

VARC

**DIRECTIONS** for questions 1 to 3: The passage given below is followed by a set of three questions. Choose the best answer to each question.

Before 1989, if anyone asked me what we Poles were striking and struggling for, the answer would have been so simple – freedom. No shadings, no caveats, just freedom. Some of us had read Isaiah Berlin's famous essays on liberty and the philosophical writings of Charles Taylor. Some of us, of course, were aware of Berlin's distinction between "negative" and "positive" freedom. Yet it crossed few if any of our minds that the difference between the two would shape the course of our lives as free people. ...

Negative freedom was the easy part. We abolished censorship; so, too, the midnight knock at the door. Everyone has a right to travel abroad; no one is persecuted because of his or her beliefs. But somehow we no longer want to read the very books that our struggles freed from the censor's imprisoning mind. Few people have money for foreign travel and fewer still, even if the churches are full, have any kind of real faith. We are free, but what are we to do with this freedom except dream of riches?

I do not want to exaggerate our plight and so agree that negative freedom is a precondition of other values. Yet I doubt that Berlin, Taylor and others would suggest that we be satisfied with this level of liberty and nothing more. Indeed, when we resign ourselves to thinking about freedom only as negative freedom, we forget the innate, if moderate, optimism of the classic liberal writers.

John Stuart Mill, for example, understood that few people utilize their liberties in the pursuit of "high" culture. Still, for him, there existed an antidote to this "natural" inequality – education – which would lift people above their "lower" pleasures. This enlightened idea of education was, more or less, at the base of liberal thinking. It remained there until recently, when we began to fear education for the demanding choices it placed before us: between true and false, good and evil, beautiful and ugly. To recognize a hierarchy in our choices presupposed, it seemed, a hierarchy of meaning, too. ... And nowadays in our received skepticism we are – across this once divided continent – deeply afraid of being hierarchic.

**Q1.** Which of the following best fits the definition of negative freedom as can be inferred from the passage?

- a) Possession of the capacity to act upon one's free will.
- b) Freedom from external restraints.
- c) Freedom to form the government by the citizens of the country.
- d) Freedom to travel to any country.

**Q2.** Which of the following statements would Berlin and Taylor most agree with?

- a) Attaining negative freedom is not a necessary precondition for attaining positive freedom.
- b) It is easy to attain negative freedom but to attain positive freedom, education is indispensable.
- c) In a society which attained negative freedom, the people should strive to attain positive freedom.
- d) People should be satisfied with negative freedom and should not aspire for more.

**Q3.** According to the author, what is the reason that the Poles fear education?

- a) Education will remove inequalities and bring the rich and the poor on an equal plane.
- b) The choices that education places before them reminds them of the hierarchy in their society before getting freedom.
- c) Education was the reason why the continent was divided in the past.
- d) Education makes them aware of the choices that they face and makes them understand the hierarchy inherent in those choices.

**DIRECTIONS** for questions 4 to 6: The passage given below is followed by a set of three questions. Choose the best answer to each question.

In a critical reinterpretation of the work of many early investigators, Bekoff and Jamieson (1991) argued that dogs kept in the laboratory are unable to show their natural capacities and therefore, they should be observed in nature. They advise that ‘good ethologists think themselves into the minds of the animals’ but at the same time they dismiss simulation theory because it is not possible to simulate the mental state of animals by using a mental structure which evolved for a different purpose and gained its experience in a different environment. ...

Over the years, many researchers have toyed with a question, originally put forward by Nagel (1974) in relation to bats. Nagel queried whether natural science could ever offer a method of understanding the subjective conscious state in another creature. Nagel wondered ‘What is it like for a bat to be a bat?’, but many try to answer a much simpler form of the question ‘What is it like for us to be a bat?’ Although we have little to offer in answer to the original question, the answers to the second question are usually regarded as demonstrating anthropomorphism. ...

Recent discussions on anthropomorphism have revealed that whether this method of scientific inquiry is advantageous or disadvantageous depends mostly on the problem at hand. Functional anthropomorphism could be a useful tool in answering questions about the function or evolution of behaviour. ... Experiencing that humans display behaviours that function to

reduce anxiety after aggressive interaction, one might assume that a similar pattern of behaviour in another species may have the same function. ... In case of a social mammal like the dog that possesses some behavioural features that make it successful in human communities, one might be entitled to use a functional anthropomorphic stance in order to look for functional similarities. For example, observing similarities in a behaviour pattern that helps individuals to maintain close contact with specific group members, one could argue for functional similarity between the parent-infant and the owner-dog relationship. Such functional anthropomorphism could be a valid way for generating hypotheses on the functional aspects of behaviour because it lets one assume overlaps in roles played by certain behavioural systems. ...

**Q4.** How is Bekoff and Jamieson's claim (in the first paragraph) related to the question asked by Nagel (in the second paragraph)?

- a) Bekoff and Jamieson's claim provides us with a broad outline for answering Nagel's question.
- b) Bekoff and Jamieson believe that we cannot answer the question put forward by Nagel.
- c) Bekoff and Jamieson's claim is not related to the question posed by Nagel.
- d) Bekoff and Jamieson opine that good ethologists will be able to answer Nagel's question.

**Q5.** Which of the following statements best supports the idea that "functional anthropomorphism could be a valid way for generating hypotheses on the functional aspects of behaviour"?

- a) There are similarities between the behaviour of a parent and that of an infant.
- b) The behaviour of a dog in an owner-dog relationship has some similarities to that of an infant in a parent-infant relationship.
- c) The behaviour of individuals in any group depends on the dynamics of that group.
- d) There are similarities between the behavioural patterns of dogs and infants.

**Q6.** Which of the following can be inferred to be true regarding functional anthropomorphism?

- a) Functional anthropomorphism is useful for understanding the behaviour of only those species which exist in close contact with humans.
- b) Functional anthropomorphism assumes that the behaviour of a species in a situation will be similar to that exhibited by humans.
- c) Functional anthropomorphism deduces the function that a behaviour serves in a species by understanding the function of a similar behaviour in humans.
- d) Functional anthropomorphism helps us understand what it is like for a dog to be a dog.

**DIRECTIONS** for questions 7 to 12: The passage given below is followed by a set of six questions. Choose the best answer to each question.

Citizens in wealthy nations are divided between those who want to close the gates on immigration and those who welcome the newcomers, argues Toby Shelley in his book “Exploited: Migrant Labour in the New Global Economy.” The ambitious poor in this unequal world are willing to risk their lives to improve their lot. Haphazard enforcement that includes fines or jail time, employer abuses and public resentment do little to dissuade jobseekers. Most voluntarily set out on long journeys, counting on jobs nonexistent in their homelands and anticipating tedious, revolting or dangerous work. Shelley reveals that people jump through hoops of horror to live in lands that offer opportunity.

Yet the typical reader who picks up this book doesn’t need to be convinced about the exploitation, and the book will disappoint those who long for a specific plan of action. For now, ordinary citizens can only read about the rising inequality and degrading values that accompany a two-tier class society, one group with “rights” and the other without. ...

In a world with national borders, governments easily claim that the newcomers from other countries have “no rights,” so the migrants become a convenient foe in the politics of enforcement. According to Shelley, employers, large and small, take advantage of undocumented workers willing to toil for low wages. The skilled native is able to focus on the most valuable tasks like skilled work and customer relations, while the immigrants with limited education focus on support tasks but help bring the price down for the overall project. Yet the wealthy respond as though their communities are under attack by those fleeing poverty in their homelands.

That attitude – wealthy nation as victim – suggests that the labor is not forced, that the workers don’t mind a lack of standing in communities, reinforcing an illusion of fairness in what is essentially a class system. “Trade liberalization... has created a bigger pool of people desperate to improve their circumstances through migration, while simultaneously the pressures of competing with lower-cost rivals abroad may have made employers in some sectors more likely to take on cheaper, undocumented labour,” notes Shelley. The employers claim to value the migrants’ worth ethic, otherwise known as a willingness to accept low pay and horrendous conditions. “The ‘hunger’ for

work, the ‘reliability’ and ‘flexibility’ of migrant labour are employers’ terms for long hours, lack of overtime pay, unpaid duties, zero hour contracts... and disposability of migrant labour.”

A government enforcement policy that focuses more on immigration status than workplace rights sets the stage for abuse of all workers, and Shelley concludes that “the government has chosen to promote a narrative in which migration is associated with law and order rather than rights.”

A strong point in Shelley’s book is its exposure of the blatant unfairness of point-based systems that create classes of workers with different sets of rights, institutionalizing inequality and encouraging criminality. “Experience shows that the more managed, restricted and hedged about with regulatory barbed wire a migrant labour is, the less control authorities have over it,” Shelley notes. ...

