JAMMU AND KASHMIR PUBLIC SERVICE COMMISSION

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Subject: Conduct of Written Examination for the post of Scientific Assistant in Forest, Ecology & Environment Department - Provisional Answer Key thereof.

Notification No. PSC/Exam/S/2024/50
Dated: 29.08.2024

In pursuance of Rule 10(c) of the Jammu & Kashmir Public Service Commission (Conduct of Examination) Rules, 2022, as amended upto date, the Provisional Answer Key of Question Paper pertaining to the written examination for the post of **Scientific Assistant** held on **29.08.2024**, is hereby notified for seeking the objections from candidates.

Provisional Answer Key
SCIENTIFIC ASSISTANT

Test Booklet Question No. (Series A)		Test Booklet Question No. (Series A)		Test Booklet Question No. (Series A)	
Q1	D	Q14	B	Q27	A
Q2	B	Q15	C	Q28	A
Q3	D	Q16	B	Q29	B
Q4	B	Q17	B	Q30	C
Q5	C	Q18	A	Q31	B
Q6	B	Q19	D	Q32	C
Q7	B	Q20	A	Q33	B
Q8	B	Q21	C	Q34	B
Q9	B	Q22	D	Q35	A
Q10	B	Q23	A	Q36	C
Q11	B	Q24	C	Q37	C
Q12	A	Q25	C	Q38	D
Q13	B	Q26	D	Q39	D

Test Booklet Question No. (Series A)		Test Booklet Question No. (Series A)		Test Booklet Question No. (Series A)	
Q40	B	Q61	B	Q82	D
Q41	D	Q62	B	Q83	D
Q42	C	Q63	C	Q84	D
Q43	D	Q64	D	Q85	C
Q44	A	Q65	B	Q86	B
Q45	C	Q66	A	Q87	A
Q46	B	Q67	B	Q88	B
Q47	B	Q68	B	Q89	D
Q48	B	Q69	D	Q90	A
Q49	A	Q70	C	Q91	A
Q50	A	Q71	B	Q92	D
Q51	A	Q72	B	Q93	A
Q52	D	Q73	C	Q94	D
Q53	B	Q74	D	Q95	D
Q54	B	Q75	D	Q96	C
Q55	C	Q76	A	Q97	B
Q56	B	Q77	C	Q98	B
Q57	B	Q78	C	Q99	C
Q58	A	Q79	D	Q100	B
Q59	A	Q80	A		
Q60	D	Q81	B		
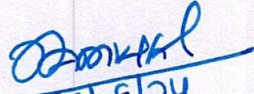
The candidates are advised to refer to **Question Booklet (Series A)** to match the corresponding question(s) in their respective Question Booklet Series and if any candidate feels that the key to any of the question(s) is/are wrong, he/she may represent on prescribed format/proforma annexed as **Annexure-A** along with the documentary proof/evidence **(hard copies only)** and fee of Rs.500/- per question in the form of Demand Draft drawn in favour of **COE, J&K PSC** (refundable in case of genuine/correct representation) to the Controller of Examinations, Jammu & Kashmir Public Service Commission, from 30.08.2024 to 03.09.2024.**The candidates are further advised to clearly mention the question(s) objected to with reference to its serial number as it appears in the Question Booklet of Series A of the provisional answer key.**

Further, any objection/application not accompanied by the requisite Demand Draft of Rs.500/- as prescribed, shall not be considered/entertained under any circumstances. Candidates are, in their own interest, advised to adhere to these instructions and not submit any objection unaccompanied by the Demand Draft as required under extant rules.

The Commission shall not entertain any such representation(s) after the expiry of the stipulated period i.e. **after 03.09.2024 (Tuesday), 05.00 pm**.

The provisional answer key is available on the website of the Commission http://www.jkpsc.nic.in.

29/08/24

(Sachin Jamwal) JKAS
Controller of Examinations
J&K Public Service Commission

No. PSC/Ex-Secy/2024/37   Dated: 29.08.2024
Copy to the: -
1. Director, Information and Public Relations, J&K for publication of the notice in all leading newspapers published from Jammu/Srinagar.
2. P.S. to Hon'ble Chairman, J&K Public Service Commission for information of the Hon'ble Chairman.
3. P.S. to Hon'ble Member, Shri _____ for information of the Hon'ble Member.
4. P. A. to Secretary, J&K Public Service Commission for information of the Secretary.
5. Main file/Stock file/Notice Board.

