

17979

16117

3 Hours / 100 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.

Marks

1. Solve any TEN of the following:

20

- Enlist any four advantages of irrigation.
- Define hydrological cycle.
- Define yield of catchment.
- Define duty.
- Define base period
- Define gravity dam.
- Enlist joints in gravity dam.
- State the purpose of spillway.
- Enlist two advantages of Bandhar.
- State the necessity of percolation tank.

P.T.O.

- k) Enlist types of weir.
- l) Enlist the purposes of canal lining?
- m) Classify the canal according to its alignment.
- n) Define balancing depth.

2. Solve any FOUR of the following: **16**

- a) Define runoff. State the methods of calculating runoff.
- b) Explain with neat sketch Symons rain gauge.
- c) A catchment area of a site is 900 km^2 . Compute maximum flood discharge by Inglis formula.
- d) State the cropping seasons in Maharashtra. Give the crop sown in each season.
- e) An irrigation canal has a gross commanded area (GCA) of 80,000 hectares out of which 85% is cultivable area. The intensity of irrigation Kharif season is 30% and for Rabi season 60%. Find the discharge required at the head of canal if the duty at its head is 800 ha/cumecs for Kharif season and 1700 ha/cumecs for rabi season.
- f) State the methods for assessment of irrigation water and describe any one.

3. Solve any FOUR of the following: **16**

- a) State the methods of controlling sedimentation in storage reservoir.
- b) Fix FRL from following data:
 - (i) D.S.L. = 110.00 m
 - (ii) Effective live storage = 8000 m^3
 - (iii) Tank losses = 1500 m^3

Contour RL	110	112	114	116	118	120
Capacity in m^3	1000	3000	5000	6000	9000	12000

- c) State the point to be considered while selecting the site for a storage reservoir.

- d) Differentiate between gravity dam and earthen dam w.r.to:
 - (i) Foundation
 - (ii) Seepage
 - (iii) Construction
 - (iv) Maintenance
- e) Draw a neat sketch of earthen dam.
- f) State the precautions and remedial measures to control the seepage through earthen dam.

4. Solve any FOUR of the following: 16

- a) Distinguish between the elementary and practical profile of gravity dam with neat sketch.
- b) State the purpose and location of :
 - (i) Drainage gallery
 - (ii) Inspection gallery
- c) List the different types of energy dissipators and state their suitability.
- d) Define spillway. Enlist different types of spillways.
- e) State the requirements for an ideal site for Bandhara.
- f) State the components and use of Bandhara scheme.

5. Solve any FOUR of the following: 16

- a) Draw a neat sketch of percolation tank.
- b) State the component of lift irrigation system with their functions.
- c) Enlist the component parts of sprinkler irrigation system.
- d) Differentiate between Weir and Barrage.
- e) Draw a layout of Diversion head work and name the important parts.
- f) State the functions of:
 - (i) Divide wall
 - (ii) Fish ladder.

6. Solve any FOUR of the following:**16**

- a) Draw a neat sketch of canal in cutting.
 - b) Design the section of an unlined channel from following data:
 $Q = 50 \text{ m}^3/\text{sec}$, $V = 1 \text{ m/sec}$, $\frac{B}{D} = 6$, $N = 0.025$ side slope 2:1
 - c) State the properties of good lining material.
 - d) State the types of cross drainage works on irrigation channel and describe any one.
 - e) Explain in brief head regulator and cross regulator.
 - f) Suggest the preventive measures of water logging.
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