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VARC

Instructions [1 - 4]

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. 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 carry out their primary duty.

D Archaeology helps historians to interpret historical facts.

2. All of the following, if true, can weaken the passage's claim that facts do not speak for themselves, EXCEPT:

A the truth value of a fact is independent of the historian who expresses it.

B a fact, by its very nature, is objective and universal, irrespective of the context in which it is placed.

C facts, like truth, can be relative: what is fact for person X may not be so for person Y.

D the order in which a series of facts is presented does not have any bearing on the production of meaning.

3. 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 exploring the socio-political and economic factors that led to the Battle.

B producing a detailed timeline of the various events that led to the Battle.

C deriving historical facts from the relevant documents and inscriptions.

D providing a nuanced interpretation by relying on the auxiliary sciences.

4. All of the following describe the "common-sense view" of history, EXCEPT:

A real history can be found in ancient engravings and archival documents.

B only the positivist methods can lead to credible historical knowledge.

C history is like science: a selective system of cognitive orientations to reality.

D history can be objective like the sciences if it is derived from historical facts.

Instructions [5 - 8]

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

A European television productions have the potential to become global hits.

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 national broadcasters dominate in the EU in terms of total television viewing hours.

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

A a unifying force.

B filling an entertainment gap.

C a looming cultural threat.

D an economic threat.

7. 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 An Italian comedy show hosted by an international star.

B An original German TV science fiction production.

C A murder mystery drama set in North Africa and France.

D A trans-Atlantic romantic drama set in Europe and America.

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 Netflix has been gradually losing market share to other streaming television service providers.

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

D Research shows that older women across the EU enjoy watching romantic comedies on Netflix, whereas younger women prefer historical fiction dramas.

Instructions [9 - 12]

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 ThredUP, 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."

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

A customers bought all their clothes online.

B clothes were not thrown and burnt in landfills

C second-hand stores sold only high-quality clothes.

D Primark and Boohoo recycled their clothes for vintage stores

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

A recycling is currently not financially attractive for luxury brands.

B luxury brands want to maintain their brand image.

C luxury brands do not like their product to be devalued.

D the British don't buy second-hand clothing.

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

A are of high quality and long lasting.

B do not bleed toxins and dyes.

C are sold by genuine vintage stores.

D do not shed microfibres.

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

A has created environmental problems.

B is not cost-effective for retailers

C offers luxury clothing at cut-rate prices.

D is an anti-consumerist attitude.

Instructions [13 - 16]

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 leftwing 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.

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

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

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

14. 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,'. . ."

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

A claims about liberalism's disintegration are exaggerated and misunderstand its core features.

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

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

D the essence of liberalism lies in greater individual self-expression and freedoms.

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

A its repeated harking back to premodern notions of liberty.

B its failure to note historical instances in which the process of declining liberalism has managed to reverse itself.

C its extreme pessimism about the future of liberalism today and predictions of an ultimate decline.

D its very narrow definition of liberalism limited to individual freedoms.

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: 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

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: 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 3

B Option 4

C Option 1

D Option 2

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. 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.

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. 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.

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.

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 Counterfactuals help people to prepare for the future by understanding intentions and making decisions.

B People create counterfactual alternatives to reality for various reasons, including reasoning about other people's beliefs.

C Counterfactual alternatives to reality are created for a variety of reasons and is part of one's developmental process.

D Counterfactual thinking helps to reverse past and future actions and reason out false beliefs.

24. 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 Protection from heat waves is important but current reports and public policies seem ineffective.

B People are vulnerable to heatwaves caused due to climate change, measures taken are ineffective.

C Heatwaves pose an enormous risk; the media plays a pivotal role in alerting people to this danger.

D News stories help in warning about heatwaves, but they have to become more effective.

LRDI

Instructions [25 - 29]

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.

i) The minimum among the numbers of coins in the three sacks in the box is 1.
ii) The median of the numbers of coins in the three sacks is 1.
iii) The maximum among the numbers of coins in the three sacks in the box is 9.

25. What is the total number of coins in all the boxes in the 3^{rd} row?

A 36
B 30
C 15
D 45

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

A 3
B 4
C 5
D 8

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

28. How many sacks have exactly one coin?

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

Instructions [30 - 34]

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

30. For which firm(s) can the amounts raised by them be concluded with certainty in each year?

A Only Bzygoo and Czechy and Drjbna
B Only Czechy and Drjbna
C Only Drjbna
D Only Czechy

31. 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 exactly Rs. 8 crores.

C It is either Rs. 7 crores or Rs. 8 crores.

D It is either Rs. 8 crores or Rs. 9 crores.

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

33. 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 12

B 9

C 11

D 10

34. If the total amount of money raised in 2014 is Rs. 12 crores, then which of the following is not possible?

A Bzygoo raised the same amount of money as Elavalaki in 2013.

B Alfloo raised the same amount of money as Drjbna in 2013.

C Alfloo raised the same amount of money as Bzygoo in 2014.

D Bzygoo raised more money than Elavalaki in 2014.

Instructions [35 - 39]

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 Days 2 through 5.

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

Day 2	Day 3	Day 4	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 5
B 7
C 6
D 8

36. Who attains the maximum total score?

A Cannot be determined
B Akhil
C Bimal
D Chatur

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?

Instructions [40 - 44]

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.

40. What was the total amount spent on tickets (in Rs.) by Bipasha?

A 90

B 120

C 110

D 100

41. 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-3

C Ride-1, Ride-2, and Ride-4

D Ride-1 and Ride-4

42. Which ride was taken by all three visitors?

A Ride-1

B Ride-4

C Ride-3

D Ride-2

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

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

Quantitative Aptitude

45. 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 580

B 290

C 289

D 579

46. Any non-zero real numbers x,y such that $y \neq 3$ and $\frac{x}{y} < \frac{x+3}{y-3}$, Will satisfy the condition.

A $\frac{x}{y} < \frac{y}{x}$

B If $y < 0$, and $-x < y$

C If $y > 10$, and $-x > y$

D If $x < 0$, and $-x < y$

47. 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 2m and 3n

C m and 2n

D 2m and n

48. 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 $\frac{3}{2}$

C $\frac{5}{2}$

D $\frac{1}{2}$

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

50. For some positive real 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

51. 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 $\frac{k}{4y} + 9y$ 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 90

B 120

C 75

D 60

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 45311

B 51311

C 33130

D 40991

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 58.8

B 67.2

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 35.42%

B 52%

C 31.25%

D 26%

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 1944000

B 972000

C 1620000

D 1296000

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 nonmanufacturing employees is

A 6:5

B 4:5

C 5:4

D 5:6

58. 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 amount 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

59. 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

60. 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

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

B $\frac{2abr^2}{a^2+b^2}$

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

D $\frac{abr^2}{a^2+b^2}$

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 1:2:4

B 1:2:1

C 2:4:1

D 1:1:2

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

64. 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 $a_5 = b_9, a_{19} = b_{19}$ and $b_2 = 0$, then a_{11} equals

A 86

B 79

C 83

D 84

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

A 243

B 486

C 378

D 189

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

Answers

VARC

1.**B**	2.**C**	3.**A**	4.**C**	5.**B**	6.**A**	7.**C**	8.**A**
9.**C**	10.**D**	11.**A**	12.**A**	13.**C**	14.**A**	15.**C**	16.**A**
17.**B**	18.**D**	19.**2**	20.**3**	21.**4132**	22.**4312**	23.**C**	24.**C**

LRDI

25.**D**	26.**C**	27.**4**	28.**9**	29.**5**	30.**B**	31.**C**	32.**17**
33.**C**	34.**A**	35.**B**	36.**D**	37.**25**	38.**D**	39.**26**	40.**C**
41.**B**	42.**A**	43.**6**	44.**140**				

Quant

45.**D**	46.**B**	47.**C**	48.**D**	49.**15**	50.**7**	51.**6**	52.**A**
53.**B**	54.**C**	55.**C**	56.**D**	57.**B**	58.**16**	59.**407**	60.**7**
61.**B**	62.**C**	63.**45**	64.**B**	65.**C**	66.**967**		

Explanations

VARC

1. **B**

The passage suggests that historians can rely on disciplines such as archaeology, among others, to establish basic facts. The relevant portion of the passage is:

"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."

In this context, the "auxiliary sciences" are mentioned as tools that historians can use to ensure the accuracy of basic facts. Archaeology is included in this list, suggesting that it helps historians in ascertaining factual accuracy by providing evidence from material remains, artifacts, and other archaeological findings. Therefore, Option B correctly reflects the role of archaeology in supporting historians in their pursuit of factual accuracy.

2. **C**

Option C is the correct answer because it aligns with the passage's perspective that the interpretation of facts is subjective and can be influenced by different perspectives. The passage argues that historians play a crucial role in selecting and interpreting facts, and Option C supports this idea by suggesting that facts, like truth, can be relative.

If facts are relative, it means that what one person considers a fact may not be viewed the same way by another person. This relativity of facts supports the notion that the historian's interpretation and perspective play a significant role in determining what is considered a fact. Therefore, Option C, if true, reinforces the passage's claim that facts are not entirely objective and independent of the historian's perspective, and it does not weaken the passage's argument.

3. **A**

The passage suggests that while establishing basic facts is necessary, the essential function of historians goes beyond this. It emphasizes the selective and interpretive nature of historical writing, where historians are expected to go deeper into understanding the context and motivations behind historical events.

Option A, which involves exploring the socio-political and economic factors that led to the Battle of Hastings, is in line with the idea of providing a nuanced interpretation. This option indicates a focus on understanding the underlying causes and influences that shaped the historical event, reflecting a more comprehensive and contextual approach to historical writing.

Option B: While timelines are important, the author suggests that the historian's essential function goes beyond establishing basic chronological facts.

Option C: The author acknowledges the importance of basic facts but argues that historians must go beyond mere fact-finding.

Option D: While the author acknowledges the use of auxiliary sciences, it also suggests that the historian's focus should go beyond relying solely on these sciences for basic facts, emphasizing the historian's selective and interpretive role in presenting historical events.

4. **C**

"*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 common-sense view of history, as described in the passage, emphasizes that history consists of a body of ascertained facts found in documents and engravings. In contrast, Option C suggests that history is like science, framing it as a selective system of cognitive orientations to reality. This characterization does not align with the common-sense view, which is more concerned with factual accuracy and tangible historical evidence rather than presenting history as a selective system akin to science. Therefore Option C is the correct answer.

Option A accurately reflects the common-sense view as described in the passage.

The common-sense view includes a broader acceptance of historical methods beyond positivism, as mentioned in the passage (option B) and as per the passage, involves a fallacy in believing that historical facts are objective and independent of interpretation (Option D).

5. **B**

Option B is not supported by the information in the passage. While the passage mentions that Netflix has offices across Europe, it also notes that the big decisions still rest with American executives. The passage suggests that Netflix's content might still exhibit a somewhat mid-Atlantic quality, and the company's executive decisions remain under the control of Americans, making it less accurate to claim that Netflix has completely transformed into a truly European entity.

Option A is supported by the passage, which mentions shows like "Lupin," a French crime caper on Netflix, becoming global hits.

Option C: The passage specifically mentions that, according to Ampere, a media-analysis company, in 2015, about 75% of Netflix's original content was American, but now the figure is half. This indicates a shift in the geographical distribution of Netflix's original programming, with a decrease in the proportion of American content.

Option D is true as the passage mentions that streaming services like Netflix account for about a third of all viewing hours, challenging the dominance of national broadcasters.

6. **A**

Option A is the correct answer because the passage emphasizes that the rise of Netflix in Europe is seen as a unifying force. The author notes that Netflix and similar streaming services, by pumping the same content into homes across the continent, contribute to making culture a cross-border endeavor. This is described as a shared experience among Europeans, as they binge-watch the same series. The idea is that having a common cultural experience, facilitated by platforms like Netflix, can be a unifying factor among the diverse populations of Europe. Therefore, the rise of Netflix is portrayed in a positive light as a force that brings people together through shared cultural consumption.

7. **C**

The passage mentions that certain genres, particularly murder mysteries and dramatic conflicts like "bloodthirsty maelstroms between arch Romans and uppity tribesmen," have a more universal appeal. This suggests that themes involving suspense, mystery, and conflicts can transcend cultural boundaries and be attractive to a broader audience.

Therefore, a murder mystery drama set in North Africa and France aligns with the passage's implication that such themes have a more universal appeal, making it likely to be successful with audiences across the diverse countries of the EU. So Option C is the correct answer.

Option A is incorrect as the passage states that comedy does not travel well.

Option B: While science fiction may have a global appeal, the passage emphasizes genres like murder mysteries having a more universal appeal.

Option D: The passage doesn't discuss the appeal of romantic dramas, and the trans-Atlantic setting may not necessarily align with the passage's suggestion that certain themes work better across borders within Europe.

8. **A**

The author concludes that the rise of Netflix in Europe is seen as a unifying force, emphasizing shared experiences through common series. If research were to show a wide variance in the popularity and viewing of Netflix shows across different EU countries (Option A), it would suggest that the impact of Netflix on cultural unity is not as consistent or unifying as the author implies. The wide variance could indicate that cultural preferences or barriers within different EU countries limit the effectiveness of Netflix as a unifying force across the entire region.Therefore Option A is the correct answer.

Option B: While this finding could have implications for Netflix's business, it doesn't necessarily address the cultural unifying aspect mentioned in the author's conclusion.

Option C: This finding doesn't directly relate to the author's conclusion about Netflix serving as a unifying force within Eur

Option D: While this finding highlights audience preferences, it doesn't directly address the author's conclusion regarding the cross-border unifying role of Netflix in Europe.

9. **C**

The central idea of the passage is the promotion of sustainable shopping practices, particularly second-hand shopping, as a means to combat the detrimental environmental effects of the fashion industry. But, the passage also discusses the need for consumers to be mindful of the environmental impact of their clothing choices, **opting for high-quality items** that last longer and shed fewer microfibers.
The passage argues that opting for second clothing might not always be beneficial for the environment by highlighting the microfibre pollution that they can potentially cause. Now, if the second-hand clothes being sold were only of higher quality, it would take care of this problem (*[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”****)*
So, the correct answer is Option C.

Option A is more about the purchasing channel than the nature of the clothes so it does not necessarily undermine the central idea of the passage.

