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III B.TECH II SEM

SUPPLEMENTARY EXAMINATIONS

MARCH 2025

NEC NARASARAOPETA ENGINEERING COLLEGE
(AUTONOMOUS)

III B.Tech II Semester Supple. Examinations, March-2025

Sub Code: 19BCE6TH02 IRRIGATION & WATER RESOURCES ENGINEERING

Time: 3 hours (CE) Max. Marks: 60

Note: Answer All **FIVE** Questions All Questions Carry Equal Marks (5 X 12 = 60M)

Q.No		Questions	KL	CO	M
1	a	What are rain gauges? Explain the different types of rain gauges.	2	1	08
		Explain rainfall mass curve	3	3	04
		OR			
	b	List the different methods of determining the average depth of precipitation over an area. Explain any one of the methods in detail.	5	1	05
		In a drainage basin, there exist six rain gauges, and the average rainfall at these stations is 106, 91, 65, 55, 62 and 48 cm. Determine if these rain gauges are adequate to give reliable measurements of rainfall with an error of less than 10%. If not, how many additional rain gauges are needed?	4	2	07
2	a	Write a detailed note about various equations to calculate the Evapotranspiration.	3	2	12
		OR			
	b	List the different types of evaporation and explain the factors affecting evaporation in detail.	3	2	05
		The results of an infiltrometer test on soil are given below. Determine Horton's infiltration capacity equation for this soil.	4	2	07

Time since the start(h)	0.25	0.5	0.75	1	1.25	1.5	1.75	2
Infiltration Capacity(cm/h)	5.6	3.2	2.1	1.50	1.20	1.10	1.0	1.0

3	a	List the factors affecting runoff and elaborate in detail.										5	2	06
		Rainfall data of a magnitude 4 cm and 5cm occurring non two consecutive 4 hr duration of catchment area 25 km^2. Produce the following hydrograph at an outlet of the catchment and estimate the rainfall and Ø-index. Draw the graph also.										4	4	06
		Time from the start of rainfall	-6	0	6	12	18	24	30	36	42	48	54	60	
		Observed flow	7	5	13	26	21	16	12	9	7	5	5	4	
		OR													
	b	The monthly rainfall value of the 50% dependable year at a site selected for the construction of an irrigation tank is given below. Estimate the monthly and annual runoff volume of the catchment area 1500 ha.										4	2	06

Month	June	July	Aug	Sep	Oct
Monthly rainfall (mm)	90	160	145	22	240

		Elaborate components of hydrographs also explain in detail the characteristics of streams.										5	4	06

4	a	A stream of water of 125 litres/sec was diverted from a canal, and 100 litres/sec were delivered to the field. An area of 1.6 hectares was irrigated in 8 hours. The effective depth of the root zone was 1.7m. The runoff loss in the field was 420 m^3. The depth of water penetration varied linearly from 1.7m at the head end of the field to 1.1m at the tail end. The available moisture holding capacity of the soil is 20cm/m depth of soil. Determine the various irrigation efficiencies. Irrigation was started at a moisture extraction level of 50% of available moisture.	4	5	12
		OR			
		Compare drip irrigation and Sprinkler irrigation.	2	5	06
	b	Write a short note on the factors influencing duty, delta and base period.	3	6	06
5	a	What do you understand about Reservoir sedimentation?	2	6	06
		Summarize the criteria for the safe design of the earth dam.	2	7	06
		OR			
	b	How do you estimate the life of a reservoir?	2	6	06
		Discuss the advantages and disadvantages of gravity dams.	3	7	06

KL: Blooms Taxonomy Knowledge Level CO: Course Outcome M:Marks

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NARASARAOPETA ENGINEERING COLLEGE
(AUTONOMOUS)

III B.Tech II Semester Supple. Examinations, March-2025

Sub Code: 19BCE6TH04 TRANSPORTATION ENGINEERING

Time: 3 hours (CE) Max. Marks: 60

Note: Answer All **FIVE** Questions.

All Questions Carry Equal Marks (5 X 12 = 60M)

Q.No		Questions	KL	CO	M
1		**UNIT-I**			
	a	Write in detail about highway planning in India for the first twenty-year plan.	K2	CO1	[6M]
		Elaborate the engineering surveys conducted for highway alignment.	K2	CO1	[6M]
		OR			
	b	Summarize the various requirements of ideal highway alignment.	K2	CO1	[6M]
		Discuss the various classification of roads and its functions.	K2	CO1	[6M]
2		**UNIT-II**			
	a	The speed of overtaking and overtaken vehicles is 80 and 50 kmph respectively. On a two-way traffic road, the acceleration of overtaking vehicle is 0.99 m/sec^2. i. Calculate safe OSD **(4)** ii. Mention the minimum length of overtaking zone. **(4)** iii. Draw the sketch of overtaking zone with all details. **(4)**	K3	CO2	[12M]
		OR			
	b	Calculate the minimum sight distance required to avoid a head on collision of two cars approaching from the opposite direction at 90 and 60 kmph. Assume a reaction time of 2.5 seconds coefficient of friction of 0.7 and brake efficiency of 50 % in either case.	K3	CO2	[12M]
3		**UNIT-III**			
	a	Discuss about collision and condition diagrams with a neat sketch.	K2	CO3	[6M]
		Describe in detail the various types of road markings commonly used with neat sketches.	K2	CO3	[6M]
		OR			
	b	List out the various factors cause accidents in traffic engineering with IRC standards.	K2	CO3	[6M]
		What is an intersection? Explain in detail the two broad classifications of intersection.	K2	CO3	[6M]
4		**UNIT-IV**			
	a	Briefly explain the ductility test for bitumen with neat sketches.	K2	CO4	[6M]
		Illustrate the importance and procedure of crushing strength test for coarse aggregate with neat sketches.	K2	CO4	[6M]
		OR			
	b	Show in detail about the design of joints in rigid pavement.	K2	CO4	[6M]
		Describe the functions of the components of flexible pavements.	K2	CO4	[6M]
5		**UNIT-V**			
	a	Illustrate briefly the different types of failures of rigid pavements.	K2	CO5	[6M]
		Elucidate the method of strengthening of existing pavement with flexible overlay.	K2	CO5	[6M]
		OR			
	b	Enumerate any two commonly employed methods for the structural evaluation of flexible and rigid pavements.	K2	CO5	[12M]

KL: Blooms Taxonomy Knowledge Level CO: Course Outcome M:Marks

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