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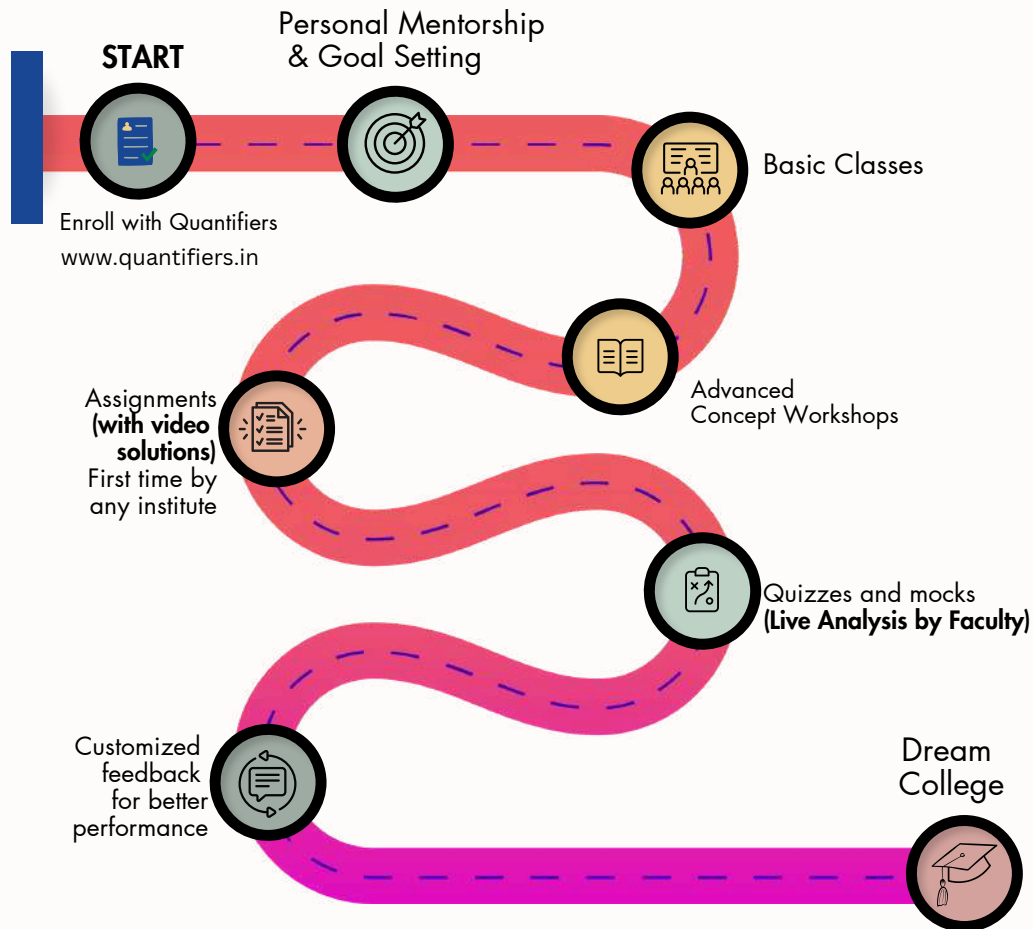
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CAT 2013 VARC (Memory Based Paper)

DIRECTIONS for question 1: The following question presents four statements, of which three, when placed in appropriate order, would form a contextually complete paragraph. Pick the statement that is not part of the context.
(A) But as access to other texts is enjoyed more widely, some of the dominance textbooks now enjoy will wane.
(B) As indeed will the power of teachers whose prejudices may often be just as ingrained as those found in textbooks, and rather harder to pin down.
(C) It won't be long before children, will be able to access, by way of smartphones, the textbooks prescribed for their courses.
(D) As long as textbooks in one form or another are used and as long as they are issued or approved by the state. They will remain a political issue.

DIRECTIONS for questions 2 to 5: Read the following passage and answer the questions that follow it.

Psychotherapeutic processes deal with psychological problems, ranging from mild ones like a depressed mood, to more subtle ones like interpretation of dreams to more controversial problems like dissociative identity disorder. Denied emotions (not admitting or voicing one's emotions to the therapist) is a root cause of many psychological problems as honest communication is the numerouno factor for the psychotherapeutic process to work. Emotional honesty can be a difficult task for the client or patient.

Psychotherapists make analysis of dreams a significant part of their work. It is tempting to wish petulantly that the unconscious would speak to us more clearly as significance of many dreams eludes us. But dreams that can be interpreted provide helpful he information like warnings of personal pitfalls, solution guides to problems; sources of necessary information and judgement, as direction-finders when we feel lost, as pointers to the way we need to go when we are floundering and the message always seems to be one designed to nurture spiritual growth.

The unconscious may communicate to us when we are awake with as much elegance and beneficence as when we are asleep, although in a slightly different form of 'idle thoughts or even fragments of thought. As with dreams, wo pay these idle thoughts no attention and cast them aside as insignificant. Hence patients in psychoanalysis are instructed to say everything, however insignificant, that comes in their minds. Idle thoughts provide us with insight into ourselves and others.

The seemingly alien and unwanted quality Is characteristic of unconscious material and its manner of presentation to the conscious mind. This and the associated resistance of the conscious mind led Freud to perceive the unconscious as a repository of the primitive, the antisocial and the evil within us. He tended to assume that mental illness somehow resided in the unconscious as a demon in the subterranean depths of our mind. To Carl Jung fell the responsibility of correcting this which he did through his work "The Wisdom of the Unconscious." As he concluded, mental illness is not a product of the unconscious but a phenomenon of consciousness or a disordered relationship between conscious and unconscious. Consider the matter of repression. Freud discovered in his patients' sexual desires and hostile feelings of which they were unaware but which were making them ill. Because these desires and feelings resided in the unconscious, the notion arose that it was the

unconscious that caused mental illness. But why were these desires and feelings in the unconscious in the first place? Why were they repressed? The answer is that the conscious mind did not want them. And it is in this not wanting, this disowning, that the problem lies.

2. A major difference between the points of view expressed by Freud and Jung as discussed in the passage is
(A) One considered ailments of the mind to be the result of conflict between the conscious and the unconscious, while the other considered ther to be inherent in the unconscious.
(B) One considered that ailments of the mind are grounded in the conscious, while the other considered them to be triggered by the unconscious.
(C) One considered that the evil qualities of human beings reside in their unconscious mind, while the other considered that the unconscious mind repressed desires and feeling.
(D) One considered that ailments of the mind are grounded in the unconscious, while the other considered them to be triggered by the conscious.

3. Which of the following statements are logically consistent with the content of the paragraph?
(I) Idle thoughts can sometimes illuminate the situation of the person as valuable messages from the unconscious can be received.
(II)Emotionally dishonest clients are very poor communicators and suffer from psychological problems.
(III) Dissociative identity disorder is primarily due to denied emotions.
(IV) Dreams can help effect, in us, better understanding, and development, of the spirit within.
(V) Honest communication and open interaction can positively influence psychotherapeutic decision
A. I, III, IV, V
B. I, IV, V
C. I, II, IV
D. II. IV. V

4. If a paragraph were to be inserted between the first and the second paragraphs, it would most likely deal with which of the following?
(A) Dreams can be instrumental in gauging a person's emotional state.
(B) Emotions are, very often, the substance of a person's idle thoughts.
(C) It is very difficult to gauge emotional honesty.
(D) Dreams, often, are indicative of emotions that remain unexpressed.

5. In saying "It is tempting to wish petulantly that the unconscious would speak to us more". (in para 2) the author wishes to indicate that
(A) The inability to understand the unconscious can irritate psychotherapists when pursuing their objectives.
(B) The inability to understand the unconscious can puzzle psychotherapists in pursuit of their objectives.
(C) The inability to understand the unconscious can frustrate psychotherapists when pursuing their objectives.

(D) The inability to understand the unconscious can divert psychotherapists from their objectives.

DIRECTIONS for question 6: In the question, there are five sentences or parts of sentences that form a paragraph. Identify the sentence(s) or part(s) of sentence(s) that is/are correct in terms of grammar and usage. Then, choose the most appropriate option.
(a) Leonardo da Vinci was a self-taught man and began teaching himself Latin at the early age.
(b) He became a great engineer and was the first to discover that blood circulated through the body.
(c) He believed that coarse people of bad habits and shallow judgments did not deserve so beautiful an instrument and such a complex anatomical equipment than the human body.
(d) They should merely have a sack for taking in food and letting it out again, for they are nothing but the alimentary canal.
(e) Very fond of animals, he was himself a vegetarian and had the habit of buying caged birds from the market and setting them free immediately.
(A) A and C
(B) B and D
(C) Only A
(D) Only E

DIRECTIONS for question 7: The sentences given in the following question, when properly sequenced, form a coherent paragraph. Each sentence is labelled with a letter. From among the four choices given below the question, choose the most logical order of sentences that constructs a coherent paragraph.
(a) Although thoughts are primary, thoughts in are primary themselves have no method of transmission and are therefore dependent on speech.
(b) If we were to summarize the logo-centric approach to meaning, we should state that what emerges is that speech is the original signifier of meaning.
(c) Language, the cornerstone of humanity, emerges as a process to allow our thoughts to travel across space and between people.
(d) Language can then be viewed as a system of verbal signs that signify individual thought.
(e) Language produces speech to transmit thoughts and writing to transmit speech.
(A) cabed
(B) baced
(C) beacd
(D) caedb

DIRECTIONS for question 8: In the following question, the word in capitals is used in four different ways. Choose the option in which the usage of the word is INCORRECT or INAPPROPRIATE.
MELT
(A) The crowd melted away after the prayer meeting.
(B) Even the sternest mother's heart melts at the sight of her baby crying.
(C) His anxiety melted away when he received an SMS from his daughter confirming that she had reached her destination safely.

