

Ref: AIMCAT1710

INSTRUCTIONS

1. Read the instructions given at the beginning/end of each section or at the beginning of a group of questions very carefully.
2. This test has a total of 90 questions in three sections: (i) Verbal Ability and Reading Comprehension – 40 Questions (ii) Data Interpretation and Logical Reasoning – 24 Questions and (iii) Quantitative Ability – 26 Questions. The total time available for the test is **180 minutes**. However, you will be allotted exactly 60 minutes for answering the questions in each section and you cannot switch from one section to another while answering the questions in a section.
3. All questions carry three marks each. Each wrong answer to any multiple-choice type question will attract a penalty of one mark. Wrong answers to any non multiple-choice type question will not attract any penalty.

SECTION I: VERBAL ABILITY AND READING COMPREHENSION

SUB-SECTION: READING COMPREHENSION

Number of Questions = 20

DIRECTIONS for questions 1 to 5: The passage given below is followed by a set of five questions. Choose the best answer to each question.

On September 19, 2006, a military-led coup in Thailand overthrew the democratically elected government headed by Prime Minister Thaksin Shinawatra. Thailand is not unfamiliar with such upheavals. There have been seventeen coups in the past sixty years. This time, however, Internet users noticed a marked increase in the number of Web sites that were not accessible, including several sites critical of the military coup. A year earlier in Nepal, the king shut down the Internet along with international telephone lines and cellular communication networks when he seized power from the parliament and prime minister. In Bahrain, during the run-up to the fall 2006 election, the government chose to block access to a number of key opposition sites. These events are part of a growing global trend. Claiming control of the Internet has become an essential element in any government strategy to rein in dissent – the twenty-first century parallel to taking over television and radio stations.

In contrast to these exceptional events, the constant blocking of a swath of the Internet has become part of the everyday political and cultural reality of many states. A growing number of countries, including South Korea and Pakistan, are blocking Web sites that are perceived as a threat to national security.

Notwithstanding the wide range of topics filtered around the world, there are essentially three motives or rationales for Internet filtering: politics and power, social norms and morals, and security concerns. Accordingly, most of the topics subject to filtering fall under one of three thematic headings: political, social, and security. A fourth theme – Internet tools – encompasses the networking tools and applications that allow the sharing of information relating to the first three themes.

Protecting intellectual property rights is another important driver of Internet content regulation, particularly in Western Europe and North America. However, in the forty countries that were tested in 2006, this is not a major objective of filtering.

On one extreme is Saudi Arabia, which heavily censors social content. While there is also substantial political filtering carried out in Saudi Arabia, it is done with less scope and depth. On the other fringe are Syria and China, focusing much more of their extensive filtering on political topics. Myanmar and Vietnam are also notable for their primary focus on political issues, which in the case of Vietnam contradicts the stated reason for filtering the Internet. Iran stands out for its pervasive filtering of both political and social material.

Filtering directed at political opposition to the ruling government is a common type of blocking that spans many countries. Politically motivated filtering is characteristic of authoritarian and repressive regimes. The list of countries that engage in substantial political blocking includes Bahrain, China, Libya, Iran, Myanmar, Pakistan, Saudi Arabia, Syria, Tunisia, Uzbekistan, and Vietnam. Thailand and Ethiopia are the most recent additions to this group of countries that filter Web sites associated with political opposition groups. Yet in other countries with an authoritarian bent, such as Russia and Algeria, we have not uncovered filtering of the Internet.

The perceived threat to national security is a common rationale used for blocking content. Internet filtering that targets the Web sites of insurgents, extremists, terrorists, and other threats generally garners wide public support. This is best typified by South Korea where pro-North Korean sites are blocked, or by India where militant and extremist sites associated with groups that foment domestic conflict are censored. In Pakistan, Web sites devoted to the Balochi independence movement are blocked.

1. According to the passage, what is the difference between Internet filtering in Saudi Arabia and China?
 - (A) While Saudi Arabia filters the Internet predominantly to protect social norms and moral, China filters the Internet predominantly for political purposes.
 - (B) Filtering on political topics is more extensive in Saudi Arabia as compared to that in China.
 - (C) Social content is not filtered in China whereas in Saudi Arabia, social content is heavily filtered.
 - (D) Internet filtering in China is more extensive than that in Saudi Arabia.
 2. Which of the following can be inferred from the passage about authoritative regimes?
 - (A) Internet content is filtered in all authoritative regimes with political motive.
 - (B) Internet content is filtered in authoritative regimes to deal with threats to national security that arise in such regimes.
 - (C) In most of the countries with authoritative regimes, politically motivated Internet filtering is widespread.
 - (D) Russia and Algeria are among the few countries with authoritative regimes which do not filter Internet content.
 3. According to the passage, what is the difference between Internet filtering in Thailand and that in Bahrain?
 - (A) In the former, Internet content was filtered for furthering political agenda while in the latter, Internet content was filtered in the guise of national security.
 - (B) In the former, Internet content was filtered to prevent dissemination of unpopular opinion
- regarding the new regime whereas in the latter, Internet content was filtered with a political motive.
- (C) In the former, Internet content was filtered to manage the perception about the change in regime whereas in the latter, Internet content was filtered to further the government's political motives.
 - (D) In the former, Internet content was filtered before the change in regime whereas in the latter, Internet content was filtered after the change in regime.
4. How many of the following correctly match the country with the primary motive for filtering Internet content in that country?
 - I. Saudi Arabia – Politics and power
 - II. Syria – Politics and power
 - III. South Korea – Security concerns
 - IV. Bahrain – Social norms and morals
 - V. Iran – Social norms and morals
 - (A) 1
 - (B) 2
 - (C) 3
 - (D) 4
 5. Which of the following can be inferred to be true from the passage?
 - (A) Protecting Intellectual Property Rights is the primary motive for filtering Internet content in Western Europe and North America.
 - (B) Countries may have disparate objectives behind internet filtering.
 - (C) Protecting Intellectual Property Rights is not as important a motive as the other three for filtering Internet content.
 - (D) Only in North America and Western Europe, Internet is filtered primarily to protect Intellectual Property Rights.

DIRECTIONS for questions 6 to 10: The passage given below is followed by a set of five questions. Choose the best answer to each question.

Does death really mean the end of our existence? Great thinkers from Plato to Blue Öyster Cult have weighed in on the question. Now, a study shows that at least one aspect of life continues: Genes remain turned on days after animals die. Researchers may be able to parlay this postmortem activity into better ways of preserving donated organs for transplantation and more accurate methods of determining when murder victims were killed.

Before you ask, microbiologist Peter Noble of the University of Washington, Seattle, and colleagues were not trying to find out what allows zombies to stalk Earth and slurp the brains of the unwary. Instead, the scientists wanted to test a new method they had developed for calibrating gene activity measurements... "It's an experiment of curiosity to see what happens when you die," Noble says.

