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APPSC Exam

Previous Paper

Simplifying
Government Exams

 SSC CHSL	 IAS EXAM	 RRB NTPC	 NTSE	 CDS
 SSC CGL	 CBSE UGC NET	 IBPS PO	 NDA	
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HDAT/650

2011

Technical Asst. Hydrology
Paper I

52/2008

HYDROLOGY

26/5/2011

Time : 150 Minutes

Max. Marks : 150

INSTRUCTIONS

1. Please check the Test Booklet and ensure that it contains all the questions. If you find any defect in the Test Booklet or Answer Sheet, please get it replaced immediately.
2. The Test Booklet contains 150 questions. Each question carries **one** mark.
3. Each question is followed by 4 answer choices. Of these, you have to select one correct answer and mark it on the Answer Sheet by darkening the appropriate circle for the question. If more than one circle is darkened, the answer will not be valued at all. Use HB pencil to make heavy black marks to fill the circle completely. Make **no** other stray marks.

e.g. : If the answer for Question No. 1 is Answer choice (2), it should be marked as follows :

1

①	●	③	④
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4. Mark Paper Code and Roll No. as given in the Hall Ticket with HB pencil by darkening appropriate circles in Part A of side 2 of the Answer Sheet. Incorrect/not encoding will lead to **invalidation** of your Answer Sheet.

Example : If the Paper Code is 027, and Roll No. is 95640376 fill as shown below :

Paper Code

0	2	7
●	○	○
①	①	①
②	●	②
③	③	③
④	④	④
⑤	⑤	⑤
⑥	⑥	⑥
⑦	⑦	●
⑧	⑧	⑧
⑨	⑨	⑨

Roll No.

9	5	6	4	0	3	7	6
○	○	○	○	●	○	○	○
①	①	①	①	①	①	①	①
②	②	②	②	②	②	②	②
③	③	③	③	③	●	③	③
④	④	④	●	④	④	④	④
⑤	●	⑤	⑤	⑤	⑤	⑤	⑤
⑥	⑥	●	⑥	⑥	⑥	⑥	●
⑦	⑦	⑦	⑦	⑦	⑦	●	⑦
⑧	⑧	⑧	⑧	⑧	⑧	⑧	⑧
●	⑨	⑨	⑨	⑨	⑨	⑨	⑨

5. Please get the signature of the Invigilator affixed in the space provided in the Answer Sheet. An Answer Sheet without the signature of the Invigilator is liable for *invalidation*.
6. To change an answer, erase completely the already darkened circle and use HB pencil to make fresh mark.
7. The candidate should **not** do rough work or write any irrelevant matter in the Answer Sheet. Doing so will lead to *invalidation*.
8. Do **not** mark answer choices on the Test Booklet. Violation of this will be viewed seriously.
9. Before leaving the examination hall, return the Answer Sheet to the Invigilator, failing which, disciplinary action will be taken.

Q. No.	1	2	3	4	5	6	7	8	9	10
1										
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Q. No.	1	2	3	4	5	6	7	8	9	10
1										
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1. Karst topography formed by the
 - (1) dissolution of limestones
 - (2) dissolution of shales
 - (3) dissolution of silt to medium sand
 - (4) dissolution of granites

2. Pumice may have a porosity of 80% but
 - (1) good interstitial connection
 - (2) poor interstitial connection
 - (3) good permeability
 - (4) none of the above

3. A line passing through all points where the sea level pressure is equal is known as
 - (1) Isobar
 - (2) Isocontour
 - (3) Isohyete
 - (4) Both (1) and (3)

4. In a cold front
 - (1) Cold air mass drives out a warm air mass
 - (2) Warm air mass replaces the retreating cold air mass
 - (3) The cold air and warm air masses are stationary
 - (4) Cold air and warm air masses are drawn simultaneously towards a low pressure area

5. Cyclonic precipitation is due to
 - (1) Mechanical lifting of moist air over mountain barriers
 - (2) Ocean near by
 - (3) Lifting of moist air converging into a low pressure belt
 - (4) Thermal convection

