School of Planning and Architecture, Bhopal
Written Test for the Post of Technical Officer
Date of Examination: 29.11.2023

Max. Marks. 100   **Duration: 2 hours**

Name of the Candidate: **Roll No. of the Candidate:**

_____   _____

1. Mark 'Cross' (X) for your selected option on the answer sheet provided along with the Question Paper.
2. If more than one option is marked for a question using ('Cross' (X)), that question/answer will not be considered for evaluation.
3. Ensure that the symbol 'Cross' (X) does not cross the box.
4. Write 'Cross' (X) legibly and clearly.
5. No other symbol apart from 'Cross' (X) shall be used for indicating your answer.
6. Your answer shall not be considered for evaluation if any other symbol apart from 'Cross' (X) is used.
7. Do not make any mark/ drawing or markings on the question/ answer sheet.
8. No candidate shall be permitted to leave the Examination Room/ Hall before the end of the examination.
9. Question/ Answer sheet will not be given back once the candidate submits the sheet.
10. There will be no negative marking for wrong answers.
11. Use only Black/ Blue Ball Point pen(s) for marking your option.
12. Mobile phones, electronic gadgets/materials are not allowed inside the examination Hall.
13. A separate sheet (page no.14) has been provided for rough work. No rough work is allowed on the question/ answer sheet or any other paper, other than the allocated space.
14. Furnish all information required on the question booklet such as Roll Number, Name of the candidate and signature, failing which the question booklet will not be evaluated. The candidate shall write only their Roll Number on the Answer Sheet.
15. Each question carries 1 mark.
16. A candidate must fill the number of boxes given at the end of the Answer Sheet.

Total no. pages: 14 + Answer Sheet   Questions attempted out of 100   [   ]

Signature of the candidate

Signature of the Invigilator

PART-A

Read the following passage and answer the questions (1-4) below:

Mary had always dreamed of becoming an astronaut. From a young age, she was fascinated by the stars and the mysteries of the universe. She spent countless hours reading about space exploration and conducting her own experiments in her backyard. Her determination led her to excel in math and science throughout school. As Mary entered her teenage years, her dream seemed more distant. She faced challenges and doubts from others who thought her goal was too ambitious. However, Mary preserved, seeking out mentors and opportunities to learn and grow. She earned a scholarship to a prestigious engineering university, where she continued to shine. After years of hard work and dedication, Mary finally achieved her dream. She was selected as one of the astronauts for a mission to Mars. The day of the launch arrived, and Mary felt a mix of excitement and nerves as she stepped into the spacecraft. As the rocket roared to life, she looked out the window, realizing that her childhood dream had become a reality.

1. Identify the sentence with the correct punctuation:
A) She couldn't believe her eyes
B) She couldn't believe her eyes, the surprise was overwhelming
C) She couldn't believe her eyes the surprise was overwhelming
D) She couldn't believe her eyes: the surprise was overwhelming

2. What is the antonym of "benevolent"?
A) Kind
B) Generous
C) Charitable
D) Malevolent

3. In the sentence "Although it was raining, she went for a walk," what type of clause is "Although it was raining"?
A) Independent clause
B) Dependent clause
C) Subordinate (or dependent) clause
D) Relative clause

4. Which preposition should be used to fill in the blank in the sentence:
"The book is _____ the table"?
A) in
B) on
C) by
D) at

5. The correct synonym for "Affluent" is
A) Poor
B) Friendly
C) Approachable
D) Prosperous

6. Which of the following sentences is grammatically incorrect?
A) She don't like to eat vegetables
B) He hasn't been to the museum before
C) They were playing soccer in the park
D) I have went to the store yesterdays

7. Choose the correct sentence with proper punctuation:
A) The concert was amazing.
B) The concert was amazing!
C) The concert was amazing?
D) The concert was amazing,

8. Select the word that is opposite in meaning to "Modest"
A) Conceited
B) Depreciated
C) Sullen
D) Intelligent

9. Find out which word or pair of words can be filled up in the blanks in the sentence in the same sequence to make it grammatically correct

Art still does not make it to news headlines, _____ the story has political _____.