Option B supports the central idea by reducing environmental harm.

Option D could align with the sustainability goal and support the central idea, so it doesn't necessarily undermine it.

10. **D**

Option D is the correct answer because the passage does not mention or suggest that the British don't buy second-hand clothing. Instead, the passage discusses challenges related to luxury brands and their reluctance to circulate their latest season stock globally at a cheaper price. The reasons mentioned include the financial

aspect(Option A), concerns about brand image(Option B), and the desire to avoid devaluing their products(Option D). Therefore, the passage does not attribute the slow adoption of companies like ThredUP in the UK to the British not buying second-hand clothing.

11. **A**

Option A is the correct answer because the passage emphasizes the environmental issues associated with fast fashion, including the wasteful disposal of garments in landfills. The opposite of this disposable and rapid turnover nature of fast fashion would be a more sustainable and durable approach, which aligns with the idea of "slow fashion."

The passage suggests that buying high-quality items that last longer is a way to combat the negative environmental impact of the fashion industry. Therefore, 'slow fashion' can be inferred to refer to clothes that are of high quality and long-lasting, promoting a more sustainable and environmentally friendly approach to fashion consumption.

12. **A**

The irony of "thrifting," as discussed in the passage, is rooted in its unintended environmental consequences. While thrifting is commonly associated with sustainable and eco-friendly practices, the passage highlights a potential environmental issue linked to the act. Specifically, the passage mentions a study commissioned by Patagonia that reveals older clothes, often found in second-hand stores, tend to shed more microfibers. These microfibers can end up in rivers and oceans, contributing to microfiber pollution. Therefore, the seemingly environmentally conscious act of thrifting, aimed at reducing waste, may inadvertently result in environmental problems through the shedding of microfibers during the washing of older garments.Therefore Option A is the correct answer

13. **C**

Option C is the correct answer because the mention of "the Davos elite" in the passage serves to illustrate the perceived hypocrisy of wealthy individuals who profess to adhere to liberal values while simultaneously amassing the majority of the wealth. The author points to the contradiction between the elite's participation in events like discussions on creating a shared future and their exclusive access to privileges, symbolized by the use of private planes. This highlights the critique that the liberal rich, represented by the Davos elite, may not align their actions with the egalitarian ideals they claim to support, emphasizing a discrepancy between rhetoric and behavior.

Option A is incorrect because the passage does not explicitly connect the decline in liberal values to the rich benefiting, but rather to internal contradictions and hubris.

Option B is incorrect as the passage does not focus on how the debate around liberalism is captured by the rich; instead, it critiques the actions of the Davos elite.
Option D is incorrect because the passage does not suggest that the rise in liberalism has led to greater interest in shared futures from unlikely social classes; rather, it critiques the behavior of the Davos elite as hypocritical.

14. **A**

All the options, other than A, are direct signs of declining or ineffective liberalism.
Option B: *Creation of business aristocracy*, the author in the first paragraph says that liberalism promoted a meritocratic aristocracy and then went ahead to argue why the meritocratic aristocracy is not a good replacement of the old aristocracy. Creation of a business aristocracy and the rise of vast companies are against the ideals of liberalism.
Option C: *Democracy has degenerated into a theatre of the absurd,* this clearly shows the non-functionality of liberalism and is a pretty valid argument for the decline of liberalism.
Option 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,* this lines says that the gap between want liberalism asked us to do and what is actually different are two very different thing. This too can be an evidence of liberalism's decline.

Option A: *And technological advances are reducing ever more areas of work into meaningless drudgery,* while this line does talk about the technological advancement in a negative sense, it does not necessarily provide evidence of the decline of liberalism per se. Instead, it highlights a potential consequence or critique within the context of technological advances. The negative impact of technology on certain types of work might be seen as a challenge that needs to be addressed within the liberal framework rather than direct evidence of the decline of liberalism.
The same challenge could be seen at a time when liberalism was prospering and thus is not an evidence of its decline.

15. **C**
The author is likely to agree with the statement in Option C, as it aligns with the author's argument in the passage that liberalism has historically reformed itself in the face of challenges. The author emphasizes the ability of liberalism to address internal problems and reform rather than attributing its success to being the dominant ideal in the past century.

Option A: While the author emphasizes the historical ability of liberalism to reform itself, there is an acknowledgment of its current challenges and failures. Therefore, the author might not fully endorse the idea that claims about liberalism's disintegration are merely exaggerated misunderstandings.

Option B: The author may disagree with this statement as it suggests accepting liberalism's decline and seeking a substitute, which contradicts the call to reform liberalism.

Option D:The author may disagree with this statement as it simplifies the essence of liberalism, which the author argues encompasses various intellectual traditions and responses to the trade-off between rights and responsibilities.

16. **A**
Option A is the correct answer because the passage does not explicitly identify Deneen's repeated emphasis on premodern notions of liberty as a reason for faulting his conclusions. While the passage criticizes Deneen for his extreme pessimism about the future of liberalism, his narrow definition of liberalism limited to individual freedoms, and his fixation on the essence of liberalism, it does not specifically address his tendency to hark back to premodern notions. Therefore, Option A stands out as an exception, as it does not align with the explicitly stated reasons for faulting Deneen's conclusions in the passage.

17. **B**

The sentence best fits in Blank 2 because it directly elaborates on the concept of 'productive dualism' introduced in before Blank 2. It provides additional information about the distinction between the "modern" and "traditional" sectors in poor countries' economies and highlights the historical perspective that contrasts developing and developed countries. This sentence helps set the stage for the subsequent discussion about the relevance of this distinction in the present context.

18. **D**

The sentence best fits in Blank 2. Placing it there provides additional information about the timeline and challenges the previously acknowledged timeline in the scientific community, creating a logical flow in the paragraph.

The sentence does not fit in Blank 1 as it does not add anything to the Sentence preceding Blank 1. Placing the sentence in Blank 3 would disrupt the flow of the passage as there is a direct link between the sentence preceding and the sentence following Blank 3. (*script on clay tablets……Many thousands of these clay tablets".)*

Similarly placing the Sentence in Blank 4 would disrupt the flow of the passage.

19. **2**

Sentence 2 is the odd one out because it introduces a broader statement about attempts to ban books and silence authors, while the other sentences are specifically focused on the banning and challenging of books in the US. Sentences 1, 3, 4, and 5 collectively form a coherent paragraph discussing the banning of Northern Lights and the escalation of book challenges in the US, while Sentence 2 introduces a different perspective that doesn't directly contribute to the flow of the paragraph regarding the specific incidents and trends mentioned in the other sentences.

20. **3**

Sentence 3 is the odd one out because it introduces a different perspective. While the other sentences discuss the negative outcomes associated with self-care in children, Sentence 3 suggests a need to consider that the bulk of research has yet to track long-term consequences. This sentence introduces a more neutral or balanced viewpoint that doesn't align with the general theme of the other sentences, which focus on the negative aspects of self-care for children.

The remaining sentences (1, 2, 4, and 5) can be put together to form a coherent paragraph discussing the concept of self-care in relation to children, particularly those referred to as "Latchkey children."

21. **4132**

The correct order is 4-1-3-2.

Sentence 4 introduces the main idea that human consciousness is often referred to as an emergent property of the human brain. This gives context for the discussion to be followed.

Now if we consider Sentences 1 and 3 we can see that Sentence 1 ends with *"**no single neuron** holds complex information like self-awareness, hope or pride."* Sentence 3 builds on the idea in Sentence 1 by stating that, nonetheless, the collective activity of all neurons in the nervous system generates complex human emotions

like fear and joy "***Nonetheless**, the sum of all neurons …..".* So we can infer that Sentence 3 must be following Sentence 1. Sentence 3 also supports the notion that emergent properties arise from the interaction of individual components.

Finally, Sentence 2 concludes the paragraph by explaining that although the exact mechanism of emergence in the human brain is not fully understood, neurobiologists agree that complex interconnections among the parts give rise to qualities specific to the whole. This sentence wraps up the discussion and reinforces the concept introduced Sentence 4.

Therefore the correct order is 4-1-3-2.

22. **4312**
The correct order is 4-3-1-2.

Sentence 4 introduces the conflict between Western Christian concepts and indigenous African tradition.This gives context for the discussion to be followed.

Now we can see that Sentence 3 starts with *"However…."* which implies that this sentence is challenging the views presented in Sentence 4 by asserting the existence of a rich indigenous African cultural ethos. Therefore Sentence 3 must be following Sentence 4.

Sentence 2 introduces Chuwkuemeka Ike and provides additional information about Chukwuemeka Ike's exploration of the conflict, adding depth to the discussion. Sentence 1 introduces an example of contemporary African writing that explores the conflict. It makes sense that first we give an example and then elaborate on it. Sentence 1 introduces the book; it is a logical inferences that Ike must be the author of this book.

Therefore Sentence 2 must be following Sentence 1.
Therefore the correct order is 4-3-1-2.

23. **C**
The passage discusses the phenomenon of counterfactual thinking, highlighting that people spontaneously create counterfactual alternatives to reality for various reasons. These reasons include explaining the past, preparing for the future, implicating various relations (including causal ones), affecting emotions, and supporting moral judgments. Additionally, the passage mentions that the ability to create counterfactuals develops throughout childhood and contributes to reasoning about other people's beliefs. Option C effectively encompasses these key points, making it the most accurate summary of the passage.

Option A focuses primarily on the preparation for the future aspect, neglecting the broader reasons for creating counterfactual alternatives.

Option B does not emphasize the developmental aspect and various reasons for creating

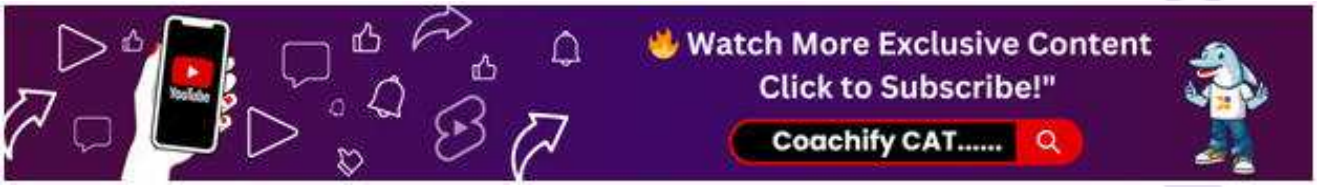
Option D inaccurately suggests that counterfactual thinking helps reverse past and future actions, which is not the main point of the passage, and it oversimplifies the role of counterfactuals.

24. **C**
The passage discusses the increasing frequency and intensity of heatwaves due to climate change, with vulnerable groups experiencing uneven impacts. It emphasizes that adaptation to heatwaves is a significant public policy concern. The research findings suggest that even vulnerable individuals may not perceive themselves as at risk of extreme heat, highlighting the importance of understanding how extreme heat is narrated. The passage specifically mentions the central role of the news media in warning people about the potential danger of heatwaves and their impacts on infrastructure and society. Option C effectively conveys the primary focus on heatwaves posing a substantial risk and the critical role of the media in alerting the public to this danger.

Option A implies a general importance of protection without specifically highlighting the role of the media in alerting people to the risks of heatwaves.

Option B acknowledges the vulnerability to heatwaves but it does not emphasize the role of the media in alerting people and suggests a broader critique of measures taken.

Option D mentions the need for news stories to become more effective but does not emphasize the central role of the media in alerting people to the risk of heatwaves, as the passage does.



LRDI

25. **D**

We are given that 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.

=> The total number of coins in a box range from 3 (1 + 1 + 1) to 27 (9 + 9 + 9)

Since, it is given that the average number of coins per sack in the boxes are all distinct integers => The total number of coins in a box would be 3, 6, 9, 12, 15, 18, 21, 24, 27 => averages of 1, 2, 3, 4,....,9 => Sum = 45.

=> Sum of averages coins in a box in a row or column = 45/3 = 15 [The total number of coins in each row is the same. The total number of coins in each column is also the same.] ==> (1)

Let us represent the final configuration of the sacks in boxes as follows:

		Table	
	C-1	C-2	C-3
R-1			
R-2			
R-3			

Also a bag (x,y) => bag in xth row and yth column.

We are given 2 clues => Table-1 & Table-2

Consider bag (3,1)

=> From Table-1 => Median = 8 & From Table-2 all 3 sacks have more than 5 coins. Also * => There is a 9 in one of the sacks.

=> c, 8, 9 are the coins in bag (3,1), now c > 5 & c + 8 + 9 should be a multiple of 3 => c = 7 is the only possiblility.

=> bag (3,1) has 7, 8, 9 coins with average = 8.

Consider bag (2,1)

Median = 2 and 1 sack has more than 5 coins. Also ** => conditions i & iii should be satisfied.

=> 1, 2, 9 are the coins in bag (2,1) with average = 4

Consider bag (1,2)

Median = 9 and 2 elements are more than 5. Also * => (9 is present & 1 is not present)

=> c, 9, 9 are the coins in bag (1,2) and c is not equal to 1 and less than 5 => c = 3 for c + 18 to be a multiple of 3.

=> 3, 9, 9 are the coins in bag (1,2) with average = 7.

Capturing this info. in the table:

		Table	
	C-1	C-2	C-3
R-1		3,9,9 (7)	
R-2	1,2,9 (4)		
R-3	7,8,9 (8)		

From (1), The average in bag (1,1) is 15 - 4 - 8 = 3.

From (1), The average in bag (1,3) is 15 - 3 - 7 = 5.

		Table	
	C-1	C-2	C-3
R-1	Avg = 3	3,9,9 (7)	Avg = 5
R-2	1,2,9 (4)		
R-3	7,8,9 (8)		

Consider bag (1,1)

Avg = 3, 1 sack has more than 5 and ** => 2 conditions are being satisfied. => (can't be condition-3 => 9 coins as the total sum of coins is it self 3*3 = 9)

=> bag (1,1) has 1, 1, 7 coins with average = 3.

Consider bag (1,3)

Avg. = 5 => Sum = 15.

Median = 6 and 2 sacks have more than 5 and * => (1 condition is satisfied)

Not condition ii as the median is 6 & Not condition iii as the sum of 2 sacks itself will become 6 + 9 = 15

=> 1, 6, c are the coins => For sum = 15 => c = 15 - 1 - 6 = 8

=> bag (1,3) has 1, 6, 8 coins with average = 5.

