CE/24/10/II 2024 PAPER-II

Direction (Q. No. 1 to 20): Read the passage and answer the question asked at the end to the best of your ability.

Passage

The field of mathematics has faced criticism for its historical lack of diversity and representation, potentially perpetuating systemic inequalities. Additionally, some mathematical models have been used to justify or predict undesirable outcomes, such as racism in policing or climate change. These examples raise concerns about the responsible use and interpretation of mathematical results.

1. Which of the following are the most logical inferences that can be made from the passage?
(i) The misuse of mathematics can perpetuate systemic inequalities.
(ii) Mathematical models are inherently value-neutral and cannot be used to justify undesirable outcomes.
(iii) Mathematical models can be used to justify or predict undesirable outcomes if not carefully considered.
(iv) All mathematicians are aware of the importance of diverse perspectives in their field.
(v) Mathematics has historically struggled with diversity and representation.
Which of the above assumptions are valid?
[A] (i), (iv) and (v)
[B] (i), (ii), (iv) and (v)
[C] (i) and (iv)
[D] (i), (ii) and (v)

Passage

Quantum entanglement is a physics phenomenon where pairs or groups of particles interact in such a way that the quantum state of each particle cannot be described independently of the state of the others, even when the particles are separated by vast distances. This counterintuitive aspect of quantum mechanics was famously referred to by Einstein as 'spooky action at a distance'. Entanglement is not just a curiosity; it's a key resource for quantum computing and quantum cryptography, enabling tasks like quantum teleportation and super-dense coding, which surpass the capabilities of classical information systems. The predictive power of quantum mechanics hinges on entanglement, making it one of the most profound concepts within physics that challenges our classical understanding of reality and opens up new frontiers in technology.

2. Which among the following is the most logical and rational inference that can be made from the passage given above?
(a) Entanglement is a key resource for quantum computing and quantum cryptography
(b) The predictive power of quantum mechanics relies on the absence of entanglement
(c) The concept of entanglement is no longer relevant with the advancement of classical physics
(d) Quantum entanglement was first discovered by Einstein

Passage

Modern advances in technology and data collection have profoundly impacted demographics. Online platforms and social media provide unparalleled access to personal information, enabling researchers to create detailed profiles of populations worldwide. This has led to more accurate demographic analysis, influencing urban planning, marketing strategies and policy- making decisions that shape the lives of billions of people globally.

3. With reference to the above passage, which of the following inferences can be drawn?
(i) Demographic analysis based on online data is always completely accurate.
(ii) Demographic data has influenced urban planning, marketing strategies and policy-making decisions.
(iii) Online platforms and social media provide valuable resources for researchers to create detailed population profiles.
(iv) The use of demographic data solely determines the lives of billions of people globally.
(v) The majority of people worldwide have equal access to online platforms and social media. valid?
Which of the above assumptions is/are
[A] (iii), (iv) and (v)
[B] (ii) and (iv)
[C] (ii) and (iii)
[D] (v) only

Passage

The field of Diversity and Inclusion (D&I) strives to create equitable workplaces that value diverse perspectives, experiences and backgrounds. However, it faces significant ethical issues, such as tokenism-where individuals from underrepresented groups are included merely to enhance the appearance of inclusivity without genuine commitment to their integration and advancement. Another issue is the potential for well-meaning D& I initiatives to inadvertently impose a 'one size fits all' approach that may not adequately address the unique needs and cultures of different groups. Moreover, there's the risk of privacy violations when collecting and handling demographic data without proper consent or safeguards. Ethical dilemmas also arise when balancing the need for affirmative action with the principle of meritocracy and in assessing the true impact of D & I program, which must go beyond mere representation to ensure that all individuals have equal opportunities for growth and leadership within organizations.

4. What is a major ethical issue faced by the field of Diversity and Inclusion
[A] Lack of representation 080
(B) Insufficient funding
[C] Tokenism
(D] Inadequate data analysis

Passage

Modern advances in technology have profoundly influenced sociology by transforming data collection and analysis methods, thereby expanding our understanding of social phenomena. With the advent of big data, advanced statistical software and computational algorithms, sociologists can now analyse vast data sets with unprecedented speed and accuracy, uncovering complex patterns of behaviour and interaction across diverse populations. The proliferation of digital communication platforms has also provided new avenues for studying social dynamics in real-time, enabling researchers to observe and interpret the nuances of virtual communities and networks. Furthermore, the integration of technology in everyday life has reshaped traditional family structures, work environments and societal norms, prompting sociologists to explore changes and their implications for human relationships and social institutions. These technological leaps have not only enriched sociological research but have also led to a renaissance in how we conceptualize and address societal challenges in an increasingly interconnected world.

