Sr. No. .....

ENTRANCE TEST-2023

SCHOOL OF ENVIRONMENTAL AND EARTH SCIENCES

GEOINFORMATICS

Total Questions : 60
Time Allowed : 70 Minutes

Question Booklet Series **A**

Roll No. : | | | | | | |

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1. $(10101)_2 + (1101)_2 =$

   (A) $(110010)_2$

   (B) $(110101)_2$

   (C) $(100010)_2$

   (D) $(101100)_2$

2. SSD stands for :

   (A) Solid Storage Drive

   (B) Serial Storage Drive

   (C) Solid Static Drive

   (D) Solid State Drive

3. Which one is not a GIS programming language ?

   (A) Fedora

   (B) Java

   (C) C++

   (D) Python

4. _____ is a network of devices that have embedded hardware and software to communicate (connect and exchange data) with other devices on the same network.

   (A) Internet of Things

   (B) Virtual Private Network

   (C) Telnet

   (D) Ping

5. The boundary surface between the earth's mantle and core is called :

   (A) Gutenberg discontinuity

   (B) Mohorovicic discontinuity

   (C) Lehmann discontinuity

   (D) Conrad discontinuity

6. It is believed by some geologists that Dal Lake is the remnant of a Pleistocene oligotrophic lake. Pleistocene Epoch began around :

   (A) 1.8 million years ago

   (B) 2.58 million years ago

   (C) 3.6 million years ago

   (D) 5.33 million years ago

7. Playa is a landform associated with :

   (A) Glaciers

   (B) Deserts

   (C) River basin

   (D) Coasts

8. An overturned fold in which the axial surface is more or less horizontal, is called :

   (A) Recumbent fold

   (B) Chevron fold

   (C) Isoclinal fold

   (D) Ptygmatic fold

9. Headquarters of the National Bureau of Soil Survey & Land Use Planning is located in :

   (A) Hyderabad

   (B) Srinagar

   (C) Nagpur

   (D) Lucknow

10. Exfoliation is a result of :

   (A) Metamorphism

   (B) Physical Weathering

   (C) Chemical Weathering

   (D) Splash Erosion

11. The basis of Land Capability Classification is :
    (A) Existing fertility and productivity
    (B) The potential for agricultural and other uses
    (C) Capacity to resist soil erosion
    (D) All of these
12. Which factor is not important for soil formation ?
    (A) Time
    (B) Parent material
    (C) Gravity
    (D) Climate
13. The visible portion of EMR lies between :
    (A) 0.2 and 0.5 micrometers
    (B) 0.4 and 0.7 micrometers
    (C) 0.6 and 0.9 micrometers
    (D) None of the above
14. Which one is an Indian Remote Sensing Satellite ?
    (A) Formosat
    (B) Envisat
    (C) Radarsat
    (D) Cartosat
15. GIS is :
    (A) A container of maps in digital form
    (B) A computerized tool for solving geographic problems
    (C) A spatial decision support system
    (D) All of the above
16. In a topographic map, a few contours are almost superimposed over one another. It indicates :
    (A) Gentle slope
    (B) Cliff
    (C) Spur
    (D) None of these
17. Pong Reservoir is built on which river ?
    (A) Beas
    (B) Sutlej
    (C) Myntdu
    (D) Kopili
18. Evapotranspiration may be measured by :
    (A) Pyranometer
    (B) Hypsometer
    (C) Hygrometer
    (D) Lysimeter
19. Hydropower potential estimation is not dependent on :
    (A) Head
    (B) Reservoir Volume
    (C) Gravity
    (D) Steam flow
20. Steeply rising ground slopes marking the outer limits of a floodplain are called :
    (A) Bluff
    (B) Levee
    (C) Backswamp
    (D) Neck
21. A rapidly descending mass, usually of snow, down a mountainside is called :
    (A) Subsidence
    (B) Rock slide
    (C) Debris slide
    (D) Avalanche

22. The 13th Goal of the United Nations Department of Economics and Social Affairs is focused on :

(A) Clean Water and Sanitation

(B) Climate Change

(C) Affordable and Clean Energy

(D) Sustainable Cities and Communities

23. The Kyoto Protocol was adopted in Kyoto, Japan, on :

(A) 14 June 1992

(B) 22 April 2016

(C) 11 December 1997

(D) 18 March 2015

24. As per the Central Pollution Control Board, Ministry of Environment, Forests and Climate Change, the threshold of Very Poor to Severe National Air Quality Index (AQI) value is :

(A) 400

(B) 350

(C) 300

(D) 250

25. Which Wildlife Sanctuary is not located in Jammu and Kashmir ?

(A) Jasrota

(B) Overa Aru

(C) Kibber

(D) Hirapora

26. Metrorail Network Map is an ideal example of :

(A) Chloropleth

(B) Isopleth

(C) Cartogram

(D) Heat map

27. On a 1:50,000 toposheet, the distance between two villages is found to be 2 cm. What is their ground distance ?

(A) 1000 m

(B) 10 km

(C) 25 km

(D) 10 m

28. Geological Survey of India has recently reported Lithium and Gold deposits in which district of Jammu & Kashmir ?

(A) Rajouri

(B) Ramban

(C) Reasi

(D) Kulgam

29. An individual's collection of genes is called :

(A) Genotype

(B) Phenotype

(C) Trait

(D) Allele

30. Male reproductive part of a flower is called :

(A) Zygote

(B) Sepal

(C) Pistil

(D) Stamen

31. Net Primary Productivity of an ecosystem is measured by :

(A) Biomass production during photosynthesis

(B) Gross primary productivity minus respiration losses

(C) Formation of new organic matter by consumers

(D) None of the above

32. The movement of materials from the leaves to other tissues of the plant is called :

(A) Tropic movement

(B) Guttation

(C) Transpiration

(D) Translocation

33. The small intestine of a human has three parts. The middle part is called :

(A) Duodenum

(B) Jejunum

(C) Ileum

(D) Colon

34. The transition between forest and grassland biomes is called :

(A) Tundra

(B) Savanna

(C) Taiga

(D) None of these

35. Which one is not an endocrine gland ?

(A) Mucous

(B) Pituitary

(C) Adrenal

(D) Pancreas

36. Alfred Russel Wallace divided the earth into how many biogeographic realms based on the distribution of animals and plants ?

(A) 4

(B) 5

(C) 6

(D) 7

37. Which law describes the orbits of planets around the sun ?

(A) Newton's law

(B) Faraday's law

(C) Kepler's law

(D) Kirchoff's Law

38. The first law of thermodynamics is the principle of :

(A) Conservation of mass

(B) Conservation of energy

(C) Conservation of charge

(D) None of the above

39. Light travels :

(A) Fastest in vacuum

(B) Fastest in water

(C) Fastest in air

(D) Independent of the medium

40. Which one is not a magnetic material ?

(A) Iron

(B) Nickel

(C) Cobalt

(D) Zinc

41. Isotopes of an element have :

(A) Different chemical and physical properties

(B) Similar chemical and physical properties

(C) Similar chemical but different physical properties

(D) Similar physical but different chemical properties

42. pH value less than 7 indicates that the solution is :

(A) Acidic

(B) Basic

(C) Neutral

(D) Hypotonic

43. Which law states that the volume of an ideal gas at constant pressure is directly proportional to its absolute temperature ?

(A) Joule's law

(B) Avogadro's law

(C) Boyle's law

(D) Charles's law

44. Removal of oxygen from a compound is an example of :

(A) Oxidation

(B) Reduction

(C) Oxygenation

(D) None of the above

45. The main aim of social forestry is :

(A) To utilize the wasteland

(B) To meet the requirement of fuel wood and fodder

(C) To create an ecological balance

(D) None of these

46. In a food chain, the third trophic level is always occupied by :

(A) Carnivores

(B) Herbivores

(C) Producers

(D) Decomposers

47. Which biogeochemical cycle is the slowest ?

(A) Carbon

(B) Nitrogen

(C) Phosphorus

(D) Sulphur

48. Which glacier in Kashmir is locally named 'Gwash Brani' - Goddess of Light ?

(A) Thajwas

(B) Nehnar

(C) Kolahoi

(D) Panjtarni

49. Most of the weather phenomena take place in the :

(A) Mesosphere

(B) Troposphere

(C) Stratosphere

(D) Ionosphere

50. The solar energy received at the earth's surface is called :

(A) Energy budget

(B) Diffusion

(C) Albedo

(D) Insolation

51. Which among the following is not a renewable source of energy ?

(A) Solar energy

(B) Biomass energy

(C) Hydro-power

(D) Geothermal energy

52. Which one is a reliable tool for studying paleoclimates ?

(A) Tree-ring reconstruction

(B) Ice-core study

(C) Coral reefs

(D) All of these

53. In a negatively skewed distribution :

(A) Mean > Mode > Median

(B) Mode < Median > Mean

(C) Mode > Median > Mean

(D) Mean > Median > Mode

54. Sample is regarded as a subset of :

(A) Data

(B) Set

(C) Distribution

(D) Population

55. What among the following is not part of a regression equation ?

(A) Intercept

(B) Slope

(C) Coefficient of variation

(D) Error term

56. A scatterplot represents the relationship between :

(A) Cause and effects

(B) Cause and problem

(C) Effects and output

(D) Production and productivity

57. The value of Permutation(n, n-1) is :

(A) n

(B) n!

(C) 2n

(D) 2n!

58. The polynomial equation $x (x + 1) + 8 = (x + 2) (x – 2)$ is :

(A) Linear equation

(B) Quadratic equation

(C) Cubic equation

(D) Bi-quadratic equation

59. If a matrix P is of order 3×4 and a matrix Q is of order 4×3, then the order of QP is :

(A) 4×3

(B) 3×4

(C) 3×3

(D) 4×4

60. Which of the following statement is not correct ?

(A) $\log_{10}(1) = 0$

(B) $\log_{10}(10) = 1$

(C) $\log (2+3) = \log (2 \times 3)$

(D) $\log (1+2+3) = \log 1 + \log 2 + \log 3$

ROUGH WORK

Sr. No. 070

ENTRANCE TEST-2022

SCHOOL OF ENVIRONMENTAL AND EARTH SCIENCES

GEO-INFORMATICS

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Question Booklet Series **B**

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SEAL

1. Which of the following UNS SDGs focuses on sustainable cities and communities ?
   (A) Goal 9
   (B) Goal 10
   (C) Goal 11
   (D) Goal 12
2. How many nation-states have signed UNFCCC ?
   (A) 145
   (B) 155
   (C) 165
   (D) 175
3. Disaster Management Act was passed by Rajya Sabha in :
   (A) 2005
   (B) 2006
   (C) 2007
   (D) 2008
4. Which of the following Acts was passed by the Indian Parliament in wake of the Bhopal Gas Tragedy ?
   (A) Environmental Protection Act
   (B) Disaster Management Act
   (C) Air (Prevention and Control of Pollution) Act
   (D) Water Pollution Act
5. Which one of the following is the largest National Park ?
   (A) Kazinag National Park
   (B) Dachigam National Park
   (C) Hemis National Park
   (D) Desert National Park
6. The largest glacier in Kashmir Valley is :
   (A) Kolahoi
   (B) Thajiwas
   (C) Nehnar
   (D) Shishram
7. The largest wetland of UT of J&K is :
   (A) Wular
   (B) Hokersar
   (C) Shallabug
   (D) Mansar
8. Map scale is :
   (A) The ratio between a distance on a map and the corresponding distance on the ground
   (B) The ratio between a distance on the ground and the corresponding distance on a map
   (C) The ratio between a distance on the ground and the corresponding distance on a GPS
   (D) All of these
9. Eutrophication of lake ecosystems is due to :
   (A) High DO and bacteria
   (B) Nitrogen and phosphorous
   (C) Chromium and mercury
   (D) Lead and hydrogen sulphide
10. Which of the following regions has the highest biodiversity ?
   (A) Tundra
   (B) Taiga
   (C) Mangroves
   (D) Tropical rain-forest

11. The final stable community in an ecological succession is called :
(A) Seral community
(B) Final community
(C) Ultimate community
(D) Climax community

12. The process of weakening the seed coat to break the dormancy is called :
(A) Vernalisation
(B) Scarification
(C) Stratification
(D) None of the above

13. Which of the following is a state bird of UT of J&K ?
(A) Kalij Pheasant
(B) Black-necked crane
(C) Paradise flycatcher
(D) Himalayan vulture

14. Which of the following natural regions is known as the 'Land of Big Games' ?
(A) Temperate grassland
(B) Tropical monsoon region
(C) Tropical savannah region
(D) Tundra

15. Permafrost is found in which of the following biomes ?
(A) Tundra
(B) Taiga
(C) Grassland
(D) Forest

16. Which of the following prevents the entry of food into the windpipe ?
(A) Trachea
(B) Larynx
(C) Epiglottis
(D) Pharynx

17. Which of the following waves have the shortest wavelength ?
(A) Cosmic rays
(B) X-rays
(C) Microwaves
(D) Radiowaves

18. The speed of light in vacuum is approximately :
(A) 300000 km/s
(B) 300000 m/s
(C) 300000 mi/s
(D) 300000 cm/s

19. When a cricket ball is thrown up vertically, the force of gravity acting on it :
(A) Is opposite to the direction of motion of the ball
(B) Is in the same direction of motion as the ball
(C) Increases as it rises up
(D) None of the above

20. What happens when light travels from air to glass ?
(A) It bends towards the normal
(B) It bends away from the normal
(C) It becomes parallel to the normal
(D) There is no change