6. Remote sensing is an art of obtaining information
 - (1) By a device that is not in contact with the object deep in the earth's crust
 - (2) By a device that is not in contact with the object
 - (3) By a device that is in contact with the object
 - (4) None of the above

7. The visible portion of the spectral sensitivity of the human eye extends
 - (1) from 0.4 to approximately 0.7 μm
 - (2) from 0.4 to 0.5 μm
 - (3) from 0.5 to 0.6 μm
 - (4) from 0.6 to 0.7 μm

8. The Markov model assumes that each variable value is dependent only on one or more of the
 - (1) hydrologic variable values of last 10 years
 - (2) hydrologic variable values of last 5 years
 - (3) hydrologic variable values of last 3 years
 - (4) hydrologic variable values of most recent

9. Thomas Fiering model requires
- (1) atleast 10 years hydrologic data
 - (2) atleast 20 years hydrologic data
 - (3) atleast 12 years hydrologic data
 - (4) atleast 15 years hydrologic data
10. Which of the following is primary porosity?
- (1) Fractures
 - (2) Solution channels
 - (3) Intergranular pores
 - (4) Stylolites
11. Which of the following is the secondary porosity?
- (1) Lava tubes
 - (2) Solution channels
 - (3) Columnar joints in pillion lavas
 - (4) Visicles
12. An amount of water an aquifer can take or release into storage is known as
- (1) Specific retention
 - (2) Storage coefficient
 - (3) Specific yield
 - (4) Elastic storage
13. A rock which transmits and storage water is called a
- (1) Aquifuse
 - (2) Aquifer
 - (3) Aquitard
 - (4) Aquiclude
14. Isohyctal method gives accurate mean area depth of rainfall
- (1) in a plain country
 - (2) in a basin consisting of plains and hills
 - (3) when there are optimum number of rain gauge stations
 - (4) when the precipitation includes snow melt
15. The rim of the funnel of raingauge is erected above ground surface
- (1) horizontally
 - (2) vertically
 - (3) inclined
 - (4) at 45° angle
16. Orographic precipitation is due to
- (1) mechanical lifting of moist air over mountain barrier
 - (2) lifting of moist air by adiabatic expansion
 - (3) mechanical lifting of moist air in plain lands
 - (4) lifting of moist air on the ocean surface

17. A self recording rain guage records
- (1) The on set and cessation of rainfall
 - (2) The cloud cover
 - (3) The intensity and cummulative depth of rainfall
 - (4) The snow melt
18. The wave length of 'blue' in the electromagnetic spectrum in
- (1) 0.6 to 0.7 μm
 - (2) 0.5 to 0.6 μm
 - (3) 0.7 to 1.3 μm
 - (4) 0.4 to 0.5 μm
19. Microwave portion of the spectrum has the wavelengths
- (1) 3 to 14 μm
 - (2) 1.3 to 3 μm
 - (3) 0.7 to 1.3 μm
 - (4) 1 mn to 1 m μm
20. A 'blue' sky is the manifestation of
- (1) Mie scattering
 - (2) Rayleigh scattering
 - (3) Non selective scattering
 - (4) Atmospheric windows
21. Models which ignore spatial variations in parameters throughout the system are called
- (1) Lumped parameter model
 - (2) Distributed parameter model
 - (3) Descriptive model
 - (4) Conceptual model
22. Simulation models which represent time-independent process are
- (1) Continuous and discrete models
 - (2) Mathematical models
 - (3) Discrete models
 - (4) Static models
23. The hydrological cycle
- (1) Has three phases - infiltration, evaporation and precipitation
 - (2) Has beginning but does not end
 - (3) Has both beginning and end
 - (4) Occurs continuously in nature

