			Course Code: B23CE3101		
		SAGI RAMA KRISHNAM RAJU ENGINEERING COLLEGE (A)			**R23**
		III B.Tech. I Semester MODEL QUESTION PAPER			
		DESIGN AND DRAWING OF REINFORCED CONCRETE STRUCTURES			
		For CIVIL			
Time: 3 Hrs.					**Max. Marks: 70 M**
		Answer Question No.1 compulsorily			
		Answer **ONE Question** from **EACH UNIT**			
		Assume suitable data if necessary			
					10 x 2 = 20 Marks
			CO	**KL**	**M**
1.	**a).**	Draw stress block parameters and obtain total force and its line of action of compression in concrete.	1	2	2
	b).	Explain briefly the following: i) Balanced section ii) Under reinforced section iii) Over reinforced section	1	2	2
	c).	Why does the Code impose minimum and maximum limits with regard to (i) spacing, (ii) percentage area of flexural reinforcement	2	2	2
	d).	Under what circumstances are doubly reinforced beams resorted to ?	2	2	2
	e).	Why is the design shear strength of concrete (τ_c) related to the percentage of tension steel p_t ?	3	2	2
	f).	Define development length. What is its significance?	3	2	2
	g).	Explain clearly the difference in the behaviour of one-way slabs and two-way slabs.	4	2	2
	h).	Explain the need for corner reinforcement in two-way rectangular slabs whose corners are prevented from lifting up.	4	2	2
	i).	Enumerate the function of the transverse reinforcement in a reinforced concrete column.	5	2	2
	j).	Explain how one-way shear and two-way are considered in isolated footings.	5	2	2
					5 x 10 = 50 Marks
		UNIT-1			
2.		An RC beam has a width of 250 mm and an overall depth of 400 mm. The effective covers for both tension and compression reinforcement is 45 mm. The beam is reinforced with three bars of 28 mm diameter in tension and three bars of 22 mm diameter in compression. Determine the ultimate moment of resistance of the beam section. Assume M 20 concrete and Fe 415 steel.	1	3	10
		OR			

3.		Analyze a beam of T-shaped cross section having an effective flange width of 1300 mm, flange thickness of 100 mm, web width of 325 mm and an effective depth of 420 mm, to determine the ultimate moment of resistance of the beam which is reinforced with 7 Nos. of 28 mm dia. bars on tension side. The materials used are concrete mix of grade M 20 and HYSD steel of grade Fe415.	1	3	10
		UNIT-2			
4.		A rectangular beam of 7 m span (center to center between supports) resting on 300 mm wide simple supports, is to carry a uniformly distributed dead load (excluding self-weight) of 15 kN/m and a live load of 20 kN/m. The overall beam depth is restricted to 550 mm. Use M20 grade of concrete and Fe 415 grade of steel and beam subjected to moderate exposure condition, design the beam section at mid span.	2	3	10
		OR			
5.		A T-beam has flange dimension 1300 mm × 100 mm. The overall depth of beam is 550 mm and width of web is 350 mm. Design the tension reinforcement of T-beam of 8 m clear span, simply supported on 230 mm wide wall supports if it is subjected to an ultimate moment 572 kNm. Use Fe 415 steel. Assume moderate exposure condition.	2	3	10
		UNIT-3			
6.		A rectangular beam section of 300 mm width and 500 mm effective depth is reinforced with 5 bars of 20 mm Ø out of which 2 bars have been bent at 45^o. Determine the shear resistance of the bent-up bars and additional shear reinforcement required if it is subjected to ultimate shear force of 300 kN. Consider concrete of grade M 20 and steel of grade Fe 415.	3	3	10
		OR			
7.		Design the torsional reinforcement in a rectangular beam section, 300 mm wide and 550 mm deep, subjected to an ultimate twisting moment of 25 kNm, combined with an ultimate bending moment of 60 kNm and an ultimate shear force of 50 kN. Assume M 20 concrete, Fe 415 steel and moderate exposure condition. Detail the longitudinal and transverse reinforcement at mid-span.	3	3	10
		UNIT-4			
8.		Design a simply supported slab to cover a hall with internal dimensions 5.0 m × 6.5 m. The slab is supported on masonry walls 230 mm thick. Assume a live load of 3 kN/m^2 and a finish load of 1.0 kN/m^2. Use M25 concrete and Fe 415 steel. Assume that the slab corners to be prevented	4	3	10

		from lifting up by the wall loads due to the floor above.			
		OR			
9.		Design a simply supported slab to cover a hall with internal dimensions 4.5 m × 6.0 m. The slab is supported on masonry walls 230 mm thick. Assume a live load of 4 kN/m^2 and a finish load of 1.0 kN/m^2. Use M 25 concrete and Fe 415 steel. Assume that the one long edge of slab is discontinuous	4	3	10
		UNIT-5			
10.		Design the reinforcement for a column with l_{ex} = l_{ey}= 3.5 m and size 300 × 500 mm, subject to a factored axial load of 1250 kN with biaxial moments of 180 kNm, and 100 kNm with respect to the major axis and minor axis respectively (i.e., M_{ux}= 180 kNm, M_{uy}= 100 kNm). Assume M 25 concrete and Fe 415 steel.	5	3	10
		OR			
11.		Design a square footing for a rectangular column 300 × 500 mm, reinforced with 6-25 mm ϕ bars, and carrying a service load of 1250 kN. Assume soil with an allowable pressure of 200 kN/m^2 at a depth of 1.25 m below ground. Assume Fe 415 grade steel for both column and footing, and M 20 grade concrete for the footing and M 25 grade concrete for column.	5	3	10

CO-COURSE OUTCOME **KL-KNOWLEDGE LEVEL** **M-MARKS**

NOTE: Questions can be given as A, B splits or as a single Question for 10 marks

Course Code: B23CE3102

SAGI RAMA KRISHNAM RAJU ENGINEERING COLLEGE (A) **R23**

III B.Tech. I Semester MODEL QUESTION PAPER

ENGINEERING HYDROLOGY

For CIVIL

Time: 3 Hrs. **Max. Marks: 70 M**

Answer Question No.1 compulsorily

Answer **ONE Question** from **EACH UNIT**

Assume suitable data if necessary

10 x 2 = 20 Marks

			CO	KL	M
1.	**a).**	Define Hydrology and mention its applications.	1	2	2
	b).	List the types of precipitation with examples.	1	2	2
	c).	What is a Unit Hydrograph?	2	2	2
	d).	List factors affecting infiltration.	2	2	2
	e).	Define Kennedy's theory in canal design.	3	2	2
	f).	What are the causes of water logging?	3	2	2
	g).	Define reservoir yield and reservoir losses.	4	2	2
	h).	What is river training? List any two structures used.	4	2	2
	i).	Define Duty, Delta, and Base period.	5	2	2
	j).	What is Irrigation Efficiency? List types.	5	2	2

5 x 10 = 50 Marks

		UNIT-1			
2.	**a).**	Explain the hydrological cycle with a neat diagram.	1	2	5
	b).	Describe any two methods of measuring rainfall.	1	2	5
		OR			
3.	**a).**	What is meant by consistency of rainfall data? Explain the double mass curve method.	1	3	5
	b).	List the factors affecting infiltration. Explain the working of any one type of infiltrometer.	1	2	5
		UNIT-2			
4.	**a).**	Explain the factors affecting runoff.	2	2	5
	b).	The ordinates of 3hr Unit Hydrograph are given below. Derive the ordinates of 6hr Unit Hydrograph.	2	3	5
		OR			
5.	**a).**	What is a Unit Hydrograph? State its assumptions and uses.	2	2	5

Time	0	3	6	9	12	15	18	21	24	27	30
Ordinates of 3 hr U.H	0	10	25	20	16	12	9	7	5	3	0

	b).	Explain how an S-hydrograph is derived and mention its applications.	2	3	5
		UNIT-3			
6.	**a).**	Design an irrigation channel to carry a discharge of 6 cumecs. Assume N=0.0225, m=1, bed slope = 0.25 m/km. Use Kennedy's theory.	3	2	5
	b).	Classify irrigation canals and explain the importance of canal alignment.	3	3	5
		OR			
7.	**a).**	List and explain the modes of failure in a gravity dam.	3	3	5
	b).	Explain the forces acting on a gravity dam with a neat sketch.	3	3	5
		UNIT-4			
8.	**a).**	Explain the procedure for determining reservoir capacity using the mass curve and demand curve method.	4	3	5
	b).	Evaluate different types of reservoir losses and suggest suitable control measures for evaporation and sedimentation.	4	4	5
		OR			
9.	**a).**	Explain the various types of developments and investigations required for reservoir planning.	4	2	5
	b).	Describe the different storage zones in a reservoir and their significance.	4	2	5
		UNIT-5			
10.	**a).**	Define Duty, Delta, and Base period. Derive the relationship among them.	5	3	5
	b).	What are the factors affecting duty? Explain methods of improving duty and the procedure for determining evapotranspiration.	5	3	5
		OR			
11.	**a).**	Differentiate between direct and indirect irrigation systems with suitable examples.	5	3	5
	b).	Compare surface and sprinkler irrigation methods in terms of suitability for crops and soil conditions.	5	3	5

