[B19 BS 2102]

SAGI RAMA KRISHNAM RAJU ENGINEERING COLLEGE (A)

II B. Tech I Semester (R19)

MATHEMATICS – IV

COMMON TO CE &EEE

MODEL QUESTION PAPER

TIME: 3 Hrs. **Max. Marks: 75 M**

Answer **ALL Questions.** All questions carry equal marks.

Q. No.		Question	Course Outcome	BTL	Marks
1	A	Determine p such that the function $f(z) = \frac{1}{2}log_e(x^2 + y^2) + i\ tan^{-1}(\frac{px}{y})$ will be an analytic function.	CO -1	K3	7
	B	In an electro static field, if the potential function is $\emptyset = 3x^2y - y^3$, then determine the flux function and the complex potential function.	CO -1	K3	8
OR					
2	A	If $f(z) = u + iv$ is an analytic function of $z = x + iy$, establish that $\left[\frac{\partial}{\partial x}\lvert f(z)\rvert\right]^2 + \left[\frac{\partial}{\partial y}\lvert f(z)\rvert\right]^2 = \lvert f'(z)\rvert^2$.	CO -1	K3	7
	B	Determine the bilinear transformation which maps the points z= 1, i,-1 into the points w = 0, 1, ∞ respectively. Determine also the fixed points of the transformation.	CO -1	K3	8
3	A	Evaluate $\oint_C \frac{z^3-2z+1}{(z-i)^2}dz$ where C is |z|=2, using Cauchy integral formula.	CO -2	K3	7
	B	Develop the function f(z)= $\frac{4z+3}{z(z-3)(z-2)}$ as Laurent series (i) (i) in |z|=1 and (ii) in the annular region 1 <|z|<3.	CO -2	K3	8
OR					
4	A	Determine the residues of $f(z) = \frac{z^3}{(z-1)^4(z-2)(z-3)}$ at its poles and hence evaluate $\oint_C f(z)dz$, where C is the circle |z| = 2.5	CO -2	K3	7
	B	Apply the calculus of Residues to evaluate $\int_0^{2\pi} \frac{d\theta}{5-3\cos\theta}$.	CO -2	K3	8
5	A	Determine the difference equation generated by $y_n = (A + Bn)3^n$.	CO -3	K3	7
	B	Solve the difference equation $y_{n+2} + y_{n+1} - 56y_n = 2^n(n^2 - 3)$.	CO -3	K3	8

<table>
<tr><td colspan="6">OR</td></tr>
<tr><td rowspan="2">6</td><td>A</td><td>Given $Z\{u_n\} = \frac{z}{z-1} + \frac{z}{z^2+1}$ determine the Z-transform of u_{n+2}.</td><td>CO -4</td><td>K3</td><td>7</td></tr>
<tr><td>B</td><td>Utilize Z-transforms to solve $u_{n+2} - 2u_{n+1} + u_n = 3n + 5$.</td><td>CO -4</td><td>K3</td><td>8</td></tr>
<tr><td rowspan="2">7</td><td>A</td><td>If X is the random variable of a Poisson distribution such that the probability for X = 2 is two-thirds of the probability for X = 1. Determine the probability for X = 0 and the probability for X = 3. What is the probability for X >3.</td><td>CO -5</td><td>K3</td><td>7</td></tr>
<tr><td>B</td><td>The average and S.D. of the marks obtained by 500 students in a examination are respectively 40% and 10%. Assuming the normality of the distribution, determine approximately
(i)how many will pass if 50% is fixed as minimum,
(ii)how many have scored marks above 60%?</td><td>CO -5</td><td>K3</td><td>8</td></tr>
<tr><td colspan="6">OR</td></tr>
<tr><td rowspan="2">8</td><td>A</td><td>Derive moment generating function of Poisson distribution.</td><td>CO -5</td><td>K3</td><td>7</td></tr>
<tr><td>B</td><td>In a Normal distribution, 31% of the items are under 45 and 8% are over 64. Determine the mean and standard deviation of the distribution.</td><td>CO -5</td><td>K3</td><td>8</td></tr>
<tr><td rowspan="2">9</td><td>A</td><td>A sample of 100 electric bulbs produced by manufacturer A showed a mean life time of 1190 hours with a standard deviation of 90 hours. A sample of 75 bulbs produced by manufacturer B showed a mean life of 1230 hours with a standard deviation of 120 hours. Determine whether there is significant difference between the mean life time of the two brands at a level of significance of 0.05</td><td>CO -6</td><td>K3</td><td>7</td></tr>
<tr><td>B</td><td>A sample of 1000 days is taken from meteorological records of a certain district and 120 of them are found to be foggy. Determine the probable limits for the percentage of foggy days in the district.</td><td>CO -6</td><td>K3</td><td>8</td></tr>
<tr><td colspan="6">OR</td></tr>
<tr><td rowspan="2">10</td><td>A</td><td>A machine is supposed to produce washers of mean thickness 0.12cm. But the mean thickenss of a random sample of 10 washers produced by the machine was found to be 0.128cm with a standard deviation of 0.008cm. Determine whether the machine is working properly at 5% level of significance.</td><td>CO -6</td><td>K3</td><td>7</td></tr>
<tr><td>B</td><td>The number of aircraft accidents that occurred during the various days of the week is given below:
<table>
<tr><td>Day:</td><td>Sun</td><td>Mon</td><td>Tue</td><td>Wed</td><td>Thu</td><td>Fri</td><td>Sat</td></tr>
<tr><td>No. of accidents</td><td>14</td><td>16</td><td>8</td><td>12</td><td>11</td><td>9</td><td>14</td></tr>
</table>
Determine whether the accidents are uniformly distributed over the week.</td><td>CO-6</td><td>K3</td><td>8</td></tr>
</table>

