KATHMANDU UNIVERSITY
End Semester Examination
July/August, 2024

Marks Scored:

Level : B.E.
Year : III

Course : ESEE 307
Semester : II

Exam Roll No. :

Time: 30 mins.

F. M. : 20

Registration No.:

Date 26 JUL 2024

SECTION "A"

[20 Q. × 0.5 = 10 marks]

Choose and encircle in the most appropriate option from each set of choices

1. Water on earth exists in a space called
[ ] lithosphere [ ] hydrosphere [ ] cryosphere [ ] biosphere

2. The average residence time of water vapor in the atmosphere is about
[ ] 8 days [ ] 10 days [ ] 12 days [ ] 14 days

3. The percentage of ground water in total fresh water in the world is about
[ ] 30 % [ ] 70 % [ ] 52 % [ ] 12 %

4. A line joining equal rainfall is called
[ ] isotherm [ ] isohyet [ ] isobar [ ] isoline

5. The science and practice of water flow measurement is known as
[ ] hydrology [ ] hydrometry [ ] hypsometry [ ] fluvimetry

6. Which cycle is the central focus of the hydrology?
[ ] energy cycle [ ] hydrologic cycle [ ] runoff cycle [ ] material cycle

7. Density of depth hoar ranges from
[ ] 400 – 830 kg/m^3 [ ] 830 – 917 kg/m^3 [ ] 100 – 300 kg/m^3 [ ] 50 – 70 kg/m^3

8. Usually evaporation pan put
[ ] few cm above ground
[ ] 5 m above ground
[ ] 1.5 m above ground
[ ] 2.5 m above ground

9. A point rainfall represents plots of
[ ] magnitude vs time
[ ] intensity vs time
[ ] magnitude vs duration
[ ] intensity vs magnitude

10. A plot between rainfall intensity vs time in chronological order is called
[ ] hydrograph [ ] mass curve [ ] hyetograph [ ] isohyet

11. Sectional staff gauge measures the
[ ] velocity of the flow
[ ] discharge of a river
[ ] height of water in a channel
[ ] sediment load in a river

12. Which method is suitable for measuring discharge of mountain stream
[ ] Dilution method
[ ] Ultrasonic methods
[ ] area-velocity method
[ ] slope-area method

13. Which method is suitable for quick and rough estimate of stream velocity?
[ ] Float method [ ] area-velocity method
[ ] Ultrasonic method [ ] current meter method

14. Current meter measures the
[ ] velocity of the flow [ ] height of water in the channel
[ ] discharge of the river [ ] sediment load in the river

15. Seeping off of precipitation from ground and reaches to ground water table is called
[ ] percolation [ ] infiltration [ ] discharge [ ] evaporation

16. The average infiltration rate is called
[ ] Φ-index [ ] W-index [ ] infiltration index [ ] evaporation index

17. An ephemeral stream
[ ] has water table above the stream bed throughout the year
[ ] has only flash flows in response to storms
[ ] has flows in the stream during wet season due to contribution of ground water
[ ] does not have any contribution of ground water at any time

18. The top of the saturated zone of ground water is called
[ ] water table [ ] water tank [ ] water bed [ ] water layer

19. Snow density kit is used to measure
[ ] depth and water equivalent [ ] snow density
[ ] water equivalent [ ] weight

20. Density of fresh snow ranges from
[ ] 100 – 200 kg/m^3 [ ] 830 – 950 kg/m^3 [ ] 50 –70 kg/m^3 [ ] 830 – 917 kg/m^3

SECTION "B"
[10 Q. × 1 = 10 marks]

Define in one sentence.

21. Effective rainfall

22. Current meter

23. Unit hydrograph

24. Prompt interflow

25. Varve

26. Infiltrometer

27. Firn

28. Lysimeter

29. Moraine

30. Perennial stream

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SECTION "C"
[4 Q. × 7 = 28 marks]

Attempt *ANY FOUR* questions.

1. Describe the forms of precipitation in detail. List all criteria for selecting a rain gauge station site. Write about the WMO standard for the network density of rain gauges.

2. Explain about the infiltration capacity and factors which affect infiltration.

3. Define runoff and describe different components of runoff with figure.

4. Explain the stream flow measurement by area-velocity and salt dilution methods.

5. Explain about snow, firn and ice with densities. How snow transformed into ice in dry snow zone?

SECTION "D"
[27 marks]

6. Differentiate between ***ANY THREE*** [3 Q. × 4 = 12]
   a. Glacial lake and ordinary lake
   b. Unit hydrograph and Flood hydrograph
   c. Infiltrometer and evaporimeter
   d. Rain gauge and staff gauge

7. Write short notes on ***ANY THREE*** [3 Q. × 3 = 9]
   a. Darcy's law
   b. Confined aquifer
   c. Bed load
   d. Lysimeter

8. Give reasons **WHY** [2 Q. × 3 = 6]
   a. snowfall occur even in summer in the high mountain areas of Nepal.
   b. current meter is not suitable to measure velocity of water in turbulent river.