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



**UNIVERSITY**

(Karunya Institute of Technology & Sciences)

(Declared as Deemed-to-be University under Sec.3 of the UGC Act, 1956)

**End Semester Examination – April/May– 2017**

|  |  |  |  |
| --- | --- | --- | --- |
|  |  |  |  |
| **Code :** | **14CE2011** | **Duration :** | **3hrs** |
| **Sub. Name :** | **WATER RESOURES ENGINEERING** | **Max. marks :** | **100** |

**ANSWER ALL QUESTIONS (5 x 20 = 100 Marks)**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Q. No. | Sub Div. | Questions | Course  Outcome | Marks |
| 1. | a. | Describe the various forms of precipitations. | CO1 | 5 |
| b. | Point out in detail the different properties of an aquifer. | CO1 | 5 |
| c. | A catchment area of 175km2 received 150cm rainfall in a year. At the outlet of the catchment, the flow in the stream draining the catchment was found to have an average rate of 1.6m3/s for the first 4 months, 2.0m3/s for next 5 months and3.5m3/s for remaining 3 months  a) What is the runoff coefficient at the catchment?  b) If the afforestation of the catchment reduces the runoff coefficient  to 0.30, calculate the increase in the abstraction from precipitation  due to infiltration, evaporation and transpiration for the same  annual rainfall of 175cm. | CO3 | 10 |
| (OR) | | | | |
| 2. | a. | Write a short note on non recording types of raingauges. | CO1 | 8 |
| b. | A 60cm diameter well is being pumped at the rate of 1360 liters/min. Measurements made in the nearby test well at the same time are as follows. At a distance of 6m from the well being pumped, the drawdown was 6m and at 15m the drawdown was 1.5m. The bottom of the well is 90m below the groundwater table.   1. Find out the coefficient of pearmeability. 2. If all the observed points were on the Dupuit curve, predict the drawdown in the well during pumping? 3. What is the specific capacity of the well? 4. Locate the water drawn point from the well? | CO3 | 12 |
|  | | | | |
| 3. | a. | Mention the methods for improving the duty of water. | CO1 | 5 |
| b. | If cotton requires about 7.5cm of water in every 40 days, and delta of cotton being 50cm, find the base period and duty of the crop. | CO3 | 5 |
| c. | Demonstrate various pumping tests to evaluate yield of an open well. | CO2 | 10 |
| (OR) | | | | |
| 4. | a. | Explain the following terms.   1. Crop Period 2. Base Period 3. Rotation Period 4. Delta 5. Duty of water | CO1 | 5 |
|  | b. | Enlist and detail about the methods of snowfall measurement. | CO1 | 5 |
|  | c. | Predict the optimum number of raingauges in a catchment area for a permissible error of 6% and 8%.   1. Number of existing raingauges = 8 2. Mean annual rainfall at gauges = 1000, 950, 900, 850, 800, 700, 600, and 400 mm. | CO3 | 10 |
|  | | | | |
| 5. | a. | Summarise the methods for conservation of water. |  | 10 |
| b. | A 30cm diameter well penetrates 25m below the static water table. After 24 hours of pumping at 5400 liters/min, the water level in the test well at 90m is lowered by 0.53m, and in the well away from the drawdown is 1.11m. What is the transmissibility of the aquifer? Also determine the drawdown in main well. | CO3 | 10 |
| (OR) | | | | |
| 6. | a. | Calculate the population of a city in 2020 by   1. Arithmetic increase method 2. Geometric increase method 3. Incremental increase method 4. Decreased rate of growth method  |  |  | | --- | --- | | **Year** | **Population (P)** | | 1950 | 12000 | | 1960 | 16500 | | 1970 | 26800 | | 1980 | 41500 | | 1990 | 57500 | | 2000 | 68000 | | 2010 | 74100 | | CO3 | 20 |
|  | |  |  |  |
| 7. | a. | Illustrate the different types of reservoirs. | CO2 | 5 |
|  | b. | Compare and contrast between artificial recharge and natural recharge. | CO1 | 5 |
|  | c. | A reservoir has the following areas enclosed by contours at various elevations. Determine the capacity of reservoir between elevations 200.00 and 300.00.   |  |  | | --- | --- | | **Elevation** | **Area of contour (km2)** | | 200.00 | 150.00 | | 220.00 | 175.00 | | 240.00 | 210.00 | | 260.00 | 270.00 | | 280.00 | 320.00 | | 300.00 | 400.00 |   Use a. Trapezoidal formula   1. Prismoidal formula | CO3 | 10 |
| (OR) | | | | |
| 8. | a. | Cite and extend the limits, sources, effects and treatment for total dissolved solids. | CO1 | 5 |
|  | b. | Interpret the factors considered for selection of site for reservoir. | CO1 | 5 |
|  | c. | Differentiate and elaborate between impulse and reaction turbines. | CO2 | 10 |
|  | | **Compulsory:** |  |  |
| 9. | a. | Classify and write about the river training works according to their purpose. | CO2 | 5 |
|  | b. | Elaborate on surplus weir and tank sluice. | CO2 | 5 |
|  | c. | Illustrate any 5 water related environmental problems. | CO1 | 10 |