Pong clearly states that the listener can have no idea where the message is going, hence he cant predict the spin as mentioned in B. It is not stated anywhere that it is as passive as bowling. So, D is also ruled out. E is not about the limitations of PingPong, but about Dumb Charade. Also, there is no ball in Dumb Charade. As for Option C, there is a parallel drawn between the adjustment essential for a good play and communication theories (hence rules), and compared to the benefits of Dumb Charades, Ping Pong is limited by the number of players. Choice (C)

16. Action, interaction and transaction is CLOSET to:
(A) Advertising, Buyer negotiating with a seller, Bidding for a player in Indian Premier League.
(B) Preparing an election manifesto, Addressing a public gathering, Engaging in door to door canvassing.
(C) Preparing for MBA entrance exam, Writing the MBA entrance exam, Facing an interview for business school.
(D) Applying for learner licence, Negotiating with a driving school, Driving a Car.
(E) Negotiating overseas posting, Applying for visa, Undertaking a journey.

Solution:
Bowling is only action (only stimulus)., Ping Pong is interaction (two way)., Dumb Charades is transaction (as it is a cooperative play between team mates).
By the same logic, Choice (A) Advertising (only one sender is involved), negotiation between a buyer and seller (two players) and bidding (multiple participants) is the correct answer.
Choice (A)

Analyse the following passage and provide appropriate answers for the questions 17-19 that follows:

Advances in economic theory in the 1970s and 1980s illuminated the limits of markets; they showed that unfettered markets do not lead to economic efficiency whenever information is imperfect or markets are missing (for instance, good insurance markets to cover the key risks confronting individuals). And information is always imperfect and markets are always incomplete. Nor do markets, by themselves, necessarily lead to economic efficiency when the task of a country is to absorb new technology, to close the "knowledge gap": a central feature of development. Today, most academic economists agree that markets, by themselves, do not lead to efficiency; the question is whether government can improve matters.

While it is difficult for economists to perform experiments to tests their theories, as a chemist or a physicist might, the world provides a vast array of natural experiments as dozens of countries try different strategies. Unfortunately, because each country differs in its history and circumstances and in the myriad of details in the policies – and details do matter – it is often difficult to get a clear interpretation. What is clear, however, is that there have been marked differences in performance, that the most successful countries have been those in Asia, and that in most of the Asian countries, government played a very active role. As we look more carefully at the effects of particular policies, these conclusions are reinforced; there is a remarkable congruence between what economic theory says government should do and what the East Asian government actually did. By the same token, the economic theories based on imperfect information and incomplete risk markets that predicted that the free flow of short-term capital – a key feature of market fundamentalist policies – would produce not growth but instability have also been borne out.

17. "…whether government can improve matters". Here 'matters' indicates
(A) Economic efficiency
(B) Information imperfectness
(C) Knowledge gaps
(D) Good insurance markets
(E) Incomplete risk markets

Solution:
Two causes are mentioned, which lead to economic efficiency – information imperfectness and knowledge gaps. Hence, B and C would have been correct had they been given in one option. D and E are not mentioned before the given statement. Hence, "matters" here would mean economic efficiency. Choice (A)

18. Which of the following options CANNOT be inferred from the above passage?
(A) Free flow of short-term capital might fail to ensure economic growth.
(B) Insurance market is a proof that 'markets, by themselves, do not lead to efficiency'.

(C) It is difficult to interpret the success of economic policies of Asian countries.
(D) Technology can impede market efficiency.
(E) State intervention and imperfect information can never go hand-in-hand.

Solution:
The last line of the passage justifies A. Statement A can be inferred from the third line of the first paragraph . The fifth line of the second paragraph clearly states that it is difficult to get a clear interpretation of the phrases of any country. Hence, statement C can also be inferred. The statement "Nor do markets, by themselves...new technology" in the first paragraph suggests that technology can be an impediment (though not necessarily). Option E, cannot be inferred from the passage. Choice (E)

19. Which of the following statements BEST captures the ESSENCE of the two paragraph in the above passage?
(A) Paragraph I and Paragraph II are parallel arguments that are unrelated.
(B) Paragraph I describes markets in general whereas Paragraph II describes market failures in Asian economic theories fail to explain success of Asian economies in particular.
(C) Paragraph I explains why markets fail. Paragraph II spells out why market based economic theories fail to explain success of Asian economies.
(D) Paragraph I raises question and Paragraph II answers it.
(E) Paragraph I states an economic theory and Paragraph II cities a natural experiment to disprove it.

Solution:
Only D is possible, because the first paragraph clearly asks the question whether government intervention can improve matters(last line), and the second paragraph gives evidence that it can. Choice (D)

Analyse the following passage and provide appropriate answers for the questions 20-23 that follows:

The base of Objectivism according to Ayan Rand is explicit: "Existence exists–and the act of grasping the statement implies two corollary axioms: that something exists which one perceives and that one exists possessing consciousness, consciousness being the faculty of perceiving that which exists."

Existence and consciousness are facts implicit in every perception. They are the base of all knowledge (and the precondition of proof): knowledge presupposes something to know and someone to know it. They are absolutes which cannot be questioned or escaped: every human utterance, including the denial of these axioms, implies, their use and acceptance.

The third axioms at the base of knowledge–an axiom true, in Aristotle's word, of "being qua being" –is the Law of Identity. This law defines the essence of existence: to be is to be something, a thing is what it is; and leads to the fundamental principle of all action, the law of causality. The law of causality states that a thing's actions are determined not by chance, but by its nature, i.e., by what it is.

It is important to observe the interrelation of these three axioms. Existence is the first axiom. The universe exists independent of consciousness. Man is able to adapt his background to his own requirements, but "Nature, to be commanded, must be obeyed" (Francis Bacon). There is no mental process that can change the laws of nature or erase facts. The function of consciousness is not to create reality, but to apprehend it. "Existence is Identity, Consciousness is Identification."

20. Which of the following is DEFINITELY CORRECT according to the passage:
(A) Only what can be perceived exists.
(B) What exists is perceived.
(C) All that exists does not have consciousness.
(D) Consciousness makes perception of being possible.
(E) Something to be known and someone to know are the *conditio sine qua non* for existence.

Solution:
This is a direct question. The last part of the first paragraph clearly states that consciousness is the faculty of perceiving that which exists. D is definitely correct. Choice (D)

21. Which of the following is the ESSENCE of 'The law of Causality'?
(A) To be is to be something; 'being qua being'.
(B) Wishing to become something else denies the nature of that being.
(C) The law of identity is the same as the law of causality.
(D) Essence of existence.
(E) Actions of a being are determined by its nature.

Solution:
Again a direct question. The correct answer can be found in the last line of the second paragraph - "The law of causality...but by its nature, i.e., by what it is.". Choice (E)

22. Which of the following can be best captured as 'Identity' and 'Identification'?

(A) College as identity; perception of cultural events as identification.
(B) Twitter as identity; perception of Twitter as identification.
(C) Government as identity; perception of taxation of citizens as identification.
(D) Marriage as identity; perception of children as identification.
(E) MBA as identity; perception of campus placement as identification.

Solution:
"Existence is Identity, Consciousness is Identification" - implies that the existence of something is identity, and identification is the perception of the existence of that thing. Hence the parallels of identity and identification cannot be about two different entities. In the options given, only option B talks of the same matter of existence. Choice (B)

23. The author would interpret Francis Bacon's "Nature, to be commanded, must be obeyed" as:

(A) Reality should not be modified or escaped but faced.
(B) Man's existence depends on nature's whims.
(C) Essentially and objectively nature is superior to humans.
(D) Obstacles are better circumvented than confronted.
(E) Before channelling nature one must first comply with it.

Solution:
Option B is farfetched, C and D are extraneous. A and E are close options. But the question is how the author would intepret the quote from Bacon. E is the meaning of the quote, and therefore not the interpretation. The author quotes Sir Francis Bacon to state that" The function of consciousness is not to create reality,but to apprehend it". Hence, the inferred meaning (by the author) is A. 'Apprehend' here, is in the sense of fathomed Choice (A)

Analyse the following passage and provide appropriate answers for the questions 24-26 that follows:

Each piece, or part, of the whole of nature is always merely an approximation to the complete truth, or the complete truth so far as we know it. In fact, everything we know is only some kind of approximation, because we know that we do not know all the laws as yet. Therefore, things must be learned only to be unlearned again or, more likely, to be corrected.

The principle of science, the definition, almost, is the following: The test of all knowledge is experiment. Experiment is the sole judge of scientific "truth." But what is the source of knowledge? Where do the laws that are to be tested come from? Experiment, itself, helps to produce these laws, in the sense that it give us hints. But also needed is imagination to create from these hints the great generalizations–to guess at the wonderful, simple, but very strange patterns beneath them all, and then to experiment to check again whether we have made the right guess. This imagining process is so difficult that there is a division of labour in physics: there are theoretical physicists who imagine, deduce, and guess at new laws, but do not experiment; and then there are experimental physicists who experiment, imagine, deduce, and guess.

We said that the laws of nature are approximate: that we first the "wrong" ones, and then we find the "right" ones. Now, how can an experiment be "wrong"? First, in a trivial way: the apparatus can be faulty and you did not notice. But these things are easily fixed and checked back and forth. So without snatching at such minor things, how can the results of an experiment be wrong? Only by being inaccurate. For example, the mass of an object never seems to change; a spinning top has the same weight as a still one. So a "law" was invented: mass is constant, independent of speed. That "law" is now found to be incorrect. Mass is found to increase with velocity, but appreciable increase requires velocities near that of light. A true law is: if an object moves a speed of less than one hundred miles a second the mass is constant to within one part in a million. In some such approximate form this is correct law. So in practice one might think that the new law makes no significant difference. Well, yes and no. For ordinary speeds we can certainly forget it and use the simple constant mass law as a good approximation. But for high speeds we are wrong, and the higher the speed, the more wrong we are.

Finally, and most interesting, philosophically we are completely wrong with the approximate law. Our entire picture of the world has to be altered even though the mass changes only by a little bit. This is a very peculiar thing about the philosophy, or the ideas, behind the laws. Even a very small effect sometimes requires profound changes to our ideas.

24. Which of the following options is DEFINITELY NOT an approximation to the complete truth?

(A) I know that I know.
(B) I know that I do not know.
(C) I know what I know.
(D) I know what I do not know.
(E) I know that others do not know.

