Code: 20A01603

R20

B.Tech III Year II Semester (R20) Regular Examinations August 2023

HYDROLOGY AND IRRIGATION ENGINEERING

(Civil Engineering)

Time: 3 hours Max. Marks: 70

PART – A

(Compulsory Question)

*****

1 Answer the following: (10 X 02 = 20 Marks)

(a) List the forms of precipitation. 2M

(b) Explain the terms: 2M
(i) Evaporation.
(ii) Infiltration.

(c) Define S-Hydrograph and its applications. 2M

(d) Describe the following: 2M
(i) Porosity.
(ii) Specific yield.

(e) Give the relationship between duty, delta and base period. 2M

(f) Explain the following: 2M
(i) Kor depth.
(ii) Kor period.

(g) Explain the balancing depth and Borrow pits used for designing of canal. 2M

(h) List the types of canal lining. 2M

(i) Explain the components of diversion head works. 2M

(j) Define Exit gradient in diversion head works. 2M

PART – B

(Answer all the questions: 05 X 10 = 50 Marks)

2 With the help of neat sketch explain any one recording rain gauges with their merits and demerits. 10M

OR

3 Explain the various factors affecting infiltration capacity. 10M

4 The ordinate of 4hrs unit hydrograph are given below. Obtain the ordinates of 12 hrs unit hydrograph for the catchment: 10M

Time [hrs]	0	4	8	12	16	20	24	28	32	36	40	44
Ordinates of 4 hrs Unit Hydrograph	0	40	90	150	170	150	90	72	47	25	10	0

OR

5 (a) Give the divisions of sub surface water. 5M

(b) Explain various types of aquifers. 5M

6 Explain the various types of irrigation in detail. 10M

OR

7 Describe in detail about irrigation efficiency and crop season of India. 10M

8 Explain Kennedy's theory and its drawbacks. 10M

OR

9 Give the necessity of living of canals. Also give the advantages & Disadvantages. 10M

10 Explain the Blighs Creep theory. 10M

OR

11 Describe the Layouts of diversion head works. 10M

*****

Code: 20A01603

R20

B.Tech III Year II Semester (R20) Supplementary Examinations January 2024

HYDROLOGY AND IRRIGATION ENGINEERING

(Civil Engineering)

Time: 3 hours Max. Marks: 70

PART – A

(Compulsory Question)

*****

1		Answer the following: (10 X 02 = 20 Marks)	
	(a)	Define Engineering Hydrology and its applications.	2M
	(b)	Explain the terms: (i) Rain, (ii) Snow.	2M
	(c)	Define Hydrograph and its applications in water resources project.	2M
	(d)	Explain the terms: (i) Aquifer, (ii) Aquifuge.	2M
	(e)	Explain the Necessity of Irrigation.	2M
	(f)	Explain the term: (i) Gross command area, (ii) Culturable command area.	2M
	(g)	Define the term canal.	2M
	(h)	Explain the cause of water logging.	2M
	(i)	Define the terms: (i) Diversion head works, (ii) Storage head works.	2M
	(j)	Explain the advantage and disadvantage of Khoslas theory.	2M

PART – B

(Answer all the questions: 05 X 10 = 50 Marks)

2	With the help of neat sketch explain Horton's representation of hydrological cycle.	10M
	OR	
3	An Area is composed of a square of side 10 km and an equilateral triangle placed on the Top, left side and right side. The annual precipitation recorded at 4 corners of the square considered clockwise from the top corner is 600 mm, 860 mm, 960 mm and 1020 mm respectively. The Apex of the Top, left side and right side triangle has recorded is 550 mm, 750 mm and 500 mm of annual rainfall. Estimate the average depth of rainfall by Airthematic Method and Thiessen Polygon Method.	10M
4	Define unit hydrograph. Explain the assumptions made in deriving the unit hydrograph.	10M
	OR	
5	Define the terms porosity, specific yield and specific retention coefficient of permeability and transmissibility.	10M
6	Explain the methods of irrigation with neat flow diagram.	10M
	OR	

Contd. in Page 2

7	Estimate the frequency of irrigation from the data: (i) Field Capacity of soil = 34%, (ii) Permanent Wilting Point = 16%, (iii) Density of Soil = 1.5 g/cm^3, (iv) Depth of the root zone = 25 cm, (v) Daily consumption use of water = 15 smm.	10M
8	Explain Lacey's silt theory and its drawbacks.	10M
	OR	
9	A channel section is to be designed for the following data: Discharge Q= 5 cumec Lacey's Silt factor is 1.5 Channel side slope is 1H:1V Determine the bed slope of the channel.	10M
10	Explain the types of diversion head works.	10M
	OR	
11	Explain the causes and failure of hydraulic structures on permeable foundations.	10M

*****