Shelley argues for decriminalization of immigration, focusing less on raids and more on workplace rights, and effective ‘**naturalization**’ norms and notes that open borders – eliminating the undocumented status – could do more than closed borders in reducing the extreme wage inequality between borders. Many immigrants would go back and forth to their native countries, counteracting the potential brain drain by sharing knowledge and investment capital. ...

Most worrisome is how “keep-illegals-in-their-place,” “they-do-the-dirty-work,” “I’m-helping-this-nanny-by-paying-her-half-the-minimum-wage” attitudes weaken our moral compass. Communities can no longer throw up their hands, accepting tired excuses that industries depend on cheap immigrant labor and human rights have less priority, because the entrenched inequality – hardly temporary – brutalizes the controllers and controlled alike, as observed 125 years ago by US writer and one-time slave Frederick Douglass: “No man can put a chain about the ankle of his fellow man without at last finding the other end fastened about his own neck.”

Shelley and the rest of us must turn controlled anger to presenting the tough solutions: To end illegal immigration, consumers must accept higher costs and do without some luxuries. At the very least, citizens of the wealthiest nations have an obligation to examine numerous military, environmental, education, population and economic-growth policies – all of which set the conditions for inequality and displacement, creating a bleak world for so many.

**Q7.** Which of the following can be understood from the passage?

- a) Largely open borders between countries could increase knowledge sharing and lead to a reduction of costs due to an elimination of the systems of border controls.
- b) The author recommends that the current policies, that consider certain forms of immigration, be changed.

- c) 'Naturalization' refers to a practice of living in another country on a temporary basis before seeking legal permission to stay permanently.
- d) Immigrants cause long-term benefits but at the cost of short-term pain in the form of lower wages and greater unemployment for natives.

**Q8.** As can be inferred from the passage, which of the following has not been mentioned in the book "Exploited: Migrant Labour in the New Global Economy."?

- a) Unfairness of a system that fosters inequality in society.
- b) Immigrants' rights and criminalization of their actions.
- c) Attitude of the well-to-do in wealthy nations to immigrants.
- d) A practical plan to solve the problem of immigrants and the society that plays host to them.

**Q9.** Which of the statement(s) is/ are not true, as understood from the passage?

1. For the politicians, the migrant labourer is a bogeyman he can use to his advantage.
2. The rich act as if they are being victimised by the poor migrants.
3. Reliability and flexibility are euphemisms used by the employer for the enslavement of immigrant workers.
4. Government policies do not support the unfair treatment meted out to migrants.
5. Immigrants are low skilled workers who are willing to work for low pay; they reduce cost of operation in project and firm and perform supporting tasks freeing up natives for skilled jobs.

- a) a and e
- b) Only d
- c) a, b and e
- d) c and d

**Q10.** The abuse of all workers, according to Toby Shelley, is chiefly the result of

- a) capitalists trying to maximise their profits at the expense of poor labour.
- b) the attitude of the rich projecting themselves as victims of mass migration.
- c) the governmental policy that gives greater importance to legal rights than to human rights.
- d) the pressure of competition on industrialists leading them to exploit every avenue to reduce costs.



**Q11.** According to the passage, the reasons for the migration of labour include ...

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. The wide gap between the living standards in rich and poor countries.
2. Lack of employment opportunities in poor countries.
3. Restrictions on and regulation of migrant workers.
4. Global warming, political stability, demographic slippage into impoverishment.
5. Economic, military and environmental policies of the developed nations.
6. Trade Liberalization.

**Q12.** According to Frederick Douglass, it is imperative for societies to act because

- a) inhuman treatment of our fellowmen will tear our moral fibre.
- b) we could one day find ourselves in the position of the less fortunate.
- c) the positive benefits of migration balance the negative consequences of migration.
- d) the loss we suffer is negligible compared to the benefit accruing to the poor migrant.

**DIRECTIONS** for questions 13 to 18: The passage given below is followed by a set of six questions. Choose the best answer to each question.

*"Imagination enriches everything in life;  
Yet pain and pleasure can be real and might still be there;*

....

....

*For oft we still must weep or laugh, since we are human."*

There is not a more unthinking way of talking than to say such and such pains and pleasures are only imaginary, and therefore to be got rid of or under-valued accordingly. There is nothing imaginary in the common acceptance of the word. The logic of Moses in the *Vicar of Wakefield* is good argument here: – "Whatever is, is." Whatever touches us, whatever moves us, does touch and does move us. We recognize the reality of it, as we do that of a hand in the dark. We might as well say that a sight which makes us laugh, or a blow which brings tears into our eyes, is imaginary, as that anything else is imaginary that makes us laugh or weep.

We can only judge of things by their effects. Our perception constantly deceives us, in things with which we suppose ourselves perfectly conversant; but our reception of their effect is a different matter. Whether we are materialists or immaterialists, whether things be about us or within us, whether we think the sun is a substance, or only the image of a divine thought, an idea, a thing imaginary, we are equally agreed as to the notion of its warmth. But, as this warmth is felt differently by different temperaments, so what we call imaginary things affect different minds. What we have to do is not to deny their effect, because we do not feel in the same proportion, or whether we even feel it at all; but to see whether our neighbors may not be moved. If they are, there is, to all intents and purposes, a moving cause. But we do not see it? No; – neither perhaps do they. They only feel it; they are only sentient, – a word which implies the sight given to the imagination by the feelings.

But what do you mean, we may ask in return, by seeing? Some rays of light come in contact with the eye; they bring a sensation to it; in a word, they touch it; and the impression left by this touch we call sight. How far does this differ in effect from the impression left by any other touch, however mysterious? An ox knocked down by a butcher, and a man knocked down by a fit of apoplexy, equally feel themselves compelled to drop. The tickling of a straw and of a comedy equally move the muscles about the mouth. The look of a beloved eye will so thrill the frame, that old philosophers have had recourse to a doctrine of beams and radiant particles flying from one sight to another. In fine, what is contact itself, and why does it affect us? There is no one cause more mysterious than another, if we look into it.

Nor does the question concern us like moral causes. ... If, instead of saying that the causes which moved in us this or that pain or pleasure were imaginary, people were to say that the causes themselves were removable, they would be nearer the truth. When a stone trips us up, we do not fall to disputing its existence: we put it out of the way. When we suffer from what is called an imaginary pain, our business is not to canvass the reality of it. Whether there is any cause or not in that or any other perception, or whether everything consists not in what is called effect, it is sufficient for us that the effect is real. Our sole business is to remove those second causes, which always accompany the original idea.

As in deliriums, for instance, it would be idle to go about persuading the patient that he did not behold the figures he says he does. He might reasonably ask us, if he could, how we know anything about the matter; or how we can be sure that in the infinite wonders of the universe certain realities may not become apparent to certain eyes, whether diseased or not. There is no one cause more mysterious than another. Our business would be to put him into that state of health in which human beings are not diverted from their comforts by a liability to such imaginations. We could explain that such a morbidity is clearly no more a fit state for a human being than a disarranged state of works is for a watch; and that seeing the general



tendency of nature to this completeness or state of comfort, we naturally conclude that the imaginations in question are at least not of the same lasting or prevailing description.

**Q13.** According to the first para of the passage, why is it injudicious to say that certain pains and pleasures are only imaginary?

- a) We recognize the inherent reality of things that touch us and move us, even if they are a figment of our imagination or suppositions and do not seem perceptible or evident.
- b) There is nothing imaginary in the common acceptation of the word 'imaginary' as explained by Moses' statement "Whatever is, is."
- c) Our reaction to the consequences of certain pains and pleasures is not real enough.
- d) As long as we are mortal, we will experience pain and pleasure but these can be got rid of or under-valued easily.

**Q14.** Which of the following choices correctly summarizes the contents of the second paragraph?

- a) Materialists may think that the sun is a substance while the immaterialists may think that the sun is the image of a divine thought but they both agree as to the notion of its warmth. They agree that our perception constantly deceives us, in things which we suppose ourselves perfectly conversant, but our reception of their effect is a different matter.
- b) Materialists who think that the sun is the image of a divine thought and immaterialists who think that the sun is a substance both agree that certain things may be felt differently by different people. We must not refuse to deny the effects of things as sometimes we cannot see things but can only feel them.
- c) Whether we are materialists or immaterialists, we disagree on the causes of events but agree on the effects observed. The effects may be felt to a different degree, just as a thing which is called imaginary, would be felt differently. We need to look at the influence of the effects on our neighbors as well and not dismiss the causes as imaginary.
- d) Whether we are materialists or immaterialists, we agree on the causes of events but disagree on the effects observed. The effects may be felt to a similar degree, just as a thing which is called imaginary, would be felt uniformly. We need to confirm whether the same effect is experienced by our neighbours as well.