Solution:
The question is which option is DEFINITELY NOT an approximation of the complete truth. In the given options, A, C, D and E are definitely approximations. B is also not an approximation, but the complete truth.
Choice (B)

25. Consider the two statements from the passage:

Statement I: The mass of an object never seems to change.
Statement II: Mass is found to increase with velocity.
Which of the following options CANNOT be concluded from the above passage?

(A) Both statements I and II are approximation to the complete truth.
(B) Both statements I and II are complete truth so far as we know.
(C) Statement I is an approximation to the complete truth but Statement II is complete truth.
(D) Statement I reveals that experimental physicists who imagine, deduce, and guess are philosophically wrong.
(E) Statement II shows that theoretical physicists can pinpoint the shortcomings of experimental physicists.

Solution:
This is again a tricky question like the previous one. Statement A is incorrect, as Statement I is an approximation ('seems"). B is also negated as Statement I is not a complete truth according to the passage. C and D are true, therefore the incorrect answer.

We cannot infer from the passage that Statement II says anything about theoretical physicists correcting the findings of experimental physicists regarding the proportionate increase of mass with velocity. Choice (E)

26. 'Big Bang' is a popular theory related to the origin of the universe. It states that the universe was the outcome of a big bang that released enormous energy.

Which of the following is the MOST PROBABLE inference about the big bang theory?

(A) Big Bang Theory was first proposed by experimental physicists.
(B) Big Bang Theory was first proposed by theoretical physicists.
(C) Big Bang Theory was first proposed by experimental physicists and then deduced by theoretical physicists.
(D) Philosophers got the Big Bang theory wrong.
(E) Big Bang theory is not an approximation of the complete truth

Solution:
Since the original Big Bang could not have been understood as a result of an experiment, it surely was a theory formed by conjectures.
Choice (B)

SECTION-B
DECISION MAKING

Analyse the following caselet and answer the questions 27-29 that follow:

Indian Institute of Research is a Government-established body to promote research. In addition to helping in policy making, it also provides free online access to all the articles to the public. It has a mission of publishing high quality research articles. Till 2010, the publication of articles was very slow because there is no incentives for researchers to publish. Researchers stuck to the mandatory one article a year. Most of the researchers engaged in offering consultancy and earned extra income. Since its inception, the institute was considered the best place for cutting edge research. The new director of the institute was not happy with the work done by the researchers in silo and came out with a new research policy in 2013 to increase research output and improve collaboration among researchers. It was decided that extra benefits would be offered to researchers with new publications. As a result, the number of research articles increased fourfold in 2014. At the 2015 annual audit, an objection was raised against the new benefits scheme. Auditors were not happy with increased expenses towards remuneration for researchers. Further, the Government opined that the publication was itself a reward and hence researchers need be paid nothing extra. The director tried to defend his policy but the response from the government was not encouraging.
1. Note: Auditors role is to verify accounts.

27. The following facts were observed by an analytics team hired by the government to study the extant situation.

1. There was a four-fold increase in the number of researchers leaving the organization in 2014.
2. A researcher died while on duty.
3. The quantity of articles published declined substantially.
4. The average number of people accessing an article decreased by 2%.

Which of the following options would justify the government's intention to DISCONTINUE the scheme?
(A) 1 and 2 (B) 2 and 3 (C) 3 only (D) 4 only (E) 3 and 4

Solution:
Fact (1) does not indicate that the researchers are leaving due to the lack of any incentive. It does not even provide information whether the researchers are going to the institutes that are offering incentive.
Fact (2) has no bearing on the decision.
Fact (3) indicates that the incentives have not yielded positive result. The researchers are only interested in availing the incentive but not in the quality of the work. Hence, (3) justifies.
Fact (4) has no relevance as the number of people accessing the papers is not the target group. Thus only (3) is the answer. Choice (C)

28. The director still wanted to persuade the government to review its stand. He had framed the following arguments:

1. Most famous researchers in the world are also the highest paid.
2. American institute of research gives extra benefits to its scientists.
3. This year's highest paid researchers had won the Nobel Prize last year.

Considering the Government to be reasonable which of the following options is UNLIKELY to convince the Government?

(A) 1 and 2 (B) 2 only (C) 2 and 3
(D) 1 and 3 (E) 1, 2 and 3

Solution:
In argument (1), the cause and effect relation is not brought out clearly. It is not known whether the researchers became famous after being paid well or the other way round. Argument (2) does not bring out the effects of the extra benefits. Argument (3) also does not bring out the cause and effect relation properly. Hence, (1), (2) and (3) are unlikely to convince the Government.

Choice (E)

29. The director wanted to promote good decision making at Indian Institute of Research. A few trusted colleagues offered the following suggestions:

1. Auditors need not be allowed to object to extra benefits schemes.
2. Auditors need not pin-point sudden increase in expenditure.
3. Auditors need not be consulted before taking any policy level decision.

Which of the following combination of options should the director agree THE MOST with?

(A) 1 and 2 (B) 2 only (C) 2 and 3
(D) 1 and 3 (E) 1, 2 and 3

Solution:
It is given that the role of the auditor is to verify accounts only, i.e. to check the correctness and point out any abnormality but not to make any qualitative comments. As the auditors do not have any interest in how the institute is run. Hence, (1) and (3) are the suggestions that the director agrees the most with. Choice (D)

Analyse the following caselet and answer the question 30-31 that follow:

Kamal Chinnappa, Vimal Rao, Ganesh Krishnan and Dinesh Kumar own a salon each on the Barbil street. They are the only hairdressers on that street. Each of them offered three services viz. haircut, shaving and hair-dye. One evening, all four of them met in a nearby tea-stall and agreed to charge `100 for any of the three services (haircut, shave and hair-dye) on weekdays. They also agreed to increase this rate to `115 on weekends and holidays. All verbally decided to implement the agreement.

30. The following day Kamal, being the most competent hairdresser on the street, was contemplating charging higher than agreed upon price.

Which of the following would enable him to charge more with minimal violation of the agreement?

(A) He should introduce a new and specialized service at is `130.
(B) He should open another shop on the same street and charge `150.
(C) He should charge `130 for those wanting to jump the queue.
(D) He should charge `115 for a service to a particular customer and give the next service free.
(E) He should open his shop two hours before others and close it two hours after.

Solution:
Choice (A) does not violate the prices the four agreed for the three services. By creating a specialised service and charging more for it, the violation is minimal. Hence (A) is the answer. The agreement is not shop specific but service specific. Hence (B) is not the answer. Choices (C) and (D) violate the agreement. Choice (E) does not refer to charging more. Thus, (A) is the answer. Choice (A)

31. Vimal relies heavily on a bunch of loyal customers. He is concerned about retaining them.

Which of the following options should he choose if he does not want to violate the agreement?

(A) He should charge differential rates for loyal customers.
(B) He should charge the loyal customers lower.
(C) He should make every third visit free for his loyal customers.
(D) He should charge all the agreed upon price.
(E) He should allow his loyal customers to jump the queue.

Solution:
Vimal wants to retain his loyal customers without violating the agreement. Choices (A), (B) and (C) violate the agreement. Choice (D) does not indicate any special privilege to loyal customers. Choice (E) shows that Vimal is giving preference to loyal customers, while not violating the agreement. Thus, (E) is the best option.

Choice (E)

Analyse the following caselet and answer the questions 32-33 that follow:

The city of Yashmund is served by licensed taxis operating on officially sanctioned metered rates and driven by licensed drivers who do not own the taxis but pay a monthly rent to the taxi-owners. Shailesh Nair, the mayor of Yashmund, perceived that most of these taxi do not offer sufficient comfort and safety to passengers.

32. The Mayor wants the owners and drivers to care about comfort.

Which of the following decisions, IF TAKEN, is MOST LIKELY to increase the comfort levels of passengers?

(A) The mayor issues a guidelines that taxis will be randomly inspected by the police for the comfort level.
(B) The mayor ensures banks grant drivers loans to own cars. Owners driven cars generally offer greater comfort.
(C) The mayor introduces licensing of air-conditioned taxis which can charge increased rates to the rich customers.
(D) The mayor introduces a feedback system that records passenger satisfaction with comfort levels; this will affect renewal of annual taxi license.
(E) The mayor permits doubling metered rates which will ensure enhanced income for owners to invest in greater comfort.

Solution:
The mayor wants both the owners and the drivers to care about comfort.
Choice (A): This will have some effect on the owners and also the drivers to take care of the comfort but random checking will not have a very significant effect.
Choices (B) and (C): These do not refer to the existing taxis.
Choice (D): This is a decision that builds checks in to the system of renewal, which cannot be bypassed. Hence, this measure is MOST LIKELY to help in the owners and drivers care about comfort.
Choice (E): Increased income may not automatically make the owners to invest in providing comfort. Choice (D)

33. The mayor wants to involve the car owners in finding a solution to the problem of comfort and safety. He is concerned that the customers may not be willing to pay more for safety.

Which of the options below is MOST LIKELY to convince the owners?
(A) The taxi owners who clear comfort-inspection can charge higher rentals from the drivers and drivers with impeccable safety record can charge the same from customers.
(B) The taxis that clear comfort-inspection can charge 25% above the metered rates; studies have shown that customers are willing to pay around 18% extra for comfort.
(C) If a taxi owner has a consistent record of comfort and safety the government will subsidize a second loan.
(D) Taxis can charge 25% more if they clear comfort-inspection. However, owners of the taxis found compromising on safety will be jailed.
(E) Taxis that pass comfort-inspection test can charge 25% more. Should they violate any traffic rule this privilege would be withdrawn.

Solution:
It is given that the customers are not ready to pay more for safety. Hence, (A) cannot be the answer. Choice (B) refers to comfort but not to the safety aspect. A second loan is not in the context of the information given as nothing is mentioned about the first loan. Hence (C) cannot be the answer. Choice (D) involves punishment along with the incentive. Even the punishment is an extreme one. While (E) involves an incentive and the likely withdrawal of the same in case of violation. Thus (E) is more positive in nature.
Choice (E)

Analyse the following caselet and answer the questions 34-35 that follow:

Chatterjee, the MLA of Trikathapur, owes his election success to his close friend and businessman Ghosh. The victory had appeared unlikely for Chatterjee after the arrival of Bhowmick, a budding politician with hordes of money. However, his clean image along with Ghosh's money ensured Chatterjee's resounding victory.

