VERBAL ABILITY AND READING COMPREHENSION

The passage below is accompanied by four questions. Based on the passage, choose the best answer for each question.

The Positivists, anxious to stake out their claim for history as a science, contributed the weight of their influence to the cult of facts. First ascertain the facts, said the positivists, then draw your conclusions from them. This is what may [be] called the common-sense view of history. History consists of a corpus of ascertained facts. The facts are available to the historian in documents, inscriptions, and so on [Sir George Clark] contrasted the "hard core of facts" in history with the surrounding pulp of disputable interpretation forgetting perhaps that the pulpy part of the fruit is more rewarding than the hard core It recalls the favourite dictum of the great liberal journalist C.P. Scott: "Facts are sacred, opinion is free.". . .

What is a historical fact? According to the common-sense view, there are certain basic facts which are the same for all historians and which form, so to speak, the backbone of history—the fact, for example, that the Battle of Hastings was fought in 1066. But this view calls for two observations. In the first place, it is not with facts like these that the historian is primarily concerned. It is no doubt important to know that the great battle was fought in 1066 and not in 1065 or 1067, and that it was fought at Hastings and not at Eastbourne or Brighton. The historian must not get these things wrong. But [to] praise a historian for his accuracy is like praising an architect for using well-seasoned timber or properly mixed concrete in his building. It is a necessary condition of his work, but not his essential function. It is precisely for matters of this kind that the historian is entitled to rely on what have been called the "auxiliary sciences" of history—archaeology, epigraphy, numismatics, chronology, and so forth. . . .

The second observation is that the necessity to establish these basic facts rests not on any quality in the facts themselves, but on an apriori decision of the historian. In spite of C.P. Scott's motto, every journalist knows today that the most effective way to influence opinion is by the selection and arrangement of the appropriate facts. It used to be said that facts speak for themselves. This is, of course, untrue. The facts speak only when the historian calls on them: it is he who decides to which facts to give the floor, and in what order or context. The only reason why we are interested to know that the battle was fought at Hastings in 1066 is that historians regard it as a major historical event. Professor Talcott Parsons once called [science] "a selective system of cognitive orientations to reality." It might perhaps have been put more simply. But history is, among other things, that. The historian is necessarily selective. The belief in a hard core of historical facts existing objectively and independently of the interpretation of the historian is a preposterous fallacy, but one which it is very hard to eradicate.

1. If the author of the passage were to write a book on the Battle of Hastings along the lines of his/her own reasoning, the focus of the historical account would be on:
(a) providing a nuanced interpretation by relying on the auxiliary sciences.
(b) exploring the socio-political and economic factors that led to the Battle.
(c) producing a detailed timeline of the various events that led to the Battle.
(d) deriving historical facts from the relevant documents and inscriptions.

2. According to this passage, which one of the following statements best describes the significance of archaeology for historians?
(a) Archaeology helps historians to locate the oldest civilisations in history.
(b) Archaeology helps historians to ascertain factual accuracy.
(c) Archaeology helps historians to interpret historical facts.
(d) Archaeology helps historians to carry out their primary duty.

3. All of the following, if true, can weaken the passage's claim that facts do not speak for themselves, EXCEPT:
(a) a fact, by its very nature, is objective and universal, irrespective of the context in which it is placed.
(b) facts, like truth, can be relative: what is fact for person X may not be so for person Y.
(c) the order in which a series of facts is presented does not have any bearing on the production of meaning.
(d) the truth value of a fact is independent of the historian who expresses it.

4. All of the following describe the "common-sense view" of history, EXCEPT:
(a) only the positivist methods can lead to credible historical knowledge.
(b) history can be objective like the sciences if it is derived from historical facts.
(c) real history can be found in ancient engravings and archival documents.
(d) history is like science: a selective system of cognitive orientations to reality

The passage below is accompanied by four questions. Based on the passage, choose the best answer for each question.

Umberto Eco, an Italian writer, was right when he said the language of Europe is translation. Netflix and other deep-pocketed global firms speak it well. Just as the EU employs a small army of translators and interpreters to turn intricate laws or impassioned speeches of Romanian MEPs into the EU's 24 official languages, so do the likes of Netflix. It now offers dubbing in 34 languages and subtitling in a few more. . . .

The economics of European productions are more appealing, too. American audiences are more willing than before to give dubbed or subtitled viewing a chance. This means shows such as "Lupin", a French crime caper on Netflix, can become global hits In 2015, about 75% of Netflix's original content was American; now the figure is half, according to Ampere, a media-analysis company. Netflix has about 100 productions under way in Europe, which is more than big public broadcasters in France or Germany. . . .

Not everything works across borders. Comedy sometimes struggles. Whodunits and bloodthirsty maelstroms between arch Romans and uppity tribesmen have a more universal appeal. Some do it better than others. Barbarians aside, German television is not always built for export, says one executive, being polite. A bigger problem is that national broadcasters still dominate. Streaming services, such as Netflix or Disney+, account for about a third of all viewing hours, even in markets where they are well-established. Europe is an ageing continent. The generation of teens staring at phones is outnumbered by their elders who prefer to gawp at the box.

In Brussels and national capitals, the prospect of Netflix as a cultural hegemon is seen as a threat. "Cultural sovereignty" is the watchword of European executives worried that the Americans will eat their lunch. To be fair, Netflix content sometimes seems stuck in an uncanny valley somewhere in the mid-Atlantic, with local quirks stripped out. Netflix originals tend to have fewer specific cultural references than shows produced by domestic rivals, according to Enders, a market analyst. The company used to have an imperial model of commissioning, with executives in Los Angeles cooking up ideas French people might like. Now Netflix has offices across Europe. But ultimately the big decisions rest with American executives. This makes European politicians nervous.

They should not be. An irony of European integration is that it is often American companies that facilitate it. Google Translate makes European newspapers comprehensible, even if a little clunky, for the continent's non-polyglots. American social-media companies make it easier for Europeans to talk politics across borders. (That they do not always like to hear what they say about each other is another matter.) Now Netflix and friends pump the same content into homes across a continent, making culture a cross-border endeavour, too. If Europeans are to share a currency, bail each other out in times of financial need and share vaccines in a pandemic, then they need to have something in common—even if it is just bingeing on the same series. Watching fictitious northern and southern Europeans tear each other apart 2,000 years ago beats doing so in reality.

5. Based only on information provided in the passage, which one of the following hypothetical Netflix shows would be most successful with audiences across the EU?

(a) A trans-Atlantic romantic drama set in Europe and America.
(b) An Italian comedy show hosted by an international star.
(c) An original German TV science fiction production.
(d) A murder mystery drama set in North Africa and France.

6. The author sees the rise of Netflix in Europe as:

(a) an economic threat.
(b) a looming cultural threat.
(c) filling an entertainment gap.
(d) a unifying force.

7. Based on information provided in the passage, all of the following are true, EXCEPT:

(a) national broadcasters dominate in the EU in terms of total television viewing hours.
(b) Netflix has been able to transform itself into a truly European entity.
(c) only half of Netflix's original programming in the EU is now produced in America.
(d) European television productions have the potential to become global hits.

8. Which one of the following research findings would weaken the author's conclusion in the final paragraph?

(a) Research shows there is a wide variance in the popularity and viewing of Netflix shows across different EU countries.
(b) Research shows that older women across the EU enjoy watching romantic comedies on Netflix, whereas younger women prefer historical fiction dramas.

(c) Research shows that Netflix hits produced in France are very popular with North American audiences.

(d) Research shows that Netflix has been gradually losing market share to other streaming television service providers.

The passage below is accompanied by four questions. Based on the passage, choose the best answer for each question.

Over the past four centuries liberalism has been so successful that it has driven all its opponents off the battlefield. Now it is disintegrating, destroyed by a mix of hubris and internal contradictions, according to Patrick Deneen, a professor of politics at the University of Notre Dame Equality of opportunity has produced a new meritocratic aristocracy that has all the aloofness of the old aristocracy with none of its sense of noblesse oblige. Democracy has degenerated into a theatre of the absurd. And technological advances are reducing ever more areas of work into meaningless drudgery. "The gap between liberalism's claims about itself and the lived reality of the citizenry" is now so wide that "the lie can no longer be accepted," Mr Deneen writes. What better proof of this than the vision of 1,000 private planes whisking their occupants to Davos to discuss the question of "creating a shared future in a fragmented world"? . . .

Deneen does an impressive job of capturing the current mood of disillusionment, echoing left wing complaints about rampant commercialism, right-wing complaints about narcissistic and bullying students, and general worries about atomisation and selfishness. But when he concludes that all this adds up to a failure of liberalism, is his argument convincing? He argues that the essence of liberalism lies in freeing individuals from constraints. In fact, liberalism contains a wide range of intellectual traditions which provide different answers to the question of how to trade off the relative claims of rights and responsibilities, individual expression and social ties liberals experimented with a range of ideas from devolving power from the centre to creating national education systems.

Mr Deneen's fixation on the essence of liberalism leads to the second big problem of his book: his failure to recognise liberalism's ability to reform itself and address its internal problems. The late 19th century saw America suffering from many of the problems that are reappearing today, including the creation of a business aristocracy, the rise of vast companies, the corruption of politics and the sense that society was dividing into winners and losers. But a wide variety of reformers, working within the liberal tradition, tackled these problems head on. Theodore Roosevelt took on the trusts. Progressives cleaned up government corruption. University reformers modernised academic syllabuses and built ladders of opportunity. Rather than dying, liberalism reformed itself.

Mr Deneen is right to point out that the record of liberalism in recent years has been dismal. He is also right to assert that the world has much to learn from the premodern notions of liberty as self-mastery and self-denial. The biggest enemy of liberalism is not so much atomisation but old-fashioned greed, as members of the Davos elite pile their plates ever higher with perks and share options. But he is wrong to argue that the only way for people to liberate themselves from the contradictions of liberalism is "liberation from liberalism itself". The best way to read "Why Liberalism Failed" is not as a funeral oration but as a call to action: up your game, or else.

9. The author of the passage is likely to disagree with all of the following statements, EXCEPT:

(a) if we accept that liberalism is a dying ideal, we must work to find a viable substitute.

(b) the essence of liberalism lies in greater individual self-expression and freedoms.

(c) claims about liberalism's disintegration are exaggerated and misunderstand its core features.

(d) liberalism was the dominant ideal in the past century, but it had to reform itself to remain so.