Representation regarding objection(s) to any Question/Answer pertaining to the Written Examination for the post of Scientific Assistant in Forest, Ecology & Environment Department held on 29.08.2024

(NOTE: USE SEPARATE FORMS FOR SEPARATE QUESTIONS)

Name of the Applicant   : _____

Roll No.   : _____

Correspondence Address : _____

Contact/Mobile No. :   _____

Date of Application: _____ 2024

Demand Draft No. date :   _____

Candidates Account No.(16 digit) & IFSC Code :_____

_____

Question No. in Series A	Details of the Objection	Resource Material (copy to be enclosed)	Details of the Website (if any)

Correct Answer/Option as per candidate :

Signature of the Candidate

Note: Application for each question/answer shall be made on separate page in the given format, otherwise the first question entered in the format shall only be considered.

Booklet Serial No. **221237**

TEST BOOKLET
SCIENTIFIC ASSISTANT
Written Test - 2024
(25)

A

Time Allowed: Two Hours   *Maximum Marks: 100*

INSTRUCTIONS

1. IMMEDIATELY AFTER THE COMMENCEMENT OF THE EXAMINATION, YOU SHOULD CHECK THAT THIS TEST BOOKLET *DOES NOT* HAVE ANY UNPRINTED OR TORN OR MISSING PAGES OR ITEMS, ETC. IF SO, GET IT REPLACED BY A COMPLETE TEST BOOKLET.

2. **Please note that it is the candidate's responsibility to encode and fill in the Roll Number and Test Booklet Series Code A, B, C or D carefully and without any omission or discrepancy at the appropriate places in the OMR Answer /Response Sheet. Any omission/discrepancy will render the Response Sheet liable for rejection.**

3. You have to enter your Roll Number on the Test Booklet in the Box provided alongside. *DO NOT* write *anything else* on the Test Booklet.

4. This Test booklet contains **100** items (questions). Each item comprises of four responses (answers). You will select the response which you want to mark on the Answer Sheet/Response Sheet. In case you feel that there is more than one correct response, mark the response which you consider the best. In any case, choose *ONLY ONE* response for each item.

5. You have to mark all your responses *ONLY* on the separate Answer /Response Sheet provided. *See directions in the Response Sheet.*

6. *All* items carry equal marks.

7. Before you proceed to mark in the Answer /Response Sheet, the response to various items in the Test Booklet, you have to fill in some particulars in the Answer /Response Sheet as per instructions sent to you with your Admission Certificate.

8. After you have completed filling in all your responses on the Response Sheet and the examination has concluded, you should hand over to the Invigilator *only the Answer /Response Sheet*. You are permitted to take away with you the Test Booklet and *Candidate's Copy of the Response Sheet .*

9. Sheets for rough work are appended in the Test Booklet at the end.

10. While writing Centre, Subject and Roll No. on the top of the Answer Sheet/Response Sheet in appropriate boxes use **"ONLY BALL POINT PEN"**.

11. **Penalty for wrong answers:**
    THERE WILL BE PENALTY FOR WRONG ANSWERS MARKED BY THE CANDIDATE IN THE WRITTEN TEST (OBJECTIVE TYPE QUESTIONS PAPERS).
    (i)   There are four alternatives for the answer to every question. For each question for which a wrong answer has been given by the candidate, **(0.25)** of the marks assigned to that question will be deducted as penalty.
    (ii) If a candidate gives more than one answer, it will be treated as a **wrong answer** even if one of the given answers happens to be correct and there will be same penalty as above for that question.
    (iii) If a question is left blank, i.e., no answer is given by the candidate, there will be **no penalty** for that question.

(25)(A)   (2)

1. Which of the following electromagnetic waves has the longest wavelength?

   A) Gamma rays.

   B) Microwaves.

   C) X-rays.