A) up until, dispute
B) unless, ramifications
C) without, perspective
D) given, conclusion

10. He has been absent _____ Friday.
A) since
B) from
C) for
D) All are correct

11. In a survey, 40% of the respondents said they prefer coffee, 30% prefer tea, and the rest had no preference. If there were 500 respondents, how many had no preference?
A) 100
B) 150
C) 200
D) 250

12. If a triangle has angles measuring 30^0, 60^0 and 90^0, what type of triangle is it?
A) Equilateral
B) Isosceles
C) Scalene
D) Right

13. Solve for x in the equation $2x^3 - 5x^2 + 3x - 1 = 0$.
A) x = 1
B) x= -1
C) x = 1 or x = 1/2
D) x = 1/2

14. In a box plot (box-and-whisker plot), what does the box represent?
A) The interquartile range
B) The mean of the data
C) The standard deviation
D) The median

15. Arithmetic mean between (a-b) and (a+b) is:
A) a
B) b
C) 2a
D) 0

16. The water consumption rate is in an apartment building with 70 families having an average family size of 5 persons is "135 litres per person per day". Assuming 80% of the total daily water requirement in the apartment is met from recycled water, then effective daily water requirement for the building from municipality would be .... litres.
A) 37,800
B) 9,450
C) 47,250
D) 10,500

17. A tradesman sold an article at a loss of 20%. If the selling price has been increased by Rs. 100/-. There would have been a gain of 5%. What was the cost price of the article?
A) 250
B) 300
C) 350
D) 400

18. How many seconds will a 500 m long train take to cross a man walking with a speed of 3km/hr in the direction of the moving train if the speed of the moving train is 63 km/hr?
A) 45   C) 30
B) 35   D) 32

19. Arjun is twice as efficient as Mohit and takes 90 days less than Mohit to complete the job. Find the time in which they can finish the job together.
A) 30 days   C) 60 days
B) 45 days   D) 90 days

20. Five bells commence ringing together and ring at intervals of 2, 4, 6, 8 and 10 seconds respectively. Find in 40 minutes, how many times do they ring together?
A) 16 times   C) 21 times
B) 19 times   D) 24 times

21. A man is facing South. He turns 135^0 in the anticlockwise direction and then 180^0 in the clockwise direction. Which direction is he facing now?

A) North - East   C) South - East
B) South - West   D) North - West

22. If 3x – 5 = 16, what is the value of x?
A) 3   C) 7
B) 7   D) 21

23. What is the next number in the series: 2, 6, 12, 20, ...?
A) 22   C) 36
B) 30   D) 40

24. Which of the following numbers is the smallest?
A) 0.75   C) 0.6
B) 1/2   D) 2/3

25. If Monday is two days before the day after tomorrow, what day is it today?
A) Monday   C) Wednesday
B) Tuesday   D) Sunday

26. Introducing a man, Neeraj said, "His wife is the only daughter of my wife". How is Neeraj related to that man?
A) Father   C) Father in Law
B) Grandfather   D) Son

27. Tanya is older than Eric. Cliff is older than Tanya. Eric is older than Cliff. If the first two statements are true, then the third statement is
A) True   C) Uncertain
B) False   D) None of the above

28. In each of the following questions, various terms of an alphabet series are given with one or more terms missing as shown by (?). Choose the missing terms out of the given alternatives.

OTE, PUF, QVG, RWH, ?

A) SYJ
B) TCI

C) SXJ
D) SXI

29. If word REASON is coded as 5 and word BELIEVED is coded as 7, then what is the code for word GOVERNMENT:

A) 9
B) 10

C) 8
D) None of the above

30. COBBLER : SHOE
A) Jockey : Horse
B) Contractor : Building

C) Mason : Chisel
D) Cowboy : Hat

31. What is the main objective of the "Pradhan Mantri Jan Dhan Yojana (PMJDY)" in India?
A) Promoting digital literacy
B) Providing healthcare services

C) Financial inclusion of every household
D) Encouraging entrepreneurship

32. Which river is often referred to as a "Ganga of the South"?
A) Yamuna
B) Godavari

C) Kaveri
D) Brahmaputra

33. What is the total number of Fundamental Duties mentioned in the Indian Constitution?
A) 10
B) 11

C) 12
D) 9

34. Fatehpur Sikri was founded as the capital of the Mughal Empire by ....
A) Aurangzeb
B) Humayun

C) Shah Jahan
D) Akbar

35. Which of the following are features of the object-oriented approach to databases?
A) The ability to represent the world in a non-geometric way
B) The need to split objects into their component parts
C) The ability to develop database models based on location rather than state and behaviour
D) The ability to develop more realistic models of the real world

36. Which of the following is NOT a Greenhouse Gas?
A) Chlorofluorocarbons (CFCs)
B) Hydrogen

C) Nitrous Oxide
D) Water Vapour

37. "Constitution Day" is celebrated on
A) 26 November
B) 23 November

C) 25 February
D) 15 January

38. What is the Latest GDP ranking of India in the World?
A) 31
B) 5

C) 8
D) 111

39. 'Mushkbudji' an aromatic rice variety recently received a Geographical Indication (GI) by Government of India. The above mentioned rice belonged to which of the following State or UT?
A) Assam
B) Puducherry

