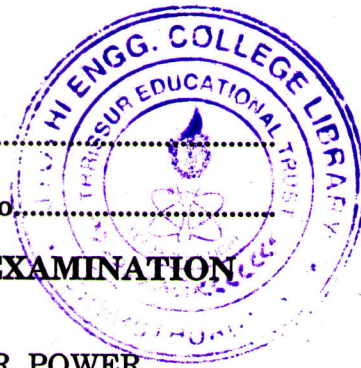


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Name.....

Reg. No.....



**EIGHTH SEMESTER B.TECH. (ENGINEERING) DEGREE EXAMINATION
APRIL 2017**

CE/PTCE 09 803 L 15—SURFACE HYDROLOGY AND WATER POWER

(2009 Admissions)

Time : Three Hours

Maximum : 70 Marks

Part A

*Answer all the questions.
Each question carries 2 marks.*

1. Distinguish between depression storage and interception.
2. How size and shape of the basin affect the run-off ?
3. What do you mean by skewness co-efficient ?
4. Differentiate between gross head and net head.
5. State the uses of draft tube.

(5 × 2 = 10 marks)

Part B

*Answer any four out of six.
Each question carries 5 marks.*

6. Discuss the various errors in precipitation measurement.
7. Using Blaney-Criddle formula determine the evapo-transpiration for crop of natural light vegetation, for the following data during the month of December : Consumptive use co-efficient is 0.80, percentage of sunshine hours during December is 7.15 (for place having latitude 36°N) and mean monthly temperature is 15°C.
8. State the underlying assumptions and limitations of unit hydrograph theory.
9. Discuss the role of probability theory in the processing of data and hydrological design.
10. A catchment area of 120 hectares is drained by storm run-off which over a duration of 45 minutes results in 3 cm. of rainfall. The area has a run-off co-efficient of 0.3, estimate the resulting maximum rate of flow.
11. For the turbo-generators with an installed capacity of 50000 kW, the load variation is 10000 kW minimum to 40000 kW maximum. Determine the load factor, capacity factor and utilization factor.

(4 × 5 = 20 marks)

Turn over

Part C

Answer all the questions.

12. Explain the method of testing the consistency or homogeneity of rainfall records.

Or

13. The infiltration capacity of an area was studied and the following data was obtained :

Time (hrs.) : 0.25 0.50 0.75 1.0 1.25 1.50 1.75 2.0 2.25

Frequency (cm./hr.) : 6.5 3.4 2.3 1.8 1.4 1.28 1.0 1.0 1.0

Find an equation for infiltration capacity in the exponential form.

14. The following data pertain to a drainage basin having an area of 3000 km². Develop a synthetic unit hydrograph. Length of main channel = 130 km. Distance from the centroid of drainage area to the outlet = 80 km. Assume $C_t = 1.50$ and $C_p = 4.0$.

Or

15. Derive the instantaneous unit hydrograph for the catchment area having drainage area is 150 km², time of concentration is 16 hour and storage co-efficient is 10 hour. The area between the successive 2-hour isochrones is 3, 8, 18, 20, 18, 16, 10 and 4 km².
16. A flood series covering 22 years has the following values : Logarithm mean = 3.4, Logarithm standard deviation = 0.018 and Logarithm third moment = -8.2×10^{-5} . Compute the flood discharges for return periods of 25, 50, 100 and 1000 years. Assume that Log-Pearson type III distribution can be fitted to the flood series.

Or

17. Describe the step by step procedure of reservoir routing by modified Pul's method.
18. What are the component parts of hydroelectric plants ? Briefly describe their functions.

Or

19. A run-off river station has an installed capacity of 20000 kW and has a load factor of 20 % while operating as a peak load station. If the plant efficiency is 80 % when working under a head of 18 m, what would be the minimum discharge of the river so that the station may serve as a base load station ? What would be the load factor of the plant if the discharge of the river rises to 25 cumecs ?

(4 × 10 = 40 marks)