END SEMESTER (REGULAR/RETEST) EXAMINATION, NOVEMBER/DECEMBER – 2024

Semester : 3rd

Branch : Civil Engineering

Subject Code : Cv-301

WATER RESOURCE ENGINEERING

Full Marks – 70

Time – Three hours

The figures in the margin indicate full marks for the questions.

Instructions :

(i) Question Nos. 1, 2, 3 and 11 are compulsory.

(ii) Answer any *five* questions from Question Nos. 4 to 10.

1. Fill in the blanks :   1×5=5

    (a) In _____method, water is spread or flooded on a rather smooth flat land, without much control or prior preparation.

    (b) The average delta for rice is _____ cm.

    (c) When the size of the drops is less than 0.5 mm., it is called _____.

[Turn over

(d) The _____ pressure of water as it flows or seeps through the body of the dam or its foundation.

(e) Afforestation is a measure to control _____ erosion.

2. Write True or False :   1×5=5

(a) Fish ladder is a device, which is constructed in the river bed in front of the head regulator.

(b) One cumec day is equal to 8.64 hectare-metres.

(c) A cross-drainage work is a structure which does not carry the discharge of a natural stream across a canal intercepting the stream.

(d) Canal lining decreases the duty of water.

(e) Dam which is constructed to store water during floods and release it gradually at a safe rate, when the flood recedes is called a Storage dam.

3. Choose the correct answers :   1×5=5

(a) Monsoon period is

    (i) December-February   (ii) June-October

    (iii) October-November   (iv) March-May

(b) Agents of soil erosion is

    (i) Afforestation

    (ii) Reforestation

    (iii) Overgrazing by cattle

    (iv) None of the above

(c) The computation of average precipitation or rainfall done by Arithmetic average method, If P_1, P_2, P_3, —— Pn etc. are the precipitation measured at n gauge stations, then

    (i) $Pav = \dfrac{P_1 + P_2 + P_3 + ----- + Pn}{n}$

    (ii) $Pav = \dfrac{P_1 - P_2 + P_3 ----- Pn}{n}$

    (iii) $Pav = \dfrac{P_1 + P_2 + P_3}{n}$

    (iv) All of the above

(d) A cross-drainage work should be avoided as per as possible by

    (i) diverting one stream into another

    (ii) changing the alignment of the canal so that it crosses below the junction of two streams

    (iii) All of the above

(e) Functions of head regulator is

    (i) to make the regulation of supply in the canal

    (ii) to control the silt entry in the canal

    (iii) to shut out river floods

    (iv) All of the above

4. (a) What is irrigation ?   2

   (b) Write why the irrigation is necessary in our State.   2

   (c) Describe in brief the different methods of irrigation.   5

5. (a) Define the term 'Crop period'.   1

   (b) Define the term 'Intensity of Irrigation'. 1

   (c) Derive the relation among Duty, Delta and Base period.   3

   (d) What do you understand by Crop rotation ? What are its advantages ?   1+3=4

6. (a) What do you mean by Integrated watershed management ?   2

   (b) Describe the objectives of Watershed management.   4

   (c) Explain how soil erosion can be minimized.   3

7. (a) What is Evaporation and Transpiration ?   2

   (b) Describe in brief the different types of precipitation.   2

   (c) Explain the different types of automatic rain gauge with neat sketches.   5

8. (a) Distinguish clearly between the Rigid and Non-rigid dams.   2

   (b) What are the causes of failures of earth dams ?   3

   (c) Write the advantages of Gravity dams. 4

9. (a) State the various ill effects of water logging.   3

   (b) Explain with the help of a diagram, the various component parts, along with their functions of a diversion headwork.   6

10. (a) What do you mean by Cash crops ? Give two examples of cash crops.   2+2=4

   (b) Give two examples of Rabi crops.   2

(c) Find the average rainfall over a basin with a suitable method for the data given below : 3

Rain gauge station	Area of Thiessen Polygon (A) sq.km	Precipitation (P)mm
A	45	30.8
B	38	34.6
C	30	32.6
D	40	24.6

11. Write short notes on any *four* : 2.5×4=10

(a) Computation of rainfall by Isohyetal method.

(b) Factors affecting the duty.

(c) A Weir.

(d) Canal lining.

(e) Forces acting on Gravity Dam.