10. All of the following statements are evidence of the decline of liberalism today, EXCEPT:

(a) "And technological advances are reducing ever more areas of work into meaningless drudgery."

(b) ". . . the creation of a business aristocracy, the rise of vast companies . . ."

(c) "Democracy has degenerated into a theatre of the absurd."

(d) "'The gap between liberalism's claims about itself and the lived reality of the citizenry' is now so wide that 'the lie can no longer be accepted,'. . ."

11. The author of the passage refers to "the Davos elite" to illustrate his views on:

(a) the unlikelihood of a return to the liberalism of the past as long as the rich continue to benefit from the decline in liberal values.

(b) the fact that the rise in liberalism had led to a greater interest in shared futures from unlikely social classes.

(c) the hypocrisy of the liberal rich, who profess to subscribe to liberal values while cornering most of the wealth.

(d) the way the debate around liberalism has been captured by the rich who have managed to insulate themselves from economic hardships.

12. The author of the passage faults Deneen's conclusions for all of the following reasons, EXCEPT:

(a) its extreme pessimism about the future of liberalism today and predictions of an ultimate decline.
(b) its repeated harking back to premodern notions of liberty.
(c) its very narrow definition of liberalism limited to individual freedoms.
(d) its failure to note historical instances in which the process of declining liberalism has managed to reverse itself.

The passage below is accompanied by four questions. Based on the passage, choose the best answer for each question.

The Second Hand September campaign, led by Oxfam . . . seeks to encourage shopping at local organisations and charities as alternatives to fast fashion brands such as Primark and Boohoo in the name of saving our planet. As innocent as mindless scrolling through online shops may seem, such consumers are unintentionally—or perhaps even knowingly— contributing to an industry that uses more energy than aviation. . . .

Brits buy more garments than any other country in Europe, so it comes as no shock that many of those clothes end up in UK landfills each year: 300,000 tonnes of them, to be exact. This waste of clothing is destructive to our planet, releasing greenhouse gasses as clothes are burnt as well as bleeding toxins and dyes into the surrounding soil and water. As ecologist Chelsea Rochman bluntly put it, "The mismanagement of our waste has even come back to haunt us on our dinner plate."

It's not surprising, then, that people are scrambling for a solution, the most common of which is second-hand shopping. Retailers selling consigned clothing are currently expanding at a rapid rate . . . If everyone bought just one used item in a year, it would save 449 million lbs of waste, equivalent to the weight of 1 million Polar bears. "Thrifting" has increasingly become a trendy practice. London is home to many second-hand, or more commonly coined 'vintage', shops across the city from Bayswater to Brixton.

So you're cool and you care about the planet; you've killed two birds with one stone. But do people simply purchase a second-hand item, flash it on Instagram with #vintage and call it a day without considering whether what they are doing is actually effective? According to a study commissioned by Patagonia, for instance, older clothes shed more microfibres. These can end up in our rivers and seas after just one wash due to the worn material, thus contributing to microfibre pollution. To break it down, the amount of microfibres released by laundering 100,000 fleece jackets is equivalent to as many as 11,900 plastic grocery bags, and up to 40 per cent of that ends up in our oceans So where does this leave second-hand consumers? [They would be well advised to buy] high-quality items that shed less and last longer [as this] combats both microfibre pollution and excess garments ending up in landfills. . . .

Luxury brands would rather not circulate their latest season stock around the globe to be sold at a cheaper price, which is why companies like Thred UP, a US fashion resale marketplace, have not yet caught on in the UK. There will always be a market for consignment but there is also a whole generation of people who have been taught that only buying new products is the norm; second-hand luxury goods are not in their psyche. Ben Whitaker, director at Liquidation Firm B-Stock, told Prospect that unless recycling becomes cost-effective and filters into mass production, with the right technology to partner it, "high-end retailers would rather put brand before sustainability."

13. Based on the passage, we can infer that the opposite of fast fashion, 'slow fashion', would most likely refer to clothes that:

(a) do not shed microfibres.
(b) are sold by genuine vintage stores.
(c) are of high quality and long lasting.
(d) do not bleed toxins and dyes.

14. According to the author, companies like ThredUP have not caught on in the UK for all of the following reasons EXCEPT that:

(a) the British don't buy second-hand clothing.
(b) luxury brands do not like their product to be devalued.
(c) luxury brands want to maintain their brand image.
(d) recycling is currently not financially attractive for luxury brands.

15. The act of "thrifting", as described in the passage, can be considered ironic because it:

(a) offers luxury clothing at cut-rate prices.
(b) has created environmental problems.
(c) is an anti-consumerist attitude.
(d) is not cost-effective for retailers.

16. The central idea of the passage would be undermined if:

(a) customers bought all their clothes online.

(b) second-hand stores sold only high-quality clothes.
(c) Primark and Boohoo recycled their clothes for vintage stores.
(d) clothes were not thrown and burnt in landfills.

17. There is a sentence that is missing in the paragraph below. Look at the paragraph and decide where (option 1, 2, 3, or 4) the following sentence would best fit.

Sentence: And probably much earlier, moving the documentation for kissing back 1,000 years compared to what was acknowledged in the scientific community.

Paragraph: Research has hypothesised that the earliest evidence of human lip kissing originated in a very specific geographical location in South Asia 3,500 years ago.__(1)__. From there it may have spread to other regions, simultaneously accelerating the spread of the herpes simplex virus 1. According to Dr Troels Pank Arbøll and Dr Sophie Lund Rasmussen, who in a new article in the journal Science draw on a range of written sources from the earliest Mesopotamian societies, kissing was already a well-established practice 4,500 years ago in the Middle East.__(2)__. In ancient Mesopotamia, people wrote in cuneiform script on clay tablets.__(3)__. Many thousands of these clay tablets have survived to this day, and they contain clear examples that kissing was considered a part of romantic intimacy in ancient times.__(4)__. "Kissing could also have been part of friendships and family members' relations," says Dr Troels Pank Arbøll, an expert on the history of medicine in Mesopotamia.

(a) Option 4 (b) Option 2
(c) Option 3 (d) Option 1

18. There is a sentence that is missing in the paragraph below. Look at the paragraph and decide where (option 1, 2, 3, or 4) the following sentence would best fit.

Sentence: Dualism was long held as the defining feature of developing countries in contrast to developed countries, where frontier technologies and high productivity were assumed to prevail.

Paragraph: __(1)__. At the core of development economics lies the idea of 'productive dualism': that poor countries' economies are split between a narrow 'modern' sector that uses advanced technologies and a larger 'traditional' sector characterized by very low productivity.__(2)__. While this distinction between developing and advanced economies may have made some sense in the 1950s and 1960s, it no longer appears to be very relevant. A combination of forces have produced a widening gap between the winners and those left behind.__(3)__. Convergence between poor and rich parts of the economy was arrested and regional disparities widened.__(4)__. As a result, policymakers in advanced economies are now grappling with the same questions that have long preoccupied developing economies: mainly how to close the gap with the more advanced parts of the economy.

(a) Option 1 (b) Option 2
(c) Option 3 (d) Option 4

19. Five jumbled up sentences (labelled 1, 2, 3, 4 and 5), related to a topic, are given below. Four of them can be put together to form a coherent paragraph. Identify the odd sentence and key in the number of that sentence as your answer.

1. Self-care particularly links to loneliness, behavioural problems, and negative academic outcomes.
2. "Latchkey children" refers to children who routinely return home from school to empty homes and take care of themselves for extended periods of time.
3. Although self-care generally points to negative outcomes, it is important to consider that the bulk of research has yet to track long-term consequences.
4. In research and practice, the phrase "children in self-care" has come to replace latchkey in an effort to more accurately reflect the nature of their circumstances.
5. Although parents might believe that self-care would be beneficial for development, recent research has found quite the opposite.

20. Five jumbled up sentences (labelled 1, 2, 3, 4 and 5), related to a topic, are given below. Four of them can be put together to form a coherent paragraph. Identify the odd sentence and key in the number of that sentence as your answer.

1. The banning of Northern Lights could be considered a precursor to censoring books for "moral", world view or religious reasons.
2. Attempts to ban books are attempts to silence authors who have summoned immense courage in telling their stories.
3. Now the banning and challenging of books in the US has escalated to an unprecedented level.
4. The widely acclaimed fantasy novel Northern Lights was banned in some parts of the US, and was the second most challenged book in the US.
5. The American Library Association documented an unparalleled number of reported book challenges in 2022, about 2,500 unique titles.

21. The four sentences (labelled 1, 2, 3 and 4) given below, when properly sequenced, would yield a coherent paragraph. Decide on the proper sequencing of the order of the sentences and key in the sequence of the four numbers as your answer.
1. Like the ants that make up a colony, no single neuron holds complex information like self-awareness, hope or pride.
2. Although the human brain is not yet understood enough to identify the mechanism by which emergence functions, most neurobiologists agree that complex interconnections among the parts give rise to qualities that belong only to the whole.
3. Nonetheless, the sum of all neurons in the nervous system generate complex human emotions like fear and joy, none of which can be attributed to a single neuron.
4. Human consciousness is often called an emergent property of the human brain.

22. The four sentences (labelled 1, 2, 3 and 4) given below, when properly sequenced, would yield a coherent paragraph. Decide on the proper sequencing of the order of the sentences and key in the sequence of the four numbers as your answer.
1. Contemporary African writing like 'The Bottled Leopard' voices this theme using two children and two backgrounds to juxtapose two varying cultures.
2. Chukwuemeka Ike explores the conflict, and casts the Western tradition as condescending, enveloping and unaccommodating towards local African practice.
3. However, their views contradict the reality, for a rich and sustaining local African cultural ethos exists for all who care, to see and experience.
4. Western Christian concepts tend to deny or feign ignorance about the existence of a genuine and enduring indigenous African tradition.

23. The passage given below is followed by four alternate summaries. Choose the option that best captures the essence of the passage.

Heatwaves are becoming longer, frequent and intense due to climate change. The impacts of extreme heat are unevenly experienced; with older people and young children, those with pre-existing medical conditions and on low incomes significantly more vulnerable. Adaptation to heatwaves is a significant public policy concern. Research conducted among at-risk people in the UK reveals that even vulnerable people do not perceive themselves as at risk of extreme heat; therefore, early warnings of extreme heat events do not perform as intended. This suggests that understanding how extreme heat is narrated is very important. The news media play a central role in this process and can help warn people about the potential danger, as well as about impacts on infrastructure and society

(a) People are vulnerable to heatwaves caused due to climate change; measures taken are ineffective.
(b) News stories help in warning about heatwaves, but they have to become more effective.
(c) Heatwaves pose an enormous risk; the media plays a pivotal role in alerting people to this danger.
(d) Protection from heat waves is important but current reports and public policies seem ineffective.

