10CV846

Eighth Semester B.E. Degree Examination, Feb./Mar. 2022
Water Resources Engineering

Time: 3 hrs.   Max. Marks:100

Note: 1. *Answer any FIVE full questions, selecting at least TWO questions from each part.*
     2. *Assume missing data suitably.*

PART – A

1   a.   Give an account of water management sectors.   **(15 Marks)**
    b.   Enumerate the water management community.   **(05 Marks)**

2   a.   Explain the hydrologic process of atmospheric circulation.   **(07 Marks)**
    b.   Explain the components of hydrological cycle with neat sketch.   **(06 Marks)**
    c.   Give a brief account of mechanism of precipitation and types of precipitation.   **(07 Marks)**

3   a.   Derive an equation for rain fall - runoff relation using SCS method.   **(12 Marks)**
    b.   Define: (i) rainfall excess   (ii) hydrologic loss   **(02 Marks)**
    c.   What is drainage basin? Explain types of drainage patterns in a drainage basin.   **(06 Marks)**

4   a.   Discuss drip irrigation and compare and contrast its salient features with those of sprinkler irrigation.   **(10 Marks)**
    b.   Enumerate the impact of irrigation development.   **(10 Marks)**

PART – B

5   a.   What is flood plain management? Explain the general factors to be considered for the flood plain management of a river valley project.   **(10 Marks)**
    b.   Discuss expected damage and risk based analysis.   **(10 Marks)**

6   a.   A catchment area of 120 hectares is drained by storm run-off which over a duration of 45 minutes results in 3 cm of rain fall. The area has a time of concentration of 30 minutes and run-off coefficient of 0.3. Estimate the resulting maximum rate of flow.   **(05 Marks)**
    b.   A watershed has a run-off coefficient of 0.20 area 150 hectares with the general slope of 0.001 and maximum length of travel of over land flow of 1.25 KM. Information of the storm of 50 years return period is given as follows:

Duration (minutes)	15	30	45	60	80
Rainfall (mm)	40	60	75	100	120

      Estimate the peak flow to be drained by a culvert for a 50 year storm.   **(10 Marks)**
    c.   Briefly describe detention pond.   **(05 Marks)**

7   a.   State the design considerations for storm water in highway pavement drainage.   **(05 Marks)**
    b.   Write short notes on the following pavement drainage inlets:
      (i) Grate inlets   (ii) Curb opening inlet   (iii) Slotted drain inlets   **(15 Marks)**

8   a.   Briefly explain the four types of dams.   **(08 Marks)**
    b.   Define spillway. Give an account of free over fall spillways and morning glory spill ways.   **(12 Marks)**

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