

HTJ-5

Seat Number

A

Question Paper
Code

Time: 60 Minutes Maximum Marks: 100

Important Instructions:

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- Candidate must submit OMR sheet to invigilator after completion of exam.
- Under no circumstances should the candidate carry the question paper and OMR SHEET out of the examination room.

Other Instructions:

1. This question paper has a total of 100 questions. The answers to the questions have to be given in the OMR SHEET given to you.
2. Each question is given four options A, B, C and D. The answer to each question is one of A, B, C and D.
For example, (1) Who is the Prime Minister of India?
(A) Manmohan Singh (B) Narendra Modi (C) Amit Shah (D) Rajnath Singh
In the answer sheet (OMR SHEET)



The answer in the above example is "B". Hence the circle of "B" is darkened.

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1. A train 200 meters long passes a pole in 10 seconds. What is the speed of the train?
 (A) 10 m/s (B) 15 m/s
 (C) 20 m/s (D) 25 m/s
2. A table shows the monthly savings of 5 employees: 200, 300, 400, 500, 600. What is the median savings?
 (A) 300 (B) 400
 (C) 450 (D) 500
3. Choose the next figure in the sequence:
 ● → ● → ○ → ? ● → ● → ○ → ?
 (A) ● (B) ○
 (C) • (D) ■
4. 150 people attended a seminar. 90 attended Session A, 80 attended Session B, and 40 attended both. How many attended only one session?
 (A) 90 (B) 100
 (C) 110 (D) 120
5. In a group of 100 people, 60 like tea, 50 like coffee, and 20 like both. How many like neither?
 (A) 10 (B) 20
 (C) 30 (D) 40
6. The present age ratio of A and B is 4:5. After 5 years, the ratio will be 5:6. What is A's age?
 (A) 20 (B) 25
 (C) 30 (D) 35
7. In a survey of 120 students, 50 study Mathematics, 70 study Science, and 30 study both subjects. How many students study only one subject?
 (A) 20 (B) 50
 (C) 60 (D) 70
8. Complete the series:
 1 → 4 → 9 → 16 → ? 1 → 4 → 9 → 16 → ?
 (A) 20 (B) 25
 (C) 36 (D) 49
9. The sum of the ages of a father and son is 60. Four years ago, the father's age was three times the son's age. What is the son's age?
 (A) 12 (B) 17
 (C) 18 (D) 20
10. A father is 5 times as old as his son. In 10 years, he will be 3 times as old as his son. What is the present age of the father?
 (A) 30 (B) 40
 (C) 50 (D) 60
11. A line graph shows monthly revenue: Jan: 200, Feb: 300, Mar: 250, Apr: 350, May: 300. What is the average revenue?
 (A) 250 (B) 260
 (C) 280 (D) 300
12. Can you determine the value of xx?
 Statement 1: $2x+5=15$
 Statement 2: x is an integer.
 (A) Only 1 is sufficient. (B) Only 2 is sufficient.
 (C) Both are sufficient. (D) Insufficient data.
13. Pointing to a man, a woman said, "His brother's father is my father's son." How is the woman related to the man?
 (A) Sister (B) Cousin
 (C) Niece (D) Aunt
14. Pointing to a photograph, a woman says, "He is the son of my only son's mother." How is the man related to the woman?
 (A) Son (B) Grandson
 (C) Husband (D) Nephew
15. A bar chart shows sales for 5 months: Jan: 30, Feb: 40, Mar: 50, Apr: 60, May: 70. What is the percentage increase in sales from Jan to May?
 (A) 100% (B) 110%
 (C) 133.33% (D) 150%
16. If $x : y = 3 : 4$ and $y : z = 5 : 6$, find $x : y : z$.
 (A) 15:20:24 (B) 10:15:18
 (C) 12:15:18 (D) 15:18:20
17. If the cost price of 15 items equals the selling price of 12 items, find the profit percentage.
 (A) 20% (B) 25%
 (C) 30% (D) 40%
18. A man buys an article for ₹1,200 and sells it for ₹1,500. What is the profit percentage?
 (A) 20% (B) 25%
 (C) 30% (D) 35%

19. Solve for x : $2x + 5 = 3x - 10$.
 (A) $x = 15$ (B) $x = 5$
 (C) $x = -5$ (D) $x = 10$
20. A car travels 240 km in 4 hours. If its speed is increased by 20%, how much time will it take for the same distance?
 (A) 3 hours (B) 3.5 hours
 (C) 4 hours (D) 2.5 hours
21. Find the sum of the first 10 terms of an AP where the first term is 3 and the common difference is 2.
 (A) 80 (B) 90
 (C) 120 (D) 110
22. A invests ₹5,000 and B invests ₹6,000 in a business. At the end of the year, they make a profit of ₹11,000. What is B's share?
 (A) ₹6,000 (B) ₹6,500
 (C) ₹5,500 (D) ₹4,500
23. If 15 workers can build a wall in 10 days, how long will 25 workers take?
 (A) 4 days (B) 6 days
 (C) 5 days (D) 7 days
24. If the ratio of A's age to B's age is 4:5, and their total age is 45, what is A's age?
 (A) 20 (B) 22
 (C) 24 (D) 18
25. 40% of a number is 20. What is 60% of the same number?
 (A) 25 (B) 30
 (C) 35 (D) 40
26. A price of a shirt was increased by 20%, and then a discount of 10% was given. What is the net percentage change?
 (A) 10% increase (B) 8% increase
 (C) 8% decrease (D) 12% increase
27. Two trains, 150 m and 225 m long, cross each other in 15 seconds when traveling in opposite directions. Find their relative speed.
 (A) 20 m/s (B) 25 m/s
 (C) 30 m/s (D) 35 m/s
28. Find the smallest number that, when divided by 12, 15, and 18, leaves a remainder of 4.
 (A) 184 (B) 180
 (C) 220 (D) 236
29. The average of five consecutive numbers is 27. What is the largest number?
 (A) 29 (B) 30
 (C) 31 (D) 32
30. The average of 8 numbers is 24. If one number is excluded, the average becomes 22. Find the excluded number.
 (A) 32 (B) 40
 (C) 38 (D) 48
31. Which of the following is a Fundamental Duty as per Article 51A of the Indian Constitution?
 (A) To protect and improve the environment (B) To ensure equality among citizens
 (C) To guarantee justice to all (D) To promote harmony and brotherhood
32. In case of the absence of both the President and the Vice President, who acts as the President of India?
 (A) Prime Minister (B) Chief Justice of India
 (C) Speaker of Lok Sabha (D) Attorney General of India
33. Which article of the Indian Constitution states that the "State shall strive to promote welfare of the people"?
 (A) Article 36 (B) Article 37
 (C) Article 38 (D) Article 39
34. Which of the following Fundamental Rights cannot be suspended during a National Emergency?
 (A) Right to Equality (B) Right to Freedom
 (C) Right to Constitutional Remedies (D) Right to Life and Personal Liberty
35. Which of the following words were added to the Preamble of the Indian Constitution by the 42nd Amendment Act, 1976?
 (A) Sovereign, Democratic, Republic (B) Socialist, Secular, Integrity
 (C) Liberty, Equality, Fraternity (D) Justice, Liberty, Equality
36. Which mission has been launched by the Government of India to eliminate sickle cell anemia by 2047?
 (A) National Health Mission (B) Sickle Cell Anemia Elimination Mission
 (C) Ayushman Bharat Health Initiative (D) National Genetic Disease Eradication Program
37. Which state inaugurated the world's largest solar park, the Shakti Sthala, in 2023?
 (A) Rajasthan (B) Gujarat
 (C) Karnataka (D) Madhya Pradesh
38. What is the name of India's first indigenously developed 5G network?
 (A) BharatNet (B) GaganyaanNet
 (C) Bharat 5G (D) Made-in-India 5G