21. The density of water is maximum at :

(A) 0°C

(B) 1°C

(C) 2°C

(D) 4°C

22. Who was the first to propose the Atomic Theory ?

(A) J.J. Thomson

(B) John Dalton

(C) Neils Bohr

(D) T.A. Edison

23. Which of the following given elements is the most electropositive ?

(A) S

(B) Cl

(C) Mg

(D) Al

24. The equation of state for an ideal gas is represented as :

(A) PV=R/T

(B) P/V=RT

(C) P/V=nRT

(D) PV=nRT

25. Carbon is a common component of :

(A) Limestone

(B) All organisms

(C) Volcanic gases

(D) All of the above

26. How does the concentration of carbon dioxide in the atmosphere affect climate ?

(A) As carbon dioxide concentration increases, temperatures decreases

(B) As carbon dioxide concentration increases, temperatures increases

(C) Carbon dioxide concentrations do not affect climate

(D) As carbon dioxide concentrations increase, temperatures become more random

27. Which process releases nitrogen gas (N_2) back into the atmosphere ?

(A) Denitrification

(B) Nitrogen fixation

(C) Decay

(D) Nitrification

28. Phosphorus does NOT travel through which of the following spheres ?

(A) Lithosphere

(B) Atmosphere

(C) Biosphere

(D) Geosphere

29. Although direct measurements of atmospheric carbon dioxide have only been taken consistently since the 1950s, scientists have been able to retrieve data from the proxies that include :

(A) Ice cores from ice sheets

(B) Sediment cores from the ocean

(C) Tree rings

(D) All of the above

30. The height of the troposphere is approximately :

(A) 80 km

(B) 50 km

(C) 12 km

(D) 120 km

31. The lowest layer of the atmosphere is :

(A) Troposphere

(B) Stratosphere

(C) Ionosphere

(D) Thermosphere

32. Which of the following is a primary air pollutant ?

(A) Ozone

(B) Formaldehyde

(C) Photochemical smog

(D) Hydrocarbons

33. The median of 2,6,6,8,4,2,7,9 values is :

(A) 4

(B) 5

(C) 6

(D) 7

34. The average of the three numbers is 21. If two of the numbers are 4 and 12, what is the remaining number ?

(A) 37

(B) 47

(C) 57

(D) 67

35. The fishbowl draw is a method of drawing :

(A) Independent sample

(B) Structured sample

(C) Non-random sample

(D) Random sample

36. For a perfectly homogenous population, the minimum required sample size is :

(A) 1

(B) 2

(C) Whole population

(D) Infinite

37. The sum of the first 200 natural numbers is :

(A) 19100

(B) 20100

(C) 21100

(D) 22100

38. If $A = \begin{bmatrix} -1 & 4 \\ 5 & 8 \end{bmatrix}$, the trace of matrix A is :

(A) 6

(B) 7

(C) 8

(D) 9

39. What is the order of matrix $A = \begin{bmatrix} 3 & 5 \\ 7 & 9 \end{bmatrix}$?

(A) 2×3

(B) 2×2

(C) 3×3

(D) 4×4

40. The main key difference between AND gate and OR gate is that :

(A) AND gate gives a true output only when all the inputs are true whereas the OR gate gives a true output when at least one of the inputs is true

(B) AND gate gives a true output only when one of the inputs is true whereas the OR gate gives a true output when all the inputs are true

(C) Both (A) and (B)

(D) None of the above

41. The decimal equivalent of 101010 is :

(A) 38

(B) 40

(C) 42

(D) 44

42. The binary equivalent of 323 :

(A) 101000111

(B) 101000010

(C) 101000001

(D) 101000011

43. The full form of HTTP is :

(A) HyperText Transfer Package

(B) HyperTransfer Text Package

(C) HyperText Transfer Protocol

(D) HyperText Transfer Practice

44. The location of a resource on the internet is given by :

(A) URL

(B) Email

(C) IP

(D) Protocol

45. Which of the following is the longest glacier outside the polar regions ?

(A) Fedchenko Glacier

(B) Siachin Glacier

(C) Gangotri Glacier

(D) Hispar Glacier

46. Mohorovičić discontinuity marks the boundary between :

(A) Crust and Mantle

(B) Mantle and Core

(C) Inner and Outer Core

(D) None

47. Continental drift theory was proposed by :

(A) Alfred Wegener

(B) Thomas Alva Edison

(C) Arthur Holmes

(D) Eduard Suess

48. Holocene is the name given to the geological epoch that began :

(A) 5,650 years BP

(B) 11,650 years BP

(C) 15,650 years BP

(D) 20,650 years BP

49. Gully erosion is an advanced stage of :

(A) Rill erosion

(B) Splash erosion

(C) Sheet erosion

(D) Wind erosion

50. Which of the following soil conservation methods is generally implemented in the coastal and dry regions ?
(A) Contour ploughing
(B) Terrace farming
(C) Mulching
(D) Shelter belts

51. Which of the following is the first stage of water erosion ?
(A) Rill erosion
(B) Sheet erosion
(C) Gully erosion
(D) Splash erosion

52. *Karewas* are found in :
(A) West Bengal
(B) Rajasthan
(C) Nagaland
(D) Jammu and Kashmir

53. A handheld camera with the flash turned on during dim light is an example of :
(A) Active sensor
(B) Passive sensor
(C) Proactive sensor
(D) None

54. GIS allows the user to perform :
(A) Store data
(B) Edit data
(C) Create searches
(D) All of the above

55. GIS was coined by :
(A) Roger Tomlinson
(B) Roger James
(C) Richard Frost
(D) None of the above

56. On a topographic map, the closer the contour lines the :
(A) Steeper the slope
(B) Flatter the land surface
(C) Gentler the slope
(D) Lower the elevation

57. The graph showing discharge versus time represents :
(A) Hydrograph
(B) Pluviograph
(C) Environmental flow
(D) None of the above

58. Hydrograph will peak faster in :
(A) Forested land
(B) Agricultural land
(C) Urbanized land
(D) All of the above

59. Pluviograph is an instrument used for measuring :
(A) Snow
(B) Hail
(C) Precipitation
(D) Sleet

60. Pyranometer is an instrument used for measuring :
(A) Lunar radiation
(B) Solar radiation
(C) Terrestrial radiation
(D) None of the above

SEAL

Sr. No. 078

ENTRANCE TEST-2020

SCHOOL OF ENVIRONMENTAL AND EARTH SCIENCES

GEO-INFORMATICS

Question Booklet Series **B**

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1. The UNFCCC is an International Environmental treaty that came into force on :

(A) 21 March 1994

(B) 21 March 1995

(C) 21 April 1994

(D) 21 April 1995

2. Which of the following is not a Millennium Development Goal ?

(A) Eradicate extreme poverty and hunger

(B) Achieve universal primary education

(C) Promote gender equality and empower women

(D) Improve mental health

3. Which of the following UN Sustainable Development Goals focuses on affordable and clean energy ?

(A) Goal 6

(B) Goal 7

(C) Goal 9

(D) Goal 8

4. The UNCCD entered into force in :

(A) December 1996

(B) December 1997

(C) December 1998

(D) December 1999

5. Sapphire, a precious gemstone, is found in :

(A) East Karakorum, Leh

(B) Paddar, Kishtwar

(C) Uri, Baramulla

(D) Sonamarg, Ganderbal

6. Which of the following is the largest glacier of Kashmir Valley ?

(A) Nehnar

(B) Kolahoi

(C) Shishram

(D) Hoksar

7. Which of the following is a Ramsar designated wetland ?

(A) Hokersar

(B) Khushalsar

(C) Aanchar

(D) Shallabug

8. The botanical name of Chilgoza Pine is :

(A) *Pinus roxburghii*

(B) *Pinus gerardiana*

(C) *Pinus wallichiana*

(D) None of these

9. Which of the following is not an example of primary succession ?

(A) Vegetation colonising old lava fields on a volcanic island

(B) Moss growing on mountain cliffs

(C) Salt marsh vegetation on a mud flat

(D) Grassland growing on the site of a previous rainforest

10. In thermal stratification of water bodies, the middle region which shows drastic temperature change is called :

(A) Mesolimnion

(B) Epilimnion

(C) Metalimnion

(D) Hypolimnion

11. In cryogenic storage, seeds are stored at :
    (A) –15°C
    (B) –25°C
    (C) –35°C
    (D) –196°C
12. The word ecosystem was first used by :
    (A) A.G. Tansley
    (B) G.E. Hutchinson
    (C) Charles Elton
    (D) Vladimir Vernadsky
13. The digestive enzyme found in saliva is called :
    (A) Pepsin
    (B) Bile
    (C) Amylase
    (D) Both (A) and (B)
14. Which of the following is not part of large intestine ?
    (A) Colon
    (B) Duodenum
    (C) Caecum
    (D) Rectum
15. Leucocytes are also called :
    (A) Red Blood Corpuscles
    (B) White Blood Corpuscles
    (C) Platelets
    (D) All of the above
16. Tropical grasslands are also called :
    (A) Prairies
    (B) Pampas
    (C) Steppes
    (D) Savannas
17. According to Coulomb's Law, electrostatic force between two static point charges q1 and q2 placed some distance apart is not :
    (A) Inversely proportional to their product
    (B) Inversely proportional to the square of the distance between them
    (C) Directed along the line joining the two charged particles
    (D) None of the above
18. The bending of light at the boundary of two dissimilar media is called :
    (A) Reflection
    (B) Refraction
    (C) Diffraction
    (D) Total Internal Reflection
19. At absolute temperature, the kinetic energy of a gas is :
    (A) Positive
    (B) Zero
    (C) Negative
    (D) Both (A) and (C)
20. The acceleration due to gravity varies with :
    (A) Latitude
    (B) Height
    (C) Depth
    (D) All of the above
21. Discovery of electron is credited to :
    (A) John Dalton
    (B) Ernest Rutherford
    (C) J.J. Thomson
    (D) None of the above

22. Which of the following is a property of acids ?
(A) Acids produce H^+ ions when dissolved in water
(B) Acids have sour teste
(C) Acids are composed of hydrogen
(D) All of the above

23. The mass number of an atom is :
(A) Number of electrons present in the nucleus of an atom
(B) Number of protons present in the nucleus of an atom
(C) Number of neutrons present in the nucleus of an atom
(D) Number of protons and neutrons present in the nucleus of an atom

24. According to Boyle's Law :
(A) At constant temperature, the volume of a given amount of a gas is directly proportional to its pressure
(B) At constant pressure, the volume of a given amount of a gas is inversely proportional to its temperature
(C) At constant temperature, the volume of a given amount of a gas is inversely proportional to its pressure
(D) At constant volume, the temperature of a given amount of a gas is inversely proportional to its pressure

25. Glaciers across high mountain Asia are retreating except those located in :
(A) Karakoram
(B) Tibetan Plateau
(C) Eastern Himalaya
(D) Western Himalaya

26. The enzyme that fixes atmospheric CO_2 in C4 plants is :
(A) Aldolase
(B) Hydrogenase
(C) PEP carboxylase
(D) Amylase

27. The highest amount of Carbon is stored in :
(A) Atmosphere
(B) Soil
(C) Oceans
(D) None of these

28. The ultimate source of energy in an ecosystem is :
(A) Sunlight
(B) Nutrients
(C) Food
(D) Water

29. Which of the following can be used to reconstruct past climate ?
(A) Tree rings
(B) Ice cores
(C) Lake sediments
(D) All of these

30. The normal lapse rate is 6.5°C per :
(A) Kilometer rise in altitude
(B) Kilometer fall in altitude
(C) Mile rise in altitude
(D) Mile fall in altitude

31. The phenomenon in which temperature increases with increasing altitude is known as :

(A) Temperature anomaly

(B) Temperature inversion

(C) Lapse rate

(D) Insolation

32. Tropospheric ozone formation results due to the chemical reactions between :

(A) Oxides of nitrogen and volatile organic compounds in the presence of sunlight

(B) Oxides of sulphur and volatile organic compounds in the presence of sunlight

(C) Oxides of carbon and volatile organic compounds in the presence of sunlight

(D) Oxides of nitrogen and volatile organic compounds

33. What is the median of following series : 7, 44, 32, 8, 9, 17, 19, 16, 15 ?

(A) 15

(B) 16

(C) 17

(D) 19

34. Square of standard deviation is called :

(A) Harmonic mean

(B) Variance

(C) Mode

(D) 2nd quartile

35. Arithmetic mean is :

(A) Affected by extreme values

(B) Not affected by extreme values

(C) Both (A) and (B)

(D) None of these

36. Sum of deviations of values from their mean is always :

(A) 1

(B) 0

(C) 2

(D) 3

37. The output of an AND gate with three inputs, A, B, and C, is 'high' or '1' when :

(A) A = 1, B = 1, C = 0

(B) A = 0, B = 0, C = 0

(C) A = 1, B = 1, C = 1

(D) A = 1, B = 0, C = 1

38. A series of numbers in which each number is the sum of the two preceding numbers is called :

(A) Fibonacci Series

(B) Taylor Series

(C) Laurent Series

(D) Hypergeometric Series

39. What is 'a', if $B = \begin{bmatrix} 1 & 4 \\ 2 & a \end{bmatrix}$ is a singular matrix ?

(A) 5

(B) 6

(C) 7

(D) 8

40. If $|A| = 0$, then A is a :

(A) Zero matrix

(B) Singular matrix

(C) Non-singular matrix

(D) None of these

41. The father of supercomputer is :

(A) John Neumann

(B) Charles Babbage

(C) Seymour Cray

(D) Adam Dunkels

42. A computer on the network that is used for sharing resources with others is called :

(A) Workstation

(B) Client

(C) Server

(D) Mainframe

43. The binary form of decimal number 125 is :

(A) 1111001

(B) 1111110

(C) 1111111

(D) 1111101

44. Rows of a relation are called :

(A) Tuple

(B) Entity

(C) Data structure

(D) Schema

45. What is the second most abundant element in Earth's crust ?

(A) Nitrogen

(B) Oxygen

(C) Carbon

(D) Silicon

46. Carbon sequestration is achieved through :

(A) Rocks

(B) Soils

(C) Plants

(D) All of the above

47. A stream weathers and erodes its channel and floodplain by :

(A) Hydraulic action

(B) Abrasion

(C) Solution

(D) All of the above

48. New lithosphere forms and spreads outward at :

(A) Divergent boundary

(B) Convergent boundary

(C) Transform plate boundary

(D) None of the above

49. Humus is mostly concentrated in which horizon ?

(A) O-horizon

(B) B-horizon

(C) C-horizon

(D) A-horizon

50. Which of the following is primary factor that affects the rate of weathering ?

(A) Topography

(B) Climate

(C) Volume

(D) Biological organisms

51. Which of the following are types of water erosion ?

(A) Rill erosion

(B) Gully erosion

(C) Both (A) and (B)