**Q15.** What do the examples presented in the fourth and fifth sentences of the third para serve to illustrate?

- a) Life is a comedy and we must judge things by their effects.
- b) Two different effects can be produced by the same cause and we are affected by both psychological elements as well as physical contact.
- c) Philosophers happily use the same doctrine to explain how multiple causes can lead to a common consequence.
- d) Independent factors can result in the same effect and there are different kinds of contact that affect us, not merely the physical.

**Q16.** According to the author, we should NOT be concerned with which of the following when it comes to dealing with imaginary pain?

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. Whether the cause of pain itself was removable and how to remove the secondary causes, those that accompany the original idea of pain.
- 2. Disputing its existence or the causes of any other perception.
- 3. Its real effect.
- 4. Labelling the causes of the pain as imaginary.
- 5. Opposing the reality of pain.

**Q17.** What can be inferred from the last paragraph of the passage?

- a) The ground-work of all happiness is health. Take care of this ground; and the doleful imaginations that come to warn us against its abuse will avoid the abuse of health.
- b) A delusional person considers that his imaginary thought processes represent reality; we need to ensure that these transient imaginations do not take him away from an appropriate state of comfort in his existence. Imaginary causes which cannot be adequately described should be removed.
- c) In the past, philosophers provided misleading answers as to how mysterious events occurred but now we have the ability to perceive things better. We can even make a delusional person achieve a higher state of mental well-being.

d) Imaginations have no role to play in the natural and complete state of the universe. A strong belief that something is true is the first step in making it real.

**Q18.** Given below are some ideas from the passage. Arrange the ideas in the correct chronological order as they appear in the passage and enter the sequence of 5 numbers as your answer, in the input box given below the question.

1. Being aware that effects are felt differently by others ...
2. What a delusional person imagines could be incomplete and cannot be described adequately.
3. Removing the causes of real effects ...
4. The same effect can be displayed by multiple causes ...
5. Recognition of the reality of effects, even of imaginary things ...

**DIRECTIONS** for questions 19 to 24: The passage given below is followed by a set of six questions. Choose the best answer to each question.

In the coming year, we're going to witness a breakthrough in our understanding of what sleep is for. So why do we need to sleep? It surprises most people to learn that this is even a question. Every other basic bodily function – like eating, drinking, breathing or urinating – has a pretty clear purpose. Our bodies and brains need food, water, and oxygen to stay alive and to replenish themselves, and if they didn't rid themselves of the byproducts of this metabolism, we'd be awash in our own toxic waste. Likewise, sleep must be required for something important. We all spend decades in this strange state, immobilized, unconscious, and vulnerable. But what exactly does sleep do for us?

Parents tell their children they need to sleep because they're tired and require rest. But, of course, mere 'rest' is not good enough. Lying still for eight hours is no substitute for sleep. My own mother had a different theory. She said I needed to sleep because I had too much "sleepy gas." It had been building up all day long, and so I needed to sleep to get rid of it. In fact, scientists observed a long time ago that if you keep a sheep awake continuously for several days and then inject some of its cerebrospinal fluid into another, well-rested sheep, that sheep will fall right asleep, presumably because some naturally-occurring sleep substance had reached a soporific level in the donor. But this line of research never quite solved the puzzle. Although a number of putative sleep substances have now been identified,

we're not sure how they might work biochemically, or how sleep (as opposed to mere rest) might break them down.

Other sleep-deprivation studies done in the early 1980s took a more brutal approach. Rats were kept awake for weeks until they died from a lack of sleep. One then investigated the precise cause of death. Such studies (now outlawed) could not pinpoint any specific culprits, such as particular organ failures. One striking observation, however, was that the rats ate much more than normal and yet wasted away. Their metabolism seemed to be wrecked. So maybe sleep is required for energy regulation, in some unspecified way. Other popular theories are that sleep is required for tissue repair, or immune function, or for consolidating learning and memory.

The new development, and the cause for optimism, is an original approach to the problem that makes the first quantitative, testable predictions about the function of sleep. Two physicists, Van Savage of Harvard Medical School and Geoff West of Santa Fe Institute, have analyzed how sleep varies across mammals of different species. Normally physiological time ticks slower for bigger animals. For example, elephants live much longer than mice and their hearts beat much slower. The interesting thing is that the lifetimes and pulse times of both elephants and mice scale in the same way with their body mass – in direct proportion to their mass raised to the  $1/4$  power – with the curious implication that the hearts of mice and elephants will typically beat the same number of times in their lifetime.

What is so strange about sleep in this regard is that it behaves differently from all other physiological times. It's backward. Mice sleep longer than elephants, not shorter – about fourteen hours a day compared to four. Savage and West interpret this as evidence that sleep is related to cellular repair. They note that cells produce destructive byproducts, such as free radicals, in the course of normal metabolism, and they hypothesize that sleep somehow helps repair the damage that ensues. Then, using classic laws about how metabolic rate varies across different species, they derive mathematical predictions about how sleep duration should vary with an animal's size. But which size is most relevant – brain size or body size? The key is that they are not proportional. If sleep is for repairing the brain, Savage and West derive one prediction; if it's for repairing the body, they derive a different prediction. When they finally confront their model with the available data, they infer that sleep is mainly required for repairing the brain, not the body. **So much for beauty sleep.**

**Q19.** According to the physicists Van Savage and Geoff West, what is a possible explanation for the observation that mice sleep for a longer duration than elephants?

a) Normally physiological time ticks slower for bigger animals but elephants are an exception to this rule.

b) Though the lifetimes and pulse times of both elephants and mice scale in the same way with their body mass, a longer sleep time in mice positively impacts learning and memory as well as boosts the immune system.

c) Mice need to sleep longer to clean up all the byproducts generated by their revved-up metabolism.

d) In the case of mice, the metabolism speeds up during sleep generating more harmful byproducts and these take a longer time to clear.

**Q20.** What is the primary concern of the author in this passage?

a) To question an explanation about the nature of sleep and its types.

b) To discredit the idea about differences between sleep among various animals.

c) To reiterate the importance of sleep.

d) To explore the causes for sleep.

**Q21.** Which of the following statements can be inferred from 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 (2) and (4) apply, then enter 24 (but not 42) in the input box.

1. Sleep duration in the animal kingdom is inversely proportional to body size.

2. Some substances in the body can build up due to lack of sleep but it is not entirely clear how lack of sleep can result in death.

3. There are more naturally occurring sleep substances discovered in murine systems as compared to elephants.

4. Sleep deprivation leads to a decreased appetite and low immune functions.

5. Elephants get better quality sleep as compared to mice even though the former sleep for a shorter duration than the latter.

**Q22.** The boldfaced part of the passage plays which of the following roles?

a) It invalidates an idea.

b) It resolves a difference of opinion.

c) It states a solution to the problem described in the previous sentence.

d) It points out a paradox contained in a controversial viewpoint.

**Q23.** What is the main conclusion of the passage?

- a) If sleep is for repairing the brain, then brain size is important but if it is important for repairing the body, then body size does not really matter.
- b) Sleep has more effect on the health of the brain than on the health of the body.
- c) Sleep helps remove the “sleepy gas” in the brain but does not play a central role in flushing the free radicals and other toxic byproducts from the body, as previously thought.
- d) The amount of sleep an animal gets is determined by its brain size only and not its body size.

**Q24.** A documentary on Animal Planet reported the same research experiment carried out by Van Savage and Geoff West, one of the findings of which is reproduced below:

“An animal Y was found to sleep for 10.4 hours a day and another animal Z was found to sleep for 19 hours a day.”

Based on the given passage, which of the following is true?

- a) Animal Y is larger than an elephant but has a larger brain while animal Z is smaller than a mouse and has a smaller brain.
- b) Animal Y is almost half the size of an elephant but has a larger brain, while animal Z is larger than a mouse and has a smaller brain than a mouse.
- c) Animal Y’s heart will beat faster than an elephant and animal Z’s heart will beat slower than a mouse.
- d) The size of Animal Y lies in a range between the sizes of a mouse and an elephant, while animal Z is smaller than a mouse.

**Q25. DIRECTIONS** *for questions 25 and 26:* Five sentences related to a topic are given below. Four of them can be put together to form a meaningful and coherent short paragraph. Identify the odd one out. Choose its number as your answer and key it in.

1. And, in the world beyond the tale we turn the page, or close the book, and we resume our lives.



2. Fiction allows us to slide into other heads, other places, and look out through other eyes.
3. We draw our lines around any moments of pain, and remain upon our islands, where they cannot hurt us as they are covered with a smooth, safe, nacreous layer that lets them slip, pearllike, from our souls without real pain.
4. And then in the tale we stop before we die, or we die vicariously and unharmed.
5. Lives that are, like any other, unlike any other.

**Q26. DIRECTIONS** *for questions 25 and 26:* Five sentences related to a topic are given below. Four of them can be put together to form a meaningful and coherent short paragraph. Identify the odd one out. Choose its number as your answer and key it in.