5. With reference to the above passage, which of the following inferences can be drawn?
(i) Sociologists are no longer needed with the advent of modern advances in data collection and analysis.
(ii) The integration of technology has reshaped traditional family structures, work environments and societal norms.
(iii) Big data, advanced statistical software and computational algorithms enable rapid and accurate analyses of large data sets.
(iv) Technology has completely eliminated the need for human interaction and social dynamics.
Which of the above assumptions is/are valid?
[A] (ii) only
[B] (ii), (iii) and (iv)
[C] (ii) and (iii)
[D] (iii) and (iv)

Passage

Papua New Guinea (PNG) is a developing nation that could greatly benefit from research and development in mechanical engineering. With limited access to clean water, energy and transportation infrastructure, PNG struggles with poverty and economic growth. Investing in mechanical engineering can help address these challenges by improving hydroelectric power generation, designing more efficient irrigation systems and enhancing rural road networks.

6. Which of the following are the most logical inferences that can be made from the passage?
(i) PNG's main challenge is lack of technology, not access to clean water, energy and infrastructure.
(ii) Papua New Guinea faces challenges related to access to clean water, energy and transportation infrastructure.
(iii) Investing in mechanical engineering can help improve hydroelectric power generation and design more efficient irrigation systems.
(iv) Mechanical engineering research and development could enhance rural road networks and contribute to economic growth.

Which of the above assumptions is/are valid?
[A] (ii) and (iv)
[B] (ii), (iii) and (iv)
[C] (ii) only
[D] (ii) and (iii)

Passage

Sociologist James Hughes claims that science has been tied to a cultural narrative of conquering death since the Age of Enlightenment. He cites Francis Bacon (1561–1626) as an advocate of using science and reason to extend human life, noting Bacon's novel New Atlantis, wherein scientists worked toward delaying aging and prolonging life. Robert Boyle (1627–1691), a founding member of the Royal Society, also hoped that science would make substantial progress with life extension, according to Hughes. Alexis Carrel (1873–1944) was inspired by a belief in indefinite human life and developed experiments with cells, says Hughes.

7. Which of the following are the most rational and logical inferences that can be made from the passage?
(i) Biologist Alexis Carrel believed in indefinite human lifespan after experimenting with cells.
(ii) Francis Bacon's novel New Atlantis describes scientists working on delaying aging and prolonging life, but does not mention the replacement of old blood with young blood.
(iii) James Hughes is a sociologist who claims that science has been tied to a cultural narrative of conquering death since the Age of Enlightenment.
(iv) Francis Bacon advocated for using science and reason to extend human life through his novel New Atlantis.
Which of the above assumptions is/are valid?
[A] (i), (iii) and (iv)
[B] (i) and (iii)
[C] (i) only
[D] None of the above

Passage

The WHO intensified the global smallpox eradication campaign by contributing $2.4 million annually to the effort and adopted new disease surveillance methods, at a time when 2 million people were dying from smallpox per year. The initial problem the WHO team faced was inadequate reporting of smallpox cases. WHO established a network of consultants who assisted countries in setting up surveillance and containment activities. The WHO also helped contain the last European outbreak in Yugoslavia in 1972. After over three decades of fighting smallpox, a Global Commission declared in 1979 that the disease had been eradicated – the first disease in history to be eliminated by human effort.

8. What was declared by a Global Commission in 1979?
[A] Smallpox had been eradicated – the first disease in history to be eliminated by human effort
[B] Smallpox had become less prevalent
[C] Smallpox was still a major public health threat
[D] Smallpox had been cured

Passage

Interdisciplinary research between the History of India and Carnatic Music offers a profound avenue for understanding the cultural, social and political narratives that have shaped contemporary India. By exploring the evolution of Carnatic Music within its historical context, scholars can uncover how musical traditions reflect societal changes, religious influences and the ebb and flow of imperial dynasties. This synergy not only enriches our appreciation for the art form but also provides insights into the nation's diverse identities. It allows us to trace the migration of musical styles, the impact of colonialism and the role of music in social cohesion and resistance movements. Such interdisciplinary work can foster a deeper sense of national unity by highlighting shared heritage and cultural continuity across regions while acknowledging regional variations and their historical significance. This approach can contribute to education, tourism and policy-making, promoting cultural preservation, cross-cultural dialogue and informed decision-making that respects and celebrates India's rich tapestry of history and music.