Although scientists analyzing blood and liver tissue from human cadavers had previously noted the postmortem activity of a few genes, Noble and colleagues systematically evaluated more than 1000. The team measured which of these genes were functioning in tissues from recently deceased mice and zebrafish, tracking changes for 4 days in the fish and 2 days in the rodents.

At first, the researchers assumed that genes would shut down shortly after death, like the parts of a car that has run out of gas. What they found instead was that hundreds of genes ramped up. Although most of these genes upped their activity in the first 24 hours after the animals expired and then tapered off, in the fish some genes remained active 4 days after death.

Many of these postmortem genes are beneficial in emergencies; they perform tasks such as spurring inflammation, firing up the immune system, and counteracting stress. Other genes were more surprising. "What's jaw-dropping is that developmental genes are turned on after death," Noble says. These genes normally help sculpt the embryo, but they aren't needed after birth. One possible explanation for their postmortem reawakening, the researchers say, is that cellular conditions in newly dead corpses resemble those in embryos. The team also found that several genes that promote cancer became more active. That result could explain why people who receive transplants from the recently deceased have a higher risk of cancer, Noble says.

In an accompanying paper, Noble and two colleagues demonstrated another possible use for gene activity measurements, showing that they can provide better estimates of the time of death. Those results impress forensic scientist David Carter of Chaminade University of Honolulu. Although making a time of death estimate is crucial for many criminal investigations, "we are not very good at it," he says. Such estimates often rely on evidence that isn't directly connected to the body, such as the last calls or texts on the victim's cellphone. Noble and his colleagues, Carter says, have "established a technique that has a great deal of potential to help death investigation."

A mouse or zebrafish doesn't benefit, no matter which genes turn on after its death. The patterns of gene activity that the researchers observed may represent what happens when the complex network of interacting genes that normally keeps an organism functioning unwinds. Some genes may turn on, for example, because other genes that normally help kept them silent have shut off. By following these changes, researchers might be able to learn more about how these networks evolved, Noble says. "The headline of this study is that we can probably get a lot of information about life by studying death."

6. Which of the following is not an application of the findings of the study conducted by Peter Noble and colleagues mentioned in the passage?
 - (A) The findings may help us in studying the effectiveness of the various ways in which organs for transplantation can be preserved.
 - (B) The findings may be useful in criminal investigations for determining the time at which murder victims were killed.
 - (C) The findings may help us in understanding the interaction between genes in an organism.
 - (D) The findings may help us to understand how death affects our body which can be used for increasing our lifespan.
 7. Which of the following can be understood about the research of Noble and colleagues?
 - (A) They were probably the first to identify the activity of genes after death.
 - (B) They were probably the first to methodically study the activity of a number of genes after death.
 - (C) They were the first to investigate the relation between the risk of cancer and organ transplantation.
 - (D) They were the first group of researchers to answer metaphysical questions related to the end of human existence with laboratory research.
 8. It can be understood from the passage that
 - (A) the activity of some postmortem genes decreases immediately after death and then increases before completely shutting off.
 - (B) some postmortem genes are more active immediately after death than they are before death.
 - (C) the activity of some postmortem genes decrease gradually after death before completely shutting off.
 - (D) some postmortem genes become inactive immediately after death.
9. Which of the following is one of the reasons mentioned in the passage for explaining the activity of genes post mortem?
 - (A) Some genes which suppress the activity of other genes are turned off after death.
 - (B) Some genes try to prevent the deterioration of the cells after death.
 - (C) After death, various cells become carcinogenic because of which some genes become active.
 - (D) The inactivity of cells in corpses is similar to the inactivity of cells in embryos which trigger some developmental genes.
 10. Studying the activity of genes after death will help criminal investigations because
 - (A) this will probably help in estimating the time of death more accurately than indirect evidence such as calls and texts.
 - (B) this will probably provide a more reliable estimate of the time of death than indirect evidence such as calls and texts.
 - (C) this will provide the most accurate estimate of the time of death.
 - (D) using this, criminal investigators can determine the exact times of death of the victims.

DIRECTIONS for questions 11 to 15: The passage given below is followed by a set of five questions. Choose the best answer to each question.

No person travelling across Europe or the United States can fail to be impressed by the architectural similarity of one gas station or airport to another. Anyone thirsting for a soft drink will find one bottle of Coca-Cola to be almost identical with the next. Clearly a consequence of mass-production techniques, the uniformity of certain aspects of our physical environment has long outraged intellectuals.

However, focussed on what society was, intellectuals are blind to what it is fast becoming. For the society of the future will offer not a restricted, standardised flow of goods, but the greatest variety of unstandardised goods and services any society has even seen. We are moving not towards a further extension of material standardisation, but towards its dialectical negation.

The end of standardisation is already in sight in the United States. From a single homogenous unit, the mass market has exploded into a series of segmented, fragmented markets, each with its own needs, tastes and way of life. This fact has begun to alter American industry beyond recognition. The result is an astonishing change in the actual outpouring of goods offered to the consumer.

Philip Morris, for example, sold a single major brand of cigarettes for twenty-one years. Since 1954 by contrast, it has introduced six new brands and so many options with respect to size, filter and menthol that the smoker now has a choice among sixteen different variations. This fact would be trivial, were it not duplicated in virtually every major product field. Gasoline? Until a few years ago, the American motorist took his pick of either 'regular' or 'premium'. Today he drives up to a Sunoco pump and is asked to choose among eight different blends and mixes. Groceries? Between 1950 and 1963 the number of different baking mixes and flour on the American grocery shelf increased from eighty-four to 200. Even the variety of pet foods increased from fifty-eight to eighty-one. One major company, Corn Products, produces a pancake syrup called Karo. Instead of offering the same product nationally, however, it sells two different viscosities, having found that Pennsylvanians, for some regional reason, prefer their syrup thicker than other Americans. In the field of office decor and furniture, the same process is at work. 'There are ten times the new styles and colours there were a decade ago,' says John A. Saunders, president of General Fireproofing Company, a major manufacturer in the field. 'Every architect wants his own shade of green.' Companies, in other words, are discovering wide variations in consumer wants and are adapting their production lines to accommodate them. Two economic factors encourage this trend: first, consumers have more money to lavish on their specialised wants; second, and even more important, as technology becomes more sophisticated, the cost of introducing variations declines.

Our social critics who are technologically naive fail to understand this. It is only primitive technology that imposes standardisation. Automation, in contrast, frees the path to endless, blinding, mind-numbing diversity. The rigid uniformity and long runs of identical products which characterise our traditional mass-production plants are becoming less important. Numerically controlled machines can readily shift from one product model or size to another by a simple change of programmes. Short product runs become economically feasible. Automated equipment permits the production of a wide variety of products in short runs at almost "mass-production" costs. Many engineers and business experts foresee the day when diversity will cost no more than uniformity.