39. Which city hosted the G20 Summit in 2023 under India's presidency?
 (A) Bengaluru (B) Delhi
 (C) Mumbai (D) Chennai
40. Which country won the ICC Cricket T20 World Cup 2024?
 (A) England (B) Australia
 (C) India (D) South Africa
41. Fill in the blank with the correct article:
 I saw _____ owl sitting on the tree.
 (A) an (B) a
 (C) the (D) No article
42. Identify the part of speech for the underlined word:
 "The children played happily in the park."
 (A) Noun (B) Adjective
 (C) Adverb (D) Preposition
43. "તેની મા ઘરે છે." માં કઈ વિભક્તિ છે?
 (A) ત્રીજી (B) પહેલી
 (C) બીજી (D) સાતમી
44. કયું વિસર્ગ છે?
 (A) અઃ (B) અં
 (C) અહ (D) અઃ
45. "જાજન" શબ્દ કયા સમાસનું ઉદાહરણ છે?
 (A) ઢંઢ (B) તત્પુરુષ
 (C) બહુબ્રીહિ (D) અવ્યયીભાવ
46. The slope of a ground surface is determined using which of the following formulas?
 (A) $(\text{Vertical Distance} / \text{Horizontal Distance}) \times 100$ (B) $(\text{Horizontal Distance} / \text{Vertical Distance}) \times 100$
 (C) $(\text{Vertical Distance} \times \text{Horizontal Distance})$ (D) $(\text{Vertical Distance} / \text{Total Distance}) \times 100$
47. What is the primary function of Differential Global Positioning System (DGPS) compared to a standard GPS?
 (A) Measure longer distances (B) Improve positional accuracy
 (C) Provide 3D modelling (D) Enhance real-time data collection
48. Which of the following is NOT an advantage of using UAVs in surveying?
 (A) Cost-effectiveness for small projects (B) High-resolution data collection
 (C) Reduced human involvement in data acquisition (D) Ability to perform precise leveling
49. In GIS, a raster data model represents:
 (A) Point features as lines (B) Geographic features using grid cells
 (C) Vector shapes with attribute data (D) Digital contours in 3D
50. Which method of contouring involves determining contour points by interpolation between measured values?
 (A) Trigonometric levelling (B) Direct contouring
 (C) Indirect contouring (D) Aerial contouring
51. Which instrument is most suitable for measuring both horizontal and vertical angles with high accuracy during a topographic survey?
 (A) Dumpy Level (B) Total Station
 (C) Theodolite (D) Handheld GPS
52. Which of the following technologies is used to generate high-resolution Digital Elevation Models (DEMs) from airborne platforms?
 (A) LIDAR (B) GIS
 (C) UAV (D) DGPS
53. Which remote sensing method uses thermal radiation to analyze surface temperatures?
 (A) Passive remote sensing (B) Active remote sensing
 (C) Thermal infrared remote sensing (D) Hyperspectral remote sensing
54. In the Indian context, which organization is primarily responsible for creating and maintaining topographic maps?
 (A) Geological Survey of India (GSI) (B) Survey of India (SOI)
 (C) National Remote Sensing Centre (NRSC) (D) Indian Space Research Organisation (ISRO)
55. What is a significant advantage of using Computer-Aided Drawing (CAD) for map preparation?
 (A) Reduced need for survey data (B) Automated land area measurement and plotting
 (C) Elimination of manual data validation (D) Real-time integration with satellite images
56. Which of the following is NOT an essential element of a map?
 (A) Title (B) Legend
 (C) Map layout software version (D) Scale

