17502

21819

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 THREE of the following:** **12**

(i) Define irrigation and state any four ill effects of irrigation.

(ii) State the factors affecting runoff.

(iii) Describe in brief hydrological cycle with neat sketch.

(iv) Define:

1) Crop period

2) Base period

3) Duty

4) Delta

Marks

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

(i) A proposed tank has 950 km^2 of good catchment area. Assuming that dependable rainfall is 75% of average annual rainfall of 110 cm, calculate yield in ha-m using inglis formula for Non ghat area.

(ii) Fix the control level i.e. Dead Storage Level (DSL) and Full Reservoir Level (FRL) from the following data:

Effective storage for crops = 3200 ha-m

Tank losses = 20% of effective storage

Carry over allowance = 10% of effective storage

Dead storage = 10% of gross storage.

Contour RL (m)	250	253	256	278	281	284
Storage (mm^3)	3.3	4.1	5.25	42.65	47.3	55.12

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

a) Describe in brief factors affecting silting.

b) Draw area capacity curve and state its significance.

c) Describe in brief structural failure of earthen dam with neat sketch.

d) Discuss seepage control in earthen dam.

e) Draw typical cross section of earthen dam. Show all components of its.

f) Define gravity dam and enlist forces acting on gravity dam.

Marks

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

a) Differentiate between theoretical and practical profile of gravity dam.

b) Define spillway. State the necessity and location of emergency spillway.

c) State the necessity of energy dissipators in spillway and enlist types of energy dissipators.

d) State the factors affecting on selection of site for percolation tank.

e) Define bandhara irrigation and state three advantages of bandhara.

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

(i) State the two advantages and two limitations of sprinkler irrigation.

(ii) Enlist component parts of drip irrigation and state function of each.

(iii) Define weir and state classification of weir

(iv) Define barrage and draw typical sketch of barrage. Write names to component parts of it.

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

(i) Draw a neat labeled layout of lift irrigation scheme and state function of major component parts.

(ii) Design a trapezoidal channel for carrying 25 m^3/sec discharge of water. The bed slope of canal is 1:1800 side slope is 1:5:1 Assume C = 50.

Marks

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

a) Find the design discharge of canal for irrigating the crops as per detail given below:

(i) Transit losses = 10%

(ii) Time factor = 0.6

(iii) Capacity factor = 0.7

Sr. No.	Name of crop	Area under irrigation in Ha	Duty (Ha/cumec)
1	Sugarcane	300	650
2	Rice (Kharif)	200	600
3	Wheat (Rabbi)	1100	1700

b) Differentiate between gravity dam and earthen dam (eight points).

c) Draw neat sketch of following:

(i) Aqueduct

(ii) Super passage

(iii) Level crossing

(iv) Inlet and outlet

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

a) Differentiate between weir and barrage.

b) State the function of following components of diversion head works:

(i) Fish ladder

(ii) Silt excluder

(iii) Divide wall

(iv) Guide bank

c) State eight advantages of canal lining

d) Draw labeled diagram of canal cross section in cutting.

e) State the necessity of providing:

(i) Canal Escape

(ii) Canal Falls and Rapids

(iii) Cross Regulator

(iv) Canal outlets