34. After the elections, Ghosh requested Chatterjee to sanction the land adjoining his factory, for expansion. However, The requested government land was a green belt reducing harmful pollution from the factory.

Which of the following is the BEST option for Chatterjee in these circumstances?

(A) Chatterjee should approve the sale only after Ghosh plants a large number of trees around the factory and the city.
(B) Chatterjee should oblige Ghosh provided he recruits 20 locals as his employees on condition that they plant and maintain a tree each in their locality.
(C) As Ghosh is paying market rates Chatterjee should approve the sale with no riders.
(D) Chatterjee should approve the sale and ensure that the green belt is shifted to a different tract of land outside the city, purchased from the proceeds of the sale.

(E) Chatterjee should unconditionally approve the transfer of the land to Ghosh as a token of gratitude.

Solution:
Choice (E) is unethical. The land in the question was a green belt reducing the pollution from the factory of Mr. Ghosh. Hence, shifting the green belt elsewhere is incorrect. Hence, (D) cannot be the answer. Neither choice (B) nor choice (C) addresses the aspect of green belt. Hence, neither of the two can be the answer. A large number of trees around the factory would act as green belt. Hence, (A) is the best option.

Choice (A)

35. Inspired by Bhowmick's manifesto, Chatterjee is contemplating a green policy which can adversely affect Ghosh's business interests.

Which of the following actions from Ghosh is likely to convince Chatterjee NOT to pursue this policy?

(A) Request Chatterjee to defer implementation of the green policy by 3 years, the time needed to make his factory green.
(B) Remind Chatterjee that it is for his clean image that people voted him and not for Bhowmick's green policy.
(C) Warn Chatterjee that all industrialists will turn against him and despite his clean image he may be hated by the industry.
(D) Appeal to Chatterjee's sympathy citing the potential loss his business will suffer if the policy were to be implemented.
(E) Threaten Chatterjee that he should not take his loyalty for granted as Bhowmick has invited him to join his party.

Solution:
Choices (B), (C) and (E) are negative in nature. Choice (D) shows selfishness. Choice (A) indicates that Mr. Bhowmick is ready to fall in line with the policy, but is requesting for some time so that he can make his factory green. Choice (A)

Analyse the following caselet and answer the questions 36-38 that follow:

Nicky, Manoj and Benita are graduates from a top ranked B-school. They joined ABC corporation a year ago. ABC is known for its performance oriented culture. This is the first time the organization recruited from a top ranked B-school. They are part of a five member team with two others from lower ranked B-schools. Nicky, Manoj and Benita draw 40 percent higher salaries than other team members. This team reports to Amelia Ganeshmurthi, a senior executive.

36. Amelia is disappointed with the performance of Nicky, Manoj and Bentia. She came to know that ABC was not their first choice and they had spent the first ten months applying to other organizations. However, they have now started liking ABC and promised to do their best henceforth. Amelia has to rate their annual performance and decide about their future. She has the following choices:

1. Fire them from ABC for insincerity and save the organization's time and money.
2. Give them average ratings with a year to prove their worth and fire them from ABC if they fail to show significant progress.
3. Impose a pay-cut of 15% since they have not delivered on the promise, but give them relatively high ratings.
4. Give them relatively poor ratings with one year time to improve and fire them from ABC if they fail to show significant progress.
5. Give them high ratings and give them a second chance to prove their worth.

Which of the following options rank the above choices in the order of MOST APPROPRIATE to LEAST APPROPRIATE?

(A) 1, 2, 4 (B) 2, 1, 4
(C) 4, 2, 5 (D) 4, 3, 1
(E) 5, 2, 3

Solution:
The question states that Nicky, Manoj and Benita started liking ABC and have promised to do their best. Hence, (1) is not an appropriate step. But till now they have not shown any good work. Hence, (3), i.e. giving a high rating, is not appropriate. (2), (4) and (5) talk about giving them some to deliver what they have promised. Hence, they are appropriate. Among them the most appropriate to the least appropriate order is (4), (2) and (5), based on the rating suggested in them. As they have not shown any good work, giving a relatively low rating is the most appropriate decision, then comes the average rating and the least appropriate step is giving high rating. Thus (4), (2) and (5) is the required order. Choice (C)

37. Recruiting Nicky, Manoj and Benita was part of a larger initiative to make the organization attractive to prospective employees. Recently Amelia's boss informally told her that the trio's perception of the organization might influence future recruitment from top B-schools. However, the trio had already expressed their unhappiness about the organization to Amelia. She suspected that her promotion due next year might depend on the trio!

Which of the following is the BEST way for Amelia to deal with this situation?

(A) Henceforth, she should be lenient with the trio.

(B) She should promise the trio an early promotion if they can help her recruit good talent from top B-schools.
(C) Henceforth, she should occasionally invite the trio for dinner and informal outings.
(D) She should tell her boss that it is unfair to link her promotion to the trio's behaviour.
(E) She should convey the trio's unhappiness to her boss.

Solution:
The organisation wants to make itself attractive to prospective employees. This can happen when the existing employees have a good opinion about the organisation. It is given that they already expressed their unhappiness about the organisation. Amelia sensed that her promotion might depend on the trio. Neither (A) nor (C) can be the the best way, because being lenient may make the trio become complacent. Choice (B) is unethical, because their role is not finding talent. Amelia, being their immediate boss, has the responsibility to ensure appropriate behaviour of the trio towards the organisation. Hence, (D) is not the best way. Amelia should immediately bring the unhappiness of the trio to the notice of her boss, so that he remains informed and may come up with suggestions. Hence, (E) is the best way to deal with the situation. Choice (E)

38. Nicky's performance on the job is disappointing though she is considered a very helpful person outside the workplace helping her teammates and others in the organization with their personal needs e.g. finding a place to rent, a good place to get homely food etc. On the other hand, Manoj and Benita are performing well in their respective jobs and are perceived by their teammates as important to the team. But they are not interested in helping outside the workplace. Amelia has to decide the future of the trio. She has the following options:

1. Inform the higher authorities about Nicky's poor performance and ask them to take a call.
2. Send Nicky for a one month training earmarked for top performing employees.
3. Serve Nicky an ultimatum to improve within the next six months or get fired.
4. Even though they performed well, give Manoj and Benita average ratings because of their disinterest in helping outside workplace.
5. Give Manoj and Betia high ratings based on their performance.

Which of the following combination of above options will be the MOST APPROPRIATE?
(A) 1 and 5 (B) 2 and 4 (C) 2 and 5
(D) 3 and 4 (E) 3 and 5

Solution:
(1) indicates that Amelia is passing on the responsibility. Hence, (1) is not appropriate. (2) is also not appropriate because Nicky is not a top performing employee. (3) is appropriate because Nicky's performance is disappointing. (4) is inappropriate, because the rating should not depend on helping outside workplace. (5) is appropriate because Manoj and Benita are performing well. Thus, (3) and (5) are the most appropriate options. Choice (E)

Analyse the following caselet and answer the questions 39-41 that follow:

Recently a private food testing agency reported the presence of a harmful chemical in *Crunchy Chips,* a product of a fast moving consumer goods giant. The report sparked a nationwide outcry.

39. Rajan Shekhawat, the CEO of the company, feared this incident might affect the company's image among consumers. Rajan had the following options:

1. Apologizing publicly for this inconvenience and immediately withdrawing the products from all stores.
2. Communicates 'the correct findings' to the public.
3. Hire a reputed independent testing agency to verify the claims of the report.
4. Establish internal mechanisms to prevent repetition of such incidences in future.
5. Give higher incentives to distribution and retailers for selling the company brands.

Which of the following would be the MOST APPROPRIATE ORDER of options for Rajan, starting from the immediate?
(A) 3, 1, 5 (B) 3, 2, 4
(C) 1, 3, 5 (D) 1, 2, 5
(E) 5, 3, 2

Solution:
Option (1) amounts to admission of guilt. Withdrawing the products from all stores will adversely affect the company's image. Hence this option cannot be a part of the answer. Between choices (B) and (E) hiring an agency and making the results known has to take immediate priority over incentivizing distributors or establishing internal mechanisms. Hence choice (B) is the most appropriate order. Choice (B)

40. Mukesh Routary, a shopkeeper in a remote village was surprised to read in the newspaper, his only source of information, about harmful chemicals in *Crunchy Chips*. He had stocked a large quantity of *Crunchy Chips* for the forthcoming festive season. He also realized that people in his village are completely unaware of this controversy. He had the following options:

1. Sell the entire stock at a discount before the news spreads.

2. Destroy the entire stock and advise customers not to buy this product from other shops as well.
3. Donate the entire stock of Crunchy Chips to a local orphanage.
4. Inform customers about the controversy but understate its seriousness.
5. Ignore the news and sell the stock at the forthcoming festive season as planned.
6. Explore the veracity of the report and then take decision.

If arranged from ethical to unethical which of the following is DEFINITELY the WRONG order?

(A) 6, 5, 1 (B) 6, 1, 4 (C) 4, 5, 1
(D) 2, 4, 3 (E) 2, 4, 1

Solution:
Selling the stock as planned, getting rid of it by selling it off immediately or donating it to an orphanage are all unethical. Options (1), (3), (5) are unethical by varying degrees. Verifying the report and destroying the entire stock are the most ethical and responsible options. Choices (2) and (6) are ethical. Choice (4) is slightly unethical, since Mukesh is warning his customers but downplaying the negative effects.

In choice (A), option 6 which is the most ethical is followed by selling the stock at the rate planned. This is comparatively more ethical than getting rid of all the stock by selling it off to customers. Hence choice (A) follows the correct order from ethical to unethical. Choice (B) goes from option 6, which is the most ethical, to option 1, which is the most unethical and then option 4, which is slightly unethical. Hence this is the wrong order. In choice (C), option of 4 which is slightly unethical, is followed by ignoring the report which is slightly more unethical, which in turn is followed by the most unethical option of dumping the stock on unsuspecting customers. Choice (C) is also in the right order. In choices (D) and (E), the most ethical option of destroying the entire stock is followed by the slightly unethical option 4, which is in turn followed by either 3 or 1 which are both highly unethical. Hence these choices also include the right order. Choice (B) is definitely the wrong order. Choice (B)

41. An independent and trustworthy confidante of Rajan Shekhawat, the CEO of the company, informed him that one of their main competitors had bribed the food testing agency to manipulate the report.