(D) Neither (A) nor (B)

52. Land where the potential natural vegetation is predominantly grasses, grass-like plants, forbs, or shrubs is called as :

(A) Agricultural land

(B) Rangeland

(C) Forest land

(D) Wetland

53. The science of deriving information about an object from measurements made at a distance from the object is called :

(A) Geographic Information Science

(B) Information Science

(C) Remote Sensing

(D) None of the above

54. Which of the following is not a component of Geographic Information Systems ?

(A) Software

(B) Hardware

(C) Query

(D) People

55. The contour lines connect points of equal :

(A) Distance

(B) Angle

(C) Elevation

(D) Area

56. First satellite based remote sensing programme for broad-scale observation of the Earth's land areas was :

(A) SPOT

(B) Landsat

(C) IRS

(D) Geoeye-1

57. Which among the following is a component of water cycle ?

(A) Evaporation

(B) Runoff

(C) Precipitation

(D) All of the above

58. A graph plotting discharge versus time is called :

(A) Hydrogram

(B) Hydrograph

(C) Discharge

(D) Streamflow

59. Process by which the water vapour escapes from the living plant leaves and enters the atmosphere is called :

(A) Evapotranspiration

(B) Evaporation

(C) Transpiration

(D) Potential evaporation

60. Flash floods are characterised by :

(A) Rapid rises in water levels

(B) Devastating flow velocities

(C) Neither (A) nor (B)

(D) Both (A) and (B)

SEAL

1. What is the decimal equivalent of 1100110 ?
   (A) 104
   (B) 106
   (C) 108
   (D) 102
2. The binary equivalent of 819 is :
   (A) 1100110011
   (B) 1100110001
   (C) 1010101010
   (D) 1001100101
3. The difference between memory and storage is that :
   (A) Memory is temporary and storage is permanent
   (B) Memory is slow and storage is fast
   (C) Memory is permanent and storage is temporary
   (D) None of the above
4. When was Google Chrome first launched ?
   (A) 2000
   (B) 2008
   (C) 2004
   (D) 2006
5. Which of the following has the lowest infiltration capacity ?
   (A) Pasturelands
   (B) Farmlands
   (C) Built-up
   (D) Forest lands
6. Tundra biome is characterized by :
   (A) Tree growth hindered by the cold temperatures and short growing seasons
   (B) Tree growth hindered by scanty rainfall and deficiency in soil nutrients
   (C) Tree growth hindered by scanty rainfall and acidic soils
   (D) None of the above
7. Hemis High Altitude National Park is famous for :
   (A) Black bear
   (B) Snow leopard
   (C) Brown bear
   (D) Markhor
8. Accumulation of urea and other waste substances in the blood is called :
   (A) Hemodialysis
   (B) Cystitis
   (C) Urethritis
   (D) Uremia
9. Which of the following is the state bird of J & K ?
   (A) Black crested bulbul
   (B) Hill myna
   (C) Black necked crane
   (D) White throated kingfisher
10. Lysimeter is an instrument to measure :
   (A) Evapotranspiration
   (B) Transpiration
   (C) Infiltration
   (D) Evaporation
11. Hydropower potential depends upon which of the following parameters :
   (A) Streamflow
   (B) Head
   (C) Both (A) and (B)
   (D) None of the above
12. Hydrograph is a graph :
   (A) Showing the temperature versus time
   (B) Showing the rainfall versus time
   (C) Showing the rate of flow versus time past a specific point in a river
   (D) None of the above
13. Which of the following are soil conservation measures to arrest erosion ?
   (A) Ploughing
   (B) Trenching
   (C) Contour plowing
   (D) All of the above
14. Sand dunes are formed by which type of erosion :
   (A) Ravine erosion
   (B) Guilly erosion
   (C) Sheet erosion
   (D) Aeolian erosion

15. What is the major land use and land cover of cold desert region of Ladakh ?
(A) Rocky terrain
(B) Agriculture
(C) Sand dunes
(D) Forests

16. The term ecosystem was first used by Arthur George Tansley in :
(A) 1930
(B) 1945
(C) 1950
(D) 1935

17. Which of the following is not dicotyledonous ?
(A) Mango
(B) Castor
(C) Pea
(D) Rice

18. The seed coat is formed from :
(A) Endosperm
(B) Integuments
(C) Ovary
(D) None of the above

19. Phenyl Mercuric Acetate results in :
(A) Enhanced Transpiration
(B) Reduced Transpiration
(C) Reduced Imbibition
(D) Reduced Respiration

20. Soils that are formed in volcanic ash and contain aluminium organic compounds are known as :
(A) Alfisols
(B) Entisols
(C) Gelisols
(D) Andisols

21. If the order of matrix A is $m \times p$ and the order of B is $p \times n$. Then the order of matrix AB is ?
(A) $n \times m$
(B) $m \times n$
(C) $n \times p$
(D) $m \times p$

22. $\frac{n!}{(n-3)!} = ?$
(A) $n(n-1)(n-2)$
(B) $n!$
(C) $(n-3)!$
(D) $n(n-1)(n-2)(n-3)$

23. Roots of quadratic equation $x^2 - 3x = 0$, will be
(A) 3
(B) 0, –3
(C) 0, 3
(D) None of these

24. What is the value of x in the exponential equation $9 + e^{2x-4} = 10$?
(A) 4
(B) 3
(C) 2
(D) 5

25. Which of the following is false about the Correlation Coefficient ?
(A) Varies between 0 to 1
(B) Describe degree of association between two variables
(C) A positive value indicates a rise in one variable accompanies a rise in the other
(D) Is denoted by the symbol "r"

26. Which of the following is not a measure of the central tendency ?
(A) Variance
(B) Mean
(C) Mode
(D) Median

27. Marks of the Geoinformatics paper follow a normal distribution with a mean of 65 and a standard deviation of 12. Approximately what proportion of the students have scores below 50 ?
(A) 51%
(B) 11%
(C) 89%
(D) 15%

28. Which of the following are true about the normal distribution?
(A) 58.6% of the observations lie between the mean and one standard deviation
(B) The mean, median, mode and variance of a normally distributed data area same
(C) 99.7% of the observations lie between the mean and three standard deviations
(D) None of the above

29. Indicate the correct arrangement for electromagnetic radiations in order of their increasing wavelength :
(A) X-rays, Visible, Infrared, Microwave
(B) Visible, Infrared, Microwave, X-rays
(C) X-rays, Infrared, Visible, Microwave
(D) Microwave, Visible, Infrared, X-rays

30. Light travels slower in glass than in air because :
(A) Refractive index of air is greater than that of glass
(B) Density of glass greater than that of air
(C) Refractive index of air is less than that of glass
(D) Density of glass is less than that of air

31. The Acceleration due to gravity is zero at :
(A) The equator
(B) Poles
(C) Sea level
(D) The center of the earth

32. The temperature at which a ferromagnet material becomes paramagnetic is called :
(A) Neutral temperature
(B) Inversion temperature
(C) Curie temperature
(D) None of the above

33. The number of neutrons in the radioactive isotope of hydrogen is :
(A) 2
(B) 0
(C) 3
(D) 1

34. According to Arrhenius Concept, acids are :
(A) Proton acceptors
(B) Compounds which give hydrogen ion
(C) Proton donor
(D) Compounds which give hydroxyl ion

35. Methanol and ethanol are miscible in water due to
(A) Covalent character
(B) Oxygen bonding character
(C) Hydrogen bonding character
(D) None of the above

36. The average kinetic energy of an ideal gas per molecule in SI units at 25°C will be
(A) 61.7×10^{-21} J
(B) 6.17×10^{-21} J
(C) 7.16×10^{-20} J
(D) 6.17×10^{-20} J

37. GIS deals with which kind of data :
(A) Spatial data
(B) Numeric data
(C) Binary data
(D) Complex data

38. Remote sensing techniques make use of the which of the following :
(A) Electric waves
(B) Electromagnetic waves
(C) Sound waves
(D) All of the above

39. GPS is used for which of the following data :
(A) Altitude
(B) Latitude
(C) Longitude
(D) All of the above

40. The science of map-making is known as ?
(A) Cartography
(B) Remote Sensing
(C) GIS
(D) Geomatics

41. The branch of geology dealing with the studies of fossils is :
(A) Geomorphology
(B) Stratigraphy
(C) Archaeology
(D) Palaeontology

42. The instrument used for reading the intensity of earthquake wave is called :
(A) Hygrometer
(B) Seismometer
(C) Seismogram
(D) Seismograph

43. The limestone deposits which grow upwards from the floor of underground cave are known as :
(A) Stromatolite
(B) Stalactite
(C) Stalagmite
(D) Column

44. Ozone layer is located in ?
(A) Troposphere
(B) Stratosphere
(C) Thermosphere
(D) Mesosphere

45. The Plio-pleistocene sediments of Kashmir valley are known as :
(A) Verinag formation
(B) Lolab formation
(C) Karewa formation
(D) Zewan formation

46. Major constituent of the Earth's atmosphere is :
(A) Oxygen
(B) Argon
(C) Carbon Dioxide
(D) Nitrogen

47. Threat of global warming is increasing due to the increasing concentration of :
(A) Carbon dioxide
(B) Black carbon
(C) Particulate matter
(D) Sulphur dioxide

48. Kyoto Protocol is linked to :
(A) SDGs
(B) UNCCCD
(C) Montreal Protocol
(D) UNFCCC

49. Which of the following is a sub-species of European red deer found in Kashmir ?
(A) Hangul
(B) Markhor
(C) Chiru
(D) Ibex

50. Lines on a map connecting places having same amount of rainfall are called :
(A) Isotherms
(B) Isobars
(C) Contours
(D) Isohyets

51. Which of the following is not a tributary of Indus river ?
(A) Sutlej
(B) Beas
(C) Jhelum
(D) None of the above

52. Lignite deposits in Kashmir are found at :
(A) Nichhama, Handwara
(B) Mokam, Anantnag
(C) Hipora, Shopian
(D) None of the above

53. Which of the following is a consequence of global warming ?
(A) Melting of glaciers
(B) Increasing frequency and intensity of flooding
(C) Increasing glacial lake outburst flooding (GLOFs)
(D) All of the above

54. The process of nutrient enrichment in a lake is termed as :
(A) Limiting nutrients
(B) Enrichment
(C) Schistosomiasis
(D) Eutrophication

SEAL

55. How many Sustainable Development Goals (SDGs) have been agreed to, by all the world's nations, as part of the 2030 Agenda ?

(A) 17
(B) 7
(C) 27
(D) 14

56. The Total Dissolved Solids (TDS) in drinking water can be reduced by the following method :

(A) Distillation
(B) Reverse osmosis
(C) Ion exchange
(D) All of the above

57. Which of the following minor forest produce in J&K has tremendous medicinal importance ?

(A) Dioscorea
(B) Hazel nut
(C) Resin
(D) Oleander

58. Which of the following are floating ocean plants and animals ?

(A) Nekton
(B) Benthos
(C) Plankton
(D) Terrenus

59. Environmental flow is provided within a river, wetland or coastal zone to :

(A) Promote ecotourism and water sports
(B) Round the year hydropower generation
(C) Promote climate change mitigation and adaptation
(D) Maintain healthy aquatic ecosystems and ensure sustainability of their services

60. The melting of glaciers in Himalaya under the changing climate will in the long run most likely result in which of the following scenarios :

(A) Decrease in the frequency and magnitude of disasters
(B) Increase the water supplies in the Himalaya
(C) Adversely impact the food, water and energy security
(D) All of the above

1. Which of the following is not an internet browser ?
   (A) Chrome
   (B) Internet Explorer
   (C) Firefox
   (D) Python
2. DBMS don't use which of the following database structure ?
   (A) Hierarchical model
   (B) Network model
   (C) Topologic model
   (D) Relational model
3. Which of the following is not an example of the spreadsheet software ?
   (A) MS Excel
   (B) Lotus
   (C) Xoom Office
   (D) IMS
4. Bytecode is :
   (A) A compiler that produces an independent executable file
   (B) Is not a machine code and thus, not tied to any particular hardware
   (C) A data type in C programming language
   (D) A Database Management System
5. Universe began :
   (A) 4 billion years ago
   (B) 10-15 billion years ago
   (C) 1 billion years ago
   (D) 5-8 billion years ago
6. Which of the following divisions of the geologic time scale is an era of the Phanerozoic eon ?
   (A) Paleozoic
   (B) Paleocene
   (C) Permian
   (D) Proterozoic
7. On an average, how thick is the crust of earth ?
   (A) 100 km
   (B) 40 km
   (C) 150 km
   (D) 92 km
8. The core of earth is thought to be composed of :
   (A) Granite
   (B) Basalt
   (C) Solid Iron-Nickel alloy
   (D) Peridotite
9. Which of the following is not a measure of soil conservation ?
   (A) Mulching
   (B) Tillage cropping
   (C) Check dams
   (D) Pruning
10. Land capability classification is based on which of the following properties ?
   (A) Soil fertility, climate, topography and water availability
   (B) Geology, drainage, weathering and geomorphology
   (C) Climate, vegetation, glaciers, population
   (D) All of the above
11. Soil erosion is associated with :
   (A) Frost shattering and heaving
   (B) Rills and ravines
   (C) Floods and water logging
   (D) Snow avalanches
12. Soil texture influences which of the following ?
   (A) Hydrologic properties
   (B) Climatic processes
   (C) Tectonic processes
   (D) Magmatic properties

13. Remote sensing does not use which region of electromagnetic radiation for sensing ?
(A) Visible near-infrared
(B) Thermal infrared
(C) Microwaves
(D) Radiowaves

14. Digital topographic data in the form of DEM is generated from :
(A) Contours
(B) Thermal remote sensing data
(C) Intensity images
(D) All of the above