1. The father of free-market economics noted this paradox in 18th century Scotland, as rain-sodden and damp then as it is today.
2. But around the world billions of people already struggle during dry seasons; drought and deluge are a costly threat in many countries.
3. “Nothing is more useful than water,” observed Adam Smith, but “scarcely anything can be had in exchange for it.”
4. Better modelling tools may also convince governments everywhere of the urgency of dealing with water scarcity, and with clever pricing, clearer ownership and a bit of co-operation, water scarcity can be alleviated.
5. Where water is in ample supply his words still hold true.

**Q27. DIRECTIONS** *for questions 27 to 29:* In the question, the word in capitals is used in **six** 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].

FRET

1. Sheetal showed off the lovely fretted design of the sari border as she stood beside the intricately carved and fretted balustrades lining the terrace.
2. The cable fretted through the wood, leaving a gaping hole.
3. The waterfall – with the water leaping in a seething, fretting mass over the edge of a precipice – was an awe-inspiring sight.
4. We watched intently as strong winds were fretting the English channel and the water was fretting the shores on either side of the Strait of Dover.
5. Why would anyone get themselves in fret over something so trivial?
6. The grand marble edifice of the Taj Mahal is slowly turning brownish-yellow as the marble slowly frets out under pounding by the wind and rain.

**Q28. DIRECTIONS** *for questions 27 to 29:* In the question, the word in capitals is used in **six** 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].

LAY

1. The kids laid in money for a vacation.
2. We need to lay up supplies for the future.
3. She laid me up for breaking the expensive Chinese teapot.
4. “The Lay of Leithian” is an unfinished poem written by J. R. R. Tolkien.
5. The Villa Bon Abri lays in a beautiful and sheltered hollow on the outskirts of the lively city Maastricht in Netherlands.
6. The Indian swine flu epidemic laid low thousands of people.

**Q29. DIRECTIONS** *for questions 27 to 29:* In the question, the word in capitals is used in **six** 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].

FLUSHED

1. The army used tear gas to flush out the terrorists.
2. The mason has to ensure that the marbonite tiles are flush on the ground.
3. Her cheeks, normally a pale shade, flushed when she overheard the embarrassing remarks.
4. Flushed up with patriotism, I decided to quit my job and join the movement against terrorism.
5. Muhammad Ali knocked his opponent out by a flush blow to the jaw.
6. A recently conducted economic study indicates that there are flush times ahead for multi-brand retail.

**Q30. DIRECTIONS** *for questions 30 to 32:* The sentences given below, when properly sequenced, form a coherent paragraph. Each sentence is labeled with a number (1, 2, 3, 4, 5 or 6). Decide on the proper order for the sentences and key in the correct sequence of six numbers as your answer in the input box given below the question.

1. Apple has popularised existing technologies four times: with the Macintosh computer in 1984, the iPod in 2001, the iPhone in 2007 and the iPad in 2010.
2. If technophiles were to write their own Testament, these might be the opening lines.
3. Recently the faithful have prayed that Apple will pull it off again with its smartwatch.
4. "In the beginning was Apple. All things were made by it; and without it was not anything made that was made."
5. Many firms already make wrist-based devices that measure sleep patterns and exercise, but so far the category has remained a niche plaything for geeks and athletes.
6. Apple's ability to redefine the appeal of whole categories of computing has attracted the unerring faith of millions of followers.

**Q31. DIRECTIONS** *for questions 30 to 32:* The sentences given below, when properly sequenced, form a coherent paragraph. Each sentence is labeled with a number (1, 2, 3, 4, 5 or 6). Decide on the proper order for the sentences and key in the correct sequence of six numbers as your answer in the input box given below the question.

1. Also, health care, education and other services are vestigial.
2. Currently, they live in camps or shared rooms in neighbouring countries. They cannot work here.
3. It is unlikely that the refugees who have fled the ghastly war in Syria will be able to return home anytime soon.
4. Nor are many likely to start a new life abroad.
5. “We are alive but not living,” says Yasser Jani, a 39-year-old chemistry teacher who, with his wife and children, has been in a camp in southern Turkey since June 2011.
6. They are fast approaching 1 million and their future is bleak.

**Q32. DIRECTIONS** *for questions 30 to 32:* The sentences given below, when properly sequenced, form a coherent paragraph. Each sentence is labeled with a number (1, 2, 3, 4, 5 or 6). Decide on the proper order for the sentences and key in the correct sequence of six numbers as your answer in the input box given below the question.

1. And who from there set up not just the first Brazilian football team but the first organised league, and thereby a grand, glorious, essential sporting future.
2. Preserved in mahogany bust form, the moustachioed but still mischievous founding paterfamilias of Brazilian football has spent the last two weeks peering out at this burnished modern mega-sport – still recognisably the same activity Miller himself imported across the Atlantic 120 years ago – from his private mausoleum in Brazil’s largest city, São Paulo.
3. It was played at a few posh boarding schools and almost nowhere else.
4. Miller’s other sporting import, rugby, had less appeal.
5. Here he is, then: Charles Miller.
6. Miller is a fabled figure here, the English-schooled, Brazilian-Scottish father-mentor-instigator of football in Brazil, who famously set sail

from Southampton in 1894 with two leather footballs and a copy of the Hampshire Football Association's rules of the game.

**Q33. DIRECTIONS** *for questions 33 and 34:* The question presents a sentence and four different ways of phrasing the sentence. Select the answer choice that produces the most effective sentence in terms of word choice and sentence construction and enter its number in the input box given below the question. Your answer should make the sentence clear, exact and free of grammatical error. It should also minimize awkwardness, ambiguity and redundancy.

The college is a corner of our hearts, where hope has not yet died, the prison house has not yet closed, the battle has not lost, we assert, endow and defend here as final reality the best of our dreams.

1. The college is a corner of our hearts where hope has not yet died, the prison house has not yet closed, the battle has not yet been lost; where we assert, endow and defend as final reality the best of our dreams.
2. A college is a corner of our hearts, where hope has not yet died, the prison house was not yet closed, the battle has not lost, here we assert, endow and defend as final reality the best of our dreams.
3. A college is a corner of our hearts where hope has not yet died, the prison house has not yet closed, the battle is not yet lost; here we assert, endow and defend, as final reality, the best of our dreams.
4. A college is a corner of our hearts where hope has not yet died, the prison house has not yet closed, the battle has not yet been lost; here we assert, endow and defend in final reality the best of our dreams.

**Q34. DIRECTIONS** *for questions 33 and 34:* The question presents a sentence and four different ways of phrasing the sentence. Select the answer choice that produces the most effective sentence in terms of word choice and sentence construction and enter its number in the input box given below the question. Your answer should make the sentence clear, exact and free of grammatical error. It should also minimize awkwardness, ambiguity and redundancy.

Judging by books published about Germany in recent decades, you might conclude that the subject worth only writing about was twelve years from 1933 to 1945 from where Hitler took power to the end of the second world war and it is easy to see why writers return back to it to try to understand the incomprehensible.

1. Judging by books published about Germany in recent decades, you might conclude that the subject worth only writing about was twelve years from 1933 to 1945 from where Hitler took power to the end of the

second world war and it is easy to see why writers return back to it to try to understand the incomprehensible.

2. Judging by the books published about Germany in recent decades, you might conclude that the only subject worth writing about was the twelve years from 1933 to 1945: from when Hitler took power to the end of the second world war and it is easy to see why writers return again to it to try to understand incomprehensible.

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4. Judging by the books published about Germany in recent decades, you might conclude that the only subject worth writing about was the twelve years from 1933 to 1945: from when Hitler took power to the end of the Second World War, and it is easy to see why writers return to it to try to understand the incomprehensible.

DILR

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

On a particular day, Jacob, a stock trader, was planning to invest in the shares of one or more of ten companies – C1 through C10. The following table provides four financial ratios – Debt Equity Ratio (D/E), Earnings Per Share (EPS), Asset Turnover Ratio (ATR) and Return on Assets (RoA) – for each of the ten companies and the share price (in Rs.) of each company on that day:



Company	D/E	EPS	ATR	RoA	Share Price (in Rs.)
C <sub>1</sub>	0.845	10.5	1.54	0.21	25
C <sub>2</sub>	0.878	15.6	1.05	0.35	37
C <sub>3</sub>	1.254	12.4	1.84	0.47	41
C <sub>4</sub>	1.365	11.8	1.56	0.17	39
C <sub>5</sub>	0.845	14.6	1.44	0.46	47
C <sub>6</sub>	0.915	10.8	1.67	0.28	51
C <sub>7</sub>	1.156	11.7	1.74	0.19	70
C <sub>8</sub>	1.268	12.5	1.21	0.31	24
C <sub>9</sub>	1.354	13.7	1.34	0.39	36
C <sub>10</sub>	1.248	13.1	1.49	0.41	68

**Note:** There was no additional cost involved in purchasing the shares of any company.

**Q1. DIRECTIONS** for question 1: Select the correct alternative from the given choices.

If Jacob purchased exactly 13 shares of each company for which Debt Equity ratio is greater than 0.896 and ATR is greater than 52, what is the total amount that Jacob spent in purchasing the shares?