57. Which type of map scale is most suitable for understanding relationships over large geographic areas?
 (A) Numerical scale (B) Large-scale map
 (C) Small-scale map (D) Graphical scale
58. Which of the following notations is commonly used in the discipline of maps for representing rivers?
 (A) Solid black lines (B) Dotted blue lines
 (C) Blue curved lines (D) Green dashed lines
59. Which of the following factors most significantly influences the bearing capacity of soil?
 (A) Soil compaction method (B) Depth of groundwater table
 (C) Type of vegetation on the soil (D) Mineral composition of the soil
60. Which of the following is NOT a method for soil compaction?
 (A) Dynamic compaction (B) Vibro-compaction
 (C) Electroosmosis (D) Freeze-thaw cycling
61. Which of the following is NOT a method of artificial groundwater recharge?
 (A) Injection wells (B) Percolation tanks
 (C) Check dams (D) Surface irrigation
62. A watershed is defined as:
 (A) The area covered by a river and its tributaries (B) The area of land draining to a common outlet
 (C) The groundwater table beneath a river basin (D) A region defined by rainfall distribution
63. Artificial groundwater recharge is most effective in which type of soil?
 (A) Sandy soil (B) Silty soil
 (C) Clayey soil (D) Loamy soil
64. Which term refers to the underground zone where all the pores are completely filled with water?
 (A) Vadose zone (B) Water table
 (C) Saturated zone (D) Perched water table
65. Which type of soil stabilization involves adding lime to improve strength?
 (A) Mechanical stabilization (B) Chemical stabilization
 (C) Bituminous stabilization (D) Electrical stabilization
66. Which of the following systems is widely used for rating green buildings in India?
 (A) LEED (Leadership in Energy and Environmental Design) (B) GRIHA (Green Rating for Integrated Habitat Assessment)
 (C) BREEAM (Building Research Establishment Environmental Assessment Method) (D) WELL Building Standard
67. The primary cause of water pollution in urban areas is:
 (A) Agricultural runoff (B) Industrial effluents
 (C) Domestic sewage (D) Overfishing
68. Which of the following is NOT a component of a natural ecosystem?
 (A) Producers (B) Consumers
 (C) Decomposers (D) Industrial emissions
69. Which of the following is NOT included in an environmental audit?
 (A) Waste management practices (B) Air quality analysis
 (C) Financial profitability of the project (D) Resource consumption evaluation
70. Which of the following is the most environmentally sustainable practice for managing solid waste?
 (A) Landfilling (B) Open burning
 (C) Recycling and reuse (D) Incineration
71. The acceptable noise level for residential areas during nighttime as per WHO guidelines is:
 (A) 55 dB (B) 45 dB
 (C) 35 dB (D) 65 dB
72. Which of the following pollutants contributes the most to global warming?
 (A) Sulfur dioxide (SO₂) (B) Nitrous oxide (N₂O)
 (C) Carbon dioxide (CO₂) (D) Methane (CH₄)
73. Which process in an ecosystem is responsible for recycling nutrients from dead organisms back into the soil?
 (A) Photosynthesis (B) Decomposition
 (C) Predation (D) Respiration
74. Which of the following is the most effective structural feature for making buildings earthquake-resistant?
 (A) Solid and rigid foundation (B) Use of heavy materials
 (C) Flexible joints and base isolators (D) Use of thin walls
75. Which of the following materials is most suitable for constructing earthquake-resistant buildings?
 (A) Ordinary brick and mortar (B) Reinforced concrete with steel
 (C) Glass-reinforced plastic (D) Heavy natural stones
76. Which structural characteristic minimizes damage during cyclones or hurricanes?
 (A) High roof pitches (B) Strong vertical members
 (C) Aerodynamic building shapes (D) Lightweight materials

77. Which of the following disasters is NOT directly linked to seismic activity?
 (A) Tsunamis (B) Floods
 (C) Landslides (D) Cyclones
78. What is the primary reason for liquefaction during an earthquake?
 (A) Vibrations causing landslides (B) Excess pore water pressure in saturated soils
 (C) Weak structural materials in buildings (D) Fault rupture at the surface
79. What is the most critical design consideration for earthquake-resistant masonry structures?
 (A) Use of brittle materials (B) Heavy walls to counter vibrations
 (C) Proper reinforcement and ductility (D) Thick mortar joints for binding
80. Which factor is NOT considered in the geometric design of a road?
 (A) Traffic volume (B) Climatic conditions
 (C) Vehicle speed and dimensions (D) Nearby land use patterns
81. Which of the following is the most critical factor in determining road alignment?
 (A) Cost of construction (B) Geometric design standards
 (C) Topography of the area (D) Availability of construction materials
82. The design speed of a highway influences all the following except:
 (A) Horizontal alignment (B) Pavement thickness
 (C) Superelevation (D) Sight distance
83. Which of the following is NOT included in a traffic volume study?
 (A) Peak hour factor (B) Average Daily Traffic (ADT)
 (C) Modal split analysis (D) Vehicle classification
84. Which of the following is a primary disadvantage of rigid pavements compared to flexible pavements?
 (A) Higher maintenance cost (B) Low initial cost
 (C) Susceptibility to temperature variations (D) Difficulty in accommodating future traffic
85. The **Cost Approach** for property valuation is calculated as:
 (A) Replacement cost minus depreciation (B) Market value plus time value of money
 (C) Future rental income multiplied by interest rate (D) Assessed land value divided by economic life
86. In Rate Analysis, which of the following is NOT considered a factor affecting rates?
 (A) Market price fluctuations (B) Availability of materials and labor
 (C) Seasonal variations (D) Property rights of the contractor
87. A **leasehold property** refers to:
 (A) Property owned outright by an individual (B) Property rented on a monthly basis
 (C) Property held under a long-term lease agreement (D) Property used for agricultural purposes
88. The **Income Approach** for property valuation is most suitable for:
 (A) Agricultural land (B) Residential buildings
 (C) Commercial properties generating rental income (D) Vacant plots
89. Which of the following factors does NOT directly affect the value of land?
 (A) Accessibility to infrastructure (B) Environmental conditions
 (C) Construction material costs (D) Legal restrictions
90. What does the term **Time Value of Money (TVM)** signify in property valuation?
 (A) Money grows over time due to inflation. (B) The present worth of money is higher than its future worth.
 (C) Money decreases in value over time due to depreciation. (D) Property value increases only in favorable economic conditions.
91. Which of the following is NOT a purpose of estimation in civil engineering?
 (A) Preparing tenders (B) Determining project feasibility
 (C) Identifying project risks (D) Computing construction costs
92. Which of the following documents is NOT part of a standard tendering process?
 (A) Notice Inviting Tender (NIT) (B) Bill of Quantities (BOQ)
 (C) Letter of Acceptance (LOA) (D) Feasibility Study Report
93. Which of the following safety equipment is most commonly used for working at height in construction projects?
 (A) Welding helmets (B) Safety harnesses
 (C) Noise-canceling headphones (D) Safety gloves
94. Which of the following is NOT a factor affecting material management?
 (A) Storage and handling (B) Weather conditions
 (C) Supplier relationship (D) Building layout design
95. Which of the following technologies is most commonly associated with **smart construction management**?
 (A) Blockchain (B) LiDAR scanning
 (C) Machine Learning (ML) (D) All of the above
96. Which of the following technologies is a cornerstone for achieving **net-zero energy buildings**?
 (A) Passive solar design (B) Artificial intelligence systems
 (C) Wind turbines (D) All of the above

