PARUL UNIVERSITY
FACULTY OF ENGINEERING & TECHNOLOGY
B.Tech. Summer 2018 – 19 Examination

Semester: 4   Date: 06/05/2019
Subject Code: 03110254   Time: 2:00 pm to 4:30 pm
Subject Name: Watershed Hydrology   Total Marks: 60

Instructions:
1. All questions are compulsory.
2. Figures to the right indicate full marks.
3. Make suitable assumptions wherever necessary.
4. Start new question on new page.

Q.1   **Objective Type Questions**   (15)
1. The condensed water vapour of the atmosphere falling in drops (>0.5 mm, maximum size of 6 mm) from the clouds is known as _____.
2. A graph showing discharge versus time is called as _____.
3. The rainfall at single station is called as _____.
4. A light steady rain in fine drops (0.5 mm) and intensity < 1mm/hr is called _____.
5. Water entering the soil at the ground surface is called _____.
6. Define Pan Coefficient.
7. What are the three important phases of the hydrologic cycle?
8. State the Hydrologic equation.
9. State Horton's equation for infiltration.
10. Write any two factors affecting evaporation.
11. In a cold front
    (i) cold air mass drives out a warm air mass
    (ii) warm air mass replaces the retreating cold air mass
    (iii) cold air and warm air masses are drawn simultaneously towards a low pressure area
    (iv) the cold and warm air masses are stationary
12. The shape of the hydrograph is effected by
    (i) non-uniform areal distribution of rainfall.
    (ii) shape of the basin.
    (iii) direction of storm movement.
    (iv) all the above factors
13. A self-recording rain-gauge
    (i) records by hourly depth of rain
    (ii) records the snow melt
    (iii) records the cumulative depth of rainfall
    (iv) records the rainfall intensity
14. Evapotranspiration depends upon
    (i) hours of bright sunshine
    (ii) temperature
    (iii) type of crop
    (iv) all the above factors
15. Cyclonic precipitation is due to
    (i) orographic lifting
    (ii) ocean nearby
    (iii) convergence of storms towards a low pressure belt
    (iv) conflict between cold and warm air masses

Q.2   **Answer the following questions. (Attempt any three)**   (15)
A) What is flood routing? What are the various equations used in flood routing?
B) Write the limitations of unit hydrograph.
C) Explain Hydrological cycle.
D) Differentiate between a hydrograph and hyetograph.

Q.3   A) What are the different factors affecting runoff?   **(07)**

B) State the different methods of determining infiltration. Briefly describe the   **(08)**
working of different types of infiltrometer.

<div align="center">OR</div>

B) What are the different types of precipitation? Explain with sketches if any.   **(08)**

Q.4   A) For a small catchment, the infiltration rate at the beginning of rain was observed to **(07)**
be 90 mm/hr and decreased exponentially to a constant rate of 8 mm/hr after $2\frac{1}{2}$ hr.
The total infiltration during $2\frac{1}{2}$ hr was 50 mm. Develop the Horton's equation for the
infiltration rate at any time $t < 2\frac{1}{2}$ hr.

<div align="center">OR</div>

A) The ordinates of a 4-hour unit hydrograph for a particular basin are given below. **(07)**
Determine the ordinates of the S-curve hydrograph and therefrom the ordinates of
the 6-hour unit hydrograph.

Time (hr)	0	2	4	6	8	10	12	14	16	18	20	22	24
4-hr UH (cumec)	0	25	100	160	190	170	110	70	30	20	6	1.5	0

B) What are the different types of rain gauges used for the measurement of   **(08)**
precipitation? Explain any two with sketches if any