17502

11920

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.

Marks

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

(i) Define

(1) Runoff

(2) Irrigation

(3) Maximum flood discharge

(4) Hydrological cycle

(ii) Classify the irrigation project on the basis of purpose and administration.

(iii) Compute the MFD of the stream over a catchment area of 150 km^2 using :

(1) Dicken's formula (C = 27)

(2) Ingli's formula

(iv) Derive relation between Duty, Delta and Base period.

P.T.O.

Marks

b) **Attempt any <u>ONE</u> of the following:** **6**

(i) In an area four raingauge stations which are equidistant from each other at a distance of 6 km. The rainfall measured at each station is 4 cm, 2.8 cm, 6 cm and 8 cm. Calculate average rainfall.

(ii) Fix the control levels DSL, FRL, HFL and TBL from following data.

(1) Effective storage required 3000 Ha.m.

(2) Carry over allowances and tank losses 25%.

(3) Dead storage - 10% of gross storage.

Contour RL(m)	580	582	584	610	612	614
Storage (Mm^3)	3.0	4.5	6.0	30	40	50

Assume flood lift as 1.5 m free board as 2.5 m.

2. Attempt any <u>FOUR</u> of the following: **16**

a) Define rate of silting and enlist any three factors affecting silting of reservoir.

b) State the types of survey required for irrigation project and data required for irrigation project.

c) Differentiate between earthen dam and gravity dam. (four points)

d) Draw the neat sketch of gravity dam with usual notation.

e) Explain any two types of failure of earthen dam and give their remedial measures.

f) Explain energy dissipitation spillway with and without gates.

3. Attempt any <u>FOUR</u> of the following: **16**

a) Differentiate between ogee spillway and bar type spillway.

b) Explain theoretical and practical profile of gravity dam.

c) Give the salient feature of vertical gate with their use.

d) State any four criteria for selection of site for percolation tank.

e) Give the construction and working of bandhara irrigation.

Marks

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

(i) State two advantages and two disadvantages of bandhara irrigation.

(ii) Draw layout of lift irrigation and give their component.

(iii) State the component of weir with their functions.

(iv) Define barrage and enlist the function of their component part.

b) **Attempt any <u>ONE</u> of the following:** **6**

(i) Draw the layout of drip irrigation and write the maintenance of drip irrigation.

(ii) Calculate the balancing depth for a channel section having a bed width equal to 18 m and side slope of 1:1 in cutting and 2:1 in filling. The bank embankment are kept 3.0 m higher than the ground level and creast width of bank is kept as 2.0 m.

5. **Attempt any <u>TWO</u> of the following:** **16**

a) A main canal irrigates the following crops.

Name of crop	Base period (Days)	Area under crop (ha)	Duty (ha/cumes)
Cotton	200	2500	1300
Wheat	120	7000	2000
Rice (Kharif)	120	3050	900
Sugarcane	360	4600	800
Vegetables (Hw)	120	1400	500

Design the capacity of canal consider canal losses as 10% and capacity factor 0.85.

b) State the procedure of maintenance and repair of radial and vertical gate.

Marks

c) Suggest the suitable type of CD work and draw sketch of it under each of the following situation.

(i) Nala bed level is above FSL of canal.

(ii) HFL of nala is in between FSL of canal and bed level of canal.

(iii) Canal bed level and nala bed same.

(iv) Canal bed level is above HFL of Nala.

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

a) Draw a neat sketch of diversion head work show component parts of it and write the function of each.

b) Differentiate between weir and barrage with respect to.

(i) Flood control

(ii) Afflux

(iii) Maintenance

(iv) Crest level

c) Classify the canal according to alignment and position in canal network.

d) Explain the design procedure for most economical canal section.

e) Explain water logging and state three causes of water logging.