(D) The cries of opposition suddenly melted to cheers when the principal agreed to the demands of the students.

DIRECTIONS for question 9: The sentences given in the following question, when properly sequenced, form a coherent paragraph. Each sentence is labelled with a letter. From among the four choices given below the question, choose the most logical order of sentences that constructs a coherent paragraph.
(a) Generally speaking, in pre-capitalist societies people produced things directly for other people, not for sale on a market in Marx's language, they produced for use, not exchange.
(b) However, producing things for sale (or exchange) creates a new dynamic, different from societies that produce directly for use.
(c) Capitalism is very different from past modes of production.
(d) Under capitalism, nearly all of the products of human labor are commodities, that is, they are produced for sale.
(e) Every system of production has to regulate how much of people's labor is spent producing one thing versus another, so that society does not expend labor on things that are useless.
(f) Marx called this "generalized commodity production people obtain their needs and wants by purchasing them on a market, and people produce what other people need and want by selling things on a market.
(A) DFBEAC
(B) ABCDEF
(C) EACDFB
(D) CDFABE

DIRECTIONS for questions 10 to 12: Read the following passage and answer the questions that follow it.

SOVEREIGN in tastes, steely-eyed and point-on in perception of risk, and relentless in maximisation of happiness." This was Daniel mcfadden's memorable summation, in 2006, of the idea of Everyman held by economists. That this description is unlike any real person was Mr. Mcfadden's point. The Nobel prizewinning economist at the University of California, Berkeley, wryly termed homo economicus "a rare species". In his latest paper he outlines a "new science of pleasure, in which he argues that economics should draw much more heavily on fields such as psychology. Neuroscience and anthropology. He wants economists to accept that evidence from other disciplines does not just explain those bits of behaviour that do not fit the standard models. Rather, what economists consider anomalous is the norm. Homo economicus, not his fallible counterpart, is the oddity.

To take one example, the "people" in economic models have fixed preferences which are taken as given. Yet a large body of research from cognitive psychology shows that preferences are in fact rather fluid. People value mundane things much more highly when they think of them as somehow "their own: they insist on a much higher price for a coffee cup they think of as theirs, for instance, than for an identical one that isn't. This "endowment effect" means that people hold on to shares well past the point where it makes sense to sell them. Cognitive scientists have also found that people dislike losing something much more than they like gaining the same amount. Such "loss aversion can explain why people often pick insurance policies with lower deductible charges even that they are more expensive. At

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the moment of an accident a deductible feels like a loss, whereas all those premium payments are part of the status quo.

Such tools have implications for policy. Plenty of poor people in America are wary of programmes like the Earned Income Tax Credit (EITC) because the idea of getting a handout from the government reinforces a sense of helpnessness. Dignity is not something mainstream economics has much truck with. But creating a sense of dignity turns out to be a powerful way of affecting decisions. One study by Crystal Hall, Jiaying Zhao and eldarshafir, a trio of psychologists, found that getting poor people in a soup kitchen to recall a time when they felt successful and proud" made them almost twice as likely to accept leaflets that told them how to get an EITC refund than members of another group who were merely ely asked about the last meal meal the they had eaten.

Taking the path Mr. Mcfadden urges might also lead economists to reassess some articles of faith. Economists tend to think that more choice is good. Yet people with many options sometimes fail to make any choice at all : think of workers who prefer their employers to put them by "default" into pension plans at preset contribution rates. Explicitly modelling the process of making a choice might prompt economists to take a more ambiguous view of an abundance of choices. This is undoubtedly messier than standard economics. So is real life.

10. Which of the following most accurately represents the author's criticism of "Homo economicus"?
(A) It gives an inaccurate picture of consumer behavior in real economic transactions.
(B) The ideal person who makes choices in conservative economic models is, in fact, the opposite of 'homo economicus".
(C) It is nowhere close to the unpredictable consumer in real economic situations.
(D) It is the economists' mythical Everyman.

11. The author of the passage mentions the observations of Hall, Zhao and Sharif in order to
A. Demonstrate that people take pride in their achievements even in hard times.
B. Demonstrate how empathy can play a significant role in persuasion.
C. Provide support for the assertion that dignity is a powerful factor in decision-making.
D. Illustrate that authorities would be able to implement policies more effectively if the understand their citizens.

12. The view mentioned in the last paragraph (Taking the path… real life") refers to which of the following?
A. People are loath to make any choice when faced with a plethora of options.
B. Consumers prefer to seek expert guidance while making a choice.
C. Employers coax workers to accept pension plans with fixed contribution rates.
D. The view that more choice is good for consumers should be regarded with skepticism.

DIRECTIONS for question 13: The following question has a paragraph from which the last sentence has been deleted. From the given options, choose the sentence that completes the paragraph in the most appropriate way.

The scientist and the artist are both concerned to change the world the one the external world of man's objective relations with nature, the other the internal world of his subjective relations with his fellow men. The scientist discovers a contradiction in his consciousness of the external world and resolves it in a scientific hypothesis: the artist discovers a contradiction in his consciousness of the internal world and resolves it in a work of art. Both are creative acts. The scientist extends our knowledge and hence also our control of nature.

(A) The artist takes complex explanations and renders them simple.

(B) In doing so, he proves that there is nothing we cannot do everything is brought within our reach.

(C) The artist heightens our sense of ourselves as social beings and so advances the class struggle.

(D) The artist teaches us to think for ourselves.

DIRECTIONS for question 14: The following question presents four statements, of which three, when placed in appropriate order, would form a contextually complete paragraph. Pick the statement that is not part of the context

A. The trade in iron ore makes it the second-largest commodity market by value after crude oil

B. The metal provides the backbone of skyscrapers, bridges and motorways, and the carapace and internal organs of cars, fridges and washing machines.

C. Given steel's ubiquity - it makes up 95% of global metal production - iron ore, the raw material from which it is made, attracts strangely little attention

D. The development of a process to turn raw earth into stool merits a high spot on a list of mankind's most ingenious achievements.

DIRECTIONS for questions 15 to 17: Read the following passage and answer the questions that follow it.

Marcel Proust (1871-1922) was immensely well read. "In Search of Lost Time" encapsulates within itself the main traditions in French literature: both in fiction (from Madame de Lafayette through Stendhal, Balzac, Flaubert and Zola) and in the bellelettristic-philosophical line (from Montaigne through Pascal, La Rochefoucauld and Chamfort). Proust formed a strong taste for generalization through these latter writers. I own a small book of his maxims, drawn from the novel and his discursive writings, and an unusually high quotient of them are dazzling. Let one example suffice: "It has been said that the greatest praise of God lies in the negation of the atheist, who considers creation sufficiently perfect to dispense with a creator. As an asthmatic child, Proust read more than most children. By the age of 15, he was already immersed in contemporary literature, having read the essays and novels of Anatole France and Pierre Loti, the poetry of Mallarme and Leconte de Lisle, and a number of the novels of Dostoyevsky, Tolstoy, Dickens and George Eliot. Unlike Henry James, who referred to their works as "baggy monsters," Proust fully appreciated the great Russian novelists. He thought Tolstoy "a serene god. Valuing especially his ability to generalize in the form of setting down laws about human nature. For Proust, Dostoyevsky surpassed all other writers, and he found "The Idiot" the most beautiful novel he had ever read. He admired Dostoyesky's skill with sudden twists in plot, providing the plausible surprises that propelled his novels.

In his 1905 essay "On Reading," a key document in Proust's freeing himself to write his great novel, he quoted Descartes: "The reading of all good books is like a conversation with the

most cultivated of men of past centuries who have been their authors Proust's examination of the original psychological act called "reading," that "noblest of distractions. He stated that reading is superior to conversation, which "dissipates immediately."

A book, he felt, is "a friendship… and the fact that it is directed to one who is absent, gives it something disinterested, almost moving." Books are actually better than friends, Proust thought, because you turn to them only when you truly desire their company and can ignore them when you wish, neither of which is true of a friend. One also frequently loves people in books, "to whom one had given more of one's attention and tenderness [than] to people in real life." In his own novel, Proust wrote. "Real life, life at last laid bare and illuminated the only life in consequence which can be said to be really lived— is literature."

