M.E. Second Semester (Civil (Environmental Engineering) (P.T.) (CGS)
13389 : Watershed Management : 2 SCEE 1

P. Pages : 2

Time : Three Hours

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Max. Marks : 80

Notes : 1. All question carry marks as indicated.
2. Answer **three** question from Section A and **three** question from Section B.
3. Due credit will be given to neatness and adequate dimensions.
4. Assume suitable data wherever necessary.
5. Illustrate your answer necessary with the help of neat sketches.
6. Use of pen Blue/Black ink/refill only for writing the answer book.

SECTION – A

1. a) Explain briefly.
   i) Concept of storage.
   ii) Small and large watershed.   7

   b) Explain with a neat sketch an engineering representation of hydrologic cycle.   6

2. a) Discuss the role of water in energy sphere.   6

   b) Explain with a neat sketch the average annual energy budget for the earth.   7

3. a) What are the various factors affecting interception? Compare interception loss and interception storage.   6

   b) Explain the water budget method for estimating evapotranspiration.   7

4. a) Why statistical and probability knowledge is important in hydrology? Explain.   6

   b) Explain plotting distribution method to predict the value of rainfall at different return periods.   7

5. a) Discuss the various flood flow formulae.   6

   b) Derive 4-h unit hydrography from three storms occurring successively in the amount of 5.30cm, 4.30cm and 2.30cm respectively of 4-h duration each on specified watershed. The stream flow with respect to time data is given in table as under.   8

Time (h)	0	2	4	6	8	10	12	14	16	18	20	22
Stream flow m³/s	20	50	85	105	150	250	270	135	120	85	45	20

Assume:
i) Base flow 20m³/s.
ii) Stream flow loss 0.30cm uniformly.
iii) Watershed area 450 km².

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SECTION – B

6. a) Explain Theis equation and write the steps to determine aquifer parameter.   7

    b) Determine the discharge from a strainer well of 20cm diameter working under a depression head of 6m. The well taps only one confined aquifer whose thickness is 20m. Take the coefficient of permeability as 3×10^{-4} m/s and radius of influence as 300m.   7

7. a) How would you estimate the yield of a tube well? Explain the procedure for the design of a tube well.

    b) Explain in detail about salt water intrusion and its prevention.

8. a) What is watershed characterization? How it can be used.   6

    b) Explain the formulation of project proposal for watershed management work.   7

9. a) What is wetlands? Discuss briefly the best management practices on wetlands.   7

    b) Explain different phases of watershed development.   6

10. a) What are the factors affecting roof runoff quality? Explain briefly.   6

    b) Discuss the various methods of surface water harvesting.   7

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