		Table	
	C-1	C-2	C-3
R-1	1,1,7 (3)	3,9,9 (7)	1,6,8 (5)
R-2	1,2,9 (4)		
R-3	7,8,9 (8)		

Consider bag (3,3)

0 sacks have more than 5 coins and ** => conditions i & ii are being satisfied.

=> 1,1,c are the coins. Now c = 1 or 2 or 3 or 4 => c = 1 or 4 for number of coins to be a multiple of 3.

But c = 1 as no other bag has the possibility to get avg. = 1 as bag (2,2) should have 1, b, c coins and b and c should be more than 1 as only 1*

=> bag (3,3) has 1, 1, 1 coins with average = 1.

Now, we can fill the averages in all the bags.

		Table	
	C-1	C-2	C-3
R-1	1,1,7 (3)	3,9,9 (7)	1,6,8 (5)
R-2	1,2,9 (4)	Avg = 2	Avg = 9
R-3	7,8,9 (8)	Avg = 6	1,1,1 (1)

In bag (2,3) Avg. = 9 => 9, 9, 9 are the coins.

In bag (2,2) => Avg. = 2 => Sum = 6 and only 1* => smallest elemens=t should be 1.

=> 1, b, c are the coins where b + c = 5 and b,c can't be equal to 1 and less than 5 => 2 + 3 = 5 is the only possibility.

=> 1, 2, 3 are the coins with average = 2.

		Table	
	C-1	C-2	C-3
R-1	1,1,7 (3)	3,9,9 (7)	1,6,8 (5)
R-2	1,2,9 (4)	1,2,3 (2)	9,9,9 (9)
R-3	7,8,9 (8)	Avg = 6	1,1,1 (1)

Considering bag (3,2)

Avg. = 6 => Sum = 18.

2 sacks more than 5 coins and ** => 2 sacks have 1 and 9 coins.

=> bag (3,2) has 1, c, 9 coins and c = 18 - 1 - 9 = 8

=> bag (3,2) has 1, 8, 9 coins with average = 6 coins.

==> Final required table, bracket number => average coins per sack in the bag.

		Table	
	C-1	C-2	C-3
R-1	1,1,7 (3)	3,9,9 (7)	1,6,8 (5)
R-2	1,2,9 (4)	1,2,3 (2)	9,9,9 (9)
R-3	7,8,9 (8)	1,8,9 (6)	1,1,1 (1)

Sum of coins in 3rd row = 8*3 + 6*3 + 1*3 = 45.

26. **C**

We are given that 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.

=> The total number of coins in a box range from 3 (1 + 1 + 1) to 27 (9 + 9 + 9)

Since, it is given that the average number of coins per sack in the boxes are all distinct integers => The total number of coins in a box would be 3, 6, 9, 12, 15, 18, 21, 24, 27 => averages of 1, 2, 3, 4,....,9 => Sum = 45.

=> Sum of averages coins in a box in a row or column = 45/3 = 15 [The total number of coins in each row is the same. The total number of coins in each column is also the same.] ==> (1)

Let us represent the final configuration of the sacks in boxes as follows:

		Table	
	C-1	C-2	C-3
R-1			
R-2			
R-3			

Also a bag (x,y) => bag in xth row and yth column.

We are given 2 clues => Table-1 & Table-2

Consider bag (3,1)

=> From Table-1 => Median = 8 & From Table-2 all 3 sacks have more than 5 coins. Also * => There is a 9 in one of the sacks.

=> c, 8, 9 are the coins in bag (3,1), now c > 5 & c + 8 + 9 should be a multiple of 3 => c = 7 is the only possiblility.

=> bag (3,1) has 7, 8, 9 coins with average = 8.

Consider bag (2,1)

Median = 2 and 1 sack has more than 5 coins. Also ** => conditions i & iii should be satisfied.

=> 1, 2, 9 are the coins in bag (2,1) with average = 4

Consider bag (1,2)

Median = 9 and 2 elements are more than 5. Also * => (9 is present & 1 is not present)

=> c, 9, 9 are the coins in bag (1,2) and c is not equal to 1 and less than 5 => c = 3 for c + 18 to be a multiple of 3.

=> 3, 9, 9 are the coins in bag (1,2) with average = 7.

Capturing this info. in the table:

		Table	
	C-1	C-2	C-3
R-1		3,9,9 (7)	
R-2	1,2,9 (4)		
R-3	7,8,9 (8)		

From (1), The average in bag (1,1) is 15 - 4 - 8 = 3.

From (1), The average in bag (1,3) is 15 - 3 - 7 = 5.

		Table	
	C-1	C-2	C-3
R-1	Avg = 3	3,9,9 (7)	Avg = 5
R-2	1,2,9 (4)		
R-3	7,8,9 (8)		

Consider bag (1,1)

Avg = 3, 1 sack has more than 5 and ** => 2 conditions are being satisfied. => (can't be condition-3 => 9 coins as the total sum of coins is it self 3*3 = 9)

=> bag (1,1) has 1, 1, 7 coins with average = 3.

Consider bag (1,3)

Avg. = 5 => Sum = 15.

Median = 6 and 2 sacks have more than 5 and * => (1 condition is satisfied)

Not condition ii as the median is 6 & Not condition iii as the sum of 2 sacks itself will become 6 + 9 = 15

=> 1, 6, c are the coins => For sum = 15 => c = 15 - 1 - 6 = 8

=> bag (1,3) has 1, 6, 8 coins with average = 5.

		Table	
	C-1	C-2	C-3
R-1	1,1,7 (3)	3,9,9 (7)	1,6,8 (5)
R-2	1,2,9 (4)		
R-3	7,8,9 (8)		

Consider bag (3,3)

0 sacks have more than 5 coins and ** => conditions i & ii are being satisfied.

=> 1,1,c are the coins. Now c = 1 or 2 or 3 or 4 => c = 1 or 4 for number of coins to be a multiple of 3.

But c = 1 as no other bag has the possibility to get avg. = 1 as bag (2,2) should have 1, b, c coins and b and c should be more than 1 as only 1*

=> bag (3,3) has 1, 1, 1 coins with average = 1.

Now, we can fill the averages in all the bags.

		Table	
	C-1	C-2	C-3
R-1	1,1,7 (3)	3,9,9 (7)	1,6,8 (5)
R-2	1,2,9 (4)	Avg = 2	Avg = 9
R-3	7,8,9 (8)	Avg = 6	1,1,1 (1)

In bag (2,3) Avg. = 9 => 9, 9, 9 are the coins.

In bag (2,2) => Avg. = 2 => Sum = 6 and only 1* => smallest elemens=t should be 1.

=> 1, b, c are the coins where b + c = 5 and b,c can't be equal to 1 and less than 5 => 2 + 3 = 5 is the only possibility.

=> 1, 2, 3 are the coins with average = 2.

		Table	
	C-1	C-2	C-3
R-1	1,1,7 (3)	3,9,9 (7)	1,6,8 (5)
R-2	1,2,9 (4)	1,2,3 (2)	9,9,9 (9)
R-3	7,8,9 (8)	Avg = 6	1,1,1 (1)

Considering bag (3,2)

Avg. = 6 => Sum = 18.

2 sacks more than 5 coins and ** => 2 sacks have 1 and 9 coins.

=> bag (3,2) has 1, c, 9 coins and c = 18 - 1 - 9 = 8

=> bag (3,2) has 1, 8, 9 coins with average = 6 coins.

==> Final required table, bracket number => average coins per sack in the bag.

		Table	
	C-1	C-2	C-3
R-1	1,1,7 (3)	3,9,9 (7)	1,6,8 (5)
R-2	1,2,9 (4)	1,2,3 (2)	9,9,9 (9)
R-3	7,8,9 (8)	1,8,9 (6)	1,1,1 (1)

Bags (2,1), (3,1), (1,2), (3,2), (2,3) have at least 1 sack with 9 coins. => Total of 5 bags.

27. **4**

We are given that 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.

=> The total number of coins in a box range from 3 (1 + 1 + 1) to 27 (9 + 9 + 9)

Since, it is given that the average number of coins per sack in the boxes are all distinct integers => The total number of coins in a box would be 3, 6, 9, 12, 15, 18, 21, 24, 27 => averages of 1, 2, 3, 4,....,9 => Sum = 45.

=> Sum of averages coins in a box in a row or column = 45/3 = 15 [The total number of coins in each row is the same. The total number of coins in each column is also the same.] ==> (1)

Let us represent the final configuration of the sacks in boxes as follows:

		Table	
	C-1	C-2	C-3
R-1			
R-2			
R-3			

Also a bag (x,y) => bag in xth row and yth column.

We are given 2 clues => Table-1 & Table-2

Consider bag (3,1)

=> From Table-1 => Median = 8 & From Table-2 all 3 sacks have more than 5 coins. Also * => There is a 9 in one of the sacks.

=> c, 8, 9 are the coins in bag (3,1), now c > 5 & c + 8 + 9 should be a multiple of 3 => c = 7 is the only possiblility.

=> bag (3,1) has 7, 8, 9 coins with average = 8.

Consider bag (2,1)

Median = 2 and 1 sack has more than 5 coins. Also ** => conditions i & iii should be satisfied.

=> 1, 2, 9 are the coins in bag (2,1) with average = 4

Consider bag (1,2)

Median = 9 and 2 elements are more than 5. Also * => (9 is present & 1 is not present)

=> c, 9, 9 are the coins in bag (1,2) and c is not equal to 1 and less than 5 => c = 3 for c + 18 to be a multiple of 3.

=> 3, 9, 9 are the coins in bag (1,2) with average = 7.

Capturing this info. in the table:

		Table	
	C-1	C-2	C-3
R-1		3,9,9 (7)	
R-2	1,2,9 (4)		
R-3	7,8,9 (8)		

From (1), The average in bag (1,1) is 15 - 4 - 8 = 3.

From (1), The average in bag (1,3) is 15 - 3 - 7 = 5.

		Table	
	C-1	C-2	C-3
R-1	Avg = 3	3,9,9 (7)	Avg = 5
R-2	1,2,9 (4)		
R-3	7,8,9 (8)		

Consider bag (1,1)

Avg = 3, 1 sack has more than 5 and ** => 2 conditions are being satisfied. => (can't be condition-3 => 9 coins as the total sum of coins is it self 3*3 = 9)

=> bag (1,1) has 1, 1, 7 coins with average = 3.

Consider bag (1,3)

Avg. = 5 => Sum = 15.

Median = 6 and 2 sacks have more than 5 and * => (1 condition is satisfied)

Not condition ii as the median is 6 & Not condition iii as the sum of 2 sacks itself will become 6 + 9 = 15

=> 1, 6, c are the coins => For sum = 15 => c = 15 - 1 - 6 = 8

=> bag (1,3) has 1, 6, 8 coins with average = 5.

		Table	
	C-1	C-2	C-3
R-1	1,1,7 (3)	3,9,9 (7)	1,6,8 (5)
R-2	1,2,9 (4)		
R-3	7,8,9 (8)		

Consider bag (3,3)

0 sacks have more than 5 coins and ** => conditions i & ii are being satisfied.

=> 1,1,c are the coins. Now c = 1 or 2 or 3 or 4 => c = 1 or 4 for number of coins to be a multiple of 3.

But c = 1 as no other bag has the possibility to get avg. = 1 as bag (2,2) should have 1, b, c coins and b and c should be more than 1 as only 1*

=> bag (3,3) has 1, 1, 1 coins with average = 1.

Now, we can fill the averages in all the bags.

		Table	
	C-1	C-2	C-3
R-1	1,1,7 (3)	3,9,9 (7)	1,6,8 (5)
R-2	1,2,9 (4)	Avg = 2	Avg = 9
R-3	7,8,9 (8)	Avg = 6	1,1,1 (1)

In bag (2,3) Avg. = 9 => 9, 9, 9 are the coins.

In bag (2,2) => Avg. = 2 => Sum = 6 and only 1* => smallest elemens=t should be 1.

=> 1, b, c are the coins where b + c = 5 and b,c can't be equal to 1 and less than 5 => 2 + 3 = 5 is the only possibility.

=> 1, 2, 3 are the coins with average = 2.

		Table	
	C-1	C-2	C-3
R-1	1,1,7 (3)	3,9,9 (7)	1,6,8 (5)
R-2	1,2,9 (4)	1,2,3 (2)	9,9,9 (9)
R-3	7,8,9 (8)	Avg = 6	1,1,1 (1)

Considering bag (3,2)

Avg. = 6 => Sum = 18.

2 sacks more than 5 coins and ** => 2 sacks have 1 and 9 coins.

=> bag (3,2) has 1, c, 9 coins and c = 18 - 1 - 9 = 8

=> bag (3,2) has 1, 8, 9 coins with average = 6 coins.

==> Final required table, bracket number => average coins per sack in the bag.

		Table	
	C-1	C-2	C-3
R-1	1,1,7 (3)	3,9,9 (7)	1,6,8 (5)
R-2	1,2,9 (4)	1,2,3 (2)	9,9,9 (9)
R-3	7,8,9 (8)	1,8,9 (6)	1,1,1 (1)

Average = Median in boxes (3,1), (2,2), (2,3) and (3,3) => 4 boxes.

28. **9**

We are given that 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.

=> The total number of coins in a box range from 3 (1 + 1 + 1) to 27 (9 + 9 + 9)

Since, it is given that the average number of coins per sack in the boxes are all distinct integers => The total number of coins in a box would be 3, 6, 9, 12, 15, 18, 21, 24, 27 => averages of 1, 2, 3, 4,....,9 => Sum = 45.

=> Sum of averages coins in a box in a row or column = 45/3 = 15 [The total number of coins in each row is the same. The total number of coins in each column is also the same.] ==> (1)

Let us represent the final configuration of the sacks in boxes as follows:

		Table	
	C-1	C-2	C-3
R-1			
R-2			
R-3			

Also a bag (x,y) => bag in xth row and yth column.

We are given 2 clues => Table-1 & Table-2

Consider bag (3,1)

=> From Table-1 => Median = 8 & From Table-2 all 3 sacks have more than 5 coins. Also * => There is a 9 in one of the sacks.

=> c, 8, 9 are the coins in bag (3,1), now c > 5 & c + 8 + 9 should be a multiple of 3 => c = 7 is the only possiblility.