15. In the passage the author is primarily concerned with?
 (A) critically examining Proust's "In Search of Lost Time.
 (B) providing a synopsis of Proust's reading tastes
 (C) evaluating Proust's position in the great literary tradition
 (D) discussing the intellectual influence Proust's contemporaries had on his work

16. The author quotes an example of Proust's maxims to highlight his (Proust's)
(A) Grasp of the metaphysical.
(B) Penchant for the philosophical.
(C) belief in a Supreme Being
(D) exceptional choice of thought and word.

17. The passage implies that Proust subscribes to which of the following views?
(a) a good book is like having a conversation with a classical writer.
(b) Reading is a virtuous pastime and it leaves an indelible impression on one's mind.
(c) Literature imitates life.
(d) A reader can invest the feelings forcharacters in a book.
(e) Dostoyevsky's "The Idiot was appreciated by him for the unanticipated turns in the plot.
(f) Dostoyevsky's "The Idiot" was known for its aesthetics, its gripping pace and its unlikely element of surprise.
 (A) a, c, d, e
 (B) a, e, f
 (C) a, b, c, e
 (D)a, b, c, d, e

CAT 2013 DILR

DIRECTIONS for questions 1 to 4: Answer these questions on the basis of the information given in the next page.
Summary of the estimate of memory space occupied by the information worldwide, stored in various storage media, in the year 2000

Summary of the estimate of memory space occupied by the information worldwide, stored in various storage media, in the year 2000
Grand Total = 2,120,370 Tera Bytes (TB) of Memory Space
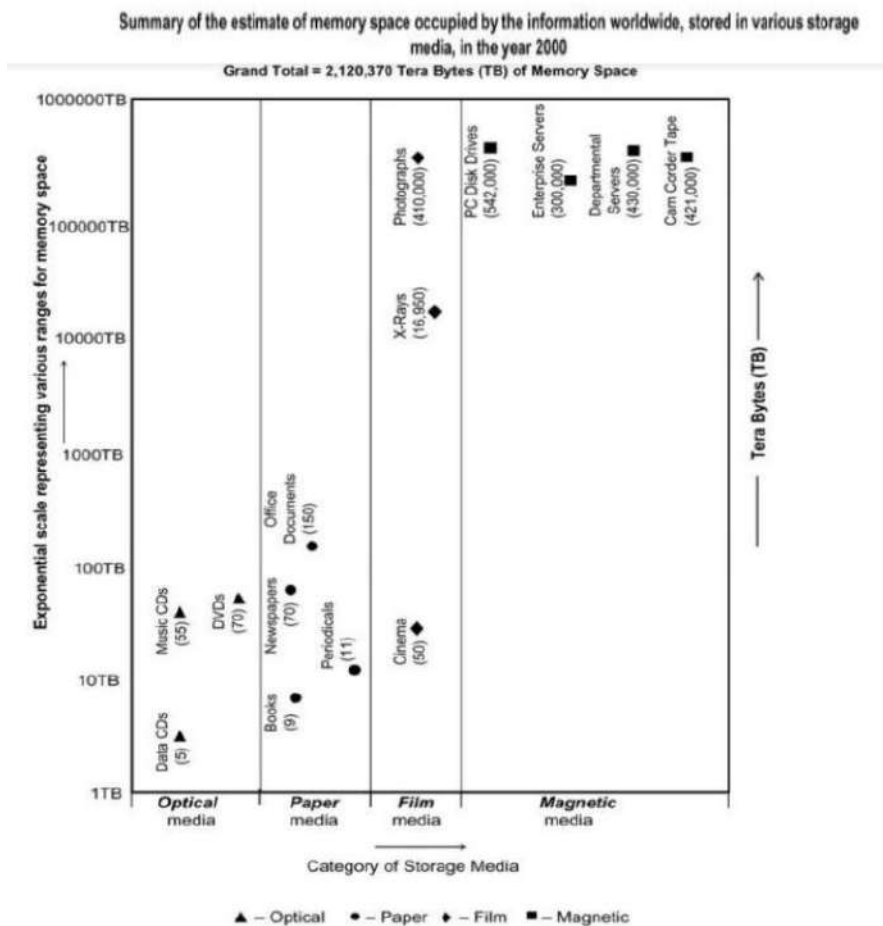
1. If the information contained in each X-Ray occupies 30MB of memory space on an average, and by using a new technology each X-Ray is now stored in magnetic media that saves 60% of the memory space required, what is the total amount of memory space of magnetic media that is required to store all the X-Rays available in the year 2000. (1MB= 10^6 Bytes of memory space)
(A) 10,170 TB
(B) 6,780 TB
(C) 1,703,170 TB
(D) None of these

2. The information stored in Newspapers, Books and Periodicals forms what percentage of the total information stored on paper media? Assume that the information stored per unit memory space occupied is the same for all the media mentioned.

(A) 37.5%
(B) 45%
(C) 57%
(D) 54%

3.. When compared to the total memory space occupied by the information stored in any single category of storage media, what is the highest percentage share of memory space occupied by the information stored in any single media within that category (approximately)?
(A) 68.75%
(B) 62.5%
(C) 96%
(D) 98.3%

4. Due to advances in technology, the information stored per unit memory space occupied worldwide increases by 20% every year, while the total memory space available worldwide increases at the rate of 10% every year. If in the year 2000, 80% of the memory space available worldwide is occupied by the information available worldwide, and the information available worldwide were to increase by 45% every year, then which of the following years is the earliest by which there will be a shortage of memory space?
(A) 2002
(B) 2003
(C) 2004
(D) 2005

DIRECTIONS for questions 5 to 8: Answer these questions on the basis of the information given below.
The following is the table of points drawn at the end of all the matches in a six-nation Hockey tourmament, in which each country played with every other country exactly once. The table gives the positions of the countries in terms of their respective total points scored (i.e., in the decreasing order of their total points). Each win was worth three points, each draw one point And there were no points for a loss. Some information in the table has been intentionally left out. The results of none of the individual matches are known, except that Pakistan beat India and no two teams finished with the same number of points.

Position	Country	Won	Drawn	Lost	Goals For	Goals Against	Total Points
1.	Australia				17	5	15
2.	Netherlands				9	6	10
3.	Pakistan					2	8
4.	India				2	5	
5.	South Korea				7	11	2
6.	Spain				6	16	

15. Which of the following matches was a draw?
(A) India Vs South Korea
(B) Spain Vs Netherlands

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(C) Netherlands Vis South Korea
(D) Spain South Korea

6. The total number of points won by India is
(A) 5
(B) 6
(C) 7
(D) Cannot be determined

7. The total number of goals scored in the matchbetween Netherlands and Pakistan is
(A) 0
(B) 1
(C) 2
(D) Cannot be determined

8. The number of goals scored by Australia against India is at most
(A) 5
(B) 4
(C) 3
(D) 2

Directions for questions 9 to 11: Answer them on the basis of the information given below

Each of nine persons, P, Q, R, S, T, U, V, W and X, lives in a different flat in an apartment building, which has six floors (excluding the ground floor, which is used only for parking) and three flats on each floor. The three flats on each floor are in a row and no two adjacent flats on a floor are occupied. At least one person lives on each floor.

Further the following information is known:
(i)   P and Q live on the same floor.
(ii) R and S live on different floors.
(iii) T lives in the middle flat on the fourth floor.
(iv) U lives on the sixth floor and V lives on the first floor.
(v)   W lives on the floor which is immediately above the floor on which X lives.

9. If W and U do not live on the same floor, then which of the following cannot be true?
A. W lives on 3rd floor
B. Q lives on 3rd floor
C. R lives on 2nd floor
D. P lives on 2nd floor

10 If S and R are living on the first floor and the sixth floor respectively, then which of the following must be true?
A.T is living on the same floor as X
B.Q is living on the 2nd floor
C.P is living on the 3rd floor
D.W is living alone on his floor

11. If Q lives on the third floor, then how many combinations of persons could live on second floor?
A. 8
B. 6
C. 5
D. 7

Directions for questions 12 to 14: Answer them based on the information given below
Four friends —John, Mike, Lewis and Peter-went on a picnic and they participated in four adventure sports Paragliding, Skiing, Bungee, Jumping and Rock Climbing. Further, the following information is known about them:
(i)The number of persons who participated in Skiing is one more than that of those who participated in Bungee Jumping, which, in turn, is same as that of those who participated in Paragliding, which, in turn, is twice that of those who participated in Rock Climbing
(ii)Every person participated in at least one event and each sport was taken up by at least one person.
(iii)John participated in Skiing but not in Rock Climbing while Lewis participated in Bungee Jumping but not in Paragliding.
(iv)None of them participated in both Bungee Jumping and Rock Climbing.
(v)Peter participated in three sports.
(vi)Between Skiing and Paragliding, Mike participated in exactly one sport.

12. If Lewis participated in two sports, which of the following is definitely false?
(A) Mike did not participate in Skiing.
(B) John participated in Paragliding.
(C) Lewis participated in Skiing.
(D) Mike participated in Paragliding.