97. Which recent advancement is commonly used for **monitoring real-time construction progress**?
- (A) UAVs (Drones) (B) Traditional surveying instruments
(C) Augmented Reality (AR) (D) Geotagging
98. In the field of **soil stabilization**, what is the primary benefit of using **geosynthetics**?
- (A) Increased compaction (B) Improved load-bearing capacity and drainage
(C) Reduced time for excavation (D) Lowering the cost of lime or cement
99. Which modern tool is widely used for **real-time traffic management** in urban areas?
- (A) Internet of Things (IoT) sensors (B) LiDAR mapping systems
(C) Smart RFID tags (D) Digital twin models
100. Which recent development in **green building materials** significantly reduces carbon emissions during construction?
- (A) Fiber-reinforced polymers (B) Carbon-cured concrete
(C) Recycled asphalt pavements (D) Fly ash bricks

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 - (C) Vehicle speed and dimensions
 - (D) Nearby land use patterns
18. Which of the following is the most critical factor in determining road alignment?
 - (A) Cost of construction
 - (B) Geometric design standards
 - (C) Topography of the area
 - (D) Availability of construction materials
19. Which of the following is a primary disadvantage of rigid pavements compared to flexible pavements?
 - (A) Higher maintenance cost
 - (B) Low initial cost
 - (C) Susceptibility to temperature variations
 - (D) Difficulty in accommodating future traffic
20. The design speed of a highway influences all the following except:
 - (A) Horizontal alignment
 - (B) Pavement thickness
 - (C) Superelevation
 - (D) Sight distance

21. Which of the following is NOT included in a traffic volume study?
 - (A) Peak hour factor
 - (B) Average Daily Traffic (ADT)
 - (C) Modal split analysis
 - (D) Vehicle classification
22. Which of the following is the most effective structural feature for making buildings earthquake-resistant?
 - (A) Solid and rigid foundation
 - (B) Use of heavy materials
 - (C) Flexible joints and base isolators
 - (D) Use of thin walls
23. What is the most critical design consideration for earthquake-resistant masonry structures?
 - (A) Use of brittle materials
 - (B) Heavy walls to counter vibrations
 - (C) Proper reinforcement and ductility
 - (D) Thick mortar joints for binding
24. Which of the following disasters is NOT directly linked to seismic activity?
 - (A) Tsunamis
 - (B) Floods
 - (C) Landslides
 - (D) Cyclones
25. What is the primary reason for liquefaction during an earthquake?
 - (A) Vibrations causing landslides
 - (B) Excess pore water pressure in saturated soils
 - (C) Weak structural materials in buildings
 - (D) Fault rupture at the surface
26. Which structural characteristic minimizes damage during cyclones or hurricanes?
 - (A) High roof pitches
 - (B) Strong vertical members
 - (C) Aerodynamic building shapes
 - (D) Lightweight materials
27. Which of the following materials is most suitable for constructing earthquake-resistant buildings?
 - (A) Ordinary brick and mortar
 - (B) Reinforced concrete with steel
 - (C) Glass-reinforced plastic
 - (D) Heavy natural stones
28. The primary cause of water pollution in urban areas is:
 - (A) Agricultural runoff
 - (B) Industrial effluents
 - (C) Domestic sewage
 - (D) Overfishing
29. Which of the following is NOT a component of a natural ecosystem?
 - (A) Producers
 - (B) Consumers
 - (C) Decomposers
 - (D) Industrial emissions
30. Which process in an ecosystem is responsible for recycling nutrients from dead organisms back into the soil?
 - (A) Photosynthesis
 - (B) Decomposition
 - (C) Predation
 - (D) Respiration
31. Which of the following is the most environmentally sustainable practice for managing solid waste?
 - (A) Landfilling
 - (B) Open burning
 - (C) Recycling and reuse
 - (D) Incineration
32. Which of the following is NOT included in an environmental audit?
 - (A) Waste management practices
 - (B) Air quality analysis
 - (C) Financial profitability of the project
 - (D) Resource consumption evaluation
33. The acceptable noise level for residential areas during nighttime as per WHO guidelines is:
 - (A) 55 dB
 - (B) 45 dB
 - (C) 35 dB
 - (D) 65 dB
34. Which of the following pollutants contributes the most to global warming?
 - (A) Sulfur dioxide (SO₂)
 - (B) Nitrous oxide (N₂O)
 - (C) Carbon dioxide (CO₂)
 - (D) Methane (CH₄)
35. Which of the following systems is widely used for rating green buildings in India?
 - (A) LEED (Leadership in Energy and Environmental Design)
 - (B) GRIHA (Green Rating for Integrated Habitat Assessment)
 - (C) BREEAM (Building Research Establishment Environmental Assessment Method)
 - (D) WELL Building Standard
36. Which of the following is NOT a method for soil compaction?
 - (A) Dynamic compaction
 - (B) Vibro-compaction
 - (C) Electroosmosis
 - (D) Freeze-thaw cycling
37. Which term refers to the underground zone where all the pores are completely filled with water?
 - (A) Vadose zone
 - (B) Water table
 - (C) Saturated zone
 - (D) Perched water table
38. Which of the following factors most significantly influences the bearing capacity of soil?
 - (A) Soil compaction method
 - (B) Depth of groundwater table
 - (C) Type of vegetation on the soil
 - (D) Mineral composition of the soil
39. A watershed is defined as:
 - (A) The area covered by a river and its tributaries
 - (B) The area of land draining to a common outlet
 - (C) The groundwater table beneath a river basin
 - (D) A region defined by rainfall distribution
40. Artificial groundwater recharge is most effective in which type of soil?
 - (A) Sandy soil
 - (B) Silty soil
 - (C) Clayey soil
 - (D) Loamy soil