24. The passage given below is followed by four alternate summaries. Choose the option that best captures the essence of the passage.

People spontaneously create counterfactual alternatives to reality when they think "if only" or "what if" and imagine how the past could have been different. The mind computes counterfactuals for many reasons. Counterfactuals explain the past and prepare for the future, they implicate various relations including causal ones, and they affect intentions and decisions. They modulate emotions such as regret and relief, and they support moral judgments such as blame. The ability to create counterfactuals develops throughout childhood and contributes to reasoning about other people's beliefs, including their false beliefs.

(a) Counterfactual alternatives to reality are created for a variety of reasons and is part of one's developmental process.
(b) People create counterfactual alternatives to reality for various reasons, including reasoning about other people's beliefs.
(c) Counterfactuals help people to prepare for the future by understanding intentions and making decisions.
(d) Counterfactual thinking helps to reverse past and future actions and reason out false beliefs.

DATA INTERPRETATION AND LOGICAL REASONING

Answer the following questions based on the information given below:

Odsville has five firms – Alfloo, Bzygoo, Czechy, Drjbna and Elavalaki. Each of these firms was founded in some year and also closed down a few years later.

Each firm raised Rs. 1 crore in its first and last year of existence. The amount each firm raised every year increased until it reached a maximum, and then decreased until the firm closed down. No firm raised the same amount of money in two consecutive years. Each annual increase and decrease was either by Rs. 1 crore or by Rs. 2 crores.

The table below provides partial information about the five firms.

Firm	First year of existence	Last year of existence	Total amount raised (Rs. crores)
Alfloo	2009	2016	21
Bzygoo	2012	2015	
Czechy	2013		9
Drjbna	2011	2015	10
Elavalaki	2010		13

25. For which firm(s) can the amounts raised by them be concluded with certainty in each year?
(a) Only Czechy
(b) Only Bzygoo and Czechy and Drjbna
(c) Only Drjbna
(d) Only Czechy and Drjbna

26. What best can be concluded about the total amount of money raised in 2015?
(a) It is either Rs. 7 crores or Rs. 8 crores or Rs. 9 crores.
(b) It is either Rs. 7 crores or Rs. 8 crores.
(c) It is exactly Rs. 8 crores.
(d) It is either Rs. 8 crores or Rs. 9 crores.

27. What is the largest possible total amount of money (in Rs. crores) that could have been raised in 2013?

28. If Elavalaki raised Rs. 3 crores in 2013, then what is the smallest possible total amount of money (in Rs. crores) that could have been raised by all the companies in 2012?
(a) 10 (b) 9
(c) 12 (d) 11

29. If the total amount of money raised in 2014 is Rs. 12 crores, then which of the following is not possible?
(a) Alfloo raised the same amount of money as Drjbna in 2013.
(b) Bzygoo raised more money than Elavalaki in 2014.
(c) Bzygoo raised the same amount of money as Elavalaki in 2013.
(d) Alfloo raised the same amount of money as Bzygoo in 2014.

Answer the following questions based on the information given below:

Anjali, Bipasha, and Chitra visited an entertainment park that has four rides. Each ride lasts one hour and can accommodate one visitor at one point. All rides begin at 9 am and must be completed by 5 pm except for Ride-3, for which the last ride has to be completed by 1 pm. Ride gates open every 30 minutes, e.g. 10 am, 10:30 am, and so on. Whenever a ride gate opens, and there is no visitor inside, the first visitor waiting in the queue buys the ticket just before taking the ride. The ticket prices are Rs. 20, Rs. 50, Rs. 30 and Rs. 40 for Rides 1 to 4, respectively. Each of the three visitors took at least one ride and did not necessarily take all rides. None of them took the same ride more than once. The movement time from one ride to another is negligible, and a visitor leaves the ride immediately after the completion of the ride. No one takes a break inside the park unless mentioned explicitly.

The following information is also known.

1. Chitra never waited in the queue and completed her visit by 11 am after spending Rs. 50 to pay for the ticket(s).
2. Anjali took Ride-1 at 11 am after waiting for 30 mins for Chitra to complete it. It was the only ride where Anjali waited.
3. Bipasha began her first of three rides at 11:30 am. All three visitors incurred the same amount of ticket expense by 12:15 pm.

4. The last ride taken by Anjali and Bipasha was the same, where Bipasha waited 30 mins for Anjali to complete her ride. Before standing in the queue for that ride, Bipasha took a 1-hour coffee break after completing her previous ride.

30. What was the total amount spent on tickets (in Rs.) by Bipasha?
(a) 110 (b) 100
(c) 90 (d) 120

31. Which were all the rides that Anjali completed by 2:00 pm?
(a) Ride-1 and Ride-3
(b) Ride-1, Ride-2, and Ride-4
(c) Ride-1 and Ride-4
(d) Ride-1, Ride-2, and Ride-3

32. Which ride was taken by all three visitors?
(a) Ride-1 (b) Ride-3
(c) Ride-2 (d) Ride-4

33. How many rides did Anjali and Chitra take in total?

34. What was the total amount spent on tickets (in Rs.) by Anjali?

Answer the following questions based on the information given below:

Three participants – Akhil, Bimal and Chatur participate in a random draw competition for five days. Every day, each participant randomly picks up a ball numbered between 1 and 9. The number on the ball determines his score on that day. The total score of a participant is the sum of his scores attained in the five days. The total score of a day is the sum of participants' scores on that day. The 2-day average on a day, except on Day 1, is the average of the total scores of that day and of the previous day. For example, if the total scores of Day 1 and Day 2 are 25 and 20, then the 2-day average on Day 2 is calculated as 22.5. Table 1 gives the 2-day averages for

Table 1: 2-day averages for Days 2 through 5

Day 2	Day 3	Day4	Day 5
15	15.5	16	17

Participants are ranked each day, with the person having the maximum score being awarded the minimum rank (1) on that day. If there is a tie, all participants with the tied score are awarded the best available rank. For example, if on a day Akhil, Bimal, and Chatur score 8, 7 and 7 respectively, then their ranks will be 1, 2 and 2 respectively on that day. These ranks are given in Table 2.

Table 2: Ranks of participants on each day

	Day 1	Day 2	Day 3	Day 4	Day 5
Akhil	1	2	2	3	3
Bimal	2	3	2	1	1
Chatur	3	1	1	2	2

The following information is also known.
1. Chatur always scores in multiples of 3. His score on Day 2 is the unique highest score in the competition. His minimum score is observed only on Day 1, and it matches Akhil's score on Day 4.
2. The total score on Day 3 is the same as the total score on Day 4.
3. Bimal's scores are the same on Day 1 and Day 3.

35. What is Akhil's score on Day 1?
(a) 7 (b) 6
(c) 5 (d) 8

36. Who attains the maximum total score?
(a) Bimal
(b) Chatur
(c) Cannot be determined
(d) Akhil

37. What is the minimum possible total score of Bimal?

38. If the total score of Bimal is a multiple of 3, what is the score of Akhil on Day 2?
(a) Cannot be determined
(b) 5
(c) 6
(d) 4

39. If Akhil attains a total score of 24, then what is the total score of Bimal?

Answer the following questions based on the information given below:

There are nine boxes arranged in a 3 × 3 array as shown in Tables 1 and 2. Each box contains three sacks. Each sack has a certain number of coins, between 1 and 9, both inclusive.

The average number of coins per sack in the boxes are all distinct integers. The total number of coins in each row is the same. The total number of coins in each column is also the same.

	1st column	2nd column	3rd column
1st row		9	6
2nd row	2		
3rd row	8		

Table 1

	1st column	2nd column	3rd column
1st row	1**	2*	2*
2nd row	1**	0*	3*
3rd row	3*	2**	0**

Table 2

Table 1 gives information regarding the median of the numbers of coins in the three sacks in a box for some of the boxes. In Table 2 each box has a number which represents the number of sacks in that box having more than 5 coins. That number is followed by a * if the sacks in that box satisfy exactly one among the following three conditions, and it is followed by ** if two or more of these conditions are satisfied.

1. The minimum among the numbers of coins in the three sacks in the box is 1.
2. The median of the numbers of coins in the three sacks is 1.
3. The maximum among the numbers of coins in the three sacks in the box is 9.

40. What is the total number of coins in all the boxes in the 3rd row?

(a) 36 (b) 30
(c) 15 (d) 45

41. How many boxes have at least one sack containing 9 coins?

(a) 3 (b) 8
(c) 5 (d) 4

42. For how many boxes are the average and median of the numbers of coins contained in the three sacks in that box the same?

43. How many sacks have exactly one coin?

44. In how many boxes do all three sacks contain different numbers of coins?

45. For any natural numbers m, n and k, such that k divides both m + 2n and 3m + 4n, k must be a common divisor of
(a) m and n (b) m and 2n
(c) 2m and 3n (d) 2m and n

46. The sum of all possible values of x satisfying the equation $2^{4x^2} - 2^{2x^2} + x + 16 + 2^{2x+30} = 0$, is
(a) 3 (b) 5/2
(c) 3/2 (d) 1/2

47. Any non-zero real numbers x, y such that y ≠ 3 and $\frac{x}{y} < \frac{x+3}{y-3}$, will satisfy the condition
(a) If y > 10, then -x > y (b) x/y < y/x
(c) If x < 0, then -x < y (d) If y < 0, then -x < y

48. Let a, b, m and n be natural numbers such that a > 1 and b > 1. If $a^m b^n = 144^{145}$, then the largest possible value of n - m is
(a) 579 (b) 580
(c) 289 (d) 290

49. Let k be the largest integer such that the equation $(x - 1)^2 + 2kx + 11 = 0$ has no real roots. If y is a positive real number, then the least possible value of k/4y + 9y is?