=> bag (3,1) has 7, 8, 9 coins with average = 8.

Consider bag (2,1)

Median = 2 and 1 sack has more than 5 coins. Also ** => conditions i & iii should be satisfied.

=> 1, 2, 9 are the coins in bag (2,1) with average = 4

Consider bag (1,2)

Median = 9 and 2 elements are more than 5. Also * => (9 is present & 1 is not present)

=> c, 9, 9 are the coins in bag (1,2) and c is not equal to 1 and less than 5 => c = 3 for c + 18 to be a multiple of 3.

=> 3, 9, 9 are the coins in bag (1,2) with average = 7.

Capturing this info. in the table:

		Table	
	C-1	C-2	C-3
R-1		3,9,9 (7)	
R-2	1,2,9 (4)		
R-3	7,8,9 (8)		

From (1), The average in bag (1,1) is 15 - 4 - 8 = 3.

From (1), The average in bag (1,3) is 15 - 3 - 7 = 5.

		Table	
	C-1	C-2	C-3
R-1	Avg = 3	3,9,9 (7)	Avg = 5
R-2	1,2,9 (4)		
R-3	7,8,9 (8)		

Consider bag (1,1)

Avg = 3, 1 sack has more than 5 and ** => 2 conditions are being satisfied. => (can't be condition-3 => 9 coins as the total sum of coins is it self 3*3 = 9)

=> bag (1,1) has 1, 1, 7 coins with average = 3.

Consider bag (1,3)

Avg. = 5 => Sum = 15.

Median = 6 and 2 sacks have more than 5 and * => (1 condition is satisfied)

Not condition ii as the median is 6 & Not condition iii as the sum of 2 sacks itself will become 6 + 9 = 15

=> 1, 6, c are the coins => For sum = 15 => c = 15 - 1 - 6 = 8

=> bag (1,3) has 1, 6, 8 coins with average = 5.

		Table	
	C-1	C-2	C-3
R-1	1,1,7 (3)	3,9,9 (7)	1,6,8 (5)
R-2	1,2,9 (4)		
R-3	7,8,9 (8)		

Consider bag (3,3)

0 sacks have more than 5 coins and ** => conditions i & ii are being satisfied.

=> 1,1,c are the coins. Now c = 1 or 2 or 3 or 4 => c = 1 or 4 for number of coins to be a multiple of 3.

But c = 1 as no other bag has the possibility to get avg. = 1 as bag (2,2) should have 1, b, c coins and b and c should be more than 1 as only 1*

=> bag (3,3) has 1, 1, 1 coins with average = 1.

Now, we can fill the averages in all the bags.

		Table	
	C-1	C-2	C-3
R-1	1,1,7 (3)	3,9,9 (7)	1,6,8 (5)
R-2	1,2,9 (4)	Avg = 2	Avg = 9
R-3	7,8,9 (8)	Avg = 6	1,1,1 (1)

In bag (2,3) Avg. = 9 => 9, 9, 9 are the coins.

In bag (2,2) => Avg. = 2 => Sum = 6 and only 1* => smallest elemens=t should be 1.

=> 1, b, c are the coins where b + c = 5 and b,c can't be equal to 1 and less than 5 => 2 + 3 = 5 is the only possibility.

=> 1, 2, 3 are the coins with average = 2.

		Table	
	C-1	C-2	C-3
R-1	1,1,7 (3)	3,9,9 (7)	1,6,8 (5)
R-2	1,2,9 (4)	1,2,3 (2)	9,9,9 (9)
R-3	7,8,9 (8)	Avg = 6	1,1,1 (1)

Considering bag (3,2)

Avg. = 6 => Sum = 18.

2 sacks more than 5 coins and ** => 2 sacks have 1 and 9 coins.

=> bag (3,2) has 1, c, 9 coins and c = 18 - 1 - 9 = 8

=> bag (3,2) has 1, 8, 9 coins with average = 6 coins.

==> Final required table, bracket number => average coins per sack in the bag.

		Table	
	C-1	C-2	C-3
R-1	1,1,7 (3)	3,9,9 (7)	1,6,8 (5)
R-2	1,2,9 (4)	1,2,3 (2)	9,9,9 (9)
R-3	7,8,9 (8)	1,8,9 (6)	1,1,1 (1)

Bag (1,1) => 2 sacks with 1 coins, (2,1) => 1 sack, (2,2) => 1 sack, (3,2) => 1 sack, (1,3) => 1 sack, (3,3) => 3 sacks.

=> Total = 2 + 1 + 1 + 1 + 1 + 3 = 9 sacks.

29. **5**

We are given that 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.

=> The total number of coins in a box range from 3 (1 + 1 + 1) to 27 (9 + 9 + 9)

Since, it is given that the average number of coins per sack in the boxes are all distinct integers => The total number of coins in a box would be 3, 6, 9, 12, 15, 18, 21, 24, 27 => averages of 1, 2, 3, 4,....,9 => Sum = 45.

=> Sum of averages coins in a box in a row or column = 45/3 = 15 [The total number of coins in each row is the same. The total number of coins in each column is also the same.] ==> (1)

Let us represent the final configuration of the sacks in boxes as follows:

		Table	
	C-1	C-2	C-3
R-1			
R-2			
R-3			

Also a bag (x,y) => bag in xth row and yth column.

We are given 2 clues => Table-1 & Table-2

Consider bag (3,1)

=> From Table-1 => Median = 8 & From Table-2 all 3 sacks have more than 5 coins. Also * => There is a 9 in one of the sacks.

=> c, 8, 9 are the coins in bag (3,1), now c > 5 & c + 8 + 9 should be a multiple of 3 => c = 7 is the only possiblility.

=> bag (3,1) has 7, 8, 9 coins with average = 8.

Consider bag (2,1)

Median = 2 and 1 sack has more than 5 coins. Also ** => conditions i & iii should be satisfied.

=> 1, 2, 9 are the coins in bag (2,1) with average = 4

Consider bag (1,2)

Median = 9 and 2 elements are more than 5. Also * => (9 is present & 1 is not present)

=> c, 9, 9 are the coins in bag (1,2) and c is not equal to 1 and less than 5 => c = 3 for c + 18 to be a multiple of 3.

=> 3, 9, 9 are the coins in bag (1,2) with average = 7.

Capturing this info. in the table:

		Table	
	C-1	C-2	C-3
R-1		3,9,9 (7)	
R-2	1,2,9 (4)		
R-3	7,8,9 (8)		

From (1), The average in bag (1,1) is 15 - 4 - 8 = 3.

From (1), The average in bag (1,3) is 15 - 3 - 7 = 5.

		Table	
	C-1	C-2	C-3
R-1	Avg = 3	3,9,9 (7)	Avg = 5
R-2	1,2,9 (4)		
R-3	7,8,9 (8)		

Consider bag (1,1)

Avg = 3, 1 sack has more than 5 and ** => 2 conditions are being satisfied. => (can't be condition-3 => 9 coins as the total sum of coins is it self 3*3 = 9)

=> bag (1,1) has 1, 1, 7 coins with average = 3.

Consider bag (1,3)

Avg. = 5 => Sum = 15.

Median = 6 and 2 sacks have more than 5 and * => (1 condition is satisfied)

Not condition ii as the median is 6 & Not condition iii as the sum of 2 sacks itself will become 6 + 9 = 15

=> 1, 6, c are the coins => For sum = 15 => c = 15 - 1 - 6 = 8

=> bag (1,3) has 1, 6, 8 coins with average = 5.

		Table	
	C-1	C-2	C-3
R-1	1,1,7 (3)	3,9,9 (7)	1,6,8 (5)
R-2	1,2,9 (4)		
R-3	7,8,9 (8)		

Consider bag (3,3)

0 sacks have more than 5 coins and ** => conditions i & ii are being satisfied.

=> 1,1,c are the coins. Now c = 1 or 2 or 3 or 4 => c = 1 or 4 for number of coins to be a multiple of 3.

But c = 1 as no other bag has the possibility to get avg. = 1 as bag (2,2) should have 1, b, c coins and b and c should be more than 1 as only 1*

=> bag (3,3) has 1, 1, 1 coins with average = 1.

Now, we can fill the averages in all the bags.

		Table	
	C-1	C-2	C-3
R-1	1,1,7 (3)	3,9,9 (7)	1,6,8 (5)
R-2	1,2,9 (4)	Avg = 2	Avg = 9
R-3	7,8,9 (8)	Avg = 6	1,1,1 (1)

In bag (2,3) Avg. = 9 => 9, 9, 9 are the coins.

In bag (2,2) => Avg. = 2 => Sum = 6 and only 1* => smallest elemens=t should be 1.

=> 1, b, c are the coins where b + c = 5 and b,c can't be equal to 1 and less than 5 => 2 + 3 = 5 is the only possibility.

=> 1, 2, 3 are the coins with average = 2.

		Table	
	C-1	C-2	C-3
R-1	1,1,7 (3)	3,9,9 (7)	1,6,8 (5)
R-2	1,2,9 (4)	1,2,3 (2)	9,9,9 (9)
R-3	7,8,9 (8)	Avg = 6	1,1,1 (1)

Considering bag (3,2)

Avg. = 6 => Sum = 18.

2 sacks more than 5 coins and ** => 2 sacks have 1 and 9 coins.

=> bag (3,2) has 1, c, 9 coins and c = 18 - 1 - 9 = 8

=> bag (3,2) has 1, 8, 9 coins with average = 6 coins.

==> Final required table, bracket number => average coins per sack in the bag.

		Table	
	C-1	C-2	C-3
R-1	1,1,7 (3)	3,9,9 (7)	1,6,8 (5)
R-2	1,2,9 (4)	1,2,3 (2)	9,9,9 (9)
R-3	7,8,9 (8)	1,8,9 (6)	1,1,1 (1)

Bags with different number of coins in all 3 sacks are (2,1), (3,2), (2,2), (3,2), (1,3) => 5 bags.

30. **B**

In this set, we are told that the amount each firm raised every year increased until it reached a maximum, and then decreased until the firm closed down and no firm raised the same amount of money in two consecutive years.

The increase or decrease can be ± 1 or ± 2. => (1)

We are also told that each firm raised Rs. 1 crore in its first and last year of existence

Consider A:

It raised money for 8 years

=> The raising pattern looks like follows:

1, a, b, c, d, e, f, 1 => where a, b, c,..,, f are the unknown amounts raised.

Also a + b + c + d + e + f = 21 - 2 = 19.

We can observe that 19/6 is slightly greater than 3 => The average amount raised should be around 3.

If a = 3 and f = 3 => b + c + d + e = 13 (not possible) as the minimum case would be (4, 5, 6, 4) => Not possible.

If a = 3 and f = 2 => b + c + d + e = 14 (not possible) as the minimum case would be (4, 5, 4, 3) => Not possible.

=> a = 2 and f = 2 => b + c + d + e = 15 the minimum case is (3, 4, 5, 3) or (3, 5, 4, 3) which gives a sum of 15.

So, the possible cases for A are:

	2009	2010	2011	2012	2013	2014	2015	2016
A	1	2	3	4	5	3	2	1
	1	2	3	5	4	3	2	1

Consider B:

The patterns looks as follows:

1, a, b, 1

If a = 2, b has to be equal to 3 to satisfy (1)

if a = 3, b has to be equal to 2 to satisfy (1)

=> The possible cases for B are:

B	2012	2013	2014	2015
	1	2	3	1
	1	3	2	1

Consider C:

The pattern looks as follows:

1, ..., 1

Let us assume there are 2 gaps between => a + b = 7 (Not possible) as maximum case would be 1, 3, 2, 1

Let us assume there are 3 gaps between => a + b + c = 7, the minimum case possible is 1, 2, 3, 2, 1 => Satisfies.

Now, if there are 4 gaps => a + b + c + d = 7 => The average value is 7/4 which is less than 2 => Not possible.

=> The possible cases for C are:

C	2013	2014	2015	2016	2017
	1	2	3	2	1

Consider D:

The pattern looks as follows:

1, a, b, c, 1

=> a + b + c = 8

When a = 2 and c = 2 => b = 4 => 2, 4, 2 => Satisfies.

When a = 2 and c = 3, b should be 3 (Not satisfying (1))

When a = 3 and c = 3, b should be 2 (Not satisfying (1))

=> The possible cases for D are:

D	2011	2012	2013	2014	2015
	1	2	4	2	1

Consider E:
The pattern looks as follows:
1,.....,1

For 1 or 2 gaps, we can't get a sum of 11.

Assume 3 gaps => a + b + c = 11, the maximum case is 3, 5, 3 => Satisfies.

Now, assume 4 gaps

=> a + b + c + d = 11, the minimum case is 2, 3, 4, 2 or 2, 4, 3, 2 which satisfies (1) and 2 + 3 + 4 + 2 = 11.

=> The possible cases for E are:

E	2010	2011	2012	2013	2014	2015
	1	3	5	3	1	-
	1	2	3	4	2	1
	1	2	4	3	2	1

In summary, the possible cases for all 5 companies is:

	2009	2010	2011	2012	2013	2014	2015	2016
A	1	2	3	4	5	3	2	1
	1	2	3	5	4	3	2	1

B	2012	2013	2014	2015
	1	2	3	1
	1	3	2	1

C	2013	2014	2015	2016	2017
	1	2	3	2	1

D	2011	2012	2013	2014	2015
	1	2	4	2	1

E	2010	2011	2012	2013	2014	2015
	1	3	5	3	1	-
	1	2	3	4	2	1
	1	2	4	3	2	1

We see that only for C and D, we can conclude the amounts raised with certainty.

31. **C**
In this set, we are told that the amount each firm raised every year increased until it reached a maximum, and then decreased until the firm closed down and no firm raised the same amount of money in two consecutive years.

The increase or decrease can be ± 1 or ± 2. => (1)

We are also told that each firm raised Rs. 1 crore in its first and last year of existence

Consider A:

It raised money for 8 years

=> The raising pattern looks like follows:

1, a, b, c, d, e, f, 1 => where a, b, c,.., f are the unknown amounts raised.

Also a + b + c + d + e + f = 21 - 2 = 19.

We can observe that 19/6 is slightly greater than 3 => The average amount raised should be around 3.