The finding that pre-automation technology yields standardisation, while advanced technology permits diversity is borne out by even a casual look at that controversial American innovation, the supermarket. Like petrol stations and airports, supermarkets tend to look alike whether they are in Milan or Milwaukee. By wiping out thousands of little 'mom and pop' shops they have without doubt contributed to uniformity in the architectural environment. Yet the array of goods they offer the consumer is incomparably more diverse than any corner shop could afford to stock. Thus at the very moment that they encourage architectural sameness, they foster gastronomic diversity.

11. Which of the following sentences will best complete the first paragraph of the passage?
 - (A) Some decry the Hiltonization of our hotels; others charge that we are homogenizing the entire human race.
 - (B) In the same breath, however, they reveal shocking ignorance about the character of super-industrialism.
 - (C) Certainly, it would be difficult to deny that industrialism has had a leveling effect.
 - (D) Ironically, the people of the future may suffer not from an absence of choice, but from a paralyzing surfeit of it.
12. Why has the author mentioned the example of cigarettes in the passage?
 - (A) To show that the business of cigarettes has grown since 1954 and to encourage the reader to try cigarettes of different size filters.
 - (B) To encourage investors to invest in the cigarette business as it seems promising.
 - (C) To illustrate the fact that today customers have a large number of choices made available to them.
 - (D) To show that there is hardly any variety in available products.
13. The examples provided by the author to illustrate his point that we are moving towards a dialectical negation of material standardisation would include all of the following EXCEPT.....?

- | | |
|------------------------------|------------------|
| (a) Gasoline | (b) Cat food |
| (c) Packed chips | (d) Baking flour |
| (e) Office tables and chairs | (f) Cement |
- | | |
|----------------|-------------|
| (A) b and f | (B) b and c |
| (C) a, e and d | (D) c and f |

14. Which of the following **cannot** be understood from the last three paras of the passage?

Identify all that apply and enter the corresponding number in the input box given below. You must enter your answer in increasing order only. For example, if you think (1) and (2) apply, then enter 12 (but not 21) in the input box.

- (1) Consumers today are richer and have more money to spend than the customers of yesterday.
- (2) Smaller shops in pre-automation times could not afford to keep large variety of products.
- (3) Architects of today are not as creative as before.
- (4) Similarity of supermarkets belies the diversity they offer.
- (5) Today's architects have more specific demands on colours used in architectural designs than before.
- (6) Companies pay less heed to the consumer demands of today.

15. What is the primary purpose of the author in the last two paragraphs of the passage?

- (A) To prove that social critics are not technologically competent.
- (B) To state that the cost of customised production almost equals mass production with the help of technology.
- (C) To describe what engineers of today predict and to acclaim programmers for their work on automation.
- (D) To illustrate that automation is better than traditional methods.

DIRECTIONS for questions 16 to 20: The passage given below is followed by a set of five questions. Choose the best answer to each question.

If we believe Robert Harrison, a professor of Italian literature at Stanford, people in our society are getting younger even as they continue to age.

A scholar of romance studies, Harrison described his latest research as a "cultural exploration of how youth and aging have interacted and evolved from antiquity to today."

Harrison has examined gardens, forests and death through literature, religion and mythology. Now he's taking a similar approach to the question of age in his new book, Juvenescence: A Cultural History of Our Age.

"We age simultaneously in different ways, biologically, psychologically and socially, while also aging within the larger framework of a culture whose history predates us and will outlast us," Harrison noted.

Drawing on literature, philosophy, evolutionary science and other sources, Harrison identified and explored the cultural forces that have helped turn our society into the "youngest" society on earth. For the first time in human history, "The young have become a model of emulation for the older population, rather than the other way around," Harrison said.

The process of juvenescence that got underway in the postwar period, he observed, "has unleashed extraordinary youthful energies in our species and represents one of the momentous revolutions in human cultural history." With his latest project, Harrison "wanted to explore that history and understand where we are in relation to it, at the present juncture."

Through case studies that deal with Socratic philosophy, the emergence of Christianity, the European Enlightenment and the founding of the American republic, Harrison explored different forms of cultural renewal and rejuvenation, almost all of which involve a creative retrieval of older legacies.

In Western culture, Harrison noted, classical antiquity plays a fundamental role in cultural rejuvenation.

"We have many different antiquities in the course of our history. The Middle Ages had its antiquity, which is different than the antiquity of the Renaissance. There is an Enlightenment antiquity, different than the antiquity retrieved by the Romantics, or the Modernists, and so forth, yet in each case the new grew out of the old."

"We live in an age of juvenescence," says Harrison, who hosts the radio talk show Entitled Opinions (about Life and Literature) on KZSU, the campus radio station. The term juvenescence has two meanings, either in positive terms of cultural rejuvenation or, on the other hand, of juvenilization.

"Rejuvenation is about recognizing heritage and legacy, and incorporating and re-appropriating historical perspective in the present – like the Founding Fathers did when they created a new nation by drawing on ancient models of republicanism and creatively retrieving many legacies of the past," Harrison said, citing an example from his book.

"Unlike rejuvenation, juvenilization is characterized by the loss of cultural memory and a shallowing of our historical age."

Harrison proposed another example. "I use two figures to answer the question of how old we are in our age of juvenescence. One is Lolita, from Vladimir Nabokov's novel, and the other is Molloy, from Samuel Beckett's eponymous work. Culturally, we are at once as young as Lolita and as old as Molloy. That makes us a very strange age indeed," he said.

A bedridden but educated vagrant, Molloy is the heir of multi-millennial tradition but now decrepit and seemingly endlessly old. Lolita, on the other hand, belongs to a new age, as an adolescent with no historical memory who will live and die an adolescent no matter how old she gets.

As Harrison sees it, the average citizen of the developed world today enjoys the luxury of remaining childishly innocent with respect to the instruments that he or she operates, consumes and otherwise depends on daily. "It is hard to say whether we are on the cusp of a wholesale rejuvenation of human culture or whether we are tumbling into a dangerous and irresponsible juvenility."

In his book, Harrison centrally draws on the biological concept of **neoteny**, a term that refers to the retention of juvenile characteristics through adulthood, and expands it into a cultural and historical context. "Constantly chasing after novelty is not rejuvenation. Innovation *ex nihilo* is often isolated and forgets where it comes from. The truly new is a renewal from what has preceded and a recognition of that age."