50. The number of positive integers less than 50, having exactly two distinct factors other than 1 and itself, is

51. For some positive ral number x, if $\log_{\sqrt{3}}(x) + \frac{\log_x 25}{\log_x(0.008)} = \frac{16}{3}$, then the value of $\log_3(3x^2)$ is

52. Pipes A and C are fill pipes while Pipe B is a drain pipe of a tank. Pipe B empties the full tank in one hour less than the time taken by Pipe A to fill the empty tank. When pipes A, B and C are turned on together, the empty tank is filled in two hours. If pipes B and C are turned on together when the tank is empty and Pipe B is turned off after one hour, then Pipe C takes another one hour and 15 minutes to fill the remaining tank. If Pipe A can fill the empty tank in less than five hours, then the time taken, in minutes, by Pipe C to fill the empty tank is
(a) 60 (b) 90
(c) 75 (d) 120

53. Anil borrows Rs 2 lakhs at an interest rate of 8% per annum, compounded half-yearly. He repays Rs 10320 at the end of the first year and closes the loan by paying the outstanding amount at the end of the third year. Then, the total interest, in rupees, paid over the three years is nearest to
(a) 40991 (b) 45311
(c) 33130 (d) 51311

54. Ravi is driving at a speed of 40 km/h on a road. Vijay is 54 meters behind Ravi and driving in the same direction as Ravi. Ashok is driving along the same road from the opposite direction at a speed of 50 km/h and is 225 meters away from Ravi. The speed, in km/h, at which Vijay should drive so that all the three cross each other at the same time, is
(a) 67.2 (b) 58.8
(c) 61.6 (d) 64.4

55. Minu purchases a pair of sunglasses at Rs.1000 and sells to Kanu at 20% profit. Then, Kanu sells it back to Minu at 20% loss. Finally, Minu sells the same pair of sunglasses to Tanu. If the total profit made by Minu from all her transactions is Rs.500, then the percentage of profit made by Minu when she sold the pair of sunglasses to Tanu is
(a) 26% (b) 31.25%
(c) 52% (d) 35.42%

56. The price of a precious stone is directly proportional to the square of its weight. Sita has a precious stone weighing 18 units. If she breaks it into four pieces with each piece having distinct integer weight, then the difference between the highest and lowest possible values of the total price of the four pieces will be 288000. Then, the price of the original precious stone is
(a) 972000 (b) 1296000
(c) 1944000 (d) 1620000

57. In a company, 20% of the employees work in the manufacturing department. If the total salary obtained by all the manufacturing employees is one-sixth of the total salary obtained by all the employees in the company, then the ratio of the average salary obtained by the manufacturing employees to the average salary obtained by the non manufacturing employ
(a) 4 : 5 (b) 6 : 5
(c) 5 : 6 (d) 5 : 4

58. A container has 40 liters of milk. Then, 4 liters are removed from the container and replaced with 4 liters of water. This process of replacing 4 liters of the liquid in the container with an equal volume of water is continued repeatedly. The smallest number of times of doing this process, after which the volume of milk in the container becomes less than that of water, is

59. If a certain amount of money is divided equally among n persons, each one receives Rs. 352. However, if two persons receive Rs. 506 each and the remaining is divided equally among the other persons, each of

them receive less than or equal to Rs. 330. Then, the maximum possible value of n is:

60. Jayant bought a certain number of white shirts at the rate of Rs 1000 per piece and a certain number of blue shirts at the rate of Rs 1125 per piece. For each shirt, he then set a fixed market price which was 25% higher than the average cost of all the shirts. He sold all the shirts at a discount of 10% and made a total profit of Rs 51000. If he bought both colors of shirts, then the maximum possible total number of shirts that he could have bought is

61. A triangle is drawn with its vertices on the circle C such that one of its sides is a diameter of C and the other two sides have their lengths in the ratio a : b. If the radius of the circle is r, then the area of the triangle is

(a) $\frac{2abr^2}{a^2+b^2}$ (b) $\frac{4abr^2}{a^2+b^2}$

(c) $\frac{abr^2}{a^2+b^2}$ (d) $\frac{abr^2}{2(a^2+b^2)}$

62. In a rectangle ABCD, AB = 9 cm and BC = 6 cm. P and Q are two points on BC such that the areas of the figures ABP, APQ, and AQCD are in geometric progression. If the area of the figure AQCD is four times the area of triangle ABP, then BP : PQ : QC is:

(a) 2 : 4 : 1 (b) 1 : 2 : 4

(c) 1 : 1 : 2 (d) 1 : 2 : 1

63. The area of the quadrilateral bounded by the Y-axis, the line x = 5 and the lines |x - y| - |5 - x| = 2, is

64. If $p^2 + q^2 - 29 = 2pq - 20 = 52 - 2pq$, then the difference between the maximum and minimum possible value of $(p^3 - q^3)$ is

(a) 243 (b) 378

(c) 189 (d) 486

65. Let both the series $a_1, a_2, a_3, \ldots$ and $b_1, b_2, b_3, \ldots$ be in arithmetic progression such that the common differences of both the series are prime numbers. If $a_5 = b_{19}$ and $b_2 = 0$, then a_{11} equal?

(a) 86 (b) 84

(c) 79 (d) 83

66. Let a_n and b_n be two sequences such that $a_n = 13 + 6(n - 1)$ and $b_n = 15 + 7(n - 1)$ for all natural numbers n. Then, the largest three-digit integer that is common to both these sequences is:

ANSWER KEY AND EXPLANATIONS

VERBAL ABILITY AND READING COMPREHENSION

1. **(b)**
2. **(b)**
3. **(b)**
4. **(d)**
5. **(d)**
6. **(d)**
7. **(b)**
8. **(a)**
9. **(d)**
10. **(a)**
11. **(c)**
12. **(b)**
13. **(c)**
14. **(a)**
15. **(b)**
16. **(b)**
17. **(b)**
18. **(b)**
19. **(3)**
20. **(2)**
21. **(4132)**
22. **(4321)**
23. **(c)** The passage discusses the increasing frequency and intensity of heatwaves due to climate change, particularly affecting vulnerable groups. The passage emphasizes the crucial role of the news media in warning the public about the dangers of heatwaves and their impacts on infrastructure and society.
    Therefore, Option (c) accurately conveys the main points about the substantial risk posed by heatwaves and the media's critical role in public alertness.
    Option (a) broadly highlights the importance of protection without specifically addressing the media's role in alerting people to heatwave risks.
    Option (b) calls for more effective news stories but does not emphasize the central role of the media in waming about heatwave risks, as the passage does.
    Option (d) acknowledges vulnerability to heatwaves but does not emphasize the media's role in alerting people and suggests a broader critique of protective measures.
    Hence, option (c).
24. **(a)** The main points of the passage are:
    1 People naturally create counterfactual scenarios for multiple purposes
    2 These include explaining the past, preparing for the future, understanding various relationships (including causal ones), influencing emotions, and forming moral judgments
    3 Counterfactuals evolves throughout childhood and aids in reasoning about others' beliefs
    Thus, Option (a) captures the essence of the passage most accurately.
    Option (b) fails to highlight the developmental aspect and the various reasons for creating counterfactuals. It also implies that people intentionally create counterfactual alternative, while passage states that people spontaneously creater these alternatives.
    Option (c) emphasizes only the preparation for the future, overlooking the broader purposes of counterfactual thinking.
    Option (d) incorrectly implies that counterfactual thinking helps reverse past and future actions, which is not correct. Counterfactual alternative do not reverse the past actions, it helps explain the past.
    Hence, option (a).

DATA INTERPRETATION AND LOGICAL REASONING

25. **(d)** We can represent the money raised each year for each company as follows.

	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	Total
A	1							1			21
B				1			1				
C					1						9
D			1								10
E		1									13

For each or these companies we will try to make cases satifying the given conditions.
We will write the amount of money raised by them in consecutive years from starting from their 1st year till their last year.
For A, the sum is 21 where first and last values must be 1.
This is possible for the following order of numbers.
Case 1: $1 \to 2 \to 3 \to 4 \to 5 \to 3 \to 2 \to 1$
Case 2: $1 \to 2 \to 3 \to 5 \to 4 \to 3 \to 2 \to 1$
For B, the only two possible order of numbers is
Case 1: $1 \to 2 \to 3 \to 1$
Case 2: $1 \to 3 \to 2 \to 1$
For C, the sum is 9 where first and last values must be 1.
This is only possible when the order of numbers is
$1 \to 2 \to 3 \to 2 \to 1$

For D, the sum is 10 where first and last values must be 1.
This is only possible when the order of numbers is
$1 \rightarrow 2 \rightarrow 4 \rightarrow 2 \rightarrow 1$
For E, the sum is 13 where first and last values must be 1.
This is possible for the following order of numbers.
Case 1: $1 \rightarrow 2 \rightarrow 4 \rightarrow 3 \rightarrow 2 \rightarrow 1$
Case 2: $1 \rightarrow 2 \rightarrow 3 \rightarrow 4 \rightarrow 2 \rightarrow 1$
Case 3: $1 \rightarrow 3 \rightarrow 5 \rightarrow 3 \rightarrow 1$
Hence, we get the following table with all possible cases.

For C and D we can definitely determine the amounts raised by them each year.
Hence, option (d).

	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	Total
A	1	2	3	4	5	3	2	1			21
	1	2	3	5	4	3	2	1			
B				1	2	3	1				7
				1	3	2	1				
C					1	2	3	2	1		9
D			1	2	4	2	1				10
E		1	2	4	3	2	1				13
		1	2	3	4	2	1				
		1	3	5	3	1					

26. **(b)** Consider the solution for the first questions of this set.

	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	Total
A	1	2	3	4	5	3	2	1			21
	1	2	3	5	4	3	2	1			
B				1	2	3	1				7
				1	3	2	1				
C					1	2	3	2	1		9
D			1	2	4	2	1				10
E		1	2	4	3	2	1				13
		1	2	3	4	2	1				
		1	3	5	3	1					

Amount of money raised in 2015 by:
A = 2
B = 1
C = 3
D = 1
E = 1 or 0
$\therefore$ Total money raised by them in 2015 = 2 + 1 + 3 + 1 + (1 or 0) = 8 or 7 crores.
Hence, option (b).

27. **(17)** Consider the solution for the first questions of this set.

	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	Total
A	1	2	3	4	5	3	2	1			21
	1	2	3	5	4	3	2	1			
B				1	2	3	1				7
				1	3	2	1				
C					1	2	3	2	1		9
D			1	2	4	2	1				10
E		1	2	4	3	2	1				13
		1	2	3	4	2	1				
		1	3	5	3	1					

Highest amoun of money that can be raised in 2013 by:
A = 5
B = 3
C = 1
D = 4
E = 4
∴ Highest total amount of money that can be raised by them in 2013 = 5 + 3 + 1 + 4 + 4 = 17 crores.
Hence, 17.