13. If John participated in Paragliding, which of the following statements is definitely true?
(A) Mike participated in Rock Climbing.
(B) John Participated in Bungee Jumping.
(C) Lewis did not participate in Skiing.
(E) Peter did not participate in Rock Climbing.

14.Which of the following is not a possible combination of number of sports taken up by John, Mike and Lewis?
(A) John-1, Mike-2, Lewis-2
(B) John-3, Mike-1, Lewis-1
(C) John-1, Mike-3, Lewis-1
(D) John-2, Mike-2, Lewis-1

15. Eight men have their first names, as Ratan, Rama, Ramesh, Ramu, Rakesh, Rajan, Rishabh and Rohit and their surnames are Kulkarni, Arora, Jain, Dutta, Singh, Sharma, Sen and Murthy, not necessarily in the same order. These eight persons are sitting around a circular table as per the following instructions:
(i) Ramu is sitting opposite Kulkarni and to the left of Singh.
(ii) Rajan is sitting opposite Sharma and next to Murthy, who is sitting to the left of Rama.

(iii) Arora is sitting opposite Ratan and Rohit sits adjacent to Dutta.
(iv) Rama, who is next to Rishabh and Ramesh, sits opposite Sen.

If Rishabh Arora sits between Kulkarni and Sharma, and opposite Singh, then who sits opposite Rakesh Dutta?
(A) Ramesh Murthy
(B) Rama Murthy
(C) Rajan Jain
(D) Rishabha Arora

DIRECTIONS for questions 16 to 19: These questions are based on the following information.
There are ten are ten boxes, numbered 1 to 10, each containing g gold coins. Each of the coins in nine of these ten boxes weighs 10 gm, whereas each of the coins in the tenth box weighs 20 gm. A digital weighing machine is provided. Now, a logician, Mr.Kapil, is invited. The task assigned to him is that he has to find out the box containing the coins weighing 20 gm each.

16. If g= 9, then what is the minimum possible number of times for which the weighing machine is to be used?
(A) 1
(B) 2
(C) 3
(D) 4

17. If g = 7. What is the minimum possible number of times for which the weighing machine is to be used?
(A) 1
(B) 2
(C) 3
(D) 4

18. If g = 3, what is the minimum possible number of times for which the weighing machine is to be used?
(A) 3
(B) 2
(C) 5
(D) 4

19. If g = 2, what is the minimum possible number of times for which the weighing machine is to be used?
(A) 2
(B) 3
(C) 5
(D) 4

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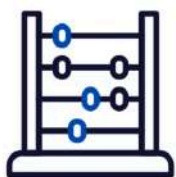
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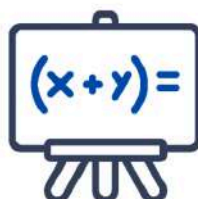
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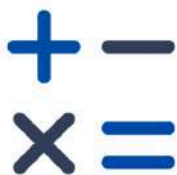
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CAT 2013 QUANT

DIRECTIONS for questions 1 and 2: Answer the questions on the basis of the information given below.
Functions g and h are defined on n constants, a_0, a_1, a_2, a_3 --------- a_{n-1} as follows:
$G(a_p, a_q) = a|p-q|$, if $|p-q| \leq (n-4)$ and
$= a_n - |p-q|$, if $|p-q| > (n-4)$
$H(a_p, a_q) = a_k$, where k is the remainder when p + q is divided by n

1. If n = 10, find the value of g(g (a2, a8), g(a1, a7)).
(A) a9
(B) a7
(C) a2
(D) a0

2. If h (ak, am) = am for all m, where $1 \leq m < n$ and $0 \leq k < n$, and m is a natural number, find k.
(A) 0
(B) 1
(C) n-1
(D) n-2

DIRECTIONS for questions 3 to 5: Answer the questions independently of each other.
3. In a bag there are a total of 150 coins in three denominations - ₹1, ₹2 and ₹#5 with at least one coin of each denomination being present in the bag. The total value of the Re 1 coins is at least 50% of the total value of the coins in the bag. If there are 235 coins in the bag and the total value of the ₹ 2 coins is at least 3% of the total value of the coins in the bag, find the number of ₹2 coins in the bag.
(A) 2
(B) 3
(C) 4
(D) 1

4. Let P, Q, S. R, T, U and V represent the seven distinct digits from 0 to 6, not necessarily in that order. If PQ and RS are both two-digit numbers adding up to the three-digit number TUV, find the value of V.
(A) 3
(B) 6
(C) 5
(D) Cannot be determined

5. There are five cards lying on a table in one row. Five numbers from among 1 to 100 have to be written on them, one number per card, such that the difference between the numbers on any two adjacent cards is not divisible by 4. The remainder when each of the five numbers is divided by 4 is written down on another card, ie, sixth card, in that order. How many sequences can be written down on the sixthcard?
(A) $2^2 3^2$

(B) $4(3)^4$
(C) $4^2 3^3$
(D) $4^2 3^4$

DIRECTIONS for questions 6 to 11: Answer the questions independently of each other.

6. A, b and care the lengths of the sides of the triangle ABC and d, e, and fare the lengths of the sides of the triangle DEF. If the following equations hold true:
A $(a + b + c) = d^2$
B $(a + b + c) = e^2$
C $(a + b + c) = f^2$
Then which of the following is always true of triangle DEF?
(A) It is an acute-angled triangle.
(B) It is a right-angled triangle.
(C) It is an obtuse-angled triangle.
(D) None of the above

7. Sujith looked at the six-digit number on his CAT admit card and said "If I multiply the first two digits with three, I get all ones. If I multiply the next two digits with six, I get all twos. If I multiply the last two digits by 9, I get all threes". What is the sum of the digits of the number on Sujith's admit card?
(A) 30
(B) 33
(C) 60
(D) 45

8. Two cars P and Q start from two points A and B towards each other simultaneously. They meet for the first time 40 km from B. After meeting they exchange their speeds as well as directions and proceed to their respective starting points. On reaching their starting points, they turn back with the same speeds and meet at a point 20 km from A. Find the distance between A and B.
(A) 130 km
(B) 100 km
(C) 120 km
(D) 110 km

9. Consider the following two curves in the XY plane:
$Y = 2x^3 + 3x^2 + 4$ and
$Y = 3x^2 - 2x + 8$
Which of the following statements is true for $-3 <= x <= 2$?
(A) The two curves intersect thrice.
(B) The two curves intersect twice
(C) The two curves intersect once.
(D) The two curves do not intersect.

10. A cuboidal aquarium, of base dimensions 100 cm x 80 cm and height 60 cm, is filled with water to its brim. The aquarium is now tilted along one of the 80 cm edges and the water

begin to spill. The tilting is continued till the water surface touches a line on the base which is at a distance of one-third of the length from (and parallel to the edge on which the aquarium is being tilted. Now the box is returned to its original position. By how many centimetres hasthe height of water reduced?
(A) 50
(B) 40
(C) 20
(D) 10

11. Some persons are standing at distinct points on a circle, all facing towards the centre. Each possible pair of persons who are not adjacent sing a three-minute song, one pair after another. If the total time taken by all the pairs to finish singing is 1 hour, findthe number of persons standing on the circle.
(A) 5
(B) 7
(C) 9
(D) 8

DIRECTIONS for questions 12 and 13: Answer these questions on the basis of the information given below.
In a triangle PQR, $<Q+<R = 120°$. PQ = 12cm and PR = 9 cm

12. Find the length of QR.
(A) $15/\sqrt{2}$ cm
(B) $3\sqrt{13}$ cm
(C) $5\sqrt{5}$ cm
(D) $5\sqrt{17}$ cm

13. If the angle bisector of$< P$ meets QR at M, find the length of PM.
(A) $28\sqrt{5}/9$ cm
(B) $42\sqrt{5}/11$ cm
(C) $36\sqrt{3}/7$ cm
(D) $4\sqrt{3}$cm

14. Outside sweet shop, its name "Madhu Sweet House is displayed using blinking lights. Each word flashes at a regular interval and remains lit for 1 second. After remaining lit for 1 second, "Madhu" remains unlit for 3½, seconds, "Sweet" remains unlit for 5¾seconds and "House" remains unlit for 9⅕ seconds. If all the words flash together at 8:00p.m. Sharp, find the time interval between the next time the first two words flash together and the next time the last two words flash together.
(A) 45 seconds
(B) 22.5 seconds
(C) 112 seconds
(D) 6.75 seconds

15. If $g(x) = p|x| – q x^2$, where p and q are constants, then at $x = 0$, $g(x)$ will be
(A) maximum when $p>0$, $q > 0$

(B) minimum when p < 0, q < 0
(C) minimum when p> 0, q < 0
(D) maximum when p > 0, q< 0

16. A television company manufactures two models of televisions — A and B. Each unit of model A requires four hours to manufacture and each four hours h unit of model B requires two hours to manufacture. The total time available in a month to manufacture these two models is 1600 hours. The profits generated on selling each unit of model A and each unit of model B are ₹1200 and ₹1000 respectively. Find the number of units of each of model A and model B televisions to be manufactured to maximize the profit.
(A) 200 model A and 600 model B
(B) 800 model A
(C) 800 model Bs
(D) None of the above