16. According to the passage, Robert Harrison could be all of the following EXCEPT?
- (a) Academic scholar (b) Talk Show Host
 - (c) Author (d) Religious leader
 - (e) Sociologist (f) Psychologist
- (A) d and f (B) a, d and e
 (C) b and c (D) a, c and d
17. As mentioned in the passage, Robert Harrison's latest research focuses on which of the following?
- (A) Drawing a comparison between evolutionary biology and evolutionary culture, and suggesting that people behave in a puerile way in their old age.
 - (B) The history and relationship of youth and ageing.
 - (C) The side effects of senescence and the stress on environmental protection of gardens and forests.
 - (D) The synergy between the synthetic forces of the wisdom of the old and the insurgent forces of the youthful energy and genius of the young.
18. Which of the following can be inferred from para 6 of the passage?
- (A) Preceding the war, the older generation set examples for the younger generation.
 - (B) In the post war period, people in general started focussing on "how to appear young".
- (C) The postwar process of rejuvenation unleashed change in cultural aspects of society.
- (D) The present scenario where the older generation mimicks the younger is a cyclic process that happens after every few aeons.
19. What does the author imply when he uses the word 'youngest' in para 5?
- (A) Maximum population of the world is between 20 and 30 years of age.
 - (B) Even the older people of society have adapted to the kind of cultural life led by the younger generation.
 - (C) The process of ageing has reduced drastically due to advances in evolutionary science.
 - (D) People have started to exercise a lot more and this has lengthened their lifespan on earth.
20. Which of the following can be understood from the passage?
- (A) "Juvenilization" in the passage refers to irresponsible immaturity.
 - (B) The tone of Robert Harrison in the boldfaced part of the text is one of ambivalence.
 - (C) The term "neoteny" in the passage refers to the 'truly new' being a renewal from what has preceded and older legacies assuming younger forms in the process of rejuvenation.
 - (D) Juvenilization is similar to rejuvenation in all aspects except cultural memory.

SUB-SECTION: VERBAL ABILITY

Number of Questions = 20

DIRECTIONS for questions 1 to 4: In each question, there are sentences or fragments of sentences that form a paragraph. Identify the sentence(s) or fragments of sentence(s) that is/ are **correct** in terms of grammar and usage, including spelling, punctuation and logical consistency. Enter the number corresponding to the sentence(s) or fragments of sentence(s) in the input box provided below the question. [Note: Enter your answer in increasing order only. For example, if you think that the fragments (2) and (4) are **correct**, then enter 24 (but not 42) in the input box.]

1. (1) The April 2015 earthquake in Nepal killed more than 8,000 people and injured more than 21,000.
 (2) Its epicenter was east of Gorkha District at Barpak, Gorkha, and its hypocenter was at a depth of approximately 8.2 km (5.1 miles).
 (3) The earthquake triggered an avalanche on the Mount Everest, killing 21, making April 25, 2015 the deadliest day on the mountain in history.
 (4) The earthquake triggered another huge avalanche in Langtang valley, where 250 people were reported missing.
 (5) Hundred of thousand of people had been made homeless with entire villages flattened, across many districts of the country.

2. (1) An unobserved particle is wisp of reality, shimmer of existence – there isn't a good metaphor for it,

- (2) because it is vague both by definition and with nature. Until you do have a peek.
- (3) Then it becomes a particle proper it can be put into words it is a thing with a place. Many experiments exploring the microscopic realm,
- (4) over the best part of a century, have reinforced the conclusion that, when we're not paying attention, the world is fuzzy and undecided.
- (5) By looking at things only, observing them, measuring them, do we make them recognisably "real".

3. (1) Life isn't easy as a Maasai herder on Serengeti plain in eastern Africa.
- (2) At any moment, disease could sweep through your livestock, the source of all your almost wealth. Drought could parch your pastures,
- (3) or bandits could steal the herd. No matter how careful you are, or how hard you work, fate could leave you destitute.
- (4) But, thanks to a Maasai tradition known as osotua – literally umbilical cord – anyone in need can request aid from their network of friends.
- (5) Anyone who's asked was obliged to help, often by giving livestock, as long as it doesn't jeopardise their own survival.

4. (1) Archaeologists need a new theory for the colonization of Americas. Plant and animal DNA buried under two Canadian lakes
 (2) squash the idea that the first Americans travelled through an ice-free corridor that extended from Alaska to Montana and that formed when
 (3) twin glaciers that blanketed central Canada had receded. The analysis, published online in the 10th August issue of Nature, and authored by
 (4) palaeogeneticist Eske Willerslev of the University of Copenhagen, suggests that the passageway became habitable 12,600 years ago. That's 1,000 years nearly
 (5) after the formation of the Clovis tribes – once thought to be the first Americans – and even longer after other, pre-Clovis tribes had settled the continents.

DIRECTIONS for questions 5 to 8: In each question, the word in capitals is used in five different ways. Identify the option(s) in which the usage of the word is INCORRECT or INAPPROPRIATE and enter the number corresponding to the sentence (s) (in which the usage is INCORRECT or INAPPROPRIATE) in the input box provided below each question. [Note: Enter your answer in increasing order only. For example, if you think that sentences (1) and (3) are incorrect, then enter 13 (but not 31) in the input box].

5. CLEAR

- (1) The witness gave evidence to the jury members which showed that the suspect was actually in the clear.
 (2) The people cleared out the office premises as soon as they heard of the bomb threat.
 (3) She kept clear of him after the incident.
 (4) The dog cleared the fence by several inches in the dog show.
 (5) To help clear off the air, the HR Manager held a meeting of all employees and explained the new policy changes in detail.

6. LIGHT

- (1) He thought about the problem for a long time and finally lit on the perfect solution.
 (2) The doctor advised him to go light on spicy food as he was recovering from a serious heart attack.
 (3) He made light of his personal difficulties and was able to lead the organization forward in the midst of several crises.
 (4) The top management acted according to their own light and seldom acceded to the demands of the workers.
 (5) My grandfather used to remark that there was, always, light at the end of the tunnel.

7. GROUND

- (1) The chief minister cut the ground from their feet and ensured that there was no opposition to his plans of improving the infrastructure of the city.

- (2) After a stint in the world of academia, the research scientist was back on his own ground and covered new ground in every research based seminar.
 (3) The fresher needed to learn the business up from the ground.
 (4) The Olympic champion stood his ground in the face of doping charges against him.
 (5) Sir Ian Wilmut, Keith Campbell and colleagues at the Roslin Institute broke new ground when they cloned the first mammal Dolly.

8. HIT

- (1) He hit the nail on the head with his accurate description.
 (2) It finally hit at him that this was the treasure that he was looking for.
 (3) Rajesh managed to hit the high points in the meeting as he had prepared well.
 (4) Samuel tried hard to score a hit with his bosses but he failed.
 (5) The union leader hit about his critics who were not happy with his performance.

DIRECTIONS for questions 9 to 12: The sentences given in each question, when properly sequenced, form a coherent paragraph. Each sentence is labeled with a number (1, 2, 3, 4 or 5). Decide on the proper order for the sentences and key in this sequence of five numbers as your answer.

9. (1) Positive or negative synergies can exist.
 (2) Synergy in management and in relation to teamwork refers to the combined effort of individuals as participants of the team.
 (3) Negative synergy, on the other hand, has negative effects such as: reduced efficiency of operations, decrease in quality, underutilization of resources and disequilibrium with the external environment.
 (4) Positive synergy has positive effects such as improved efficiency in operations, greater exploitation of opportunities, and improved utilization of resources.
 (5) The condition of synergy exists when the organization's parts interact to produce a joint effect that is greater than the sum of the parts acting alone.

