

(3 hours)

Max. Marks: 80

- Note:** (1) Question no.1 is compulsory
 (2) Solve any 3 questions out of remaining
 (3) Assume data wherever necessary and clearly mention the assumptions made.
 (4) Draw neat figures as required.

- Q1 Answer any four out of the following** 20
- a Discuss in brief various methods of surface irrigation. 05
 - b Define Duty, delta and Base period. Derive the relationship between them. 05
 - c What is hydrograph? Draw a single peaked hydrograph and explain its components. 05
 - d Explain the terms 'storage coefficient' and 'coefficient of permeability'. 05
 - e What are the factors on which the selection of site of reservoir depends? 05
 - f Give the detail classification of Dams 05
- Q2 a** After how many days will you supply water to soil in order to ensure efficient irrigation of the given crop, if 07
- (i) Field Capacity of soil = 27%
 - (ii) Permanent wilting point = 14%
 - (iii) Dry density of soil = 15 kN/m³
 - (iv) Effective depth of root zone = 75 cm
 - (v) Daily consumptive use of water for the given crop = 11 mm
- b** The CCA of area of watercourse is 1200 ha. Intensities of sugarcane and wheat crops are 20% and 40% respectively the duties for the crops at the head of the watercourse are 730 ha/cumecs and 1800 ha/cumecs respectively. Calculate the Discharge at the water course. 07
- c** What is the importance of duty? Explain the variation of duty with the place of its measurement 06
- Q3 a** Discuss the various method of computing average rainfall over a basin 08
- b** A catchment has five rain gauge stations. In a year, the annual rainfalls recorded by the gauges are 78.8 cm, 90.2 cm 98.6 cm, 102.4 cm and 70.4 cm. For a 6% error in the estimation of the mean rainfall, determine the additional number of gauges needed 04
- c** Using the 3 hr unit hydrograph given below, find the peak flow, resulting from four successive 3 hr periods of rainfall producing 0.35, 0.87, 1.39 and 0.77 cm of runoff respectively from a basin. 08

Time (hr)	0	1	2	3	4	5	6	7	8	9	10	11	12	13
Flow (m ³ /s)	0	16	58	173	337	440	400	285	215	165	122	90	60	35

Time (hr)	14	15
Flow (m ³ /s)	16	0

Neglect base flow

TURN OVER

- Q4 a** Derive an expression for discharge from a well fully penetrating an unconfined aquifer. 07
- b** During a recuperation test, the water in an open well was depressed by pumping by 2.5 m and it is recuperated 1.8 m in 80 minutes. Find (a) yield from a well of 4 m diameter under a depression head of 3 meters, (b) the diameter of well to yield 8 lit/sec under a depression head of 2 m. 05
- c** What is reservoir sedimentation? What are the methods to control it 08
- Q5 a** Write a short note on storage zones of reservoir and control levels 06
- b** What are the modes of failure of gravity dam 07
- C** Write a short note on practical profile of gravity dam 07
- Q6 a** What are the causes of failure of earthen dam 10
- b** Write a short note on following: 10
1. Cross Drainage Works.
 2. Arch dam and Buttress Dam.