

315314

12526

3 Hours / 70 Marks

Seat No.

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- Instructions* – (1) All Questions are *Compulsory*.
- (2) Answer each next main Question on a new page.
- (3) Illustrate your answers with neat sketches wherever necessary.
- (4) Figures to the right indicate full marks.
- (5) Assume suitable data, if necessary.
- (6) Use of Non-programmable Electronic Pocket Calculator is permissible.
- (7) Mobile Phone, Pager and any other Electronic Communication devices are not permissible in Examination Hall.
- (8) Use of Steam tables, logarithmic, Mollier's chart is permitted.

Marks

- 1. Attempt any FIVE of the following :** **10**
- a) Enlist the classification of Irrigation on the basis of purposes.
- b) State any four benefits of Irrigation.
- c) Define base period and crop period.
- d) State any four advantages of spillway in dams.
- e) Enlist the forces acting on Gravity dam.
- f) State any two advantages of Bandhara Irrigation.
- g) Define canal lining and state material used for canal lining.

P.T.O.

2. Attempt any THREE of the following :**12**

- a) Define rainfall and explain Symon's rain gauge station.
- b) The following data show a catchment area with average annual rainfall by using arithmetic mean method. Find out the mean rainfall over entire catchment area.

Station	A	B	C	D
Rainfall (mm)	110	103	99	89

- c) Define Runoff and state the factors affecting runoff.
- d) Derive relation between Duty, Delta, and Base period.

3. Attempt any THREE of the following :**12**

- a) Explain the various engineering survey to be conducted for an irrigation project. Enlist the data to be collected for same.
- b) Differentiate between earthen dam and gravity dam on any four points.
- c) Explain with sketch the various forces acting on gravity dam.
- d) Draw a labelled sketch of earthen dam showing all its component parts and state functions of –
 - i) Cutl off trench
 - ii) Rock toe

4. Attempt any THREE of the following :**12**

- a) Draw a layout of lift irrigation scheme. Explain its function with component parts.
- b) Differentiate between sprinkler irrigation and drip irrigation.
- c) Explain how percolation tank differ from irrigation tank.
- d) Explain the classification of canal as per alignment.
- e) Differentiate between weir and barrage.

5. Attempt any TWO of the following :

12

- a) Find the designed discharge of a canal having following details.
- Transit losses = 18%
 - Time factor = 0.7
 - Capacity factor = 0.8

Sr No	Name of Crop	Area under irrigation (Ha)	Duty at field in Ha/cumec.
1	Sugarcane	350	700
2	Rice (Kharif)	150	600
3	Bajari (Kharif)	600	1500
4	Wheat (Rabbi)	1200	1800
5	Vegetable (H.W.)	400	800

- b) Fix the F.R.L., TDL and HFL from data.
- D.S.L. = 210.00 m
 - Effective Live storage = 8500 m³
 - Max. flood discharge = 500 m³
 - Tank losses = 450 m³/sec
 - Length of waste weir = 100 m
 - Free board = 2.5 m
 - $Q = 1.8 L.H.^{3/2}$ (Francis formula)

Contour R.L. (m)	210	212	214	216	218	220
Capacity (m ³)	1500	3200	5000	6500	9000	12000

- c) Suggest suitable routine measures to maintain earthen dam, to serve its purposes.

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[4]

Marks

6. Attempt any TWO of the following :

12

- a) Enlist the types of spillway and suggest suitability of spillway according to site condition.
 - b) Draw neat layout of diversion head work and write function of following component.
 - i) Head Regulator
 - ii) Divide wall
 - iii) Fish ladder
 - iv) Scouring sluices
 - c) Suggest the suitable type of CD-work and draw sketch under each situation.
 - i) Canal bed level and Nala bed level are same.
 - ii) Canal bed level is above HFL of Nala.
 - iii) Canal bed level is above FSL of canal.
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