10. (1) The best Eskimo carvings of all ages seem to possess a powerful ability to reach across the great barriers of language and time and communicate directly with us.
 (2) We then realize that these carvings are not the cold sculptures of a frozen world.
 (3) We discover subtle living forms of the animal, human and mystical world.
 (4) Instead they reveal to us the passionate feelings of a vital people well aware of all the joys, terrors, tranquility, and wildness of life around them.

- (5) The more we look at these arctic carvings, the more life we perceive within them.

11. (1) Off to the side were dozens of key-punch machines – what passed in those days for computer terminals.
(2) The university's enormous mainframe computers stood in the middle of a vast white room, looking, as one faculty member remembers, "like one of the last scenes in the movie '2001: A Space Odyssey'."
(3) The University of Michigan had one of the most advanced computer science programs in the world, and over the course of the Computer Center's life, thousands of students passed through that white room, the most famous of whom was a gawky teenager named Bill Joy.
(4) The University of Michigan opened its new Computer Center in 1971, in a brand-new building on Beal Avenue in Ann Arbor, with beige-brick exterior walls and a dark-glass front.
(5) In 1971, all this was state of the art.

12. (1) In retrospect, the answer seems fairly straightforward.
(2) Secondly, the author Rebecca Wells, being an actress herself, didn't read from her novels as she travelled across the country so much as she acted it out, playing each character with such skill that she turned her readings into performances.
(3) The book is heartwarming and beautifully written, a compelling story of friendship and mother-daughter relationships; it's sticky and it spoke to people.
(4) But the success of Ya-Ya is actually a tribute to the Power of Context, more specifically, to one specific aspect of context, which is the critical role that groups play in social epidemics.
(5) Why did *Divine Secrets of the Ya-Ya Sisterhood* turn into an epidemic?

DIRECTIONS for questions 13 to 16: Five sentences related to a topic are given in each question. Four of the sentences can be put together to form a meaningful and coherent short paragraph. Identify the odd one out. Choose its number as your answer and key it in.

13. (1) To appreciate the power of epidemics, we have to abandon this expectation about proportionality.
(2) Epidemics are another example of geometric progression: when a virus spreads through a population, it doubles and doubles again, until it has (figuratively) grown from a single sheet of paper all the way to the sun in fifty steps.
(3) We are, as humans, heavily socialized to make a kind of rough approximation between cause and effect.
(4) As human beings we have a hard time with this kind of progression, because the end result – the effect – seems far out of proportion to the cause.

- (5) We need to prepare ourselves for the possibility that sometimes big changes follow from small events, and that sometimes these changes can happen very quickly.

14. (1) Through a series of such disciplines – mental, emotional, and moral – he exercised his small, embryonic freedom until it grew larger and larger, until he had more freedom than his captors.
(2) He would describe himself in the classroom, in his mind's eye, and give his students the lessons he was learning during his very torture.
(3) They had more liberty, more options to choose from in their environment; but he had more freedom, more internal power to exercise his options.
(4) Frankl was a determinist raised in the tradition of Freudian psychology.
(5) In the midst of his experiences, Victor Frankl would project himself into different circumstances, such as lecturing to his students after his release from the death camps in Nazi Germany.

15. (1) This theory says that between you and anything you want to accomplish there is a constraint, or limiting factor, that determines how fast you get to where you want to go.
(2) 80 percent of your constraints will be within yourself; only 20 percent of constraints will be outside of yourself, contained in other people and situations.
(3) The speed at which you will pass through this bottleneck will largely determine the speed of your entire journey.
(4) Eliyahu Goldratt described an important breakthrough in thinking in his book *The Goal* described as "the theory of constraints".
(5) If you are driving down a freeway and traffic construction is narrowing all cars into a single lane, this bottleneck or choke point becomes the constraint that determines how fast you will get to your destination.

16. (1) For political and diplomatic reasons, West German politicians carefully avoided the term "reunification" during the run-up to what Germans frequently refer to as *die Wende*.
(2) Good Bye Lenin! is the notable exception and possibly signals the emergence of a unified German film culture.
(3) West Germans are largely absent in films originating in the East.
(4) One of the most remarkable aspects of the cinematic representation of the new Germany is how – at least during the first decade after unification – East and West Germans mutually ignored each other.
(5) East Germans are equally absent in the majority of films made in the West.

DIRECTIONS for questions 17 to 20: Read each paragraph and answer the question given below it.

17. A study of illusionist paintings began with Zeuxis. According to the *Naturalis Historia* of Pliny the Elder, Zeuxis and his contemporary Parrhasius (of Ephesus and later Athens) staged a contest to determine the greater artist. When Zeuxis unveiled his painting of grapes, they appeared so real that birds flew down to peck at them. But when Parrhasius, whose painting was concealed behind a curtain, asked Zeuxis to pull aside that curtain, the curtain itself turned out to be a painted illusion. Parrhasius won, and Zeuxis said, "I have deceived the birds, but Parrhasius has deceived Zeuxis." Zeuxis vowed that he would win the contest the next time. In an attempt to expand his work, Zeuxis painted a boy carrying a basket of grapes. But when birds, once again, tried to peck them, he was extremely displeased, stating that he must have painted the boy with less skill. This story was commonly referred to in 18th- and 19th-century art theory to promote spatial illusion in painting.

Which of the following would serve as a valid assumption of Zeuxis?

- (A) If there is a boy in the painting, the birds will not approach the basket of grapes.
- (B) Zeuxis judged that he had failed as an illusionist painter.
- (C) A realistic looking boy in the painting should scare the birds from coming to peck at the grapes.
- (D) Zeuxis was not as creative the second time.

18. Joshua Silver, an atomic physicist got interested in lenses, the focal length of which can be easily altered (adaptive lenses), in the mid-80s, and this led him by a sort of "back-door" into vision and vision correction. He has invented a pair of corrective glasses that can be adjusted on the spot to fit 90% of prescriptions. The glasses have hollow fluid-filled lenses whose curvature can be altered pneumatically with the turn of a knob. Silver has dubbed his invention Adaptive Spectacles, and he hopes they can be distributed in parts of the world where optometrists and prescription lenses are hard to come by. An excited Mr. Joshua said, "We have been working on a simple and inexpensive method of vision correction which should obviate the need for large numbers of highly trained personnel. Though globally applicable, this method has an immediate application in the developing world." Inspite of this great breakthrough, Adaptive Spectacles did not create a dent in the market.

Which of the following, if true, can explain the above situation?

