17502

11718

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) Use of Steam tables, logarithmic, Mollier's chart is permitted.

Marks

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

(i) State any four advantages and four ill effects of irrigation.

(ii) Explain with neat sketch automatic rain gauge. (any one)

(iii) From following data find out the average annual rainfall by Isohyetal method.

Isohytes (mm)	9-10	10-11	11-12	12-13	13-14	14-15
Area between Isohyetes (km^2)	22	80	105	90	70	16

Marks

(iv) State meaning of

1) Crop period

2) Base period

3) Duty

4) Delta

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

(i) A tank has a catchment area of 120 km^2 out of which 20 km^2 is independent. The average annual rainfall of the catchment is 80 cm. The runoff of average bad year is 20% of annual average bad year. The runoff from the intercepted catchment available for this tank is 20% of actual runoff. Calculate assured yield.

(ii) Fix control level of medium size reservoir from the given data.
Effective storage required for crops = 300 ha-m
Tank losses = 20% of effective storage
Carry over allowances = 10% of effective storage
Dead storage = 10% of gross storage

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

Flood Lift = 3m, Free Board = 3m

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

a) State four factors affecting the rate of siltting of reservoir.

b) List the data collected engineering survey for an irrigation project.

c) Write the functions of following component of Earthen Dam.

(i) Berm

(ii) Cross Drain

(iii) COT

(iv) Turfing

Marks

d) Draw a neat labelled sketch of Earthen Dam.

e) Explain hydraulic failures and seepage failure of Earthen Dam.

f) State the eight factors affecting selection of site for gravity dam.

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

a) Describe with sketches types of joints used in gravity dam. (any two)

b) Enlist the forces acting on gravity dam. Show them with a neat sketch.

c) Draw a labelled sketch of Radial gate. State its suitability.

d) State four points for selection of site for percolation tank.

e) Draw layout of bandhara and state its component parts.

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

(i) Draw layout of lift irrigation scheme, list the components of scheme.

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

(iii) What is diversion headwork? State its component with functions.

(iv) Draw a labelled sketch of barrage and state two advantages of it.

Marks

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

(i) State the need of sprinkler irrigation. Draw layout of sprinkler irrigation scheme. (Show various components of sprinkler irrigation scheme in layout)

(ii) A canal section has following parameters.

1) Bottom width of canal = 10 m

2) FSD = 1.5 m

3) Bank width = 2 m

4) Side slope in cutting = 1:1

5) Side slope in filling = 1.5:1

6) FB = 0.5 m

Calculate the balancing depth of canal.

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

a) A main canal irrigates the following crop calculate the duty of each crop at the head of main canal.

	Name of Crop	Delta	Transit losses
(i)	Jowar (kh)	45 cm	20%
(ii)	Wheat (Rubi)	30 cm	40%
(iii)	Sugarcane	180 cm	40%
(iv)	Vegetable (Hw)	50 cm	40%
(v)	Ground nut (Hw)	30 cm	40%

Assume suitable data if required.

Marks

b) Compare between Earthen Dam and Gravity Dam w.r.t.

(i) Foundation

(ii) Seepage

(iii) Construction material

(iv) Length of dam

(v) Construction method

(vi) Cost

(vii) Manpower required

(viii) Maintenance

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

(i) Canal bed level and Nala bed level are same

(ii) Canal bed level is above HFL of Nalla.

(iii) Nala bed level is above FSL of Canal

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

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

a) Differentiate between head regulator and cross regulator on four points.

b) Draw a neat sketch of Diversion head work show components parts of it.

c) Draw the cross section of canal in partial cutting.

d) Compare between contour canal and ridge canal.

e) Compare between aqueduct and super passage.