Which of the following actions will BEST help *Crunchy Chips* to bounce back?

(A) Proclaim over the media that their product is completely safe.
(B) Secretly hire a food testing agency to ascertain the quality of the competitor's product.
(C) Hire another food testing agency to test and communicate the outcome to the consumers.
(D) File a defamation case against the competitor for their alleged involvement in the conspiracy.
(E) File a defamation case against the food testing agency.

Solution:
Choices (D) and (E) only lead to more negative press and hence they cannot help the company bounce back. Choice (B) is ineffective since defaming the competitor's product will not benefit the company in any way. Choice (A) is an empty proclamation without any proof. Hence (C) is the best course of action that the company can adopt. Choice (C)

Analyse the following caselet and answer the questions 42- 44 that follow:

Purushottam Bhatnagar owns and operates a sweetshop *Puru and Sons.* He is about 60 years old and is eager to hand over the business to his sons Ratan and Pramod. He however, fears that his sons, fresh from college may not understand the tricks of the trade.

42. Purushotham sends a batch of sweets to the Police station across the street every day. Ratan construed it as a bride and wanted to stop this practice.

Which of the following arguments, IF TRUE, would BEST convince Ratan NOT to give up this practice?

(A) In the last three years, three attempts to burgle *Puru and Sons* were effectively foiled by the Police.
(B) Each policeman receives only two pieces of sweet, too small to be considered a bride.
(C) The police in return send two policemen in mufti to mingle with the customers during rush hours to prevent pickpockets.
(D) Every day, Purushottam also sends a batch of sweets to the school next to the station, an orphanage nearby and the temple at the end of the street.
(E) Purushotham's competitor Uttampurush who runs a *sweetshop* in the same street and his neighbour Mahapurush who runs a *samosa* stall, both do similar things every day.

Solution:
Choices (A), (C) and (E) all amount to bribing since there is a *quid pro quo* situation wherein Purushottam is benefiting in some way in exchange for the box of sweets. Hence these choices are unlikely to convince Ratan. Choice (B) is irrelevant since the size or distribution of the sweet box does not concern Ratan since he objects to the very act of sending sweets to the police station. Choice (D) is most likely to convince Ratan since he will not think of the box of sweets as a bribe if a similar box is being sent to other public institutions in the locality.
Choice (D)

43. Purushottam's eldest son discovered that the shop repackaged sweets that were close to expiry and sold them at a discount under different names. These sweets usually get sold very fast. But his son was concerned about the possible consequences of this practice.

Purushottam was thinking of the following arguments to convince his son.

1. These sweets are consumed the same day and therefore there is no cause for worry.
2. Reduced prices give enough indication about the sweets to the customers.
3. These products are preferred by those who cannot afford full price and in a way, this is a service done to them.
4. In the past 30 years not a single person has reported ill because of consumption of these sweets.
5. Repackaging and selling sweets is a common practice.

Which combination of arguments below is MOST LIKELY to convince Ratan?

(A) 1 and 3 (B) 1 and 4 (C) 2 and 3
(D) 2 and 5 (E) 4 and 5

Solution:

Argument 1 implies that there is no harm in selling these sweets. Hence this argument is likely to convince Ratan. Argument 2 is disingenuous since it isn't being made explicitly clear to the customers that the sweets were close to expiry. Hence this argument is unlikely to convince Ratan. Argument 3 is not mindful of the harmful effects of selling close-to-expiry sweets to unsuspecting customers, hence this argument is unlikely to convince Ratan. Argument 4 shows Ratan proof that these sweets have no caused harm over a significant period of time. Hence this argument is likely to convince Ratan. Argument 5 is not likely to convince Ratan since it does not quell his doubts regarding the sale of these sweets. Hence only arguments 1 and 4 are likely to convince Ratan. Choice (B)

44. Purushottam's younger son Pramod discovered that 10% of their customers whom Purushottam called *privileged* customers purchased sweets at prices fixed 10 years ago (which is significantly lower than the current prices). Purushottam told him, "This 10% are my core and loyal customers with whom I have personal connect and therefore they deserve this privilege". Pramod refuted his father's argument citing the following information.

1. These customers form the top 20% of the income brackets of the city.
2. These customers frequently purchase from other sweetshops at market prices.
3. None of them recognises and greets Purushottam at the shop or at anywhere else.
4. None of them was present at Pramod's marriage.
5. These customers actually buy sweets at *Puru and Sons* for others not part of the core and loyal customers group.

Which of the following combinations of the above will MOST LIKELY convince Purushottam to charge market price to all?

(A) 1 and 2 (B) 2 and 4 (C) 2 and 5
(D) 3 and 4 (E) 4 and 5

Solution:

Fact 1 is not likely to convince Purushottam since he values personal contact over anything else and the income of his customers is immaterial to his relationship with them. Facts 3 and 4 cast a doubt on the notion that Purushottam has personal contact with his core and loyal customers. But fact 5 shows that the core and loyal group is misusing its relationship with Purushottam. This is most likely to convince him to withdraw the privilege extended to them. Fact 2 shows that these customers also frequent other shops where they are not given any special treatment. Hence facts 2 and 5 are most likely to convince to convince Purushottam. Choice (C)

Analyse the following caselet and answer the questions 45-47 that follow:

Six people working at the Bengaluru office of Simsys are planning to buy flats at a real estate project at Whitefield. Their preferences are listed below:

Person	Designation	First Preference	Second Preference	Third Preference
Bhatia	Vice President	Ground floor flat	Price < `50 lacs.	Shopping mall within 5 km.
Patel	Client Relationship Manager	Distance to office < 10 km.	Recreation Club	
Khan	Project Manager	Recreation Club	Place for morning walk	Car parking
Singh	Senior Software Engineer	Shopping mall within 15 km.	Price < `30 lacs.	Place for morning walk
Yadav	Assistant Software Engineer	Price < `50 lacs.	Distance to office < 10 km.	
Lingdo	Assistant Software Engineer	Recreation club		

They have identified 7 real estate projects with following facilities available (**marked with** √):

Real Estate Project	**M**	**N**	**O**	**P**	**Q**	**R**	**S**
Price	`60-80 lacs.	`45-50 lacs.	`20-25 lacs.	`65-80 lacs.	`35-45 lacs.	`25-40 lacs.	`20-30 lacs.
Distance to office	< 5 km	< 10 km	> 20 km	> 15 km	< 2 km	< 10 km	< 5 km.
Place for morning walk	√	√	√	√	√	√	
Recreation Club	√				√		√
Distance to shopping mall	Inside	> 25 km.	< 2 km.	Inside	< 5 km.	> 10 km.	> 20 km.
Car parking facility	√		√			√	√
Availability of ground floor flat		√				√	

A person is 'satisfied' if a project meets all three preferences.

45. Identify the project(s) where NONE of the 6 persons will be 'satisfied'.
(A) M only (B) N only
(C) P only (D) N and P only
(E) In all projects at least one person will be 'satisfied'.

46. Identify the project(s), where AT LEAST 3 of the 6 persons will be 'satisfied'.
(A) M only (B) S only
(C) Q and R only (D) M, Q and S only
(E) M, Q and R only

47. The marketing managers of all the six projects have agreed to add a recreation club and a car parking facility to the projects. In this changed scenario identify projects where AT MOST 2 of the 6 persons will NOT be 'satisfied'.
(A) N, Q and R only
(B) P only
(C) M and P only
(D) N and P only
(E) M, N and P only

Solutions for questions 45 to 47:

According to the given information, the people who would be 'satisfied' with each real estate project are listed below:

Project	**'Satisfied' persons**
M	Patel, Khan, Lingdo
N	Yadav
O	Singh
P	None
Q	Patel, Yadav, Lingdo
R	Yadav and maybe Singh (data inadequate regarding Singh)
S	Patel, Yadav, Lingdo

45. None of the 6 persons will be ' satisfied' with project P. Choice (C)

46. At least 3 persons will be 'satisfied' with projects M, Q and S. Choice (D)

47. If a recreation club and parking facility are added, then the table of persons 'satisfied' with each project will be as shown below:

Project	**'Satisfied' persons**
M	Patel, Khan, Lingdo
N	Yadav, Khan, Patel, Lingdo
O	Singh, Lingdo, Khan
P	Khan, Lingdo
Q	Patel, Yadav, Lingdo, Khan
R	Yadav, Patel, Khan , Lingdo and maybe Singh (data inadequate regarding Singh)
S	Patel, Yadav, Lingdo

The projects where at most two persons will not be 'satisfied' or at least 4 persons will be satisfied are N, Q and R. Choice (A)

Analyse the following caselet and answer the questions 48-49 that follow:

Geetha Gawde can cultivate up to 6 crops a year. Crop A and B are ready for harvest in 2 months; crop C and D in 3 months, and crop E and F in 4 months. Crop A can be cultivated from January to June; crop B can be cultivated from April to September; crop C can be cultivated from May to December; crops D as well as E can be cultivated from August to December, and crop F from November to May. If Geetha plans a change of crop the soil should be left fallow for one month; however, if the same crop is sown no fallow time is needed. Sowing takes place only at the beginning of a month. Geetha can only harvest a maximum of 1000 units of any crop at any point in time. The *production cost per unit* (incurred at the time of sowing) and *price per unit* of crop are as follows:

Crop	Production cost per unit crop (in USD)	Price per unit crop (in USD)
A	20	60
B	5	55
C	25	70
D	15	75
E	5	65
F	35	75

For Geetha soil preparation does not incur any cost. If a crop is abandoned before the scheduled harvesting, she gets no money. Geetha is preparing a cropping schedule to maximize her annual profits (i.e. price – cost). She plans to replicate the schedule in the coming years.

48. Which of the following would DEFINITELY be a part of the ideal schedule?
(A) Cultivate crop B in August or September.
(B) Cultivate crop B from April to September.
(C) Do not cultivate any crop in August but cultivate crop D in September.
(D) Cultivate crop D or crop E in August or September.
(E) Do not cultivate any crop in August; but cultivate crop D or crop E in September.