- (A) A number of highly trained optometrists found themselves out of work due to the breakthrough.
- (B) The fluid in the lenses expands with increase in temperature and has to be changed after a given period of time as it tends to get milky, affecting vision.
- (C) The method utilises an adaptive lens and effectively piggy-backs on the eye-brain adaptive optical system.
- (D) Adaptive Spectacles is a promising technology for mass vision-correction at very low cost.

19. For John Locke, the 17th-century political philosopher whose ideas helped found America, the problem with anarchy is the "want of a common judge". In the pre-political "state of nature", where a disinterested third party is nowhere to be found, simple conflicts between individuals can quickly turn bloody – or even deadly. But in political society, Locke wrote, legislators, judges and police mediate and calmly resolve tussles before they escalate.

And in the troubled city of Baltimore, Maryland's largest, an unsparing Department of Justice (DOJ) report released on August 10th, 2016 shows just how far the police department has strayed from its mission of protecting the people who live in the city while using the "highest standards of ethics, integrity and accountability".

Which of the following will best complete the blank sentence in the paragraph above?

- (A) Society engages in a pattern or practice of conduct that violates the constitution or federal law.
- (B) There are numerous anecdotes about how particular New York residents are mistreated by the police.
- (C) Reading the 163-page report on the DOJ's 14-month investigation is an exercise in picking up one's lower jaw from the keyboard about every other paragraph.
- (D) Society is supposed to work on this principle, though in reality, officials are known to occasionally veer from their role as honest, impartial defenders of the public good.

20. Social software encompasses the software tools and platforms that allow dynamic, informal, and shared communication across an expanding group of individuals. In our personal lives, most of us are familiar (or becoming familiar) with social software tools, but most of us have not experienced them extensively in the enterprise. Unfortunately, social software advocates haven't done a very good job of communicating the value these tools bring to the enterprise. While social software may well improve relationships, build trust and community, and tap into a greater diversity of ideas, these vague promises do little to convince skeptical executives concerned primarily with business performance. This is a shame because social software can be tightly linked to business performance improvement.

Which of the following sentences strengthens the above argument?

- (A) The only way to accelerate and sustain usage of social software in the enterprise is to target implementation against very specific operating performance levers.
- (B) Social software advocates haven't done a very good job of communicating the value these tools bring to the enterprise
- (C) By using social software employees have more interactions and both their explicit knowledge and their expertise is exposed to others who need them but were not looking for them.
- (D) Many executives are wary about the potential loss of confidentiality and expanded opportunity for airing personal grievances.

SECTION II: DATA INTERPRETATION AND LOGICAL REASONING

SUB-SECTION: DATA INTERPRETATION Number of Questions = 12

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

Three countries – A, B and C – export and import goods only among themselves. The value of all the goods exported from a country is called the Export Value of that country and the value of all the goods imported by a country is called the Import Value of that country.

The following table presents the Export Value (in \$ mn) and the Import Value (in \$ mn) of each of these three countries for a particular year:

Country	Export Value (\$ mn)	Import Value (\$ mn)
A	39	30
B	41	31
C	29	48

Further, for any two countries X and Y, the Net Exports of X with respect to Y are defined as the value of exports from X to Y minus the value of exports from Y to X. It is known that the Net Exports of A with respect to C are \$13 mn.

DIRECTIONS for question 1: Select the correct alternative from the given choices.

1. What are the Net Exports of C with respect to B?
(A) \$6 mn (B) -\$6 mn
(C) \$4 mn (D) -\$4 mn

DIRECTIONS for question 2: Type in your answer in the input box provided below the question.

2. What is the value of the exports (in \$ mn) from A to B?

DIRECTIONS for questions 3 and 4: Select the correct alternative from the given choices.

3. If the Total Trade between any pair of countries X and Y is defined as the sum of the value of

exports from X to Y and value of exports from Y to X, then between which of the following pairs of countries is the Total Trade the highest?

- (A) A, B
 - (B) B, C
 - (C) A, C
 - (D) Cannot be determined
4. Which of the following values is the least?
(A) Exports from B to C
(B) Exports from C to B
(C) Exports from A to C
(D) Exports from A to B

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

Six teams – A through F – participated in a football tournament comprising two stages – League stage and Knockout stage. In the League stage, each team played against each of the other teams exactly once. In each match in this stage, the winning team was awarded three points and the losing team was awarded no points. In case of a draw, the two teams were awarded one point each.

At the end of the League stage, the six teams were ranked such that the team with the highest number of points was ranked first and the team with the lowest number of points was ranked sixth. Only the top four teams at the end of the League stage participated in the Knockout stage, in which the top ranked team played against the fourth ranked team, while the second ranked team played against the third ranked team. The winners of these two matches played the finals against each other and the winner of the finals was declared the winner of the tournament. In case of a draw in any of the Knockout matches, the team with the higher number of points in the League stage was declared the winner of the match.

The first table below provides the goals scored by the two teams in each match of the League stage (the teams being represented as Team X and Team Y) and the second table provides the total number of goals scored for (i.e., by) each team and the total number of goals scored against (i.e., conceded by) each team in both the stages of the tournament combined.

Team X	Goals		Team Y
A	2	3	B
A	4	1	D
A	3	5	F
B	2	1	C
B	4	5	F
D	2	2	B
C	1	4	F
D	2	3	E
D	1	5	F
E	2	2	F
A	5	2	C
E	2	1	C
E	0	1	A
B	2	3	E
D	1	5	C

Team	Goals For	Goals Against
A	16	12
B	15	15
C	10	14
D	7	19
E	12	9
F	22	13

DIRECTIONS for questions 5 and 6: Select the correct alternative from the given choices.

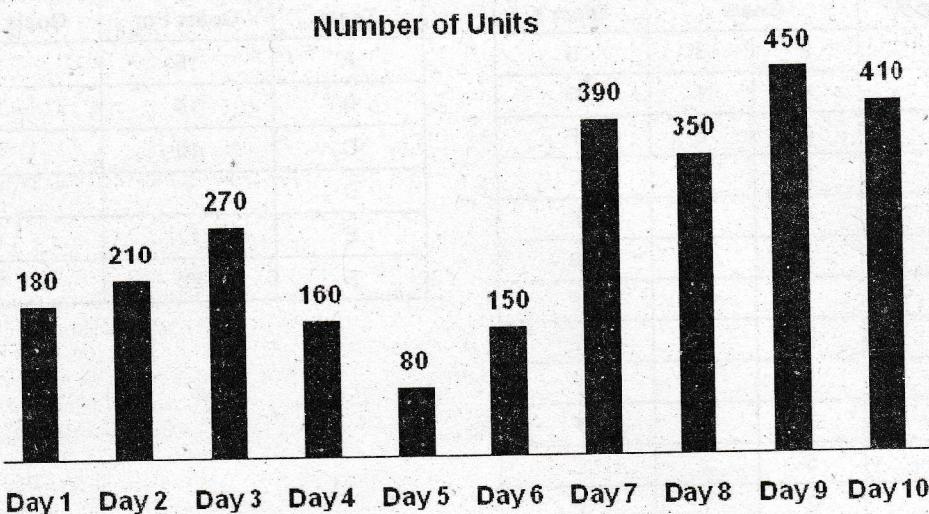
5. Which team was the winner of the tournament?
 (A) F (B) C
 (C) B (D) E
6. How many goals were scored in the Finals by both the teams combined?
 (A) 1
 (B) 2
 (C) 3
 (D) Cannot be determined

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

In a factory, there are four plants – Plant A, Plant B, Plant C and Plant D – that can be used for manufacturing plastic bottles. Each plant can manufacture a maximum of 120 units in a day. Operating each plant on any day will incur a Fixed cost for that day, which is independent of the number of units manufactured by the plant on that day, and a Variable cost, which varies with the number of units manufactured by that plant.