   D) Radio waves

2. The blue color of the sky during daytime is primarily due to which type of scattering by the atmosphere?

   A) Absorption scattering

   B) Rayleigh scattering

   C) Mie scattering

   D) Non-coherent scattering

3. **Assertion:** All objects, regardless of temperature, emit electromagnetic radiation across all wavelengths.

   Reason: Radiation laws describe the relationship between an object's temperature and the peak wavelength of its emitted radiation.

   A) Assertion is False, Reason is False.

   B) Assertion is True, Reason is True.

   C) Assertion is True, Reason is False.

   D) Assertion is False, Reason is True.

4. Healthy vegetation has a _____ reflectance in the green part of the electromagnetic spectrum compared to other wavelengths.

   A) Lower

   B) Higher

   C) Mixed

   D) None of these

5. _____ refers to the total amount of electromagnetic energy received by a surface per unit area.

   A)   Backscatter

   B)   Emittance

   C)   Irradiance

   D)   None of these

6. **Assertion:** Dry soil has a higher reflectance in the visible and near-infrared (VNIR) region of the electromagnetic spectrum compared to wet soil.

   Reason: Water absorbs strongly in the VNIR region.

   A)   Assertion is False, Reason is False.

   B)   Assertion is True, Reason is True.

   C)   Assertion is True, Reason is False.

   D)   Assertion is False, Reason is True.

7. Match the columns:

   Column - 1

   i)   Healthy Vegetation

   ii) Water

   iii) Bare Soil

   iv) Snow

   Column - 2

   1)   Low reflectance across most of the visible spectrum

   2)   Low reflectance in near-infrared (NIR)

   3)   High reflectance in near-infrared (NIR)

   4)   High reflectance in visible region

   A)   i-1, ii-2, iii-3, iv-4

   B)   i-3, ii-2, iii-1, iv-4

   C)   i-3, ii-1, iii-4, iv-2

   D)   i-2, ii-3, iii-1, iv-4

8. Sun-synchronous orbits are a specific type of polar orbit with the additional characteristic of:

A) Maintaining a constant altitude above the Earth's surface

B) Always crossing the equator at the same local time.

C) Providing high-resolution stereo imagery.

D) Being used primarily for communication purposes.

9. According to Kepler's First Law, the path of a planet orbiting the Sun is:

A) A perfect circle with the Sun at the center.

B) An ellipse with the Sun at one focus.

C) A straight line with the Sun at one end.

D) A random, unpredictable path.

10. The NISAR satellite actually uses two different radar wavelengths. What are the two primary wavelengths used by NISAR?

A) Ultraviolet and infrared

B) L-band and S-band

C) X-band and K-band

D) Microwave and radio

11. Active forest fire is effectively generated with _____.

A) $2.0 \, \mu m$

B) $3.9 \mu m$

C) $15.0 \, \mu m$

D) None of these

12. Scatterometer, sensor measures the strength of backscattered radar signals, used to determine wind speed and direction over the ocean, is _____ sensor.

A)   Non-Imaging Sensor

B)   Imaging Sensor

C)   Passive Sensor

D)   None of these

13. **Assertion:** Hyperspectral remote sensing allows for more accurate mapping of plant nutrient deficiencies compared to multispectral remote sensing.

Reason: Hyperspectral sensors capture data in a much wider range of narrow spectral bands compared to multispectral sensors.

A)   Assertion is False, Reason is False.

B)   Assertion is True, Reason is True.

C)   Assertion is True, Reason is False.

D)   Assertion is False, Reason is True.

14. Brightness temperature in a microwave image refers to:

A)   The actual temperature of the Earth's surface at the time the image was taken.

B)   A relative measure of the microwave radiation emitted by the Earth's surface.

C)   The color assigned to represent different microwave wavelengths in the image.

D)   The amount of time it takes for the microwave signal to travel from the satellite to Earth and back.

15. Lidar (Light Detection and Ranging) for remote sensing typically uses wavelengths in the _____ of the electromagnetic spectrum.

A)   SWIR Region

B)   Thermal Region

C)   NIR region

D)   All of these

16. What is the term for the one-way signal transmission used by GPS?

   A) Geotracking

   B) Pseudo-ranging

   C) Triangulation

   D) Dead reckoning

17. DGPS improves the accuracy of GPS by:

   A) Launching new satellites

   B) Correcting for atmospheric delays.