49. Which of the following schedules would maximize her annual profit while minimising the costs, if Geetha decides NOT to repeat a crop in a calendar year?
(A) Crops A, B and E
(B) Crops B, D AND F
(C) Crops B, D, E and F
(D) Crops C, D and F
(E) Crops A, B, D or E

Solutions for questions 48 and 49:

Given that, crops A and B are ready for harvest in two months, crops C and D in three months and crops E and F in four months. Crop A can be harvested from January to June, crop B from April to September, crop C from May to December, crop D from August to December, crop E from August to December and crop F from November to May. Geetha plans to maximize profits and also to replicate the schedule in the coming years. Changing the crop needs a fallow time of one month. Sowing the same crop does not need any fallow time.

Profit per unit crop in USD is shown below:

Crop	Profit per unit crop (USD)
A	40
B	50
C	45
D	60
E	60
F	40

Given a choice between two crops, Geetha would harvest the more profitable one and the one that takes less harvesting time.

Considering these choices, her ideal harvesting schedule would be

Jan – Feb	March	April – May	June – July	August	Sept – Nov	December
A	Fallow	B	B	Fallow	D	Fallow

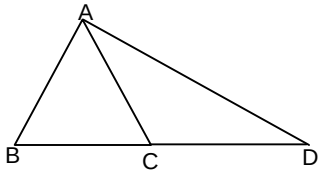
48. Choice (C) is part of the ideal schedule. Choice (C)

49. Choice (A), while minimizing costs, is more profitable. Choice (A)

SECTION-C

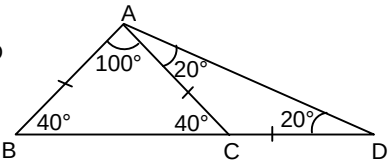
QUANTITATIVE ABILITY AND DATA INTERPRETATION

50. In the figure below, AB = AC = CD. If is ∠ADB = 20°, what is the value of ∠BAD?



(A) 40°
(B) 60°
(C) 70°
(D) 120°
(E) 140°

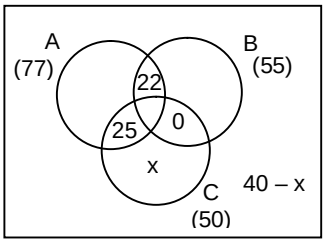
Solution:



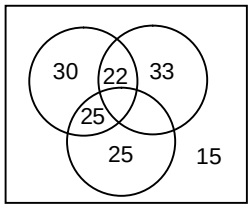
AB = AC = CD
As AC = CD ,
in ΔCAD, ∠A = ∠D = 20°.
∴In ΔABC, ∠C = 40°. As AB = AC, in ΔABC, ∠B = 40°. ∴∠A = 100°, i.e. ∠BAD = 120°.
Choice (D)

51. In an amusement park along with the entry pass a visitor gets two of the three available rides (A, B and C) free. On a particular day 77 opted for ride A, 55 opted for B and 50 opted for C; 25 visitors opted for both A and C, 22 opted for both A and B, while no visitor opted for both B and C. 40 visitors did not opt for ride A or B, or both. How many visited with the entry pass on that day?
(A) 102 (B) 115 (C) 130
(D) 135 (E) 150

Solution
The data is shown in the Venn diagram below.

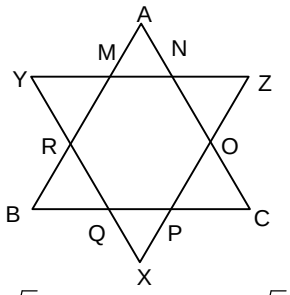


The conclusions are shown below



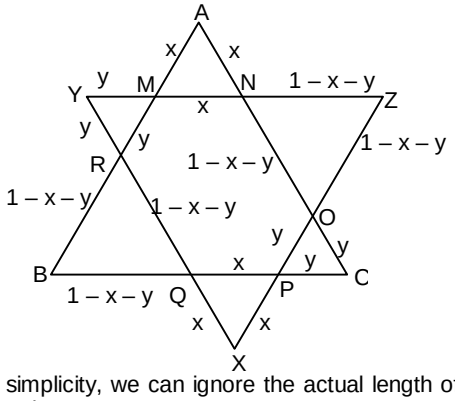
The total number of visitors is 77 + 33 + 40 = 150. Choice (E)

52. ΔABC and ΔXYZ are equilateral triangles of 54 cm sides. All smaller triangles like ΔANM, ΔOCP, ΔQPX etc are also equilateral triangles. Find the area of the shape MNOPQRM.



(A) $243\sqrt{3}$ sq. cm. (B) $486\sqrt{3}$ sq. cm.
(C) $729\sqrt{3}$ sq. cm. (D) $4374\sqrt{3}$ sq. cm.
(E) None of the above

Solution:



For simplicity, we can ignore the actual length of AB and XY.
Let AB = XY =1
Let QP = x, PC = y
∴BQ = 1 – x – y
ΔAMN and ΔXPQ are equilateral triangles with each side equal to x.
ΔOPC and ΔRMY are equilateral triangles with each side equal to y.
ΔNOZ and ΔQRB are equilateral triangles with each side equal to 1 – x – y.
The perimeter of the hexagon MNOPQR is 2. But the area cannot be uniquely determined. Let the area be H and let the sum of the areas of ΔQPX, ΔONZ, ΔMRY be G. We see that H + G is constant. This constant is, say S (S = $\frac{\sqrt{3}}{4}$, because XYZ is an equilateral triangle of side 1). G is the sum of the areas of 3 equilateral triangles, of sides x, y, 1 –x – y respectively. The minimum value of G is $3\left(\frac{\sqrt{3}}{4}\right)\left(\frac{1}{3}\right)^2$, i.e. $\frac{\sqrt{3}}{12}$, i.e. $\frac{S}{3}$.

(This occurs when x = y = 1 – x – y = $\frac{1}{3}$)

The maximum value of G is $\frac{\sqrt{3}}{4}$, i.e. S.

This occurs when x = y = 0.

$\therefore \frac{S}{3} < G < S$. Hence, $0 < H < \frac{2S}{3}$.

As each side of Δ ABC and ΔXYZ is 54 (and not 1), we conclude that $0 < H < 486\sqrt{3}$.

$\left(\because \frac{2}{3}\frac{\sqrt{3}}{4}(54)^2 = 486\sqrt{3}\right)$.

The answer should be cannot be determined or the question should have been "What is the possible area of the hexagon MNOPQR?" Choice (E)

53. Akhtar plans to cover a rectangular floor of dimensions 9.5 meters and 11.5 meters using tiles. Two types of square shaped tiles are available in the market. A tile with side 1 meter costs `100 and a tile with side 0.5 meters costs `30. The tiles can be cut if required. What will be the minimum cost of covering the entire floor with tiles?

(A) 10930 (B) 10900 (C) 11000
(D) 10950 (E) 10430

Solution:

The area of the floor is $(9.5)(11.5)m^2 = 109.25m^2$. The 1m $\times$ 1m tiles cost `100 each while the 0.5m $\times$ 0.5m ones cost ` 30 each. The cost of cutting has not been mentioned and we have to assume it can be ignored. ('cannot be determined' is not there.) As the bigger tile is less expensive (per unit area), we use only the bigger tiles, as far as possible. We can buy 109 bigger tiles and 1 small tile. The cost would be 109(100) + 30 = 10,930. Choice (A)

54. Anita, Biplove, Cheryl, Danish, Emily and Feroze compared their marks among themselves. Anita scored the highest marks, Biplove scored more than Danish. Cheryl scored more than at least two others and Emily had not scored the lowest.

Statement I: Exactly two members scored less than Cheryl.

Statement II: Emily and Feroze scored the same marks.

Which of the following statements would be sufficient to identify the one with the lowest marks?

(A) Statement I only.
(B) Statement II only.
(C) Both Statement II and Statement II are required together.
(D) Neither Statement I nor Statement II is sufficient.
(E) Either Statement I or Statement II is sufficient.

Solution:

(1) Anita's score is the highest.
(2) Biplove scored more than Danish.
(3) Cheryl scored more than at least two others.
(4) Emily did not score the lowest.

(I) Exactly two members scored less than Cheryl.

(II) Emily and Feroze scored the same marks.

We have to determine who scored the lowest marks. From I, one of the possible orders is A B__ C __ __. The lowest could be D or F. Not sufficient.

From II, the lowest scorer is neither E nor F. Also it is not C, nor B, nor A (see 3, 2, 1 above). $\therefore$ It has to be D. Sufficient. Choice (B)

55. Rani bought more apples than oranges. She sells apples at `23 a piece and makes 15% profit. She sells oranges at `10 a piece and makes 25% profit. If she gets `653 after selling all the apples and oranges, find her profit percentage.

(A) 16.8% (B) 17.4% (C) 17.9%
(D) 18.5% (E) 19.1%

Solution:

The data is tabulated below.

	Oranges	Apples
CP		
SP	10	23
Profit %	25%	15%
Number	x	y

Rani gets `653 after selling all the apples and oranges. i.e. 10x + 23y = 653 ……(1)

Rem $\frac{653}{10}$ = 3. $\therefore$ Rem $\frac{23y}{10}$ = 3.

One possible solution is y = 1. $\therefore$ x = 63. This and the other solutions are listed below.

10(63) + 23(1) = 653 =10(40) + 23(11)
= 10(17) + 23(21).

As x < y, (x, y) = (17,21).

The proceeds from the sale of 17 oranges is `170. The profit is 25%. $\therefore$ The cost has to be `136.

The proceeds from the sale of 21 apples is `483. The profit is 15% $\therefore$ The cost has to be $`483\left(\frac{100}{115}\right) = `420$.

On the whole, the profit percentage is $\frac{34+63}{136+420} = \frac{97}{556}$ = 17.4%. Choice (B)

56. Consider the set of numbers $\{1, 3, 3^2, 3^3, \ldots 3^{100}\}$. The ratio of the last number and the sum of the remaining numbers is closet to:

(A) 1 (B) 2 (C) 3 (D) 50 (E) 99

Solution:

There are 101 numbers in the set. The sum of the first 100 is $\frac{1(3^{100}-1)}{2} \approx \frac{3^{100}}{2}$ The last is 3^{100}.