[B19CE2101]

SAGI RAMA KRISHNAM RAJU ENGINEERING COLLEGE (A)

II B. Tech I Semester (R19) Regular Examinations

MECHANICS OF SOLIDS

MODEL QUESTION PAPER

TIME: 3 Hrs. **Max. Marks: 75 M**

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

All questions carry equal marks

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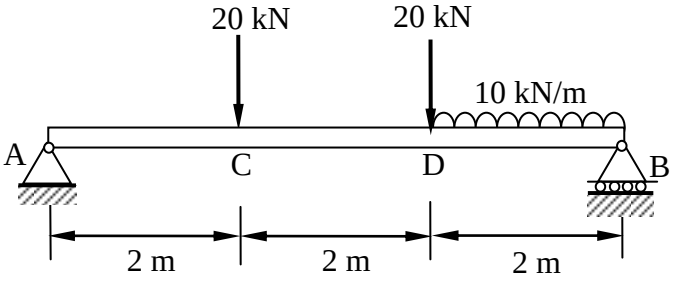
			CO	KL	M
		UNIT - I			
1.	a).	Explain the Stress-Strain diagram for mild steel.	1	3	7
	b).	A steel rod of 3cm diameter and 5m long is connected to two grips and the rod is maintained at a temperature of 95˚C. Determine the stress exerted when the temperature falls to 30˚C if i) the ends do not yield ii) the ends yield by 0.12 cm Take E= $2x10^5$ MN/m^2 α= $12x10^{-6}$/˚C	1	3	8
		OR			
2.	a).	Derive an expression for the Normal and Tangential Stresses on an oblique plane, when the body is subjected to direct stresses in two mutually perpendicular direction accompanied by a shear stress.	1	2	7
	b).	At a point within a body is subjected to two mutually perpendicular directions, the stresses are 150 N/mm^2(tensile) and 100 N/mm^2(compression). Each of the above stresses is accompanied by a shear stress of 100N/mm^2. Determine the Normal, Shear and Resultant stresses on an oblique plane inclined at 45˚ with the axis of minor tensile stress.	1	3	8
		UNIT - II			
3.	a).	A Simply supported beam of length 6m, carries a point load of 3 KN and 6KN at distances of 2m and 4m from the left end. Draw SFD and BMD.	2	3	8
	b).	Derive the relation between Load, Shear Force and Bending Moment	2	2	7
		OR			
4.	a).	A simply supported beam of length 8 m rests on supports 5 m apart, the right hand end is overhanging by 2 m and the left hand end is overhanging by 1 m. The beam carries a uniformly distributed load of 5 kN/m over the entire length. It also carries two point loads of 4 kN and 6 kN at each end of the beam. The load of 4 kN is at the extreme left of the beams, whereas the load of 6 kN is at the extreme right of the beam. Draw S.F. and B.M. diagrams for the beam and find the points of contraflexure.	2	3	8
	b).	A Cantilever 1.5m long is loaded with a UDL of 2KN/m run over a length of 1.25m from free end. It also carries a point load of 3KN at a distance of 0.25m from free end. Draw SFD and BMD.	2	3	7
		UNIT - III			
5.	a).	A rectangular beam 200mm deep and 300mm wide is Simply Supported over a span of 8m. What uniformly distributed load per metre, the beam can carry, if the bending Stress is not to exceed 120N/mm^2.	3	3	8
	b).	A I-Section beam 350mmx150mm has a web thickness of 10mm and a flange thickness of 20mm. If the Shear force acting on the section is 40KN.	3	3	7