28. **(d)** Consider the solution for the first questions of this set.

	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	Total
A	1	2	3	4	5	3	2	1			21
	1	2	3	5	4	3	2	1			
B				1	2	3	1				7
				1	3	2	1				
C					1	2	3	2	1		9
D			1	2	4	2	1				10
E		1	2	4	3	2	1				13
		1	2	3	4	2	1				
		1	3	5	3	1					

Smallest amount of money that can be raised in 2012 by:
A = 4
B = 1
C = 1
D = 2
E = 3
∴ Smallest total amount of money that can be raised by them in 2012 = 4 + 1 + 1 + 2 + 3 = 11 crores.
Hence, option (d).

29. **(c)** Consider the solution for the first question of this set.

	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	Total
A	1	2	3	4	5	3	2	1			21
	1	2	3	5	4	3	2	1			
B				1	2	3	1				7
				1	3	2	1				
C					1	2	3	2	1		9
D			1	2	4	2	1				10
E		1	2	4	3	2	1				13
		1	2	3	4	2	1				
		1	3	5	3	1					

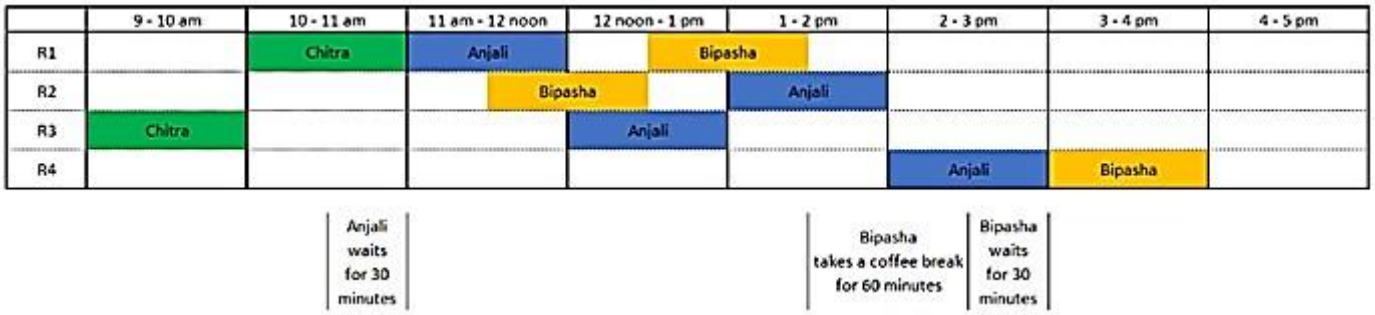
Amount of money raised in 2014 by

A = 3
B = 2 or 3
C = 2
D = 2
E = 1 or 2
If the total amount of money raised by them in 2014 is 12 crores this is possible only when B raised 3 crores i.e., case 1 for B and E raises 2 crores i.e., case 1 or 2 for E.
We have the following cases left.

	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	Total
A	1	2	3	4	5	3	2	1			21
	1	2	3	5	4	3	2	1			
B				1	2	3	1				7
				1	3	2	1				
C					1	2	3	2	1		9
D			1	2	4	2	1				10
E		1	2	4	3	2	1				13
		1	2	3	4	2	1				
		1	3	5	3	1					

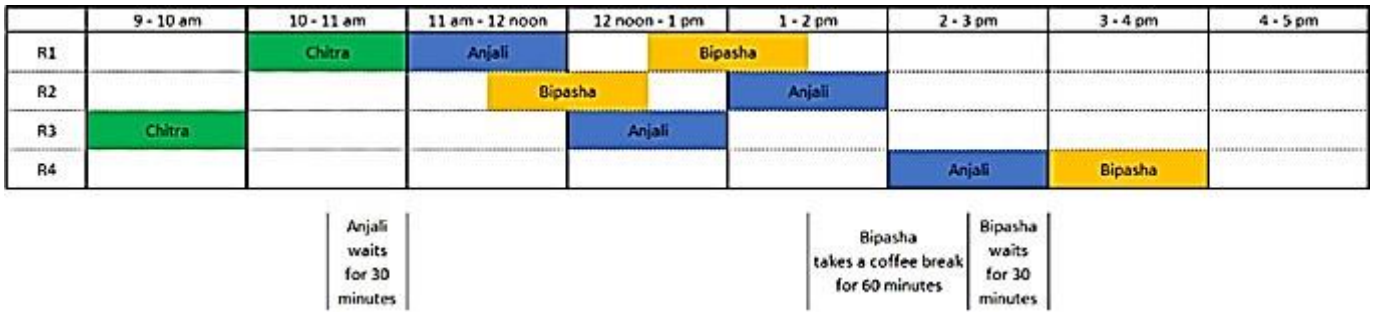
Option (a): A and D can both raise 4 crores in 2013, hence option (a) is possible.
Option (b): B raises 3 crores and E raises 2 crores in 2014, hence option (b) is possible.
Option (c): B cannot raise the same amount as E in 2013, hence option (c) is not possible.
Option (d): A and B can both raise 3 crores in 2014, hence option (d) is possible.
Hence, option (c).

30. **(a)** We get the following chart for the rides taken by the three visitors.



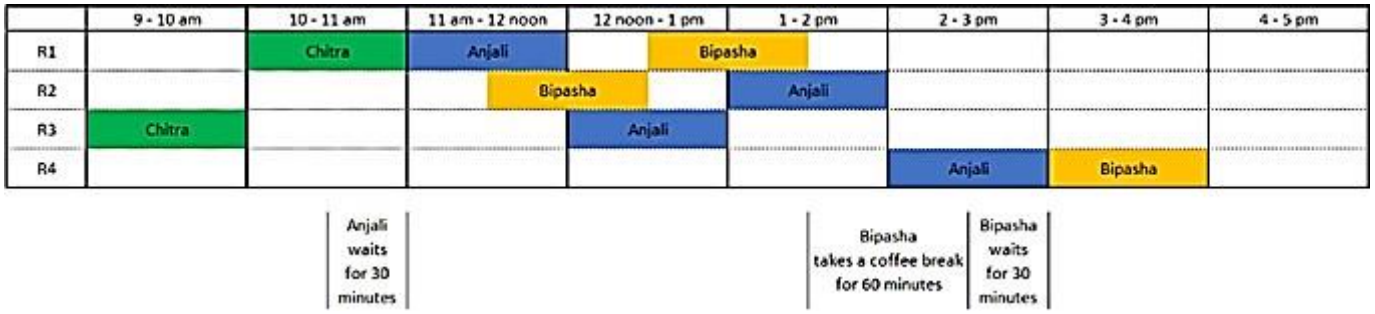
Bipasha took rides 1, 2 and 4.
Her total cost for tickets = 20 + 50 + 40 = Rs. 110.
Hence, option (a).

31. **(d)** We get the following chart for the rides taken by the three visitors.



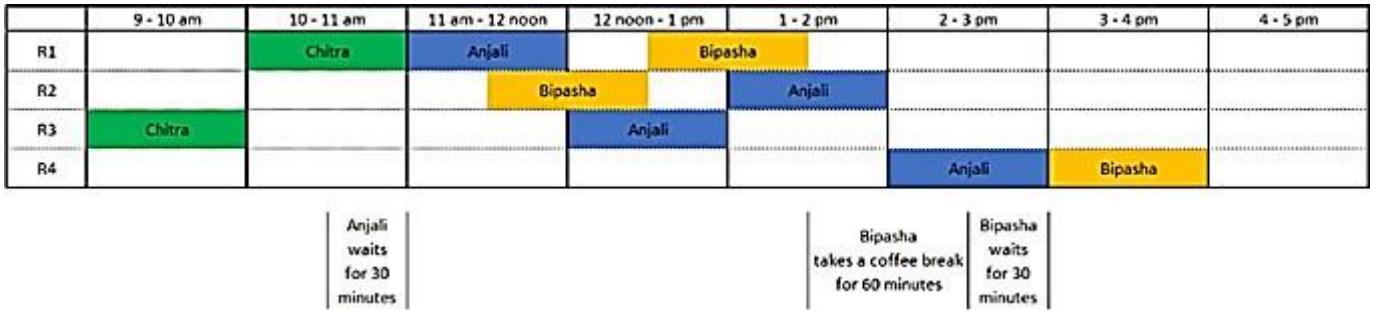
By 2 pm Anjali took rides 1, 2 and 3.
Hence, option (d).

32. **(a)** We get the following chart for the rides taken by the three visitors.



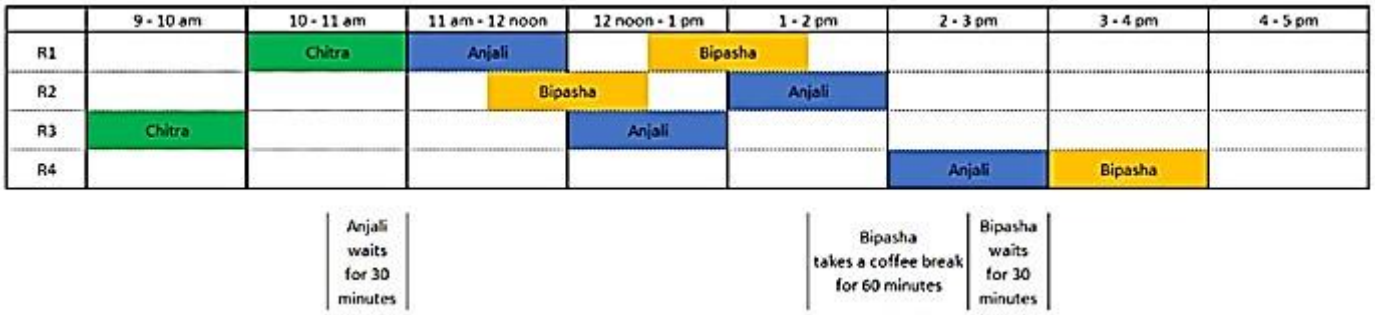
Ride 1 was taken by all thee visitors.
Hence, option (a).

33. **(6)** We get the following chart for the rides taken by the three visitors.



Anajli took rides 1, 2, 3 and 4 i.e., 4 rides
Chitra took rides 1 and 3 i.e., 2 rides
Anjali and Chitra together took 4 + 2 = 6 rides.
Hence, 6.

34. **(140)** We get the following chart for the rides visited by the three persons.