9. Which of the following are the most rational and logical inferences that can be made from the passage?
(i) This synergy between History of India and Carnatic Music can foster a deeper sense of national unity by highlighting shared heritage and cultural continuity.
(ii) The study of Carnatic Music is only relevant to specific regions in India.
(iii) This approach cannot contribute to education, tourism and policy-making.

(iv) Carnatic Music reflects the cultural, social and political narratives that have shaped contemporary India.
(v) Interdisciplinary research between the History of India and Carnatic Music can solely focus on the evolution of music without considering broader historical context.

Which of the above assumptions is/are valid?
[A] (i) and (iv)
[B] (ii), (iii) and (iv)
[C] (iv) only
[D] (ii) only

Passage

Interdisciplinary collaboration between mathematics and statistics in India can foster innovative solutions to real-world problems. By integrating mathematical modeling with statistical analysis, researchers can develop more accurate predictions for economic growth, public health initiatives and environmental sustainability. This synergy can also drive breakthroughs in emerging fields like data science and Artificial Intelligence.

10. Consider the following statements:
(i) Interdisciplinary collaboration between mathematics and statistics can lead to innovative solutions.
(ii) This synergy can drive breakthroughs in emerging fields like data science and Artificial Intelligence.

Which of the above assumptions reflect(s) the passage above?
[A] (i) only
[B] (ii) only
[C] Neither (i) nor (ii)
[D] Both (i) and (ii)

Passage

Sri Lanka, an island nation, is rich in biodiversity and natural resources, stands significantly benefit from geological studies due to its complex history of tectonic activity, mineral wealth and vulnerability to natural disasters such as tsunamis and earthquakes. By advancing geological research, Sri Lanka can better understand the distribution and sustainability of its mineral resources, harness early warning systems, while also improve earthquake and tsunami prediction models. This knowledge will not only bolster infrastructure development and disaster resilience but also enhance public safety and environmental conservation efforts, ensuring a resilient and prosperous future for its people. Geological research can also aid in addressing challenges related to groundwater management, soil erosion and landslide prevention, thereby supporting sustainable development across the country's diverse ecosystems.

11. With reference to the above passage, which of the following statements are correct?
(i) Geological research can help improve earthquake and tsunami prediction models.
(ii) Geological research can completely eliminate the risk of natural disasters.
(iii) Understanding mineral distribution and sustainability is crucial for responsible mining practices.
(iv) The country's vulnerability to natural disasters is not a major concern for geological studies.
(v) Geological research in Sri Lanka is solely focused on economic benefits.

Which of the above assumptions are valid?
[A] (i), (iii) and (iv)
[B] (i) and (iii)
[C] (ii) and (iv)
[D] (ii), (iv) and (v)

Passage

Mycoremediation, a novel application in bioremediation, utilizes fungi to clean pollutants from the environment. Certain species of fungi can break down toxic substances such as heavy metals and pesticides, promoting soil and water remediation. This biological approach offers a sustainable alternative to traditional methods, highlighting the potential of mycology in mitigating environmental degradation and restoring ecosystems.

12. With reference to the above passage, which of the following inferences can be drawn?
(i) Mycology has the potential to mitigate environmental degradation and restore ecosystems.
(ii) All species of fungi are capable of breaking down toxic substances.
(iii) Mycoremediation can completely eliminate pollutants from the environment.
(iv) Fungi can be used to clean pollutants from the environment.

Which of the above assumptions are valid?
[A] (i) and (iv)
[B] (ii), (iii) and (iv)
[C] (i), (ii) and (iii)
[D] (i), (ii) and (iv)

Passage

Researchers are harnessing advancements in optics and nanotechnology to revolutionize light-based water purification, leveraging the unique disinfection processes. These innovations aim to provide clean drinking water for millions worldwide, combating diseases like cholera and typhoid. Additionally, scientists are exploring the use of metamaterials to create ultra-efficient solar panels, generating power from renewable sources and supporting sustainable development goals.

13. Which of the following are the most rational and logical inferences that can be made from the passage?

(i) These innovations will immediately solve the global clean water crisis without any additional effort or infrastructure.
(ii) Metamaterials are being explored for their potential in creating ultra-efficient solar panels.
(iii) These innovations aim to provide clean drinking water for millions worldwide, combating diseases like cholera and typhoid.
(iv) Portable water purifiers will completely eliminate the need for traditional water treatment methods.

Which of the above assumptions is/are valid?

[A] (i), (ii), (iii) and (iv)
[B] (ii) and (iii)
[C] (i) only
[D] (ii) and (iii)

Passage

Much of Leibniz's work went on to have a deep impact on the field of psychology. Leibniz thought that there are many petites' perceptions, or small perceptions of which we are not aware. He believed that by the principle that phenomena found in nature were continuous by default, it was likely that the transition between conscious and unconscious states had intermediate steps. For this to be true, there must also be a continuum of awareness at any given time. His theory regarding consciousness in relation to perception was an early theory regarding the stages of sleep. In this way, Leibniz's theory of perception laid the groundwork for later theories on the idea of the unconscious.

