Hall Ticket Number :										

R-17

Code: 7G671

IV B.Tech. I Semester Regular & Supplementary Examinations January 2022

Design and Drawing of Irrigation Structures

(Civil Engineering)

Max. Marks: 70 Time: 3 Hours

Answer *any One* question from the following (1 x 70 = 70Marks)

		Marks	CO	Blooms Level
1.	Design and draw of a canal regulator cum road bridge with the following data. The right bank is 5 m wide and left bank is 2 m wide on both sides. Good foundations are available at +19.00. Assume the ground level at the site as +22.00			

Description	**Up-stream**	**Down-stream**
Full supply discharge	40 Cumec	35 cumec
Bed width	18 m	18 m
Bed level	+20.00	+20.00
Full supply depth	4 m	3.5 m
Full supply level	+24.00	+23.50
Top level of bank	+25.00	+24.50

70M CO1 5, 6

OR

2. Design and draw the surplus work of a tank forming part of a chain of tanks. The combined catchment area of the group of tanks is 30 km^2 and the area of the catchment intercepted by the upper tanks is 19 km^2. Water will be stored in the tank to a level of +12.00 meters above MSL limiting the submersion of foreshore lands up to a level of +12.75 meters above MSL. The general ground level at the proposed site of work is +11.00 meters, and the ground level below the proposed surplus slopes off till it reaches +10.00 meters in about 6 meters distance.

The tank bund has a top width of 2 meters at level +14.50 with 2:1 side slope on either side. The tank bunds are designed for a saturation gradient of 4:1 with 1-meter clear cover. The foundations are of hard gravel at a level of 9.50 meters near the site of work. 70M CO4 5, 6

Hall Ticket Number :										

R-17

Code: 7G674

IV B.Tech. I Semester Regular & Supplementary Examinations January 2022

Disaster Management

(Common to All Branches)

Max. Marks: 70 Time: 3 Hours

Answer *any five full questions* by choosing one question from each unit (5x14 = 70 Marks)

****

			Marks	CO	Blooms Level
		UNIT–I			
1.	a)	Define Disaster and Hazard. Write a detailed note on Natural disaster.	7M	CO1	L1
	b)	Explain the difference between hazard and vulnerability with examples.	7M	CO1	L2
		OR			
2.	a)	How can we mitigate on the disasters in the environment?	7M	CO1	L1
	b)	How does capacity influence disaster? Explain with example.	7M	CO1	L1
		UNIT–II			
3.	a)	How Earthquake is measured and what are all the damages caused by Tsunami.	7M	CO2	L1
	b)	Explain the necessary steps to be avoid dangerous epidemics after a flood disaster?	7M	CO2	L2
		OR			
4.	a)	List the activities that trigger human-induced disasters.	7M	CO2	L1
	b)	Describe the Bhopal Gas Tragedy	7M	CO2	L2
		UNIT–III			
5.	a)	Explain in detail about the impacts of disaster on environment.	7M	CO3	L2
	b)	Explain in detail about Recent Trends in Disaster Management.	7M	CO3	L2
		OR			
6.	a)	How does climate change affect disasters?	7M	CO3	L1
	b)	Explain in detail about urban disaster.	7M	CO3	L2
		UNIT–IV			
7.	a)	Discuss the important steps in relief distribution. Examine the problem areas during recovery phase of disaster management.	7M	CO4	L3
	b)	Discuss key stages of Disaster Cycle.	7M	CO4	L3
		OR			
8.	a)	Explain the role and functions of a disaster manager.	7M	CO4	L2
	b)	Discuss the principles of community based disaster management.	7M	CO4	L3
		UNIT–V			
9.	a)	Describe the role of sustainable development in disaster management.	7M	CO5	L2
	b)	Explain the need of quick reconstruction technologies in disaster management.	7M	CO5	L2
		OR			
10.	a)	Explain the factors to be considered while planning the rebuilding works after a major disaster due to flood.	7M	CO5	L2
	b)	Describe the role of land use planning and development regulations in disaster management.	7M	CO5	L2

END

Hall Ticket Number :										