24. The difference between inflow and out flow in the storage of groundwater is expressed by
- (1) The hydrological cycle
 - (2) The Darcy's law
 - (3) The surface runoff
 - (4) The drainage density
25. Vegetation tends to
- (1) Increase the runoff
 - (2) Decrease the runoff
 - (3) Decrease the infiltration
 - (4) Increase the evaporation
26. Anemometer is used to measure
- (1) The wind velocity
 - (2) The soil moisture
 - (3) The evaporation
 - (4) The evapotranspiration
27. Potential evapotranspiration is determined
- (1) from pan evaporation data
 - (2) pan coefficient
 - (3) run of coefficient
 - (4) by thornthwaite equation
28. Stream frequency is defined as
- (1) Number of streams per unit area of the basin
 - (2) Total area of the basin to the circumference
 - (3) Length of the overland flow to the basin area
 - (4) None of the above
29. Intermittant streams flow
- (1) Both in dry and wet period
 - (2) Only in dry periods
 - (3) During the rainy period
 - (4) None of the above
30. Surface run off occurs when the intensity of rainfall
- (1) exceeds infiltration
 - (2) less than infiltration
 - (3) equal to infiltration
 - (4) and subsurface run off equal

31. Condensation of moisture takes place due to
- (1) Dynamic or adiabatic cooling
 - (2) Pressure difference between moisture lader air used hot air
 - (3) Increase in the temperature of moisture air
 - (4) None of the above
32. Which of the following gases has the major volume in the atmosphere?
- (1) Carbon dioxide
 - (2) Nitrogen
 - (3) Argon
 - (4) Oxygen
33. Angularity in shape of the grains tends to
- (1) increase the velocity of groundwater
 - (2) decrease the porosity
 - (3) increase the sorting coefficient
 - (4) increase the intrinsic permeability
34. Length of the steams per unit area is expressed as
- (1) drainage density
 - (2) stream frequency
 - (3) circularity ratio
 - (4) bifurcation ratio
35. A rock which neither transmits nor stores water in called as
- (1) Confined aquifer
 - (2) Unconfined aquifer
 - (3) Aquiclude
 - (4) Aquifuse
36. A rock which only stores water but do not transmit significant amount of water is called as
- (1) Aquifer
 - (2) Aquitard
 - (3) Aquifuse
 - (4) Aquiclude
37. Water below the surface of the ground is
- (1) capillary water
 - (2) groundwater
 - (3) intermediate water
 - (4) soil water

38. The water which occurs in the soil zone and the intermediate zone is called as
- (1) Suspended or redose water
 - (2) Meteoric water
 - (3) Connate water
 - (4) Groundwater
39. The concentration of elements dissolved in water is commonly expressed as
- (1) parts per million (PPM)
 - (2) cubit ft
 - (3) meter cube
 - (4) parts per billion
40. In brackish water the total dissolved solids are found to be between
- (1) 0-1000 mg/l
 - (2) 10,000-1,00,000 mg/l
 - (3) 1000-10,000 mg/l
 - (4) more than 1,00,000 mg/l
41. Water that has been derived from magma is called
- (1) Volcanic water
 - (2) Plutonic water
 - (3) Magmatic water
 - (4) Juvenile water
42. Water vapor and dust in atmosphere are major causes for
- (1) Mie scattering
 - (2) Atmospheric windows
 - (3) Rayleigh scattering
 - (4) Non selective scattering
43. A graph of spectral reflectance of an object as a function of wave lenth is termed as
- (1) Spectral reflectance curve
 - (2) Diffuse reflectance property
 - (3) Specular reflectance property
 - (4) Both (2) and (3) of the above
44. Lambertian reflectors of an object one having
- (1) Feat surfaces that manifest mirror like reflectors
 - (2) Rough surfaces
 - (3) Coasse grained surfaces
 - (4) Fine grained surfaces