If a = 3 and f = 3 => b + c + d + e = 13 (not possible) as the minimum case would be (4, 5, 6, 4) => Not possible.

If a = 3 and f = 2 => b + c + d + e = 14 (not possible) as the minimum case would be (4, 5, 4, 3) => Not possible.

=> a = 2 and f = 2 => b + c + d + e = 15 the minimum case is (3, 4, 5, 3) or (3, 5, 4, 3) which gives a sum of 15.

So, the possible cases for A are:

	2009	2010	2011	2012	2013	2014	2015	2016
A	1	2	3	4	5	3	2	1
	1	2	3	5	4	3	2	1

Consider B:

The patterns looks as follows:

1, a, b, 1

If a = 2, b has to be equal to 3 to satisfy (1)

if a = 3, b has to be equal to 2 to satisfy (1)

=> The possible cases for B are:

B	2012	2013	2014	2015
	1	2	3	1
	1	3	2	1

Consider C:

The pattern looks as follows:

1, ..., 1

Let us assume there are 2 gaps between => a + b = 7 (Not possible) as maximum case would be 1, 3, 2, 1

Let us assume there are 3 gaps between => a + b + c = 7, the minimum case possible is 1, 2, 3, 2, 1 => Satisfies.

Now, if there are 4 gaps => a + b + c + d = 7 => The average value is 7/4 which is less than 2 => Not possible.

=> The possible cases for C are:

C	2013	2014	2015	2016	2017
	1	2	3	2	1

Consider D:

The pattern looks as follows:

1, a, b, c, 1

=> a + b + c = 8

When a = 2 and c = 2 => b = 4 => 2, 4, 2 => Satisfies.

When a = 2 and c = 3, b should be 3 (Not satisfying (1))

When a = 3 and c = 3, b should be 2 (Not satisfying (1))

=> The possible cases for D are:

D	2011	2012	2013	2014	2015
	1	2	4	2	1

Consider E:

The pattern looks as follows:

1,.....,1

For 1 or 2 gaps, we can't get a sum of 11.

Assume 3 gaps => a + b + c = 11, the maximum case is 3, 5, 3 => Satisfies.

Now, assume 4 gaps

=> a + b + c + d = 11, the minimum case is 2, 3, 4, 2 or 2, 4, 3, 2 which satisfies (1) and 2 + 3 + 4 + 2 = 11.

=> The possible cases for E are:

E	2010	2011	2012	2013	2014	2015
	1	3	5	3	1	-
	1	2	3	4	2	1
	1	2	4	3	2	1

In summary, the possible cases for all 5 companies is:

	2009	2010	2011	2012	2013	2014	2015	2016
A	1	2	3	4	5	3	2	1
	1	2	3	5	4	3	2	1

B	2012	2013	2014	2015
	1	2	3	1
	1	3	2	1

C	2013	2014	2015	2016	2017
	1	2	3	2	1

D	2011	2012	2013	2014	2015
	1	2	4	2	1

E	2010	2011	2012	2013	2014	2015
	1	3	5	3	1	-
	1	2	3	4	2	1
	1	2	4	3	2	1

Money raised in 2015 is 2 + 1 + 3 + 1 + 0/1 = 7 or 8.

32. **17**

In this set, we are told that the amount each firm raised every year increased until it reached a maximum, and then decreased until the firm closed down and no firm raised the same amount of money in two consecutive years.

The increase or decrease can be ± 1 or ± 2. => (1)

We are also told that each firm raised Rs. 1 crore in its first and last year of existence

Consider A:

It raised money for 8 years

=> The raising pattern looks like follows:

1, a, b, c, d, e, f, 1 => where a, b, c,.., f are the unknown amounts raised.

Also a + b + c + d + e + f = 21 - 2 = 19.

We can observe that 19/6 is slightly greater than 3 => The average amount raised should be around 3.

If a = 3 and f = 3 => b + c + d + e = 13 (not possible) as the minimum case would be (4, 5, 6, 4) => Not possible.

If a = 3 and f = 2 => b + c + d + e = 14 (not possible) as the minimum case would be (4, 5, 4, 3) => Not possible.

=> a = 2 and f = 2 => b + c + d + e = 15 the minimum case is (3, 4, 5, 3) or (3, 5, 4, 3) which gives a sum of 15.

So, the possible cases for A are:

	2009	2010	2011	2012	2013	2014	2015	2016
A	1	2	3	4	5	3	2	1
	1	2	3	5	4	3	2	1

Consider B:

The patterns looks as follows:

1, a, b, 1

If a = 2, b has to be equal to 3 to satisfy (1)

if a = 3, b has to be equal to 2 to satisfy (1)

=> The possible cases for B are:

B	2012	2013	2014	2015
	1	2	3	1
	1	3	2	1

Consider C:

The pattern looks as follows:

1, ..., 1

Let us assume there are 2 gaps between => a + b = 7 (Not possible) as maximum case would be 1, 3, 2, 1

Let us assume there are 3 gaps between => a + b + c = 7, the minimum case possible is 1, 2, 3, 2, 1 => Satisfies.

Now, if there are 4 gaps => a + b + c + d = 7 => The average value is 7/4 which is less than 2 => Not possible.

=> The possible cases for C are:

C	2013	2014	2015	2016	2017
	1	2	3	2	1

Consider D:

The pattern looks as follows:

1, a, b, c, 1

=> a + b + c = 8

When a = 2 and c = 2 => b = 4 => 2, 4, 2 => Satisfies.

When a = 2 and c = 3, b should be 3 (Not satisfying (1))

When a = 3 and c = 3, b should be 2 (Not satisfying (1))

=> The possible cases for D are:

D	2011	2012	2013	2014	2015
	1	2	4	2	1

Consider E:

The pattern looks as follows:

1,.....,1

For 1 or 2 gaps, we can't get a sum of 11.

Assume 3 gaps => a + b + c = 11, the maximum case is 3, 5, 3 => Satisfies.

Now, assume 4 gaps

=> a + b + c + d = 11, the minimum case is 2, 3, 4, 2 or 2, 4, 3, 2 which satisfies (1) and 2 + 3 + 4 + 2 = 11.

=> The possible cases for E are:

E	2010	2011	2012	2013	2014	2015
	1	3	5	3	1	-
	1	2	3	4	2	1
	1	2	4	3	2	1

In summary, the possible cases for all 5 companies is:

	2009	2010	2011	2012	2013	2014	2015	2016
A	1	2	3	4	5	3	2	1
	1	2	3	5	4	3	2	1

B	2012	2013	2014	2015
	1	2	3	1
	1	3	2	1

C	2013	2014	2015	2016	2017
	1	2	3	2	1

D	2011	2012	2013	2014	2015
	1	2	4	2	1

E	2010	2011	2012	2013	2014	2015
	1	3	5	3	1	-
	1	2	3	4	2	1
	1	2	4	3	2	1

Maximum money raised in 2013 is 5 + 3 + 1 + 4 + 4 = 17.

33. **C**

In this set, we are told that the amount each firm raised every year increased until it reached a maximum, and then decreased until the firm closed down and no firm raised the same amount of money in two consecutive years.

The increase or decrease can be ± 1 or ± 2. => (1)

We are also told that each firm raised Rs. 1 crore in its first and last year of existence

Consider A:

It raised money for 8 years

=> The raising pattern looks like follows:

1, a, b, c, d, e, f, 1 => where a, b, c,..,, f are the unknown amounts raised.

Also a + b + c + d + e + f = 21 - 2 = 19.

We can observe that 19/6 is slightly greater than 3 => The average amount raised should be around 3.

If a = 3 and f = 3 => b + c + d + e = 13 (not possible) as the minimum case would be (4, 5, 6, 4) => Not possible.

If a = 3 and f = 2 => b + c + d + e = 14 (not possible) as the minimum case would be (4, 5, 4, 3) => Not possible.

=> a = 2 and f = 2 => b + c + d + e = 15 the minimum case is (3, 4, 5, 3) or (3, 5, 4, 3) which gives a sum of 15.

So, the possible cases for A are:

	2009	2010	2011	2012	2013	2014	2015	2016
A	1	2	3	4	5	3	2	1
	1	2	3	5	4	3	2	1

Consider B:

The patterns looks as follows:

1, a, b, 1

If a = 2, b has to be equal to 3 to satisfy (1)

if a = 3, b has to be equal to 2 to satisfy (1)

=> The possible cases for B are:

B	2012	2013	2014	2015
	1	2	3	1
	1	3	2	1

Consider C:

The pattern looks as follows:

1, ..., 1

Let us assume there are 2 gaps between => a + b = 7 (Not possible) as maximum case would be 1, 3, 2, 1

Let us assume there are 3 gaps between => a + b + c = 7, the minimum case possible is 1, 2, 3, 2, 1 => Satisfies.

Now, if there are 4 gaps => a + b + c + d = 7 => The average value is 7/4 which is less than 2 => Not possible.

=> The possible cases for C are:

C	2013	2014	2015	2016	2017
	1	2	3	2	1

Consider D:

The pattern looks as follows:

1, a, b, c, 1

=> a + b + c = 8

When a = 2 and c = 2 => b = 4 => 2, 4, 2 => Satisfies.

When a = 2 and c = 3, b should be 3 (Not satisfying (1))

When a = 3 and c = 3, b should be 2 (Not satisfying (1))

=> The possible cases for D are:

D	2011	2012	2013	2014	2015
	1	2	4	2	1

Consider E:

The pattern looks as follows:

1,.....,1

For 1 or 2 gaps, we can't get a sum of 11.

Assume 3 gaps => a + b + c = 11, the maximum case is 3, 5, 3 => Satisfies.

Now, assume 4 gaps

=> a + b + c + d = 11, the minimum case is 2, 3, 4, 2 or 2, 4, 3, 2 which satisfies (1) and 2 + 3 + 4 + 2 = 11.

=> The possible cases for E are:

E	2010	2011	2012	2013	2014	2015
	1	3	5	3	1	-
	1	2	3	4	2	1
	1	2	4	3	2	1

In summary, the possible cases for all 5 companies is:

	2009	2010	2011	2012	2013	2014	2015	2016
A	1	2	3	4	5	3	2	1
	1	2	3	5	4	3	2	1

B	2012	2013	2014	2015
	1	2	3	1
	1	3	2	1

C	2013	2014	2015	2016	2017
	1	2	3	2	1

D	2011	2012	2013	2014	2015
	1	2	4	2	1

E	2010	2011	2012	2013	2014	2015
	1	3	5	3	1	-
	1	2	3	4	2	1
	1	2	4	3	2	1

Given that E raised 3 in 2013 => in 2012 he could have raised a minimum of 4 crores.

=> Minimum amount is 4 + 1 + 0 + 2 + 4 = 11.

34. **A**

In this set, we are told that the amount each firm raised every year increased until it reached a maximum, and then decreased until the firm closed down and no firm raised the same amount of money in two consecutive years.

The increase or decrease can be ± 1 or ± 2. => (1)

We are also told that each firm raised Rs. 1 crore in its first and last year of existence

Consider A:

It raised money for 8 years

=> The raising pattern looks like follows:

1, a, b, c, d, e, f, 1 => where a, b, c,.., f are the unknown amounts raised.

Also a + b + c + d + e + f = 21 - 2 = 19.

We can observe that 19/6 is slightly greater than 3 => The average amount raised should be around 3.

If a = 3 and f = 3 => b + c + d + e = 13 (not possible) as the minimum case would be (4, 5, 6, 4) => Not possible.

If a = 3 and f = 2 => b + c + d + e = 14 (not possible) as the minimum case would be (4, 5, 4, 3) => Not possible.

=> a = 2 and f = 2 => b + c + d + e = 15 the minimum case is (3, 4, 5, 3) or (3, 5, 4, 3) which gives a sum of 15.

So, the possible cases for A are:

	2009	2010	2011	2012	2013	2014	2015	2016
A	1	2	3	4	5	3	2	1
	1	2	3	5	4	3	2	1

Consider B:

The patterns looks as follows:

1, a, b, 1

If a = 2, b has to be equal to 3 to satisfy (1)

if a = 3, b has to be equal to 2 to satisfy (1)

=> The possible cases for B are:

B	2012	2013	2014	2015
	1	2	3	1
	1	3	2	1

Consider C:

The pattern looks as follows:

1, ..., 1

Let us assume there are 2 gaps between => a + b = 7 (Not possible) as maximum case would be 1, 3, 2, 1

Let us assume there are 3 gaps between => a + b + c = 7, the minimum case possible is 1, 2, 3, 2, 1 => Satisfies.

Now, if there are 4 gaps => a + b + c + d = 7 => The average value is 7/4 which is less than 2 => Not possible.

=> The possible cases for C are:

C	2013	2014	2015	2016	2017
	1	2	3	2	1

Consider D:

The pattern looks as follows:

1, a, b, c, 1

=> a + b + c = 8

When a = 2 and c = 2 => b = 4 => 2, 4, 2 => Satisfies.

When a = 2 and c = 3, b should be 3 (Not satisfying (1))

When a = 3 and c = 3, b should be 2 (Not satisfying (1))

=> The possible cases for D are:

D	2011	2012	2013	2014	2015
	1	2	4	2	1

Consider E:

The pattern looks as follows:

1,.....,1

For 1 or 2 gaps, we can't get a sum of 11.

Assume 3 gaps => a + b + c = 11, the maximum case is 3, 5, 3 => Satisfies.

Now, assume 4 gaps

=> a + b + c + d = 11, the minimum case is 2, 3, 4, 2 or 2, 4, 3, 2 which satisfies (1) and 2 + 3 + 4 + 2 = 11.

=> The possible cases for E are:

E	2010	2011	2012	2013	2014	2015
	1	3	5	3	1	-
	1	2	3	4	2	1
	1	2	4	3	2	1

In summary, the possible cases for all 5 companies is:

	2009	2010	2011	2012	2013	2014	2015	2016
A	1	2	3	4	5	3	2	1
	1	2	3	5	4	3	2	1

B	2012	2013	2014	2015
	1	2	3	1
	1	3	2	1

C	2013	2014	2015	2016	2017
	1	2	3	2	1

D	2011	2012	2013	2014	2015
	1	2	4	2	1

E	2010	2011	2012	2013	2014	2015
	1	3	5	3	1	-
	1	2	3	4	2	1
	1	2	4	3	2	1

Given that total amount raised in 2014 is 12

=> 3 + 3/2 + 2 + 2 + 1/2 = 12 =>

=> possible case is 3 + 3 + 2 + 2 + 2 = 12.