R-17

Code: 7G677

IV B.Tech. I Semester Regular & Supplementary Examinations January 2022

Finite Element Methods for Civil Engineering

(Civil Engineering)

Max. Marks: 70 Time: 3 Hours

Answer *any five full questions* by choosing one question from each unit (5x14 = 70 Marks)

****

			Marks	CO	Blooms Level
		UNIT–I			
1.	a)	What is constitutive relationship? Establish the constitutive relations for a linear elastic isotropic material.	8M		
	b)	State the principle of minimum potential energy. Give the significance in finite element analysis.	6M		
		OR			
2.		A simply supported beam is subjected to uniformly distributed load over entire span and it is subjected to a point load at the centre of the span. Calculate the bending moment and deflection at midspan by using Rayleish – Ritz method	14M		
		UNIT–II			
3.	a)	Define shape function. State its characteristics	7M		
	b)	Write about the convergence criteria and compatibility conditions	7M		
		OR			
4.		A fixed beam of span 6 m carries central point load of 10 kN and udl of 6kN/m over right half span. Develop the global stiffness matrix and calculate the nodal displacements. Take E =210 Gpa, I = 6×10^{-6} m^4	14M		
		UNIT–III			
5.		What is strain displacement matrix? Develop shape functions and Strain displacement matrix, for four noded rectangular two dimensional element.	14M		
		OR			
6.		Generate stiffness matrix for the triangular element as shown in Fig. 1. Also calculate the shape functions and nodal displacements.			

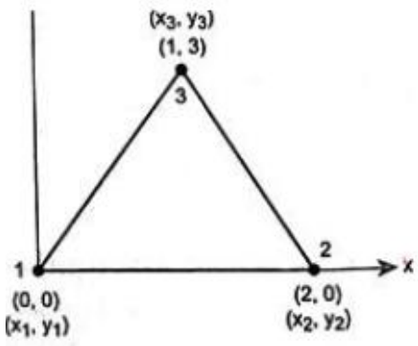


Fig.1 14M

		UNIT–IV			
7.		A four noded rectangular element has the following coordinates: 1(0,0), 2 (2,0), 3 (2,1), 4(0,1).Determine the Jacobian matrix, Strain – Displacement matrix and Element Stresses.	14M		
		OR			
8.		Derive the shape function for 4 noded quadrilateral element and develop the Strain displacement matrix.	14M		
		UNIT–V			
9.		Evaluate the integral I = $\int e^x + 1/x + 5\, dx$ using Gaussian integration with one, two, three integration points and compare with exact solution	14M		
		OR			
10.		Write short notes on Static condensation and assemblage of elements.	14M		

END

Hall Ticket Number :										

R-17

Code: 7G672

IV B.Tech. I Semester Regular & Supplementary Examinations January 2022

Foundation Engineering

(Civil Engineering)

Max. Marks: 70 Time: 3 Hours

Answer *any five* full questions by choosing one question from each unit (5x14 = 70 Marks)

****

			Marks	CO	Blooms Level
		UNIT–I			
1.	a)	Discuss Standard Penetration Test. What are the various corrections? What is the importance of the test in geotechnical engineering?	7M	1	2
	b)	The field N-Value in a deposit of fully submerged fine sand was 40 at a depth of 6m. The average saturated fine unit weight of the soil is 19 kN/m^3. Calculate the corrected N-Value as per IS: 2131-1981	7M	2	3
		OR			
2.	a)	What are the factors that affect the sample disturbance? How are these effects minimized?	7M	1	2
	b)	Describe the salient features of a good sub-soil investigation report	7M	1	2
		UNIT–II			
3.	a)	How a slope analyzed using Swedish circle method? Derive an expression for the factor of safety.	7M	2	4
	b)	An excavation is made with a vertical face in a clay soil which has Cu=50kN/m^2, γ_t=18kN/m^3. Determine the maximum depth of excavation, so that the excavation is stable	7M	4	3
		OR			
4.	a)	Derive an expression for the factor of safety of infinite slope in dry cohesion less soils	7M	2	4
	b)	An infinite slope is to be constructed of a clay soil at a slope angle of 30^0.The ground water level is at the ground surface itself, with seepage parallel to the ground. The soil properties are c'=15kN/m^2, $\phi=22^0$,γ_{sat}=20kN/m^3. What is the factor of safety against movement along plane parallel to the ground surface at depths of 4m and 5.5m?	7M	2	3
		UNIT–III			
5.		What are various types of retaining wall structures, describe with neat sketches.	14M	3	2

