17502

21718

3 Hours / 100 Marks Seat No. | | | | | | | | |

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) Preferably, write the answers in sequential order.

Marks

1. a) **Attempt any <u>THREE</u> of the following:** **12**

(i) State the necessity of irrigation in India.

(ii) Define:

(1) Hydrology

(2) Rainfall Intensity

(3) Runoff

(5) Yield

Marks

(iii) The following table provides the data for the influence area and rainfall.

Influence area in sq. km.	360	275	420	650
Rainfall in cm.	60.5	75.8	100.20	83.80

From above dates compute the average annual rainfall by Theissen's Polygon method.

iv) Define:

(1) Duty

(2) Delta

(3) Base Period

(4) Crop Period

b) **Attempt any ONE of the following:** **6**

(i) Describe in brief Hydrologic cycle with neat sketch.

(ii) Fix up the F.S.L., H.F.L. T.B.L. from the following data:

(1) Dead storage level = 200m.

(2) Effective live storage = 7.0 Ha.m

(3) Evaporation losses = 0.7 Ha.m

(4) Carry over = 0.5 Ha.m

(5) Max. flood discharge = 400 cumec

(6) Length of the waste weir (Clear water way) = 120.00 m.

(7) Franci's formula Q = $1.9\ LH^{3/2}$ cumecs

(8) Free board = 1.5 m.

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

a) Draw area capacity curve for a reservoir. State its use.

b) Define sitting of reservoir? State factors affecting reservoir.

c) Compare Earthen and Gravity dam with respect to foundation, seepage, construction and maintenance.

Marks

d) Draw a typical cross-section of earth dam; show the all component parts.

e) Define seepage? Enlist the various methods used to reduce seepage in earthen dam.

f) Define spillway and explain in brief ogee type spillway with neat sketch.

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

a) Distinguish between Low dam and High dam.

b) Explain in brief emergency spillway.

c) Describe and sketch Radial gate.

d) State the advantages and disadvantages of bandhara irrigation.

e) State the points to be kept in mind while selecting site for percolation tank.

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

(i) List the components of Lift Irrigation and state use of each.

(ii) Differentiate between sprinkler and drip irrigation on any four points.

(iii) Differentiate between weir and barrage.

(iv) State function of fish ladder and silt excluder.

b) **Attempt any ONE of the following:** **6**

(i) Give a field layout or arrangement for drip irrigation system; stating the component parts and their functions.

(ii) Design the economical section of a canal suitable in the following case:–

(1) Discharge = 1.3 cumecs

(2) Coefficient of Rugosity = 0.025

(3) Canal is in full cutting with side slopes. = $\frac{3}{2}$: 1

(4) Longitudinal bed slope = 1 in 2000

Marks

5. Attempt any TWO of the following: **16**

a) A main canal taking off from a storage reservoir irrigates the following crops as shown below:

Name of crop	Crop period in Days	Area to be irrigated in Hectare	Duty at the Head of main canal in Ha/cumecs
Sugarcane	280	360	650
Overlap on Sugarcane (H.W.)	100	80	650
Rabi Jawar	120	4850	1700
Bajri (Monsoon)	121	6490	2860
Vegetables (H.W.)	120	360	700

Find the discharge required at the head of the main canal taking time factor as $\frac{6}{10}$, Assume 15% transit losses.

b) Describe in brief types of failure of earthen dam with neat sketch and state the remedial measures for the same.

c) Draw a neat sketch of following structures and state their suitability favouring:

(i) Head Regulator

(ii) Siphon Aqueduct

(iii) Super Passage

(iv) Level Crossing

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

a) Describe in brief types of weir.

b) Draw a layout of diversion head work with its all components.

c) Define canal lining. Enlist the common materials used for canal lining.

d) State the important points to be considered while fixing the alignment of canals.

e) State the causes and remedial measures of water logging.