41. Which of the following is NOT a method of artificial groundwater recharge?
 (A) Injection wells (B) Percolation tanks
 (C) Check dams (D) Surface irrigation
42. Which type of soil stabilization involves adding lime to improve strength?
 (A) Mechanical stabilization (B) Chemical stabilization
 (C) Bituminous stabilization (D) Electrical stabilization
43. Which type of map scale is most suitable for understanding relationships over large geographic areas?
 (A) Numerical scale (B) Large-scale map
 (C) Small-scale map (D) Graphical scale
44. In the Indian context, which organization is primarily responsible for creating and maintaining topographic maps?
 (A) Geological Survey of India (GSI) (B) Survey of India (SOI)
 (C) National Remote Sensing Centre (NRSC) (D) Indian Space Research Organisation (ISRO)
45. What is a significant advantage of using Computer-Aided Drawing (CAD) for map preparation?
 (A) Reduced need for survey data (B) Automated land area measurement and plotting
 (C) Elimination of manual data validation (D) Real-time integration with satellite images
46. Which of the following notations is commonly used in the discipline of maps for representing rivers?
 (A) Solid black lines (B) Dotted blue lines
 (C) Blue curved lines (D) Green dashed lines
47. Which of the following is NOT an essential element of a map?
 (A) Title (B) Legend
 (C) Map layout software version (D) Scale
48. What is the primary function of Differential Global Positioning System (DGPS) compared to a standard GPS?
 (A) Measure longer distances (B) Improve positional accuracy
 (C) Provide 3D modelling (D) Enhance real-time data collection
49. Which of the following technologies is used to generate high-resolution Digital Elevation Models (DEMs) from airborne platforms?
 (A) LIDAR (B) GIS
 (C) UAV (D) DGPS
50. In GIS, a raster data model represents:
 (A) Point features as lines (B) Geographic features using grid cells
 (C) Vector shapes with attribute data (D) Digital contours in 3D
51. The slope of a ground surface is determined using which of the following formulas?
 (A) $(\text{Vertical Distance} / \text{Horizontal Distance}) \times 100$ (B) $(\text{Horizontal Distance} / \text{Vertical Distance}) \times 100$
 (C) $(\text{Vertical Distance} \times \text{Horizontal Distance})$ (D) $(\text{Vertical Distance} / \text{Total Distance}) \times 100$
52. Which instrument is most suitable for measuring both horizontal and vertical angles with high accuracy during a topographic survey?
 (A) Dumpy Level (B) Total Station
 (C) Theodolite (D) Handheld GPS
53. Which remote sensing method uses thermal radiation to analyze surface temperatures?
 (A) Passive remote sensing (B) Active remote sensing
 (C) Thermal infrared remote sensing (D) Hyperspectral remote sensing
54. Which method of contouring involves determining contour points by interpolation between measured values?
 (A) Trigonometric levelling (B) Direct contouring
 (C) Indirect contouring (D) Aerial contouring
55. Which of the following is NOT an advantage of using UAVs in surveying?
 (A) Cost-effectiveness for small projects (B) High-resolution data collection
 (C) Reduced human involvement in data acquisition (D) Ability to perform precise leveling
56. કયું વિસર્ગ છે?
 (A) અઃ (B) અં
 (C) અહ (D) અઠ્ઠ
57. "જાજન" શબ્દ કયા સમાસનું ઉદાહરણ છે?
 (A) ક્રંદ (B) તત્પુરુષ
 (C) બહુબ્રીહિ (D) અવ્યયીભાવ
58. "તેની મા ઘરે છે." માં કઈ વિભક્તિ છે?
 (A) ત્રીજી (B) પહેલી
 (C) બીજી (D) સાતમી

59. Identify the part of speech for the underlined word:
"The children played happily in the park."
(A) Noun (B) Adjective
(C) Adverb (D) Preposition
60. Fill in the blank with the correct article:
I saw _____ owl sitting on the tree.
(A) an (B) a
(C) the (D) No article
61. Which city hosted the G20 Summit in 2023 under India's presidency?
(A) Bengaluru (B) Delhi
(C) Mumbai (D) Chennai
62. Which country won the ICC Cricket T20 World Cup 2024?
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(C) To guarantee justice to all (D) To promote harmony and brotherhood
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70. Which of the following words were added to the Preamble of the Indian Constitution by the 42nd Amendment Act, 1976?
(A) Sovereign, Democratic, Republic (B) Socialist, Secular, Integrity
(C) Liberty, Equality, Fraternity (D) Justice, Liberty, Equality
71. If the ratio of A's age to B's age is 4:5, and their total age is 45, what is A's age?
(A) 20 (B) 22
(C) 24 (D) 18
72. Solve for x: $2x + 5 = 3x - 10$.
(A) $x = 15$ (B) $x = 5$
(C) $x = -5$ (D) $x = 10$
73. The average of five consecutive numbers is 27. What is the largest number?
(A) 29 (B) 30
(C) 31 (D) 32
74. A price of a shirt was increased by 20%, and then a discount of 10% was given. What is the net percentage change?
(A) 10% increase (B) 8% increase
(C) 8% decrease (D) 12% increase
75. If the cost price of 15 items equals the selling price of 12 items, find the profit percentage.
(A) 20% (B) 25%
(C) 30% (D) 40%
76. A man buys an article for ₹1,200 and sells it for ₹1,500. What is the profit percentage?
(A) 20% (B) 25%
(C) 30% (D) 35%
77. If 15 workers can build a wall in 10 days, how long will 25 workers take?
(A) 4 days (B) 6 days
(C) 5 days (D) 7 days
78. Two trains, 150 m and 225 m long, cross each other in 15 seconds when traveling in opposite directions. Find their relative speed.
(A) 20 m/s (B) 25 m/s
(C) 30 m/s (D) 35 m/s