- a) Rs. 2613
- b) Rs. 2574
- c) Rs. 2821
- d) Rs. 2470

**Q2. DIRECTIONS** for questions 2 to 4: Type in your answer in the input box provided below the question.

If Jacob purchased an equal number of shares of all companies for which EPS was greater than 12 and RoA was less than 0.4 but did not spend more than Rs. 10000 in all, at most how many shares of each company did Jacob buy?

**Q3. DIRECTIONS** for questions 2 to 4: Type in your answer in the input box provided below the question.

If Jacob spent a total of exactly Rs. 1000 in purchasing at least one share of each company for which ATR is less than 1.65 and EPS is greater than 12,

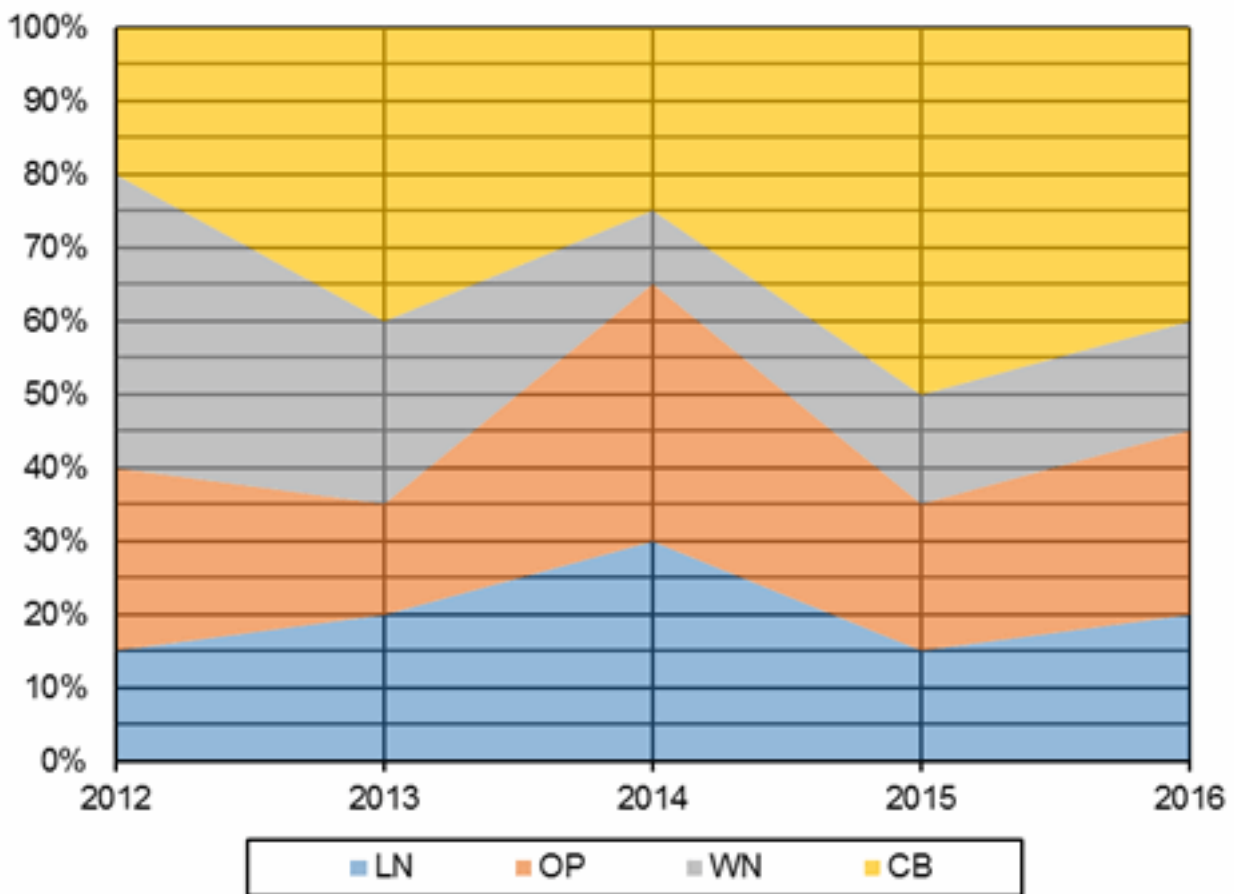
what is the maximum number of shares of a single company that Jacob could have purchased?

**Q4. DIRECTIONS** for questions 2 to 4: Type in your answer in the input box provided below the question.

If Jacob spent an equal amount in purchasing the shares of each company for which the EPS is less than 14 and the Share Price is greater than 45, what is the minimum total number of shares that Jacob would have purchased?

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

In a country, there were exactly four states – LN, OP, WN and CB. The area chart given below provides the GDP of each of the four states as a percentage of the total GDP of the country, for five years, from 2012 to 2016. Further, it is known the GDP of CB remained constant over the five years.



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

In how many years, from 2013 to 2016, did the GDP of LN increase as compared to the previous year?

- a) 1
- b) 2
- c) 3
- d) 4

**Q6. DIRECTIONS** for questions 5 to 8: Select the correct alternative from the given choices.

What is the ratio of the GDP of WN in 2014 to that of OP in 2012?

- a) 0.32
- b) 0.64
- c) 0.2
- d) 0.4

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

In how many years, from 2013 to 2016, did the GDP of at least two states decrease as compared to the previous year?

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

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

What is the highest percentage increase in the GDP of any state in any year, from 2013 to 2016, as compared to the previous year?

- a) 140%
- b) 240%
- c) 373.33%
- d) 273.33%

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

Each of six persons, Alan, Bob, Chris, Dave, Gary and Harry, live in a house of a different colour among Red, Blue, Green, Black, Yellow and Orange.

Further, each house is of a different type among Villa, Apartment, Bungalow, Cottage, Mansion and Ranch.

It is also known that

1. Alan, who does not live in the Ranch, lives in the Black house, while the Mansion is Red.
2. Bob lives in the Cottage, which is not Green.
3. the Bungalow is not Green, while the Apartment is Blue.
4. Dave lives neither in the Apartment nor in the Red house.
5. Harry, who lives in the Orange house, does not live in the Villa.

**Q9. DIRECTIONS** for questions 9 to 12: Select the correct alternative from the given choices.

What is the colour of the house that Dave lives in?

- a) Yellow
- b) Green
- c) Blue
- d) Cannot be determined

**Q10. DIRECTIONS** for questions 9 to 12: Select the correct alternative from the given choices.

If Alan lives in the Villa, what is the type of house that Harry lives in?

- a) Bungalow
- b) Ranch
- c) Apartment
- d) Cannot be determined

**Q11. DIRECTIONS** for questions 9 to 12: Select the correct alternative from the given choices.

Which of the following statements is sufficient to determine the type of house and the colour of the house that each person lives in?

- a) Chris lives in the Blue house.
- b) The Villa is Green in colour.
- c) Harry does not live in a Ranch.
- d) None of the above.

**Q12. DIRECTIONS** for questions 9 to 12: Select the correct alternative from the given choices.

How many arrangements are possible for the type of the house and the colour of the house that each person lives in?

- a) 1
- b) 3
- c) 4
- d) 6

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

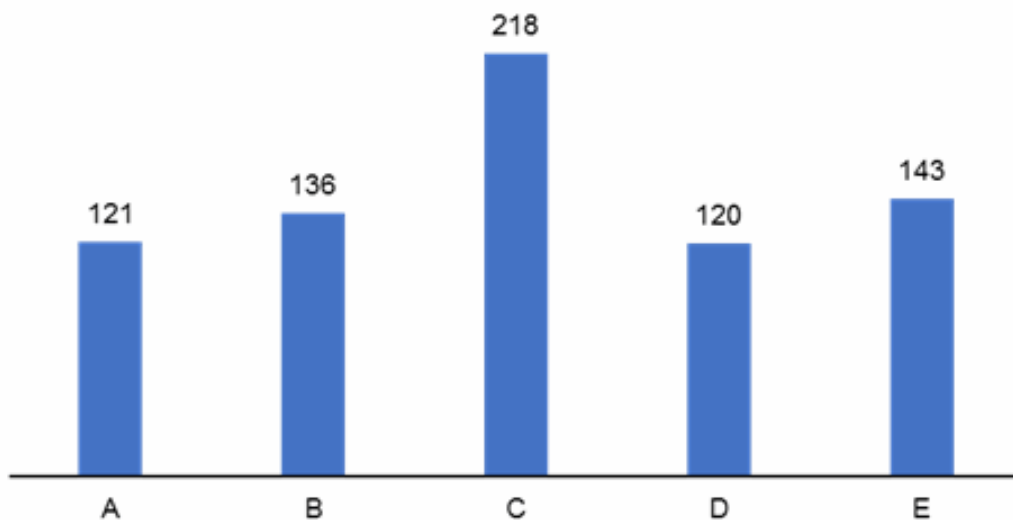
In Sotheby's Auction house, ten items – Item 1 through Item 10 – were put up for auction and sold on a particular day. Exactly five people – A through E – participated in the auction for each of the ten items. For each item, each of the five participants had to submit exactly one bid (i.e., the amount that she was willing to pay) and the item was sold to the person who submitted the highest bid. Each of the five persons had a certain amount with her before the auction for the first item started.