14. Which one of the following statements best reflects the crux of the passage?

[A] Leibniz believed that human consciousness is a discrete and binary state, with no intermediate steps between conscious and unconscious states.
[B] Leibniz's work had no significant impact on psychology, as his ideas were too abstract.
[C] Leibniz's concept of petites perceptions laid the groundwork for later theories on the unconscious mind.
[D] Leibniz's theory of perception focused solely on the relationship between the external world and our direct perceptions of it.

Passage

The cell was first discovered by Robert Hooke in 1665, which can be found in his book Micrographia. In describing, he saw 60 observations in detail of various objects under a coarse compound microscope. One observation was from very thin slices of bottle cork. Hooke discovered a multitude of tiny pores that he named "cells". This came from the Latin word Cella, meaning a small room like monks lived in and also Cellula, which meant the six-sided cell of a honeycomb. However, Hooke did not know their real structure or function. What Hooke had thought were cells were actually empty cell walls of plant tissues. With microscopes during this time having low magnification, Hooke was unable to see that there were other internal components of the cells he was observing. Therefore, he did not think the Cellulae were alive.

15. Which one of the following statements best reflects the crucial message conveyed by the author of the passage?

[A] Cells were fully understood by Hooke, including their internal components and functions
[B] The term 'cellulae' refers to the six-sided structure of a honeycomb
[C] Hooke discovered the nucleus of a cell in his book Micrographia
[D] Robert Hooke's discovery of 'cells' in 1665 was an incomplete understanding of their true structure and function

Passage

Within the intricate field of intellectual property law lies a niche concept known as 'moral rights', which extends beyond financial compensation, granting creators certain non-economic protections. Moral rights, embedded in various international treaties and domestic laws, such as the Berne Convention and the Copyright Acts in many countries, encompass the right of integrity (the creators' right

to object to any distortion or mutilation of their work that would be prejudicial to their honour or reputation), the right of attribution (the right to be credited for their authorship), and the right of withdrawal (under certain conditions, the right to retract the work from circulation). These rights are crucial for ensuring that creators maintain control over how their works are presented and associated with, safeguarding their personal and artistic integrity even after transferring economic rights to others.

16. What do moral rights in intellectual property law grant creators?
[A] The ability to transfer economic rights only
[B] Only the right to claim ownership of their work
[C] A guarantee that their work will be widely disseminated
[D] Non-economic protections beyond financial compensation

Passage

Modern advances have profoundly shaped ecological understanding and conservation efforts, transforming once-daunting fieldwork into a symphony of high-resolution data and predictive modeling. Satellite imagery, drones and sensors now provide real-time monitoring of habitats, allowing scientists to track biodiversity trends at unprecedented scales. Genomic technologies reveal the intricate web of species interactions and evolutionary histories, offering insights into ecosystem resilience. Moreover, machine learning algorithms predict ecological responses to climate change, aiding in the proactive management of natural resources. These technological strides enable more effective protection of our planet's biodiversity, fostering a new era of precision conservation that promises to safeguard the intricate tapestry of life on Earth.

17. Which of the following are the most logical inferences that can be made from the passage?
(i) Technology has eliminated the need for fieldwork in ecological research.
(ii) Machine learning algorithms can completely predict ecological responses to climate change.
(iii) Genomic technologies reveal species interactions and evolutionary histories.
(iv) Satellite imagery, drones and sensors provide real-time monitoring of habitats.
Which of the above assumptions is /are valid?
[A] (i) and (ii)
[B] (iii) and (iv)
[C] (i), (ii) and (iii)
[D] (ii) only

Passage

Initiatives like precision farming and vertical agriculture can revolutionize food production, increase yields while minimize environmental impact. Community-led agroecological projects can empower small-scale farmers, promoting sustainable practices and equitable access to markets. By leveraging cutting-edge tech and cooperative models, we can unlock a more resilient, productive and just food system for all.