C) Jammu & Kashmir
D) Odisha

40. Which of the following is the highest peak of the Satpura Range?
A) Gurushikhar
B) Dhupgarh

C) Sad-Bhawna Shikhar
D) Nokrek Peak

PART -B

41. Which of the following is an interpolation method:
   A) INVERSE DISTANCE WEIGHTING
   B) TRIANGULAR IRREGULAR NETWORKS
   C) REGULARISED SPLINES WITH TENSION AND KRIGING
   D) All of the above

42. Which of the following may be caused by error in manual digitizing?
   i) Overshoot and undershoot
   ii) Fuzzyness
   iii) Wobble
   iv) Switch-backs
   v) Spikes

   A) i, iv and v   C) iii, iv and v
   B) ii, iii and v   D) i, ii and iii

43. What is the Maximum size of a table in PostgreSQL?
   A) 8TB   C) 32TB
   B) 16TB   D) 40TB

44. What will be the wavelength if the energy produced is 36J?
   A) $0.5*10^{-26}$m   C) $0.55*10^{-16}$m
   B) $0.55*10^{-26}$m   D) $0.55*10^{-6}$m

45. The Instantaneous Field Of View (IFOV) belong to
   A) Spatial Resolution   C) Radiometric Resolution
   B) Spectral Resolution   D) 40TBTemporal Resolution

46. What is meant by the term 'data quality'?
   A) The generalization present in the source data
   B) The lineage of the data
   C) The resolution of the data
   D) The inherent quality of the data as characterized by its accuracy, precision, bias, level of error, etc

47. Which statement below is NOT correct?
   A) Geostationary orbits typically have a rotation time of 90 min.
   B) Communication satellites typically use geostationary orbits.
   C) Geostationary satellites rotate at the same speed as the Earth.
   D) Geostationary satellites do not cover the whole Earth.

48. Microwave images have the advantages of-
   A) Snow-water study   C) Soil Moisture study
   B) Penetration through clouds   D) All of these

49. Which programming language is commonly used for geospatial programming and analysis?
A) Java
C) Python
B) C++
D) Ruby

50. What does the term "geocoding" refer to in the context of geospatial data?
A) Converting coordinates to street addresses
B) Adding elevation data to geographic features
C) Creating interactive web maps
D) Analyzing spatial relationships

51. Which technology is often used to obscure or protect individual identities in geospatial data?
A) Blockchain
C) Differential Privacy
B) Geofencing
D) SQL Injection

52. What does "Aadhar" refer to in the context of Indian government policies?
A) A government healthcare program
B) A Unique identification number for Indian residents
C) A tax filing system
D) A national transportation initiative

53. Which Indian government initiative focuses on the development and promotion of startup companies?
A) Skill India
C) Startup India
B) Make in India
D) Swachh Bharat Abhiyan

54. What is the main advantage of edge computing in comparison to cloud computing?
A) Lower cost
C) Unlimited storage capacity
B) Faster data processing
D) Improved security

55. What is the primary benefit of quantum computing over classical computing
A) Faster processing of traditional data
B) Enhanced cyber security
C) The ability to perform complex calculations at unprecedented speeds
D) Lower energy consumption

56. What is the primary goal of the Reserve Bank of India (RBI) in the context of financial regulations?
A) Promoting e-commerce platforms
B) Ensuring the security of Aadhaar data
C) Maintaining price stability and ensuring the stability of the financial system
D) Regulating the IT sector

57. Which technology trend is associated with the development of self-driving cars and drones?
A) Augmented Reality (AR)
C) Artificial Technology (AT)
B) Internet of Things (IoT)
D) Blockchain

58. Which of the following is NOT a common application of GIS?
   A) Environmental Impact Assessment
   B) Weather Forecasting
   C) Real Estate Management
   D) Video Game Development

59. What is the primary function of GIS software?
   A) Creating 3D models
   B) Managing and analyzing spatial data
   C) Editing text documents
   D) Playing multimedia files

60. What does GPS stand for in the context of GIS?
   A) Global Position System
   B) Geographic Positioning Software
   C) Geographic Projection System
   D) Global Pointing System

61. Which GIS component is responsible for storing geographic data in tabular form?
   A) Spatial Database
   B) Data Layer
   C) Attribute Table
   D) Cartographic Output

62. What does the term "Georeferencing" mean in GIS?
   A) Assigning geographic coordinates to a map or image
   B) Digitizing geographic features
   C) Creating thematic maps
   D) Converting raster to vector data