The auction started with Item 1 and ended with Item 10, in that order. For any item, the person who submitted the highest bid had to pay the amount she had bid for that item before the auction for the next item can be started. Further, for none of the items did any person submit a bid higher than the amount that she had with her at the start of the auction of that item. For each item, the bids submitted by the five persons were all distinct integral multiples of 1000. The following table provides partial information about the bids submitted (in Rs.) by each person for each item and the graph given below the table provides the total amount available with each person at the start of the day:

Bids submitted (in Rs. '000)

Person	Item 1	Item 2	Item 3	Item 4	Item 5	Item 6	Item 7	Item 8	Item 9	Item 10
A	21		42	30	12		29	45	30	69
B			41	25	31	26	35	62	21	
C	23	36	36		21	28	36			74
D	24	34	38	32	40		31	68	34	75
E	12	31		31	34	32		74	29	70

Amounts Available (in Rs. '000)



**Q13. DIRECTIONS** for questions 13 to 16: Select the correct alternative from the given choices.

How many items were sold to E?

- a) 1
- b) 2
- c) 3
- d) 4

**Q14. DIRECTIONS** for questions 13 to 16: Select the correct alternative from the given choices.

Who bid the highest amount for Item 2?

- a) A
- b) B
- c) C
- d) Cannot be determined

**Q15. DIRECTIONS** for questions 13 to 16: Select the correct alternative from the given choices.

Among the following persons, who will have the maximum amount left with her after the ten items are sold?

- a) A
- b) B
- c) C
- d) Cannot be determined

**Q16. DIRECTIONS** for questions 13 to 16: Select the correct alternative from the given choices.

How many items were sold to B?

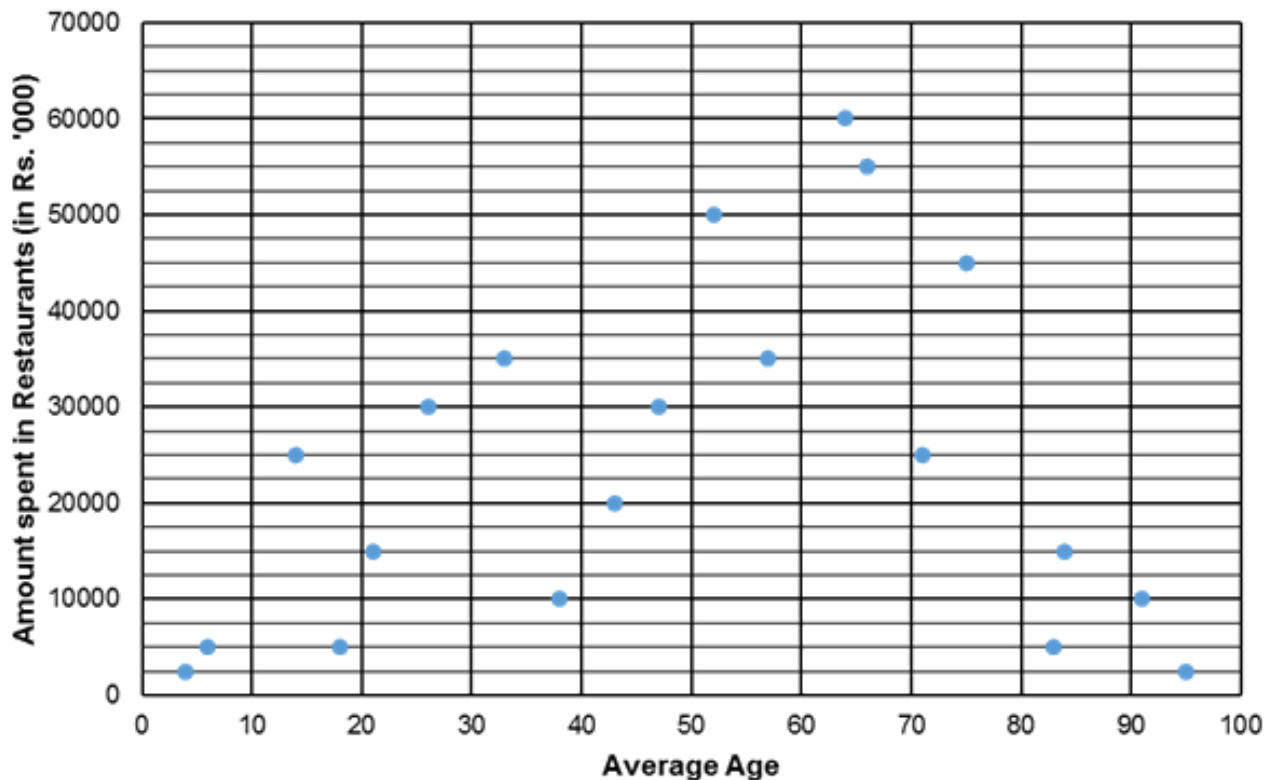
- a) 1
- b) 2
- c) 3
- d) Cannot be determined

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

Kalyan, as a part of his college assignment, was studying the total amount spent in restaurants by the populations of two countries, Country A and Country B, across different age groups. He divided the entire population of each country into ten age groups: 0 – 10 years, 11 – 20 years, 21 – 30 years and so on up to 91 – 100 years.



After collecting the data, he plotted a scatter chart, given below, with the horizontal axis representing the average age (in years) of the persons in each age group and the vertical axis representing the total amount spent in restaurants (in Rs. '000) by all the persons in that group. In his hurry to complete the assignment on time, he forgot to label the points in the graph. However, he knew that, for any age group, the average age of all the persons in that age group in Country A was greater than that in Country B.



**Q17. DIRECTIONS** for questions 17 to 20: Select the correct alternative from the given choices.

What is the total amount spent (in Rs. '000) in restaurants by all the persons of Country A whose age is at least 31 years?

- a) 190,000
- b) 187,500
- c) 185,000
- d) 192,500

**Q18. DIRECTIONS** for questions 17 to 20: Select the correct alternative from the given choices.

How many of the following can be the total amount (in Rs. '000) spent by all the persons of Country B whose age is between 36 years and 65 years?

- 1. 65000
- 2. 95000
- 3. 150000
- 4. 170000

5. 195000

- a) 1
- b) 2
- c) 3
- d) 4

**Q19. DIRECTIONS** for questions 17 to 20: Select the correct alternative from the given choices.

For which age group is the ratio of the total amount spent in restaurants by all the people of that age group in Country A to that in Country B the highest?

- a) 0-10 years
- b) 11-20 years
- c) 71-80 years
- d) 81-90 years

**Q20.** If, in each age group, there were an equal number of persons in Country A and in Country B, in how many age groups was the amount spent in restaurants per person in Country B at least 25% more than that in Country A?

- a) 5
- b) 4
- c) 6
- d) 0

**Q21. DIRECTIONS** for questions 21 to 24: Select the correct alternative from the given choices.

Who among the following was sitting on the same side as A?

- a) H
- b) K
- c) J
- d) L

**Q22. DIRECTIONS** for questions 21 to 24: Select the correct alternative from the given choices.

Which of the following pairs of people were definitely sitting on the same side of the table?

- a) J, E
- b) F, L

- c) F, G
- d) J, C

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

If E was sitting two places to the left of L, then who among the following was sitting on the same side as B?

- a) F
- b) J
- c) I
- d) H

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

Which of the following pairs of people are definitely sitting on the same side of the table but not adjacent to each other?

- a) E, G
- b) J, I
- c) G, F
- d) J, K

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

Five persons – Ratan, Tim, Uday, Vir and Wasim – sell rice in their respective shops in a neighbourhood. The price at which each person sells one kg of rice, i.e., his Selling Price per kg, is distinct. Further, for each person, the price at which he purchases the rice, i.e., his Cost Price per kg, is distinct. The Profit that each person makes in selling one kg of rice is also distinct. The Selling Price per kg (in Rs.), Cost Price per kg (in Rs.) and the Profit per kg (in Rs.) are all positive integral multiples of 5.