79. A car travels 240 km in 4 hours. If its speed is increased by 20%, how much time will it take for the same distance?
 (A) 3 hours (B) 3.5 hours
 (C) 4 hours (D) 2.5 hours
80. If $x : y = 3 : 4$ and $y : z = 5 : 6$, find $x : y : z$.
 (A) 15:20:24 (B) 10:15:18
 (C) 12:15:18 (D) 15:18:20
81. 40% of a number is 20. What is 60% of the same number?
 (A) 25 (B) 30
 (C) 35 (D) 40
82. A invests ₹5,000 and B invests ₹6,000 in a business. At the end of the year, they make a profit of ₹11,000. What is B's share?
 (A) ₹6,000 (B) ₹6,500
 (C) ₹5,500 (D) ₹4,500
83. The average of 8 numbers is 24. If one number is excluded, the average becomes 22. Find the excluded number.
 (A) 32 (B) 40
 (C) 38 (D) 48
84. Find the sum of the first 10 terms of an AP where the first term is 3 and the common difference is 2.
 (A) 80 (B) 90
 (C) 120 (D) 110
85. Find the smallest number that, when divided by 12, 15, and 18, leaves a remainder of 4.
 (A) 184 (B) 180
 (C) 220 (D) 236
86. A bar chart shows sales for 5 months: Jan: 30, Feb: 40, Mar: 50, Apr: 60, May: 70. What is the percentage increase in sales from Jan to May?
 (A) 100% (B) 110%
 (C) 133.33% (D) 150%
87. A father is 5 times as old as his son. In 10 years, he will be 3 times as old as his son. What is the present age of the father?
 (A) 30 (B) 40
 (C) 50 (D) 60
88. 150 people attended a seminar. 90 attended Session A, 80 attended Session B, and 40 attended both. How many attended only one session?
 (A) 90 (B) 100
 (C) 110 (D) 120
89. A line graph shows monthly revenue: Jan: 200, Feb: 300, Mar: 250, Apr: 350, May: 300. What is the average revenue?
 (A) 250 (B) 260
 (C) 280 (D) 300
90. A train 200 meters long passes a pole in 10 seconds. What is the speed of the train?
 (A) 10 m/s (B) 15 m/s
 (C) 20 m/s (D) 25 m/s
91. Can you determine the value of xx ?
 Statement 1: $2x+5=15$
 Statement 2: x is an integer.
 (A) Only 1 is sufficient. (B) Only 2 is sufficient.
 (C) Both are sufficient. (D) Insufficient data.
92. Pointing to a photograph, a woman says, "He is the son of my only son's mother." How is the man related to the woman?
 (A) Son (B) Grandson
 (C) Husband (D) Nephew
93. Choose the next figure in the sequence:
 $\bullet \rightarrow \bullet \rightarrow \circ \rightarrow ? \rightarrow \bullet \rightarrow \bullet \rightarrow \circ \rightarrow ?$
 (A) \bullet (B) \circ
 (C) \bullet (D) \blacksquare
94. Complete the series:
 $1 \rightarrow 4 \rightarrow 9 \rightarrow 16 \rightarrow ? \rightarrow 1 \rightarrow 4 \rightarrow 9 \rightarrow 16 \rightarrow ?$
 (A) 20 (B) 25
 (C) 36 (D) 49
95. In a group of 100 people, 60 like tea, 50 like coffee, and 20 like both. How many like neither?
 (A) 10 (B) 20
 (C) 30 (D) 40
96. Pointing to a man, a woman said, "His brother's father is my father's son." How is the woman related to the man?
 (A) Sister (B) Cousin
 (C) Niece (D) Aunt

97. In a survey of 120 students, 50 study Mathematics, 70 study Science, and 30 study both subjects. How many students study only one subject?
- (A) 20 (B) 50
(C) 60 (D) 70
98. The present age ratio of A and B is 4:5. After 5 years, the ratio will be 5:6. What is A's age?
- (A) 20 (B) 25
(C) 30 (D) 35
99. The sum of the ages of a father and son is 60. Four years ago, the father's age was three times the son's age. What is the son's age?
- (A) 12 (B) 17
(C) 18 (D) 20
100. A table shows the monthly savings of 5 employees: 200, 300, 400, 500, 600. What is the median savings?
- (A) 300 (B) 400
(C) 450 (D) 500

HTJ-5

Seat Number

C

Question Paper
Code

Time: 60 Minutes Maximum Marks: 100

Important Instructions:

- Do not open the Question Paper unless instructed to do so.
- Candidate must submit OMR sheet to invigilator after completion of exam.
- Under no circumstances should the candidate carry the question paper and OMR SHEET out of the examination room.

Other Instructions:

1. This question paper has a total of 100 questions. The answers to the questions have to be given in the OMR SHEET given to you.
2. Each question is given four options A, B, C and D. The answer to each question is one of A, B, C and D.
For example, (1) Who is the Prime Minister of India?
(A) Manmohan Singh (B) Narendra Modi (C) Amit Shah (D) Rajnath Singh
In the answer sheet (OMR SHEET)



The answer in the above example is "B". Hence the circle of "B" is darkened.