45. A synthetic unit hydrograph is developed for a basin
- (1) Whose stream is gauged
 - (2) Computing the basin slope
 - (3) Having no rain gauge station
 - (4) Having a rain gauge station
46. The shape of the hydrograph is affected by
- (1) Varying rainfall intensity
 - (2) Shape of the basin
 - (3) Direction of storm movement
 - (4) All the above factors
47. Interception loss is
- (1) Uniform throughout the storm
 - (2) More towards the end of the storm
 - (3) More at the beginning of the storm
 - (4) Low at the beginning and high at the end of the storm
48. Evaporation from water surface
- (1) increases with temperature
 - (2) increase with humidity
 - (3) increase if there is salinity or pollution
 - (4) decrease with wind velocity
49. Evapotranspiration depends upon
- (1) type of crop
 - (2) wind speed
 - (3) temperature
 - (4) all the above factors
50. Soil groups i.e. boulders, gravels, silts and clays are distinguished based on the
- (1) Particle size distribution
 - (2) Chemical composition
 - (3) Engineering properties
 - (4) Parent rock from which they are derived
51. In clay soils the particle size of the grains are
- (1) 0.002 - 0.006 mm
 - (2) 0.6 - 2.0 mm
 - (3) less than 0.002 mm
 - (4) 2 - 6 mm
52. Clay deposits are mainly composed of the minerals
- (1) Quartz and clay minerals
 - (2) Hornblende and mica minerals
 - (3) Quartz and hornblende
 - (4) None of the above

53. Event simulation models one those in which
- (1) spatial variations in parameters throughout the system ignored
 - (2) the transformation is affected by techniques that have little or no known physical basis
 - (3) mathematical statements represents the system
 - (4) the line frame of the simulation in shortened
54. Tatum is also known as
- (1) Storage indication method
 - (2) Successive average lag method
 - (3) Progressive average lag method
 - (4) None of the above
55. Straddle - storage is also known as
- (1) Progressive average log method
 - (2) Muskingum
 - (3) Model calibration
 - (4) Simulation of snow melt
56. A system in which input-output relationship does not depend on the time at which the input is applied is known as
- (1) Continuous and discrete system
 - (2) Stable system
 - (3) Linear system
 - (4) Time-invariant system
57. The cyclone with its sources in the tropic regions is called as
- (1) Cyclonic storms
 - (2) Convection storms
 - (3) Tropical cyclones
 - (4) Orographic storms
58. Horton has classified stream order by assigning order one to
- (1) Streams which have branches of two streams
 - (2) Streams which have branches of three streams
 - (3) Streams which have branches of four streams
 - (4) Small unbranched, finger tip tributaries
59. Time interval from the center of mass of the rainfall excess to the peak of the resulting hydrograph is
- (1) Time to peak
 - (2) Time of concentration
 - (3) Recessive time
 - (4) Lag time
60. Stream flow is recorded by
- (1) Tensiometer
 - (2) Anemometer
 - (3) Double ring infiltrometer
 - (4) Wire-weight gauges

61. Flood routing is the process of determining
- (1) Reservoir storage
 - (2) Discharge over the spill way and through sluice ways
 - (3) Head available for the plant
 - (4) Exclusion of silt-charge from the reservoir
62. Wedge storage in a channel reach is a function of
- (1) Inflow into the reach
 - (2) Outflow from the reach
 - (3) The routing period
 - (4) Differ between the inflow and outflow
63. A hydrograph of surface run off resulting from a relatively short, intense rain is called
- (1) S-type unit hydrograph
 - (2) Distribution graph
 - (3) Unit hydrograph
 - (4) Flood hydrograph
64. Which of the following wave lengths in the spectral region are often called as "Chlorophyll absorption bands"
- (1) 0.45 to 0.6 μm
 - (2) 0.45 to 1.3 μm
 - (3) Centered about 0.45 and 0.67 μm
 - (4) 0.7 to 1.3 μm
65. Wave lengths of 1.4, 1.9 and 2.7 μm in the spectral regions are referred as
- (1) Water absorption bands
 - (2) Chlorophyll absorption bands
 - (3) Inorganic absorption bands
 - (4) Average reflectance curves
66. When atmospheric particle diameters essentially equal the wavelength of the energy being sensed gives
- (1) Atmospheric windows
 - (2) Mie scattering
 - (3) Rayleigh scattering
 - (4) None selective scattering
67. Push broom scanners are also called as
- (1) Across multispectral scanner
 - (2) Along track multispectral scanner
 - (3) LISS
 - (4) Side-looking scanners

68. Multi Spectral scanner (MSS) employs a single detector

- (1) Perband of the multi spectral signal
- (2) For two bands of the multi spectral signal
- (3) For three bands of the multi spectral signal
- (4) Only for infrared rays