The following information is known about the Cost Price per kg, the Selling Price per kg and the Profit per kg of each person:

1. Tim purchases rice at Rs. 20 per kg and the profit per kg that Tim makes is Rs. 5 more than what Uday makes.
2. Ratan, who sells rice at Rs. 50 per kg, purchases rice for Rs. 5 per kg more than what Vir purchases it for.
3. The Selling Price per kg of rice for Wasim is at least Rs. 45, while the Cost Price per kg is at least Rs. 25.
4. The Cost Price per kg for any of the five persons is not greater than Rs. 40, while the Selling Price per kg for any of the five persons is not greater than Rs. 55.
5. The profit per kg that Tim makes is Rs. 10 more than what Vir makes.

6. Uday sells rice at Rs. 35 per kg and the profit per kg for Uday is Rs. 20 less than that of Ratan.

**Q25. DIRECTIONS** for questions 25 to 27: Type in your answer in the input box provided below the question.

What is the maximum profit (in Rs.) that any person makes in selling one kg of rice?

**Q26. DIRECTIONS** for questions 25 to 27: Type in your answer in the input box provided below the question.

What is the price (in Rs.) at which Tim sells one kg of rice?

**Q27. DIRECTIONS** for questions 25 to 27: Type in your answer in the input box provided below the question.

What is the price (in Rs.) at which Uday purchases one kg of rice?

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

If, on a particular day, one of the five persons, Mr. X, sold 50 kg of rice and made a profit of Rs. 1250, who is Mr. X?

- a) Wasim
- b) Uday
- c) **Vir**
- d) **Tim**

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

Amar wants to go on a camping trip with exactly five of his friends. He has to select five friends who will accompany him out of eight friends – A through H. Of these eight friends, A, B, F and G are girls and the remaining are boys. Further, only C, E and F know how to pitch a tent. When selecting the five friends, Amar wants to select at least two friends who know how to pitch a tent.

Further, it is also known that

- (i) if A is selected, E cannot be selected.
- (ii) if B is selected, both C and D must be selected.
- (iii) G cannot be selected unless F is selected.
- (iv) C can be selected if and only if G is selected.
- (v) H cannot be selected unless both B and F are selected.

**Q29. DIRECTIONS** for questions 29 to 31: Select the correct alternative from the given choices.

What is the maximum number of girls that Amar can select?

- a) 1
- b) 2
- c) 3
- d) 4

**Q30. DIRECTIONS** for questions 29 to 31: Select the correct alternative from the given choices.

How many of the eight friends will definitely be selected?

- a) 1
- b) 2
- c) 3
- d) 4

**Q31. DIRECTIONS** for questions 29 to 31: Select the correct alternative from the given choices.

Who among the following will definitely not be selected?

- a) A
- b) E
- c) H
- d) More than one of the above

**Q32. DIRECTIONS** for question 32: Type in your answer in the input box provided below the question.

In how many ways can Amar select the five friends?

QA

**Q1. DIRECTIONS** for questions 1 and 2: Select the correct alternative from the given choices.

In a hugely popular singing reality show, every day, the best performer of the day was conferred with the title of 'Leader of the Day' and was given a cash prize of Rs.10001. On the first of August 2017, if the title was jointly awarded

to 17 singers and the cash prize was equally shared by all of them, the prize amount received by each singer was a

- a) natural number.
- b) non-terminating recurring decimal.
- c) non-terminating non-recurring decimal.
- d) terminating decimal.

**Q2. DIRECTIONS** for questions 1 and 2: Select the correct alternative from the given choices.

Find the percentage change in the volume of a cone, if the radius of its base is decreased by 20% and its height is increased by 50%.

- a) 4% decrease
- b) 6% decrease
- c) 4% increase
- d) 6% increase

**Q3. DIRECTIONS** for question 3: Type in your answer in the input box provided below the question.

A group of workers in a puppet manufacturing company was assigned the task of making 395 puppets. Each worker in the group works at a constant rate and makes five puppets per hour. At the end of the first hour, some of the workers were reassigned to another task; at the end of the second hour, the same number of the remaining workers were also reassigned to another task, and a similar reassignment occurred at the end of every hour till the task was complete. If the entire task was completed in 4 hours and 20 minutes, how many puppets were finished in the first three hours?

**DIRECTIONS** for questions 4 and 5: Answer the questions on the basis of the information given below.

Raju is walking down an escalator (a moving staircase) which is moving down. From the top, he takes 20 steps to reach the bottom, while Rajat, who walks twice as fast as Raju, takes 30 steps from the top to reach the bottom.



**Q4.** Find the total number of steps visible at any point of time on the escalator.

- a) 40
- b) 48
- c) 60
- d) 56

**Q5.** Find the number of steps that Rajesh, a friend of Raju, would take to reach the bottom, if he starts from the top and walks half as fast as Raju.

- a) 10
- b) 12
- c) 16
- d) 18

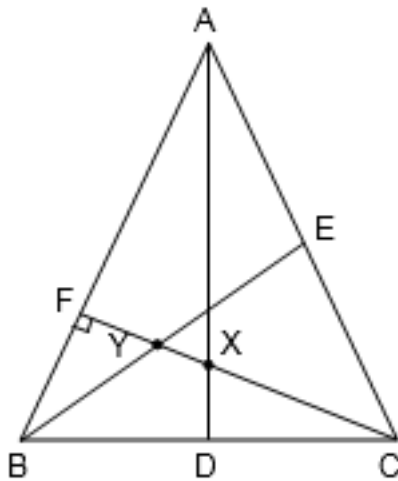
**Q6. DIRECTIONS** for question 6: Select the correct alternative from the given choices.

Which of the following gives the product of all the positive numbers which differ from their reciprocal by 3?

- a)  $\sqrt{2}$
- b) 2
- c) 3
- d) None of the above

**Q7. DIRECTIONS** for question 7: Type in your answer in the input box provided below the question.

As shown in the figure below, ABC is a triangle, such that  $AB = 14$  cm,  $BC = 13$  cm and  $AC = 15$  cm. If AD and BE are angle bisectors, intersecting the altitude CE, drawn to side AB, at X and Y respectively, and the measure (in cm) of XY is  $m$ , find the value of  $42m$ .



**Q8. DIRECTIONS** for question 8 to 15: Select the correct alternative from the given choices.

If  $a$  and  $b$  are positive real numbers such that  $a + b = 6$ , find the minimum value of  $a^2 + b^2$ .

- a) 18
- b) **20**
- c) **26**
- d) None of the above

**Q9. DIRECTIONS** for question 8 to 15: Select the correct alternative from the given choices.

Akash, Bilal and Chintu were supposed to divide a certain amount,  $N$ , among themselves in the ratio  $1 : 2 : 3$  respectively. Instead, they erroneously divided the amount in the ratio  $4 : 3 : 2$  respectively. If in the process, Akash gained Rs. 2000, find  $N$ .

- a) Rs. 4500
- b) Rs. 6300
- c) Rs. 7200
- d) Rs. 9600

**Q10. DIRECTIONS** for question 8 to 15: Select the correct alternative from the given choices.

Find the product of the roots of the equation  $(2x^2 + 13)(x - 3) + (2x^2 + 13)(x - 5) = 0$ .

- a) 26
- b) **-26**

- c) 39
- d) -39

**Q11. DIRECTIONS** for question 8 to 15: Select the correct alternative from the given choices.

A retailer selling mangoes offered a flat discount of 10% on his marked price. Further, owing to persistent bargaining by a customer, he offered  $n$  mangoes free for every 12 mangoes purchased by the customer and still made an overall profit of 20% in the transaction. Find the value of  $n$ , if the mangoes

were marked at  $66\frac{2}{3}\%$  more than their cost price.

- a) 1
- b) 2
- c) 3
- d) 4

**Q12. DIRECTIONS** for question 8 to 15: Select the correct alternative from the given choices.

For  $-1 < r < 1$ , if  $F(r) = 8 + 8r + 8r^2 + \dots$ , find the value of  $\frac{F(r) \cdot F(-r)}{F(r) + F(-r)}$ .

- a) 2
- b) 4
- c) 8
- d) 16

**Q13. DIRECTIONS** for question 8 to 15: Select the correct alternative from the given choices.

If the product of three consecutive natural numbers is 16 times their sum, which of the following gives the sum of the squares of the three numbers?

- a) 110
- b) 171
- c) 149
- d) 194

**Q14. DIRECTIONS** for question 8 to 15: Select the correct alternative from the given choices.

If  $y = |x + 1| - |x - 2|$ , then which of the following is true of  $y$ ?