   C) Increasing the signal strength

   D) Reducing satellite clock drift

18. **Assertion:** GAGAN is a satellite-based augmentation system that improves the accuracy and integrity of GPS for aviation applications in India.

   Reason: GAGAN provides real-time corrections for atmospheric errors and satellite clock drift, which are major sources of inaccuracy in GPS.

   A) Assertion is True, Reason is True.

   B) Assertion is True, Reason is False.

   C) Assertion is False, Reason is False.

   D) Assertion is False, Reason is True.

19. IRNSS has been developed with _____ satellites.

   A) 3

   B) 5

   C) 4

   D) 7

20. GPS satellites transmit _____ signal frequency for positioning.

    A)   Two L band frequencies

    B)   One L band frequency

    C)   Two C band frequency

    D)   One X band frequency

21. Match the columns:

Column - 1		**Column - 2**
i)	Satellite Constellation	1) A group of satellites orbiting the Earth that work together to provide GPS positioning.
ii)	Triangulation	2) A measure of the geometric distribution of GPS satellites in the sky relative to the receiver.
iii)	Position Dilution of Precision (PDOP)	3) The mathematical principle used by GPS receivers to determine their location.
iv)	Spoofing	4) The practice of manipulating or tricking a GPS receiver by broadcasting false GPS signals.

    A)   i-2, ii-3, iii-1, iv-4

    B)   i-1, ii-2, iii-3, iv-4

    C)   i-1, ii-3, iii-2, iv-4

    D)   i-2, ii-1, iii-4, iv-3

22. An error matrix in classification reports_____

    A)   Commission errors

    B)   Omission Errors

    C)   Overall Errors

    D)   All of the above

23. WAAS method, used in GPS positioning, refers to

   A) Wide Area Augmentation System

   B) Wide Antenna Aperture System

   C) Whole Area Acceleration System

   D) None of these

24. RTK DGPS requires a:

   A) Direct line of sight to the reference station

   B) Complex setup with multiple reference stations

   C) Data link for real-time corrections

   D) Long time period for data collection

25. Cartosat satellites are designed for _____.

   A) Communication

   B) Weather Forecasting

   C) Topographic Mapping

   D) All of the above.

26. The IRS-1C satellite carried which of the following sensors?

   A) LISS-I (Linear Imaging Self-Scanning Sensor - I)

   B) LISS-III (Linear Imaging Self-Scanning Sensor - III)

   C) WiFS (Wide Field Sensor)

   D) Both (B) and (C)

27. Which filtering technique is best suited for noise reduction in a remote sensing image?

   A)   Median filter

   B)   Sharpening filter

   C)   Edge detection filter

   D)   High-pass filter

28. What is the role of a transformation model in image registration?

   A)   Defines the mathematical relationship between pixel locations in the images.

   B)   Improves the contrast of the images

   C)   Reduces noise in the images

   D)   Saves disk space by compressing the images

29. Maximum likelihood image classification is a

   A)   Non-Parametric Classification

   B)   Parametric Classification

   C)   Unsupervised Classification

   D)   None of these.

30. What is the primary goal of histogram equalization in image processing?

   A)   To reduce noise in an image

   B)   To sharpen edges in an image

   C)   To improve the contrast of an image

   D)   To convert an image to grayscale

31. What is the main objective of PCA in data analysis?

A) To classify data points into different categories

B) To reduce the dimensionality of data while preserving maximum variance

C) To improve the interpretability of data

D) To enchance edges in the data

32. The Kappa coefficient considers _____.

A) Perfect agreement

B) Chance agreement

C) Both perfect and chance agreement

D) None of these

33. Assertion: Hyperspectral data analysis techniques are constantly evolving to address the challenges associated with large data volume and complex processing.

Reason: Traditional statistical methods are sufficient for analyzing all types of remote sensing data, including hyperspectral.

A) Assertion is True, Reason is True.

B) Assertion is True, Reason is False.

C) Assertion is False, Reason is False.

D) Assertion is False, Reason is True.

34. The normalized band ratio (NBR) uses _____ channels.

A) Visible and SWIR

B) NIR and SWIR

C) NIR and Thermal

D) None of these.