CO-COURSE OUTCOME **KL-KNOWLEDGE LEVEL** **M-MARKS**

NOTE: Questions can be given as A, B splits or as a single Question for 10 marks

					Course Code:B23CE3103
		SAGI RAMA KRISHNAM RAJU ENGINEERING COLLEGE (A)			**R23**
		III B.Tech. I Semester MODEL QUESTION PAPER			
		GEOTECHNICAL ENGINEERING – I			
		For CIVIL			
Time: 3 Hrs.					**Max. Marks: 70 M**
		Answer Question No.1 compulsorily			
		Answer **ONE Question** from **EACH UNIT**			
		Assume suitable data if necessary			
					10 x 2 = 20 Marks
			CO	**KL**	**M**
1.	**a).**	Derive the relation between w, G, S and e	1	2	2
	b).	Explain the importance of consistency indices.	1	2	2
	c).	State Darcy's law	2	1	2
	d).	Explain Terzaghi's effective stress principle	2	2	2
	e).	Explain the assumptions in Boussinesq's theory	3	2	2
	f).	List any two uses of Newmark's influence charts.	3	1	2
	g).	Define compaction.	4	1	2
	h).	Explain the concept of primary and secondary consolidation.	4	2	2
	i).	What is critical void ratio?	5	1	2
	j).	Explain Mohr-Coulomb failure theory.	5	2	2
					5 x 10 = 50 Marks
		UNIT-1			
2.	**a).**	Derive the Relation $\rho_d = \frac{(1-n_a)G\rho_w}{1+wG}$	1	2	5
	b).	In a field exploration, a soil sample was collected in a sampling tube of internal diameter 5cm below ground water table. The length of the extracted sample was 10.2 cm and its weight was 387gm.If G=2.7, and the weight of the dried sample is 313 g, Determine the porosity, Void Ratio, Degree of Saturation, Bulk density and dry density of the sample.	1	3	5
		OR			
3.	**a).**	Discuss about Indian Standard Classification System	1	2	5
	b).	A soil sample obtained from a core cutter is 500mm in diameter and 100mm in height. Its wet unit weight is 17kN/m3 and dry unit weight is 13kN/m3. If the specific gravity of solids is 2.8 determine the volume of solids of the specimen and also determine the moisture content in the soil specimen	1	3	5
		UNIT-2			
4.	**a).**	Explain the factors Effecting Permeability	2	2	5
	b).	A Sand deposit consists of two layers. The to player is 2.5 m thick (ρ=1709.67 kg/m^3) and the bottom layer is 3.5 m thick (ρ_{sat}=2064.52	2	3	5

		kg/m^3). The water table is at a depth of 3.5 m from the surface and the zone of capillary saturation is 1 m above the water table. Determine the Total, Neutral and Effective stresses.			
		OR			
5.	**a).**	Explain Quick sand condition and critical hydraulic gradient.	2	2	5
	b).	A Constant head Permeability test was carried out on a cylindrical sample of sand 10cms dia & 15cm height. 160 cm^3 of water was collected in 1.75 mins. Under a head of 30 cm. Compute the Coefficient of permeability (K) & Velocity of Flow.	2	3	5
		UNIT-3			
6.	**a).**	Derive an expression for the vertical stress at a point due to a point load, using Boussinesq's theory.	3	2	5
	b).	A square foundation 5mx 5m is to carry a load of 4000 kN. Calculate the vertical stress at a depth of 5m below the centre of the foundation I_N=0.084 for m=n=0.5. Also determine the vertical stress using 2:1 distribution.	3	3	5
		OR			
7.	**a).**	Explain about Newmark's Influence Chart	3	2	5
	b).	A Concentrated Load of 2000 kN is applied at the ground surface. Determine the vertical stress at a point P which is6m directly below the load. Also calculate the vertical stress at a point R which is at a depth of 6m but at a horizontal distance of 5m from the axis of the load.	3	3	5
		UNIT-4			
8.	**a).**	Discuss in brief the effect of Compaction on Engineering Properties of Soil?	4	2	5
	b).	A Stratum of Clay is 2m thick and has an initial overburden pressure of 50 kN/m^2 at its middle. Determine the final settlement due to an increase of 40 kN/m^2 at the middle of the clay layer. The clay is over-consolidated, with a pre consolidation pressure of 75 kN/m^2. The values of the coefficients of recompression and Compression index are 0.05 and 0.25, respectively. Take initial Void ratio as 1.40	4	3	5
		OR			
9.	**a).**	Discuss Terzaghi's theory of consolidation, Stating various assumptions	4	2	5
	b).	A 3m thick clay layer beneath a building is over lain by a permeable stratum and is under lain by an impervious rock. The coefficient of consolidation of the clay was found to be 0.025cm2/minute. The final expected settlement for the layer is 8cm, (a) How much time will it take for 80% of the total settlement to take place? (b) Determine the time required for a settlement of 2.5cm to occur (c) Compute the settlement that would occur in one year.	4	3	5
		UNIT-5			
10.	**a).**	Explain the advantages of triaxial shear test over the direct shear test	5	2	5
	b).	In a direct shear test, the following results are obtained. Normal stress (kN/m^2) 25 50 75 Shear stress at failure (kN/m^2) 30 45 60	5	3	5

		Size of soil sample is 60mm x 60mm. Find the shear parameters if a triaxial test was conducted on the same soil with a cell pressure of 30kN/m2, what would be the deviator stress at failure?			
		OR			
11.	**a).**	Explain the classification of the shear tests based on drainage conditions, along with the practical situations they simulate?	5	2	5
	b).	A Shear Vane of 7.5 cm diameter and 11 cm length was used to measure the shear strength of soft clay. If a torque of 600 N-m was required to shear the soil, Calculate the shear strength. The Vane was then rotated rapidly to cause remoulding of the soil. The Torque Required in the remoulded state was 200 N-m. Determine the Sensitivity of the soil.	5	3	5

CO-COURSE OUTCOME **KL-KNOWLEDGE LEVEL** **M-MARKS**

NOTE: Questions can be given as A, B splits or as a single Question for 10 marks

					Course Code: B23CE3104
		SAGI RAMA KRISHNAM RAJU ENGINEERING COLLEGE (A)			**R23**
		III B.Tech. I Semester MODEL QUESTION PAPER			
		REPAIR AND REHABILITATION OF STRUCTURES			
		For CIVIL			
Time: 3 Hrs.					**Max. Marks: 70 M**
		Answer Question No.1 compulsorily			
		Answer **ONE Question** from **EACH UNIT**			
		Assume suitable data if necessary			
					10 x 2 = 20 Marks
			CO	**KL**	**M**
1.	**a).**	Define the following terms i) Repair, ii) Rehabilitation.	1	1	2
	b).	Differentiate between strengthening and retrofitting.	1	2	2
	c).	List out various nondestructive tests on concrete.	2	1	2
	d).	Define damage assessment.	2	1	2
	e).	Define the term durability.	3	1	2
	f).	List various corrosion protection techniques.	3	1	2
	g).	What is ferro cement? Where will it be useful?	4	2	2
	h).	List the various types of special concretes.	4	1	2
	i).	Differentiate between gunite and shotcrete.	5	2	2
	j).	Differentiate between shoring and underpinning.	5	2	2
					5 x 10 = 50 Marks
		UNIT-1			
2.	**a).**	List out the physical causes of deterioration of concrete and explain any three of them with neat sketches.	1	2	10
		OR			
3.	**a).**	Explain the causes and characteristics of cracks in RCC structural members.	1	2	10
		UNIT-2			
4.	**a).**	List out various Non-destructive testing methods and explain any one of them with neat sketches	2	2	10
		OR			
5.	**a).**	Explain the step wise procedure involved in rapid assessment of damage.	2	2	10
		UNIT-3			
6.	**a).**	Explain the thermal properties of concrete in detail.	3	2	10
		OR			
7.	**a).**	Mention the various corrosion protection techniques and explain any two of them.	3	2	10

		UNIT-4			
8.	**a).**	Differentiate between AFRP, CRFP and GFRP.	4	2	10
		OR			
9.	**a).**	Explain about epoxy resin and its applications.	4	2	10
		UNIT-5			
10.	**a).**	Explain the step wise procedure involved in epoxy injection.	5	2	10
		OR			
11.	**a).**	List out various techniques for strengthening of beams and explain any one technique with neat sketch.	5	2	10

