Reg.No. \_\_\_\_\_\_\_\_\_\_\_\_\_

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**End Semester Examination – Nov / Dec – 2019**

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| **Code :** | **18CE3036** | **Duration :** | **3hrs** |
| **Sub. Name :** | **SURFACE FLOW HYDROLOGY** | **Max. Marks :** | **100** |

**ANSWER ANY FIVE QUESTIONS (5 x 16 = 80 Marks)**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Q. No.** | **Sub Div.** | **Questions** | **Course**  **Outcome** | **Marks** |
| 1. | a. | Explain “Hydrological cycle” with a neat sketch. | CO1 | 6 |
| b. | Describe the water budget equation and enumerate with practical examples. | CO1 | 6 |
| c. | Discuss the application of hydrology in practice. | CO1 | 4 |
|  |  |  |  |  |
| 2. | a. | Describe return period and random variable. | CO2 | 4 |
| b. | Explain frequency analysis. | CO2 | 6 |
| c. | Describe the stochastic and deterministic models. | CO2 | 6 |
|  |  |  |  |  |
| 3. | a. | Explain the types of precipitation. | CO3 | 4 |
| b. | The rain fall recorded at the various rain gauge stations are as follows.   |  |  | | --- | --- | | Rain gauge station number | Precipitation in mm | | 1 | 35 | | 2 | 38 | | 3 | 41 | | 4 | 45 | | 5 | 47 | | 6 | 50 | | 7 | 52 | | 8 | 55 |   Determine the average rainfall over the catchment area. | CO3 | 8 |
| c. | Describe double mass analysis. | CO3 | 4 |
|  |  |  |  |  |
| 4. | a. | Explain the concept of flood estimation. | CO4 | 5 |
| b. | The peak values of the floods from the year 1941 to 1955 are 4000,5400,7000,4600,3800,5800,4900,7800,6400,5300,4700,5200,10000 and 5200 cumecs. Estimate the magnitude of flood having frequency equal to (i) 100 years, (ii) 300 years. The ỹn = 0.5128 and Sn=1.0206. | CO4 | 6 |
| c. | Explain the step by step method of construction of unit hydrograph for a storm of unit duration. | CO4 | 5 |
|  |  |  |  |  |
| 5. | a. | Explain flood routing. | CO5 | 6 |
| b. | Describe the process of reservior sedimentation. | CO5 | 5 |
| c. | Explain the factors affecting evaporation process. | CO5 | 5 |
|  |  |  |  |  |
| 6. | a. | Explain temporal and spatial distribution of precipitation. | CO3 | 6 |
| b. | Describe the process of finding missing precipitation data. | CO3 | 5 |
| c. | Explain the Thiessan polygon method. | CO3 | 5 |
|  |  |  |  |  |
| 7. | a. | Explain the streamflow measurements. | CO4 | 5 |
| b. | Explain S-curve hydrograph. | CO4 | 5 |
| c. | Unit hydrograph ordinates of 4 hour are given below:   |  |  |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | | Time (Hr) | 0 | 4 | 8 | 12 | 16 | 20 | 24 | 28 | 32 | 36 | | UHO | 0 | 17 | 28 | 42 | 72 | 60 | 47 | 32 | 15 | 0 |   Find out ordinates of 8 hour unit hydrograph. | CO4 | 6 |
| **COMPULSORY QUESTION (1 x 20 = 20 Marks)** | | | | |
| 8. | a. | Explain the estimation of evaporation by pan evaporation. | CO6 | 7 |
| b. | Explain the working principle of Lysimeter for the determination of evapo transpiration. | CO6 | 7 |
| c. | Explain the infiltration loss estimation (phi index). | CO6 | 6 |