18. Which of the following are the most logical inferences that can be made from the passage?
(i) Community-led agroecological projects can empower small-scale farmers and promote sustainable practices.
(ii) Technologies like precision farming and cooperative models can create a more resilient food system
(iii) Precision farming and vertical agriculture can completely eliminate environmental impact from food production.
(iv) All community-led agroecological projects will be equally successful and effective.
(v) Only small-scale farmers are in need of empowerment through agroecological projects.
Which of the above assumptions are valid?
[A] (i), (iv) and (v)
[B] (ii) and (iii)
[C] (ii), (iv) and (v)
[D] (i) and (ii)

Passage

Estheticism, a philosophical movement originating in the late 19th century, champions the primacy of art and beauty as the highest values, transcending moral or practical considerations.
Coined by philosopher Alexander Baumgarten, the term 'aesthetics' itself, evolved to describe a stance where art is not just a representation of reality but an end in itself. Proponents like Walter Pater and Oscar Wilde argued that art should be appreciated for its intrinsic beauty and sensory experience, rather than for didactic or utilitarian purposes. This perspective asserts that the appreciation of art and beauty refines one's sensibility and fosters a deeper understanding of life, promoting an aesthetic philosophy of life

where the pursuit of beauty becomes a spiritual and intellectual quest, elevating humanity beyond the ordinary and mundane.

19. What in the primary focus at philosophical Estheticism?
[A] The study of reality
[B] The development of a didactic philosophy
[C] The pursuit of moral and practical
[D] The primacy of art and beauty

Passage

In the realm of condensed matter physics, Topological Insulators (TIs) exhibit unique properties. These materials have a bulk that is an electrical insulator and a surface that is a conductor. Tis are characterized by their non-trivial topological invariants, which govern the behaviour of electrons at the surface. This phenomenon leads to exotic phenomena such as quantum spin Hall Effect and Majorana fermions.

20. Which of the following are the most rational and the logical inferences that can be made from the passage?
(i) Tis can be used to create perfect conductors with zero resistance.
(ii) Topological insulators have a bulk that is an electrical insulator and a surface that is a conductor.
(iii) Topological insulators are only found in nature, not in synthetic materials.
(iv) All materials that exhibit a quantum spin Hall Effect are also topological insulators.
(v) The study of Tis has led to the discovery of exotic phenomena such as Majorana fermions.
Which of the above assumptions are valid?
[A] (i) and (iii)
[B] (ii) and (v)
[C] (iii) and (iv)
[D] None of the above

21. What is a possible consequence of holding a rigid personal opinion during a conversation?
[A] Improved understanding of the speaker's point
[B] Premature judgment of the speaker's message
[C] Encouragement for the speaker to clarify their message
[D] Enhanced miscommunication between the listener and speaker

22. Which of the following is considered to be a form of non-verbal communication?
[A] Proxemics
[B] Microexpressions
[C] Eye contact
[D] All of the above

23. What is a common effect of being stressed or emotionally overwhelmed during a conversation?
[A] You become more empathetic and understanding
[B] You are more likely to misread others and send confusing non-verbal signals
[C] You respond with greater clarity and precision
[D] You remain calm and composed, improving communication

24. What is the benefit of giving a short, focused response during a conversation?
[A] It helps the listener understand your point more clearly
[B] It encourages the listener to ask more questions
[C] It strengthens the impact of your message
[D] Both [A] and [C]

25. If someone in the workplace says something offensive in a way that you don't agree with, what is the best way to respond?
[A] Ignore the situation and pretend it didn't happen
[B] Respond immediately with anger and express your disagreement
[C] Calmly address your concerns, listen to their perspective and engage in a respectful discussion
[D] Criticize the person in front of others and humiliate them

26. Which of the following is an example of an environmental barrier of communication?
[A] Lack of interest in the topic
[B] Use of complex and bombastic language
[C] A lot of background noise
[D] Misinterpretation of non-verbal cues

27. What is the first step in the active listening process?
[A] Summarizing the speaker's message
[B] Comprehension of the message being communicated
[C] Not being sensitive to the speaker's feelings
[D] Figuring out how to turn their points against them

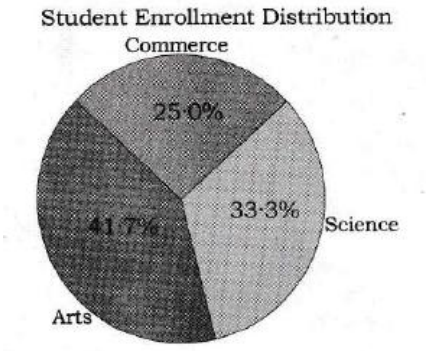
28. What should you do to communicate effectively during a conversation?
[A] Check your phone to stay informed
[B] Plan what you're going to say next while the other person is speaking
[C] Avoid distractions and stay focused on the conversation
[D] Daydream to relax your mind while listening

29. Which of the following is an advantage of group discussion compared to one-on-one conversations?
[A] You are more likely to hear a broader range of opinions
[B] You will have relatively more time to speak
[C] The conversation is always more organized
[D] There is less chance of conflict

30. What does it mean to be a good listener?
[A] To listen with the goal of understanding the speaker's message
[B] To focus on both the verbal and non-verbal cues of the speaker
[C] To provide responses that ensure mutual understanding with the speaker
[D] All of the above

31. What day of the week will October 12, 2035 be?
[A] Friday
[B] Saturday
[C] Sunday
[D] Monday

32. What is the total number of students enrolled in Arts and Science together, given the following pie chart showing the distribution of students among different streams?