Anjali took all 4 rides hence spent 20 + 50 + 30 + 40 = Rs. 140.
Hence, 140.

35. **(a)** We get the following table for their score on each of the 5 days.

	Day 1	Day 2	Day 3	Day 4	Day 5	Total
A	7	4 or 5	5	3	4 or 5	25 or 24 or 23
B	5	2 or 1	5	7	8 or 7	25 or 26 or 27
C	3	9	6	6	6	30
Total	15	15	16	16	18	

Akhil's score on Day 1 is 7.
Hence, option (a).

36. **(b)** We get the following table for their score on each of the 5 days.

	Day 1	Day 2	Day 3	Day 4	Day 5	Total
A	7	4 or 5	5	3	4 or 5	25 or 24 or 23
B	5	2 or 1	5	7	8 or 7	25 or 26 or 27
C	3	9	6	6	6	30
Total	15	15	16	16	18	

Chatur gets the maximum total score of 30.
Hence, option (b).

37. **(25)** We get the following table for their score on each of the 5 days.

	Day 1	Day 2	Day 3	Day 4	Day 5	Total
A	7	4 or 5	5	3	4 or 5	25 or 24 or 23
B	5	2 or 1	5	7	8 or 7	25 or 26 or 27
C	3	9	6	6	6	30
Total	15	15	16	16	18	

Minimum total score of Bimal is 25.
Hence, 25.

38. **(d)** We get the following table for their score on each of the 5 days.
If Bimal's total score is a multiple of 3, it means Bimals get a total score of 27 hence Akhil gets a total score of 23.
This is possible when Akhil get 4 on Day 2 and 4 on Day 5.
Hence, option (d).

39. **(26)** We get the following table for their score on each of the 5 days.

	Day 1	Day 2	Day 3	Day 4	Day 5	Total
A	7	4 or 5	5	3	4 or 5	25 or 24 or 23
B	5	2 or 1	5	7	8 or 7	25 or 26 or 27
C	3	9	6	6	6	30
Total	15	15	16	16	18	

If Akil gets a total score of 24, Bimal will get a total score of 26.
Hence, 26.

40. **(d)** Each box has three sacks. We will consider three values for each sacks representing the number of coins in each sack in ascending order.
Table 1: Medians of C1R2, C1R3, C2R1 and C3R1 are given. If numbers of coins in each sack is written in ascending order for all boxes, these medians will be the middle value.
Median for C2R1 is 9, hence the third value must be 9.

	C1	C2	C3
R1		, 9, 9	, 6,
R2	, 2,		
R3	, 8,		

Table 2:
The number given represents the number of sacks having more than 5 coins. We can represent this information as follows:

	C1	C2	C3
R1	$\leq 5, \leq 5, > 5$ *	$\leq 5, 9, 9$ *	$\leq 5, 6, > 5$ *
R2	$\leq 5, 2, > 5$ **	$\leq 5, \leq 5, \leq 5$ *	$> 5, > 5, > 5$ *
R3	$> 5, 8, > 5$ *	$\leq 5, > 5, > 5$ **	$\leq 5, \leq 5, \leq 5$ **

C2R1: The sum of coins so far is 9 + 9 = 18.
*Exactly one condition is satisfied i.e., highest number coins in a sack is 9.
The first sack should have coins less than 5 and the average should be an integer.
This is possible only when the first sack has 3 coins.
∴ Average number of coins/sack = (3 + 9 + 9)/3 = 7

C2R3: Median has to be greater than 5, hence condition 2 cannot be satisfied, hence conditions 1 and 3 have to be satisfied.
The first and third sacks have 1 and 9 coins respectively.

The second sack has more than 5 coins, such that the average is an integer. This is only possible when it has 8 coins.
∴ Average number of coins/sack = (1 + 8 + 9)/3 = 6

C2R2: If median is one, then first sack will also have 1 coin which would satisfy 2 of the given conditions, hence median cannot be 1.
Since all the values are less than or equal to 5, condition 3 cannot be satisfied.
Hence, the only condition that can be satisfied is the first condition that lowest number of coins is 1.

C1R2: **At least 2 conditions should be satisfied.
The median cannot be 1, hence the conditions to be satisfied are 1st and 3rd.
∴ Frist sack has 1 coin and third sack has 9 coins.
∴ Average number of coins/sack = (1 + 2 + 9)/3 = 4

C1R3: All sacks have more than 5 coins, hence condition 1 and 2 cannot be satisfied.
Hence, the only condition that can be satisfied is that the third sack has 9 coins.
Now, the two sacks have combined 8 + 9 = 17 coins.
The total should be a multiple of 3 (average is an integer), and the first sack has more than 5 coins. This is possible only when the third sack has 7 coins.
∴ Average number of coins/sack = (7 + 8 + 9)/3 = 8

C1R1: Since 2 conditions need to be satisfied and the average has to be an integer, this is possible when number of coins is 1, 1, 7 or 1, 5, 9

	C1	C2	C3
R1	1, 1, 7 1, 5, 9	3, 9, 9 avg = 7	≤ 5, 6, > 5 *
R2	1, 2, 9 avg = 4	1, ≤ 5, ≤ 5 *	> 5, > 5, > 5 *
R3	7, 8, 9 avg = 8	1, 8, 9 avg = 6	≤ 5, ≤ 5, ≤ 5 **

Case 1: C1R1 has 1, 5, 9 coins.
Total coins in C1 = 1 + 5 + 9 + 1 + 2 +9 + 7 + 8 + 9 = 51
Now C2 so far has = 3 + 9 + 9 + 1 + 1 + 8 + 9 = 40 coins
∴ C2 needs 51 – 40 = 11 more coins from two sacks in C2R2 block. This is not possible since these blocks have less than or equal to 5 coins each in them.
Hence, this case is rejected.

Case 2: C1R1 has 1, 1, 7 coins.
Total coins in C1 = 1 + 1 + 7 + 1 + 2 + 9 + 7 + 8 + 9 = 45
∴ Number of coins in the two sacks in C2R2 = 45 – 40 = 5 coins.
⇒ Number of coins in each column = 45.

C2R2: Since first condition is satisfied, no other condition should be satisfied. Also, the sum of coins in second and third sack is 5. This is possible when the number of coins in them is 2 and 3 respectively.

	C1	C2	C3
R1	1, 1, 7 avg = 3	3, 9, 9 avg = 7	≤ 5, 6, > 5 *
R2	1, 2, 9 avg = 4	1, 2, 3 avg = 2	> 5, > 5, > 5 *
R3	7, 8, 9 avg = 8	1, 8, 9 avg = 6	≤ 5, ≤ 5, ≤ 5 **

C3R3: All sacks have ≤ 5 coins hence condition 3 cannot be satisfied. Hence, the first two conditions should be satisfied.
⇒ The first and the second sacks have 1 coin each.
Since the average has to be an integer, the third sack can be 1 or 4 coins.
With 4 coins the average will become (1 + 1 + 4)/3 = 2 which cannot be the case since C2R1 already have average of 2 and all blocks have distinct averages.

∴ Third sack has 1 coin.
∴ Average number of coins/sack = (1 + 1 + 1)/3 = 1

	C1	C2	C3
R1	1, 1, 7 avg = 3	3, 9, 9 avg = 7	≤ 5, 6, > 5 *
R2	1, 2, 9 avg = 4	1, 2, 3 avg = 2	> 5, > 5, > 5 *
R3	7, 8, 9 avg = 8	1, 8, 9 avg = 6	1, 1, 1 avg = 1

The averages so far have been, 1, 2, 3, 4, 6, 7, and 8. So C3R1 and C3R2 will have average 6 or 9 in any order.
For average to be 9, all sacks must have exactly 9 coins. This is possible only for C3R2.
∴ Average for C3R2 is 9 and that for C3R1 is 5.
C3R1: will have a total of 5 × 3 = 15 coins.
Second sack has 6 coins, hence the other 2 sacks will have 15 – 6 = 9 coins.
Since exactly one condition has to be satisfied, this is possible when first sack has 1 coin and third sack has 8 coins.
Hence, we get the following final table.

	C1	C2	C3
R1	1, 1, 7 avg = 3	3, 9, 9 avg = 7	1, 6, 8 avg = 5
R2	1, 2, 9 avg = 4	1, 2, 3 avg = 2	9, 9, 9 avg = 9
R3	7, 8, 9 avg = 8	1, 8, 9 avg = 6	1, 1, 1 avg = 1

Total coins in third row = 7 + 8 + 9 + 1 + 8 + 9 + 1 + 1 + 1 = 45
Hence, option (d)

41. **(c)** Consider the solution to first questions of this set.

	C1	C2	C3
R1	1, 1, 7 avg = 3	3, 9, 9 avg = 7	1, 6, 8 avg = 5
R2	1, 2, 9 avg = 4	1, 2, 3 avg = 2	9, 9, 9 avg = 9
R3	7, 8, 9 avg = 8	1, 8, 9 avg = 6	1, 1, 1 avg = 1

C1R2, C1R3, C2R1, C2R3 and C3R2 i.e., 5 blocks have at least one sack containing 9 coins.
Hence, option (c).

42. **(4)** Consider the solution to first questions of this set.

	C1	C2	C3
R1	1, 1, 7 avg = 3	3, 9, 9 avg = 7	1, 6, 8 avg = 5
R2	1, 2, 9 avg = 4	1, 2, 3 avg = 2	9, 9, 9 avg = 9
R3	7, 8, 9 avg = 8	1, 8, 9 avg = 6	1, 1, 1 avg = 1

Average and median is same for C1R3, C2R2, C3R2 and C3R3 i.e., 4 blocks.
Hence, 4.

43. **(9)** Consider the solution to first questions of this set.

	C1	C2	C3
R1	1, 1, 7 avg = 3	3, 9, 9 avg = 7	1, 6, 8 avg = 5
R2	1, 2, 9 avg = 4	1, 2, 3 avg = 2	9, 9, 9 avg = 9
R3	7, 8, 9 avg = 8	1, 8, 9 avg = 6	1, 1, 1 avg = 1

9 sacks have exactly 1 coin.
Hence, 9.

44. **(5)** Consider the solution to first questions of this set.

	C1	C2	C3
R1	1, 1, 7 avg = 3	3, 9, 9 avg = 7	1, 6, 8 avg = 5
R2	1, 2, 9 avg = 4	1, 2, 3 avg = 2	9, 9, 9 avg = 9
R3	7, 8, 9 avg = 8	1, 8, 9 avg = 6	1, 1, 1 avg = 1

C1R2, C1R3, C2R2, C2R3 and C3R1 i.e., 5 blocks all sacks containing different number of coins.
Hence, 5.