- a)
- $-3 \leq y \leq 0$

b)  
 $-3 \leq y \leq 3$

c)  $y \leq -3$   
 d)  $y \geq 3$

**Q15. DIRECTIONS** for question 8 to 15: Select the correct alternative from the given choices.

Usually, Mahesh takes 150 minutes to drive from his house to his in-laws' house. Last Sunday, after covering 20% of the distance to his in laws' house, Mahesh's car developed an engine problem, which reduced his speed (when compared to his usual speed) by 15 km/hr for the remaining part of the journey. If it took Mahesh a total of 190 minutes to cover the entire distance, find the distance (in km) between his house and his in-laws' house.

- a) 120  
 b) 150  
 c) 240  
 d) 270

**Q16. DIRECTIONS** for questions 16 and 17: Type in your answer in the input box provided below the question.

How many positive integers less than or equal to 2020 will not have any zero in them when represented in the number system to the base 5?

**Q17. DIRECTIONS** for questions 16 and 17: Type in your answer in the input box provided below the question.

A triangle is constructed in the  $x$ - $y$  plane, with the vertices of its base lying on the line  $x + y = 36$ , and the third vertex being the origin, such that all the vertices have integer co-ordinates. How many such triangles can be constructed, if no portion of the triangle lies outside the first quadrant and the magnitude of its area is a positive integer?

**Q18. DIRECTIONS** for question 18 to 22: Select the correct alternative from the given choices.

Cities A, B and C are interconnected in such a way that one can go directly from A to C or go from A to C via B. One can go from A to B in  $n$  ways, from

B to C in  $(n + 2)$  ways and directly from A to C in  $2n$  ways. If the total number of ways in which one can go from A to C is 60, find the value of  $n$ .

- a) 7
- b) 8
- c) 5
- d) 6

**Q19. DIRECTIONS** for question 18 to 22: Select the correct alternative from the given choices.

A tank has four emptying taps, all of equal efficiencies, but each fixed

at  $\frac{1}{5}$  th,  $\frac{2}{5}$  th,  $\frac{3}{5}$  th and  $\frac{4}{5}$  th of the height of the tank respectively. Two filling taps, each of which individually can fill the tank in 200 minutes, are also connected to the tank. If the ratio of the efficiency of each emptying tap and the efficiency of each filling tap is 1 : 3, and all the six taps are opened simultaneously, then in how much time will the empty tank be filled?

- a) 166 minutes
- b) 174 minutes
- c) 182 minutes
- d) 154 minutes

**Q20. DIRECTIONS** for question 18 to 22: Select the correct alternative from the given choices.

Find the value of  $k$  such that the pair of equations  $6x + 9y = 24$  and  $kx + 6y = 16$  has an infinite number of solutions.

- a) 4
- b) 6
- c) 9
- d) Cannot be uniquely determined

**Q21. DIRECTIONS** for question 18 to 22: Select the correct alternative from the given choices.

In a textile shop, the number of shirts having a design is thrice the number of shirts not having a design. The shop also has sarees of exactly three colours – Brown, Black and Yellow. The number of brown sarees is half the number of black sarees and one-fifth of the number of yellow sarees. Find the number of shirts not having a design, given that the total number of shirts and sarees in the shop is 72 and the number of sarees that are handspun is four times that of those that are not handspun.

- a) 9

- b) 8
- c) 7
- d) 6

**Q22. DIRECTIONS** for question 18 to 22: Select the correct alternative from the given choices.

The price of a commodity increased by 30%. Find the percentage reduction in the consumption of the commodity by a family, if the expenditure on the commodity by the family decreased by 9%.

- a) 20%
- b) 23.75%
- c) 26.25%
- d) 30%

**Q23. DIRECTIONS** for question 23: Type in your answer in the input box provided below the question.

Nagesh took six AIMCATs and the total score that he obtained in each AIMCAT was a distinct number between 121 to 130, both inclusive. If the average of his AIMCAT scores at the end of every AIMCAT was an integer, and he scored 127 in the sixth test, how much did he score in the fifth test?

**Q24. DIRECTIONS** for question 24: Select the correct alternative from the given choices.

In how many ways can 195 be expressed as the sum of two or more consecutive positive integers?

- a) 3
- b) 4
- c) 5
- d) 7

**Q25. DIRECTIONS** for question 25: Type in your answer in the input box provided below the question.

Aniket has three pen stands and 13 distinct pens, exactly three of which write with red ink. One stand can hold six pens, one can hold four pens and the third can hold three pens. In how many ways can Aniket put all the 13 pens in the three pen stands such that all the three red ink pens are in the same pen stand. (Ignore arrangements of the pens within a pen stand)

**Q26. DIRECTIONS** for questions 26 to 30: Select the correct alternative from the given choices.

If  $a$  and  $b$  are positive integers such that  $a^2 + 64a + 1188 = b^2$ , which of the following gives the value of  $(b - a)$ ?

- a) 2
- b) 34
- c) 42
- d) 50

**Q27. DIRECTIONS** for questions 26 to 30: Select the correct alternative from the given choices.

How many distinct values of  $x$  are possible such that  $(\log_y x)^{101} = \log_y(x^{101})$ , if  $x$  is a positive real number and  $y$  is an integer between 1000 and 2000 (excluding both)?

- a) 999
- b) 1000
- c) 1999
- d) 2997

**Q28. DIRECTIONS** for questions 26 to 30: Select the correct alternative from the given choices.

Amar was walking towards a building at a constant speed. In ten minutes, he observed that the angle of elevation of the top of the building changed from  $45^\circ$  to  $60^\circ$ . How much more time will he take to reach the foot of the building?

- a)  $5(\sqrt{3} + 1)$  minutes
- b) 5 minutes
- c)  $5\sqrt{3}$  minutes
- d)  $5(3 + \sqrt{3})$  minutes

**Q29. DIRECTIONS** for questions 26 to 30: Select the correct alternative from the given choices.

Out of 240 students in a coaching centre, where every student prepares for at least one of the two exams – IIT JEE and AIEEE, the number of students preparing for IIT JEE is between 75% and 85% (both inclusive), whereas the number of students preparing for AIEEE is between 35% and 45% (both inclusive). If the maximum possible and the minimum possible number of students preparing for both IIT JEE and AIEEE are denoted by  $A$  and  $B$  respectively, find the value of  $A + B$ .



- a) 48
- b) 96
- c) 72
- d) 120

**Q30. DIRECTIONS** for questions 26 to 30: Select the correct alternative from the given choices.

If  $n$  is a natural number, find the largest number which always divides the expression  $n(n + 1)(n + 2)(n + 7)$ .

- a) 12
- b) 24
- c) 36
- d) 48

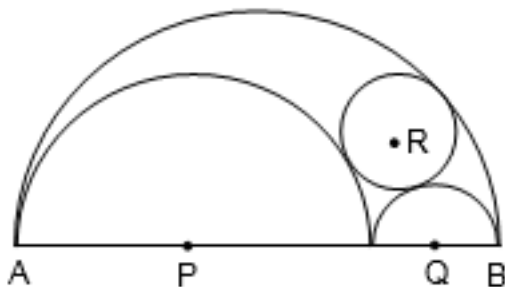
**Q31. DIRECTIONS** for questions 31 and 32: Type in your answer in the input box provided below the question.

A polynomial  $f(x) = x^3 + x^2 + ax - 10$  has three distinct roots, each of which is also a root of the polynomial  $F(x) = x^4 + bx^3 + 43x^2 - 360x + c$ , where  $a$ ,  $b$  and  $c$  are real numbers. If  $a < 0$ , find the value of  $(a + b + c)$ .

**Q32. DIRECTIONS** for questions 31 and 32: Type in your answer in the input box provided below the question.

If  $\log_6 \cos x (6 \sin x) = \frac{3}{2}$ , for  $x$  lying in the interval  $\left[0, \frac{\pi}{2}\right]$ , find the value of  $\tan 2x$ . Enter your answer accurate upto two decimal places.

**Q33. DIRECTIONS** for question 33: Select the correct alternative from the given choices.



In the figure above, two semicircles, with centres at P and Q, of radii 3 cm and 1 cm respectively, are drawn, sharing their bases with that of a larger semicircle, of diameter AB. The two smaller semicircles touch each other

externally, while touching the larger semicircle internally. If a circle, centred at R, is drawn such that it touches to the two smaller semicircles externally, while touching the larger semicircle internally, find the radius (in cm) of the circle centred at R.

- a)  $\frac{5}{6}$
- b)  $\frac{12}{13}$
- c)  $\frac{1}{3}\sqrt{2}$
- d)  $\frac{1}{2}\sqrt{3}$

**Q34. DIRECTIONS** for question 34: Type in your answer in the input box provided below the question.

At a certain school, the Class X has four sections – A, B, C and D. A committee of students needs to be formed by selecting exactly two representatives from each of the four sections. If each section has four representatives, comprising two boys and two girls, and the committee must comprise four boys and four girls, in how many ways can the committee be formed?