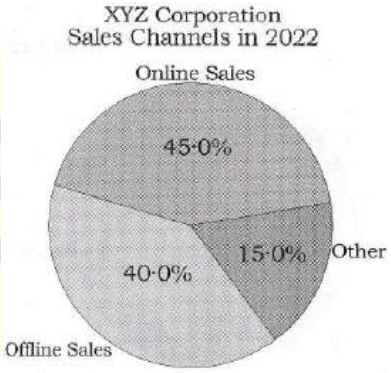


[A] 250
[B] 260
[C] 270
[D] 280

33. How many different 7-letter words (with or without meaning) can be constructed using all the letters of the word 'LACWORK' so that each word must end with R?
[A] 120
[B] 128
[C] 117
[D] 109

34. A woman takes 1/11 time in rowing a certain distance downstream than upstream. What is the ratio of the speed of current to the speed of the boat?
[A] 6/5
[B] 11/5
[C] 11/6
[D] 5/6

35. What is the approximate percentage of sales generated by online channels for XYZ Corporation in 2022, given the following pie chart?

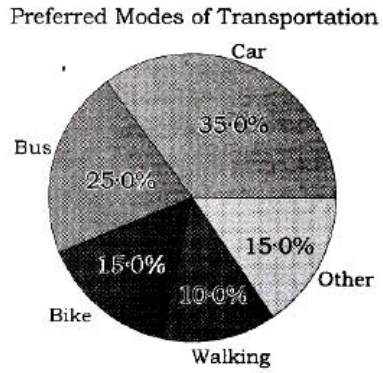


[A] 42%
[B] 48%
[C] 52%
[D] 55%

36. In a theatre with 12 rows of seats, each row has 20 seats. The first row is considered the front row and the last row is the back row. The following constraints apply:
Row 1 and Row 12 are reserved for VIP guests.
Rows 2–5 are reserved for premium seating.
Rows 6–11 are for general admission.
If a group of 8 friends wants to sit together in the general admission section, what is the maximum number of rows they can occupy?
[A] 2
[B] 3
[C] 4
[D] 6

37. In how many ways can the letters of the word 'ADDERA' be arranged so that the vowels (A, E) are always together and the same order as in the original word?
[A] 720
[B] 480
[C] 360
[D] 240

38. In a recent survey, students from two colleges, Alpha and Beta, were asked about their preferred modes of transportation. The results are shown in the pie chart below.



[A] More students from Alpha college prefer to walk or bike compared to those from Beta college
[B] A higher percentage of students from Beta college prefer to take the bus compared to those from Alpha college
[C] The majority of students from both colleges prefer to travel by car
[D] There is no significant difference in preferred modes of transportation between the two colleges

39. In a family, A is the father of B, C is the sister of B, D is the son of C and E is the daughter of B. If F is the husband of D's maternal grandmother, how is F related to E?
[A] Grandfather
[B] Father
[C] Uncle
[D] Brother-in-law

40. Choose the group which is different from the others.
[A] [37, 51, 61, 71]
[B] [23, 53, 61, 89]
[C] [13, 41, 59, 73]
[D] [13, 19, 37, 61]

41. Calculate the number of trailing zeros in the factorial of 1000.
[A] 249
[B] 250
[C] 248
[D] 245

42. The average score of 8 students in a math test is 82. If 3 more students join the class and the new average score becomes 78, what is the sum of the scores of the 3 new students?
[A] 186
[B] 198
[C] 202
[D] 222

43. If KOZRM stands for PLAIN and NLFHV stands for MOUSE, what does GJZXY stand for?
[A] CRAZE
[B] SLATE
[C] GRACE
[D] TRACE

44. If the word 'TRATH' is represented by OSUUT and 'BOUNCE' is represented by CPQEDF, which of the following represents 'RIGHT' using the same pattern?
[A] MPNKFB
[B] DJJUBV
[C] SIZUN
[D] MVUNVJ