63. What is the purpose of the Digital India initiative launched by the Indian government?
   A) To promote digital currency
   B) To improve the digital literacy of the elderly population
   C) To transform India into a digitally empowered society and knowledge economy
   D) To regulate e-commerce platforms

64. Which of the following is a vector data format?
   A) GeoTIFF
   B) KML
   C) Shapefile
   D) TIFF

65. What is the purpose of a buffer in GIS?
   A) To reduce data size
   B) To smooth out the data
   C) To identify features within a specified distance of a location
   D) To create high-resolution maps

66. Which GIS tool is used for finding the shortest route between two locations on a network?
   A) Network Analysis
   B) Spatial Join
   C) Spatial Analysis
   D) Geocoding

67. What does LIDAR technology in GIS stand for?
   A) Light Detection and Ranging
   B) Land Information Data and Records
   C) Longitudinal Integrated Data for Area Mapping
   D) Laser Imaging and Detection for Augmented Reality

68. In GIS, what is a "Raster"?
  A) A type of vector data
  B) A grid of cells representing geographic features
  C) A graphical representation of GIS data
  D) A tool for digitizing maps

69. What is the purpose of a GIS query?
  A) To display maps
  B) To search for specific information within GIS data
  C) To create new GIS data
  D) To edit existing GIS data

70. What does DEM stand for in GIS?
  A) Digital Elevation Model
  B) Detailed Environmental Mapping
  C) Digitized Earth Measurements
  D) Dynamic Elevation Mapping

71. What does EDM, used for measurements, stand for?
  A) Electronic Datum Meter Measurement
  B) Electromagnetic Datum Miles Measurement
  C) Electromagnetic Distance Measurement
  D) Electrical Datum Module Measurement

72. Representative fraction (RF) used in mapping techniques, is defined as ....
  A) Length of an object in the drawing / Actual length of the object on site
  B) Length of an object in the drawing / Isometric length of the object
  C) Actual length of the object / Length of an object in the drawing
  D) Isometric length of the object / Length of an object in the drawing

73. Theodolite is an instrument used for measurement of ....
  A) Distance only
  B) Horizontal angles only
  C) Vertical angles only
  D) Both horizontal and vertical angles

74. Which among the following is not related to any GIS software?
  A) MapInfo
  B) ArcGIS
  C) ERDAS
  D) STAAD Pro

75. Which of the following command is used in AUTOCAD to create 3D solid between various cross sections?
  A) LOFT
  B) EXPLODE
  C) 3DSURF
  D) SURFACE

76. Which of the following type of projection is followed in the UTM (Universal Transverse Mercator)?
  A) Planar
  B) Conical
  C) Cylindrical
  D) Spherical

77. Which of the following is a file format of vector data model?
  A) PDF
  B) PCX
  C) EOO
  D) XLS

78. ArcGIS is product of ....
    A) ESRI   C) Infosys
    B) USGS   D) Survey of India

79. Attributes in GIS can be categorized as ....
    A) Normal   C) Conditional
    B) Ordinal   D) All of the above

80. Which of the four files that make up a shapefile in a GIS program, contains information about the coordinate system?
    A) .shx   C) .shp
    B) .prj   D) .dbf

81. What tab in Catalog displays the metadata, in a GIS program?
    A) Preview   C) Contents
    B) Properties   D) Description

82. The National Geospatial Policy of India was notified recently by the Ministry of Science and Technology, Govt of India, in the year..........
    A) 2021   C) 2023
    B) 2020   D) 2022

83. The process of associating a place name, an address, or information with map coordinates is known as: -
    A)   Geo-coding   C) Data Analysis
    B)   Data Acquisition   D) Data Processing

84. Branch of study of GIS data

    A)   Geographic information science   C)   Geographic Data
    B)   Geographic science   D)   None of the above

85. UAV stands for
    A)   Unmanned aerial vehicle   C) Unmanned air vehicle
    B)   Uni aerial vehicle   D) None of the above

86. What are main types of Datum when talking about surveying?
    A)   Geoid   C) None of the above
    B)   Ellipsoid   D) Both A & B

87. Association of data with some positions on the earth's surface by using a spatial reference system

    A)   Digitizing Process   C) Georeferencing
    B)   Geo-coding   D) Data Acquisition

88. What is the study and practice of making maps?

A) Geography   C) Mapping
B) Cartography   D) Projection

89. How many IRNSS satellites (NavIC) are placed in Geostationary Orbit?

A) 2   C) 4
B) 3   D) 5

90. TopoJSON offers advantages over GeoJSON by:

A) Including rich attribute data
B) Providing a more compact file size
C) Supporting 3D geospatial data
D) Offering a more human-readable structure