CO-COURSE OUTCOME **KL-KNOWLEDGE LEVEL** **M-MARKS**

NOTE: Questions can be given as A, B splits or as a single Question for 10 marks

					Course Code: B23CE3105
		SAGI RAMA KRISHNAM RAJU ENGINEERING COLLEGE (A)			**R23**
		III B.Tech. I Semester MODEL QUESTION PAPER			
		ARCHITECTURE AND TOWN PLANNING			
		For CIVIL			
Time: 3 Hrs.					**Max. Marks: 70 M**
		Answer Question No.1 compulsorily			
		Answer **ONE Question** from **EACH UNIT**			
		Assume suitable data if necessary			
					10 x 2 = 20 Marks
			CO	**KL**	**M**
1.	**a).**	Define 'arch' and 'vault' in Roman architecture.	1	1	2
	b).	Name two examples of Indo-Saracenic buildings.	1	1	2
	c).	What are the basic geometric forms used in architecture?	2	1	2
	d).	What is meant by 'zoning' in residential planning?	2	1	2
	e).	What are the main differences between Classical and Post-Classic architecture?	3	1	2
	f).	Name two principles of Bauhaus design philosophy.	3	1	2
	g).	List three basic principles of ancient Indian town planning.	4	1	2
	h).	Define 'Rajpath' and 'Vidhi' in ancient Indian city layout.	4	1	2
	i).	List three main purposes of urban landscaping.	5	1	2
	j).	What is meant by 'urban densification'?	5	1	2
					5 x 10 = 50 Marks
		UNIT-1			
2.	**a).**	Compare and contrast Egyptian, Greek, and Roman temple architecture. Discuss their purposes, structural systems, and decorative elements.	1	2	10
		OR			
3.	**a).**	Discuss the influence of climate, available materials, and religious beliefs on the architectural styles of Egypt, Greece, and Rome. Provide specific examples to support your analysis.	1	2	10
		UNIT-2			
4.	**a).**	Describe the fundamentals of design composition and explain how they guide the architectural design process from concept to execution.	2	2	10
		OR			
5.	**a).**	Describe the various privacy considerations in residential planning and explain how architects address these through design strategies.	2	2	10
		UNIT-3			
6.	**a).**	Explain Walter Gropius's Bauhaus philosophy and discuss its impact on architectural education and practice worldwide.	3	2	10
		OR			

7.	**a).**	Describe Oscar Niemeyer's innovative use of concrete forms and explain how his structural expressions contributed to architectural aesthetics.	3	2	10
		UNIT-4			
8.	**a).**	Explain the fundamental principles of ancient Indian town planning as described in classical texts. Discuss how these principles reflected the social, religious, and economic organization of ancient Indian society.	4	2	10
		OR			
9.	**a).**	Describe the water management systems in ancient Indian cities. Explain how planners addressed water supply, drainage, and flood control in urban areas.	4	2	10
		UNIT-5			
10.	**a).**	Explain the role of landscaping in urban planning and describe how it contributes to the quality of urban life. Discuss the integration of natural and built environments.	5	2	10
		OR			
11.	**a).**	Explain the concept of compact city development and describe how it relates to vertical expansion. Discuss the planning principles that support compact urban form.	5	2	10

CO-COURSE OUTCOME **KL-KNOWLEDGE LEVEL** **M-MARKS**

NOTE: Questions can be given as A, B splits or as a single Question for 10 marks

Course Code: B23CE3106					
SAGI RAMA KRISHNAM RAJU ENGINEERING COLLEGE (A)					**R23**
III B.Tech. I Semester MODEL QUESTION PAPER					
CLIMATE CHANGE IMPACT ON ECO-SYSTEM					
For CIVIL					
Time: 3 Hrs.					**Max. Marks: 70 M**
Answer Question No.1 compulsorily					
Answer **ONE Question** from **EACH UNIT**					
Assume suitable data if necessary					
					10 x 2 = 20 Marks
			CO	**KL**	**M**
1.	**a).**	What is the difference between weather and climate?	1	1	2
	b).	List three natural factors that influence climate change.	1	1	2
	c).	Define evaporation and transpiration.	2	1	2
	d).	What is surface runoff?	2	1	2
	e).	What is a rain gauge and how is precipitation measured?	3	1	2
	f).	List four factors that influence precipitation patterns.	3	1	2
	g).	Define climate oscillations and give three examples.	4	1	2
	h).	What is meant by climate anomaly?	4	1	2
	i).	What is the difference between climate change and climate variability?	5	1	2
	j).	What is radiative forcing?	5	1	2
					5 x 10 = 50 Marks
		UNIT-1			
2.	**a).**	Describe how atmospheric composition affects radiation absorption and emission, with particular reference to greenhouse gases.	1	2	10
		OR			
3.	**a).**	Compare and contrast natural climate variability with anthropogenic climate change, providing examples of each.	1	2	10
		UNIT-2			
4.	**a).**	Describe the movement of water through soil layers, explaining the concepts of infiltration, percolation, and groundwater recharge.	2	2	10
		OR			
5.	**a).**	Explain the relationship between surface runoff and groundwater flow, describing how they contribute to streamflow.	2	2	10
		UNIT-3			
6.	**a).**	Explain the adiabatic process and its significance in atmospheric thermodynamics, describing dry and saturated adiabatic lapse rates.	3	2	10
		OR			

7.	**a).**	Explain the global wind circulation system, describing the three-cell model and its relationship with pressure belts and precipitation zones.	3	2	10
		UNIT-4			
8.	**a).**	Describe the formation and characteristics of flash floods, explaining the factors that make certain regions more susceptible to flash flooding.	4	2	10
		OR			
9.	**a).**	Describe the spatial and temporal characteristics of drought, explaining how drought propagates through the hydrological cycle.	4	2	10
		UNIT-5			
10.	**a).**	Explain the concept of climate sensitivity and describe its importance in understanding the magnitude of future climate change under different emission scenarios.	5	2	10
		OR			
11.	**a).**	Describe the role of aerosols in climate change, explaining their direct and indirect effects on the Earth's radiation budget.	5	2	10

CO-COURSE OUTCOME **KL-KNOWLEDGE LEVEL** **M-MARKS**

NOTE: Questions can be given as A, B splits or as a single Question for 10 marks

					Course Code: B23CE3107
		SAGI RAMA KRISHNAM RAJU ENGINEERING COLLEGE (A)			**R23**
		III B.Tech. I Semester MODEL QUESTION PAPER			
		ADVANCED SURVEYING			
		For CIVIL			
Time: 3 Hrs.					**Max. Marks: 70 M**
		Answer Question No.1 compulsorily			
		Answer **ONE Question** from **EACH UNIT**			
		Assume suitable data if necessary			
					10 x 2 = 20 Marks
			CO	**KL**	**M**
1.	**a).**	Explain the purpose of using tide gauges in hydrographic surveying.	1	2	2
	b).	Describe the role of horizontal control in hydrographic surveys.	1	2	2
	c).	Explain the basic principles of mine surveying.	2	2	2
	d).	Describe the significance of surface and underground control surveys.	2	2	2
	e).	Define terrestrial photogrammetry and its applications.	3	2	2
	f).	Describe the function of a photo-theodolite.	3	2	2
	g).	Explain the significance of coordinate systems in field astronomy.	4	2	2
	h).	Describe the role of spherical trigonometry in computing positions	4	2	2
	i).	Explain the concept of 3D laser scanning in modern mapping.	5	2	2
	j).	Describe how mobile mapping systems collect geospatial data.	5	2	2
					5 x 10 = 50 Marks
		UNIT-1	**CO**	**KL**	**M**
2.	**a).**	Explain the procedure of locating soundings from shore and boat.	1	2	5
	b).	Describe the method of reducing soundings to datum.	1	2	5
		OR			
3.	**a).**	Illustrate the theory of tides and the working of self-registering instruments.	1	2	5
	b).	Interpret the role of shoreline survey in hydrographic projects.	1	2	5
		UNIT-2			
4.	**a).**	Apply the Weisbach triangle method for transferring alignment from surface to underground.	2	3	5
	b).	Illustrate the steps involved in tunnelling surveys with appropriate instruments.	2	3	5
		OR			
5.	**a).**	Demonstrate the process of auxiliary adjustments in mining theodolites.	2	3	5
	b).	Explain how you would apply underground surveying procedures in a real-life mining scenario.	2	3	5

		UNIT-3			
6.	**a).**	Solve simple problems involving aerial scale and lens height.	3	3	5
	b).	Demonstrate the calculation of ground distances using vertical photographs.	3	3	5
		OR			
7.	**a).**	Apply formulas to calculate horizontal and vertical angles in terrestrial photogrammetry.	3	3	5
	b).	Interpret the results obtained from aerial photographs for mapping purposes.	3	3	5
		UNIT-4			
8.	**a).**	Compute celestial coordinates based on astronomical observations.	4	3	5
	b).	Solve spherical triangle problems relevant to field astronomy.	4	3	5
		OR			
9.	**a).**	Apply celestial coordinate transformations to find latitude and longitude.	4	3	5
	b).	Solve a directional problem using the principles of azimuth and altitude.	4	3	5
		UNIT-5			
10.	**a).**	Summarize the advantages of 3D laser scanning in surveying.	5	2	5
	b).	Interpret how modern mapping techniques improve spatial data collection.	5	2	5
		OR			
11.	**a).**	Explain the integration process of GIS and BIM in mapping.	5	2	5
	b).	Describe the functioning of UAV/drone-based survey techniques.	5	2	5