3. The method of evaluating the OMR Sheet with more than one option will not be considered.
4. Type your application number in the space provided at the top of this page. Write and sign your name at the bottom of the page. Candidate should not write his application number except in the space provided in the OMR SHEET. The signature of both the candidate and the invigilator in the OMR SHEET is mandatory. Candidates with OMR SHEET without signature of candidate and invigilator will be disqualified.
5. It is forbidden to leave the examination room from the beginning to the end of the examination. Gossiping, shouting or violating the invigilator's instructions during the examination will be considered as misconduct.
6. Check the number of questions, pages of the question paper exactly as per the instructions printed on the cover page. Defective question paper which has less questions / pages is reprinted twice, if there is any difference in sequence or any other, get another good question paper from the invigilator immediately. This work should be done by the candidate within five minutes of starting the examination. Afterwards, the question paper will not be changed and any additional period will not be given.
7. Carefully read the instructions given backside of the OMR SHEET and first page of question booklet. Rough work to be done on question booklet only.
8. Candidates who make any attempt to establish their identity with any kind of identification mark, text, alphabet mark in the examination answers will be disqualified.
9. Candidate should use only **black ball point pen** in OMR SHEET. No other ink or pen or pencil or white ink should be used and any corrections made with white ink, blade or rubber or any other means shall not be evaluated.
10. Candidates are prohibited from carrying or using any type of handwritten, book or paper note, calculator, mobile phone, or any other type of electronic equipment in the examination room / hall except call letter. If a candidate is found to be doing so, they will be disqualified

Undertaking

I have carefully read and understood all the above mentioned instructions and agree to abide by the same.

Candidate's Signature: _____

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95.	Which of the following technologies is most commonly associated with smart construction management ? (A) Blockchain (B) LiDAR scanning (C) Machine Learning (ML) (D) All of the above
96.	In the field of soil stabilization , what is the primary benefit of using geosynthetics ? (A) Increased compaction (B) Improved load-bearing capacity and drainage (C) Reduced time for excavation (D) Lowering the cost of lime or cement

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HTJ-5

Seat Number

D

Question Paper
Code

Time: 60 Minutes Maximum Marks: 100

Important Instructions:

- Do not open the Question Paper unless instructed to do so.
- Candidate must submit OMR sheet to invigilator after completion of exam.
- Under no circumstances should the candidate carry the question paper and OMR SHEET out of the examination room.

Other Instructions:

1. This question paper has a total of 100 questions. The answers to the questions have to be given in the OMR SHEET given to you.
2. Each question is given four options A, B, C and D. The answer to each question is one of A, B, C and D. For example, (1) Who is the Prime Minister of India?
(A) Manmohan Singh (B) Narendra Modi (C) Amit Shah (D) Rajnath Singh
In the answer sheet (OMR SHEET)



The answer in the above example is "B". Hence the circle of "B" is darkened.

3. The method of evaluating the OMR Sheet with more than one option will not be considered.
4. Type your application number in the space provided at the top of this page. Write and sign your name at the bottom of the page. Candidate should not write his application number except in the space provided in the OMR SHEET. The signature of both the candidate and the invigilator in the OMR SHEET is mandatory. Candidates with OMR SHEET without signature of candidate and invigilator will be disqualified.
5. It is forbidden to leave the examination room from the beginning to the end of the examination. Gossiping, shouting or violating the invigilator's instructions during the examination will be considered as misconduct.
6. Check the number of questions, pages of the question paper exactly as per the instructions printed on the cover page. Defective question paper which has less questions / pages is reprinted twice, if there is any difference in sequence or any other, get another good question paper from the invigilator immediately. This work should be done by the candidate within five minutes of starting the examination. Afterwards, the question paper will not be changed and any additional period will not be given.
7. Carefully read the instructions given backside of the OMR SHEET and first page of question booklet. Rough work to be done on question booklet only.
8. Candidates who make any attempt to establish their identity with any kind of identification mark, text, alphabet mark in the examination answers will be disqualified.
9. Candidate should use only **black ball point pen** in OMR SHEET. No other ink or pen or pencil or white ink should be used and any corrections made with white ink, blade or rubber or any other means shall not be evaluated.
10. Candidates are prohibited from carrying or using any type of handwritten, book or paper note, calculator, mobile phone, or any other type of electronic equipment in the examination room / hall except call letter. If a candidate is found to be doing so, they will be disqualified

Undertaking

I have carefully read and understood all the above mentioned instructions and agree to abide by the same.

Candidate's Signature: _____

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 (C) બીજી (D) સાતમી
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 (A) ધ્વંજ (B) તત્પુરુષ
 (C) બહુબ્રીહિ (D) અવ્યયીભાવ
58. કયું વિસર્ગ છે?
 (A) અઃ (B) અં
 (C) અહ (D) અઃ