A) In 2013, B raised 2 crores and E also raised 3/4 crores => Not Possible.

B) In 2013, A could have raised 5/4 and D raised 4 => Possible.

C) In 2014, A raised 3 and B raised 3 => Possible.

D) In 2014, B raised 3 where as E raised 2 => 3 > 2 => Possible.

35. **B**

Table 1: 2-day averages for Days 2 through 5			
Day 2	**Day 3**	**Day 4**	**Day 5**
15	15.5	16	17

Let the total score of day 1, day 2, day 3, day 4, and day 5 are d1, d2, d3, d4, and d5, respectively.

The table shows that d1+d2 = 30 ... eq (1), d2+d3 = 31 ... eq (2), d3+d4 = 32 .... eq(3), d4+d5 = 34 ... eq(4)

It is given that participants are ranked each day, with the person having the maximum score being awarded the minimum rank (1) on that day. All participants with a tied score are awarded the best available rank if there is a tie.
It is given that the total score on Day 3 is the same as the total score on Day 4.

Therefore, d3 = d4 => d3 = d4 = 16, which implies d2 = 15, d5 = 18, and d1 = 15.

The day-wise score is given below:

	Day 1	Day 2	Day 3	Day 4	Day 5
Akhil					
Bimal					
Chatur					
Total Score	15	15	16	16	18

It is known that 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.

Hence, only Chatur scored 9 (one time) on Day 2, and no other person scored 9 on any of the given 5 days. Chatur scored 3 only one time, which was on Day 1. Therefore, the scores obtained by Chatur on Day 3, Day 4, and Day 5 are 6, 6, and 6, respectively. It is also known that Akhil's score on Day 4 is the same as the score obtained by Chatur on Day 1. Hence, Akhil's score on Day 4 is 3.

Hence, we get the following table:

	Day 1	Day 2	Day 3	Day 4	Day 5
Akhil				3	
Bimal				7	
Chatur	3	9	6	6	6
Total Score	15	15	16	16	18

From Table 2, we see that the rank of Bimal and Akhil is the same, which is 2. Hence, The score obtained by Akhil and Bimal is the same. Let the score be x. Therefore, 6+2x = 16 => x = 5

The rank of Chatur on Day 5 is 2, and the rank of Bimal is 1, which implies the score obtained by Bimal will be more than Chatur. Hence, Bimal can score either 7 or 8 on Day 5. Therefore, the score obtained by Akhil on Day 5 is either 5 or 4.

	Day 1	Day 2	Day 3	Day 4	Day 5
Akhil			5	3	5/4
Bimal			5	7	7/8
Chatur	3	9	6	6	6
Total Score	15	15	16	16	18

It is given that Bimal's scores are the same on Day 1 and Day 3. Hence, the score obtained by Bimal on Day 1 is 5, which implies The score obtained by Akhil is 7 on Day 1.

From Table 2, we can see that the rank of Bimal is 3 on Day 2, and the rank of Akhil is 2 on Day 2. Hence, the score of Bimal will be lower than Akhil on Day 2.

Let the score of Akhil be a, and the score of Bimal be b. Then 9+a+b = 15, and a > b

=> a+b =6, and a> b

Hence, the value of a can be 4/5, and the value of b can be 2/1

Therefore, the final table is given below:

	Day 1	Day 2	Day 3	Day 4	Day 5
Akhil	7	4/5	5	3	5/4
Bimal	5	2/1	5	7	7/8
Chatur	3	9	6	6	6
Total Score	15	15	16	16	18

From the table, we can see that the score of Akhil is 7 on day 1.

The correct option is B

36. **D**

Table 1: 2-day averages for Days 2 through 5			
Day 2	**Day 3**	**Day 4**	**Day 5**
15	15.5	16	17

Let the total score of day 1, day 2, day 3, day 4, and day 5 are d1, d2, d3, d4, and d5, respectively.

The table shows that d1+d2 = 30 ... eq (1), d2+d3 = 31 ... eq (2), d3+d4 = 32 .... eq(3), d4+d5 = 34 ... eq(4)

It is given that participants are ranked each day, with the person having the maximum score being awarded the minimum rank (1) on that day. All participants with a tied score are awarded the best available rank if there is a tie.

It is given that the total score on Day 3 is the same as the total score on Day 4.

Therefore, d3 = d4 => d3 = d4 = 16, which implies d2 = 15, d5 = 18, and d1 = 15.

The day-wise score is given below:

	Day 1	Day 2	Day 3	Day 4	Day 5
Akhil					
Bimal					
Chatur					
Total Score	15	15	16	16	18

It is known that 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.

Hence, only Chatur scored 9 (one time) on Day 2, and no other person scored 9 on any of the given 5 days. Chatur scored 3 only one time, which was on Day 1. Therefore, the scores obtained by Chatur on Day 3, Day 4, and Day 5 are 6, 6, and 6, respectively. It is also known that Akhil's score on Day 4 is the same as the score obtained by Chatur on Day 1. Hence, Akhil's score on Day 4 is 3.

Hence, we get the following table:

	Day 1	Day 2	Day 3	Day 4	Day 5
Akhil				3	
Bimal				7	
Chatur	3	9	6	6	6
Total Score	15	15	16	16	18

From Table 2, we see that the rank of Bimal and Akhil is the same, which is 2. Hence, The score obtained by Akhil and Bimal is the same. Let the score be x. Therefore, 6+2x = 16 => x = 5

The rank of Chatur on Day 5 is 2, and the rank of Bimal is 1, which implies the score obtained by Bimal will be more than Chatur. Hence, Bimal can score either 7 or 8 on Day 5. Therefore, the score obtained by Akhil on Day 5 is either 5 or 4.

	Day 1	Day 2	Day 3	Day 4	Day 5
Akhil			5	3	5/4
Bimal			5	7	7/8
Chatur	3	9	6	6	6
Total Score	15	15	16	16	18

It is given that Bimal's scores are the same on Day 1 and Day 3. Hence, the score obtained by Bimal on Day 1 is 5, which implies The score obtained by Akhil is 7 on Day 1.

From Table 2, we can see that the rank of Bimal is 3 on Day 2, and the rank of Akhil is 2 on Day 2. Hence, the score of Bimal will be lower than Akhil's on Day 2.

Let the score of Akhil be a, and the score of Bimal be b. Then 9+a+b = 15, and a > b

=> a+b =6, and a> b

Hence, the value of a can be 4/5, and the value of b can be 2/1

Therefore, the final table is given below:

	Day 1	Day 2	Day 3	Day 4	Day 5	Total score
Akhil	7	4/5	5	3	5/4	23/24/25
Bimal	5	2/1	5	7	7/8	27/26/25
Chatur	3	9	6	6	6	30
Total Score	15	15	16	16	18	80

From the table, we can see that the maximum score is obtained by Chatur.

The correct option is D

37.**25**

Table 1: 2-day averages for Days 2 through 5			
Day 2	**Day 3**	**Day 4**	**Day 5**
15	15.5	16	17

Let the total score of day 1, day 2, day 3, day 4, and day 5 are d1, d2, d3, d4, and d5, respectively.

The table shows that d1+d2 = 30 ... eq (1), d2+d3 = 31 ... eq (2), d3+d4 = 32 .... eq(3), d4+d5 = 34 ... eq(4)

It is given that participants are ranked each day, with the person having the maximum score being awarded the minimum rank (1) on that day. All participants with a tied score are awarded the best available rank if there is a tie.

It is given that the total score on Day 3 is the same as the total score on Day 4.

Therefore, d3 = d4 => d3 = d4 = 16, which implies d2 = 15, d5 = 18, and d1 = 15.

The day-wise score is given below:

	Day 1	Day 2	Day 3	Day 4	Day 5
Akhil					
Bimal					
Chatur					
Total Score	15	15	16	16	18

It is known that 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.

Hence, only Chatur scored 9 (one time) on Day 2, and no other person scored 9 on any of the given 5 days. Chatur scored 3 only one time, which was on Day 1. Therefore, the scores obtained by Chatur on Day 3, Day 4, and Day 5 are 6, 6, and 6, respectively. It is also known that Akhil's score on Day 4 is the same as the score obtained by Chatur on Day 1. Hence, Akhil's score on Day 4 is 3.

Hence, we get the following table:

	Day 1	Day 2	Day 3	Day 4	Day 5
Akhil				3	
Bimal				7	
Chatur	3	9	6	6	6
Total Score	15	15	16	16	18

From Table 2, we see that the rank of Bimal and Akhil is the same, which is 2. Hence, The score obtained by Akhil and Bimal is the same. Let the score be x. Therefore, 6+2x = 16 => x = 5

The rank of Chatur on Day 5 is 2, and the rank of Bimal is 1, which implies the score obtained by Bimal will be more than Chatur. Hence, Bimal can score either 7 or 8 on Day 5. Therefore, the score obtained by Akhil on Day 5 is either 5 or 4.

	Day 1	Day 2	Day 3	Day 4	Day 5
Akhil			5	3	5/4
Bimal			5	7	7/8
Chatur	3	9	6	6	6
Total Score	15	15	16	16	18

It is given that Bimal's scores are the same on Day 1 and Day 3. Hence, the score obtained by Bimal on Day 1 is 5, which implies The score obtained by Akhil is 7 on Day 1.

From Table 2, we can see that the rank of Bimal is 3 on Day 2, and the rank of Akhil is 2 on Day 2. Hence, the score of Bimal will be lower than Akhil on Day 2.

Let the score of Akhil be a, and the score of Bimal be b. Then 9+a+b = 15, and a > b

=> a+b =6, and a> b

Hence, the value of a can be 4/5, and the value of b can be 2/1

Therefore, the final table is given below:

	Day 1	Day 2	Day 3	Day 4	Day 5	Total score
Akhil	7	4/5	5	3	5/4	23/24/25
Bimal	5	2/1	5	7	7/8	27/26/25
Chatur	3	9	6	6	6	30
Total Score	15	15	16	16	18	80

From the table, we can see that the minimum score obtained by Bimal is 25.

38. **D**

Table 1: 2-day averages for Days 2 through 5			
Day 2	**Day 3**	**Day 4**	**Day 5**
15	15.5	16	17

Let the total score of day 1, day 2, day 3, day 4, and day 5 are d1, d2, d3, d4, and d5, respectively.

The table shows that d1+d2 = 30 ... eq (1), d2+d3 = 31 ... eq (2), d3+d4 = 32 .... eq(3), d4+d5 = 34 ... eq(4)

It is given that participants are ranked each day, with the person having the maximum score being awarded the minimum rank (1) on that day. All participants with a tied score are awarded the best available rank if there is a tie.

It is given that the total score on Day 3 is the same as the total score on Day 4.

Therefore, d3 = d4 => d3 = d4 = 16, which implies d2 = 15, d5 = 18, and d1 = 15.

The day-wise score is given below:

	Day 1	Day 2	Day 3	Day 4	Day 5
Akhil					
Bimal					
Chatur					
Total Score	15	15	16	16	18

It is known that 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.

Hence, only Chatur scored 9 (one time) on Day 2, and no other person scored 9 on any of the given 5 days. Chatur scored 3 only one time, which was on Day 1. Therefore, the scores obtained by Chatur on Day 3, Day 4, and Day 5 are 6, 6, and 6, respectively. It is also known that Akhil's score on Day 4 is the same as the score obtained by Chatur on Day 1. Hence, Akhil's score on Day 4 is 3.

Hence, we get the following table:

	Day 1	Day 2	Day 3	Day 4	Day 5
Akhil				3	
Bimal				7	
Chatur	3	9	6	6	6
Total Score	15	15	16	16	18

From Table 2, we see that the rank of Bimal and Akhil is the same, which is 2. Hence, The score obtained by Akhil and Bimal is the same. Let the score be x. Therefore, 6+2x = 16 => x = 5

The rank of Chatur on Day 5 is 2, and the rank of Bimal is 1, which implies the score obtained by Bimal will be more than Chatur. Hence, Bimal can score either 7 or 8 on Day 5. Therefore, the score obtained by Akhil on Day 5 is either 5 or 4.

	Day 1	Day 2	Day 3	Day 4	Day 5
Akhil			5	3	5/4
Bimal			5	7	7/8
Chatur	3	9	6	6	6
Total Score	15	15	16	16	18

It is given that Bimal's scores are the same on Day 1 and Day 3. Hence, the score obtained by Bimal on Day 1 is 5, which implies The score obtained by Akhil is 7 on Day 1.

From Table 2, we can see that the rank of Bimal is 3 on Day 2, and the rank of Akhil is 2 on Day 2. Hence, the score of Bimal will be lower than Akhil on Day 2.

Let the score of Akhil be a, and the score of Bimal be b. Then 9+a+b = 15, and a > b

=> a+b =6, and a> b

Hence, the value of a can be 4/5, and the value of b can be 2/1

Therefore, the final table is given below:

	Day 1	Day 2	Day 3	Day 4	Day 5	Total score
Akhil	7	4/5	5	3	5/4	23/24/25
Bimal	5	2/1	5	7	7/8	27/26/25
Chatur	3	9	6	6	6	30
Total Score	15	15	16	16	18	80

In the question, it is given that the total score obtained by Bimal is a multiple of 3, which implies the total score obtained by Bimal is 27, which implies the total score obtained by Akhil is 23.

Akhil will score 23, when his scores on Days 1, 2, 3, 4, and 5 are 7, 4, 5, 3, 4, respectively.

Hence, the score obtained by him on Day 2 is 4.

The correct option is D

39. **26**

Table 1: 2-day averages for Days 2 through 5			
Day 2	**Day 3**	**Day 4**	**Day 5**
15	15.5	16	17

Let the total score of day 1, day 2, day 3, day 4, and day 5 are d1, d2, d3, d4, and d5, respectively.

The table shows that d1+d2 = 30 ... eq (1), d2+d3 = 31 ... eq (2), d3+d4 = 32 .... eq(3), d4+d5 = 34 ... eq(4)

It is given that participants are ranked each day, with the person having the maximum score being awarded the minimum rank (1) on that day. All participants with a tied score are awarded the best available rank if there is a tie.

