22501

23124

3 Hours / 70 Marks Seat No. | | | | | | | | |

Instructions – (1) All Questions are *Compulsory.*

(2) Answer each next main Question on a new page.

(3) Illustrate your answer 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. Attempt any FIVE of the following: **10**

a) Enlist any four advantages of irrigation.

b) Classify irrigation project based on purpose with one example each.

c) Define :–

i) Crop period

ii) Base period

d) Enlist any two purpose of galleries in gravity dam.

e) Spillway is safety valve for dams. Justify?

f) Define dependable yield from a catchment.

g) Define :–

i) Full tank level

ii) High flood level

P.T.O.

Marks

2. Attempt any THREE of the following: **12**

a) Explain the points in the selection of site for rain gauge station?

b) Describe Thiessen's polygon method with suitable sketch.

c) Establish relation between Duty, Delta and Base period.

d) Explain the various engineering surveys to be conducted for an irrigation project, enlist the data to be collected for same.

3. Attempt any THREE of the following: **12**

a) Draw a labelled sketch of Earthern dam showing all its components and state the functions of –

i) Cut-off trench

ii) Rock toe

b) Enlist various types of gates in dams, explain Vishweswarya gate with sketch.

c) Compare between Earthern dam and gravity dam w.r.t. –

i) Foundation

ii) Construction material

iii) Construction cost

iv) Maintenance

d) Enlist the advantages and disadvantages of Bandhara irrigation scheme (four points each).

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

a) Explain how percolation tank differs from irrigation tank.

b) Discuss sprinkler irrigation system w.r.t. merits, demerits, sketch and trouble shooting of it.

c) Draw a neat layout of diversion head work and label the following components –

i) Divide wall

ii) Under sluices

iii) Fish ladder

iv) Head regulator

Marks

d) Explain the advantages of Barrage w.r.t. –

i) Cost

ii) Silting

iii) Flood control

iv) Area of submergence

e) What is meant by pick-up weir? Explain the situation where it is proposed.

5. Attempt any <u>TWO</u> of the following: **12**

a) Calculate the average annual rainfall of a catchment from the following data by using –

i) Arithmetic mean method and

ii) Theissen's polygon method.

Area of polygon in Sq. km.	20	30	24	26	25
Rainfall in mm.	1400	1500	1100	1200	1300

Also calculate maximum yield in Mm^3 by using Inglis formula.

b) Calculate the storage required in Ha.m for irrigating following crops, consider reservoir loss as 12% and canal losses 15%.

Sr.No.	Crop	Base period in (Days)	Duty in (ha/cumec)	Area under crop (Ha)
1	Wheat	150	2000	12000
2	Rice	120	900	4500
3	Sugarcane	320	700	4200
4	Cotton	210	1600	8000
5	Vegetable	120	600	2400

c) Fix control levels of medium size reservoir from given data –

Effective storage required for crops = 30 Ha.m

Tank losses = 20% of effective storage

Carry over allowance = 10% of effective storage

Dead storage = 10% of gross storages

Contour (RL) (m)	250	253	256	278	281	284
Storage (Mm^3)	3.20	4.10	5.25	42.65	47.30	55.12

Assume flood lift = 3 m and free board = 3 m.

Marks

6. Attempt any TWO of the following: **12**

a) Give a field layout of drip irrigation system, stating the component parts and their functions, also state advantages of drip irrigation over sprinkler irrigation.

b) Design a economical trapezoid section of a canal for carrying discharge of 5 m^3/s. bed slope 1:1000, N = 0.013 and side slope 1V:2H.

c) Suggest the suitable type of CD-work and draw sketch under each situation. (Any three)

i) Canal bed level and Nala bed level are same

ii) Canal bed level is above HFL of Nala

iii) Canal bed level is above FSL of canal

iv) HFL of Nala is in between FSL of canal and bed level of canal.