69. Sensors which sense naturally available energy are called

- (1) Passive sensors
- (2) Active sensors
- (3) Side looking sensors
- (4) None of the above

70. A water that has been recently involved in atmospheric circulation is called

- (1) Meteoric water
- (2) Marine water
- (3) Connate water
- (4) Metamorphic water

71. Which of the following is the Darcy's law

- (1) $V = \frac{A}{Q}$
- (2) $V = \frac{K}{QA}$
- (3) $V = Q/A$
- (4) $V = \frac{QA}{K}$

72. Reynolds number expresses the ratio of

- (1) inertial to viscous forces
- (2) viscous to inertial forces
- (3) porosity to permeability
- (4) None of the above

73. Intrinsic permeability is essentially a function of the

- (1) Pore size openings
- (2) Viscosity
- (3) Specific weight and dynamic viscosity
- (4) Composition of fluids present in the pores

74. An aquifer which has lateral and vertical changes in the physical properties is called

- (1) Homogeneous aquifer
- (2) Anisotropic aquifer
- (3) Isotropic aquifer
- (4) Both (1) and (3)

75. In the flow net the equipotential lines are

- (1) Horizontal to the flow lines
- (2) Inclined to the flow lines
- (3) Perpendicular to the flow lines
- (4) None of the above

76. Which of the following filter is used to improve the uniformity of exposure throughout an image
- (1) Absorption filters
 - (2) Antivegneting filters
 - (3) Blue filters
 - (4) Interference filters
77. Microwave signals which are in-phase or out phase returning from a given location on the earth's surface can produce
- (1) Cloud like features
 - (2) Circular polarisation
 - (3) Radar image speckle
 - (4) Radar image brightness variation
78. Seasat-1 satellite was launched in 1978 into an
- (1) 900 km near polar orbit
 - (2) 700 km near polar orbit
 - (3) 750 km near polar orbit
 - (4) 800 km near polar orbit
79. IRS - P₂ satellite launched on 15-10-1994 at an attitude of
- (1) 820 km
 - (2) 900 km
 - (3) 910 km
 - (4) 817 km
80. IRS-IC was launched on
- (1) 17-03-1988
 - (2) 28-12-1998
 - (3) 15-10-1994
 - (4) 17-7-1988
81. Plank's Radiation law is useful to compute the amount of total spectral radiant emittance
- (1) Between two selected wavelengths or frequencies
 - (2) Of selected wave lengths
 - (3) Of UV rays
 - (4) None
82. In the field of remote sensing, application of spectral bound of thermal infrared is used
- (1) to know the surface chemical composition
 - (2) to map the radiometric material
 - (3) to know the surface temperature
 - (4) to know the presence of He in the atmosphere
83. The rise of water in the capillary tube can be computed by the equation
- (1) $h_c = \frac{2\sigma}{r} \cos \theta$
 - (2) $h_c = \frac{2T}{r\gamma} \cos \theta$
 - (3) $h_c = \frac{2T}{r\gamma} \cos \lambda$
 - (4) $h_c = \frac{0.15}{r}$

84. When fluorine concentration exceeds more than 1.75 ppm in drinking water it leads to the disease
- (1) Fluorosis
 - (2) Liver damage
 - (3) Kidney dysfunction
 - (4) High blood pressure
85. In unconfined aquifer the upper surface of the zone of saturation is called as
- (1) Piezometric surface
 - (2) Water table
 - (3) Hydraulic head
 - (4) Perched water table
86. The upper surface of the water table is confined aquifer is called as
- (1) Piezometric surface
 - (2) Water table
 - (3) Perched water table
 - (4) None of the above
87. The term effective porosity is expressed as a ratio of
- (1) Total solid particles to the total volume
 - (2) Interstices to the total volume
 - (3) Total volume to the viscosity of the fluids
 - (4) Dynamic viscosity to the specific gravity
88. When nitrate concentration exceeds more than 45 ppm in drinking water it causes
- (1) Heat problem
 - (2) Methemoglobinemia
 - (3) Ulceration
 - (4) Hypertension
89. What is the permissible limits of concentration of Arsenic in drinking water
- (1) 0.07 ppm
 - (2) 1.07 ppm
 - (3) 0.09 ppm
 - (4) 0.05 ppm
90. A perched water table may lie
- (1) above the groundwater table
 - (2) below the groundwater table
 - (3) in the capillary zone
 - (4) None of the above