35. Match the columns:

Column -1

i) Histogram Equalization

ii) Image Filtering

iii) Edge Detection

iv) Band Ratio

Column - 2

1) A technique used to improve the contrast of an image by redistributing the pixel intensity values.

2) A technique used to identify and highlight the boundaries between objects in an image.

3) A process that modifies the pixel values in an image to achieve specific effects.

4) The DN value of one band is divided by that of any other band in the sensor array.

A) i-1, ii-3, iii-2, iv-4

B) i-3, ii-2, iii-1, iv-4

C) i-3, ii-1, iii-2, iv-4

D) i-4, ii-3, iii-2, iv-1

36. The healthy vegetation in standard FCC appears in _____.

A) Dark Green Color

B) Light Green Color

C) Red color

D) Brown color

37. Assertion: Geometric correction is not always necessary for accurate analysis of remote sensing data.

Reason: Geometric distortions in satellite imagery only affect the aesthetic quality and don't impact the information content.

A) Assertion is True, Reason is True.

B) Assertion is True, Reason is False.

C) Assertion is False, Reason is False.

D) Assertion is False, Reason is True.

38. Visual image interpretation keys are _____ .

A) Tone

B) Texture

C) Location

D) All of these

39. Which is not an image texture analysis method?

A) Variance

B) Mean

C) Homogeneity

D) PCA

40. GLCM, metrics for texture analysis, refers to

A) Global land correction method

B) Grey level co-occurrence matrix

C) Geo landscape counting method

D) Grey level correlation method

41. **Assertion:** Image fusion is always necessary to combine a panchromatic image with a multispectral image.

Reason: A panchromatic image alone lacks the spectral information needed for accurate classification tasks in remote sensing.

A) Assertion is True, Reason is True.

B) Assertion is True, Reason is False.

C) Assertion is False, Reason is False.

D) Assertion is False, Reason is True.

42. In a standard FCC image, healthy vegetation typically appears:

A) Blue

B) Green

C) Red

D) Black

43. **Assertion:** All thematic maps focus on political boundaries.

   Reason: Thematic maps depict specific themes or features.

A) Assertion is True, Reason is True.

B) Assertion is True, Reason is False.

C) Assertion is False, Reason is False.

D) Assertion is False, Reason is True.

44. A large scale map shows a _____ area of the Earth's surface in greater detail.

A) Smaller

B) Larger

C) Both

D) None of these

45. The Universal Transverse Mercator (UTM) projection is a conformal projection. What does conformal mean in the context of map projections?

A) It preserves areas accurately.

B) It maintains constant scale across the entire map.

C) It minimizes distortion of shapes.

D) It accurately represents distances.

46. Endmember used for classifying a hyperspectral image represent

A) Mixed class pixel

B) Pure class pixel

C) Both

D) None of these

47. On a Survey of India toposheet, you find a blue line with a series of short dashes on one side. This symbol most likely represents:

A) A perennial river

B) A seasonal stream

C) A national highway

D) A railway line

48. When referencing locations on a map or in a Geographic Information System (GIS), a datum is essential. What does a datum primarily define?

A) The projection system used to represent the curved Earth on a flat surface

B) A reference point or surface used to establish locations on Earth

C) The units of measurement used for distances and coordinates

D) The level of detail or scale of the map

49. Match the columns:

Column - 1		Column - 2
i) Mercator Projection	1)	It preserves the shapes of continents but distorts areas, especially in high latitudes (near the poles) where landmasses appear larger than they are.
ii) Lambert Conformal Conic Projection	2)	This projection is useful for regional maps where minimizing distortion within a specific area is important.
iii) Transverse Mercator Projection	3)	This projection is commonly used for national or large-scale regional maps, minimizing distortion within that specific area.
iv) Azimuthal Projection	4)	This projection is most commonly used for maps of polar regions and routes of air and sea navigation with appropriate aspect.