The number of units that should be manufactured on each day is decided in advance. On any day, based on the number of units scheduled to be manufactured on that day, only Plant A will be operated if it can manufacture all the units scheduled for the day; Plant B will be operated only if Plant A alone will not be able to manufacture all the units scheduled for the day; Plant C will be operated only if Plant A and B together will not be able to manufacture all the units scheduled for the day; Plant D will be operated only if Plants A, B and C together will not be able to manufacture all the units scheduled for the day.

The following bar graph presents the number of units scheduled to be manufactured on each day for ten consecutive days, while the table provides the per day Fixed cost and Variable cost for each plant:



Plant	Fixed Cost per day (in ₹)	Variable Cost per Unit (in ₹)
Plant A	150	6.00
Plant B	180	5.00
Plant C	110	7.00
Plant D	80	8.00

DIRECTIONS for questions 9 and 10: Type in your answer in the input box provided below the question.

9. What will be the total number of units manufactured by Plant C during the ten days?

10. What will be the total Fixed cost (in ₹) incurred during the ten days?

DIRECTIONS for questions 11 and 12: Select the correct alternative from the given choices.

11. On which of the following days will the Fixed cost as a percentage of the Variable cost be the lowest?
 (A) Day 3 (B) Day 4
 (C) Day 8 (D) Day 6

12. What is the average Total cost (sum of Fixed cost and Variable cost) incurred per unit during the ten days?
 (A) ₹7.48 (B) ₹7.32
 (C) ₹6.21 (D) ₹7.94

SUB-SECTION: LOGICAL REASONING

Number of Questions = 12

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

Six people – A through F – are sitting in six chairs, equally spaced around a circular table. Among the six, there are exactly two painters, two carpenters and two electricians and each person belongs to exactly one profession. Further, it is also known that

- (i) A, who is a painter, is sitting adjacent to an electrician.
- (ii) B is not sitting adjacent to D but is sitting opposite a carpenter.
- (iii) E is sitting to the left of A and D is sitting to the right of an electrician.
- (iv) C is sitting opposite D and to the left of a carpenter.

DIRECTIONS for questions 1 and 2: Select the correct alternative from the given choices.

1. Who among the following is a painter?
 (A) C
 (B) D
 (C) B
 (D) Cannot be determined
2. What is the profession of the person sitting opposite E?
 (A) Painter
 (B) Electrician
 (C) Carpenter
 (D) Cannot be determined

DIRECTIONS for question 3: Type in your answer in the input box provided below the question.

3. For how many persons is the profession of the person sitting to their right the same as that of the person sitting to their left?

DIRECTIONS for question 4: Select the correct alternative from the given choices.

4. Which of the following pairs of people are sitting opposite each other?
 (A) A, B (B) A, E
 (C) B, F (D) B, E

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

Six persons – A through F – are ranked from 1 to 6 according to their heights, such that the tallest person is ranked first. They are also ranked from 1 to 6 according to their weights, such that the heaviest person is ranked first. The following information is known about their heights and weights:

- (i) The tallest person is not the lightest and the shortest person is not the heaviest.
- (ii) For no person is the rank according to his height the same as the rank according to his weight.
- (iii) C, who is neither the shortest nor the heaviest, is shorter than E while B is taller than D.
- (iv) There are at least three people taller than E and at least two people lighter than E.
- (v) D is the third heaviest person among the six and at most two people are taller than D.
- (vi) F is not the shortest and E is not the heaviest.

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

5. Who is the heaviest among the six?
 (A) A
 (B) E
 (C) F
 (D) Cannot be determined
6. Who among the following is lighter than D?
 (A) E
 (B) B
 (C) F
 (D) More than one of the above
7. If there are at least two people lighter than the tallest person, who is the fifth heaviest among the six?
 (A) A (B) B
 (C) E (D) F

8. Among the following persons, for which person is the sum of the ranks by height and by weight the highest?
 (A) E (B) B (C) D (D) C

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

Each of five persons – Tarun, Unnath, Varun, Wasim and Yasar – plays a different sport among Tennis, Cricket, Hockey, Basketball and Badminton. Each person is from a different country among England, France, Spain, Germany and Belgium and each person endorses a different brand among Nike, ESPN, Gatorade, Under Armour and New Balance. Further, each of the five persons, while playing, wears a shirt of a different colour among Blue, Green, Yellow, Red and White. It is also known that

- (i) the person who is from England does not wear a Red shirt and the person who endorses Nike does not play Hockey.
- (ii) Tarun, who plays Basketball, does not endorse Under Armour and the person from Belgium plays Tennis.
- (iii) the person from Germany does not play Cricket.
- (iv) Yasar, who endorses Gatorade, does not play Badminton and the person who endorses New Balance wears a White shirt.
- (v) Unnath plays Hockey and Varun, who is from Spain, wears a green shirt.
- (vi) the person who plays Cricket does not wear a Green shirt but endorses ESPN and the person from France wears a Blue shirt and endorses Under Armour.

DIRECTIONS for questions 9 to 12: Select the correct alternative from the given choices.

9. Which country is Tarun from?
 (A) Germany
 (B) England
 (C) France
 (D) Cannot be determined
10. Which brand is endorsed by the person who plays Tennis?
 (A) New Balance (B) Under Armour
 (C) Gatorade (D) Nike
11. What is the colour of the shirt that the person from England wears?
 (A) White (B) Blue
 (C) Green (D) Yellow
12. The person who plays Hockey is from
 (A) England. (B) Belgium.
 (C) France. (D) Germany.

SECTION III: QUANTITATIVE ABILITY

Number of Questions = 26

DIRECTIONS for question 1: Select the correct alternative from the given choices.

1. If $a = b^2 = c^3 = d^4$, find the value of $\log_{(bc)^2} abcd$.
 (A) 1 (B) 3
 (C) $\frac{25}{108}$ (D) $\frac{5}{4}$

DIRECTIONS for question 2: Type in your answer in the input box provided below the question.

2. Manohar was a typist and he had just finished typing an entire book. If in order to number all the pages of the book, he made a total of 5001 key presses, find the number of pages in that book.