91. Streams which flow throughout the year
- (1) Ephemeral streams
 - (2) Intermittent streams
 - (3) Perennial streams
 - (4) All the above
92. Which of the following method is used to estimate the high flood discharge?
- (1) By land management
 - (2) By construction of levels and flood banks
 - (3) By the percent flood risk
 - (4) By flood frequency studies
93. The method of mitigating flood can be done
- (1) By construction of large reservoir across the main stream
 - (2) From the percent flood risk that can be allowed in the project
 - (3) From flood frequency studies
 - (4) By construction of reservoirs across tributaries
94. What is the permissible level of concentration of lead in drinking water
- (1) 0.05 ppm
 - (2) 1.05 ppm
 - (3) 0.005 ppm
 - (4) 0.95 ppm
95. Permissible limits of concentration of TDS in drinking water is
- (1) 1500 mg/l
 - (2) 1000 mg/l
 - (3) 500 mg/l
 - (4) 800 mg/l
96. Richard's diagram is useful for classification of waters for
- (1) Irrigation purpose
 - (2) Finding the source of elements in waters
 - (3) Finding hydro chemical facies of the waters
 - (4) Both (2) and (3)
97. The underground formations which serve as good aquifers are
- (1) Consolidated formations of clays and shales
 - (2) Unconsolidated gravels, sands and alluvium
 - (3) Rocks with no signs of weathering or fractures
 - (4) Both (1) and (3)
98. Which of the following property of soil yields good yield of water?
- (1) Porosity
 - (2) Permeability
 - (3) Uniformity coefficient > 3
 - (4) Uniformity coefficient > 10

99. An influent stream is due to

- (1) Groundwater table being above the stream bed
- (2) Groundwater table below the stream bed
- (3) Being ephemeral in nature
- (4) effluent seepage from the basin

100. Maximum surface runoff in favoured due to

- (1) presence of forest area
- (2) leaf shaped catchment
- (3) a flash storm
- (4) improved land management

101. Drainage divide of a basin generally coincides

- (1) topographic ridge
- (2) valley portions
- (3) plain lands
- (4) Both (2) and (3)

102. The lines joining all points in a basin of some key time elements in a storm are called

- (1) Isochromes
- (2) Isopachs
- (3) Isohyet
- (4) Isobars

103. Anticyclone is

- (1) low pressure area surrounded by high pressure area
- (2) differ from tropical cyclone
- (3) high pressure area surrounded by a low pressure area
- (4) some winds are not regular and or a short duration

104. A front along which warmer air is replacing colder air is

- (1) Cold and warm front.
- (2) Warm front
- (3) Cold front
- (4) Stationary front

105. When the (RSC) residual sodium carbonate is less than 1.25 in groundwater it is

- (1) Unsuitable for irrigation
- (2) Marginal for irrigation
- (3) Safe for irrigation
- (4) Permissible for irrigation

106. Piper's Trilinear diagram is useful to know

- (1) The suitability of water for irrigation
- (2) The hydrochemical facies of water
- (3) The sources of elements in water
- (4) The total dissolved solids in water

107. The principal cause of hardness in groundwater is due to the presence of

- (1) Copper and sulphate
- (2) Sulphate and nitrate
- (3) Calcium and magnesium
- (4) Iron and manganese

108. Permeability index is used to measure the effect of irrigation water on soil

- (1) Percentage of moisture content
- (2) Permeability
- (3) Porosity
- (4) None of the above

109. Schoeller proposed the chloro-Alkaline indices to indicate the

- (1) exchange of ions in the soil
- (2) exchange of ions with in the water
- (3) exchange of ions between the groundwater and its host environment
- (4) both (1) and (2)

110. The movement of air masses from high pressure regions to low pressure regions causes

- (1) Cyclonic precipitation
- (2) Convective precipitation
- (3) Orographic precipitation
- (4) Thunderstorms