59. Fill in the blank with the correct article:
I saw _____ owl sitting on the tree.
- (A) an (B) a
(C) the (D) No article
60. Identify the part of speech for the underlined word:
"The children played happily in the park."
- (A) Noun (B) Adjective
(C) Adverb (D) Preposition
61. Which state inaugurated the world's largest solar park, the Shakti Sthala, in 2023?
- (A) Rajasthan (B) Gujarat
(C) Karnataka (D) Madhya Pradesh
62. What is the name of India's first indigenously developed 5G network?
- (A) BharatNet (B) GaganyaanNet
(C) Bharat 5G (D) Made-in-India 5G
63. Which city hosted the G20 Summit in 2023 under India's presidency?
- (A) Bengaluru (B) Delhi
(C) Mumbai (D) Chennai
64. Which mission has been launched by the Government of India to eliminate sickle cell anemia by 2047?
- (A) National Health Mission (B) Sickle Cell Anemia Elimination Mission
(C) Ayushman Bharat Health Initiative (D) National Genetic Disease Eradication Program
65. Which country won the ICC Cricket T20 World Cup 2024?
- (A) England (B) Australia
(C) India (D) South Africa
66. Which of the following is a Fundamental Duty as per Article 51A of the Indian Constitution?
- (A) To protect and improve the environment (B) To ensure equality among citizens
(C) To guarantee justice to all (D) To promote harmony and brotherhood
67. Which article of the Indian Constitution states that the "State shall strive to promote welfare of the people"?
- (A) Article 36 (B) Article 37
(C) Article 38 (D) Article 39
68. Which of the following words were added to the Preamble of the Indian Constitution by the 42nd Amendment Act, 1976?
- (A) Sovereign, Democratic, Republic (B) Socialist, Secular, Integrity
(C) Liberty, Equality, Fraternity (D) Justice, Liberty, Equality
69. In case of the absence of both the President and the Vice President, who acts as the President of India?
- (A) Prime Minister (B) Chief Justice of India
(C) Speaker of Lok Sabha (D) Attorney General of India
70. Which of the following Fundamental Rights cannot be suspended during a National Emergency?
- (A) Right to Equality (B) Right to Freedom
(C) Right to Constitutional Remedies (D) Right to Life and Personal Liberty
71. A man buys an article for ₹1,200 and sells it for ₹1,500. What is the profit percentage?
- (A) 20% (B) 25%
(C) 30% (D) 35%
72. Two trains, 150 m and 225 m long, cross each other in 15 seconds when traveling in opposite directions. Find their relative speed.
- (A) 20 m/s (B) 25 m/s
(C) 30 m/s (D) 35 m/s
73. Find the smallest number that, when divided by 12, 15, and 18, leaves a remainder of 4.
- (A) 184 (B) 180
(C) 220 (D) 236
74. A invests ₹5,000 and B invests ₹6,000 in a business. At the end of the year, they make a profit of ₹11,000. What is B's share?
- (A) ₹6,000 (B) ₹6,500
(C) ₹5,500 (D) ₹4,500
75. If 15 workers can build a wall in 10 days, how long will 25 workers take?
- (A) 4 days (B) 6 days
(C) 5 days (D) 7 days
76. Solve for x: $2x + 5 = 3x - 10$.
- (A) $x = 15$ (B) $x = 5$
(C) $x = -5$ (D) $x = 10$
77. A car travels 240 km in 4 hours. If its speed is increased by 20%, how much time will it take for the same distance?
- (A) 3 hours (B) 3.5 hours
(C) 4 hours (D) 2.5 hours
78. A price of a shirt was increased by 20%, and then a discount of 10% was given. What is the net percentage change?
- (A) 10% increase (B) 8% increase
(C) 8% decrease (D) 12% increase

79. If the ratio of A's age to B's age is 4:5, and their total age is 45, what is A's age?
 (A) 20 (B) 22
 (C) 24 (D) 18
80. The average of 8 numbers is 24. If one number is excluded, the average becomes 22. Find the excluded number.
 (A) 32 (B) 40
 (C) 38 (D) 48
81. If the cost price of 15 items equals the selling price of 12 items, find the profit percentage.
 (A) 20% (B) 25%
 (C) 30% (D) 40%
82. If $x : y = 3 : 4$ and $y : z = 5 : 6$, find $x : y : z$.
 (A) 15:20:24 (B) 10:15:18
 (C) 12:15:18 (D) 15:18:20
83. The average of five consecutive numbers is 27. What is the largest number?
 (A) 29 (B) 30
 (C) 31 (D) 32
84. 40% of a number is 20. What is 60% of the same number?
 (A) 25 (B) 30
 (C) 35 (D) 40
85. Find the sum of the first 10 terms of an AP where the first term is 3 and the common difference is 2.
 (A) 80 (B) 90
 (C) 120 (D) 110
86. Pointing to a man, a woman said, "His brother's father is my father's son." How is the woman related to the man?
 (A) Sister (B) Cousin
 (C) Niece (D) Aunt
87. A father is 5 times as old as his son. In 10 years, he will be 3 times as old as his son. What is the present age of the father?
 (A) 30 (B) 40
 (C) 50 (D) 60
88. Pointing to a photograph, a woman says, "He is the son of my only son's mother." How is the man related to the woman?
 (A) Son (B) Grandson
 (C) Husband (D) Nephew
89. The sum of the ages of a father and son is 60. Four years ago, the father's age was three times the son's age. What is the son's age?
 (A) 12 (B) 17
 (C) 18 (D) 20
90. The present age ratio of A and B is 4:5. After 5 years, the ratio will be 5:6. What is A's age?
 (A) 20 (B) 25
 (C) 30 (D) 35
91. A table shows the monthly savings of 5 employees: 200, 300, 400, 500, 600. What is the median savings?
 (A) 300 (B) 400
 (C) 450 (D) 500
92. Can you determine the value of xx ?
 Statement 1: $2x+5=15$
 Statement 2: x is an integer.
 (A) Only 1 is sufficient. (B) Only 2 is sufficient.
 (C) Both are sufficient. (D) Insufficient data.
93. In a survey of 120 students, 50 study Mathematics, 70 study Science, and 30 study both subjects. How many students study only one subject?
 (A) 20 (B) 50
 (C) 60 (D) 70
94. Complete the series:
 $1 \rightarrow 4 \rightarrow 9 \rightarrow 16 \rightarrow ? \rightarrow 1 \rightarrow 4 \rightarrow 9 \rightarrow 16 \rightarrow ?$
 (A) 20 (B) 25
 (C) 36 (D) 49
95. In a group of 100 people, 60 like tea, 50 like coffee, and 20 like both. How many like neither?
 (A) 10 (B) 20
 (C) 30 (D) 40
96. A train 200 meters long passes a pole in 10 seconds. What is the speed of the train?
 (A) 10 m/s (B) 15 m/s
 (C) 20 m/s (D) 25 m/s
97. Choose the next figure in the sequence:
 $\bullet \rightarrow \bullet \rightarrow \circ \rightarrow ? \rightarrow \bullet \rightarrow \bullet \rightarrow \circ \rightarrow ?$
 (A) \bullet (B) \circ
 (C) \bullet (D) \blacksquare

98. 150 people attended a seminar. 90 attended Session A, 80 attended Session B, and 40 attended both. How many attended only one session?
- (A) 90 (B) 100
(C) 110 (D) 120
99. A bar chart shows sales for 5 months: Jan: 30, Feb: 40, Mar: 50, Apr: 60, May: 70. What is the percentage increase in sales from Jan to May?
- (A) 100% (B) 110%
(C) 133.33% (D) 150%
100. A line graph shows monthly revenue: Jan: 200, Feb: 300, Mar: 250, Apr: 350, May: 300. What is the average revenue?
- (A) 250 (B) 260
(C) 280 (D) 300