A) i-1, ii-2, iii-3, iv-4

B) i-3, ii-2, iii-1, iv-4

C) i-1, ii-3, iii-4, iv-2

D) i-3, ii-2, iii-4, iv-1

50. Match the columns:

Column -1		Column - 2	
i)	Spectral Resolution	1)	The ability to distinguish between different wavelengths of electromagnetic radiation in an image.
ii)	Spatial Resolution	2)	The distance on the ground represented by a single pixel in an image.
iii)	Ground Sampling Distance (GSD)	3)	The size of a pixel on the ground, often expressed in meters (m) or centimeters (cm).
iv)	Radiometric Resolution	4)	It relates to how much information is perceived by a satellite's sensor.

A) i-1, ii-3, iii-2, iv-4

B) i-2, ii-3, iii-4, iv-1

C) i-3, ii-2, iii-1, iv-4

D) i-4, ii-2, iii-1, iv-3

51. Forest canopy height can be derived by

A) Subtracting DTM from DSM

B) Subtracting DTM from DEM

C) Adding DSM and DEM

D) None of these

52. Contour lines represents.

A) Equal atm. pressure

B) Equal elevation

C) Equal temperature

D) All of these

53. In aerial photography, parallax refers to the apparent displacement of an object relative to its surroundings when viewed from:

A) A single camera position.

B) Two slightly different camera positions.

C) Very high altitude.

D) Low-resolution cameras.

54. Bhuvan is a geospatial portal developed by

A) Google Earth.

B) NRSC

C) DRDO

D) Ministry of Agriculture.

55. Photogrammetry is a technique used to:

A) Enhance the aesthetic quality of photographs.

B) Measure distances on a map.

C) Create 3D models from 2D images.

D) Improve the resolution of satellite imagery.

56. The vector data model in GIS represents real-world features using _____.

A) Continuous grids

B) Discrete shapes

C) Both

D) None of these

57. Kriging is a spatial interpolation technique used in geostatistics. What distinguishes kriging from other interpolation methods like Inverse Distance Weighting (IDW)?

A) Kriging only works with point data, while IDW can handle various data types.

B) Kriging considers spatial autocorrelation between data points, leading to potentially more accurate predictions.

C) Kriging is computationally more expensive than IDW

D) Kriging produces smoother surfaces compared to IDW, regardless of the data.

58. Spatial autocorrelation refers to the tendency for

A) Similar things to clustered together in space

B) Dissimilar things to clustered together in space

C) Correlation between spectral bands

D) None of these

59. **Assertion:** Cartographic modeling is the process of simplifying the Earth's surface onto a flat map, inevitably introducing distortions.

Reason: The Earth is a sphere, and a flat map cannot perfectly represent a sphere without some form of distortion.

A) Assertion is True, Reason is True.

B) Assertion is True, Reason is False.

C) Assertion is False, Reason is False.

D) Assertion is False, Reason is True.

60. Multilayer operations only work with

A) Raster

B) Polygons

C) Lines

D) All of these

61. Which of the following best describes the TIN approach to creating a Digital Elevation Model (DEM)?

A) TIN creates a regular grid of squares with elevation values assigned to each grid cell.

B) TIN utilizes a network of interconnected triangular facets to represent the terrain surface.

C) TIN requires less data compared to other DEM creation methods like LiDAR.

D) TIN is not suitable for representing areas with steep slopes or complex terrain.

62. Hyperspectral data has _____ dimensionality.

A) Low

B) High

C) Moderate

D) Very low

63. Vicarious calibration is a method for atmospheric correction of hyperspectral data. What is a significant limitation of this technique?

A) It requires complex radiative transfer modeling expertise.

B) It cannot be applied to data acquired from airborne sensors.

C) It necessitates extensive ground-based measurements of key atmospheric parameters.

D) It is only applicable to specific types of hyperspectral sensors.

64. Assertion: Full-waveform LiDAR is a passive remote sensing technique.

Reason: Full-waveform LiDAR records the return signal strength at each point along the laser pulse.

A) Assertion is True, Reason is True.

B) Assertion is True, Reason is False.

C) Assertion is False, Reason is False.

D) Assertion is False, Reason is True

65. GEDI is a space borne _____ sensor.

A) Thermal

B) Lidar

C) Optical

D) SAR

66. Match the columns:

Column - 1		**Column - 2**	
i)	Atmospheric Correction	1)	It aims to compensate for atmospheric effects and retrieve the actual spectral reflectance of the ground features.
ii)	Sensor Calibration	2)	It ensures the accuracy and consistency of the recorded DN values across different images and sensors.
iii)	Solar Zenith Angle Correction	3)	This correction aims to normalize the data for variations in illumination.
iv)	BRDF	4)	It gives the reflectance of a target as a function of illumination geometry and viewing geometry.