45. A man from Chennai was found murdered on the afternoon of the 2nd of October. His wife immediately called the police. The police questioned his wife and staff and got their alibi. The wife said she was sleeping. The maid said she was cooking breakfast. The driver said he went to the bank to deposit a cheque. The police then arrested one person among these four for further questioning on the basis of their lying to the police. Who was this person?
[A] The wife
[B] The driver
[C] The butler
[D] The cook

46. If MIRROR is coded as 4 and ABSENTEE as 6, then what is the code for ENVELOPE?
[A] 6
[B] 4
[C] 2
[D] None of the above

47. If 'Mou not mok' means 'Pigeon is dead'; 'Bot mok mei' means 'Ship is sinking'; 'Rao tok dek' means 'She isn't dead'; then which of the following words stands for 'Pigeon'?
[A] Bot
[B] Nok
[C] Mou
[D] Brot

Direction: For questions numbered 48 to 52, you will be given certain premises and a conclusion. Assuming that the premises are completely true, find whether the conclusion is:
[A] Valid
[B] Invalid
[C] Inconclusive
[D] None of the above

48. Premises:
All cats love to eat fish.
All peacocks are cats.
Conclusion:
All peacocks love to eat fish.
[A] Valid
[B] Invalid
[C] Inconclusive
[D] None of the above

49. Premises:
All men have beards.
Everyone with a beard owns a sword.
Ishan does not have a beard.
Conclusion:
Ishan has a sword.
[A] Valid
[B] Invalid
[C] Inconclusive
[D] None of the above

50. Premises:
If a house is dirty, the residents are unemployed.
The house is not dirty.
Conclusion:
The residents have jobs.
[A] Valid
[B] Invalid
[C] Inconclusive
[D] None of the above

51. Premises:
All cars run on petrol.
The BMW Beetle does not run on petrol.
Conclusion:
The BMW Beetle is not a car.
[A] Valid
[B] Invalid
[C] Inconclusive
[D] None of the above

52. Premises:
All cakes take a long time to be made.
Pizza takes a long time to be made.
Conclusion:
Pizza is a cake.
[A] Valid
[B] Invalid
[C] Inconclusive
[D] None of the above

53. What is Charles Darwin's observation of different species of finches with specialized beaks on the Galapagos Islands considered to be an example of?
[A] Selective breeding
[B] Genetic mutation
[C] Natural selection
[D] Convergent evolution

54. In optics, the refractive index of a medium is the ratio of the speed of light in a vacuum to its speed within that medium. It indicates how much the path of light bends as it enters the material. Which of the following has the highest refractive index?
[A] Diamond
[B] Air
[C] Water
[D] Ethanol

55. What was the primary toxic gas released during the Bhopal Gas Tragedy of 1984?
[A] Carbon monoxide
[B] Methyl isocyanate
[C] Ammonia
[D] Sulfur dioxide

56. Which of the following is not one of the laws of inheritance proposed by Gregor Mendel?
[A] Law of Dominance
[B] Law of Segregation
[C] Law of Independent Assortment
[D] Law of Anomaly

57. The relationship between mangroves and bacteria of the genus *Rhizobium* is best characterized as:
[A] Parasitism
[B] Mutualism

[C] Competition
[D] Commensalism

58. Which of the following best describes light pollution?
[A] The excessive or misdirected use of artificial light that negatively impacts the environment and visibility of the night sky
[B] The presence of harmful ultraviolet rays in sunlight
[C] The use of high-powered lights in industrial operations
[D] The natural reflection of sunlight by the moon

59. What is the SI unit for resistance?
[A] Becquerel
[B] Volt
[C] Joule
[D] Ohm

60. Monotremes are mammals of the order *Monotremata*. They are the only group of living mammals that lay eggs, rather than bearing live young. The only animals that belong to this order are the platypus and the:
[A] Kangaroo
[B] Echidna
[C] Koala
[D] Opossum

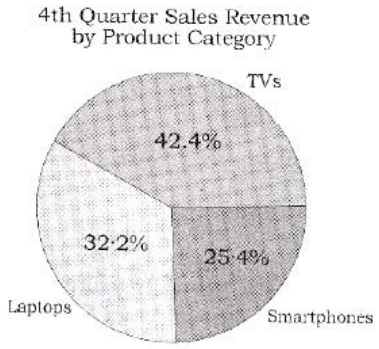
61. Albert Einstein received the Nobel Prize in Physics in 1921 for his work on which phenomenon?
[A] Quantum tunnelling
[B] The photoelectric effect
[C] General relativity
[D] None of the above

62. Which of the following is not a noble gas?
[A] Helium
[B] Sulfur
[C] Neon
[D] Argon

63. Was the year 1900 a leap year?
[A] No
[B] Yes
[C] It was a regular year
[D] It had 366 days

64. Which one of the following will have maximum change in its value if 1 is added both to the numerator and the denominator of the fractions 3/4, 2/9, 3/7?
[A] ¾
[B] 2/9
[C] 2/3
[D] 5/7

65. What is the percentage of the total sales revenue generated by laptops in the electronics store during the 4th quarter?