CO-COURSE OUTCOME **KL-KNOWLEDGE LEVEL** **M-MARKS**

NOTE: Questions can be given as A, B splits or as a single Question for 10 marks

				Course Code: B23CE3201	
		SAGI RAMA KRISHNAM RAJU ENGINEERING COLLEGE (A)			**R23**
		III B.Tech. II Semester MODEL QUESTION PAPER			
		DESIGN AND DRAWING OF STEEL STRUCTURES			
		For CIVIL			
Time: 3 Hrs.				**Max. Marks: 70 M**	
		Answer Question No.1 compulsorily			
		Answer **ONE Question** from **EACH UNIT**			
		Assume suitable data if necessary			
		Use of IS: 800:2007 and Steel tables are allowed			
				10 x 2 = 20 Marks	
			CO	**KL**	**M**
1.	**a).**	Define (i) Pitch of bolt (ii) Gauge distance (iii) Edge distance	1	2	2
	b).	Explain failures of bolted joints.	1	2	2
	c).	Explain weld defects.	2	2	2
	d).	Explain inspection methods of welded joints.	2	2	2
	e).	List the types of tension members	3	2	2
	f).	Explain the shear lag effect in tension members	3	2	2
	g).	Explain modes of failures of compression members	4	2	2
	h).	Explain the slenderness ratio of compression members	4	2	2
	i).	Differentiate between laterally and laterally unsupported beams	5	2	2
	j).	Explain the lateral torsional buckling of compression flange	5	2	2
				5 x 10 = 50 Marks	
		UNIT-I			
2.		Design a lap joint between two plates of size 120 ×12 mm thick and 100 × 12 mm thick using a single row of M20 bolt of grade 406 and grade 410 plates.	1	3	10
		OR			
3.		Two plates of 200 × 12 mm are to be connected by a double cover bolt joint with 20 mm diameter bolt. The factored tensile force on the plates is 500 kN. Design the bolted connection.	1	3	10
		UNIT-II			
4.		Design a connection to joint two plates of size 200 × 10 mm of grade Fe 410 to use full plate tensile strength using shop fillet welds if (i) a lap joint is used (ii) a double cover bolt joint is used.	2	3	10
		OR			
5.		An ISMC 250 is used to transmit a factored force of 700 kN. The channel section is connected to a gusset plate 10 mm thick. Design a fillet weld, if the overlap is limited to 300 mm. Use slot welds if required.	2	3	10

		UNIT-III			
6.		Design a tension member 3.4 m between c/c of intersections using double angle section and carrying a factored pull of 200 kN. The member is subjected to reversal of stresses.	3	3	10
		OR			
7.		Design a tension member to carry a factored tensile load of 400 kN. Two angles placed back-to-back with long legs outstanding are desirable. The length of the member is 2.9 m.	3	3	10
		UNIT-IV			
8.		Design a laced column 9 m long to carry a factored axial load of 1200 kN. The column is fixed at both the ends. Provide single lacing system with bolted connection. The column consist of two channels placed back-to-back.	4	3	10
		OR			
9.		Design a built-up column 9 m long to carry a factored axial compressive load of 1100 kN. The column is restrained in position but not in direction at both the ends. Design the column with connecting system as battens with bolted connections. Use two channel sections back-to-back. Use steel of grade Fe 410.	4	3	10
		UNIT-5			
10.		A Simply Supported steel joist of 5.0 m span has to support a load of 60 kN/m (inclusive of self-weight). The beam compression flange is restrained against buckling. Design an appropriate section using steel of grade Fe 410.	5	3	10
		OR			
11.		Design a Simply supported beam of span 3.5 m subjected to a factored bending moment of 300 kNm and factored shear of 140 kN. The beam is laterally unsupported. steel grade of Fe 410.	5	3	10

CO-COURSE OUTCOME **KL-KNOWLEDGE LEVEL** **M-MARKS**

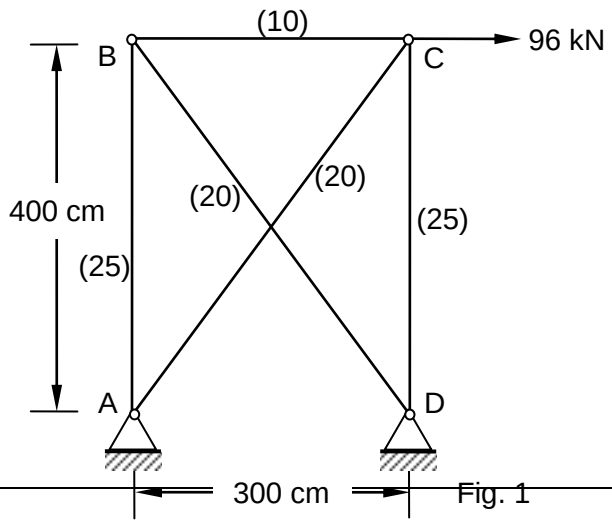
NOTE: Questions can be given as A, B splits or as a single Question for 10 marks

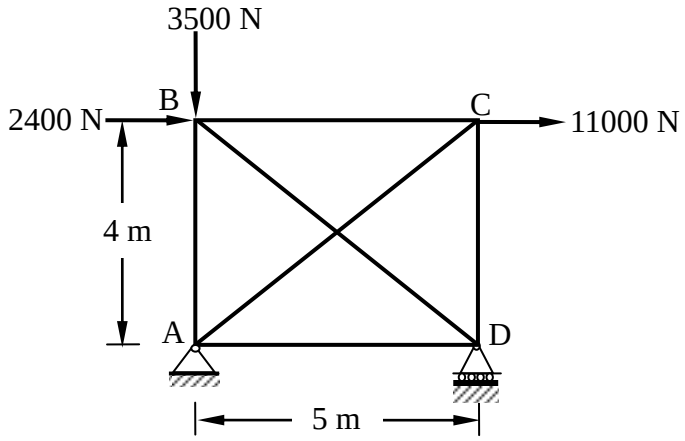
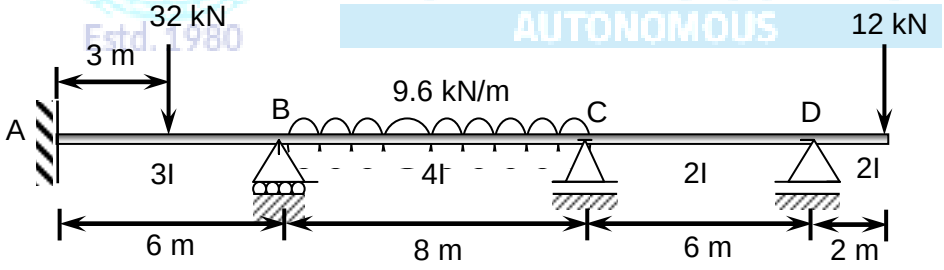
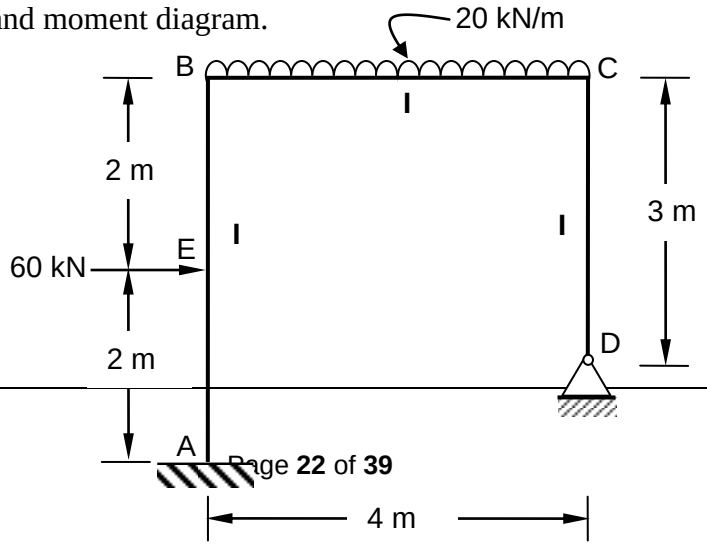
					Course Code:B23CE3202
		SAGI RAMA KRISHNAM RAJU ENGINEERING COLLEGE (A)			**R23**
		III B.Tech. II Semester MODEL QUESTION PAPER			
		HIGHWAY ENGINEERING			
		For CIVIL			
Time: 3 Hrs.					**Max. Marks: 70 M**
		Answer Question No.1 compulsorily			
		Answer **ONE Question** from **EACH UNIT**			
		Assume suitable data if necessary			
					10 x 2 = 20 Marks
			CO	**KL**	**M**
1.	**a).**	Discuss the role of engineering surveys in highway alignment?	1	2	2
	b).	What is the importance of drawings in highway project reports?	1	2	2
	c).	What are the objectives of highway geometric design?	2	2	2
	d).	Explain the difference between summit and valley curves?	2	2	2
	e).	Explain any two preventive measures for road accidents.	3	2	2
	f).	Discuss about condition diagram and collision diagram	3	2	2
	g).	Discuss the importance of the Los Angeles abrasion test?	4	2	2
	h).	What are the functions of sub-base and base courses in pavements?	4	2	2
	i).	How do you prepare existing surfaces for strengthening?	5	2	2
	j).	How do you identify different types of pavement distress?	5	2	2
					5 x 10 = 50 Marks
		UNIT-1			
2.	**a).**	Briefly outline the highway development in India	1	2	5
	b).	Compare Nagpur & Bombay Road Development plans.	1	2	5
		OR			
3.	**a).**	What is master plan? Explain the importance of master plan in highway planning	1	2	5
	b).	Briefly outline about rural road development plan?	1	2	5
		UNIT-2			
4.	**a).**	Discuss the design factors of Highway alignment?	2	2	5
	b).	Calculate the safe stopping distance for design speed of 50 kmph for two-way traffic on a two lane road. Assume coefficient of friction as 0.35 and reaction time of driver as 2.5 seconds	2	3	5
		OR			
5.	**a).**	Derive an expression for extra widening on horizontal curvers.	2	2	5
	b).	Find out the length of transition curve for the following data: Radius of horizontal curve = 400m, design speed = 100 kmph, length of wheel	2	3	5