OR

6.		What are different types of shallow foundations? Explain them with neat sketches.	14M	3	3

UNIT–IV

7.	a)	Discuss Mayerhof's bearing capacity theory. How does it differ from Terzaghi's theory?	7M	4	1
	b)	Describe the plate load test. What are its limitations?	7M	4	2

OR

8.	a)	Determine the allowable gross load and the net allowable load for a square footing of 2m side and with a depth of foundation of 1.0 m. Use Terzaghi's theory and assume local shear failure. Take a factor of safety of 3.0. The soil at the site has γ=18 kN/m^3, c'=15 kN/m^3 and Ø=25^0, Take N'c=14.8, N'q=5.6 and N'$_\gamma$=3.2.	14M	4	4

UNIT–V

9.	a)	Explain the necessity of pile foundation	7M	5	2
	b)	A group of nine piles, 8m long, is used as the foundation for a column. The piles are 30cm diameter with c/c spacing of 90cm. The sub soil consists of clay with unconfined compression strength of 180 kN/m^2. Estimate the safe load.	7M	4	4

OR

10.	a)	Discuss various forces on the well foundation	7M	5	1
	b)	Discuss the situations where a well foundation is more suitable than other types of foundations	7M	5	2

END

Hall Ticket Number :										

R-17

Code: 7GA71

IV B.Tech. I Semester Regular & Supplementary Examinations January 2022

Human Resource Management

(Common to All Branches)

Max. Marks: 70 Time: 3 Hours

Answer *any five* full questions by choosing one question from each unit (5x14 = 70 Marks)

****

			Marks	CO	Blooms Level
		UNIT–I			
1.	a)	Explain the nature and scope of human resource management in the context of an organization.	7M	1,2	1
	b)	Discuss any three ethical issues faced by human resource professionals with an example for each of them.	7M	1,2	2
		OR			
2.	a)	Write a short notes on competitive challenges influencing HRM.	7M	1,3	3
	b)	Discuss the functions of human resource management by highlighting the operative functions and its strategic intent.	7M	1,4	3
		UNIT–II			
3.	a)	Elucidate the importance of human resource planning.	7M	1,4	3
	b)	Give different methods of collecting data for job analysis and compare any two of the methods.	7M	4,5	5
		OR			
4.	a)	Explain in detail about Human Resource Information systems and its applications in business world.	7M	3,5	4
	b)	What is job design? Present any three techniques of job design.	7M	3,4	4
		UNIT–III			
5.	a)	L&G is an IT based start-up company that opts for campus recruitment. If you are a HR specialist of L & G, what process you will you recommend for the recruitment of fresher's.	7M	4,5	6
	b)	Explain any three factors that affect the selection decision outcomes.	7M	3,4	4
		OR			
6.	a)	Narrate the process of recruitment with appropriate steps and examples.	7M	1,4	5
	b)	Develop an orientation program for the undergraduate students of any degree program.	7M	3,4	6

UNIT–IV

7.	a)	Compare the different types of training.	7M	1,3	2
	b)	What is development? What are the factors influencing executing development in an organization.	7M	2,3	6

OR

8.	a)	Explain different ways an organization can support employees in career advancement.	7M	2,5	5
	b)	How can training helps employees in career progression in the organization?	7M	3,5	5

UNIT–V

9.	a)	Elucidate the procedure for arriving at the compensation for a job role.	7M	2,3	4
	b)	Explain the grievance handling procedure with the help of organizational related grievances.	7M	3,4	5

OR

10.	a)	Distinguish between monetary and non-monetary perquisites and give three examples for each of them.	7M	4,5	4
	b)	Give the importance of collective bargaining and state reasons why maintaining cordial employee-employer relationship is needed.	7M	4,5	5

****END****

Hall Ticket Number :										

R-19

Code: 7G673

IV B.Tech. I Semester Regular & Supplementary Examinations January 2022

Transportation Engineering

(Civil Engineering)