It is given that the total score on Day 3 is the same as the total score on Day 4.

Therefore, d3 = d4 => d3 = d4 = 16, which implies d2 = 15, d5 = 18, and d1 = 15.

The day-wise score is given below:

	Day 1	Day 2	Day 3	Day 4	Day 5
Akhil					
Bimal					
Chatur					
Total Score	15	15	16	16	18

It is known that 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.

Hence, only Chatur scored 9 (one time) on Day 2, and no other person scored 9 on any of the given 5 days. Chatur scored 3 only one time, which was on Day 1. Therefore, the scores obtained by Chatur on Day 3, Day 4, and Day 5 are 6, 6, and 6, respectively. It is also known that Akhil's score on Day 4 is the same as the score obtained by Chatur on Day 1. Hence, Akhil's score on Day 4 is 3.

Hence, we get the following table:

	Day 1	Day 2	Day 3	Day 4	Day 5
Akhil				3	
Bimal				7	
Chatur	3	9	6	6	6
Total Score	15	15	16	16	18

From Table 2, we see that the rank of Bimal and Akhil is the same, which is 2. Hence, The score obtained by Akhil and Bimal is the same. Let the score be x. Therefore, 6+2x = 16 => x = 5

The rank of Chatur on Day 5 is 2, and the rank of Bimal is 1, which implies the score obtained by Bimal will be more than Chatur. Hence, Bimal can score either 7 or 8 on Day 5. Therefore, the score obtained by Akhil on Day 5 is either 5 or 4.

	Day 1	Day 2	Day 3	Day 4	Day 5
Akhil			5	3	5/4
Bimal			5	7	7/8
Chatur	3	9	6	6	6
Total Score	15	15	16	16	18

It is given that Bimal's scores are the same on Day 1 and Day 3. Hence, the score obtained by Bimal on Day 1 is 5, which implies The score obtained by Akhil is 7 on Day 1.

From Table 2, we can see that the rank of Bimal is 3 on Day 2, and the rank of Akhil is 2 on Day 2. Hence, the score of Bimal will be lower than Akhil on Day 2.

Let the score of Akhil be a, and the score of Bimal be b. Then 9+a+b = 15, and a > b

=> a+b =6, and a> b

Hence, the value of a can be 4/5, and the value of b can be 2/1

Therefore, the final table is given below:

	Day 1	Day 2	Day 3	Day 4	Day 5	Total score
Akhil	7	4/5	5	3	5/4	23/24/25
Bimal	5	2/1	5	7	7/8	27/26/25
Chatur	3	9	6	6	6	30
Total Score	15	15	16	16	18	80

In the question, it is given that the score obtained by Akhil is 24, which implies the score obtained by Bimal is 26.

The answer is 26

Explanation [40 - 44]:
Consider Statement 2: Anjali took Ride-1 at 11 am after waiting for 30 minutes for Chitra to complete it. It was the only ride where Anjali waited.

This implies that Chitra took Ride 1 at 10 am. Now we also know that she spent Rs 50 and that she left at 11 am. Now, since she did one ride costing Rs 20 at 10, she must have taken Ride-3 at 9 am.

So we get the following table for Chitra.

	Ride 3	Ride 1
Time	9 am- 10 am	10 am- 11 am
Cost	Rs 30	Rs 20

Now we know that Chitra and Anjali spent Rs 50 before 12:15 pm. It is not possible for Anjali to go on Ride-3 at 10 am as we know that she was waiting for 30 minutes before taking Ride-1 (She was waiting from 10:30 am).

Now, since we know that Ride-1 was the only ride for which she waited, we can say that she took Ride-1 at 11 am and started Ride-3 at 12 am

So we get the following table for Anjali.

	Ride-1	Ride-3
Time	11 am- 12 pm	12 pm - 1pm
Cost	20	30

Now, we know that Bipasha started her first ride at 11:30 am. We also know that they all spent Rs 50 before 12:15 pm.

Therefore, the first ride Bipasha takes will be Ride-2, costing Rs 50.

So we get the following table for Bipasha.

	Ride-2	
Time	11:30 am- 12:30am	
Cost	50	

We know that Ride 3 stops at 1 pm. So the last ride taken by Anjali will either be Ride-2 or Ride-4. Now, considering Statement 4,we know that the last ride taken by Anjali and Bipasha was same and that Bipasha rode it after Anjali. So their last ride can't be 2.

So the last ride of both Bipasha and Anjali will be 4.

Now if we assume that immediately after ending Ride-3, Anjali goes to Ride-4, then the last ride of Bipasha will be Ride-4 from 2 pm - 3 pm. But we know that Bipasha rode 3 rides. So this case is not possible.

Since Anjali didn't have any break or waiting time, the only ride she can ride at 1 pm will be Ride 2 and then she will go on Ride-4 from 2 pm to 3 pm.

So we get the following table for Anjali:

	Ride-1	Ride-3	Ride-2	Ride-4
Time	11 am- 12 pm	12 pm -1 pm	1 pm- 2 pm	2 pm- 3pm
Cost	20	30	50	40

Now we know that the last ride that Bipasha took was Ride-4 and that she had a gap of 1.5 hrs before it. This is only possible when she takes one ride between Ride-2 and Ride-4. Since Ride-3 is closed at 1 pm, she can only take Ride 1. So we get the following table for her.

	Ride-2	Ride-1	Break	Waiting time	Ride-4
Time	11:30 am-12:30 pm	12:30 pm- 1:30 pm	1:30 pm- 2:30 pm	2:30 pm to 3:00pm	3 pm - 4 pm
Cost	50	20			40

40. **C**
As we can see from the table for Bipasha, she spent a total of 50+20+40= 110

Therefore the required answer is Option C: 110

41. **B**
Anjali completed a total of 4 rides, 3 of which were completed at 2. Therefore the answer is Option B: Ride-1, Ride 3, and Ride -2

42. **A**
Only Ride-1 was taken by all the visitors. Therefore the correct answer is Option A: Ride-1

43. **6**
Anjali took 4 rides, and Chitra took 2 rides. Therefore the correct answer is 6

44. **140**
As we can see from the table of Anjali she spent a total of 20+30+50+40= 140

Therefore the required answer is 140

Quant

45. **D**
It is given that $a^m \cdot b^n = 144^{145}$, where $a > 1$ and $b > 1$.

144 can be written as $144 = 2^4 \times 3^2$

Hence, $a^m \cdot b^n = 144^{145}$ can be written as $a^m \cdot b^n = \left(2^4 \times 3^2\right)^{145} = 2^{580} \times 3^{290}$

We know that 3^{290} is a natural number, which implies it can be written as a^1, where $a > 1$

Hence, the least possible value of m is 1. Similarly, the largest value of n is 580.

Hence, the largest value of (n-m) is (580-1) = 579

The correct option is D

46. **B**
It is given that $\frac{x}{y} < \frac{x+3}{y-3}$, which can be written as $\frac{x}{y} - \frac{x+3}{y-3} < 0$

=> $\frac{x(y-3)-y(x+3)}{y(y-3)} < 0$

=> $\frac{xy-3x-xy-3y}{y(y-3)} < 0$

=> $\frac{-3(x+y)}{y(y-3)} < 0$

=> $\frac{3(x+y)}{y(y-3)} > 0$

From this inequality, we can say that, when $y < 0 => y(y-3) > 0$. Now to satisfy the given equation $\frac{3(x+y)}{y(y-3)} > 0$,

$(x+y)$ must be greater than zero Hence, $x > 0$ and $|x| > |y|$

Therefore, the magnitude of x is greater than the magnitude of y.

Hence, $x > y$, and $|x| > |y|$ =>$-x < y$ (Since the magnitude of x is greater than the magnitude of y.)

The correct option is B.

47. **C**

It is given that k divides m+2n and 3m+4n.

Since k divides (m+2n), it implies k will also divide 3(m+2n). Therefore, k divides 3m+6n.

Similarly, we know that k divides 3m+4n.

We know that if two numbers a, and b both are divisible by c, then their difference (a-b) is also divisible by c.

By the same logic, we can say that {(3m+6n)-(3m+4n)} is divisible by k. Hence, 2n is also divisible by k.

Now, (m+2n) is divisible by k, it implies 2(m+2n) =2m+4n is also divisible by k.

Hence, {(3m+4n)-(2m+4n)} = m is also divisible by k.

Therefore, m, and 2n are also divisible by k.

The correct option is C

48. **D**

It is given that $2^{4x^2} - 2^{2x^2+x+16} + 2^{2x+30} = 0$, which can be written as:

=>$\left(2^{2x^2}\right)^2 - 2^{2x^2} \cdot 2^{x+15} \cdot 2^1 + \left(2^{x+15}\right)^2 = 0$

=> $\left(2^{2x^2} - 2^{x+15}\right)^2 = 0$

=> $2^{2x^2} - 2^{x+15} = 0$ (Since $(a-b)^2 = 0 => a-b = 0$)

=> $2x^2 = x + 15$

=> $2x^2 - x - 15 = 0$

=> $2x^2 - 6x + 5x - 15 = 0$

=> $2x(x-3) + 5(x-3) = 0$

=> $(2x+5)(x-3) = 0$

Hence, the possible values of x are $-\frac{5}{2}$, and 3, respectively.

Therefore, the sum of the possible values is $\left(3 - \frac{5}{2}\right) = \frac{1}{2}$

The correct option is D

49. **15**

Since there are two distinct factors other than 1, and itself, which implies the total number of factors of N is 4.

It can be done in two ways.

First case: $N = p^3$ (where p is a prime number)

Second case: $N = p_1 \times p_2$ (Where p_1, p_2 are the prime numbers)

From case 1, we can see that the numbers which is a cube of prime and less than 50 are 8, and 27 (2 numbers).

From case 2, we will get the numbers in the form (2*3), (2*5), (2*7), (2*11), (2*13), (2*17), (2*19), (2*23), (3*5), (3*7), (3*11), (3*13), (5*7) {(13 numbers)}

Hence, the total number of numbers having two distinct factors is (13+2) = 15.

50. **7**

It is given that $\log_{\sqrt{3}}(x) + \frac{\log_x(25)}{\log_x(0.008)} = \frac{16}{3}$, which can be written as:

=> $2\log_3 x + \log_{0.008} 25 = \frac{16}{3}$

=> $2\log_3 x + \log_{\frac{8}{1000}} 25 = \frac{16}{3}$

=> $2\log_3 x + \log_{\frac{1}{125}} 25 = \frac{16}{3}$

=> $2\log_3 x + \log_{5^{-3}} (5)^2 = \frac{16}{3}$

=> $2\log_3 x - \frac{2}{3} = \frac{16}{3}$

=> $2\log_3 x = \frac{16}{3} + \frac{2}{3}$

=> $2\log_3 x = 6$

=> $\log_3 x^2 = 6 \Rightarrow x^2 = 3^6$

Hence, $\log_3(3 \cdot x^2) = \log_3(3 \cdot 3^6) = \log_3 3^7 = 7$

51. **6**

It is given that $(x-1)^2 + 2kx + 11 = 0$ has no real roots. (Where k is the largest integer)

$(x-1)^2 + 2kx + 11 = 0$, which can be written as:

=> $x^2 - 2x + 1 + 2kx + 11 = 0$

=> $x^2 - 2(k-1)x + 12 = 0$

We know that for no real roots, D < 0 => b^2 -4ac < 0

Hence, $\{2(k-1)\}^2 - 4 \cdot 1 \cdot 12 < 0$

=> $4(k-1)^2 < 48$

=> $(k-1)^2 < 12$

Since k is an integer, it implies (k-1) is also an integer.

Therefore, from the above inequality, we can say that the largest possible value of (k-1) = 3 => The largest possible value of k is 4.

Now we need to calculate the least possible value of $\frac{k}{4y} + 9y$.

$\frac{k}{4y} + 9y$ can be written as $\frac{4}{4y} + 9y = \frac{1}{y} + 9y$

The least possible value of $9y + \frac{1}{y}$ can be calculated using A.M-G.M inequality.

Using A.M-G.M inequality, we get:

$\frac{9y+\frac{1}{y}}{2} \geq \sqrt{9y \times \frac{1}{y}}$

=> $\frac{9y+\frac{1}{y}}{2} \geq \sqrt{9}$

=> $\frac{9y+\frac{1}{y}}{2} \geq 3$

=> $9y + \frac{1}{y} \geq 6$

Hence, the least possible value is 6

52. **A**

Let the time taken by A to fill the tank alone be x hours, which implies the time taken by B to empty the tank alone is (x-1) hours (B is the drainage pipe), and the time taken by C to fill the tank is y hours.

It is given that when pipes A, B, and C are turned on together, the empty tank is filled in two hours.

Hence, $\frac{1}{x} - \frac{1}{x-1} + \frac{1}{y} = \frac{1}{2}$ .... Eq(1)

It is given that 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.

Hence, B worked for 1 hour, and C worked for 2 hours 15 minutes, which is equal to $\frac{9}{4}$ hours.

In 1 hour, B worked $-\frac{1}{x-1}$ units, and in $\frac{9}{4}$ hours, C worked $\frac{9}{4y}$ units.

Hence, $\frac{9}{4y} - \frac{1}{x-1} = 1$ .... Eq(2)

Solving both equations, we get $y = \frac{3}{2}$, and $x = 3$

Hence, the time taken by C is $\frac{3}{2}$ hours, which is equal to 90 minutes.

The correct option is A

53. **B**

It is given that Anil borrows Rs 2 lakhs at an interest rate of 8% per annum, compounded half-yearly. It is also known that 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.

The total amount at the end of the first year is: $200000 \times \frac{104}{100} \times \frac{104}{100} = 216320$

He repays 10320 rupees at the end of the first year, which implies the amount that remains unpaid at the end of the first year is 206000 rupees.

This unpaid amount will accrue interest for another two years.

Hence, the final amount at the end of three years is $206000 \times \frac{104}{100} \times \frac{104}{100} \times \frac{104}{100} \times \frac{104}{100} = 240990.86$

Hence, the accrued interest in these two years is (240990.86-206000) = 34990.86 rupees.

Hence, the total interest accrued over the three years = (34990.86+16320) = 51311 rupees.

The correct option is B

54. **C**

It is given that the speed of Ravi is 40 kmph, which is equal to $\frac{100}{9}$ m/s. It is also known that the speed of Ashok is 50 kmph, which is equal to $\frac{125}{9}$ m/s.