QUANTITATIVE APTITUDE

45. **(b)** For any natural numbers m, n and k, such that k divides both m + 2n and 3m + 4n, k must be a common divisor of
k divides m + 2n ⇒ m + 2n = a × k ...(1)
k divides 3m + 4n ⇒ 3m + 4n = b × k ...(2)
(1) × 3 - (2)
⇒ 3m + 6n - (3m + 4n) = 3ak - bk
⇒ 2n = (3a - b)k
∴ 2n is divisible by k
(2) - (1) × 2
⇒ 3m + 4n - 2(m + 2n) = bk - 2ak
⇒ m = (b - 2a)k
∴ m is divisible by k
∴ 2n and m are divisible by k
⇒ k is common divisor of 2n and m.
Hence, option (b).

46. **(d)** Given, $2^{4x^2} - 2^{2x^2+x+16} + 2^{2x+30} = 0$
$\Rightarrow (2^{2x^2})^2 - 2 \times 2^{2x^2} \times 2^{x+15} + (2^{x+15})^2 = 0$
$\Rightarrow (2^{2x^2} - 2^{x+15})^2 = 0$
$\Rightarrow 2^{2x^2} = 2^{x+15}$
$\Rightarrow 2x^2 = x + 15$
$\Rightarrow 2x^2 - x - 15 = 0$
$\Rightarrow (2x + 5)(x - 3) = 0$
$\Rightarrow x = -5/2$ or 3
Sum of all possible values of $x = 3 + (-5/2) = 1/2$
Hence, option (d).

47. **(d)** Given, $\frac{x}{y} < \frac{x+3}{y-3}$
$\Rightarrow \frac{x}{y} - \frac{x+3}{y-3} < 0$
$\Rightarrow \frac{x(y-3)-y(x+3)}{y(y-3)} < 0$
$\Rightarrow \frac{xy-3x-yx-3y}{y(y-3)} < 0$
$\Rightarrow \frac{-3(x+y)}{y(y-3)} < 0$
$\Rightarrow \frac{(x+y)}{y(y-3)} > 0$
Now, checking options.
Option (a): If $y > 10, y(y-3) > 0$
From (1): $\Rightarrow (x + y) > 0$
$\Rightarrow -x < y$
Hence, option (b) is incorrect.
Options (b) and (c) are slightly difficult to check. We can come back to them if required.
Option (d): If $y < 0, y(y-3) > 0$
From (1): $\Rightarrow (x + y) > 0$
$\Rightarrow -x < y$
Hence, option (d) is correct.

48. **(a)** $a^m b^n = 144^{145}$
$\Rightarrow a^m b^n = (12^2)^{145}$
$\Rightarrow a^m b^n = (2^4 \times 3^2)^{145}$
$\Rightarrow a^m b^n = 2^{580} \times 3^{290}$
To maximise n − m, we need to maximise n and minimise m.
∴ Let $3^{290} = X$
$\Rightarrow a^m b^n = X \times 2^{580}$

$\therefore a = X, m = 1, b = 2$ and $n = 580$
$\Rightarrow n - m = 580 - 1 = 579$
Hence, option (a).

49. **(6)** The given equation can be written as: $x^2 - 2x + 1 + 2kx + 11 = 0$
$\Rightarrow x^2 + (2k - 2)x + 12 = 0$
The given quadratic has no real roots, hence discriminant is less than 0.
$\Rightarrow (2k - 2)^2 - 4 \times 1 \times 12 < 0$
$\Rightarrow 4(k - 1)^2 - 48 < 0$
$\Rightarrow (k - 1)^2 < 12$
Largets integral value of k satisying above inequality is 4.
Now, we have $k/4y + 9y$
$= 4/4y + 9y$
$= 1/y + 9y$
We know AM ≥ GM
$\Rightarrow (1/y + 9y)/2 \geq \sqrt{\frac{1}{y} \times 9y}$
$\Rightarrow (1/y + 9y)/2 \geq 3$
$\Rightarrow 1/y + 9y \geq 6$
$\therefore$ Least possible value of $1/y + 9y = 6$.
Hence, 6.

50. **(15)** Positive integers having exactly two distinct factors other than 1 and itself will be of the form a × b or a^3, where a and b are prime numbers.
Case 1: a × b < 50. Possible combinations are:
If one of them is 2, the other prime number can be 3, 5, 7, 11, 13, 17, 19, 23 i.e., 8 possibilities.
If one of them is 3, the other prime number can be 5, 7, 11, 13 i.e., 4 possibilities.
If one of them is 5, the other prime number can be 7 i.e., 1 possibility.
$\therefore$ 13 cases.
Case 1: a^3. Possible values of a are 2 and 3 i.e., numbers are 8 and 27.
$\therefore$ 2 cases.
$\therefore$ Total 13 + 2 = 15 such numbers are possible.
Hence, 15.

51. **(7)** Given, $\log_{\sqrt{3}}(x) + \frac{\log_x 25}{\log_x(0.008)} = \frac{16}{3}$
$\Rightarrow \log_{3^{1/2}}(x) + \frac{\log_x 5^2}{\log_x(5)^{-3}} = \frac{16}{3}$
$\Rightarrow 2 \times \log_3(x) + \frac{2\log_x 5}{-3\log_x(5)} = \frac{16}{3}$
$\Rightarrow 2 \times \log_3(x) - \frac{2}{3} = \frac{16}{3}$
$\Rightarrow 2 \times \log_3(x) = \frac{16}{3} + \frac{2}{3} = 6$
$\Rightarrow \log 3x = 3$
$\Rightarrow x = 27$
Now, $\log_3(3x^2) = \log_3(3 \times 27^2) = \log_3(3^7) = 7$
Hence, 7.

52. **(b)** Let time taken by A and C alone to fill the tank is A and C hours respectively.
$\therefore$ Time taken B alone = (A - 1) hours.
Case 1: All three can fill the tank in 2 hours.
$\Rightarrow \frac{1}{A} - \frac{1}{A-1} + \frac{1}{C} = \frac{1}{2}$
Case 2: B works for 1 hour and C works for 5/4 hours.
$\Rightarrow -\frac{1}{A-1} \times 1 + \frac{1}{C} \times \frac{5}{4} = 1$
$(1) \times 9/4 - (2)$
$\Rightarrow \frac{9}{4A} - \frac{9}{4(A-1)} + \frac{1}{A-1} \times 1 = \frac{9}{8} - 1$
$\Rightarrow \frac{9}{4A} - \frac{5}{4(A-1)} = \frac{1}{8}$
$\Rightarrow \frac{18}{A} - \frac{10}{(A-1)} = 1$
$\Rightarrow A(A-1) = 18(A-1) - 10A$
$\Rightarrow A^2 - A = 8A - 18$
$\Rightarrow A^2 - 9A + 18 = 0$
$\Rightarrow A = 3$ or 6 hours.
Since A should be less than 5, hence we accept only $A = 3$ hours.
Now, from (1), we have
$\Rightarrow \frac{1}{A} - \frac{1}{A-1} + \frac{1}{C} = \frac{1}{2}$
$\Rightarrow \frac{1}{3} - \frac{1}{2} + \frac{1}{C} = \frac{1}{2}$
$\Rightarrow$ C = 3/2 hours = 90 minutes.
Hence, option (b).

53. **(d)** Let the amount paid at the end of 2nd year be Rs. x.
$\therefore 2,00,000 \times \left(1 + \frac{\frac{8}{2}}{100}\right)^{2\times3} = 10,320 \times \left(1 + \frac{\frac{8}{2}}{100}\right)^{2\times2} + x$
$\Rightarrow 200000 \times (1.04)^6 = 10320 \times (1.04)^4 + x$
$\Rightarrow 253063 = 12072 + x$
$\Rightarrow x = 240991$
$\therefore$ Total interest paid = (10320 + 240991) - 200000 = 51311
Hence, option (d).

54. **(c)** Speed of
Ravi = 40 × 5/18 = 100/9 m/s and
Ashok = 50 × 5/18 = 250/18 m/s
Time taken for them to meet = $\frac{225}{\frac{100}{9} + \frac{250}{18}} = \frac{225 \times 18}{450} = 9$ secs.
$\Rightarrow$ Vijay and Ravi should also meet in 9 secs.
$\therefore 9 = \frac{54}{100 - V}$
$\Rightarrow 9V - 100 = 54$
$\Rightarrow 9V = 154$
$\Rightarrow$ V = 154/9 m/s = 154/9 × 18/5 kmph = 61.6 kmph
Hence, option (c).

55. **(b)** Minu purchases a pair of sunglasses at Rs.1000 and sells to Kanu at 20% profit. Then, Kanu sells it back to Minu at 20% loss. Finally, Minu sells the same pair of sunglasses to Tanu. If the total profit made by Minu from all her transactions is Rs.500, then the percentage of profit made by Minu when she sold the pair of sunglasses to Tanu is
Initially cost price of Minu = Rs. 1000
Minu sells it to Kanu at 20% profit i.e., at Rs. 1000 + 200 = Rs. 1200
Profit earned by Minu = Rs. 200
Now, Kanu sells it back to Minu at 20% loss on 1200 i.e., at 1200 + 240 = Rs. 960
Now, let Minu sells it to Tanu at a profit of x.
$\therefore$ 200 + x = 500
$\Rightarrow$ x = 300
$\therefore$ Minu earns 300 profit by selling the sunglasses to Tanu, hence her profit % = 300/930 × 100% = 31.25%
Hence, option (b).

56. **(b)** Price (P) $\propto$ (weight)^2
$\Rightarrow P = k \times w^2$
Total value after breaking of the stone will be highest if one of the pieces is as heavy as possible and others are as light as possible i.e., the weights of the pieces are 1, 2, 3 and 12 units.
$\therefore$ Total value in this case = $k \times (1)^2 + k \times (2)^2 + k \times (3)^2 + k \times (12)^2 = 159k$

Total value after breaking of the stone will be least if weights of the pieces are as close to each other as possible i.e., the weights of the pieces are 3, 4, 5, and 6 units.
∴ Total value in this case = $k \times (3)^2 + k \times (4)^2 + k \times (5)^2 + k \times (6)^2 = 86k$
⇒ $158k - 86k = 28800$
⇒ $72k = 28800$
⇒ $k = 400$
∴ Weight of original stone = $400 \times (18)^2 = 129600$.
Hence, option (b).