Max. Marks: 70 Time: 3 Hours

Answer *any five* full questions by choosing one question from each unit (5x14 = 70 Marks)

****

			Marks	CO	Blooms Level
		UNIT–I			
1.	a)	What are the various surveys to be carried out before planning a highway system for a given area? Explain briefly.	7M	CO1	
	b)	Explain with sketches the various factors controlling the alignment of road.	7M	CO1	
		OR			
2.	a)	What are the objectives of highway geometric design? List the various geometric elements to be considered in highway design.	7M	CO1	
	b)	Explain summit and valley curves and the various cases when these are formed while two different gradients meet.	7M	CO1	
		UNIT–II			
3.	a)	Explain the relationship between speed, travel time, volume, density and capacity.	7M	CO2	
	b)	What are the applications of (a) accident location file (b) spot maps (c) collision diagrams and (d) condition diagrams.	7M	CO2	
		OR			
4.	a)	On cross roads A and B, the 15 minutes traffic volume during the design hour were 700 and 400 vehicles. The approach speeds were 50 and 30kmph for roads A and B. The width of road A is 14m and that of road B is 9.9m. Determine optimum cycle length.	7M	CO2	
	b)	Explain briefly the uses of road marking. What are various types of Road markings?	7M	CO2	
		UNIT–III			
5.	a)	Explain the objective of channelization. What are the various types of traffic island used?	7M	CO3	
	b)	What is a traffic rotary? What are its advantages and limitations?	7M	CO3	
		OR			

6.	a)	Explain briefly the various factors that are to be considered in the design of rotary intersection.	7M	CO3
	b)	What are the advantages and limitations of un-channelized and channelized intersections?	7M	CO3

UNIT–IV

7.	a)	What are the desirable properties of sub-grade soil? List the various tests of soils to assess its property.	7M	CO4
	b)	What are the applications of (a) liquid limit (b) plasticity index and (c) free swell index of soil for highway construction works?	7M	CO4

OR

8.	a)	Explain briefly the application of the various tests on aggregate for highway construction.	7M	CO4
	b)	What are the various laboratory tests on modified bituminous binder?	7M	CO4

UNIT–V

9.	a)	Draw a sketch of flexible pavement cross section and show the component parts. Enumerate the functions and importance of each component of the pavement.	7M	CO5
	b)	Estimate the design traffic to design a new flexible pavement for a two-lane undivided carriageway using the following data: Design CBR value of sub grade=8.0%, Initial traffic on completion of construction=1800cv per day, Average growth rate=6.0% per year, Design life 15 years, VDF value=2.5.	7M	CO5

OR

10.	a)	Write a note on various stresses in rigid pavement.	7M	CO5
	b)	What are the steps for the thickness design of rigid pavements as per IRC guidelines?	7M	CO5

END

Hall Ticket Number :										

R-17

Code: 7G676

IV B.Tech. I Semester Regular & Supplementary Examinations January 2022

Bridge Engineering

(Civil Engineering)

Max. Marks: 70 Time: 3 Hours

Answer *any five* full questions by choosing one question from each unit (5x14 = 70 Marks)