15. Which of the following is not an application of Remote Sensing ?
(A) Crustal deformation studies
(B) Weather monitoring studies
(C) Water quality mapping
(D) Sub-surface studies

16. Geographic Information System :
(A) Uses satellite data
(B) Integrates data from various sources
(C) Is a database management system
(D) All of the above

17. Which of the following is the largest reservoir of water ?
(A) Groundwater
(B) Lakes
(C) Rivers
(D) Atmosphere

18. The average annual rainfall of Srinagar is around :
(A) 1000 mm
(B) 700 mm
(C) 1500 mm
(D) 1800 mm

19. Lysimeter is a hydrological instrument used to measure :
(A) Evaporation
(B) Infiltration
(C) Evapotranspiration
(D) Interception

20. An isohyet is a line joining :
(A) Equal precipitation intensity
(B) Equal precipitation depth
(C) Equal storm duration
(D) Equal height of precipitation stations

21. The residence time of CO_2 in the atmosphere is of the order of :
(A) 24-72 hours
(B) 30-95 Years
(C) 1-2 months
(D) 7-15 days

22. COP21 meeting negotiated the Paris agreement on climate change that sets out global action to limit the global warming to below :
(A) 2°C
(B) 1°C
(C) 3°C
(D) None of the above

23. The Indian Water Pollution Act (Prevention & Control) came into the force in the year :
(A) 1972
(B) 1977
(C) 1956
(D) 1974

24. Which of the following statements is false about the Sustainable Development Goals (SDGs) ?
(A) No Poverty
(B) Quality education
(C) Zero hunger
(D) None of the above

25. Which of the following is not an essential element of the map composition ?
(A) Legend
(B) Scale
(C) North direction
(D) Path/row

26. In J & K State, the dominant forest type is :
(A) Himalayan moist temperate forest
(B) Himalayan dry temperate forest
(C) Sub tropical dry evergreen forest
(D) All of the above

27. Black-necked crane is found in which of the following wildlife parks ?
(A) Dachigam
(B) Kishtwar
(C) Changthang
(D) Hemis

28. The State has an identified potential for geothermal energy in :
(A) Kashmir valley
(B) Puga valley
(C) Chinta valley
(D) Suru valley

29. The enzyme that fixes atmospheric CO_2 in C4 plants is :
(A) Aldolase
(B) Hydrogenase
(C) PEP carboxylase
(D) RUBP carboxylase

30. What is the primary route of mineral absorption by roots ?
(A) Root hairs
(B) Cortex of the root
(C) Epidermis of the root
(D) Casparian strips

31. Epigeal germination is found in :
(A) Pea
(B) Gram
(C) Castor
(D) Jowar

32. During cellular respiration, NADH is :
(A) Used in electron transport system
(B) Converted to NAD+ by an enzyme called dehydrogenase
(C) Reduced to form NAD+
(D) None of the above

33. Which of the following is both an endocrine and exocrine gland ?
(A) Pancreas
(B) Adrenal
(C) Pituitary
(D) Thyroid

34. Bile contribution to digestion is :
(A) Nucleic acid metabolism
(B) Phagocytosis
(C) Emulsification of dietary lipids
(D) Carbohydrate digestion

35. Which of the following is not a biogeographical realm ?
(A) Palaearctic
(B) Nearctic
(C) Paleotropic
(D) Chapparral

36. Which of the following animals has four horns ?
(A) Alces Alces
(B) Tetracerus Quadricornis
(C) Antilope Cervicapra
(D) Pseudonis Nayaur

37. Which of the following has the greatest covalent character ?
(A) NaCl
(B) $MgCl_2$
(C) $AlCl_3$
(D) $SiCl_4$

38. A gas absorbs a photon of 355 nm and emits at two wavelengths. If one of the emissions is at 680 nm, the other is at :
(A) 518 nm
(B) 1035 nm
(C) 325 nm
(D) 743 nm

39. An atom has a mass number of 23 and atomic number 11. The number of protons are :
(A) 11
(B) 12
(C) 23
(D) 44

40. Which of the following salts is basic in nature ?
(A) NH_4NO_3
(B) Na_2CO_3
(C) Na_2SO_4
(D) NaCl

41. Fleming's left hand rule is used to find :
(A) Direction of flux in a solenoid
(B) Direction of forces on a current carrying conductor in a magnetic field
(C) Polarity of a magnetic pole
(D) Direction of magnetic field due to current carrying conductor

42. What is the magnetomotive force in a 75-turn coil of wire when there is 4A of current passing through it ?
(A) 18.75 At
(B) 300 At
(C) 40 At
(D) 187 At

43. Which law states that the internal energy of a gas is a function of temperature ?
(A) Charles' law
(B) Joule's law
(C) Regnault's law
(D) Boyle's law

44. Which of the following wavelength ranges is associated with UV spectroscopy ?
(A) 0.8 – 500 μm
(B) 380 – 750 nm
(C) 100 – 400 nm
(D) 0.1 – 10 nm

45. The distribution of heights of students in a class is roughly bell-shaped. Moreover, the average height is 68 inches and approximately 95% of the heights are between 62 and 74 inches. The standard deviation of the height distribution is approximately :
(A) 12
(B) 9
(C) 6
(D) 3

46. If n is a positive integer such that
$n ! / (n - 2) ! = 342$, find n.
(A) 15
(B) 19
(C) 17
(D) 18

47. For what value of k will the two equations $2x+4=4(x-2)$ and $-x+k=2x-1$ have the same solution?

(A) 11

(B) 7

(C) -11

(D) 17

48. If x is a negative number, which of the following must be true?

(I) $x^5 < |x|$

(II) $x < \sqrt{(-x)}$

(III) $x - 1/|x| < 0$

(A) (II) and (III) only

(B) (I), (II) and (III)

(C) (I) and (II) only

(D) (I) and (III) only

49. What is the sum of the reciprocals of the solutions to the equation $x^2-(3/5)x=-11/3$:

(A) 3/11

(B) 9/33

(C) 9/55

(D) 55/33

50. The amount of a radioactive material decays according to the formula $A(t)=A_o e^{-kt}$ where, A_o is the initial amount, k is a positive constant and t is the time in days. Find a formula for the half-life of the material.

(A) $T = \ln 2/k$

(B) $T = \ln 4/k$

(C) $T = \ln k/10$

(D) None of the above

51. The level of sound D in decibels is defined as $D=10\log(1/10^{-16})$, where 1 is the sound intensity in watts/cm^2. Determine the level in decibels of a sound with intensity $1 = 10^{-8}$ watts/cm^2 :

(A) 60 decibels

(B) 80 decibels

(C) 120 decibels

(D) 10 decibels

52. Find the 10th term of a geometric sequence if $a_1 = 45$ and the common ratio $r = 0.2$.

(A) 4.601×10^{-2}

(B) 2.304×10^{-25}

(C) 2.304×10^{-5}

(D) 2.304×10^{-9}

53. Pyranometer is the instrument which measures the :

(A) short wave radiation

(B) sunshine hours

(C) humidity

(D) albedo

54. Relative humidity of the air is defined as the ratio of :

(A) actual vapour pressure to the saturation vapour pressure at 0°C

(B) weight of water in unit volume of air to the weight of air in the same volume

(C) actual vapour pressure to the saturation vapour at the air temperature

(D) actual vapour pressure to the atmospheric pressure

55. The climate of the Kashmir valley is mainly determined by :

(A) Westerlies

(B) Trade winds

(C) Southeast monsoons

(D) Southwest monsoons

56. A measuring device which can be used to measure wind speed and direction is called :
(A) lysimeter
(B) anemometer
(C) rain gauge
(D) none of the above

57. The Ozone layer is found in :
(A) Troposphere
(B) Stratosphere
(C) Thermosphere
(D) Mesosphere

58. Which of the following is not a Greenhouse gas ?
(A) Carbon dioxide
(B) Carbon monoxide
(C) Methane
(D) All of the above

59. Black carbon enhances the melting of Himalayan glaciers as the black carbon deposition :
(A) Decreases the albedo causing positive radiative forcing
(B) Increases the albedo causing negative radiative forcing
(C) Results in acid rains in the ablation zone
(D) All of the above

60. Which of the following is an important non-timber forest produce in Kashmir forests ?
(A) Resins
(B) Mushrooms
(C) Dioscorea
(D) All of the above

Sr. No. 156

ENTRANCE TEST-2017

SCHOOL OF EARTH & ENVIRONMENTAL SCIENCES

GEO-INFORMATICS

Question Booklet Series **B**

Total Questions : 60
Time Allowed : 70 Minutes

Roll No. : | | | | | | |

Instructions for Candidates :

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SEAL

1. Arrange the following gases present in atmosphere in the decreasing order of volume

I. Helium II. Oxygen
III. Nitrogen IV. Argon

(A) I, II, III IV
(B) II, III, IV, I
(C) III, II, IV, I
(D) IV, III, I, II

2. Which of the following latitudes passes through India ?

(A) Tropic of Cancer
(B) Equator
(C) Tropic of Capricorn
(D) Arctic Circle

3. The following factor(s) is (are) responsible for degradation of soil

(A) Chemical fertilizers
(B) Landslides
(C) Floods
(D) All of the above

4. Thick blue line in map is usually used to show

(A) Hydro-electric power station
(B) Stream
(C) River
(D) Dam axis

5. Salim Ali National Park is situated in which State of India?

(A) Jammu and Kashmir
(B) Assam
(C) Karnataka
(D) Nanital, Uttarakhand

6. In the State of Jammu and Kashmir good quality sapphire deposits are found in

(A) Sanku, Dras
(B) Poddar, Kishtwar
(C) Uri, Baramulla
(D) Lolab, Kupwara

7. Konsarnag is situated in which of the mountain ranges of Jammu and Kashmir ?

(A) Harmukh Range
(B) Great Himalayan Range
(C) Pir Panjal Range
(D) None of the above

8. Which of the following is an application of the GIS?

(A) Land information system
(B) Traffic navigation system
(C) Banking information system
(D) Both (A) and (B)

9. Which of the following are the optical remote sensing sensors?

(A) LISS
(B) TM
(C) MSS
(D) All of the above

10. Pyranometer is the instrument which measures the:

(A) Solar radiation
(B) Sunshine hours
(C) Humidity
(D) Albedo

11. Relative humidity of the air is defined as the ratio of:

(A) Actual vapour pressure to the saturation vapour pressure at 0°C
(B) Weight of water in unit volume of air to the weight of air in the same volume
(C) Actual vapour pressure to the saturation vapour pressure at the air temperature
(D) Actual vapour pressure to the atmospheric pressure

12. Rainfall Hyetograph represents:

(A) A plot of rainfall depth or intensity as a function of time

(B) A plot of summation of rainfall increments as a function of time

(C) Depth of rainfall per unit time

(D) None of the above

13. GPS is used for determining which of the following parameters?

(A) Altitude

(B) Latitude

(C) Longitude

(D) All of the above

14. A measuring device which can be used to measure the amount of actual evapotranspiration by the plants is called:

(A) Lysimeter

(B) Anemometer

(C) Rain gauge

(D) None of the above

15. In a strongly skewed data distribution, which measure is the most unreliable indicator of central tendency?

(A) Range

(B) Median

(C) Mean

(D) Mode

16. Correlation Coefficient varies between:

(A) $+1$ & -1

(B) $+1$ & 0

(C) -1 & 0

(D) None of the above

17. Given the set of data [12, 16, 18, 13, 7, 9, 11, 14, 20] what is the standard deviation?

(A) 4.18

(B) 5.85

(C) 7.55

(D) 5.56

18. The standard error is a statistical measure of:

(A) The degree to which a sample has been accurately stratified

(B) The extent to which a sample mean is likely to differ from the population

(C) Both (A) and (B)

(D) None of the above

19. What comes next in the sequence: 2, 4, 10, 28, ____ ?

(A) 64

(B) 70

(C) 76

(D) 82

20. If $x = -1$, then what is the value of the function $f(x) = x^3 + 4x + 12$?

(A) 17 (B) 9

(C) 7 (D) 23

21. If logarithm of 5832 be 6, find the base

(A) $3\sqrt{2}$ (B) $2\sqrt{5}$

(C) $\sqrt{2}$ (D) $\sqrt{3}$

22. If A and B are matrices, then which from the following is true ?

(A) $A + B \neq B + A$

(B) $(A^t)^t \neq A$

(C) $AB \neq BA$

(D) All of the above

23. The acceleration due to gravity near the surface of a planet of radius R and density d is proportional to:

(A) d/R^2

(B) dR^2

(C) dR

(D) d/R

24. In which of the following cases the potential energy is defined?

(A) Conservative and non-conservative forces

(B) Conservative forces only

(C) Non-conservative forces only

(D) Neither of the above

25. A cycle tyre bursts suddenly, this represents an:

(A) Isothermal process

(B) Isobaric process

(C) Isochoric process

(D) Adiabatic process

26. The wavelength of the sunlight is

(A) 400-700 nanometers

(B) 400-700 micrometers

(C) 10-12.5 centimeters

(D) 700-900 millimeters

27. In which of the following hydrogen bond is present?

(A) H_2

(B) Ice

(C) Sulphur

(D) Hydrocarbon

28. Bohr's theory is applicable to

(A) He

(B) Li^{2+}

(C) He^{2+}

(D) None of the above

29. Which of the following acts as both an oxidizing as well as reducing agent?

(A) HNO_3

(B) HNO_2

(C) HI

(D) H_2SO_4

30. The energy of an ideal gas depends only on its:

(A) Pressure

(B) Volume

(C) Number of moles

(D) Temperature

31. A teleprinter terminal is an example of:

(A) Input device

(B) Output device

(C) Both (A) and (B)

(D) Storage device

32. Program which exactly performs operations that manual says is classified as:

(A) Stable functioning

(B) Robust

(C) Reliable

(D) None

33. A collection of related fields is called

(A) Tuple

(B) Field

(C) File

(D) Database

34. Decimal equivalent of (101011)2 is:

(A) 42

(B) 43

(C) 44

(D) 45

35. A high Biological Oxygen Demand (BOD) indicates:
(A) Low level of microbial pollution
(B) High level of microbial pollution
(C) Absence of microbes
(D) None