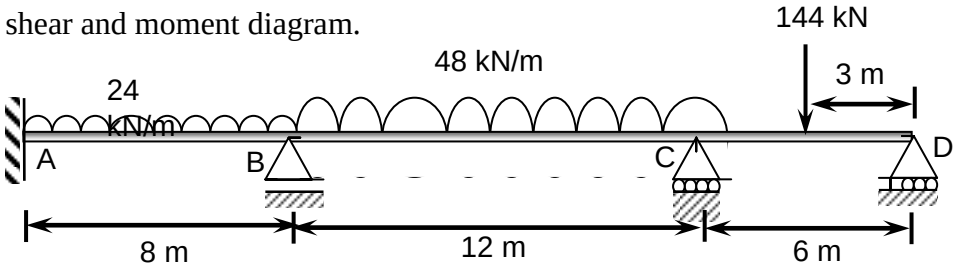
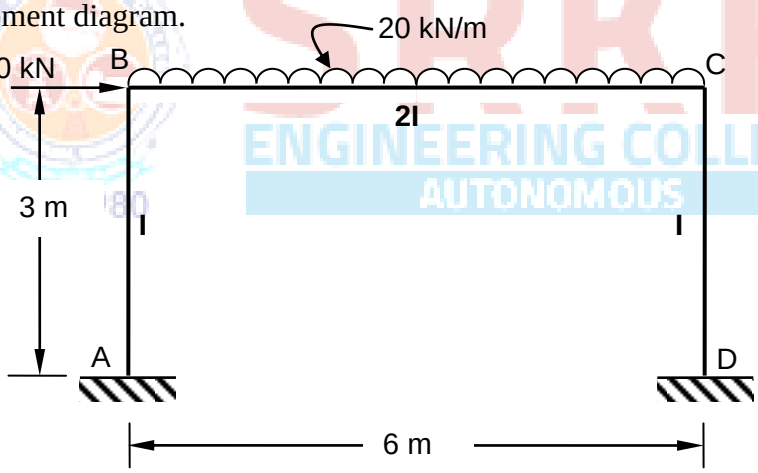
		base = 6.2m, number of lanes = 2, rainfall at the location = heavy, terrain condition = hilly, superelevation is introduced by rotating the edges with reference to center line and rate of introduction of superelevation is 1 in 150. Width of highway is 7m.			
		UNIT-3			
6.	**a).**	Explain how the speed and delay studies are carried out. What are the various uses of delay studies?	3	2	5
	b).	What are the various types of parking facilities designed for traffic needs?	3	2	5
		OR			
7.	**a).**	Explain the relationship between speed, travel, time, volume, density and capacity	3	2	5
	b).	Explain the various measures that may be taken to prevent accidents.	3	2	5
		UNIT-4			
8.	**a).**	Explain the test procedure of shape test for aggregates.	4	2	5
	b).	Estimate the thickness of cement concrete pavement using the method suggested by IRC. Modulus of elasticity of concrete = 3.5 X 105 kg/cm2, Modulus of rupture of concrete = 30 kg/cm^2, Poisson's ratio of concrete = 0.17, Modulus of subgrade reaction = 5 kg/cm^2, Wheel load = 4800 kg, Radius of contact area = 13 cm	4	3	5
		OR			
9.	**a).**	Discuss the properties of bitumen in detail	4	2	5
	b).	Explain CBR method of pavement design, how this method is useful to determine thickness of component layers?	4	2	5
		UNIT-5			
10.	**a).**	Write a descriptive note on maintenance of highways.	5	2	5
	b).	Write a short note on alligator and reflection cracking.	5	2	5
		OR			
11.	**a).**	What are the requirements of material, plants & equipment's for bituminous pavement construction? Discuss briefly.	5	2	5
	b).	Give a descriptive note on Pavement Evaluation Techniques.	5	2	5

CO-COURSE OUTCOME **KL-KNOWLEDGE LEVEL** **M-MARKS**

NOTE: Questions can be given as A, B splits or as a single Question for 10 marks

					Course Code: B23CE3204
		SAGI RAMA KRISHNAM RAJU ENGINEERING COLLEGE (A)			**R23**
		III B.Tech. II Semester MODEL QUESTION PAPER			
		STRUCTURAL ANALYSIS II			
		For CIVIL			
Time: 3 Hrs.					**Max. Marks: 70 M**
		Answer Question No.1 compulsorily			
		Answer **ONE Question** from **EACH UNIT**			
		Assume suitable data if necessary			
					10 x 2 = 20 Marks
			CO	**KL**	**M**
1.	**a.**	State Castigliano's theorem-II	1	2	2
	b).	Differentiate between static indeterminacy and kinematic indeterminacy	1	2	2
	c).	Explain "Carry over factor" and stiffens with neat sketch ?	2	2	2
	d).	Mention any five reasons due to which sway may occur in portal frames.	2	2	2
	e).	Explain advantages and disadvantages of Kani's method over moment Distribution Method?	3	2	2
	f).	What is modified stiffness factor.	3	2	2
	g).	Differentiate between an arch action and beam action.	4	2	2
	h).	State the Eddy's theorem.	4	2	2
	i).	Explain the basic difference between a guide pulley and roller support for a suspension cable?	5	2	2
	j).	Explain the function of stiffening the girder in a suspension bridge.	5	2	2
					5 x 10 = 50 Marks
		UNIT-I			
2.		By the force method analyse the truss with cross diagonals and two hinged supports shown in Fig.1 by using horizontal reaction at A as the redundant. Numbers in bracket are areas in cm^2,E=20,000 kN/cm^2  Fig. 1	1	3	10

		OR			
3.		Find the forces in the members of the given truss shown in Fig.2. Cross section area of vertical members is 28 cm^2 and for the other members is 20 cm^2. Take E = 2×10^5 MPa. Use Castigliano's theorem II.  Fig. 2	1	3	10
		UNIT-II			
4.		Analyse the continuous beam shown in Fig.3 by moment distribution method and draw shear and moment diagram  Fig.3	2	3	10
		OR			
5.		Analyse the portal frame shown in Fig.4 by moment distribution method and draw shear and moment diagram.  Fig.4	2	3	10

		UNIT-III			
6.		Analyse the continuous beam shown in Fig. 5 by Kani's method. Draw shear and moment diagram.  Fig.5	3	3	10
		OR			
7.		Analyse the portal frame shown in Fig. 6 by Kani's method. Draw shear and moment diagram.  Fig.6	3	3	10
		UNIT-IV			
8.		A symmetrical three-hinged parabolic arch of span 40 m and rise of 8 m carries a point load of 30 kN at 10 m horizontally from the left-hand hinge. The hinges are provided at the supports and at the centre of the arch. Calculate the reactions at the supports and also calculate the bending moment, radial shear and normal thrust at a distance of 10 m from the left support. Also, calculate the maximum Positive and B.M and maximum Negative B.M.	4	3	10

		OR			
9.		A two-hinged parabolic arch has a span of 40 m and a rise of 6 m it has the second moment of the arch varies as the secant of the slope of the rib axis and carries a uniformly distributed load of 30 kN/m over the left half of the spam together with a concentrated load of 120 kN act at 5m from right support. Calculate the reactions and horizontal thrust at the ends and point out the values of maximum positive and negative moments also find out the radial shear and normal thrust at 10m from right support.	4	3	10
		UNIT-V			
10.		A cable is suspended between two points A and B located 60 m apart horizontally. B is lower than A by 15 m. At point G located at a horizontal distance of 15 m from A, the cable is 12.875 m below point A. The cable carries a uniform load of 24 kN per metre of span. Determine the position and sag of the lowest point and horizontal tension H in the cable. Also determine the curved length of the cable. The cross-sectional area of the cable is 90 cm^2. Determine the maximum stress in the cable.	5	3	10
		OR			
11.		A suspension bridge of 120 m span has two three-hinged stiffening girders supported by two cables having a central dip of 12 m. the roadway has a width of 6 m. The dead load on the bridge is 5 kN/m^2 while the live load is 10 kN/m^2 which acts on the left half of the span. Determine the shear force and bending moment in the girder at 30 m from the left end. Find also the maximum tension in the cable of the position of the live load.	5	3	10