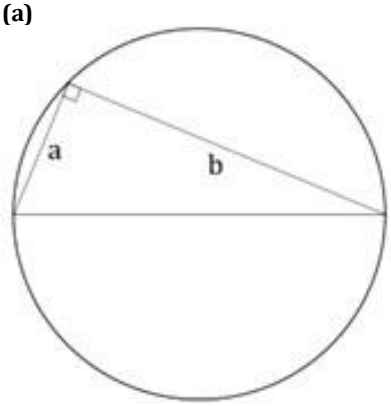
57. **(a)** Let the total number of employees be 100 and their average salary be s.
⇒ There are 20 manufacturing employees and 80 non-manufacturing
Let the average salary of manufacturing employees be 'x' and that of non-manufacturing employees be 'y'.
Total Salary of manufacturing employees is one-sixth that of total employees:
∴ $20 \times x = 1/6 \times 100 \times s$
⇒ $x = 5s/6$
Total Salary of nonmanufacturing employees is five-sixth that of total employees:
∴ $80 \times x = 5/6 \times 100 \times s$
⇒ $x = 25s/24$
The ratio of the average salary obtained by the manufacturing employees to the average salary obtained by the non-manufacturing employee = $5s/6 : 25s/24 = 4 : 5$.
Hence, option (a).

58. **(7)** 4 liters out of 40 liters is remvoed, hence $4/40 = 1/10^{th}$ is removed every time.
∴ $1 - 1/10 = 9/10^{th}$ remains every time.
Quantity of milk will become less than that of water as soon as quantity of milk goes below 20 liters.
∴ Quantity of milk remaining after n replacements = $40 \times (9/10)^n < 20$
⇒ $(0.9)^n < 0.5$
Least value of n satisfying above inequality is 7.
Hence, 7.

59. **(16)** n people get average Rs. 352.
∴ Total amount distributed = 352n.
Now, 2 people get a total of 506 + 506 = Rs. 1012
⇒ Remaining amount = 352n - 1012
The average amount received by other is less than or equal to 330
∴ $\frac{352n-1012}{n-2} \leq 330$
⇒ $352n - 1012 \leq 330n - 660$
⇒ $22n \leq 352$
⇒ $n \leq 352/22 = 16$
⇒ $n \leq 16$
∴ n can take maximum value of 16.
Hence, 16.

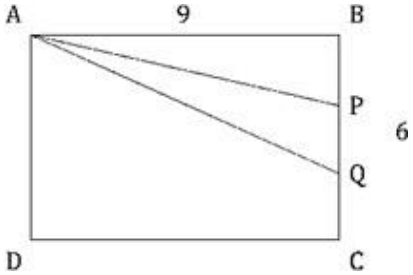
60. **(407)** Let the number of white and blue shirts bought is 'w' and 'b' respectively.
Total cost price = 1000w + 1125b
⇒ Average cost price/shirt = $\frac{1000w+1125b}{w+b}$
⇒ Average marked price/shirt = $\frac{1000w+1125b}{w+b} \times 1.25$
⇒ Average selling price/shirt = $\frac{1000w+1125b}{w+b} \times 1.25 \times 0.9$
⇒ Total selling price = $(1000w + 1125b) \times 1.25 \times 0.9$
∴ Profit = $51000 = (1000w + 1125b) \times 1.25 \times 0.9 - (1000w + 1125b)$
⇒ $51000 = (1000w + 1125b) \times (1.25 \times 0.9 - 1)$
⇒ $51000 = (1000w + 1125b) \times (0.125)$
⇒ $1000w + 1125b = 40800$
⇒ $40w + 45b = 16320$
⇒ $8w + 9b = 3264$
w + b will be maximum when we maximum the variable with least coefficiency and minimise the variable with highest coefficient. Least possible value of b cannot be 0 as at least one shirt of each type is bought. Hence, the next least possible value of b possible is 8.
∴ b = 8 and w = 399
∴ Highest possible value of w + b = 399 + 8 = 407
Hence, 407.

61. **(a)**



Concept: Diameter of a circle makes an angle of 90° on the circle.
∴ $(2r)^2 = a^2 + b^2$
⇒ $4r^2 = a^2 + b^2$
Now, Area of the triangle = 1/2 × base × height
$= 1/2 \times a \times b$
$= \frac{ab(a^2+b^2)}{2(a^2+b^2)}$
$= \frac{ab \times 4r^2}{2(a^2+b^2)}$
$= \frac{2abr^2}{a^2+b^2}$
Hence, option (a).

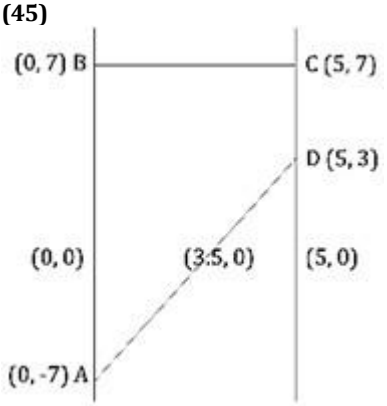
62. **(a)**



Area of ∆ABP, ∆APQ and AQCD are in GP.
Let their areas be A, Ar and Ar^2
Now, Area of AQCD = 4 × Area of ∆ABP
⇒ $Ar^2 = 4 \times A$
⇒ $r = 2$
∴ Area of ∆ABP : Area of ∆APQ : Area of AQCD = 1 : 2 : 4
From the figure given above
Area of ∆ABP = 1/2 × BP × AB = 1/2 × BP × 9 = 4.5 × BP
Area of ∆APQ = 1/2 × PQ × AB = 1/2 × PQ × 9 = 4.5 × PQ
Area of AQCD = 1/2 × (QC + AD) × AB = 1/2 × (QC + 6) × 9 = 4.5 × (QC + 6)

Now, Area of $\triangle APQ = 2 \times$ Area of $\triangle ABP$
$\Rightarrow 4.5 \times PQ = 2 \times 4.5 \times BP$
$\Rightarrow PQ = 2BP$
$\therefore QC = 6 - BP - PQ = 6 - 3BP$
Now, Area of $AQCD = 4 \times$ Area of $\triangle ABP$
$\Rightarrow 4.5 \times (QC + 6) = 4 \times 4.5 \times BP$
$\Rightarrow 4.5 \times (6 - 3BP + 6) = 4 \times 4.5 \times BP$
$\Rightarrow 6 - 3BP + 6 = 4BP$
$\Rightarrow BP = 12/7$
$\therefore PQ = 24/7$ and
$\therefore QC = 6 - 3 \times 12/7 = 6/7$
$\Rightarrow BP : PQ : QC = 12/7 : 24/7 : 6/7 = 2 : 4 : 1$
Hence, option (a).

63. **(45)**



The area of given figure ABCD = $1/2 \times (14 + 4) \times 5 = 45$.
Hence, 45.

64. **(b)** If $p^2 + q^2 - 29 = 2pq - 20 = 52 - 2pq$, then the difference between the maximum and minimum possible value of $(p^2 - q^2)$ is
Given, $p^2 + q^2 - 29 = 2pq - 20$
$\Rightarrow p^2 + q^2 - 2pq = 29 - 20$
$\Rightarrow (p - q) = 9$
$\Rightarrow p - q = \pm 3$
Also given, $p^2 + q^2 - 29 = 52 - 2pq$
$\Rightarrow p^2 + q^2 + 2pq = 81$
$\Rightarrow (p + q)^2 = 81$
$\Rightarrow p + q = \pm 9$
Case 1: $p - q = + 3$ and $p + q = + 9$
Solving these 2 equations we get, $p = 6$ and $q = 3$
$\therefore p^3 - q^3 = 216 - 27 = 189$
Case 2: $p - q = - 3$ and $p + q = + 9$
Solving these 2 equations we get, $p = 3$ and $q = 6$
$\therefore p^3 - q^3 = 27 - 216 = - 189$
Case 3: $p - q = + 3$ and $p + q = - 9$
Solving these 2 equations we get, $p = - 3$ and $q = - 6$
$\therefore p^3 - q^3 = (-27) - (-216) = 189$
Case 4: $p - q = - 3$ and $p + q = - 9$
Solving these 2 equations we get, $p = - 6$ and $q = - 3$
$\therefore p^3 - q^3 = - 216 - (-27) = - 189$
$\therefore$ Highest possible value of $p^3 - q^3 = 189$ least possible value of $p^3 - q^3 = - 189$.
$\therefore$ Required difference = $189 - (-189) = 378$
Hence, option (b).

65. **(c)** Let both the series $a_1, a_2, a_3, \ldots$ and $b_1, b_2, b_3, \ldots$ be in arithmetic progression such that the common differences of both the series are prime numbers. If $a_5 = b_9$, $a_{19} = b_2$ and $b_2 = 0$, then a_{11} equal?
Let the common difference of a_n and b_n be p and q respectively, where both p and q are prime numbers.
Given,
$a_5 = b_9$, ...(1)
$a_{19} = b_{19}$ ...(2)
(2) - (1)
$\Rightarrow a_{19} - a_5 = b_{19} - b_9$
$\Rightarrow 14p = 10q$
$\Rightarrow p/q = 5/7$
Since p and q are prime numbers, they must be equal to 5 and 7 respectively.
Now, $b_2 = 0$
$\Rightarrow b_2 = b_2 + 7q = 0 + 49 = 49$
From (1):
$a_5 = b_9 = 49$
Now, $a_{11} = a_5 + 6p = 49 + 30 = 79$
Hence, option (c).

66. **(967)** The given series are APs
Series a_n is: 13, 19, 25, 31, 37, 43, 49, ...
Series b_n is: 17, 22, 29, 36, 43, 50, ...
For 2 APs, their common terms are also in AP, with common difference as LCM of common difference of the orignal 2 APs.
The first common term of the two series is 43 and the common difference of the two series is LCM (6, 7) = 42
$\therefore$ The series comprising of common terms is 43, 85, 127, ...
Now, nth term of this series = 43 + 42(n - 1) = 42n + 1
$\Rightarrow 42n + 1 < 1000$
$\Rightarrow n < 999/42 = 23.78$
$\therefore$ Highest possible value of n = 23
$\Rightarrow$ Highest three-digit term common to both the original series = $42 \times 23 + 1 = 967$.
Hence, 967.