111. Isohyete is a line joining places of

- (1) Equal temperature
- (2) Equal height
- (3) Equal pressure
- (4) Equal rainfall intensities

112. The S-hydrograph is essentially a hydrograph produced by a continuous

- (1) Run off resulting from two centimetre of rainfall excess of indefinite period
- (2) Rainfall excess at a constant rate for a definite period
- (3) Run off resulting from one centimeter of rainfall excess of a specified duration
- (4) Rainfall excess at a constant rate for a indefinite period

113. Mean areas depth of precipitation is estimated by

- (1) pan coefficient
- (2) double ring infiltrometer
- (3) lysimeter
- (4) theissen polygon method

114. Which of the following factor affect the shape of the groundwater table?

- (1) temperature
- (2) wind velocity
- (3) humidity
- (4) rainfall intensity and duration

115. Jacob's modification of the Theis non-equilibrium equation is valid for

- (1) small values of 'u'
- (2) small values of 't'
- (3) early pumping test data
- (4) high values of 'u'

116. Which of the following equation is used to estimate the transmissivity of the aquifer using the recovery test data

- (1) $T = \frac{2.30 Q}{T t_0}$
- (2) $T = \frac{4\pi s'}{2.3 Q}$
- (3) $T = \frac{2.30 Q}{4\pi s'}$
- (4) $T = \frac{2.30 \pi s'}{Q}$

117. A system which has the property of superposition is known as

- (1) causal system
- (2) linear system
- (3) non-linear system
- (4) none of the above

118. Which of the following data needs for most of hydrologic simulation models?

- (1) Well inventory data
- (2) Watershed, channel, run off and flood information
- (3) Hydrochemical data
- (4) Both (1) and (3)

119. Stanford watershed model - IV is developed by

- (1) Horton
- (2) Henry Darcy
- (3) Crawford and linsley
- (4) Strahler

120. The ratio LZS/LZSN is called

- (1) The zone soil moisture ratio
- (2) Hygroscopic coefficient ratio
- (3) Ratio of pre volume to the total volume
- (4) None of the above

121. The graph which describes the rate at which pollutants dissolved or suspended in the run off are transported in

- (1) pollutograph
- (2) S-hydrograph
- (3) Unit hydrograph
- (4) Hydrograph

122. The cumulative fraction or mass of pollutant transported is referred as a

- (1) load graph
- (2) pollutograph
- (3) the SCS hydrograph
- (4) none of the above

123. In the optical film detectors the sensor materials are

- (1) Silverbromide grains
- (2) Bromide grains
- (3) Nitrate silver grains
- (4) Both (2) and (3)

124. In the push-broom scanners the sensor elements are arranged

- (1) across the track
- (2) in linear array
- (3) in an inclined array
- (4) none of the above

125. Mapping of the radioactive materials is carried out in the spectral region of

- (1) X-rays
- (2) γ -rays
- (3) near infrared rays
- (4) UV-rays

126. The LISS-III camera on board IRS-IC spacecraft provides a ground resolution.

- (1) 70.5 m UNIR and 22.5 m SWIR
- (2) 23.5 m UNIR and 70.5 m SWIR
- (3) 56.0 m UNIR and 188 m SWIR
- (4) 22.5 m UNIR and 70.5 SWIR

127. Wide field sensor camera on board the IRS-IC spacecraft has a spectral resolution and covers a swath of

- (1) 188 m and 804 km
- (2) 188 m and 704 km
- (3) 80 m and 604 km
- (4) 100 m and 804 km

128. The LISS-II camera board on IRS-IA has the ground resolution

- (1) 30 m
- (2) 20 m
- (3) 70.5 m
- (4) 36.25 m

129. Radiometric resolution is determined by

- (1) bandwidth of the channel used
- (2) time interval between successive units
- (3) number of discrete levels into which a signal strength may be divided
- (4) spatial resolution

130. Theoretically the temperature of the black body radiation is

- (1) 1°K
- (2) 0°K
- (3) 0.25°K
- (4) 0.75°K

131. The emmissivity of the black body is

- (1) $\Sigma b = 0$
- (2) $\Sigma b = 1.0$
- (3) $\Sigma b = 1.25$
- (4) $\Sigma b = 0.125$