CO-COURSE OUTCOME **KL-KNOWLEDGE LEVEL** **M-MARKS**

NOTE: Questions can be given as A, B splits or as a single Question for 10 marks

					Course Code: B23MC3205
		SAGI RAMA KRISHNAM RAJU ENGINEERING COLLEGE (A)			**R23**
		III B.Tech. II Semester MODEL QUESTION PAPER			
		SUSTAINABLE MATERIALS AND METHODS FOR CONSTRUCTION			
		For CIVIL			
Time: 3 Hrs.					**Max. Marks: 70 M**
		Answer Question No.1 compulsorily			
		Answer **ONE Question** from **EACH UNIT**			
		Assume suitable data if necessary			
					10 x 2 = 20 Marks
			CO	**KL**	**M**
1.	**a).**	Explain the scope of sustainability in the context of civil engineering.	1	2	2
	b).	State any two Sustainable Development Goals (SDGs) relevant to the construction industry.	1	2	2
	c).	What is embodied energy? Give one construction example.	2	2	2
	d).	Define alternative cementitious materials. Give two examples.	2	2	2
	e).	State two advantages of using geopolymer concrete in construction.	3	2	2
	f).	Mention two benefits of using recycled aggregates in construction.	3	2	2
	g).	What is operational energy in buildings?	4	2	2
	h).	State two factors that influence energy use in building materials.	4	2	2
	i).	Name any two green building rating systems.	5	2	2
	j).	Define Zero Energy Building.	5	2	2
					5 x 10 = 50 Marks
		UNIT-1			
2.	**a).**	Define sustainability. Explain its importance in civil engineering.	1	2	5
	b).	Discuss the role of the United Nations in promoting sustainability through SDGs.	1	2	5
		OR			
3.	**a).**	Explain the concept of Sustainable Consumption and Production (SCP).	1	2	5
	b).	What are the environmental impacts of consumerism?	1	2	5
		UNIT-2			
4.	**a).**	Explain embodied energy and operational energy in buildings.	2	2	5
	b).	Discuss sustainability challenges related to the use of concrete.	2	3	5
		OR			
5.	**a).**	What is the ecological footprint of construction materials? Give examples.	2	2	5
	b).	Discuss carbon emissions from cement and the use of alternative cementitious materials.	2	3	5
		UNIT-3			

6.	**a).**	Explain benefits and limitations of geopolymer concrete.	3	3	5
	b).	Discuss the role of recycled aggregates and water-efficient concrete in sustainable construction.	3	3	5
		OR			
7.	**a).**	How can waste plastic and crumb rubber be used in pavement construction?	3	3	5
	b).	What is life cycle assessment (LCA)? Mention challenges in adopting sustainable materials.	3	3	5
		UNIT-4			
8.	**a).**	How does thermal conductivity of materials affect energy use in buildings?	4	3	5
	b).	Explain why indoor air quality is important in sustainable construction.	4	2	5
		OR			
9.	**a).**	What are the energy conservation practices in cement and aggregate industries?	4	3	5
	b).	Write short notes on ECBC and OTTV (Overall Thermal Transfer Value).	4	2	5
		UNIT-5			
10.	**a).**	What is a Zero Energy Building? Mention any two features.	5	2	5
	b).	Explain the role of Building-Integrated Photovoltaics (BIPV) in energy conservation.	5	3	5
		OR			
11.	**a).**	List any two green building rating systems. Compare LEED and GRIHA.	5	3	5
	b).	What are the principles of modular construction and their sustainable benefits?	5	3	5

CO-COURSE OUTCOME **KL-KNOWLEDGE LEVEL** **M-MARKS**

NOTE: Questions can be given as A, B splits or as a single Question for 10 marks

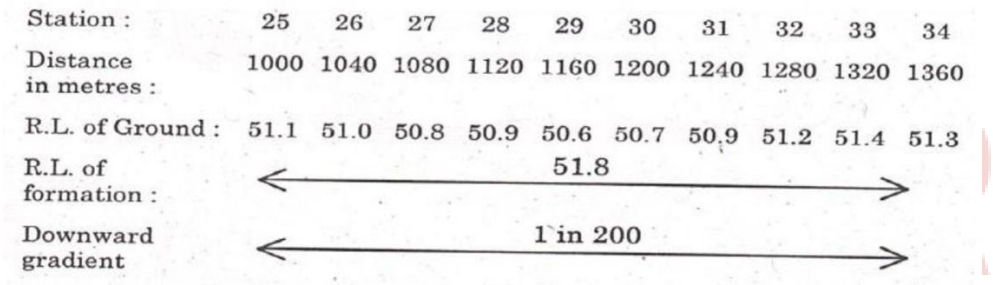
				Course Code: B23CE3206	
		SAGI RAMA KRISHNAM RAJU ENGINEERING COLLEGE (A)			**R23**
		III B.Tech. II Semester MODEL QUESTION PAPER			
		BUILDING SERVICES			
		For CIVIL			
Time: 3 Hrs.					**Max. Marks: 70 M**
		Answer Question No.1 compulsorily			
		Answer **ONE Question** from **EACH UNIT**			
		Assume suitable data if necessary			
					10 x 2 = 20 Marks
			CO	**KL**	**M**
1.	**a).**	What is the function of the truss in an escalator?	1	2	2
	b).	Why are ramps essential in public buildings?	1	2	2
	c).	List any two fire-resistant building materials.	2	2	2
	d).	What is the purpose of a fire alarm system?	2	2	2
	e).	What is wastewater reclamation?	3	2	2
	f).	What is the purpose of a floor trap in bathrooms?	3	2	2
	g).	Define lumen and lux.	4	2	2
	h).	What is sound absorption?	4	2	2
	i).	What is the role of conduits in a rainwater harvesting system?	5	2	2
	j).	List any two advantages of using solar water heaters in residential buildings.	5	2	2
					5 x 10 = 50 Marks
		UNIT-1	**CO**	**KL**	**M**
2.	**a).**	Explain the functional requirements of a building and their importance in design.	1	3	5
	b).	Describe the major components of a lift system with a neat, labelled sketch.	1	3	5
		OR			
3.	**a).**	What are escalators? Explain their types and uses in public buildings.	1	3	5
	b).	Explain how gradient is calculated for a ramp with an example.	1	3	5
		UNIT-2			
4.	**a).**	Explain the working principle of any two fire protection systems	2	3	5
	b).	Explain the importance of evacuation planning. What are the typical provisions for evacuation in high-rise buildings?	2	3	5
		OR			
5.	**a).**	What are the essential fire protection requirements for multi-storeyed buildings? Explain with examples.	2	3	5

	b).	What is fire-resistant design? Mention any four fire-resistant materials used in construction.	2	3	5
		UNIT-3			
6.	**a).**	What are traps and interceptors? Explain their types and role in plumbing systems.	3	3	5
	b).	List and explain different types of plumbing fixtures and their functions in a household.	3	3	5
		OR			
7.	**a).**	Compare one-pipe and two-pipe drainage systems with diagrams.	3	3	5
	b).	Explain the components and functioning of a hot and cold-water supply system in a residential building.	3	3	5
		UNIT-4			
8.	**a).**	Explain the terms lumen and lux. How do they influence the selection of luminaires for a space?	4	3	5
	b).	Differentiate between natural ventilation and mechanical ventilation with examples.	4	3	5
		OR			
9.	**a).**	Define direct light, diffuse light, and glare. How do they impact visual comfort in interiors?	4	3	5
	b).	Define Cooling Degree Days (CDD). How is it useful in designing energy-efficient buildings?	4	3	5
		UNIT-5			
10.	**a).**	Differentiate between passive and active (direct) solar water heating systems with examples.	5	3	5
	b).	Explain the procedure for sizing a solar water heating system for domestic use.	5	3	5
		OR			
11.	**a).**	Explain the components of a typical rainwater harvesting system with a neat sketch.	5	3	5
	b).	Explain the basic working principle of a solar water heater and its components.	5	3	5

CO-COURSE OUTCOME **KL-KNOWLEDGE LEVEL** **M-MARKS**

NOTE: Questions can be given as A, B splits or as a single Question for 10 marks

				Course Code: B23CE3207	
		SAGI RAMA KRISHNAM RAJU ENGINEERING COLLEGE (A)			**R23**
		III B.Tech. II Semester MODEL QUESTION PAPER			
		VALUATION & QUANTITY SURVEY			
		For CIVIL			
Time: 3 Hrs.					**Max. Marks: 70 M**
		Answer Question No.1 compulsorily			
		Answer **ONE Question** from **EACH UNIT**			
		Assume suitable data if necessary			
					10 x 2 = 20 Marks
			CO	**KL**	**M**
1.	**a).**	Explain the purpose of building valuation.	1	2	2
	b).	What is sinking fund and where is it used?	1	2	2
	c).	Define the term “contingencies” in estimation.	2	2	2
	d).	What are the different types of estimates?	2	2	2
	e).	Define long wall and short wall method.	3	2	2
	f).	Mention the significance of bar bending schedule in estimation.	3	2	2
	g).	State the purpose of rate analysis.	4	2	2
	h).	Define specification in construction.	4	2	2
	i).	Explain the concept of 3D laser scanning in modern mapping.	5	2	2
	j).	What is the difference between earthen and metalled roads?	5	2	2
					5 x 10 = 50 Marks
		UNIT-1	**CO**	**KL**	**M**
2.	**a).**	Explain about the conditions of contract?	1	2	10
		OR			
3.	**a).**	A freehold property having an area of 800 sq.m. is jointly held by four brothers and it is fully developed. It’s a 4 storeyed building having a basement. The structure is being designed and used as a college building. It is an RCC framed structure given for a monthly rent of Rs. 8000/- (for whole building). The usual outgoings may be taken as 20% of gross annual rent. Work out the share of each brother in property.	1	3	10
		UNIT-2			
4.	**a).**	State different types of estimates. Explain any two?	2	2	5
	b).	Explain various approvals/sanctions in estimation?	2	2	5
		OR			
5.	**a).**	Define Measurement book and SSR?	2	2	5
	b).	Explain the various components involved in the estimation of a building.	2	2	5
		UNIT-3			
6.	**a).**	Prepare a detailed estimate for a single-room building including foundation, walls,	3	3	10