36. UNFCCC came into force on
(A) 21st February, 1994
(B) 21st March, 1994
(C) 21st April, 1994
(D) 21st May, 1994

37. Fill in the gap. MDG6 is to combat HIV-Aids, _____ and other diseases.
(A) Tuberculosis
(B) Malaria
(C) Diarrhoea
(D) Cholera

38. The first sustainable development goal aims to eradicate extreme poverty. How does the UN currently measure extreme poverty?
(A) People who are unemployed and unable to access welfare benefits from the state
(B) People who live on less than $5 a day
(C) People who live on less than $1.25 a day
(D) People who claim to be living in poverty

39. National Disaster Management Authority of India was formed in:
(A) 2002
(B) 2003
(C) 2004
(D) 2005

40. CO_2 concentration at Mauna Loa Observatory touched an all-time high of 400 ppm in:
(A) 2013
(B) 2014
(C) 2015
(D) 2016

41. The biggest reservoir of carbon is:
(A) Amazon rainforest
(B) Wetlands
(C) Oceans
(D) None

42. Atmosphere does not play a significant role in the cycling of:
(A) Carbon
(B) Nitrogen
(C) Phosphorus
(D) All of these

43. In a food chain of a grassland ecosystem, the top consumers are:
(A) Herbivores
(B) Carnivores
(C) Bacteria
(D) None

44. The pyramid of energy is:
(A) Always upright
(B) Always inverted
(C) Sometimes upright
(D) Sometimes inverted

45. The second longest glacier outside poles is:
(A) Biafo
(B) Baltora
(C) Hispar
(D) Siachin

46. The vast majority of energy taken into an ecosystem is
(A) Converted into biomass by plants
(B) Utilized by secondary consumers
(C) Lost as heat
(D) Used by the primary consumers

47. 99% of the atmosphere lies within
(A) 30 km
(B) 10 km
(C) 70 km
(D) 1 km

48. Variations in the proportion of which of the following gases in air is major concern of climate change?
(A) Carbon dioxide (B) Nitrogen
(C) Oxygen (D) Argon

49. One of the characteristics of troposphere is
(A) Constant temperature with altitude
(B) Decrease in temperature with altitude
(C) Increase in temperature with altitude
(D) Small scale variation in temperature

50. What does the Stefan-Boltzmann's radiation law state?
(A) Radiant heat energy emitted from a surface is proportional to the fourth power of its absolute temperature
(B) Radiant heat energy emitted from a surface is proportional to the square of its absolute temperature
(C) Radiant heat energy emitted from a surface is directly proportional to the power of its absolute temperature
(D) None of the above

51. Dry steam power stations use geothermal steam of _____ degrees temperature to turn the turbines.
(A) $\geq 150\ ^{\circ}C$ (B) $> 1100\ ^{\circ}C$
(C) $\geq$ than $10^{\circ}C$ (D) $= 100^{\circ}C$

52. Atmospheric pressure is generated by
(A) Earth's rotation
(B) Earth's revolution
(C) Gravitational force of the earth
(D) None of these

53. Which is more suitable layer for flying of jet aeroplanes?
(A) Troposphere
(B) Mesosphere
(C) Thermosphere
(D) Stratosphere

54. Generally speaking, the most destructive earthquake waves are
(A) P waves
(B) Surface waves
(C) S waves
(D) All of the above

55. When a volcano ejects an acid lava, eruption is usually
(A) Light and less violent
(B) Soft and less violent
(C) Loud but less violent
(D) Loud and more violent

56. An example of a rock whose minerals have been crushed into thin sheets or bands is
(A) Shale
(B) Schist
(C) Conglomerate
(D) Granite

57. Which of the following is the name of the partly melted rock layer on which the plates move?
(A) Lithosphere
(B) Asthenosphere
(C) Hydrosphere
(D) Outer core

58. The San Andreas fault in California is a classic example of which of the following types of faults?
(A) Tear fault
(B) Upthrust fault
(C) Dip-slip fault
(D) Strike-slip fault

59. When the front of a glacier is stationary for a lo time, the glacier will do which of the following?
(A) Form many crevasses
(B) Build a large terminal moraine
(C) Melt away
(D) Not erode its bed

60. The Triassic, Jurassic and Cretaceous Peri constitute what Geologic Era?
(A) The Precambrian
(B) The Mesozoic
(C) The Paleozoic
(D) The Cenozoic

Sr. No. 159

ENTRANCE TEST-2016

FACULTY OF PHYSICALS & MATERIAL SCIENCE

M.Sc. GEO-INFORMATICS

Question Booklet Series **A**

Total Questions : 60
Time Allowed : 70 Minutes

Roll No. : | | | | | | |

Instructions for Candidates :

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1. Which of the following has the shortest access time ?

   (A) Cache memory (B) Magnetic core memory
   (C) RAM (D) Magnetic bubble memory

2. Which of the following is not an Operating System ?

   (A) Windows (B) OS/2
   (C) Unix (D) LAN

3. Which of the following produces the best quality graphics reproduction ?

   (A) Plotter (B) Laser printer
   (C) Dot matrix printer (D) Ink jet printer

4. Which of the following is not a Binary Number ?

   (A) 001 (B) 202
   (C) 101 (D) 110

5. The most violent type of volcano is known as :

   (A) Hawaiian type (B) Strambilian type
   (C) Pelean type (D) Vesuvian type

6. Which of the following is not a feature of Mountain Glaciation ?

   (A) Horn (B) Arete
   (C) Cirque (D) Playas

7. The instrument used to record earthquake waves is called :

   (A) Seismograph (B) Seismogram
   (C) GPS (D) None of the above

8. The era that covers the longest span of time is :

   (A) Cenozoic (B) Precambrian
   (C) Paleozoic (D) Mesozoic

9. Which of the following Geomorphic features is created by Wind Erosion ?

(A) Sand dune
(B) The Grand Canyon
(C) Cinder cone
(D) All of the above

10. Which of the following factors are used for Soil Classification ?

(A) Age and parent material of the soil
(B) Structure of the soil
(C) Climate and drainage
(D) All of the above

11. Which of the following is a land use and land cover classification system ?

(A) Anderson
(B) GNSS
(C) GAGAN
(D) All of the above

12. Which of the following is not an example of the Soil Conservation Practice ?

(A) Contour farming
(B) Mulching
(C) Terracing
(D) All of the above

13. Microwave remote sensing operates in which of the following wavelength regions ?

(A) 400–700 nanometers
(B) 400–700 micrometers
(C) 1–100 centimeters
(D) 1.2–12.5 micrometers

14. Digital Elevation Model (DEM) is generated from :

(A) Remote sensing data
(B) Topographic data
(C) Global positioning system
(D) All of the above

15. Which of the following sensors is an example of Indian Remote Sensing Satellite ?

(A) LISS
(B) ETM+
(C) MSS
(D) PRISM

16. Geoinformatics is the science that develops and uses information to address the problems of :

(A) Earth observation and Satellite sensor technology
(B) Computer science; software and hardware
(C) Geosciences, cartography, image processing and other related branches of science
(D) All of the above

17. From the historical flood records, it could be safely said that the return period of September 2014 flood was :

(A) 100 year flood
(B) 50 year flood
(C) 1000 year flood
(D) None of the above

18. A hyetograph is a graphical representation of :

(A) Discharge and time
(B) Rainfall intensity and time
(C) Rainfall depth and time
(D) Cumulative rainfall and time

19. A current meter is used to measure :

(A) Water discharge
(B) Depth of flow of water
(C) Velocity of flow of water
(D) All of the above

20. A type of rock with low hydraulic conductivity is called :

(A) Aquifer
(B) Aquitutde
(C) Aquiclude
(D) Aquitard

21. The residence time of CO_2 in the atmosphere is of the order of :

(A) 24–72 hours
(B) 30–95 years
(C) 1–2 months
(D) 7–15 days

22. COP21 meeting negotiated the Paris Agreement on Climate Change that sets out global action to limit the global warming to below :

(A) 2°C
(B) 1°C
(C) 3°C
(D) None of the above

23. The Indian Water Pollution Act (Prevention and Control) came into force in the year :

(A) 1972
(B) 1977
(C) 1956
(D) 1974

24. Which of the following statements is false about the Millenium Development Goals (MDGs) ?

(A) Poverty eradication
(B) Universal primary education
(C) Halting the spread of HIV/AIDS
(D) Nuclear energy promotion

25. Which of the following is not a map element ?

(A) Legend (B) Scale

(C) Annotation (D) Contour

26. Snow leopard habitat is spread over :

(A) The entire Kashmir valley (B) The entire Ladakh region

(C) The entire Gilgit region (D) All of the above

27. Which of the following mountain ranges is currently heavily glaciated ?

(A) Pir Panjal (B) Greater Himalaya

(C) Korakoram (D) Shamasbari

28. The critically endangered Kashmir stag, also known as Hangul has currently a population of about :

(A) 200 (B) 100

(C) 500 (D) 1000

29. The process of manipulating the genes outside the normal reproductive process is known as :

(A) Gene linking (B) Genetic manipulation

(C) Gene targetting (D) Genome recombination

30. Succession that occurs on abandoned agriculture fields is best described as :

(A) Primary succession (B) Secondary succession

(C) Coevolution (D) Prairie succession

31. Which of the following statements is correct ?

(A) Flower of tulip is a modified shoot

(B) Eyes of potato tuber are root buds

(C) The most reduced stem is found in rhizome

(D) All of the above

32. Which of the following factors is the most influential in determining the rate of transpiration ?

(A) Rain (B) Light

(C) Relative humidity of atmosphere (D) Water

33. The male and female brains have structural differences in which of the following ?

(A) Corpus callosum (B) Cerebral cortex

(C) Thalamus (D) All of these

34. The endocrine system can be controlled by which of the following ?

(A) Calcium (B) Topical hormones

(C) Glucose and sodium (D) All of these

35. How much blood does the average adult have ?

(A) 2 litres (B) 5 litres

(C) 10 litres (D) 15 litres

36. The largest terrestrial biome on earth is the :

(A) Taiga (B) Tundra

(C) Deciduous forest (D) Desert

37. Fleming's left hand rule is used to find :

(A) Direction of flux in a solenoid

(B) Direction of forces on a current carrying conductor in a magnetic field

(C) Polarity of a magnetic pole

(D) Direction of magnetic field due to current carrying conductor

38. What is the magnetomotive force in a 75-turn coil of wire when there is 4 A of current passing through it ?

(A) 18.75 At (B) 300 At

(C) 40 At (D) 187 At

39. Which law states that the internal energy of a gas is a function of temperature ?

(A) Charles' law (B) Joule's law

(C) Regnault's law (D) Boyle's law

40. Which of the following wave length ranges is associated with UV spectroscopy ?

(A) 0.8–500 μm (B) 380–750 nm

(C) 100–400 nm (D) 0.1–10 nm

41. According to the first law of thermodynamics :

(A) Total energy of an isolated system remains constant

(B) Total internal energy of a system during a process remains constant

(C) Word done by a system is equal to the heat transferred by the system

(D) All of the above

42. Which of the following substances has a polar covalent bond between its atoms ?

(A) NaCl (B) Ca_3N_2

(C) NH_3 (D) K_3N

43. Which one of the following reactions is NOT a redox reaction ?

(A) $Zn + Cu^{2+} \rightarrow Zn^{2+} + Cu$ (B) $I_2 + 2Fe^{2+} \rightarrow 2I^- + 2Fe^{3+}$

(C) $2Mg + O_2 \rightarrow 2MgO$ (D) $HCl + NaOH \rightarrow NaCl + H_2O$

44. The Total Dissolved Solids (TDS) in water can be reduced by the following method :

(A) Distillation (B) Reverse osmosis

(C) Ion exchange (D) All of the above

45. Which of the following is termed as 'third pole' ?

(A) Arctic (B) Antaractic

(C) Himalaya (D) None of the above

46. Environmental Impact Assessment (EIA) in India is mandatory under which of the following legislations ?

(A) Indian Forest Act

(B) Wildlife Protection Act

(C) Environment Protection Act

(D) Air Pollution Prevention and Control Act

47. Which one of the following is not a gaseous biogeochemical cycle in Ecosystem ?

(A) Phosphorus cycle (B) Carbon cycle

(C) Nitrogen cycle (D) Sulphur cycle

48. Which one of the following is a glacier depositional feature ?

(A) Drumlins (B) Arête

(C) Cirque (D) Horn

49. Which one of the following is correct order of layers in Atmosphere ?

(A) Troposphere, Stratosphere, Mesosphere, Thermosphere, Exosphere

(B) Stratosphere, Troposphere, Mesosphere, Thermosphere, Exosphere

(C) Stratosphere, Thermosphere, Exosphere, Troposphere, Mesosphere

(D) Stratosphere, Mesosphere, Troposphere, Thermosphere, Exosphere

50. Atmospheric pressure generated on the earth's surface is due to :

(A) Earth's rotation (B) Earth's revolution

(C) Gravitational force of the Earth (D) None of the above

51. Which is the coldest place in India ?

(A) Leh (B) Manali

(C) Siliguri (D) Drass

52. Which of the following causes rainfall in the north west part of India ?

(A) Western disturbances (B) Southwest monsoons

(C) Cyclonic depression (D) Retreating monsoons

53. The mean of the distribution is 14 and the standard deviation is 5. What is the value of the Correlation Coefficient ?