17. The age of a son who is more than two years old. Is equal to the units digit of the age of his father. After ten years, the age of the father will be thrice the age of the son. What is the sum of the present ages of the son and the father.
(A) 30 years
(B) 36 years
(C) 40 years
(D) Cannot determined

18.Given that –3 < x ≤ –1/2and ½ < y ≤ 7, which of the following statements is true?
(A) max [(x+ y) (x – y)] – min [(x + y) (x – y)] = 57½
(B) max [(x + y)²] = 169/4
(C) min [(x –y)²] = 1
(D) All of the above

19. Each side of a polygon is either parallel to the x-axis or parallel to the y-axis.A corner of the polygon is known as convex if the corresponding internal angle is 90° and as concave if the corresponding internal angle is 270°. If the polygon has 26convex corners, the number of its concave corners is
(A) 18
(B) 22
(C) 26
(D) 24

20. The density of a liquid its defined as the weight per unit volume of the liquid. The densities of two liquids A and B are in the ratio 2 : 1. The liquid B evaporates at a rate (in kg/hr) which is twice as fast compared to that of liquid A. Which evaporates at a rate of 1 kg/hour. If 70 kg of liquid A is mixed with 30 kg of liquid of B to form a mixture, find the number of hours the mixture needs to be evaporated so that the density of the resultant mixture is 1.04 times that of the original mixture. Assume that there is no chemical reaction between the liquids.
(A) 2.5
(B) 3

(C) 3.5
(D) 4

21. Let $f(x) = x/(1 + x^2)$ $g(x)= e–x/1 + [x]$ and where $[x]$ is the greatest integer less or equal to x. Then which of the following is true?
I. Domain of $(f + g) = R - (- 2, - 1]$
II. Domain of $(f + g) = R–[-1,0)$
III. [range of f] $\cap$ [range of g]$= [- 2, ½]$
IV. [range of f]$\cap$[range of g]$= [- ½, ½] –\{0\}$
(A) Both II and IV
(B) Both I and III
(C) Both I and IV
(D) Both II and III

22. The line L passing through the points (1, 1) and (2.0) meets the y-axis at A. The line through the point(½,0) and perpendicular to L meets the y-axis at Band L at C. Find area of the triangle ABC
(A) 25/16
(B) 16/9
(C) 32/19
(D) 40/23
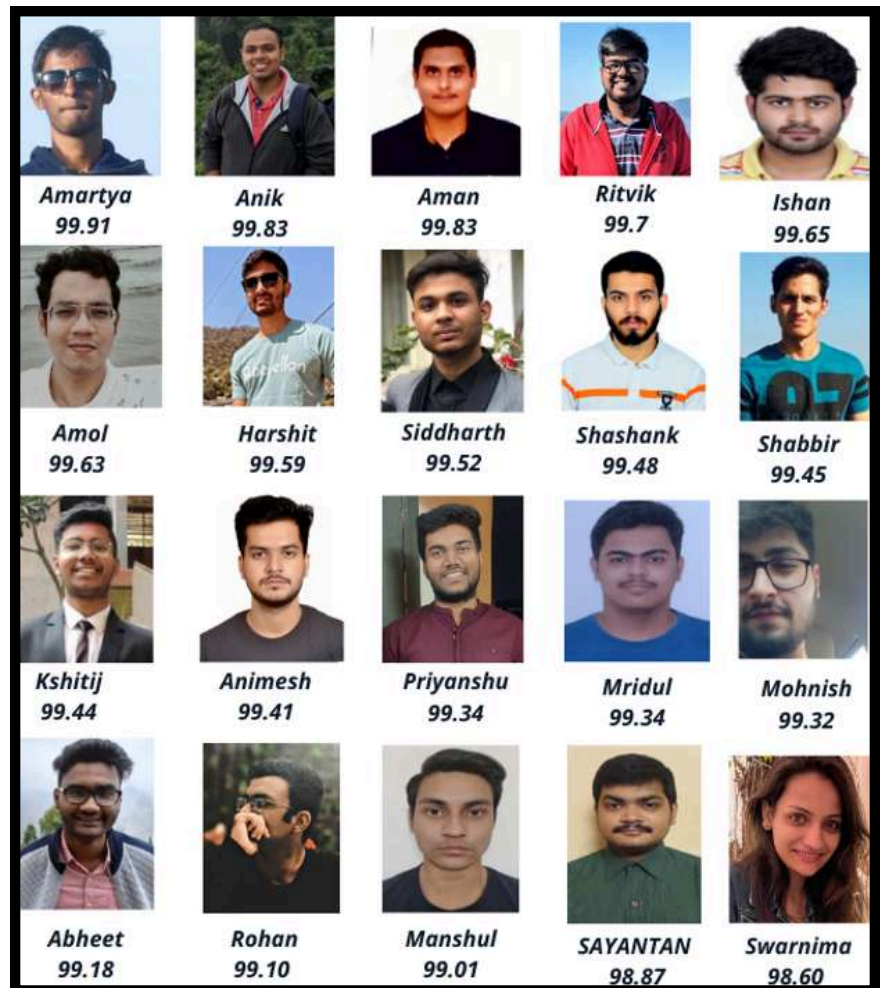
SOLUTIONS

VARC

1. Correct Answer: C

Sentence D is a general sentence that begins the paragraph. It refers to the fact that textbooks will remain a political issue until the time the government approves them.

Sentence A follows. It highlights the changed scenario. As more access to other texts is available, the dominance of textbooks may wane.

Sentence B extends the thought with the reference to the influence of teachers. Even the power of the teacher will wane. The 'indeed' in sentence B is used for emphasis. So sentences A, B compare the influence of both teachers and textbooks. Sentence C goes beyond the textbook-teacher influence comparison to indicate that textbooks may soon be available online, which is merely an elaboration on statement A. It is redundant since it does not contribute to the thought flow.

2. Correct Answer: A

From a careful reading of the fourth para, all facts provided in choice A are true. Freud assumed that mental illness resided in the unconscious. He discovered in his patient's desires (which resided in the unconscious) which were making them ill. The unconscious is a repository of the primitive, the antisocial and the evil within us. Jung concluded that mental illness is not the product of the unconscious ....but disordered relationship between conscious and unconscious. So, the first part of option A is Jung's view and the second part is Freud's view.

In choice C. Freud's view as given in the first part is correct but the second part does not correctly relate to Jung's view. Jung believed that the conscious mind repressed desires and feeling (not the unconscious mind),

Choice B is incorrect. Ailments of the mind being grounded in the conscious is not the correct view of Freud. Also, he believed that ailments resided in the unconscious and were not necessarily triggered by it. The word 'trigger' is usually used to imply 'something that did not exist earlier or 'initiate or cause) a potential risk'. While ailments may exist in the unconscious, there is no information in the passage to suggest that the unconscious causes the ailments of the mind. Choice D is incorrect. Freud's view is given correctly in the first part of D but the second part is not the view of Jung.

3. Correct Answer: B

Statement I can be deduced as it has been mentioned in the third paragraph that idle thoughts are cast aside most of the time but they can be significant and can provide valuable insights. Statement II cannot be inferred. That emotionally dishonest clients are very poor communicators and suffer from psychological problems may or may not be true. It has only been mentioned that dissociative identity disorder is dealt with in a psychotherapeutic process. The reasons for dissociative identity disorder are not mentioned. So, statement III is incorrect. From the last line of the second paragraph (..and the message always seems to nurture spiritual growth.), statement IV can be inferred. Statement V can be inferred from the first paragraph of the passage. Honest communication is vital for the psychotherapeutic process to work. So, statement I, IV, V is consistent with the passage.

4. Correct Answer: D

The concept of idle thoughts has been explained in detail only in the third para, so choice B which would follow as an extension of the concept of idle thoughts cannot be a part of the inserted paragraph. So, choice B is incorrect. It has already been mentioned that emotional honesty can be a difficult task for the client or patient. So, choice C is not correct. It presents in other words what is stated about denied emotions in the first para. Also gauging emotional honesty would not be the main objective of psychotherapists. A psychotherapist will try to understand his or her patient. Choice A seems far-fetched. Choice D would be the best option to complete the thought flow in a para between para 1 and para 2. It connects the idea of denied emotions as expressed in para 1 and the analysis of dreams for the helpful information gained (as a result of the unconscious speaking to us more clearly) as expressed in para 2.

5. Correct Answer: C

The meaning of the word petulantly is peevish impatience'. The word 'eludes' means "to escape the understanding or grasp of, to baffle". So, choice C is apt" significance of many dreams eludes us" indicates that psychotherapists can be frustrated when pursuing their objectives. The word 'frustrate' has two meanings. One is 'to prevent from accomplishing a purpose or fulfilling a desire; thwart' and the second is 'to cause feelings of discouragement or bafflement in'. The former meaning is what is applicable here - psychotherapists can be stalled in their understanding due to difficulties that come in the way. The latter meaning of the word 'frustrate' refers to an emotional aspect - One would be better off without it because of the discouragement caused - and is not applicable here. The word 'petulantly' does not mean "divert attention" or "puzzle", "irritate" is a mild term in this context. So, choices A, B and D are incorrect.