A) i-1, ii-2, iii-3, iv-4

B) i-1, ii-3, iii-2, iv-4

C) i-2, ii-3, iii-4, iv-1

D) i-4, ii-2, iii-3, iv-1

67. _____ in vector data refers to the spatial relationships between geometric features, such as how lines connect and how polygons share borders.

A) Vertex

B) Topology

C) Snipping

D) Overshoot

68. AHP is a _____ technique .

A) Data dimensionality reduction

B) Multi-criteria

C) Image fusion

D) Geometric correction

69. Data mining often involves techniques from _____.

A) Statistics

B) Machine learning

C) Computer science

D) All of the above

70. Which of the following is a service model in cloud computing that provides users with access to software applications over the internet?

A) Infrastructure as a Service (IaaS)

B) Platform as a Service (PaaS)

C) Software as a Service (SaaS)

D) Desktop as a Service (DaaS)

71. In the Analytic Hierarchy Process (AHP), how are the relative importance of different criteria determined?

A) By directly assigning a weight to each criterion.

B) Through pairwise comparisons of each criterion against all others.

C) By analyzing historical data on past decisions.

D) Using a complex mathematical formula based on all alternatives.

72. Which of the following is **NOT** a characteristic of agent-based modelling (ABM)?

A) Focuses on individual entities and their interactions.

B) Relies on centralized control to dictate agent behavior.

C) Can simulate complex emergent phenomena from individual actions.

D) Allows for the exploration of "what-if" scenarios.

73. **Assertion:** Spatial data can be efficiently stored and queried using a regular relational database table without any special considerations.

   Reason: Spatial data types and indexing techniques are not necessary for effective spatial database design.

A) Assertion is True, Reason is True.

B) Assertion is True, Reason is False.

C) Assertion is False, Reason is False.

D) Assertion is False, Reason is True.

74. Which of the following is **NOT** a typical application of virtual 3D GIS?

A) Urban planning and visualization of development projects.

B) Environmental modeling and analysis of terrain and resources.

C) Cultural heritage preservation and virtual tours of historical sites.

D) Performing complex statistical analysis on geospatial data.

75. Spatial query languages can work with _____.

A) Points

B) Lines

C) Polygons

D) All of the above

76. A farmer notices horseshoe-shaped depressions forming along the edges of their fields after heavy rainfall events. What type of erosion is most likely causing this phenomenon?

A) Gully erosion

B) Sheet erosion

C) Wind erosion

D) Splash erosion

77. National Bureau of Soil Survey and Land Use Planning is located at

A) Lucknow

B) Delhi

C) Nagpur

D) Bangalore

78. A scientist is studying the impact of deforestation on a river system. They expect that deforestation will likely lead to:

A) A decrease in rainfall and a decrease in sediment entering the river.

B) An increase in rainfall and a decrease in sediment entering the river.

C) An increase in rainfall runoff and an increase in sediment entering the river.

D) No change in rainfall runoff or sediment entering the river.

79. Tilling the soil frequently .

A) Causes wind erosion

B) Reduces wind erosion

C) Increase run off

D) Both (A) & (C)

80. **Assertion:** While the concept of a watershed is often visualized as a clearly defined basin draining to a single outlet, the boundaries between watersheds can be complex and not always readily apparent, especially in flat or low-relief landscapes.

Reason: Watersheds are dynamic systems, and water flow patterns can be influenced by subtle variations in topography, land cover, and human interventions.

A) Assertion is True, Reason is True.

B) Assertion is True, Reason is False.

C) Assertion is False, Reason is False.

D) Assertion is False, Reason is True.

81. The parent material from which a soil is formed can significantly influence its characteristics. Which of the following parent materials would likely result in a soil with the poorest drainage?