DIRECTIONS for question 3: Select the correct alternative from the given choices.

3. Find the value of n , such that
 $\sqrt{2^6 + 2^6 + \dots, n \text{ times}} = 1000$
- (A) 125 (B) 3125
(C) 625 (D) 15625

DIRECTIONS for question 4: Type in your answer in the input box provided below the question.

4. A dishonest milkman dilutes milk with water and then sells the diluted milk at a price that is 20% more than the price at which he purchased the milk. If he makes a profit of 50% in this manner, how many ml of water does he add to every litre of milk?

DIRECTIONS for questions 5 and 6: Select the correct alternative from the given choices.

5. If the price of a commodity increases by 20%, by what percent should a family reduce its consumption of that commodity, such that the expenditure by the family on the commodity increases by only 8%?
(A) 8% (B) 10%
(C) 15% (D) 25%
6. M is a point which is at a distance of 8 units from the point N = (1, 2). If P is another point with coordinates (-3, 5), then the maximum distance (in units) between M and P is
(A) 3. (B) 7.
(C) 9. (D) 13.

DIRECTIONS for questions 7 to 9: Type in your answer in the input box provided below the question.

7. The quartile deviation for the set of numbers 7, 13, 5, 1, 33, 35 and 31 is

8. If $0^\circ < \theta < 65^\circ$ and $\tan(\theta) + \tan(\theta + 60^\circ) + \tan(\theta + 120^\circ) = \sqrt{3}$, find the value of θ (in degrees).

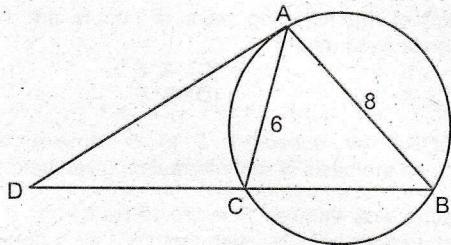
9. In how many ways can an amount of ₹100 be paid using exactly 27 coins of denominations ₹1, ₹2 and ₹5, such that at least one coin of each denomination is used?

DIRECTIONS for questions 10 to 15: Select the correct alternative from the given choices.

10. A square is inscribed in a circle and another square is circumscribed around the same circle. What is the ratio of the side of the outer square to that of the inner square?
(A) 4 : 1 (B) 2 : 1
(C) $\sqrt{2} : 1$ (D) $2\sqrt{2} : 1$

11. In an isosceles triangle, sides AB and AC each measure 63 cm. If D is a point on side BC, such that AD measures 61 cm, find the measure of (BD)(DC).
(A) 244 (B) 252
(C) 248 (D) Cannot be determined

12. In the figure below, if AC = 6, AB = 8 and DA is a tangent to the circle, find the ratio of the area of triangle ABC to that of triangle ACD.



- (A) $\frac{4}{3}$ (B) $\frac{16}{9}$
(C) $\frac{9}{16}$ (D) $\frac{7}{9}$

13. If the difference between the roots of the equation $x^2 - px + 2p = 0$ is 3, where both the roots are positive, find the equation whose roots are 2 more than the roots of the given equation.

- (A) $x^2 - 5x + 4 = 0$
(B) $x^2 - 9x + 18 = 0$
(C) $x^2 + 5x + 18 = 0$
(D) $x^2 - 13x + 40 = 0$

14. If $f(x) = 2x^2 - 1$ and $g(x) = x^2 - x + 1$, for how many integral values of x is $f(x-1) = g(x+1)$.
(A) 0 (B) 1
(C) 2 (D) More than 2

15. If a zero is appended to the extreme right of an eight-digit number written in the octal system (i.e., to base 8) and then the number so obtained is divided by $(25)_{10}$, then find the percentage increase/reduction in the value of the number.
(A) 50% reduction
(B) 60% reduction
(C) 68% reduction
(D) 100% increase

DIRECTIONS for question 16: Type in your answer in the input box provided below the question.

16. When the sum of two natural numbers is added to their LCM, a sum of 89 is obtained. How many such pairs of numbers exist?

DIRECTIONS for questions 17 to 21: Select the correct alternative from the given choices.

17. If $f(x) = \sqrt{(x+2)(x-3)(x-7)(x-11)}$ is a real valued function, how many integers are not in the domain of $f(x)$?
(A) 7 (B) 11
(C) 10 (D) Infinite

18. If A is 25% as efficient as B and can complete a certain work taking 15 days more than the time taken by B, in how many days will both A and B together complete the work?
(A) 4 days (B) 5 days
(C) 7 days (D) 10 days

19. After giving B a headstart of 24 m in a race of 240 m, A was able to catch up with B in 16 seconds.

If the speed of A is $33\frac{1}{3}\%$ more than that of B, by how many seconds will A beat B in that race?
(A) 6 (B) 8
(C) 4 (D) 12

20. Which of the following best describes the value of $\log_{4} 45$?
(A) A rational number less than 5.5
(B) An irrational number less than 5.5
(C) A rational number more than 5.5
(D) An irrational number more than 5.5

21. In a rectangle ABCD, if X and Y are the midpoints of sides AB and BC respectively, find the ratio of the area of triangle DXY and that of the rectangle.

(A) 1 : 4 (B) 3 : 8
(C) 2 : 5 (D) 5 : 8

DIRECTIONS for questions 22 to 25: Type in your answer in the input box provided below the question.

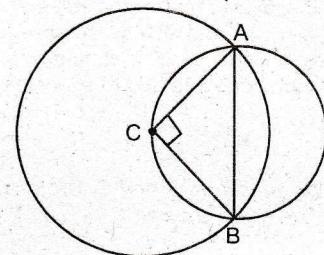
22. If the sum of all the odd factors of a number is $16\frac{2}{3}\%$ of the sum of all its even factors, then find the remainder when the number is divided by 8.

23. Rahul covered a certain distance in four hours, covering a part of the distance by car, at a speed of 60 km/hr, and the rest of the distance by bike, at a speed of 45 km/hr. Had he interchanged the two modes of transport, it would have taken him 10 minutes more to cover the entire distance. Find the total distance (in km) covered by him.

24. A certain quantity, a , varies as the sum of two quantities, of which one varies directly with another quantity b , whereas the other varies inversely with b . If when $b = 1$ or 3, $a = 16$, find the value of a , when $b = 6$.

25. If in the figure below, C is the centre of the bigger circle, $\angle ACB = 90^{\circ}$ and the measure of the common chord, AB, is 14 cm, find the area (in sq. cm)

common to both the circles. (Take $\pi = \frac{22}{7}$)



DIRECTIONS for question 26: Select the correct alternative from the given choices.

26. In a triangle ABC, if $\frac{a}{\cos B} = \frac{b}{\cos A}$, then the triangle is
(A) an equilateral triangle.
(B) an isosceles triangle.
(C) a right angled triangle.
(D) Either (B) or (C)