		and roof.			
		OR			
7.	**a).**	Estimate the quantities of brickwork, plastering, and RCC for a two-room building. Use assumed dimensions.	3	3	10
		UNIT-4			
8.	**a).**	Calculate the rate analysis for brick masonry per cubic meter.	4	3	5
	b).	Apply rate analysis to find the cost of 1 m^2 of cement plastering work. Assume standard data.	4	3	5
		OR			
9.	**a).**	Write the detailed specification for first-class brick masonry in cement mortar (1:6) for superstructure.	4	3	5
	b).	Write detailed specifications for cement concrete in foundation.	4	3	5
		UNIT-5			
10.	**a).**	Estimate the cost of earthwork for a portion of road for 360m length from the following data:  The formation width of the road is 10m and the side slopes are 2:1 in banking and 1.5:1 in cutting?	5	3	10
		OR			
11.	**a).**	The ground levels along the centre line of the road are given below Chainage (meters) | 0 | 50 | 100 | 150 RL of Ground | 97.00 | 96.50 | 96.00 | 97.50 The road is to be formed in embankment with the formation level at 100.00m throughout the length. If the road width is 10.00 m and the side slopes 2:1, calculate the quantity of earthwork required by Trapezoidal rule. Assume transverse slope as level	5	3	10

CO-COURSE OUTCOME **KL-KNOWLEDGE LEVEL** **M-MARKS**

NOTE: Questions can be given as A, B splits or as a single Question for 10 marks

					Course Code: B23CE3209
		SAGI RAMA KRISHNAM RAJU ENGINEERING COLLEGE (A)			**R23**
		III B.Tech. II Semester MODEL QUESTION PAPER			
		GROUND IMPROVEMENT TECHNIQUES			
		For CIVIL			
Time: 3 Hrs.					**Max. Marks: 70 M**
		Answer Question No.1 compulsorily			
		Answer **ONE Question** from **EACH UNIT**			
		Assume suitable data if necessary			
					10 x 2 = 20 Marks
			CO	**KL**	**M**
1.	**a).**	Compare sand wicks with strip drains.	1	2	2
	b).	Explain how forced vacuum consolidation works.	1	2	2
	c).	Differentiate between permeation grouting and compaction grouting.	2	2	2
	d).	Describe grouting method used in tunnel linings.	2	2	2
	e).	Explain separation function of geotextiles.	3	2	2
	f).	Compare geotextiles and geogrids.	3	2	2
	g).	What is the role of reinforcement in soil?	4	1	2
	h).	Discuss the components of a reinforced earth wall.	4	2	2
	i).	Explain proportioning technique in mechanical stabilization.	5	2	2
	j).	What is bituminous stabilization.	5	1	2
					5 x 10 = 50 Marks
		UNIT-1			
2.	**a).**	Explain various factors that affect field compaction of soils?	1	2	5
	b).	Explain in detail the different types of vertical drains used for in-situ densification	1	2	5
		OR			
3.	**a).**	Describe various methods of installation of stone columns?	1	2	5
	b).	Explain various types of rollers used in field compaction of soils.	1	2	5
		UNIT-2			
4.	**a).**	Explain different types of grouting with one example to each.	2	2	5
	b).	Explain various categories of grouting with neat sketches wherever	2	2	5
		OR			
5.	**a).**	Explain various components of grout plant.	2	2	5
	b).	Explain about stage grouting in detail.	2	2	5
		UNIT-3			
6.	**a).**	Explain various applications of geogrids in accordance with their	3	2	5

		functions.			
	b).	Explain any two tests carried out for suitability of geotextiles as reinforcement in soil.	3	2	5
		OR			
7.		Explain different tests you would conduct to determine the physical and hydraulic properties of geotextiles?	3	2	10
		UNIT-4			
8.	**a).**	Explain the concept of reinforced soil. How is it different from reinforced concrete?	4	2	5
	b).	Explain in detail the components of Reinforced soil	4	2	5
		OR			
9.	**a).**	Explain various applications of reinforced soil?	4	2	5
	b).	Explain various factors that affect angle of interfacial friction.	4	2	5
		UNIT-5			
10.	**a).**	Explain Ruthfutch's Method of proportioning soils for Mechanical stabilization?	5	2	5
	b).	Explain about lime stabilization of soils and various engineering benefits of lime stabilization of soils.	5	2	5
		OR			
11.	**a).**	Explain about cement stabilization of soils. Also, Explain soil-cement reactions and factors that affect cement stabilization of soil.	5	2	5
	b).	Explain various in-situ methods used in stabilization of soils,	5	2	5

CO-COURSE OUTCOME **KL-KNOWLEDGE LEVEL** **M-MARKS**

NOTE: Questions can be given as A, B splits or as a single Question for 10 marks

					Course Code:B23CE3210
		SAGI RAMA KRISHNAM RAJU ENGINEERING COLLEGE (A)			**R23**
		III B.Tech. II Semester MODEL QUESTION PAPER			
		AIR POLLUTION AND CONTROL			
		For CIVIL			
Time: 3 Hrs.					**Max. Marks: 70 M**
		Answer Question No.1 compulsorily			
		Answer **ONE Question** from **EACH UNIT**			
		Assume suitable data if necessary			
					10 x 2 = 20 Marks
			CO	**KL**	**M**
1.	**a).**	Define a pollutant and a contaminant in the context of air pollution.	1	1	2
	b).	Name any two natural and man-made particulate air pollutants.	1	1	2
	c).	What is a wind rose diagram in meteorology?	2	1	2
	d).	State the significance of effective stack height.	2	1	2
	e).	List two adverse health effects of air pollution on humans.	3	1	2
	f).	Name one major air pollution episode in India with details.	3	1	2
	g).	What is an air pollution simulation model?	4	1	2
	h).	State the purpose of stack sampling in air pollution studies.	4	1	2
	i).	What is the working principle of a cyclone in trapping particulates?	5	1	2
	j).	Name two methods for controlling gaseous pollutants.	5	1	2
					5 x 10 = 50 Marks
		UNIT-1	**CO**	**KL**	**M**
2.	**a).**	Explain the factors affecting air pollution in urban areas.	1	2	5
	b).	Describe the classification of air pollutants based on their physical state and sources.	1	2	5
		OR			
3.	**a).**	Discuss the importance of ambient air quality standards in controlling air pollution.	1	2	4
	b).	Explain the considerations for industrial siting to minimize impacts of air pollution, with examples.	1	2	6
		UNIT-2			
4.	**a).**	Describe the role of temperature lapse rates in pollutant dispersion.	2	2	4
	b).	Explain the different types of plume behavior and their relation to atmospheric stability using illustrations.	2	2	6
		OR			
5.	**a).**	Discuss the use of wind rose diagrams in understanding pollutant dispersion.	2	2	5
	b).	Describe the concept of the Gaussian plume model and its application	2	2	5

		in air pollution studies.			
		UNIT-3			
6.	**a).**	Summarize the effects of air pollution on vegetation and materials.	3	2	5
	b).	Explain the impact of air pollution on human health, with reference to specific pollutants.	3	2	5
		OR			
7.	**a).**	Describe the consequences of a major air pollution episode, such as the Bhopal gas tragedy.	3	2	4
	b).	Discuss the seasonal variations in air pollution and their link to crop calendars in India.	3	2	6
		UNIT-4			
8.	**a).**	Explain the process of ambient air quality monitoring and its importance.	4	2	5
	b).	Describe the techniques for collecting gaseous pollutants during air quality surveys.	4	2	5
		OR			
9.	**a).**	Discuss the principles of isokinetic sampling in stack monitoring.	4	2	4
	b).	Explain the role of air pollution simulation models in predicting pollutant dispersion, with examples.	4	2	6
		UNIT-5			
10.	**a).**	Describe the working principle of electrostatic precipitators (ESPs) for particulate control.	5	2	5
	b).	Explain the design considerations for wet scrubbers in controlling air pollution.	5	2	5
		OR			
11.	**a).**	Discuss the absorption method for controlling gaseous pollutants, with its advantages.	5	2	4
	b).	Explain the operational principles and limitations of cyclones and afterburners in air pollution control.	5	2	6