A) Sandy loam

B) Clay

C) Loam

D) Calcareous (lime-rich) material

82. Occurrence of black soil is not the feature of _____.

A) Maharastra

B) Gujarat

C) Madhya Pradesh

D) Ladakh

83. **Assertion:** Leguminous plants, such as beans and peas, can fix atmospheric nitrogen into a usable form without the need for free-living nitrogen-fixing bacteria in the soil.

Reason: Leguminous plants have nodules in their roots that contain symbiotic nitrogen-fixing bacteria.

A) Assertion is True, Reason is True.

B) Assertion is True, Reason is False.

C) Assertion is False, Reason is False.

D) Assertion is False, Reason is True.

84. Soil erosion is the detachment and transportation of soil particles by

A) Wind

B) Water

C) Gravity

D) All of the above

85. Which of the following nutrients is MOST critical for plant growth and is often a limiting factor in agricultural soils?

A) Calcium (Ca)

B) Magnesium (Mg)

C) Nitrogen (N)

D) Phosphorus (P)

86. Basal area, calculated from DBH, provides an estimate of the total cross-sectional area

_____.

A) of all trees in a forest stand

B) of a single tree stem at DBH

C) of a single tree stem at the base

D) None of these

87. A wildlife biologist is studying the population density of deer in a specific forest reserve. They don't have enough time to count every deer in the reserve. What type of sampling technique would be MOST appropriate for this scenario?

A) Strip transect sampling

B) Fixed-area plot sampling

C) Point-in-time sampling

D) Stratified random sampling

88. Forest surveyors use clinometers to measure.

A) Basal area of a tree

B) Height of a tree

C) DBH of a tree

D) All of these

89. Forest Survey of India's forest cover mapping definition includes all lands with a tree cover exceeding 10% canopy density, irrespective of ownership or legal status. This encompasses _____.

A) Plantations

B) Orchards

C) Bamboo forests

D) All of these

90. Geophysical techniques can be used to detect_____.

A) Anomalies related to mineral deposits

B) Locating buried minerals

C) Both (A) and (B)

D) None of these.

91. A researcher is studying groundwater flow in a valley. They measure higher water table elevations on the valley sides compared to the valley floor. The most likely explanation for this observation is:

A) Presence of impermeable bedrock underlying the valley floor

B) A recent heavy rainfall event that saturated the entire valley

C) Higher concentration of clay minerals in the valley floor sediments

D) Lower pumping rates from wells located on the valley sides

92. **Assertion:** Color variations in aerial photographs are not a reliable indicator of different rock formations.

Reason: Color variations in aerial photos can be influenced by factors other than rock type, such as vegetation cover or lighting conditions.

A) Assertion is True, Reason is True.

B) Assertion is True, Reason is False.

C) Assertion is False, Reason is False.

D) Assertion is False, Reason is True.

93. Which of the following pairs of wildlife species is MOST unlikely to be found coexisting in the same habitat within India?

A) Asiatic Blackbuck and Indian Gazelle

B) One-horned Rhinoceros and Indian Elephant

C) Gaur and Dhole

D) Bengal Tiger and Sloth Bear

94. An example of biotic interaction is

A) Predation

B) Competition

C) Herbivory

D) All of the above

95. The Rabi season crops are

A) Wheat

B) Grams

C) Mustard

D) All of these

96. Which of the following is the most reactive gas in the atmosphere, playing a crucial role in many atmospheric processes?

A) Nitrogen (N_2)

B) Argon (Ar)

C) Oxygen (O_2)

D) Carbon Dioxide (CO_2)

97. Energy flow in an ecosystem is _____.

A) Unidirectional

B) Cyclical

C) Bottom to top

D) All of these

98. BOD is a measure of

A) the total amount of oxygen dissolved in water.

B) the amount of oxygen used by microorganisms to decompose organic matter

C) the total amount of oxygen emitted from the water

D) None of these

99. Which of the following is the FIRST step in the EIA process?

A) Public hearing and consultation

B) Issuing of environmental clearance

C) Screening - Identifying if a project requires an EIA

D) Impact analysis and mitigation planning

100. Environmental management system standards like ISO 14001 define

A) Specific environmental performance targets for organizations.

B) A framework for managing environmental impacts

C) Both (A) and (B)

D) None of these

ROUGH WORK

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(25)(A)   (32)