(A) 60.6% (B) 45.6%

(C) 35.7% (D) 46.5%

54. The number of emergency cases in hospital for five days are as 12, 15, 18, 16 and 14, then variance of sample is :

(A) 5 (B) 7

(C) 11 (D) 6.5

55. A distribution that leans sharply to the left (low side) and tails far out to the right has :

(A) Positive skewness (B) Negative skewness

(C) Positive kurtosis (D) Negative kurtosis

56. What percentage of scores falls within three standard deviations from the mean ?

(A) 50.5% (B) 99.7%

(C) 95.4% (D) 68.2%

57. If a and d are the first term and the common difference of the Arithmetic Progression respectively, then the nth term of corresponding Harmonic Progression is :

(A) $a^n = a + (n - 1)d$ (B) $a^n = 1/a + (n - 1)d$

(C) $a^n = a/1 + (n - 1)d$ (D) $a^n = a/a + (n - 1)d$

58. The roots of the quadratic equation $x^2 - 6x + 10 = 0$ are :

(A) Imaginary (B) Real

(C) Irrational (D) Equal

59. If AB exists, then $(AB)^{-1}$ is :

(A) $A^{-1} B^{-1}$ (B) $B^{-1} A^{-1}$

(C) AB (D) None of the above

60. For what value of k will the two equations $2x + 4 = 4(x - 2)$ and $-x + k = 2x - 1$ have the same solution ?

(A) 11 (B) 7

(C) –11 (D) 17

ROUGH WORK

1. Which of the following is an example of the computer secondary data storage ?
   (A) Processor registers (B) Processor cache
   (C) RAM (D) Magnetic tape

2. Decimal equivalent of binary number 10101 :
   (A) 11 (B) 21
   (C) 15 (D) 7

3. The ascending order of a data hierarchy is :
   (A) Bit-byte-record-field-file-database
   (B) Byte-bit-field-record-file-database
   (C) Bit-byte-field-record-file database
   (D) Bit-byte-file-record-field -database

4. Which of the following is an internet browser ?
   (A) Internet Explorer (B) Safari
   (C) Firefox (D) All of the above

5. The age of earth is currently thought to be :
   (A) 6.5 billion years (B) 4.5 billion years
   (C) 8.5 billion years (D) 2.5 billion years

6. The layer that separates the earth's crust from the core is the :
   (A) Mantle (B) Lithosphere
   (C) Atmosphere (D) None of the above

7. Which planet is not known to have volcanoes ?
   (A) Venus (B) Mars
   (C) Saturn (D) Earth

8. Drumblin is ?
   (A) Erosional feature of glaciers (B) Depositional features of glaciers
   (C) Topographic features of Moon (D) Geomorphic features of Mars

9. Which of the following is not a mineral ?

(A) Olivine
(B) Calcite
(C) Limestone
(D) Quartz

10. Land capability is a function of :

(A) Soil, topography and climate
(B) Topography
(C) Climate
(D) All of the above

11. Which of the following factors influences the erodibility of soils ?

(A) Slope
(B) Vegetation
(C) Soil texture
(D) All of the above

12. Zone of maximum organic matter accumulation is the :

(A) A-horizon
(B) B-horizon
(C) C-horizon
(D) R-horizon

13. Optical remote sensing operates in which of the following wavelength region ?

(A) 400-700 nanometers
(B) 400-700 micrometers
(C) 400-700 centimeters
(D) 400-700 millimeters

14. Which of the following is a digital representation of the topography ?

(A) DTM
(B) DGPS
(C) SAR
(D) GIS

15. Which of the following satellites/sensors is an example of thermal sensing ?

(A) ASTER
(B) TM
(C) MODIS
(D) All of the above

16. Geographic Information System :

(A) Is a sensing technology
(B) Integrates data from various sources
(C) Synonymous to Information Technology
(D) All of the above

17. Which of the following is the largest reservoir of water ?

(A) Groundwater
(B) Lakes
(C) Rivers
(D) Atmosphere

18. The average annual rainfall of Srinagar is around :

(A) 1000 mm (B) 700 mm

(C) 1500 mm (D) 1800 mm

19. Lysimeter is a hydrological instrument used to measure :

(A) Evaporation (B) Infiltration

(C) Evapotranspiration (D) Interception

20. An isohyet is a line joining :

(A) Equal precipitation intensity

(B) Equal precipitation depth

(C) Equal storm duration

(D) Equal height of precipitation stations

21. Paddy cultivation leads to the release of which gas in the atmosphere ?

(A) Methane (B) Nitrous oxide

(C) Ozone (D) Hydroflourocarbons

22. Man and Biosphere program is affiliated with :

(A) IUCN (B) UNESCO

(C) WWF (D) UNEP

23. The Indian Water Pollution Act (Prevention and Control) came into the force in the year :

(A) 1972 (B) 1977

(C) 1956 (D) 1974

24. Which of the following statements is true about the melting of Himalayan cryosphere ?

(A) It shall impact the transboundary sharing of waters

(B) It shall adversely affect the streamflows

(C) It shall adversely affect the food security

(D) All of the above

25. The Himalayan Ibex is a type of :

(A) Goat (B) Deer

(C) Sheep (D) Horse

26. Tourism Carrying capacity of an area means its :

(A) Infrastructure capacity (B) Social capacity

(C) Ecological capacity (D) All of the above

27. UN Millennium Development Goals are meant to :

(A) Reduce child mortality (B) Empowering women

(C) Poverty reduction (D) All of the above

28. Which region of the State has the highest hydropower potential ?

(A) Kashmir valley (B) Gureza valley

(C) Chenab valley (D) Suru valley

29. The process of successful establishment of a species in a new area is called :

(A) Sere (B) Climax

(C) Invasion (D) Ecesis

30. The ecosystem with the highest plant productivity is :

(A) Desert (B) Tundra

(C) Savannah (D) Tropical rain forest

31. A probe is used in which stage of genetic engineering ?

(A) Cloning (B) Screening

(C) Cleaving DNA (D) Recombining DNA

32. All of the following structures are present in the dicot seed except :

(A) Radicle (B) Endosperm

(C) Coleoptile (D) Seed coat

33. The male hormone testosterone is produced by :

(A) Leydig cells (B) Epididymis

(C) Vas deferens (D) Seminiferous tubules

34. An example of hermaphrodite is :

(A) Frog (B) Fish

(C) Earthworm (D) Hydra

35. Axoplasm is the :

(A) Blood plasma that nourishes a nerve

(B) Fluid external to the axon but inside the myelin sheath

(C) Cytoplasm of the dendrite

(D) Cytoplasm of the axon

36. Which of the following animals is called a living fossil ?

(A) Sacculina (B) Polystomella

(C) Sea cucumber (D) Peripatus

37. Which of the following has the greatest covalent character ?

(A) NaCl (B) $MgCl_2$

(C) $AlCl_3$ (D) $SiCl_4$

38. A gas absorbs a photon of 355 nm and emits at two wavelengths. If one of the emissions is at 680 nm, the other is at :

(A) 518 nm (B) 1035 nm

(C) 325 nm (D) 743 nm

39. An atom has a mass number of 23 and atomic number 11. The number of protons are :

(A) 11 (B) 12

(C) 23 (D) 44

40. Which of the following salts is basic in nature ?

(A) NH_4NO_3 (B) Na_2CO_3

(C) Na_2SO_4 (D) NaCl

41. Which of the following is not a magnetic material ?

(A) Iron (B) Nickel

(C) Cobalt (D) Silver

42. Which of the following bonds would show the strongest absorption in the IR ?

(A) Carbon-hydrogen (B) Oxygen-hydrogen

(C) Nitrogen-hydrogen (D) Sulfur-hydrogen

43. Which of the following statements is correct ?
    (A) Wavelength is directly proportional to energy
    (B) Wavelength is directly proportional to frequency
    (C) Wavelength is inversely proportional to frequency
    (D) All of the above

44. What happens to the gravitational force between two objects, if the mass of one object is doubled ?
    (A) Remains same
    (B) Becomes double
    (C) Becomes four times
    (D) Becomes half

45. Which of the following human activity has added the maximum carbon to the atmosphere ?
    (A) Burning of fossil fuel
    (B) Deforestation
    (C) Mining
    (D) Soil erosion

46. Why is it difficult to integrate the atmospheric nitrogen in the nitrogen cycle of the biosphere ?
    (A) Few organisms can directly utilize atmospheric nitrogen gas
    (B) Nitrogen is not abundant in the atmosphere
    (C) Living organisms quickly absorb nitrogen gas
    (D) Oceans quickly absorb nitrogen gas

47. The boundaries between biomes are usually seen as :
    (A) Gradudal transition zones
    (B) Abrupt changes in vegetation but not of animals
    (C) Abrupt changes in both vegetation and animals
    (D) Distinct topographic barriers such as mountains and rivers

48. Which one of the following is a glacier erosional feature ?
    (A) Drumlins
    (B) Moraines
    (C) Cirques
    (D) Eskers

49. The "Coriolis force" is caused due to :
    (A) Wind movements
    (B) Earth's rotation
    (C) Cyclones
    (D) Jet streams

50. Western disturbances orginate from which sea ?

(A) Indian Ocean
(B) Arabian Sea
(C) Dead Sea
(D) Mediterranean Sea

51. How does the annual precipitation of Sriangar compare to that of Leh ?

(A) Same
(B) Lower
(C) Higher
(D) None of the above

52. Which of the following climatic controls is the most important ?

(A) Latitude
(B) Longitude
(C) Continentality
(D) Wind system

53. Correlation Coefficient varies from :

(A) 0–1
(B) –1 to +1
(C) –1 – 0
(D) None of the above

54. What is the standard deviation of the data set; [14, 23, 9, 12, 21, 18, 8] ?

(A) 15.987
(B) 13.456
(C) 5.398
(D) 7.876

55. Under what circumstances should we be cautious about using the mean as the measure of central tendency ?

(A) When the data is skewed
(B) When the data is positively skewed
(C) When the data is negatively skewed
(D) All of the above

56. Which of the following is true about the normal statistical distribution ?

(A) 99.7% of the data lies between $\pm 3\sigma$ of the mean
(B) 95.4% of the data lies between $\pm 2\sigma$ of the mean
(C) 68.2% of the data lies between $\pm 1\sigma$ of the mean
(D) All of the above

57. Which of the following statements is not correct ?

(A) $\text{Log}(2+3) = \log(2\times3)$
(B) $\text{Log}_{10} 10 = 1$
(C) $\text{Log}_{10} 1 = 0$
(D) $\text{Log}(1+2+3) = \log1 + \log2 + \log3$

58. What is the 30^{th} term of the Arithmetic progression : 10, 7, 4, ... ?

(A) – 97 (B) – 87

(C) – 77 (D) – 67

59. Which of the following is not a quadratic equation ?

(A) $x + 1/x = 5$ (B) $(x-3)(2x+1) = x(x+5)$

(C) $(x-2)(x+1) = (x-1)(x+3)$ (D) $(2x-1)(x-3) = (x+5)(x-1)$

60. Find the determinant of the matrix :

$$\begin{bmatrix} 5 & -2 & 3 \\ 4 & -1 & -5 \\ 6 & 7 & 9 \end{bmatrix}$$

(A) 214 (B) 300

(C) 364 (D) 376

1. Which of the following is not an operating system ?
   (A) Windows Vista (B) Red Hat Linux
   (C) Mac OS X (D) Microsoft office XP

2. The errors that can be pointed out by the compiler are :
   (A) Syntax error (B) Symantic error
   (C) Logical error (D) Internal error

3. Which of the following is not a database management system ?
   (A) Relation database management system
   (B) Object oriented database management system
   (C) Network database management system
   (D) Raster database management system

4. Which of the following performs modulation and demodulation ?
   (A) Fibre optics (B) Modem
   (C) Coaxial cable (D) Satellite

5. The rigid outer most layer of the earth is called :
   (A) Lithosphere (B) Outer core
   (C) Asthenosphere (D) Mantle

6. The Moho is located between :
   (A) Inner and outer core
   (B) Crust and Mantle
   (C) Lithosphere and Asthenosphere
   (D) Continental slope and abysmal plain

7. The most common mineral in the earth's crust is :
   (A) Olivine (B) Feldspar
   (C) Quartz (D) Hornblende

8. Fossils are most common in which type of the rocks ?
   (A) Igneous (B) Sedimentary
   (C) Metamorphic (D) All of the above

9. Which of the following is a measure of soil conservation ?

(A) Mulching
(B) Tillage cropping
(C) Check dams
(D) All of the above

10. Land capability classification is based on which of the following properties ?

(A) Soil fertility, climate, topography and water availability
(B) Geology, land degradation, weathering and geomorphology
(C) Climate, vegetation, glaciers, population
(D) None of the above

11. Soil erosion is associated with :

(A) Dunes and heaving
(B) Rills and ravines
(C) Floods and water logging
(D) Landslides and avalanches

12. Soil texture influences which of the following ?

(A) Hydrologic properties
(B) Climatic processes
(C) Tectonic processes
(D) Magmatic properties

13. Microwaves used in remote sensing have :

(A) Nanometer wavelength
(B) Micrometer wavelength
(C) Centimeter wavelength
(D) All of the above

14. Digital Elevation Model is a representation of :

(A) Electromagnetic radiation
(B) Surface topography
(C) Mountain orography
(D) Land surface processes

15. Which of the following is an example of the high spatial resolution satellite ?

(A) NOAA
(B) MODIS
(C) LANDSAT
(D) IKONOS

16. Global Positioning System is used for determining the :

(A) Location and altitude
(B) Crustal deformation
(C) Height of the tree canopies
(D) All of the above

17. Lysimeter is used to measure :

(A) Precipitation
(B) Soil moisture
(C) Evaporation
(D) Evapo-transpiration

18. What does a hyetograph display ?

(A) Variations in snowfall over time
(B) Variations in river discharge over time
(C) Variations in water temperature over time
(D) Variations in rainfall over time

19. Hard water contains high concentration of :

(A) Silicon
(B) Lead
(C) Cadmium
(D) Calcium

20. Hydropower potential estimation is dependent on :

(A) Head
(B) Stream flow and velocity
(C) Gravity
(D) All of the above

21. Which of the following international conventions is for the protection of Ozone layer ?

(A) UNFCCC
(B) CBD
(C) UNCCD
(D) None of the above

22. The algal bloom in the lakes is due to :

(A) Increase in the greenhouse gases attributed to Climate change
(B) Explosive increase in Cyanobacteria
(C) Growth of certain fungi in humid conditions
(D) Excessive loading of heavy metals