		Find the maximum shear stress developed in the I-Section.			
		OR			
6.	a).	A solid shaft has to transmit 75KW at 200 rpm, taking allowable shear stress as 70N/mm^2. Find suitable diameter for shaft, if the maximum torque transmitted at each revolution exceeds the mean by 30%.	3	3	7
	b).	A Closely Coiled helical spring of round steel wire 10mm in diameter having 10 complete turns with a mean diameter of 12cm is subjected to an axial load of 200N. Determine i) Deflection of Spring. ii) Maximum Shear Stress in the wire. iii) Stiffness of Spring. Take C= 8x10^4 N/mm^2	3	3	8
		UNIT - IV			
7.		A beam AB of 6 m span is simply supported at the ends and is loaded as shown in Fig.01. Find the position and magnitude of maximum deflection using Macaulay's method. Take E = 2× 10^5 N/mm^2, I = 60 × 10^6 mm^4.  **Fig. 01**	4	3	15
		OR			
8.		A beam of length 5 m and of uniform rectangular section is simply supported at its ends. It carries a uniformly distributed load of 9 kN/m over the entire length. Calculate the width and depth of the beam if permissible bending stress is 7 N/mm2 and central deflection is not to exceed 1 cm. Take E = 1× 10^4 N/mm2.	4	3	15
		UNIT - V			
9.	a).	Derive an expression for Crippling load when both the ends of the column are hinged.	5	2	7
	b).	A hollow cast iron column 200mm outside diameter and 150mm inside diameter, 8m long has both ends fixed. It is subjected to an axial compressive load. Taking a Factor Of Safety=6, Yield Stress=560 N/mm^2& α=1/1600. Determine Safe Rankine's load.	5	3	8
		OR			
10.	a).	Differentiate b/w thin& thick cylinder and derive Lame's equations	5	2	7
	b).	Find the thickness of the metal necessary for a cylindrical shell of internal diameter 160mm to with stand an internal pressure of 8 N/mm^2. The maximum hoop stress in the section is not to exceed 35 N/mm^2.	5	3	8

[B19CE2102]

SAGI RAMA KRISHNAM RAJU ENGINEERING COLLEGE (A)

II B. Tech I Semester (R19) Regular Examinations

FLUID MECHANICS

MODEL QUESTION PAPER

TIME: 3 Hrs. **Max. Marks: 75 M**

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

All questions carry equal marks

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			CO	KL	M
		UNIT - I			
1.	a).	Define surface tension. Prove that relationship between surface tension and pressure inside the droplet of a liquid in excess of outside pressure is given by p= with usual notions	1	3	7
	b).	A flat plate 30cm x 50cm slides on oil of specific gravity 0.8 and viscosity 0.75 N-S/m^2 over a large plate surface. Determine the force is required to drag the plate at a uniform velocity of 1.6m/sec? Thickness of oil film is 0.2mm.	1	3	8
		OR			
2.	a).	Explain the phenomenon of Capillarity. Obtain an expression for capillary rise of a liquid	2	3	7
	b).	Find the total pressure and depth of centre of pressure on a triangular plate of base 3m and height 3m which is immersed in water such that plan of the makes an angle of 60^0 with the free surface. The base of the plate is parallel to water surface and at a depth of 2m from water surface.	2	3	8
		UNIT - II			
3.	a).	Derive analytical Method for determination of Meta centric height?	2	3	7
	b).	A Wooden cylinder of circular cross section and specific gr 0.6 is required to float in oil of sp.gr.0.8. If dia. of cylinder is 'D' and length 'L' if 'L' can not exceed 0.817D	2	3	8
		OR			
4.	a).	Explain the types of Fluid flows?	3	3	7
	b).	The flow field is given $\psi = x^3y$. Check whether the given exists or not. Further check whether it is irrigational	3	3	8
		UNIT - III			
5.	a).	State and derive Bernoulli's theorem, mentioning clearly the assumptions underlying it.	4	3	7
	b).	A horizontal Venturimeter with inlet diameter 200 mm and throat diameter 100 mm is employed to measure the flow of water. The reading of the differential manometer connected to the inlet and throat is 180 mm of mercury. If the coefficient of discharge is 0.98, determine the rate of flow	5	3	8
		OR			
6.	a).	Derive the formula for velocity of flow through an orifice	5	3	7
	b).	A 4 cm diameter orifice in the vertical side of a tank discharges water. The water surface in the tank is at a constant level of 2m above the center of the orifice. If the	5	3	8

