

# 22501

**22223**

**3 Hours / 70 Marks**

Seat No. 

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- Instructions* –
- (1) All Questions are *Compulsory*.
  - (2) Illustrate your answers with neat sketches wherever necessary.
  - (3) Figures to the right indicate full marks.
  - (4) Assume suitable data, if necessary.
  - (5) Use of Non-programmable Electronic Pocket Calculator is permissible.
  - (6) Mobile Phone, Pager and any other Electronic Communication devices are not permissible in Examination Hall.
  - (7) Preferably, write the answers in sequential order.

**Marks**

- 1. Attempt any FIVE of the following: **10****
- a) State any Four advantages of irrigation.
  - b) Define
    - i) Runoff
    - ii) Dependable yield
  - c) Define duty and delta
  - d) State any two functions of a spillway.
  - e) Enlist the forces acting on a gravity dam.
  - f) Draw a neat sketch of Symon's rain gauge.
  - g) State any two silt control measures of a reservoir.

P.T.O.

- 2. Attempt any THREE of the following:** **12**
- a) Explain Hydrologic cycle with a neat sketch.
  - b) Describe Runoff and state factors affecting runoff
  - c) Describe in brief factors affecting duty.
  - d) Describe in brief with neat sketch area capacity curve.
- 3. Attempt any THREE of the following:** **12**
- a) Explain the Practical Profile of a gravity dam.
  - b) Describe the concept of Low and High gravity dam.
  - c) Differentiate earthen dam and gravity dam w.r.t. seepage, foundation, construction and maintenance.
  - d) State the components and use of the Bandhara scheme.
- 4. Attempt any THREE of the following:** **12**
- a) State advantages and disadvantages of well irrigation (Two each).
  - b) Enlist the components of a drip irrigation scheme stating the purpose of each.
  - c) Draw a neat sketch of diversion headworks showing all component parts.
  - d) Differentiate between weir and barrage.
  - e) Draw neat sketch of diversion head work.

5. Attempt any TWO of the following:

12

- a) The analysis of a storm yielded the following information regarding Isohyets. Calculate the average depth of rainfall.

Isohyet Interval in mm	70-80	80-90	90-100	100-110	110-120	120-130
Area in Km <sup>2</sup>	12	80	110	95	135	65

- b) The base period, intensity of irrigation and duty of various crops under a canal are given in the table below. Find the reservoir capacity, if the canal has 20% losses and reservoir has 12% losses.

Crop	Base Period (days)	Duty at the Field (ha/cumec)	Area under the Crop (ha)
Wheat	120	1800	4500
Sugar Cane	360	800	5400
Cotton	200	1400	2200
Rice	120	900	3500
Vegetables	120	700	1200

- c) Fix the LSL of a reservoir having 400 km<sup>2</sup> catchment area. Expected silting rate is 250 m<sup>3</sup>/km<sup>2</sup>/year and Life of 75 years. The crop water storing requirement is 82 mm<sup>3</sup>. The Canal has 42 km length, bed slope of 1/1500, Full supply depth at the head 1.0 m and tail bed level at RL 186.500.

Contour RL (m)	212	214	216
Capacity Mm <sup>3</sup>	7.5	9.2	11.7

22501

[ 4 ]

**Marks**

**6. Attempt any TWO of the following:**

**12**

- a) Draw standard layout of Lift irrigation scheme showing all major components
  - b) Describe in brief with neat sketch
    - i) Aqueduct
    - ii) Super passage
    - iii) Level crossing
  - c) Design a most economical section of a canal having design discharge of  $4 \text{ m}^3/\text{s}$ , bed grade  $1/2500$  and the canal is lined with concrete  $N = 0.012$  and side slope is 1:1
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