B.E. Civil Engineering (Model Curriculum) Semester-IV
PCCCE406 - Hydrology and Water Resources

P. Pages : 2

Time : Three Hours

GUG/W/23/13720

Max. Marks : 80

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Notes :   1.   All questions carry equal marks.
          2.   Due credit will be given to neatness and adequate dimensions.
          3.   Assume suitable data wherever necessary.
          4.   Diagrams and Chemical equation should be given wherever necessary.
          5.   Illustrate your answers wherever necessary with the help of neat sketches.

1. a) The normal annual rainfall at station A, B, C, D in a basin are 80.97, 67.59, 76.28, 92.01 cm respectively. In the year 2018 the station was inappropriate and the station. A, B, C recorded annual precipitation of 91.11, 72 23 79.89 cm respectively. Estimate the rainfall at station D in that year.   **8**

     b) Explain features and working of weighing bucket rain gauge with neat sketch.   **8**

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

2. a) Explain with diagram the different types of precipitation.   **8**

     b) Explain in detail about Rain gauge density.   **8**

3. a) Describe Water Budget and Energy Budget method for estimation reservoir evaporation.   **8**

     b) Describe Infiltration and factor affecting infiltration capacity.   **8**

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

4. a) Write a short note on W-index and Φ-index.   **8**

     b) Explain Transpiration and Evapotranspiration.   **8**

5. a) State and explain the factor affecting runoff.   **8**

     b) The ordinate of a one hour unit hydrograph at sixty minutes interval are 0,3,12,8,6,3 and $0 \, \mathrm{m^3/s}$. A two hour storm of 4 cm excess rainfall occurred in a basin from 10 am. Considering constant base flow $20 \, \mathrm{m^2/s}$ the flow of river (expressed in $\mathrm{m^3/s}$) at 1 PM is---   **8**

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

6. a) Define Area velocity method and slope area method.   **8**

     b) Define: **8**

         i)   Isochrones   iii) Box flow

         ii) Influent Stream   iv)   Water Year

7. a) Explain the followings: **8**

a) Recurrence interval of a flood.

b) Risk of the project.

c) Reliability of the project.

b) Discuss the various Flood Control measures with neat sketches. **8**

OR

8. a) Describe the probability method of flood frequency analysis. **8**

b) Explain the estimating of design food and its importance. **8**

9. a) Explain with neat sketches the occurrence of ground water. **8**

b) Explain step by step process of planning for exploration for ground water. **8**

OR

10. a) What are the ground water provinces India? **8**

b) Write a short note on: **8**

i) Well loss and specific – capacity

ii) Recuperating test

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