6. Correct Answer: B

In sentence 'a', use of the before 'early age' is incorrect as early age is a general term. If a particular age was mentioned (as in the early age of), the use of the would have been apt. So 'an' is apt before early age. Sentence 'b' is correct. In sentence 'c, the author states that coarse people or touts do not deserve a complex anatomical equipment like the human body. They have bad habits and are responsible for shallow judgments and do not add any value to the world. Consumption is their only function. In sentence 'c', the 'so...as' construction is apt. Thus 'as' is to be used in place of 'than' (and the sentence should read "did not deserve so beautiful an instrument and such a complex anatomical equipment as the human body').

Sentence 'd' is correct, here the author uses the analogy of the alimentary canal to describe coarse people. It connects with the previous sentence of the para. The author says that coarse people who do nothing much in life should merely have a sack for the digestive process and nothing more. They do not deserve a beautiful and complex body

In sentence 'e' we need the word being' to open the sentence. 'Being very fond of animals is an adjective phrase describing he' (Leonardo da Vinci) in the sentence.

So, b' and 'd' are correct.

7. Correct Answer: B

The paragraph introduces the idea about 'Logo-centric approach to meaning', given in statement 'b'. This statement also talks about the importance of speech. Statement 'a' follows by stating that thoughts though primary are dependent on speech. This is followed by a mention of language being a process involving thoughts as given in statement 'c'. 'no method of transmission' given in statement 'a' links with 'language emerges as a process to allow thoughts to travel'. The relationship between thoughts and speech in language is further explained in statement 'e'. Statement 'd' ('....then be viewed....") concludes the paragraph by combining thought and speech in a system called language. The correct sequence is 'baced'. In choice A, statement 'b' is incorrectly placed after statement 'a' and the remaining statements do not convey the meaning effectively. In choice C, statement 'e' (Language......) is incorrectly placed before statement 'c' (Language, the cornerstone of humanity,...........). Choice D may look deceptively close. Statement 'b' cannot end the paragraph and statement 'c' cannot begin the paragraph. So, 'baced'

8. Correct Answer: D
In sentence D, it should be "melted into cheers".

9. Correct Answer: C
Statement 'e' introduces the idea about the regulation of people's labor in producing things. Statement 'a' follows next with the point about production in pre-capitalist societies. Statement 'c' follows statement 'a' with its declaration that capitalism is different from earlier production modes. Further explanation about this is given in statement 'd' (commodities are produced for sale).
Statement 'f' follows statement 'd' with Marx definition of 'generalized commodity production...' Statement b which is a stand-alone sentence best concludes the paragraph. So 'eacdfb'.

10. Correct Answer: C

"this description is unlike any real person" along with "not his fallible counterpart" and "what economists consider anomalous is the norm" given in para 1 supports (C). (B) is incorrect. (A) is far from the truth. In the penultimate sentence of the first para, the author states that "Mc Fadden wants economists to accept that evidence from other disciplines does not explain ....behaviour that do not fit the standard models." So "inaccurate picture of consumer behaviour" in choice A is wrong. Choice D does not amount to criticism as such. The author identifies what the economists think about 'Homo Economicus' (idea of Everyman). He states an attribute (mythical or ideal person) and not what is wrong with it.   Choice (C)

11. Correct Answer: C
The study suggested that poor people are more likely to decide to accept handouts when they perceive themselves as successful. This indicates that the value they derive from their achievements (dignity) and not just the sense of achievement (pride) is the arbiter in their

decision making. So, choice A is incorrect and choice C is appropriate. The observations provide support for the main idea of the para. B and D are more relevant to those interacting with the poor and not the poor themselves, and are therefore inadequate. Choice C is the answer.

12. Correct Answer: D

The words 'any choice' in option (A) makes the choice extreme. (B) is beside the point. (C) is suspect and incorrect. It is given in the last para that workers prefer that their employers put them into pension plans at present contribution rates. A contradiction is indicated in choice (C) In the second sentence of the last para, it is indicated that economists tend to think that more choice is good. "...ambiguous view of an abundance of choices" as given in the last paragraph supports (D). Thus, (D) is correct.

13. Correct Answer: C

The paragraph begins with a description of the aims and objectives of the scientist and the artist. It also explains that there is a difference in the type of world each wishes to change. Inspite of a difference in the area of contradiction discovered by each of them, the work of both the scientist and the artist involves creative acts. The penultimate sentence explains the role of the scientist in creatively changing the world and it resonates with 'the external world of man's objective relations with nature', 'contradiction in his consciousness of the external world' and "resolves it in a scientific hypothesis". Therefore, the last sentence should ideally focus on the role of the artist in a creative act in more detail. Only choice C is specific. The role of the artist as given in choice C - "heightens our sense of ourselves as social beings and so advances the class struggle" closes the ideas of "internal world of his subjective relations with his fellow men", "contradiction in his consciousness of the internal world and resolves it in a work of art." Choice B would be incorrect as it continues with the role of the scientist but there is a need to deal with the role of the artist to correctly complete the thought flow and provide the necessary contrast (role of the scientist and that of the artist) as given in the earlier sentences in the paragraph.
Choices A and D are incorrect as concluding sentences. Simplifying explanations or teaching one to think for oneself are very general sentences and they could be roles performed by any other person, not necessarily an artist. These functions have also not been hinted at in the earlier sentences. So, choice C is the answer

14. Correct Answer: A

Sentence D is a general sentence that begins the paragraph. Sentence B follows. The 'metal in sentence B refers to steel in sentence D. Sentence C is also a part of the paragraph. It concludes the para by saying that steel makes up 95% of global metal production but its raw material iron ore attracts little attention. So, sentences D, B, C in that order form a paragraph about steel. A talks positively about the trade in iron ore and is not a part of the context. Sentences C and A cannot be paired together. So, D. B.C.

15. Correct Answer: B

The passage provides a survey of Proust's reading tastes. The beginnings of each paragraph provide sufficient clues - "well read', "read more", "On Reading", "A book". "In search of Lost Time" is discussed only in the first paragraph. So, choice (A) is incorrect. The passage does not compare Proust's work with that of other writers, so choice (C) is incorrect. Even

though the names of other writers are given in para 2, choice (D) is not the focus of the passage. Thus, (B) is correct.

16. Correct Answer: D

In the first para, the author is all praise for Marcel Proust. He says that the novel "In Search of Lost Time has the main traditions of French literature encapsulated within it. He then focuses on his maxims, drawn from the novel. From the example of the maxim given in the last sentence of the first paragraph, one can infer choice D as a feature of his maxims. The author wishes to state that the presentation of the thought is also important through the proper choice of words. In the penultimate line of the first para, it has been mentioned that "an unusually high quotient of them (maxims) are dazzling". The word dazzling' here means to inspire admiration or wonder. So, choice D is what the author seeks to highlight. Other choices are incorrect. "greatest praise of God" as given in the maxim does not highlight Proust's belief in God. So, choice C is incorrect. The passage mentions "French literature" and "Contemporary literature" but choice A and choice B are not implied.

17. Correct Answer: D

From the first sentence of the third para, "The reading of all good books is like a conversation with the most cultivated men of past centuries...", one can infer (a). From the clues in the second sentence of the third para. "Reading is the noblest of distractions" and "Reading does not, dissipate immediately". one can infer (b). From the last sentence of the passage, "Real life...is literature", one can infer (c). From the third sentence of the last paragraph, "One who loves people in books, to whom one had given more of one's attention......", one can infer (d). (e) is supported by "sudden twist in plot." as given in the last sentence of the second para. In (f). " unlikely element" is not true as "plausible surprises that propelled his novels" has been mentioned in the last sentence of the second para. Thus (a), (b), (c), (d) and (e) are correct.