CO-COURSE OUTCOME **KL-KNOWLEDGE LEVEL** **M-MARKS**

NOTE: Questions can be given as A, B splits or as a single Question for 10 marks

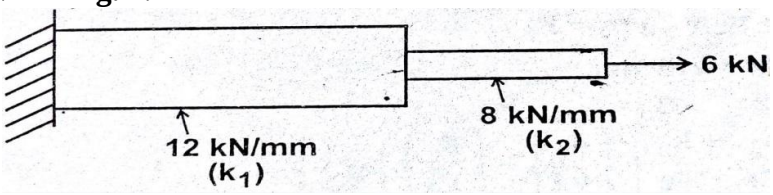
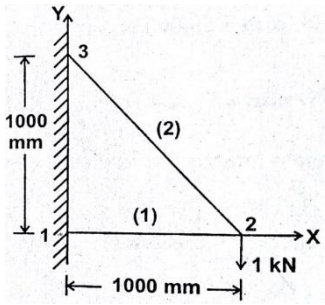
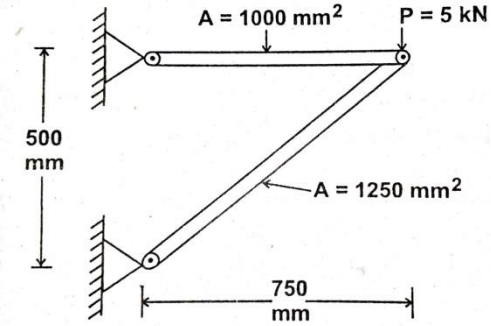
					Course Code:B23CE3211
		SAGI RAMA KRISHNAM RAJU ENGINEERING COLLEGE (A)			**R23**
		III B.Tech. II Semester MODEL QUESTION PAPER			
		RAILWAYS, AIRPORT AND HARBOUR ENGINEERING			
		For CIVIL			
Time: 3 Hrs.					**Max. Marks: 70 M**
		Answer Question No.1 compulsorily			
		Answer **ONE Question** from **EACH UNIT**			
		Assume suitable data if necessary			
					10 x 2 = 20 Marks
			CO	**KL**	**M**
1.	**a).**	Classify Indian Railways. Discuss the advantages of railways?	1	2	2
	b).	List the different types of airports	1	2	2
	c).	What is cant deficiency? State two reasons why cant deficiency is limited.	2	2	2
	d).	Discuss about super elevation	2	2	2
	e).	Write a short note on functions of airport components	3	2	2
	f).	Discuss the importance of Aprons in airways	3	2	2
	g).	What is the basic difference between natural harbor and artificial harbor?	4	2	2
	h).	Discuss about Fog signals	4	2	2
	i).	Write the differences between collective transportation and individual transportation	5	2	2
	j).	Write a short note on Mass rapid Transit	5	2	2
					5 x 10 = 50 Marks
		UNIT-1			
2.	**a).**	Enumerate the major advantages of railway transport over other modes. Discuss its cost-effectiveness, safety, energy efficiency, and role in reducing road congestion.	1	2	5
	b).	Describe the role of railways in the transportation infrastructure of a country. How do railways contribute to bulk movement, regional connectivity, and economic development?	1	2	5
		OR			
3.	**a).**	Describe the development of air transport in India.	1	2	5
	b).	Explain the roles and responsibilities of international organizations such as the ICAO and the FAA.	1	3	5
		UNIT-2			
4.	**a).**	What is the purpose of super elevation in railway curves? Describe the calculation of super elevation and explain the concept of cant deficiency and cant excess with suitable examples.	2	3	10
		OR			
5.	**a).**	Explain the various components of the geometrical design of railways. How do these components affect the safety, comfort, and efficiency of	2	3	5

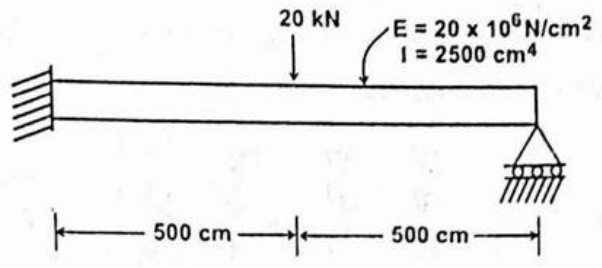
		train operations?			
	b).	Describe the role of signaling in railway operations. What are the different types of signaling systems used, and how do they enhance safety and manage traffic on the rail network?	2	3	5
		UNIT-3			
6.	**a).**	Describe the main components of an airport and explain the functions of each component.	3	2	5
	b).	Discuss the various factors affecting the site selection for an airport.	3	2	5
		OR			
7.	**a).**	Illustrate a typical airport layout plan with explanation of major components within the layout	3	3	5
	b).	Explain the factors influencing the geometrical design of runways.	3	2	5
		UNIT-4			
8.	**a).**	Discuss the different types of harbours	4	2	5
	b).	Explain the critical factors affecting site selection for a harbour.	4	3	5
		OR			
9.	**a).**	Discuss the different types of navigational aids used in harbours.	4	2	5
	b).	Explain the purpose and characteristics of fixed signals and floating signals in guiding maritime vessels safely.	4	2	5
		UNIT-5			
10.	**a).**	Explain the role of freight transportation within urban areas. What are the challenges involved in urban freight movement	5	2	5
	b).	Provide an overview of Mass Rapid Transit (MRT) systems. What are their key features, advantages, and limitations?	5	2	5
		OR			
11.	**a).**	Describe the concept of Monorail systems. What are their structural and operational characteristics?	5	2	5
	b).	Explain Bus Rapid Transit (BRT) systems. What design elements and operational strategies distinguish BRT from conventional bus services?	5	2	5

CO-COURSE OUTCOME **KL-KNOWLEDGE LEVEL** **M-MARKS**

NOTE: Questions can be given as A, B splits or as a single Question for 10 marks

					Course Code: B23CE3212
		SAGI RAMA KRISHNAM RAJU ENGINEERING COLLEGE (A)			**R23**
		III B.Tech. II Semester MODEL QUESTION PAPER			
		FINITE ELEMENT METHODS			
		For CIVIL			
Time: 3 Hrs.					**Max. Marks: 70 M**
		Answer Question No.1 compulsorily			
		Answer **ONE Question** from **EACH UNIT**			
		Assume suitable data if necessary			
					10 x 2 = 20 Marks
			CO	**KL**	**M**
1.	**a).**	Explain the need for Finite Element Analysis in engineering.	1	2	2
	b).	Explain the weighted residual method.	1	2	2
	c).	Write the shape function for a 2-noded bar element.	2	1	2
	d).	Explain the stiffness matrix for a two-node bar element.	2	2	2
	e).	Explain the general form of the stiffness matrix for a truss element.	3	2	2
	f).	Explain is the transformation matrix used in truss analysis?	3	2	2
	g).	State the stiffness matrix for a beam element.	4	1	2
	h).	What are the boundary conditions for a simply supported beam?	4	1	2
	i).	Differentiate between plane stress and plane strain conditions.	5	2	2
	j).	What is a CST element?	5	1	2
					5 x 10 = 50 Marks
		UNIT-1			
2.	**a).**	Determine the deflection at the centre of a simply supported beam of span 'L', subjected to a uniformly distributed load of w/unit length throughout its length using the Rayleigh-Ritz method.	1	3	10
		OR			
3.	**a).**	Solve the differential equation for a physical problem expressed as $\frac{d^2y}{dx^2} + 100 = 0, 0 \leq x \leq 10$ with boundary conditions as y(0) = 0 and y(10) = 0 by using i) Pont collocation method, ii) Sub-domain collocation method, iii) Least squares method and iv) Galarkin's method.	1	3	10
		UNIT-2			
4.	**a).**	Explain briefly the discretisation procedure using the finite element method.	2	2	5
	b).	Explain the node numbering scheme with an example.	2	2	5
		OR			
5.	**a).**	Determine the nodal displacements and forces for the bar loaded, as	2	3	10

		shown in **Fig. 1**.  **Fig. 1**			
		UNIT-3			
6.	**a).**	A truss structure is subjected to a load of 1 kN as shown in **Fig. 2**. Determine the nodal displacements and forces if the element stiffness of the truss is 10 kN/mm.  **Fig. 2**	3	3	**10**
		OR			
7.	**a).**	The loading and other parameters for a two-bar truss element are shown in Fig. 3. Determine the global stiffness matrix, nodal displacements, reaction forces and stresses induced in the elements. Take Young's modulus (E) = 200 GPa.  **Fig. 3**			
		UNIT-4			
8.	**a).**	Derive the stiffness matrix for the beam element.	4	2	10
		OR			
9.	**a).**	A beam, fixed at one end and supported by a roller at the other end, has a 20 kN concentrated load applied at the centre of the span, as shown in **Fig. 4**. Calculate the deflection under the load and construct the shear force and bending moment diagrams for the beam.	4	2	10

		 **Fig. 4**			
		UNIT-5			
10.	**a).**	Distinguish between CST and LST elements.	5	2	5
	b).	Explain about plane stress and plane strains of CST elements.	5	2	5
		OR			
11.	**a).**	Derivation of stiffness matrix for CST element.	5	2	10

CO-COURSE OUTCOME **KL-KNOWLEDGE LEVEL** **M-MARKS**

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