The ratio of the last to the sum of the first 100 is 2 : 1. Choice (B)

57. f is a function for which f(1) = 1 and f(x) = 2x + f(x – 1) for each natural number x ≥ 2. Find f(31).

(A) 869 (B) 929 (C) 951
(D) 991 (E) None of the above

Solution:

$f(1) = 1$ and $f(x - 1) + 2x = f(x)$ for $x \geq 2$.

$\therefore f(2) = f(1) + 2(2) = 5$

$f(3) = f(2) + 2(3) = 11$

$f(4) = f(3) + 2(4) = 19$

$f(31) = f(30) + 2(31)$

$\therefore f(31) = 1 + 2(2) + 2(3) + \ldots\ldots + 2(31)$

$= 2(1 + 2 + 3 + \ldots\ldots + 31) - 1 = 31(32) - 1$

$= 991$. Choice (D)

58. Two numbers in the base system B are 2061_B and 601_B. The sum of these two numbers in decimal system is 432. Find the value of 1010_B in decimal system.

(A) 110 (B) 120 (C) 130
(D) 140 (E) 150

Solution:

$$\begin{array}{r} 2061 \\ 601 \\ \hline S \\ \hline \end{array}$$

$\therefore 2b^3 + 6b^2 + 6b + 2 = 432$

$\Rightarrow b^3 + 3b^2 + 3b = 215$

$\Rightarrow b(b^2 + 3b + 3) = 5(43)$.

By trial, $b = 5$.

(The data has not been present properly. In base 5, we cannot use the symbol 6. It should have been 2111 + 1101)

$(1010)_B = (1010)_5 = 5 + 125 = 130$. Choice (C)

59. A water tank has **M** inlet pipes and **N** outlet pipes. An inlet pipe can fill the tank in 8 hours while an outlet pipe can empty the full tank in 12 hours. If all pipes are left open simultaneously, it takes 6 hours to fill the empty tank. What is the relationship between **M** and **N**?

(A) M : N = 1 : 1 (B) M : N = 2 : 1
(C) M : N = 2 : 3 (D) M : N = 3 : 2
(E) None of the above

Solution:

The data is tabulated below.

	Inlet	Outlet	M inlets + N outlets
Rate	3	2	3M – 2N
Time	8	12	6
Capacity	24		24

$\therefore 6(3M - 2N) = 24 \Rightarrow 3M - 2N = 4$.

The value of M : N cannot be determined.

It can be 1 : 1, in which case M = N = 4.

It can be 2 : 1, in which case N = 1, M = 2.

If it is 2 : 3, i.e. M = 2x, N = 3x then $3M - 2N = 6x - 6x = 0 \neq 4$.

If it is 3 : 2, i.e. M = 3x, N = 2x then $3M - 2N = 9x - 4x = 5x = 4$.

The relationship between M and N is not necessarily any of A to D. Choice (E)

60. Company ABC starts an educational program in collaboration with Institute XYZ. As per the agreement, ABC and XYZ will share profit in 60 : 40 ratio. The initial investment of `100,000 on infrastructure is borne entirely by ABC whereas the running cost of `400 per student is borne by XYZ. If each student pays `2000 for the program find the minimum number of students required to make the program profitable, assuming ABC wants to recover its investment in the very first year and the program has no seat limits.

(A) 63 (B) 84 (C) 105
(D) 157 (E) 167

Solution:

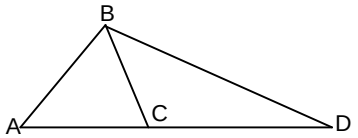
ABC invests `100,000. XYZ bears the running cost of `400 per student. Each student pays `2000. $\therefore$ The profit per student is `1600. $\therefore$ XYZ gets 40% of this, i.e. `640 while ABC gets `960.

XYZ begins to make a profit from the first student itself. For ABC to recover its investment, the partnership needs $\frac{100{,}000}{960} = \frac{10{,}000}{96} = \frac{2500}{24}$

$= 104\frac{1}{6}$ students.

$\therefore$ The partnership needs at least 105 students for ABC to break even. Choice (C)

61. Study the figure below and answer the question:

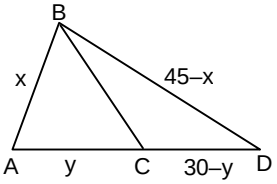


Four persons walk from Point A to Point D following different routes. The one following ABCD takes 70 minutes. Another person takes 45 minutes following ABD. The third person takes 30 minutes following route ACD. The last person takes 65 minutes following route ACBD. If all were to walk at the same speed, how long will it take to go from point B to point C?

(A) 10 min
(B) 20 min
(C) 30 min
(D) 40 min
(E) Cannot be answered as the angles are unknown.

Solution:

The data is given below.



ABCD $\rightarrow$ 70 min……(1)

ABD $\rightarrow$ 45 min…….(2)

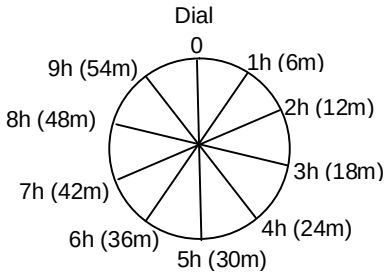
ACD $\rightarrow$ 30 min……..(3)

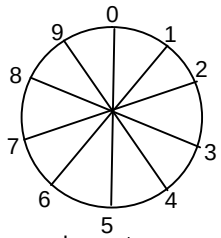
ACBD $\rightarrow$ 65 min……..(4)

Let the time taken over AB be x. On BD it is 45 – x [from (2)].
Let the time taken over AC be y. On CD it is 30 – y [from (3)].
(4) $\Rightarrow$ The time taken to cover CB is 65 – (y + 45 – x) or 20 – y + x.
(1) $\Rightarrow$ x +(20 – y + x) + (30 – y) = 70
$\Rightarrow$ x – y = 10. The time taken to cover BC is 20 – y + x = 30 minutes. Choice(C)

62. Each day on Planet M is 10 hours, each hour 60 minutes and each minute 40 seconds. The inhabitants of Planet M use 10 hour analog clock with an hour hand, a minute hand and a second hand. If one such clock shows 3 hours 42 minutes and 20 seconds in a mirror what will be the time in Planet M exactly after 5 minutes?
(A) 6 hours 18 minutes 20 seconds
(B) 6 hours 22 minutes 20 seconds
(C) 6 hours 23 minutes 20 seconds
(D) 7 hours 17 minutes 20 seconds
(E) 7 hours 23 minutes 20 seconds

Solution:





The numbers do not appear on the dial. (If they do, we would be able to make out that what we see is the reflection of a dial in a mirror rather than the dial itself.) They are shown only to facilitate calculations. The time as read in the mirror image is 3:42:20. The actual time would be 10:00:00 – 3:42:20 = 6:17:20. Five minutes later, the time would be 6:22:20. Choice (B)

63. a, b, c are integers, $|a| \neq |b| \neq |c|$ and $-10 \leq a, b, c \leq 10$. What will be the maximum possible value of [abc – (a + b + c)]?
(A) 524 (B) 693 (C) 731
(D) 970 (E) None of the above

Solution:
(1) a, b, c are integers.
(2) $|a| \neq |b| \neq |c|$
(3) $-10 \leq a, b, c \leq 10$

(2) is two statements, $|a| \neq |b|$ and $|b| \neq |c|$. Specifically, it does not include $|a| \neq |c|$. $\therefore$We can take a, b, c in such a way that $|a| \neq |b|$ and $|b| \neq |c|$ and yet $|a|$ may be equal to $|c|$. We denote this meaning as M_1. If we take a = –10, b = 9, c = –10, then abc = 900, a + b + c = –11 and abc – (a + b + c) = 911. This is the maximum value of abc – (a + b + c). This number is not among the choices, so our answer is E.
Choice (E)

Note:
However, it is very likely that the meaning which was sought to be conveyed by (2) is that no two of $|a|$, $|b|$, $|c|$ are equal. We denote this meaning as M_2. In this case, we can take a = –10, b = –9 and c = 8. Then abc = 720 and (a + b + c) = –11. $\therefore$abc – (a + b + c) = 731. The guess that the intended meaning of (2) is M_2 is strengthened by the fact that 731 appears among the options.
Credit cannot be denied to option E. However if the intended meaning of (2) was M_2, credit has to be given to choice (C) as well.

64. A square piece of paper is folded three times along its diagonal to get an isosceles triangle whose equal sides are 10 cm. What is the area of the unfolded original piece of paper?
(A) 400 sq. cm. (B) 800 sq. cm.
(C) $800\sqrt{2}$ sq. cm. (D) 1600 sq. cm.
(E) Insufficient data to answer

Solution:
A square piece of paper (say ABCD) is folded along the diagonal (say AC). The diagonal BD doubles up with D coinciding with B.
A second fold can be made along the doubled up diagonal BD such that C coincides with A.
The third fold which was conceived is not actually along either of these diagonals.
(It would have been better to describe the second and third folds as being made along the altitude to the base of isosceles triangles. For the second fold, the original diagonal AC has already undergone a significant change in its identity.)
The transformations are listed below:
ABCD Fold 1 ΔADC (B lies above D)
ΔADC Fold 2 ΔAMD (M is the midpoint of AC. C lies above A)
ΔAMD Fold 3 ΔANM (N is the midpoint of AD. D lies above A and C)
AN = 10cm, AD = 20cm and the area of ABCD is 400 cm^2. Choice (A)

65. The difference between the area of the circumscribed circle and the area of the inscribed circle of an equilateral triangle is 2156 sq. cm. What is the area of the equilateral triangle?
(A) $686\sqrt{3}$ (B) 1000 (C) $961\sqrt{2}$
(D) $650\sqrt{3}$ (E) None of the above

Solution:
Let the inradius of the equilateral triangle be r cm. Its circumradius is 2r cm.

$\therefore 4\pi r^2 - \pi r^2 = 2156 \Rightarrow r^2 = \frac{2156}{3\pi}$

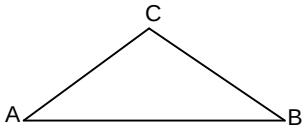
The side of the equilateral triangle = $2\sqrt{3}\,r$

The area = $\frac{\sqrt{3}}{4}(2\sqrt{3}\,r)^2 = 3\sqrt{3}\,r^2 = 3\sqrt{3}\left(\frac{2156}{3\pi}\right)$

$= \frac{2156\sqrt{3}}{\pi} \approx \frac{2156\sqrt{3}}{22}(7) = 686\sqrt{3}$ cm^2.