It is known that the distance between Ravi and Ashok is 225 meters, and the relative speed of Ravi and Ashok is $\frac{125}{9} + \frac{100}{9} = 25$ m/s

Hence, they will meet each other in $\frac{225}{25} = 9$ seconds. The distance traveled by Ravi in these 9 seconds is $\frac{100}{9} \times 9 = 100$ meters.

Since Vijay was already 54 meters behind Ravi when they were starting, Vijay must travel (100+54) = 154 meters in these 9 seconds.

Hence, the speed of Vijay is $\frac{154}{9}$ m/s, which is equal to $\frac{154}{9} \times \frac{18}{5} = \frac{308}{5} = 61.6$ kmph.

The correct option is C

55. **C**

The cost price of the sunglass for Meenu when he purchased it for the first time was 1000 rupees, and he sold it to Kanu at 20% profit. Hence, the selling price of the sunglass is 1200 rupees, which Kanu purchased. Hence, the profit made by Meenu is (1200-1000) = 200 rupees.

Hence, the cost price of the same sunglass for Kanu is 1200 rupees, and now he sold it to Meenu at a 20% loss. Hence, the selling price of the sunglass now is (1200*0.8) = 960 rupees.

The cost price of the same sunglass for Meenu when he purchased it for the second time was 960 rupees. Now Meenu sold it Tanu, at a certain price such that the total profit of Meenu becomes 500 rupees.

Hence, on the second transaction (selling it to Tanu), Meenu made a profit of (500-200) = 300 rupees.

Hence, the profit made by Minu in the second transaction is (300/960)*100% = 31.25%

The correct option is C

56. **D**

it is given that the price of a precious stone is directly proportional to the square of its weight. Let the price be denoted by C and the weight is denoted by W.

Hence, $C \propto W^2$ => $C = kw^2$ (where k is the proportional constant)

Now, Sita has a precious stone weighing 18 units.

Therefore, $C = kw^2 = k \cdot 18^2 = 324$

If she breaks it into four pieces with each piece having a distinct integer weight, then the difference between the highest and lowest possible values of the total price of the four pieces will be 288000.

To get the lowest possible value of C, we will get the weight of the four-piece as close as possible (3,4,5,6). To get the highest value we will try to take three pieces as low as possible, and one is as high as possible (1, 2, 3, 12).

Hence, the maximum cost = $k(12^2 + 1^2 + 2^2 + 3^2) = 158k$, and the minimum cost is $k(3^2 + 4^2 + 5^2 + 6^2) = 86k$

Hence, the difference is $(158k - 86k) = 72k$, which is equal to 288000.

=> $72k = 288000$

=> $k = 4000$

Hence, the price of the original stone is $324k = 324 \times 4000 = 1296000$

The correct option is D

57. **B**

Let the number of total employees in the company be 100x, and the total salary of all the employees be 100y.

It is given that 20% of the employees work in the manufacturing department, and the total salary obtained by all the manufacturing employees is one-sixth of the total salary obtained by all the employees in the company.

Hence, the total number of employees in the manufacturing department is 20x, and the total salary received by them is (100y/6)

Average salary in the manufacturing department = (100y/6*20x) = 5y/6x

Similarly, the total number of employees in the nonmanufacturing department is 80x, and the total salary received by them is (500y/6)

Hence, the average salary in the nonmanufacturing department = (500y/6*80x) = 25y/24x

Hence, the ratio is:- (5y/6x): (25y/24x)

=> 120: 150 = 4:5

The correct option is B

58. **16**

It is given that if a certain amount of money is divided equally among n persons, each one receives Rs 352. Hence, the total amount of money is (352*n) = 352n ... Eq(1)

It is also known that if two persons receive Rs 506 each and the remaining amount is divided equally among the other persons, each of them receives less than or equal to Rs 330

Hence, the maximum amount of money with them = 506*2 + (n-2)*330 = 1012+330n-660 = 352+330n

Now, $352 + 330n \geq 352n$

=> $22n \leq 352$

=> $n \leq 16$

Hence, the maximum value is 16

59. **407**

Let the number of white shirts be m, and the number of blue shirts be n. Hence, the total cost of the shirts = (1000m+1125n), and the number of shirts is (m+n)

The average price of the shirts is $\frac{1000m+1125n}{m+n}$. It is given that he 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%.

Hence, the average selling price of the shirts = $\left(\frac{1000m+1125n}{m+n}\right) \times \frac{5}{4} \times \frac{9}{10} = \frac{9}{8}\left(\frac{1000m+1125n}{m+n}\right)$

The average profit of the shirts = $\frac{9}{8}\left(\frac{1000m+1125n}{m+n}\right) - \frac{1000m+1125n}{m+n} = \frac{1}{8}\left(\frac{1000m+1125n}{m+n}\right)$

The total profit of the shirts = $\frac{1}{8}\left(\frac{1000m+1125n}{m+n}\right) \times (m+n) = \frac{1}{8}(1000m+1125n)$

Now, $=> \frac{1}{8}(1000m+1125n) = 51000$

$=> 1000m + 1125n = 51000 \times 8 = 408000$

Now to get the maximum number of shirts, we need to minimize n (since the coefficient of n is greater than the coefficient of m), but it can't be zero. Therefore, m has to be maximum.

$m = \frac{408000-1125n}{1000}$

The maximum value of m such that m, and both are integers is m = 399, and n = 8 (by inspection)

Hence, the maximum number of shirts = m+n = 399+8 = 407

60. **7**

Let's assume that after n iteration, the volume of the milk will be less than 50%, which is less than 20 liters.

Initially, the amount of milk is 40 liters, after the first iteration, the volume of milk is $40 \cdot \frac{9}{10}$

After the second iteration, the volume of milk is $40 \times \left(\frac{9}{10}\right)^2$

Similarly, after the n iterations, the volume of milk is $40 \times \left(\frac{9}{10}\right)^n$

Now,

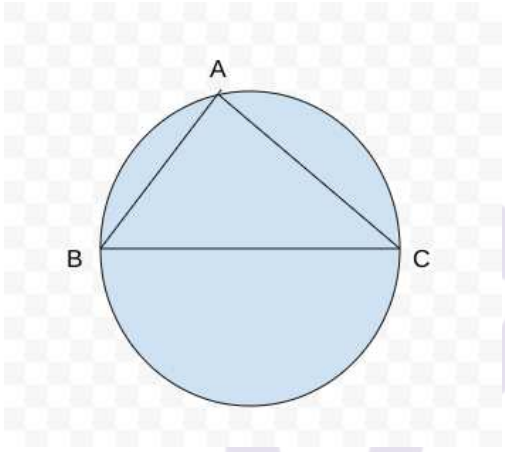
$40 \times \left(\frac{9}{10}\right)^n \leq 20$

=> $\left(\frac{9}{10}\right)^n \leq \frac{1}{2}$

=> $n \geq 7$

Hence, the correct answer is 7

61. **B**



Since BC is the diameter of the circle, which implies angle BAC is 90 degrees. Let AB = a cm, which implies AC = b cm. Hence, $BC = \sqrt{a^2 + b^2}$, which is diameter of the circle (2r).

Hence, $2r = \sqrt{a^2 + b^2}$

=> $4r^2 = a^2 + b^2$

The area of the triangle is $\frac{1}{2} \times a \times b$, which can be written as

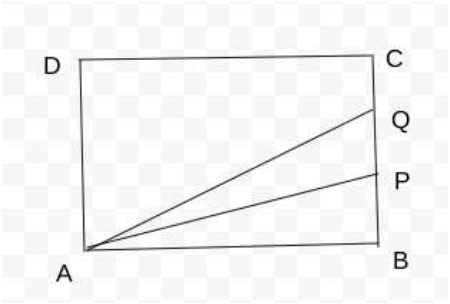
=> $\frac{a \cdot b}{2(a^2+b^2)} \times \left(a^2 + b^2\right)$

=> $\frac{a \cdot b}{2(a^2+b^2)} \times 4r^2$

=> $\frac{a \cdot b}{a^2+b^2} \times 2r^2$

The correct option is B

62. **C**

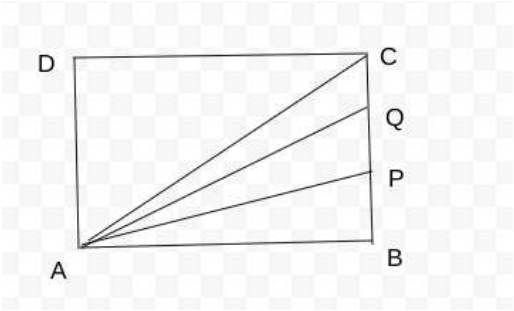


It is given that AB = 9 cm, BC = 6 cm.

It is also known that the areas of the figures ABP, APQ, and AQCD are in geometric progression.

Hence, the area of the ABP, APQ, and AQCD are k, 2k, and 4k respectively.

The ratio of BP, PQ, QC will be the ratio of the respective triangles. Hence, we can draw a line from point A to point C.



Let the area of triangle AQC be x, which implies the area of triangle ADC = ADQC - AQC = 4k -x, which is equal to the sum of the area of triangle APB, AQP, and ACQ, respectively.

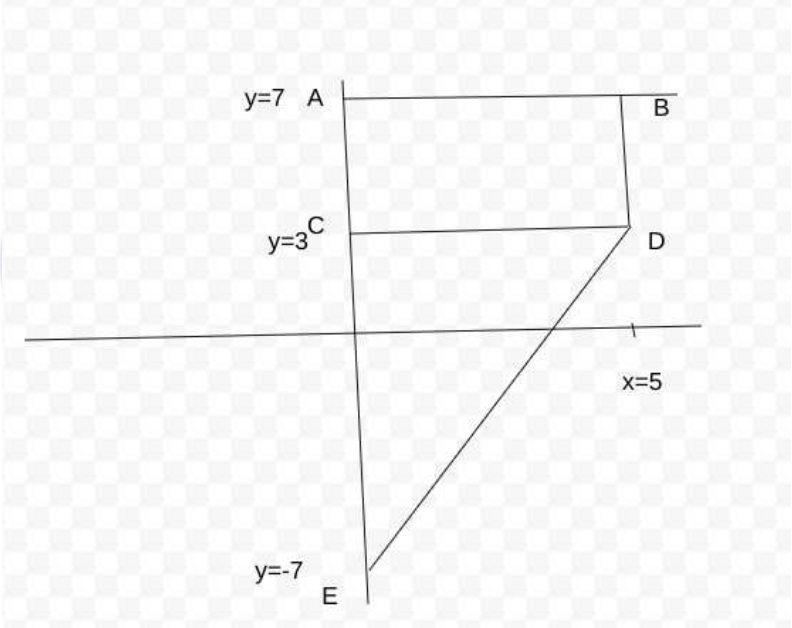
Therefore, 4k-x = 3k+x

=> x = k/2

Hence the ratio of BP: PQ: CQ = k:2k: k/2 =2:4:1

63. **45**

From the inequality and nature of x, and y, we get the given diagram:



We need to find the area of the quadrilateral ABDE = area of rectangle ABCD + area of triangle CDE

=> Area of ABCD = (7-3)*5 = 20 units, and the area of triangle CDE = (1/2)*10*5 = 25 units.

Hence, the area of the quadrilateral ABDE = (20+25) = 45 units.

64. **B**

Let the first term of both series be a_1, and b_1, respectively, and the common difference be d_1, and d_2, respectively.

It is given that $a_5 = b_9$, which implies $a_1 + 4d_1 = b_1 + 8d_2$

=> $a_1 - b_1 = 8d_2 - 4d_1$ ..... Eq(1)

Similarly, it is known that a_{19}=b_{19}, which implies $a_1 + 18d_1 = b_1 + 18d_2$

=> $a_1 - b_1 = 18d_2 - 18d_1$ ..... Eq(2)

Equating (1) and (2), we get:

=> $18d_2 - 18d_1 = 8d_2 - 4d_1$

=> $10d_2 = 14d_1$

=> $5d_2 = 7d_1$

Since, $d_1,\ d_2$ are the prime numbers, which implies $d_1 = 5,\ d_2 = 7.$

It is also known that $b_2 = 0$, which implies $b_1 + d_2 = 0 \Rightarrow b_1 = -d_2 = -7$

Putting the value of $b_1, d_1,\ \text{and},\ d_2$ in Eq(1), we get:

$a_1 = 8d_2 - 4d_1 + b_1 = 56 - 20 - 7 = 29$

Hence, $a_{11} = a_1 + 10d_1 = 29 + 10 \cdot 5 = 29 + 50 = 79$

The correct option is B

65. **C**

Given that 2pq - 20 = 52 - 2pq => 4pq = 72 => pq = 18 ---(1)

Now, $p^2 + q^2 - 29 = 2pq - 20$ => $p^2 + q^2 - 2pq = 9$ => $(p-q)^2 = 9$ => $p - q = \pm 3$

Also, $p^2 + q^2 - 29 = 2pq - 20$ => $p^2 + q^2 = 2pq + 9 = 2(18) + 9 = 45$

Now, $p^3 - q^3 = (p-q)\left(p^2 + pq + q^2\right)$ = $(p-q)(45+18)$ = $(p-q)(63)$

=> When p-q = -3 => The value is 63(-3) = -189 and when p-q = 3 => The value is 63(3) = 189.

=> The difference = 189 - (-189) = 378.

66. **967**

It is given that $a_n = 13 + 6(n-1)$, which can be written as $a_n = 13 + 6n - 6 = 7 + 6n$

Similarly, $b_n = 15 + 7(n-1)$, which can be written as $b_n = 15 + 7n - 7 = 8 + 7n$

The common differences are 6, and 7, respectively, The common difference of terms that exists in both series is l.c.m (6, 7) = 42

The first common term of the first two series is 43 (by inspection)

Hence, we need to find the mth term, which is less than 1000, and the largest three-digit integer, and exists in both series.

$t_m = a + (m-1)\,d \;<\; 1000$

=> $43 + (m-1)\,42 \;<\; 1000$

=> $(m-1)\,42 \;<\; 957$

=> m-1 < 22.8 => m < 23.8 => m = 23

Hence, the 23rd term is $43 + 22 \times \; 42 \; = \; 967$