23. The J&K and other Himalayan states are highly vulnerable to earthquake disasters because of :

(A) The high relief and mountainous terrain
(B) The stress generated by continued northward movement of the Indian plate
(C) The high volcanic activity in the region
(D) The tempering of nature by humans

24. Snow and glacier melt constitutes :

(A) Almost half of the stream-flow discharge in J&K state

(B) The entire stream-flow discharge in the J&K state

(C) Negligible proportion of the stream-flow discharge in the J&K state

(D) None of the above

25. Which of the following is an example of Choropleth maps ?

(A) Population density map (B) Drainage map

(C) Digital elevation model (D) Satellite image

26. As per the 2011 census, what is the population of J&K state ?

(A) 10.90 million (B) 11.20 million

(C) 18.5 million (D) 12.5 million

27. Changthang wildlife sanctuary hosts which of the following wildlife ?

(A) Snow leopard and Ibex

(B) European red deer and brown bear

(C) Black bear and Musk deer

(D) All of the above

28. Which of the rivers in the state has the highest hydropower energy potential ?

(A) Jhelum (B) Chenab

(C) Indus (D) Tawi

29. The enzyme that fixes atmospheric CO2 in C4 plants is :

(A) Aldolase (B) Hydrogenase

(C) PEP carboxylase (D) RUBP carboxylase

30. What is the primary route of mineral absorption by roots ?

(A) Root hairs (B) Cortex of the root

(C) Epidermis of the root (D) Casparian strips

31. Epigeal germination is found in :

(A) Pea (B) Gram

(C) Castor (D) Jowar

32. During cellular respiration, NADH is :

(A) Used in electron transport system

(B) Converted to NAD+ by an enzyme called dehydrogenase

(C) Reduced to form NAD+

(D) None of the above

33. Geographically India falls in which of the major biomes of the world ?

(A) Tropical rain forest (B) Tropical dry forest

(C) Tropical savannah (D) Tundra

34. Which of the following is false ?

(A) The thyroid gland secrets clacitonin

(B) Thyroxin is formed by iodination of tyrosine

(C) A hormone may be secreted by nerve cells

(D) Melatonin is secreted by pituitary gland

35. The scientific name of Kashmir stag (Hangul) is :

(A) Moschus fuscus hanglu (B) Cervus elaphus hanglu

(C) Muntiacus muntjac hanglu (D) Cervicapra hanglu

36. Cholecystokinin harmone is produced in :

(A) The stomach (B) The pancreas

(C) The small intestines (D) The mouth

37. Which of the following are not electromagnetic waves ?

(A) Cosmic rays (B) X-rays

(C) Gamma rays (D) Beta rays

38. If the distance between the sun and the earth is increased by three times, then the attraction between the two will :

(A) Remain constant (B) Decrease by 63%

(C) Decrease by 89% (D) Decrease by 73%

39. When the amount of work done is 333 cal and increase in internal energy is 167 cal, then the heat supplied is :

(A) 500 cal (B) 433 cal

(C) 333 cal (D) 167 cal

40. Both electric and magnetic fields in an electromagnetic waves are :

(A) Perpendicular to the direction of the propagation of wave

(B) Parallel to the direction of the wave propagation

(C) Opposite the direction that the wave travels

(D) Tangential to the direction that the wave travels

41. What is the electronic configuration of Co ?

(A) $[Ar]\ 4s^2\ 3d^{10}$ (B) $[Ar]\ 4s^2\ 3d^2$

(C) $[Ar]\ 4d^1\ 3d^3$ (D) $[Ar]\ 3d^7\ 4s^2$

42. If both, the pressure and volume of a gas are doubled, how will the absolute temperature change ?

(A) It will increase by two times its original value

(B) It will decrease to one fourth of its original value

(C) It will stay the same as its original value

(D) It will increase by four times its original value

43. Which among the following does not have the hydrogen bond ?

(A) Phenol (B) Liquid NH3

(C) Liquid HCl (D) Water

44. The oxidation number of Carbon in CH2O is :

(A) –2 (B) +2

(C) 0 (D) +3

45. The Ozone layer is found in :

(A) Troposphere (B) Stratosphere

(C) Thermosphere (D) Mesosphere

46. Which of the following is not a Greenhouse gas ?

(A) Carbon dioxide
(B) Carbon monoxide
(C) Methane
(D) Chlorofluorocarbons

47. Black carbon enhances the melting of Himalayan glaciers as the black carbon deposition :

(A) Decreases the albedo causing positive radiative forcing
(B) Increases the albedo causing negative radiative forcing
(C) Results in acid rains in the ablation zone
(D) None of the above

48. Which one of the following is an important minor forest produce in Kashmir Himalayas ?

(A) Bamboo
(B) Mushrooms
(C) Dioscorea
(D) None of the above

49. Isohytes are the lines joining the points of equal :

(A) Temperature
(B) Height
(C) Pressure
(D) Precipitation

50. Carbon sequestration is achieved through :

(A) Rocks
(B) Soils
(C) Plants
(D) All of the above

51. The pace of the anthropogenic climate change can be reduced by :

(A) The use of renewable sources of energy
(B) Reducing the deforestation
(C) Reducing the use of fossil fuels
(D) All of the above

52. The climate of the Kashmir valley is determined by :

(A) Westerlies
(B) Trade winds
(C) Monsoons
(D) None of the above

53. For the data series : 2, 1, 6, 4 and 2 :

(A) The mode is 4 (B) The median is 3

(C) The standard deviation is 4 (D) The mean is 3

54. Which of the following are true about the normal distribution ?

(A) 95% of the observations lie between the mean and two standard deviations

(B) 68% of the observations lie between the mean and one standard deviation

(C) The mean, median and mode coincide

(D) All of the above

55. Which of the following statements is true for the standard error of the mean (SEM) ?

(A) SEM is the square root of the variance

(B) SEM assesses the reliability of the mean

(C) SEM measures the spread of observations around the mean

(D) SEM is always larger than the standard deviation

56. Which of the following would generally require the largest sample size ?

(A) Cluster sampling

(B) Simple random sampling

(C) Systematic sampling

(D) Proportionate stratified sampling

57. An equivalent representation for the Boolean expression A + A′ is :

(A) 1 (B) 0

(C) A′ * A (D) A′

58. Find the cofactor, A_{23}, of the matrix $A = \begin{bmatrix} 5 & -2 & 7 \\ 6 & 1 & -9 \\ 4 & -3 & 8 \end{bmatrix}$:

(A) 7 (B) 0

(C) 23 (D) –23

59. The values of x, y, z in order , if the systems of equations $3x + y + 2z = 3$, $2x - 3y - z = -3$ and $x + 2y + z = 4$ are :

(A) 2, 1, 4 (B) 1, 2, –3

(C) 1, 2, –1 (D) 1, 1, 1

60. If the ratio of the sum of the first 6 terms of a Geometric Progression (G.P) to the sum of the first 3 terms of the G.P. is 9, what is the common ratio of the G.P. ?

(A) 3 (B) 1/3

(C) 2 (D) 9

Geo-informatics

1. Which of the following is an internet browser ?

   (a) Chrome (b) Internet Explorer

   (c) Firefox (d) All of the above

2. DBMS don't use which of the following database structure ?

   (a) Hierarchical model (b) Network model

   (c) Topologic model (d) Relational model

3. Which of the following is an example of the spreadsheet software ?

   (a) MS Excel (b) Lotus

   (c) Xoom Office (d) All of the above

4. Bytecode is :

   (a) A compiler that produces an independent executable file

   (b) Is not a machine code and thus, not tied to any particular hardware

   (c) A data type in C programming language

   (d) A database Management System

5. Horn, Col, Cirque and Arete are associated with landforms produced by :

   (a) Running water (b) Ground water

   (c) Wind action (d) Glaciers

6. A rock dominated in composition by Quartz and Feldspar is :

   (a) Basalt (b) Dunite

   (c) Granite (d) Periodolite

7. Which of the following rocks has higher porosity but lower permeability ?

   (a) Limestone (b) Sandstone

   (c) Conglomerate (d) Shale

8. Which of the following explains the build up and release of stress during an earthquake ?

(a) The modified Mercalli scale
(b) The elastic rebound theory
(c) The principle of superposition
(d) The travel difference

9. Which of the following agents of erosion shall be dominant in arid environments ?

(a) Water
(b) Wind
(c) Gravity
(d) Ice

10. Land use and Land cover information can be generated through :

(a) Remote sensing
(b) GIS
(c) Topographic surveys
(d) GPS

11. In chemical weathering, which of the following processes are important ?

(a) Hydrolysis
(b) Oxidation
(c) Dissolution
(d) All of the above

12. Peat soils have :

(a) High carbon content
(b) Low carbon content
(c) High sand content
(d) None of the above

13. Radar remote sensing sensors :

(a) Can see through clouds
(b) Can penetrate water surface
(c) Are passive sensor
(d) Operate in the visible part of the spectrum

14. The components of a typical Geographic Information System are :

(a) Hardware, software, data and users
(b) Satellites, computers, printers and models
(c) GPS, remote sensing, digital cartography and image processing
(d) Computers, DEM, applications and GPS

15. Digital Elevation Model can be generated from :

(a) Stereo images
(b) GPS measurements
(c) Contour lines
(d) All of the above

16. Vector GIS data model is suitable for :

(a) Network analysis
(b) Slope analysis
(c) Digital cartography
(d) Aspect analysis

17. Theissen polygons describe :

(a) A network of rainfall gauges
(b) Contours of equal rainfall across an area
(c) Polygons that contribute to excess overland flow
(d) Polygons created by drawing straight lines at equal distance between points

18. What does a hydrograph display ?

(a) Variations in snowfall over time
(b) Variations in river discharge over time
(c) Variations in water temperature over time
(d) Variations in rainfall over time

19. Evaporation pans provide an approximate estimate of :

(a) Actual transpiration
(b) Actual evaporation
(c) Potential evapo-transpiration
(d) Actual evapo-transpiration

20. One-in-100-year flooding event means :

(a) Flood will occur once in 100 years
(b) There is 1% chance of a flooding occurring in any given year
(c) There is high probability of the biggest of the 100 years flood occurring this year
(d) There is high chance of flooding occurring once every year

21. Which of the following is not a major green house gas ?

(a) Water vapour
(b) Carbon dioxide
(c) Methane
(d) Nitrogen

22. The State of J&K is vulnerable to the following hydrological disaster :

(a) Earthquake (b) Flooding

(c) Landslides (d) Tsunamis

23. Millennium development goals that all nation states have agreed to :

(a) Address climate change issues

(b) Address Biodiversity conservation issues

(c) Combat desertification in the developing countries

(d) Encourage development to improve the socio-economic conditions in the poorest countries

24. The human interference in the nitrogen cycle has led to :

(a) Eutrophication of lakes (b) Increased acid rains

(c) Nitrous oxide release (d) All of the above

25. Which of the following is not an essential element of the map composition ?

(a) Legend (b) Scale

(c) Direction (d) Path/row

26. In J&K State, the dominant forest type is :

(a) Himalayan moist temperate forest (b) Himalayan dry temperate forest

(c) Sub tropical dry evergreen forest (d) All of the above

27. Black-necked crane is found in which of the following wildlife parks ?

(a) Dachigam (b) Kishtwar

(c) Changthang (d) Hemis

28. The State has an identified potential for geothermal energy in :

(a) Kashmir Valley (b) Puga valley

(c) Chinta valley (d) Suru valley

29. Genetic Engineering allows us to directly manipulate :

(a) RNA (b) DNA

(c) Cell membranes (d) Bacteria

30. The biome that is characterized by long winters and short growing season :

(a) Tundra (b) Taiga

(c) Savannah (d) Tropical rainforests

31. Which of the following forms of vegetation would probably appear first on the bare rocks ?

(a) Lichens (b) Weeds

(c) Shrubs (d) Trees

32. AP2, AG and TFL1 are genes involved in :

(a) Seed maturation (b) Flower development

(c) Germination (d) Light response

33. Which of the following enzymes is present in secretions of mouth, stomach and pancreas ?

(a) Amylase (b) Trypsin

(c) Lipase (d) Lactase

34. Hormones :

(a) Are chemical regulators that are conveyed from one organ to another through blood stream

(b) May be secreted by endocrine cells

(c) May be secreted by nerve cells

(d) All of the above

35. Which of the Fauna of the Jammu and Kashmir State is endangered/threatened ?

(a) Ibex (b) Tibetan antelope

(c) Snow leopard (d) All of the above

36. Nearctic zoo-geographic realm mostly encompasses :

(a) North American continent (b) South American continent

(c) African continent (d) Australian continent

37. Which of the following forms of energy has potential to mitigate the climate change impacts ?

(a) Hydropower energy
(b) Solar energy
(c) Wind energy
(d) All of the above

38. Sound travels in air as :

(a) Electromagnetic waves
(b) Longitudinal waves
(c) Transverse waves
(d) Matter waves

39. The Stefhen Boltzmann's law states that the total emitted radiation from a black body is proportional to :

(a) Square of its absolute temperature
(b) Cube of its absolute temperature
(c) Fourth power of its absolute temperature
(d) Square of its area

40. A rubber ball is dropped from a height of 5 m on a planet where the acceleration due to gravity is unknown. On bouncing, it rises to 1.8 m, the ball loses its velocity on bouncing by a factor of :

(a) 2/25
(b) 1/5
(c) 3/5
(d) 9/25

41. Which one among the following does not have the hydrogen bond ?

(a) Phenol
(b) Liquid ammonia
(c) Water
(d) Liquid HCL

42. If both, the pressure and volume of a gas are doubled, how will the absolute temperature change ?

(a) It will increase by two times its original value
(b) It will decrease to one fourth of its original value
(c) It will stay the same as its original value
(d) It will increase by four times its original value