DILR

1. Correct Answer: B
 Total info in x-ray files = 16950 TB
All are compressed by 60%
Reduced amount = 0.4 x .16950 = 6780 TB

2. Correct Answer: A
Total paper medium = 240 TB
Newspapers + books + tutorials = 9 + 11 + 70 = 90
% = 90/240 x 100 = 37.5%

3. Correct Answer: C
 i) DVDs in optical medium = 70/130 x 100 = 53.9%
ii) Office docs in paper medium = 150/240 x 100 = 62.5%
iii) Photographs in film medium = 410/427 x 100 = 96%

4. Correct Answer: B
Let available memory space and information in 2000 be 100 and 80 units respectively
Increase in info = 30%
Increase in storage = 20%
Increase in memory space = 10%
Effective increase in memory space = 1.1 x 1.2 = 1.32 = 32%
If after n years there is a shortage, then
$80 \times (1.45)^n > 100 \times (1.32)^n$
=> n > 2
=> n = 3
So, 2000 + 3 = 2003

5. Correct Answer: D
 Since no team ended with the same number of points, Spain should have got less than Korea. Since South Korea has got only two points, it means it had two draws and three losses => It did not win over any team, i.e., even over Spain.
As Spain cannot have any wins (as it had a maximum of 1 point) the match between South Korea and Spain must have ended in a draw
So, Spain got 1 point.
Now India could have scored anywhere between 3 to 7 points
Now India definitely did beat Spain and did beat or draw with South Korea. The table excluding the points of India would be

Country	Won	Draw	Lost	Goals for	Goals Against	Points
Australia	5	0	0	17	5	15
Netherlands	3	1	1	9	6	10
Pakistan	2	2	1		2	8
India				2	5	
South Korea	0	2	3	7	11	2
Spain	0	1	4	8	17	1

Therefore, India, in its remaining matches (each of which it lost) i.e. against Netherlands and Australia scored 0 goals but conceded 4 goals. So, Australia at the most could have scored 3 goals against India,

6. Correct Answer: B
Refer to explanation in Q5

7. Correct Answer: A
Refer to explanation in Q5

8. Correct Answer: A
Refer to explanation in Q5

9. Correct Answer: D
As there are nine persons and six floors, there must be three floors with two persons each and three floors with one person each.
Given, W and U live on different floors. As W and X live on two consecutive floors, as per the given conditions those two must be either 3rd and 2nd or 2nd and 1st. So, one among them must be on the 2" floor.
If P lives on the second floor, Q must also be there.
Hence, D is false

10. Correct Answer: D
W and X must live on consecutive floors and only Floors 2, 3 is a possibility in this scenario.
P and Q will live on 5th floor.
W lives alone on his floor

11. Correct Answer: C
W, X, R, S, (R, S) -> 5 combinations

12. Correct Answer: B

Given that, no person participated in both Bungeee jumping and Rock climbing
⇒ Lewis did not participate in Rock Climbing. Peter participated In three events.
∴He participated in Paragliding. Skiling and in exactly one of Bungee jumping and Rock climbing.

	Paragliding	Skiing	Bungee Jumping	Rock Climbing	Total
John		✔		✕	
Mike					
Lewis	✕		✔	✕	
Peter	✔	✔			3
Total	2	3	2	1	

Lewis participated in two sports.
∴He participated in Skiing. ∴Mike did not participated in Skiing.
But Mike participated in one of Paragliding and Skiing.
∴Mike participated in Paragliding.
∴John did not participate in Paragliding.

	Paragliding	Skiing	Bungee Jumping	Rock Climbing
John	(✕)	✔		✕
Mike	(✔)	(✕)		
Lewis	✕	(✔)	✔	✕
Peter	✔	✔		

13. Correct Answer: C

John participated in Paragliding.

|	Paragliding	Skiing	Bungee Jumping	Rock Climbing
John	(✔)	✔		✕
Mike	(✕)	(✔)		
Lewis	✕	(✕)	✔	✕
Peter	✔	✔		

14. Correct Answer: C
From (iv) and (v), Mike participated in at most two of the four sports
So, Mike cannot participate in 3 sports

15. Correct Answer: A

Names : Ratan, Rama, Ramesh, Ramu, Rakesh, Rajan, Rishabh and Rohit.
Surnames : Kulkarni, Arora, Jain, Dutta, Singh, Sharma, Sen and Rao.
As per the instructions, we get the following diagram:
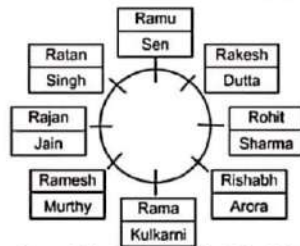
Hence, Ramesh Murthy sits opposite Rakesh Dutta.

16. Correct Answer: A

The number of gold coins in each box is 9. Then the procedure that one should apply is as follows.

We have to take a total of 45 coins, i.e., one from the first box, two from the second box, and so on fill nine from the ninth box.

If the total weight of these 45 coins is 450 gm, then tenth box is the required one. If the total weight of these 45 coins is 460 gm, the required box is the first one. If the total weight of these 45 coins is 470 gm, the required box is the second one and so on.

Therefore, we have to use the weighing machine only once.

17. Correct Answer: B

Let us take a total of 28 coins i.e., one from the first box, two from the second box, three from the third box---seven from the seventh box. If these 28 coins weight 280 gm, then the required box is one among the remaining three, otherwise we can find that in the first weighting itself.

Now, from the remaining three boxes, take one coin from first, two from the second, three from the third and this will enable us to find the required box.

18. Correct Answer: B

Take one coin from each of the first three boxes, two from each of the next three boxes and three from each of the next three boxes. If these 18 coins weigh 180 gm, then the required box is the tenth one. If these 18 coins weigh 190 gm, then the required box is in the first three. If these coins weigh 200 gm, then the required box is in the second group of three boxes. If these coins weigh 210 gm, the required box is in the third group of three boxes. Now, we already found the group of three boxes. From these three boxes, take one coin from the first box, two from the second, three from the third. Now, we can find the required box from these 3 boxes

19. Correct Answer: B

First take one coin from each of the first five boxes and two from each of the next five. Now, we can find that the group in which the required box is there. Then, we can find two boxes then one box i.e., a total of three weighing are required.

QUANT

1. Correct Answer: D
For n=10,
g(a2, a8)=a6, as |p-q|=|2-8|=n-4=6
g(a1, a7)=a6, as |p-q|=|1-7|=n-4=6

Hence, g(g(a2, a8), g(a1, a7))=g(a6, a6)
=> g(a6, a6)=a0, as |p-q|=|6-6| < n-4 (10-4=6)
Hence, a0

2. Correct Answer: A
We know that h(ak, am)= ak, where k=(p+q) mod(n)
Given, h (ak, am) = am
=> remainder of k+m when divided by n is m
k ranges from [0, (n-1)]
The above situation is only possible if k=0

3. Correct Answer: C
 Let the number of coins in denomination of 1, 2 and 5 be
x, y and z respectively. Then,
=> x+y+z =150 -(1)
Given, value of 1rs coins is at least 50% of total value
=> x>=1/2*(x+2y+z)
=> 2y+z<=x
Substituting value from (1)
50>=y+2z   -(2)
Given that z=23
=> y=127-x
Also, from (2),
y+2z<=50
=> y<=4
=> y can be [1, 2, 3, 4]
If we use y=4, x=123
then percentage value of 2rs coins will be 8/(123+8+115) which is 3.25% and greater than 3%
Hence, for y=1, 2, 3 the above value will be less than 3%.

4. Correct Answer: C
P, Q, R, S, T, U, V will be among [0, 6]
Also, the sum of PQ and RS is given as TUV
=> P Q
 +R S

 T U V

Now, (PQ+RS) will be less than 200 as both are 2-digit numbers

So, T=1

Further, Q and S cannot be 0, as is they are V would not be distinct from Q or S

P and R also can't be 0 as if they are, then we won't get a 3-digit number as sum

So, for 0, we have 2 candidates viz. U,V

Assuming V=0, then

Q=4, S=6 and then max (PQ+RS) will be (56+34) which is not a 3-digit number

So, U=0

For P and R, we have value sets as (4, 5) and (4,6)

If (P,R) =(4, 5),

Max (PQ+RS) will be (46+53=99) which isn't a 2-digit number

=> (P,R) = (4,6)

which further implies that min (PQ+RS) =51+62=113

Also, TUV ranges from 102-106,

So, 4+6 ----10. Only two possibilities for this case are 42+63=105

and 43+62=105. In both cases V=5.

5. Correct Answer: B

Possible remainders with 4 are 0, 1, 2, 3

For the first case, number with any of these remainders can be taken

Total possibilities=4

For the 2nd case, all of these remainders can occur except the one which was on the first card

(As the difference of adjacent number can't be divisible by 4, so we can't have numbers with same

remainders with 4 or else they'll cancel out)

Hence, total possibilities=3

For each of the next cards, possibilities on the card=3

Hence, total possibilities=4 x (3)^4

6. Correct Answer: A

a(a+b+c) = d^2 -(1)

b(a+b+c) = e^2 -(2)

c(a+b+c) = f^2 -(3)

(1)-[(2)+(3)]

=> a^2-(b+c)^2 = d^2-(e^2+f^2)

For a triangle sum of two sides is greater than the third side,

=> b+c > a

=> a^2-(b+c)^2 < 0

=> d^2 < e^2+f^2

The above equations can be solved differently to give

e^2 < d^2+f^2 and f^2 < d^2+e^2

Thus, for the triangle square of each side is less than the sum of squares of other 2 sides

=> The triangle is acute angled.

7. Correct Answer: A

Let the number be abcdef

So,

(ab)*3 = 111

=> ab = 37
(cd)*6 = 222
=> cd = 37
(ef)*9 = 333
=> ef = 37
So, abcdef = 373737
Sum of digits = 30

8. Correct Answer: B
A-----S-----R-----B
 |-----| |-----|
 20km   40km
 |-------------------|
      L
Exchange of speeds won't make a difference in the 2nd meeting point(S)
as relative speed takes into consideration pair of value which remain the same.
Hence, for the first meeting point Q covers 40km individually and P and Q together
cover L distance.
For the 2nd meeting P and Q together cover 3L (meet, return and again meet)
and distance covered by Q at the 2nd meeting point plus the distance covered by P between
the
two meeting points is 120km. And as the distance of 2nd meeting point(s) is 20 km from A,
=> Total distance L=120-20=100km.