91. In the context of GIS, the OGC (Open Geospatial Consortium) standards primarily focus on:

A) Vector data formats   C) Interoperability and data sharing
B) Data encryption and security   D) Geodatabase management

92. Principal Component Analysis (PCA) is a technique used for:
A) Calculating the altitude of remote sensing platforms
B) Reducing the dimensionality of multiband remote sensing data
C) Determining the geographical coordinates of an image
D) Enhancing the spatial resolution of satellite image

93. What is a "mashup" in the context of WebGIS?
A) A type of map projection
B) The process of combining data from multiple sources to create a new application or visualiaition
C) A web-based chat service for GIS professionals
    A type of GPS tracking system

94. In PostgreSQl, what is the purpose of a "Schema"?

A) A schema defines a collection of related database objects and provides a namespace for them.
B) It is a back file format used to save database data.
C) Schemas are used to create user roles and privileges.
D) A schema is a specific data type in PostgreSQL.

95. Which of the following is NOT a key objective of the National Geospatial Policy 2022 of India?
A) To make geospatial data more accessible and affordable.
B) To promote the use of geospatial data for economic development.
C) To strengthen India's geospatial infrastructure and capabilities.
D) To project India' national security.

96. In remote sensing classification, which techniques is used to categorize each pixel in an image based on its proximity to the centroids of predefined classes?

A) Principle Component Analysis (PCA) C) Random Forest Classification
B) K-Means Clustering D) Neural Network Classification

97. Which topological relationship ensures that a polygon features is both within another polygon and shares at least one boundary with it?

A) Adjacency C) Connectivity
B) Containment D) Proximity

98. Which of the following is the nodal agency for the implementation of the Indian Governments's IT Policy?

A) Ministry of Electronics and Information Technology (MeitY)
B) National Informatics Centre (NIC)
C) Department of Telecommunications (DoT)
D) Indian Space Research Organization (ISRO)

99. How does the Minimum Noise Fraction (MNF) transformation improve the interpretability and analysis of hyperspectral imagery?

A) It increases the spatial resolution of the image.
B) In enhances the spectral resolution of the image.
C) It reduces the number of spectral bands in the image.
D) It de-correlates the bands and highlights meaningful information.

100. In QGIS, what is the purpose of the "Spatialite" database format?

A) To visualize 3D spatial data
B) To manage geospatial metadata
C) To store and query geospatial data in a lightweight SQL database
D) To create custom map compositions

ROLL NO. OF THE CANDIDATE:

Q.						Q.						Q.						Q.				
1	A	B				26			C			51	A	B	C	D		76	A	B	C	D
2				D		27		B				52	A	B	C	D		77	A	B	C	D
3			C			28				D		53	A	B	C	D		78	A	B	C	D
4		B				29	A					54	A	B	C	D		79	A	B	C	D
5				D		30		B				55	A	B	C	D		80	A	B	C	D
6	A					31			C			56	A	B	C	D		81	A	B	C	D
7	A	B				32		B	C			57	A	B	C	D		82	A	B	C	D
8	A					33		B				58	A	B	C	D		83	A	B	C	D
9		B				34				D		59	A	B	C	D		84	A	B	C	D
10	A					35	A			D		60	A	B	C	D		85	A	B	C	D
11		B				36		B				61	A	B	C	D		86	A	B	C	D
12				D		37	A					62	A	B	C	D		87	A	B	C	D
13						38		B				63	A	B	C	D		88	A	B	C	D
14	A					39			C			64	A	B	C	D		89	A	B	C	D
15	A					40		B				65	A	B	C	D		90	A	B	C	D
16		B				41				D		66	A	B	C	D		91	A	B	C	D
17		B				42	A	B	C	D		67	A	B	C	D		92	A	B	C	D
18	A					43	A	B	C	D		68	A	B	C	D		93	A	B	C	D
19			C			44	A	B	C	D		69	A	B	C	D		94	A	B	C	D
20			C			45	A	B	C	D		70	A	B	C	D		95	A	B	C	D
21		B				46	A	B	C	D		71	A	B	C	D		96	A	B	C	D
22		B	C			47	A	B	C	D		72	A	B	C	D		97	A	B	C	D
23		B				48	A	B	C	D		73	A	B	C	D		98	A	B	C	D
24		B				49	A	B	C	D		74	A	B	C	D		99	A	B	C	D
25		B				50	A	B	C	D		75	A	B	C	D		100	A	B	C	D

Total questions attempted by the candidates: _____

Number of answers marked more than one option _____

I hereby declare that the information given above is correct.

Signature of the candidate _____   Signature of the Invigilator_____