43. Using your knowledge of the Coulomb's law, which of the following atoms has the largest diameter ?

(a) I (b) Br

(c) Cl (d) F

44. What is the most likely electron configuration for a Silicon atom in its ground state ?

(a) $1s^2\ 2s^2\ 2p^6\ 3s^2\ 3p^1$ (b) $1s^2\ 2s^2\ 2p^6\ 3s^2\ 3p^2$

(c) $1s^2\ 2s^2\ 2p^6\ 3s^2\ 3d^4$ (d) $1s^2\ 2s^2\ 2p^6\ 3s^2\ 3p^5$

45. The upper boundary of the stratosphere is called :

(a) Tropopause (b) Stratopause

(c) Thermosphere (d) Mesopause

46. Which of the following country is the largest contributor of Green House Gases ?

(a) India (b) China

(c) USA (d) Brazil

47. Smog is a type of :

(a) Storm (b) Hail storm

(c) Fog which is mixed with smoke (d) Cloud

48. The colder winter across the Northern Hemisphere this year is attributed to :

(a) Strong ENSO (b) Strong La-Nina

(c) Volcanic eruptions in Indonesia (d) Lower global GHG emissions

49. An environmental flow is the water regime provided within a river, wetland or coastal zone to :

(a) Maintain healthy aquatic ecosystems and ensure sustainability of their services

(b) Promote ecotourism and water sports

(c) Round the year hydropower generation

(d) Promote climate change mitigation and adaptation

50. Which of the following is the largest reservoir of Carbon ?

(a) Oceans
(b) Soils
(c) Plants
(d) Atmosphere

51. Himalayas, the Water Tower of Asia and forming the headwaters of almost all the major rivers in Asia, has an approximate glacier coverage of :

(a) 1,00,000 sq km
(b) 50,000 sq km
(c) 10,000 sq km
(d) 5,000 sq km

52. Which of the following Minor forest produce is obtained from Pinus Roxburghii in Jammu region :

(a) Olive
(b) Resin
(c) Oleander
(d) Dioscorea

53. Which of the following is false about the Correlation Coefficient ?

(a) Varies between 0 to 1
(b) Describes degree of association between two variables
(c) A positive value indicates a rise in one variable accompanies a rise in the other
(d) Is denoted by the symbol "r"

54. Marks of the Geoinformatics paper follow a normal distribution with a mean of 65 and a standard deviation of 12. Approximately what proportion of the students have scores below 50 ?

(a) 11%
(b) 89%
(c) 15%
(d) 51%

55. Which of the following statement is false ?

(a) The median is always greater than the mean
(b) The first quartile is equal to the twenty-fifth percentile
(c) In a symmetric distribution, the mean and the median are equal
(d) In a symmetric distribution, the median is halfway between the first and the third quartiles

56. Which of the following statement is false ?

(a) In random sampling, every element of the population has a known and equal chance of being selected

(b) Convenience sampling often leads to bias in estimate because sample is often not representative of the population

(c) In random sampling, the precision of a sample mean or sample proportion depends only upon the sample size (and not on the population size)

(d) If a sample of 100.000 pixels is randomly selected from a satellite image (with 15 million pixels) and the average pixel value is computed, then the true pixel value of all the pixels in the image is known

57. If $x = 1$ is a common root of the equations $ax^2 + ax = 3 = 0$ and $x^2 + x + b = 0$, then $ab = ?$

(a) 3 (b) 3.5

(c) 6 (d) 4

58. The value of k for which the system of equations $3x + 5y = 0$ and $kx + 10y = 0$ has non-zero solution is :

(a) 3 (b) 5

(c) 6 (d) 10

59. If A is a matrix of order 2×3 and B is a matrix of order 3×5, what is the order of matrix $(AB)^T$?

(a) 2×5 (b) 3×5

(c) 5×3 (d) 5×2

60. The first and last terms of an arithmetic progression are 1 and 11. If some of its terms is 36, then the number of terms will be :

(a) 7 (b) 6

(c) 9 (d) 11

Geoinformatics - 2010

1. The main components of the computer communicate with each other through :
   (a) Monitor (b) Keyboard
   (c) Memory (d) System bus

2. Who suggested the "stored program concept" :
   (a) John Von Neumann (b) Howard Aiken
   (c) Herman Hollerith (d) Charles Babbage

3. A computer on the network that is used for sharing resources with others is called :
   (a) Workstation (b) Client
   (c) Server (d) Mainframe

4. What is the maximum data capacity of the optical fiber cable :
   (a) 10 mbps (b) 1000 mbps
   (c) 10000 mbps (d) 20000 mbps

5. Which of the following is not a DOS command ?
   (a) Delete (b) CP
   (c) remove (d) None of the above

6. A grid of cells and columns for input of data in a spreadsheet is called :
   (a) File (b) Table
   (c) Worksheet (d) Workbook

7. A pictorial representation of the algorithm is called :
   (a) Word processor (b) Spreadsheet
   (c) Flowchart (d) Graphic User Interface

8. In order to make a design template for powerpoint presentation, we use :
   (a) Slide master (b) Slide sorter
   (c) Slide viewer (d) All of the above

9. The binary code, made up of only 1 and 0, for 47 is :
   (a) 00111000 (b) 00111100
   (c) 00111101 (d) 00111111

10. All the layouts, text and displays in a website are programmed using :
    (a) HTML (b) SGML
    (c) XML (d) All of the above

11. Universe began :
    (a) 4.2 billion years ago (b) 10 - 15 billion years ago
    (c) 1.9 billion years ago (d) 6 -7 billion years ago

12. Which of the following divisions of the geologic time scale is an era of the phanerozoic eon :
    (a) Paleozoic (b) Paleocene
    (c) Permian (d) Proterozoic

13. On an average, how thick is the crust of earth ?
    (a) 100 km (b) 40 km
    (c) 10 km (d) 82 km

14. All life forms on the earth are referred by :
    (a) Hydrosphere (b) Biosphere
    (c) Atmosphere (d) Exosphere

15. The core of earth is thought to be composed of :
    (a) Granite (b) Basalt
    (c) Iron - Nickel alloy (d) Peridotite

16. The amount of ground displacement in an earthquake is called the :
    (a) Dip (b) Slip
    (c) Epicentre (d) Focus

17. Which of the following statement is true ?
    (a) Most earthquakes occur at plate boundaries
    (b) Earthquakes can be caused by normal, reverse and thrust faulting
    (c) P waves travel faster than both S waves and surface waves
    (d) All of the above

18. Radiometric dating is least useful for dating :
    (a) Metamorphic rocks (b) Sedimentary rocks
    (c) Granitic rocks (d) All types of rocks

19. Which type of glaciers are common in the Kashmir Himalayas ?
    (a) Cirque glaciers (b) Valley glaciers
    (c) Alpine glaciers (d) All of the above

20. Marble is a metamorphic rock that forms from :
    (a) Limestone (b) Granite
    (c) Sandstone (d) Shale

21. Diamond is an example of what type of bonding ?
    (a) Covalent (b) Metallic
    (c) Ionic (d) None of the above

22. Ozone hole, formed due to CFCs emissions, is developed over earth's polar regions in:
    (a) Mesosphere (b) Thermosphere
    (c) Stratosphere (d) Troposphere

23. Mechanical weathering produces :
    (a) Clay minerals (b) Smaller particles
    (c) Quartz (d) All of the above

24. Thrust fault is a :
    (a) Low angle reverse fault (b) Low angle strike slip fault
    (c) Low angle normal fault (d) High angle reverse fault

25. Which of the following rocks have not been reported from Kashmir :
    (a) Precambrian (b) Permian
    (c) Triassic (d) Jurassic

26. Kyoto protocol is linked to :
    (a) UNCCD (b) UNFCCC
    (c) UNCBD (d) Montreal Protocol

27. Which of the following is not an indicator of climate change :
    (a) Glacier recession (b) Change of seasons
    (c) Shrinking of wetlands (d) Avalanches

28. A hydrograph is a plot of :

(a) discharge versus time
(b) rainfall intensity versus time
(c) rainfall depth versus duration
(d) cumulative rainfall versus time

29. Topographic maps are generated using :

(a) GPS
(b) GPRS
(c) Tachometer
(d) Odometer

30. Panjal Traps mainly consist of :

(a) Granite
(b) limestone
(c) Basalt
(d) All of the above

31. Which of the following is not a measure of the central tendency ?

(a) Mean
(b) Mode
(c) Median
(d) Standard deviation

32. Scatterplots are used to show relationship between :

(a) Mean and standard deviation of the data
(b) Histogram and variance
(c) Any two variables
(d) All of the above

33. The distribution of heights of students in a class is roughly bell-shaped. Moreover, the average height is 68 inches and approximately 95% of the heights are between 62 and 74 inches. The standard deviation of the height distribution is approximately :

(a) 12
(b) 9
(c) 6
(d) 3

34. If n is a positive integer such that $n!/(n-2)! = 342$, find n :

(a) 15
(b) 19
(c) 17
(d) 18

35. For what value of k will the two equations $2x + 4 = 4(x - 2)$ and $-x + k = 2x - 1$ have the same solution ?

(a) 11
(b) 7
(c) -11
(d) 17

36. If x is a negative number, which of the following must be true ?

I. $x^5 < |x|$

II. $x < \sqrt{(-x)}$

III. $x - 1/|x| < 0$

(a) II and III only (b) I, II and III

(c) I and II only (d) I and III only

37. What is the sum of the reciprocals of the solutions to the equation $x^2 - (3/5)x = -11/3$?

(a) 3/11 (b) 9/33

(c) 9/55 (d) 55/33

38. The amount of a radioactive material decays according to the formula $A(t) = A_0 e^{-kt}$ where, A_0 is the initial amount, k is a positive constant and t is the time in days. Find a formula for the half life of the material :

(a) $T = \ln 2/k$ (b) $T = \ln 4/k$

(c) $T = \ln k/10$ (d) None of the above

39. The level of sound D in decibels is defined as $D = 10 \log(I / 10^{-16})$, where I is the sound intensity in watts/cm^2. Determine the level in decibels of a sound with intensity $I = 10^{-8}$ watts/cm^2 :

(a) 60 decibels (b) 80 decibels

(c) 120 decibels (d) 10 decibels

40. Find the 10^{th} term of a geometric sequence if $a_1 = 45$ and the common ratio $r = 0.2$:

(a) 4.601×10^{-2} (b) 2.304×10^{-25}

(c) 2.304×10^{-5} (d) 2.304×10^{-9}

41. Two waves of same wavelength and amplitude interfere to produce a minimum when phase difference is :

(a) 0 (b) $\pi/2$

(c) π (d) $3\pi/2$

42. In electric wires, copper is used for electric conduction mainly because :

(a) It has low electrical resistivity (b) It is cheaper

(c) It is very durable and light (d) It has a high melting point

43. The path of charged particle moving in a magnetic field can be :
    (a) Straight line (b) Helix
    (c) Circle (d) All of the above

44. Earth Observation Satellites use which part of electromagnetic radiation for remote sensing :
    (a) Gamma rays (b) Cosmic rays
    (c) Sunlight (d) Radio waves

45. Which of the following is not a renewable source of energy ?
    (a) Ocean currents (b) Biomass
    (c) Geothermal (d) Uranium

46. Rutherford's experiment, which established the nuclear model of the atom, used a beam of :
    (a) Helium nuclei (b) Helium atoms
    (c) Beta particles (d) Gamma rays

47. NH_4Cl contains :
    (a) Covalent bond (b) Ionic bond
    (c) Coordinate covalent bond (d) All of the above

48. Which of the following is not a salt ?
    (a) Lead sulphide (b) Sodium chloride
    (c) Slaked lime (d) Zinc nitrate

49. Atmospheric chemistry includes study of aerosols which are responsible for :
    (a) Global warming and climate change
    (b) Scattering of incoming solar radiation
    (c) Weather of earth system
    (d) All of the above

50. Which among the following oxides of nitrogen on dissolution in water produces an acid which can act as, both, reducing and oxidizing agent ?
    (a) NO (b) N_2O_3
    (c) NO_2 (d) N_2O_5

51. The wool for the shahtoosh shawls is obtained from :

(a) Red deer (b) Tibetan antelope

(c) Barking dear (d) Wild goat

52. Which of the following minor forest produce in J & K has tremendous economic and medicinal importance ?

(a) Hazel nut (b) Dioscorea

(c) Resin (d) Oleander

53. Genetic engineering has established its applications in the field of :

(a) Food production and food security

(b) Population control

(c) Renewable energy generation

(d) All of the above

54. A cell has mitochondria, ribosomes, smooth and rough ER, and other parts. Based on this information, it could not be :

(a) A cell from a pine tree (b) A grasshopper cell

(c) A yeast (fungus) cell (d) A bacterium

55. In nutrient cycles in general, the minerals tend to be dispersed through :

(a) Evaporation (b) Assimilation

(c) Conduction (d) Surface and Sub-surface runoff

56. Which of the following are floating ocean plants and animals ?

(a) Nekton (b) Plankton

(c) Benthos (d) terrenus

57. Which of the following is a correct reaction for photosynthesis ?

(a) $6CO_2 + C_6H_{12}O_6 + \text{solar energy} = 6O_2 + 6H_2O$

(b) $6H_2O + 6CO_2 + \text{solar energy} = C_6H_{12}O_6 + 6O_2$

(c) $6H_2O + C_6H_{12}O_6 + \text{solar energy} = 6O_2 + 6CO_2$

(d) $6H_2O + 6O_2 + \text{solar energy} = C_6H_{12}O_6 + 6CO_2$

58. Fungi and bacteria, which breakdown organic matter and return nutrients to the soil, are called :

(a) Decomposers (b) Autotrophs

(c) Imposters (d) Producers

59. The loss of energy from one trophic level to the next is an example of :

(a) The law of conservation of matter

(b) The First law of thermodynamics

(c) The Second law of thermodynamics

(d) The recycling of nutrients

60. Which of the following is a Ramsar Site in J & K ?

(a) Dal lake

(b) Gangabal lake

(c) Manasbal lake

(d) Tsomoriri lake