9. Correct Answer: C
Given equations,
$y=2x^3+3x^2+4$
$y=3x^2-2x+8$
Solving for intersection points,
$=>x^3+x-2=0$
$=>(x-1)(x^2+x+2)=0$
=>x=1(2nd factor has no real roots)
The curves inter sect only once

10. Correct Answer: A
When the cuboid is tilted on 80cm edge, it spills water and it
the remaining water now assumes the shape of a triangular prism
where elongation of the prism=80 cm (edge tilted)
Also, for the triangular face, the base will be 60cm edge and the height
will be equivalent to 1/3rd of the 100 cm edge as water level drops.

Volume = Area of triangular face * elongation
=> V(new) = 1/2*60*100/3*80
=> V(new) = V(cylinder)/6

After restoring assume height of water in cuboid has reduced by a,
V(new) = V(cylinder)/a

Equating above values,
=> a = 6
Hence new height = 10cm
Reduction = 50cm

11. Correct Answer: D
Let the total number of people in circle be x
Then, each person can pair with x-3 people (excluding themselves, left and right adjacent)
So, total distinct pairs will be [x(x-3)]/2
Each pair sing a song for 3 min and total singing time was 60 minutes,
=> [x(x-3)]/2=60/3
=> x^2-3x-20=0
=> x=8

12. Correct Answer: B
In triangle PQR, given
PQ=12
PR=9
∠Q+∠R=120
=> ∠P=60
Applying cosine rule,
QR^2=PR^2+PQ^2-2PR.PQcosP
=> QR^2=9^2+12^2-2*9*12*1/2
=> QR = 3√13

13. Correct Answer: C
By angle bisector theorem,
RM:MQ=9:12 for bisected angle ∠P
RM:MQ=3:4
Let PM be x
Also, area (PQR) = area (PRM)+area (PMQ)
Area of a triangle with 2 sides a and b and included angle P is given as 1/2*a*b*sinP
Using this in above statement,
1/2*9*12*sin60= 1/2*9*y*sin30 + 1/2*12*y*sin30
=> 108√3 = 21y
=> y = 36√3/7

14. Correct Answer: D
Flash intervals of word "Madhu"=7/2+1=9/2 s
Flash intervals of word "Sweet"=23/4+1=27/4 s
Flash intervals of word "House"=73/8+1=81/8 s
The first two words will flash together for the first time after LCM (9/2, 27/4) s
i.e 27/2 s
The last two words will flash together for the first time after LCM (27/4, 81/8) s
i.e 81/4 s
Hence, the difference in these flashes is 81/4 - 27/2 = 6.75s

15. Correct Answer: C
Given $g(x)=p|x|-qx^2$
$\Rightarrow g(x)= x(p-qx)$ $x>=0$
  $g(x)= -x(p+qx)$ $x<0$
If $x=0$, $g(x)=0$
We can observe that $g(x)$ is a symmetric function
If $p>0$ and $q<0$, $g(x)$ will always be positive for $x=R-\{0\}$
$\Rightarrow g(x)$ will be minimum when $x=0$, $p>0$ and $q<0$

16. Correct Answer: C
Let the number of A and B models manufactured be x and y respectively,
Time spent on A and B models will be 4x and 2y hrs respectively
Given,
$1600=4x+2y$
$\Rightarrow 2y=1600-4x$
$\Rightarrow y=800-2x$

Now, total profit accumulated on both models is
$1200x+1000(800-2x)$ $=800000-800x$
We have to maximize this, which, as can be clearly observed, will be at x=0
Therefore, number of models B manufactured is $800-2*0=800$

17. Correct Answer: C
We assume father's age to be $10x+y$
$\Rightarrow$ Son's age = y
After 10 years,
Father's age = $10x+y+10$, Son's age = $y+10$
Given,
$3(y+10) = 10x+y+10$
$\Rightarrow 2y+20 = 10x$
The unit's digit of 10x will be 0
$\Rightarrow$ Unit's digit of 2y+20 will be 0
$\Rightarrow$ y will be 0 or 5
But it is given that son's age is greater than 2, hence y=5
Therefore, father's age=$10x+y = 2y+20+y=35$
Hence, sum of ages = 35+5 = 40yrs

18. Correct Answer: B
Checking the options
a) $max[x^2-y^2]$ -(1)
$\Rightarrow [max(x^2)-min(y^2)]$
$\Rightarrow max [(-3)^2-(1/2)^2]$
$\Rightarrow 35/4$
Similarly, $min[x^2-y^2]=[min(x^2)-max(y^2)]=[(-1/2)^2-(7)^2]=-189/4$ -(2)
$(1)-(2)=35/4-(-189/4)$
$=115/2$, i.e. false
d) also becomes false

b) max[(x+y)^2]
=> [7+(-1/2)]^2
=> 169/4

19. Correct Answer: B
Let the number of convex corners be x and concave ones be y
As the polygon sides are only parallel to either of the coordinate axes,
the internal angles must be either 90 or 270.
Sum of angles of polygon=90x+270y
=> 180(x+y-2)
x-y=4
Given x=26, => y=22

20. Correct Answer: D
The mixture contains 70kg of A and 30kg of B
Densities of A and B are in ratio 2:1
So let them be 2x and x respectively.

=> Volume of A and B in mixture will be 70/2x and 30/x litres
Initial density of mixture= Total Weight/Total Volume
=> 100/(70/2x+30/x)
=> 100x/65

After evaporation of y hrs
   X   Y
Volume 70-y   30-2y
Weight (70-y)/2x (30-2y)/x

New density=(100-3y)/[(35-y/2+30-2y)/d]
It is given that new density is 1.04 times that of initial one,
=> (100-3y)/[(35-y/2+30-2y)/d] =1.04*(100x/65)
=> 5(100-3y) =8(65-5y/2)
=> y=4

21. Correct Answer: A
For f(x)=x/(1+x^2)
Domain(f(x))=R

g(x)=e^-x/(1+[x])
For domain,
1+[x] should not be 0
=> [x] should not be -1
=> x will be R- [-1, 0)
So, domain(g(x)) =R- [-1, 0)
Hence, domain(f(x)+g(x)) =R- [-1, 0)

Range for f(x)

f(x)=x/(1+x^2)
=> f(x)+x^2*f(x)=x
=> x=(1+-sqrt(1-4*y^2))/2f(x)
f(x) is not 0 and sqrt(1-4*y^2)>=0
Therefore, f(x) will not be zero and f(x) will be [-1/2, 1/2]
So, f(x)= [-1/2, 1/2]- {0}

Range for g(x)
g(x)=e^-x/(1+[x])
So, g(x)>0 if [x]>-1
and g(x)<0 if [x]<-1
Therefore, range of g(x)=R- {0}
So, range (f(x)) intersection range(g(x)) = [-1/2, 1/2]- {0}

22. Correct Answer: A
Writing the equation of the line L,
y-1=(0-1)/(2-1) *(x-1)
=> x + y =2 -(1)

Now, equation of a line that passes through (1/2, 0) and is perpendicular to (1) will be
y=-(2-1)/(0-1)*(x-1/2)
=> x-y=1/2 -(2)

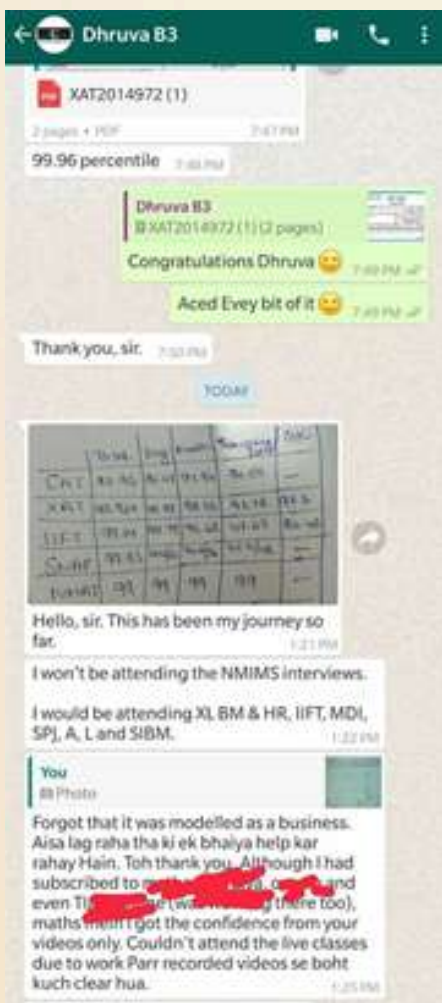(2) intersects y-axis at B (0, -1/2) and C (5/4, 3/4)
So area of triangle ABC=1/2*(5/4)*(2+1/2)=25/16

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