Note: We can accept this only as an approximate value as π is only approximately $\frac{22}{7}$. Choice (A)

66. A person standing on the ground at point A saw an object at point B on the ground at a distance of 600 meters. The object started flying towards him at an angle of 30° with the ground. The person saw the object for the second time at point C flying at 30°angle with him. At point C, the object changed direction and continued flying upwards. The person saw the object for the third time when the object was directly above him. The object was flying at a constant speed of 10 kmph.



Find the angle at which the object was flying after the person saw it for the second time. You may use additional statement(s) if required.

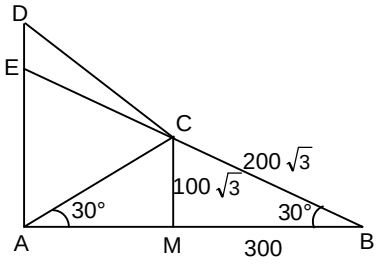
Statement I: After changing direction the object took 3 more minutes than it has taken before.

Statement II: After changing direction the object travelled an additional $200\sqrt{3}$ meters.

Which of the following is the correct option?

(A) Statement I alone is sufficient to find the angle but Statement II is not.
(B) Statement II alone is sufficient to find the angle but Statement I is not.
(C) Statement I and Statement II are consistent with each other.
(D) Statement I and Statement II are inconsistent with each other.
(E) Neither Statement I nor Statement II is sufficient to find the angle.

Solution:



At 10 km/hr (ie $\frac{25}{9}$ m/s), it takes $\frac{200\sqrt{3}(9)}{25}$ or $72\sqrt{3}$ s to cover $200\sqrt{3}$ m. (ie BC).

(I) To cover BC, it took $72\sqrt{3}$ s $\approx$ 124.7s. To cover CD it took (180 + 124.7)s ie 304.7s.

(II) CD = $200\sqrt{3}$ If CD = $200\sqrt{3}$, (and D is directly above A) there are 2 possibilities. D = A or D = E, i.e. there was no change in the direction of C. if the object is at A it is not directly overhead as it is at A. II contradicts the earlier data. (Before II can be considered in relation to I, it has to be considered in relation to the earlier data.)

I is sufficient while II contradicts the earlier data. In the absence of a more suitable option, we have to settle for D. Choice (D)

67. For two positive integers a and b, if $(a + b)^{(a+b)}$ is divisible by 500, then the least possible value of $a \times b$ is:

(A) 8 (B) 9 (C) 10
(D) 12 (E) None of the above

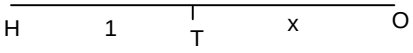
Solution:

For two positive integers a, b, $(a + b)^{a+b}$ is divisible by 500 (viz $2^2 5^3$). Therefore (a + b) is divisible by 2 and 5. The least value of a + b is 10. 10^{10} is divisible by 500. The least value of ab is 1(9) = 9. Choice (B)

68. Pradeep could either walk or drive to office. The time taken to walk to the office is 8 times the driving time. One day, his wife took the car making him walk to office. After walking 1 km, he reached a temple when his wife called to say that he can now take the car. Pradeep figured that continuing to walk to the office will take as long as walking back home and then driving to the office. Calculate the distance between the temple and the office.

(A) 1 (B) 7/3 (C) 9/7
(D) 16/7 (E) 16/9

Solution:



H is Pradeep's house, T is the temple and O is the office. Let his walking speed be u and the driving speed be 8u. HT = 1km. Let TO = x km.

$\frac{1}{u} + \frac{1+x}{8u} = \frac{x}{u} \Rightarrow \frac{x+1}{8u} = \frac{x-1}{u} = \frac{8(x-1)}{8u}$

$\Rightarrow x + 1 = 8x - 8 \Rightarrow 7x = 9$

$\Rightarrow x = \frac{9}{7}$. Choice (C)

69. If a, b and c are 3 consecutive integers between –10 to +10 (both inclusive), how many integer values are possible for the expression $\frac{a^3+b^3+c^3+3abc}{(a+b+c)^2}$?

(A) 0 (B) 1 (C) 2 (D) 3 (E) 4

Solution:

a = b – 1 and c = b + 1

$\therefore a^3 = b^3 - 3b^2 + 3b - 1$

$b^3 = b^3$

$c^3 = b^3 + 3b^2 + 3b + 1$

$3abc = 3b^3 - 3b$

$\therefore a^3 + b^3 + c^3 + 3abc = 6b^3 + 3b$

Let $E = \dfrac{a^3 + b^3 + c^3 + 3abc}{(a+b+c)^2} = \dfrac{3b(2b^2+1)}{9b^2}$

$= \dfrac{2b^2+1}{3b}$

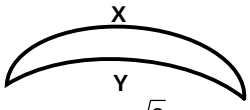
$= \dfrac{2b}{3} + \dfrac{1}{3b}$

For b = 1, E = 1

For b = –1 E = –1.

For integral values of b, the fractional part of $\dfrac{2b}{3}$ is $\dfrac{1}{3}$ or $\dfrac{2}{3}$. (ie b = –1 or 1).There can be no integral values of E other than 1 or –1. Choice (C)

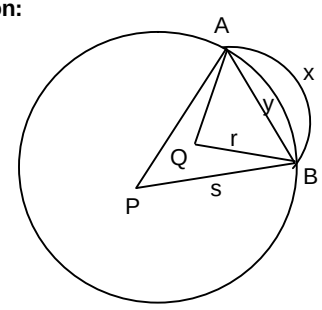
70. In the figure, below two circular curves create 60° and 90° angles with their respective centres. If the length of the bottom curve Y is 10π , find the length of the other curve.



(A) $15\pi/\sqrt{2}$ (B) $20\pi\dfrac{\sqrt{2}}{3}$ (C) $60\pi/\sqrt{2}$

(D) $20\pi/3$ (E) 15π

Solution:



The centre of arc AXB is Q and ∠AQB = 90°. Let QA = QB = r. The centre of arc AYB is P and ∠APB = 60°. Let PA = PB = s, Chord AB = s and chord AB is also equal to $\sqrt{2}$ r. The length of arc AYB is 10π, ie. $\dfrac{2\pi s}{6} = 10\pi \Rightarrow s = 30$.

Also $s = \sqrt{2}\, r \Rightarrow r = 15\sqrt{2}$

The length of arc AXB = $\dfrac{2\pi r}{4} = \pi\dfrac{\pi(15\sqrt{2})}{2}$

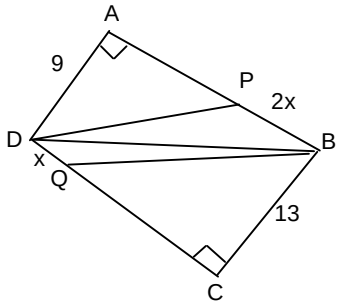
$= \dfrac{15}{\sqrt{2}}\pi$. Choice (A)

71. ABCD is a quadrilateral such that AD = 9 cm, BC = 13 cm and ∟DAB = ∟BCD = 90°. P and Q are two points on AB and CD respectively, such that DQ : BP = 1 : 2 and DQ is an integer. How many values can DQ take, for which the maximum possible area of the quadrilateral PBQD is 150 sq.cm?

(A) 14 (B) 12 (C) 10

(D) 9 (E) 8

Solution:



∠A = ∠C =90°

Area of ΔBDQ = $\dfrac{1}{2}$ (x)(13) = 6.5x.

Area of ΔDPB = $\dfrac{1}{2}$ (2x)(9) = 9x.

Area of quad PBQD = 15.5x.

$15.5x \le 150 \Rightarrow x \le \dfrac{300}{31} \approx 9.67$.

There are 9 integral values of x(viz 1,2,3,----- 9). If x = 0, DQ = PB = 0. We would not say that the ratio of DQ and PB is 1:2. Choice (D)

Study the data given in the table below and answer the questions 72- 74 that follow:

Region / Shop Type	North	East	West	South	All India
Grocers	34.7	32	32.2	30.2	32.4
Pan Bidi	7.1	21.2	13.1	19.1	14.6
Food Shops	11.8	7.9	14.8	12	11.6
General stores	12.4	9.1	12	6.6	10.1
Electrical Hardware	8.3	5.6	7.7	5.7	6.7
Chemists	6	5.8	5	5.7	5.7
Cosmetics Stores	3.8	3.6	3.3	3.9	3.7
Others	15.8	14.8	12	16.8	15.2
Total	100	100	100	100	100

All figures are in percentage

Based on a survery of 'shop types' Kamath categorized Indian states into four geographical regions as shown in the table above. His boss felt that the categorization was inadequate since important labels were missing. Kamath argued that no further labels are required to interpret the data.

72. A consultant observing the data made the following two inferences:
Inference I: The number of Grocers per-thousand-population is the highest in North India.
Inference II: The number of Cosmetic per-thousand-population is the highest in South India.
Which of following options is DEFINITELY correct?
(A) Inference **I** alone is alone is correct.
(B) Inference **II** alone is correct.
(C) Either of the inference is correct.
(D) Neither of the inference is correct.
(E) Inference **I** will be correct only if inference II is correct.

Solution:
As we have no idea about the population in the four regions, neither of the inference is definitely correct. Choice (D)

73. The average size of Food shops in East India was twice that of Food Shops in West India. Which of the following CANNOT be inferred from the above data?
(A) As far as 'Food Shops' are concerned, customers in East India prefer spatial surroundings compared to customers in the West India.
(B) As far as 'Food Shops are concerned, Rentals are very high in West India compared to East Inida.
(C) The ratio of customers buying from 'Food Shops' in East India to customers buying from 'Food Shops' in West India is 15.8:11.8.
(D) There are 740 'Food Shops' in West India.
(E) There are 240 'Food Shops' in South India.

Solution:
The question and the choices are very vague. We feel the answer has to be one of (D) or (E). The total number of shops in West India and South India has to be nearly equal for the percentages to hold. As such there cannot be a huge difference between the number of food shops in West India and South India.