132. Spectral bands between 0.1 and 100 cm are known as

- (1) micro waves
- (2) thermal infrared rays
- (3) near infrared rays
- (4) midwave infra red waves

133. To obtain higher resolution, Return Beam Vidicon (RBV) operates in the band

- (1) 0.505 — 0.850 μm
- (2) 0.505 — 0.750 μm
- (3) 0.505 — 0.650 μm
- (4) 0.405 — 0.750 μm

134. Hours of bright sunshine is recorded by

- (1) Assman hygrometer
- (2) Anemometer
- (3) Sunshine recorder
- (4) Colorado sunken pan

135. Lysimeter is used to measure

- (1) soil evaporation
- (2) wind velocity
- (3) intensity of rainfall
- (4) water body evaporation

136. Farm factor represents

- (1) Length of overland flow
- (2) Geometry of the basin
- (3) Bifurcation ratio
- (4) Stream frequency

137. Hyprometric analysis is the study of distribution of ground surface area of landmass with respect to

- (1) slope
- (2) landforms
- (3) elevation
- (4) drainage basin

138. IRS-IB is launched in

- (1) 22nd January 1990
- (2) 22nd February 1991
- (3) 17th March 1991
- (4) 29th August 1991

139. IRS-IA is launched on

- (1) 17th March — 1988
- (2) 17th June — 1988
- (3) 17th April — 1988
- (4) 17th January — 1988

140. A spring may be formed when a sloping permeable bed is

- (1) always below the ground level with no interruption
- (2) always at the peak of the mountain
- (3) always below the water table
- (4) interrupted by the naturally sloping ground surface or hill

141. Flood marks are frequently found as

- (1) Stream flow
- (2) Water surface above some arbitrary datum
- (3) Inscriptions, painted marks
- (4) None of the above

142. A steady groundwater flow condition exists when

- (1) the water levels in the wells cease to decline
- (2) the water levels drop as the pumping is continued
- (3) the water levels respond to changes in atmospheric pressure
- (4) the Laplace's equation is satisfied

143. An unsteady groundwater flow condition exists when

- (1) the Darcy's law no longer governs the flow
- (2) the water levels drop as the pumping is continued
- (3) the water comes mostly from the storage of the aquifer
- (4) the Laplace's equation is not applicable

144. The well loss coefficient

- (1) is determined from step-draw down test
- (2) gives the well efficiency
- (3) has the dimensions of L^5/T^2
- (4) gives optimum spacing of wells

145. In an arid region

- (1) rainfall is mostly during summer
- (2) each fall of rain is considered as a separate unit
- (3) ephemeral streams are common
- (4) all the above characteristics

146. A flow duration curve indicates

- (1) the duration of floods or draughts
- (2) the effect of storage
- (3) the stream flow available for different percent time
- (4) all the above items

147. Wedge storage in a channel reach is a function of

- (1) inflow into the well
- (2) local inflow (from a tributary joining at mid-reach)
- (3) prism storage
- (4) outflow from the reach

148. Which of the following is the component of hydrograph?

- (1) Water level fluctuation
- (2) Evaporation
- (3) Direct surface run off
- (4) None of the above

149. Pumping tests are conducted to determine

- (1) the aquifer constants S and T
- (2) the location of casing
- (3) the location of screen
- (4) none of the above

150. For laminar flow in a medium of sand aquifer, the Reynolds number is

- (1) < 200
- (2) 1 to 10
- (3) < 50
- (4) < 1

ROUGH WORK

147. Which of the following is the component of hydraulic conductivity?
(1) Water level fluctuation
(2) Permeability
(3) Discharge coefficient
(4) None of these

148. The location of casing is
(1) the location of casing
(2) the location of casing
(3) the location of casing
(4) none of the above

149. The location of casing is
(1) the location of casing
(2) the location of casing
(3) the location of casing
(4) none of the above

(1) Water level fluctuation
(2) Permeability
(3) Discharge coefficient
(4) None of these

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