[A] 40–5%
[B] 32–2%
[C] 31–7%
[D] 25–4%

66. In a non-leap year, how many days are there between March 15 and September 30, excluding these two days?
[A] 199
[B] 200
[C] 198
[D] 201

67. A bike travels from place X to place Y at an average speed of 6 km/hr. It then travels back to place X from place Y at an average speed of 4 km/hr. What is the average speed for the entire journey?
[A] Lies between 4 and 5 km/hr
[B] Lies between 5 and 6 km/hr
[C] Lies between 6 and 7 km/hr
[D] Lies between 7 and 8 km/hr

68. The average age of 2 teachers and 6 students is 14 years. All the 6 students are of same age. If the 2 teachers are of same age, then the age of a student is?
[A] 34 years
[B] 36 years
[C] 32 years
[D] 33 years

69. The letters from A to Z are numbered from 1 to 26 respectively. If HQ = 113 and AE = 26, then what is CE equal to?

[A] 70
[B] 42
[C] 34
[D] 88

70. If today is January 1, 2023, what date will be 366 days from now?
[A] January 2, 2024
[B] January 1, 2024
[C] December 31, 2023
[D] January 3, 2024

71. If the word “MAZE” is encoded as “8193”, then what is the code for the word “HOPE” using the same encoding pattern?
[A] 8765
[B] 8764
[C] 8766
[D] 8763

72. If in a particular year 2nd June is a Thursday, then which one of the following is correct?
[A] 16th December is a Wednesday if the year is not a leap year
[B] 28th June is a Tuesday if the year is not a leap year
[C] 28th June is a Tuesday if the year is a leap year
[D] 16th December is a Wednesday if the year is a leap year

73. One page is torn from a booklet whose pages are numbered starting from 1. The sum of the numbers on the remaining pages is 198. The torn page contains which of the following numbers?
[A] (9, 20)
[B] (15, 16)
[C] (16, 17)
[D] (18, 19)

74. If in a certain code, the first letter is replaced by its position in the English alphabet, the second letter by the next number, and so on, what is the code for “MAZE”?
[A] 13,1,26,5
[B] 13,2,26,4
[C] 13,1,25,5
[D] 12,1,26,5

75. Two friends A and B are going to play hide and seek. Currently they are standing at the same position. A runs towards North for 20 m and B runs towards South for 15 m. A then runs towards West for 40 m and B runs towards East for 10 m. A then runs towards North for 15 m and B also runs towards North for 50 m. How far are the two friends from each other now?
[A] 0 m
[B] 35 m
[C] 50 m
[D] 60 m

76. There are two parallel rows with 6 people seated in each row. In the first row, P, Q, R, S, T and U are seated such that P and U are at the extreme ends. In the second row, V, W, X, Y, Z and A are seated in a way that V is seated exactly opposite to U and A is seated exactly opposite to P. S is seated third from the right end in the first row. X is seated fourth from the left end in the second row. How many people are seated between Z and the person seated opposite to R?
[A] 2
[B] 1
[C] 3
[D] 4

77. A frog tries to come out of a dried well 30.0 m deep with slippery walls. Every time the frog jumps 70 cm, it slides down 30 cm. What is the minimum number of jumps required for the frog to come out of the well?
[A] 78
[B] 76
[C] 75
[D] 73

78. Find the number of trailing zeros in the expression given below:
(25!)^2 x (16!)^2 x (12!) x (9!) x (6!)
[A] 60
[B] 54
[C] 66
[D] 72

79. If in a certain code, the number 5 is represented by 'A', 4 by 'B', 3 by 'C', 2 by D' and 1 by 'E', what is the code for the number 2341?
[A] DBEA
[B] ADEB
[C] BEAD
[D] DCBE

80. In a circular arrangement, there are 10 people facing the centre - Aman, Bina, Chetan, Divya, Ekta, Farid, Gita, Hiral, Ishaan and Jaya. Aman sits third to the right of Divya. Bina sits second to the right of Ishaan. Chetan sits diametrically opposite to Aman. Farid sits third to the left of Gita, who is

not an immediate neighbour of Hiral. What are exactly between Farid and Chetan?
[A] Jaya
[B] Aman
[C] Divya
[D] Ishaan