74. Bala collected the same data five years after Kamath, using the same categorization. His data is presented below:

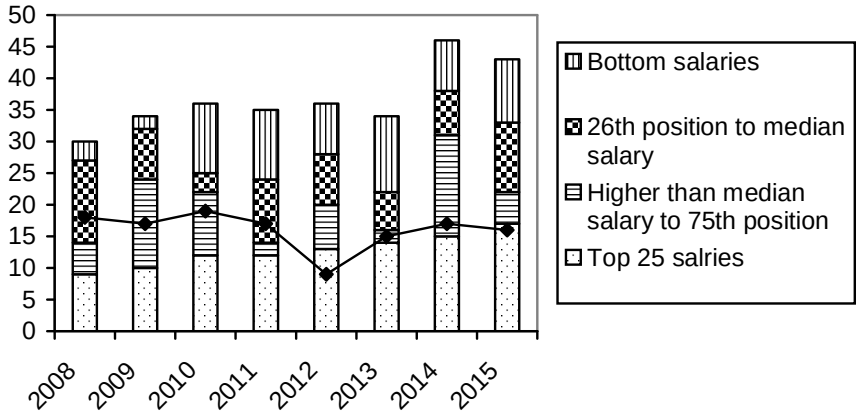
	North	East	West	South	All India
Grocers	30	32	32.2	40	32.4
Pan Bidi	7.1	25	13.1	19.1	14.6
Food shops	4	7.9	14.9	12	11.6
General stores	12.4	9.1	12	7	10.1
Electrical Hardware	15	5.8	7.6	5.7	6.7
Chemists	7	5.8	5	5.7	5.7
Cosmetic Stores	3.9	3.6	3.2	3.9	3.7
Others	20.6	10.8	12	6.6	15.2
Total	100	100	100	100	100

Which of the following statements can DEFINITELY be concluded?
(A) In the last four years the number of Electrical hardware shop types has increased in North India.
(B) In the last four years the number of Grocers shop types has increased in South India.
(C) For the last four years in All India the number of Chemists shop types has remained constant.
(D) In the four years in East India the number of 'others' shop type has decreased.
(E) As per the new survey conducted *Pan Bidi* shops in East India are next only to Grocers.

Solution:
The number of shops in the four regions has to be nearly equal for the percentages to hold. In East India Grocery shops are the highest followed by Pan Bidi shops Choice (E)

Study the graph below and answer the questions 75-78 that follow:

This graph depicts the last eight years' annual salaries (in `lacs.) offered to students during campus placement. Every year 100 students to through placement process. However, at least one of them fails to get placed. The salaries of all unplaced students are marked zero and represented in the graph.



The bold line in the graph presents Mean salaries at various years.

75. In which year maximum number of students offered salaries between `20 to `30 lacs (both inclusive)?
(A) 2008 (B) 2009 (C) 2010
(D) 2012 (E) Cannot be determined

Solution:
The question can be solved only if we assume uniform distribution of students in each segment of a bar of the graph. In case of non-uniform distribution the answer has to be "cannot be determined" but it would create a problem in the third question of the set as there is no 'Cannot be determined' in the choices there and the first and third questions in the set follow the same logic. Assuming uniform distribution we get the highest value as around 40 in 2010. Choice (C)

76. Identify the years in which the annual median salary is higher by at least 60% than the average salary of the preceding year?
(A) 2009, 2010
(B) 2012, 2014
(C) 2009, 2010, 2012
(D) 2009, 2012, 2014
(E) 2009, 2010, 2012, 2014

Solution:
The annual median salary and the average salary for the different years are as follows.

Year	Median Salary (lacs)	Avg. Salary (lacs)
2008	14	17
2009	24	16
2010	22	19
2011	14	10
2012	20	15
2013	17	16
2014	31	17
2015	23	15

The annual median salary is higher than the average salary of the preceding year by at least 60% only in 2012 and 2014. Choice (B)

77. Identify the number of years in which the difference between the average salaries of the top 25% and the bottom 25% is more than `20 lacs:
(A) 0 (B) 1 (C) 2
(D) 3 (E) 4

Solution:
Using the same logic as in the first question it is true for years 2008, 2009, 2010 and 2014.
Choice (E)

78. If the average salary is computed excluding students with no offers, in how many years will the new average salary be greater than the existing median salary? Refer the table below for number of students without offers.

Year	2008	2009	2010	2011	2012	2013	2014	2015
Number without job offers	9	5	20	2	2	4	15	2

(A) 3 (B) 4 (C) 5
(D) 6 (E) Cannot be solved without additional information

Solution:
The new average salary will be greater than the existing median salary in the years 2008, 2010 and 2013.
Choice (A)

GENERAL KNOWLEDGE

1. Which Sea lies to the west of Yemen and Saudi Arabia?
(A) The Gulf of Aden
(B) Gulf of Oman
(C) Red Sea
(D) Black Sea
(E) Persian Gulf

Solution: Choice (C)

2. In the budget Estimates of 2015-2016:
(A) Non-planned expenditure was more than revenue receipts
(B) Revenue receipts were higher than non-planned expenditure
(C) Planned expenditure was higher than Non-planned Expenditure
(D) Fiscal Deficit was lower than Revenue deficit
(E) Total expenditure was 20% higher than Total Receipts

Solution: Choice (B)

3. Consider the following statements:
1. Sinai is a part of Egypt.
2. Sinai is in Asia.
3. Sinai is in Africa.
4. Russian plane was downed in Sinai in November 2015.

Which of the above statements are true?
(A) 1 and 3 only
(B) 1, 2 and 4 only
(C) 1, 3 and 4 only
(D) 2 and 4 only
(E) 3 and 4 only

Solution: Choice (B)

4. In 2015, which country was ranked number one as "as best place to do business in"?
(A) U.S.A (B) NewZealand
(C) Singapore (D) Hong Kong
(E) India

Solution: Choice (C)

5. Perumal Murugan is a(n):
(A) Writer (B) Painter
(C) Journalist (D) Actor
(E) Director

Solution: Choice (A)

6. In percentage terms, which Indian state has the highest forest cover?
(A) Madhya Pradesh
(B) Harit Pradesh
(C) Nagaland
(D) Arunachal Pradesh
(E) Jammu & Kashmir

Solution: Choice (D)

7. Meghanad Saha was a famous:
(A) Historian (B) Economist
(C) Painter (D) Novelist
(E) Physicist

Solution: Choice (E)

8. Read the following statements:
1. Russia supports President Assad of Syria.
2. Saudi Arabia opposes President Assad of Syria.
3. Iran supports President Assad.
4. The United States support President Assad.

Which of the above statements are true:
(A) 1 and 2 only
(B) 1, 2 and 3 only
(C) 1, 2, 3 and 4
(D) 2 and 3 only
(E) 2, 3 and 4 only

Solution: Choice (B)

9. Angus Deaton is a famous:
(A) Economist (B) Pysicist
(C) Writer (D) Historian
(E) Painter

Solution: Choice (A)

10. Which of the following is not a conglomerate?
(A) Reliance (B) ITC
(C) TCS (D) Adani
(E) Murugappa

Solution: Choice (C)

11. Which of the following is the closest country to Antarctica?
(A) Argentina (B) Brazil
(C) South Africa (D) Australia
(E) New Zealand

Solution: Choice (A)

12. The "New Horizon" was in news in 2015. It refers to:
(A) Award winning book
(B) Business Consulting Company
(C) Mission to Pluto
(D) Business Magazine
(E) Award winning Oscar film

Solution: Choice (C)

13. The Islands that are under dispute of the ownership between Japan and China are:
(A) Osaka Islands
(B) Muntheetu Islands
(C) South China Islands
(D) Senkaku Islands
(E) None of the above

Solution: Choice (D)

14. The Inuit Paradox:
(A) is a place in the article circle near Greenland.
(B) is that the inuits eat a lot of fat and hardly any fruits are still very healthy.
(C) is that the Inuits eat anything that moves but spare the reindeer.
(D) is that the Inuits have very little exposure to the Sun but suffer no deficiency from Vitamin D.
(E) is a Glacier that looks like a circle form a distance but is actually a rectangle.

Solution: Choice (B)

15. Takata Corporation was in the news recently because it:
(A) was involved in airbag recalls.
(B) was the chief aide to Shinzo Abe who promised to revive the economy.
(C) was the Commander in Chief of the Japanese army accused by critics of war mongering.
(D) was the second largest seller of phones in China.
(E) was the name of a band that fuses Japanese and American music.

Solution: Choice (A)

16. Elon Musk is closely associated with:
(A) Google (B) GM
(C) Volkswagen (D) Tesla
(E) Apple

Solution: Choice (D)

17. Raspberry PI is a:
(A) computer sized credit card
(B) former name of iMac
(C) credit card sized dessert
(D) credit card swiping machine
(E) credit card sized computer

Solution: Choice (E)

18. Which of the following films is not associated with Christopher Nolan:
(A) Interstellar (B) Matrix
(C) Memento (D) Inception
(E) Prestige

Solution: Choice (B)

19. Timbuktu is :
(A) A city in China
(B) A fictional city
(C) A form of expression
(D) A city in Mongolia
(E) A city in Mali

Solution: Choice (E)

20. RuPay is related to:
(A) Rural Payment of Wages office of India
(B) National association for facilitation of Rural Payments
(C) National Payments Corporation of India
(D) Russia pay, a Russian competitor of paypal
(E) Rustic poetry, an Annual Festival held in Jaipur, Inida.

Solution: Choice (C)

21. Plasmodium Vivax causes:
(A) Typhoid
(B) Malaria
(C) AIDS
(D) Syphilis
(E) Bird Flu

Solution: Choice (B)

22. Pilatus PC-7 is a(n):
(A) frigate
(B) aircraft carrier
(C) ship
(D) submarine
(E) aircraft

Solution: Choice (E)

23. Which of the following commodity is not matched with its country. If 'right match' is considered as one of the top five producers of that commodity?
(A) Oat : Russia
(B) Wheat: : United Sates
(C) Apple : China
(D) Carrot: India
(E) Rice : Indonesia

Solution: Choice (D)

24. Which of the following countries has the lowest External Debt?
(A) United Kingdom
(B) France
(C) USA
(D) India
(E) China

Solution: Choice (D)

25. Which of the following city is not related to the automobile industry?
(A) Dharwad
(B) Lucknow
(C) Jamshedpur
(D) Pithampur
(E) Itanagar

Solution: Choice (E)