****

			Marks	CO	Blooms Level
		UNIT–I			
1.		Discuss in detail about IRC Class AA loading, IRC Class 70R loading, IRC Class A loading and IRC Class B loading.	14M	CO1	BT-2
		OR			
2.	a)	Briefly explain in detail about the types of loading conditions used for design of box culvert.	7M	CO1	BT-2
	b)	Briefly explain in detail about the design moments, shears and thrusts.	7M	CO1	BT-2
		UNIT–II			
3.		Design a R.C.C Tee beam and deck slab to suit the following data: Effective span of girders = 16 m. Clear width of road way = 7.5 m. Width of kerbs = 600 mm. Thickness of wearing coat = 80 mm. Number of main girders = 4. Spacing of main girders = 2.5 m. Spacing of cross girders = 4 m. Type of loading: I.R.C class 70R tracked vehicle. Materials: M20 grade concrete and Fe-415 grade HYSD bars. Design the deck slab and the exterior girder for flexure only and sketch the reinforcement details.	14M	CO2	BT-3
		OR			
4.		The reinforced concrete slab panel of a reinforced concrete Tee beam and slab deck is 2 m wide between Tee beams and 4 m long between cross girders. Design the R.C slab panel for I.R.C class A loading using M30 grade concrete and Fe-500 grade HYSD bars. Assume the thickness of the wearing coat as 80 mm. Sketch the details of reinforcements in the slab.	14M	CO2	BT-6
		UNIT–III			
5.		A plate girder is to be designed for a bridge girder track to suit the following data. Span of the bridge = 20 m. Dead load of track = 7.5 kN/m Equivalent uniform live load for bending moment calculations/track = 1964 kN. Equivalent uniform live load for shear calculations/ track = 2168 kN. Design the plate girder and sketch the details of the longitudinal and cross sections showing the details of cross bracing and welded connections.	14M	CO3	BT-3
		OR			
6.	a)	Discuss the importance and types of shear connectors used in a composite bridge deck	7M	CO3	BT-4
	b)	Discuss various steps that are involved in solving the design of plate girder bridges.	7M	CO3	

UNIT–IV

7. Design a steel rocker bearing for transmitting a vertical reacting of 800 kN and a horizontal reaction of 120 kN at the support of a girder bridge. Assume the following permissible stresses according to IRC: 83: 1982.
Permissible compressive stress on concrete bed block = 4 N/mm^2
Permissible flexural stress in steel plate = 160 N/mm^2
Permissible bearing stress in bearing plate = 185 N/mm^2
Permissible shear stress in steel = 105 N/mm^2
Sketch the typical details of the rocker bearing. 14M CO4 BT-3

OR

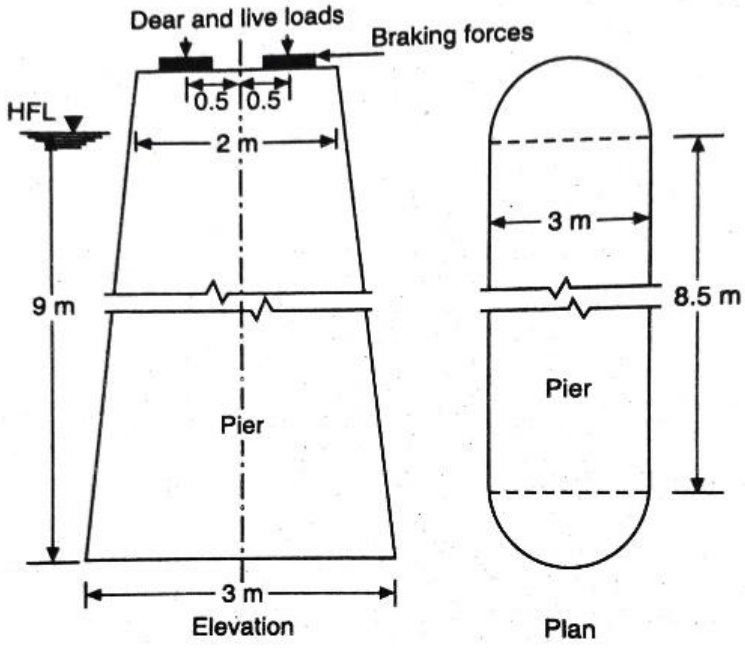
8. Explain the design principles of elastomeric pad bearing with neat sketch. 14M CO4 BT-4

UNIT–V

9. Explain the general features and design principles of abutment with neat sketch. 14M CO5 BT-4

OR

10. A pier shown in fig 1. supports the deck forming a major highway. The various forces acting on the pier are listed below:
Wind pressure on pier = 2.4 kN-m^2,
Material of pier = 1:3:6 cement concrete,
Density of concrete = 24 kN/m^2
Calculate the stress developed at the base of the pier due to the following cases:
(a) Dead load and self-weight of the pier.
(b) Effect of buoyancy.
(c) Due to eccentricity of live load .
(d) Due to longitudinal braking forces.
(e) Due to wind pressure.
Estimate the maximum and minimum stresses developed at the base of pier due to the critical combination of the vertical loads.



14M CO5 BT-6

END