KATHMANDU UNIVERSITY
End Semester Examination
May/June, 2022

Marks scored:

Level : B.Sc./ B.Tech.
Year : III
Course : ENVS 335
Semester : II
Exam Roll No. :
Time: 30 mins.
F. M. : 20
Registration No.:
Date :

SECTION "A"
[20Q. × 0.5 = 10 marks]

Mark [×] in the appropriate answer box.

1. The science of hydrology began with the concept of
[ ] runoff cycle [ ] hydrologic cycle [ ] vapor cycle [ ] ground water cycle

2. Cold matters such as snow, ice and permafrost on earth exist in a place/space called
[ ] lithosphere [ ] hydrosphere [ ] cryosphere [ ] biosphere

3. Which curve is used to check the consistency of rainfall records?
[ ] single mass curve [ ] double mass curve
[ ] rainfall curve [ ] discharge curve

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

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

6. Which method is suitable for quick and rough estimate of stream velocity?
[ ] Float method [ ] area-velocity method
[ ] Ultrasonic method [ ] tracer dilution method

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

8. The density of firn ranges from
[ ] 400 – 830 kg/m^3 [ ] 830 – 917 kg/m^3
[ ] 100 – 300 kg/m^3 [ ] 50 – 70 kg/m^3

9. A part of the precipitation that infilters and moves laterally through the upper crusts of the soil and returns to the surface at some location away from the point of entry into the soil is called
[ ] interflow [ ] infiltration [ ] discharge [ ] percolation

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

11. Which instrument is used to measure the water level of a river?
[ ] current meter [ ] rain gauge [ ] staff gauge [ ] anemometer

12. In general, potential evapotranspiration is
[ ] smaller than actual evapotranspiration [ ] greater than actual evapotranspiration
[ ] equal to actual evapotranspiration [ ] greater than evaporation

13. 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

14. A snow tube is used to measure
[ ] depth and water equivalent [ ] snow density
[ ] water equivalent [ ] weight

15. Mass balance of a glacier is the
[ ] sum of ablation and accumulation [ ] ablation minus accumulation
[ ] sum of ablation and evaporation [ ] accumulation minus ablation

16. A sudden flood due to a cloud burst is called
[ ] GLOF [ ] flash flood [ ] riverine flood [ ] high flood

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

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

19. Sediment transported to the channel by means of splash, sheet, rill and gully erosion is called
[ ] bed load [ ] wash load
[ ] bed material load [ ] sediment load

20. Detention reservoir is used to control
[ ] flood [ ] discharge [ ] evaporation [ ] infiltration

SECTION "B"

[10 Q. × 1 = 10 marks]

Define in one sentence.

21. Hydrograph

22. Current meter

23. Effective rainfall hyetograph

24. Φ-index

25. Baseflow

26. Snow

27. Ablation area of a glacier

28. Evaporimeter

29. Aquifer

30. Glacial lake

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SECTION "C"
(Long answer questions)
[4Q. × 7 = 28 marks]

Attempt *ANY FOUR* questions.

1. Explain evaporation, evapotranspiration and infiltration processes in our earth system and their importance in hydrology.

2. Explain with equations and figures the streamflow measurement by area-velocity and salt dilution methods.

3. What is surface runoff? Describe different components of surface runoff with a figure.

4. Explain sediment, its transport mechanism and different types of sediment loads.

5. Explain the importance of Glaciological studies in Nepal.

SECTION "D"
(Short answer questions)

6. Differentiate between *ANY THREE* of the following: [3Q. × 4 = 12]
   a. Flood hydrograph and Unit hydrograph
   b. Bed load and suspended load
   c. Actual evapotranspiration and Potential evapotranspiration
   d. Rain gauge and staff gauge

7. Write short notes on *ANY THREE* of the following: [3Q. × 3 = 9]
   a. Confined aquifer
   b. Darcy's law
   c. Network density of rain gauge
   d. Lysimeter

8. Give reasons WHY [2Q. × 3 = 6]
   a. snowfall occur even in summer in the high mountain areas of Nepal.
   b. non-water contact water level sensors are popular than conventional one (water contact).