		head loss in the orifice is 0.2m and the coefficient of contraction can be assumed to be 0.63 estimate			
UNIT - IV					
7.	a).	Define moment of momentum equation. What is the difference between momentum equation and impulse momentum equation?	5	2	7
	b).	The discharge of water through a pipe of diameter 40cm is 400 lit/sec. If the pipe is bend by 135^0, find the magnitude and direction of the resultant force on the bend. The pressure of flowing water is $29.43N/cm^2$.	5	3	8
OR					
8.	a).	Explain Prandtl mixing length theory and derive the expression for turbulent shear stress.	6	3	7
	b).	For laminar flow of oil having 0.3m diameter pipe, the velocity distribution is parabolic with a maximum point velocity of 3 m/s at the centre of the pipe. calculate the shearing stress at the pipe wall	6	3	8
UNIT - V					
9.	a).	Derive the Darcy – Weisbach equation for friction head loss in a pipe.	6	3	7
	b).	Water is flowing through a horizontal pipe line 1500m long and 200mm in diameter, Pressures at the two ends of the pipe line are respectively 12kpa and 2kpa. If f=0.015, determine the discharge through the pipe in liters per minute. Consider only frictional	6	3	8
OR					
10.	a).	Explain how the following flow problems are analyzed. (i) Series pipe connection (ii) Parallel pipe connection and (iii) Equivalent pipe connection.	7	4	8
	b).	Water flows through a 10cm diameter, 30m long pipe at a rate of 1400lpm. What percent of head would of 1400 lpm. What percent of head would be gained by replacing the central one third length of pipe by another pipe of 20cm diameter. Assume that the changes in section are abrupt and f=0.008 for all pipes. Neglect entrance and exit losses but consider	7	3	7

[B19CE2103]

SAGI RAMA KRISHNAM RAJU ENGINEERING COLLEGE (A)

II B. Tech I Semester (R19) Regular Examinations

BUILDING MATERIALS, CONSTRUCTION & PLANNING

MODEL QUESTION PAPER

TIME: 3 Hrs. **Max. Marks: 75 M**

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

All questions carry equal marks

*****

			CO	KL	M
		UNIT – I			
1.	a).	What are the geological, physical and chemical classificatons of rocks?	CO1	K2	7 M
	b).	Discuss the properties of building stones in relation to structural requirements	CO1	K2	8 M
		OR			
2.	a).	Illustrate the explain the working of Hoffman's kiln for burning of bricks?	CO2	K3	7 M
	b).	Explain about the qualities of good bricks?	CO2	K3	8 M
		UNIT – II			
3.	a).	Interpret notes on Header bond?	CO1	K2	7 M
	b).	Draw the sketch of English bond for 1 & 11/2 thick brick walls	CO1	K2	8 M
		OR			
4.	a).	List out various types of masonry? State the uses of stone masonry?	CO2	K3	7 M
	b).	Explain different types of Ashlar masonry with the help of sketches?	CO2	K3	8 M
		UNIT – III			
5.	a).	What are the properties of various ingredients of lime?	CO3	K2	7 M
	b).	What are the different varieities of lime and its uses?	CO3	K2	8 M
		OR			
6.	a).	Interprete various types of cements and their properties?	CO1	K2	7 M
	b).	Write a short notes on the classification of lime?	CO1	K2	8 M
		UNIT – IV			
7.	a).	How are arches classified? Give different arch classification?	CO1	K3	7 M
	b).	Show briefly the requirement of a good stair case?	CO1	K3	8 M
		OR			
8.	a).	Differentiate between king-post truss and queen post trusses?	CO1	K3	7 M
	b).	Explain briefly about prefabricated roof and their usage?	CO1	K3	8 M
		UNIT – V			
9.	a).	Explain briefly about formwork and scaffolding	CO3	K3	7 M
	b).	Define Specific gravity, Bulk density and Porosity of aggregates.	CO3	K3	8 M
		OR			
10.	a).	Explain about the classification of Temporary structures?	CO2	K2	8 M
	b).	Write an explanatory note on constitutents of Paints and characteristics of a good paint?	CO2	K2	7 M

[B19CE2104]

SAGI RAMA KRISHNAM RAJU ENGINEERING COLLEGE (A)

II B. Tech I Semester (R19) Regular Examinations

SURVEYING

MODEL QUESTION PAPER

TIME: 3 Hrs. **Max. Marks: 75 M**

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

All questions carry equal marks

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			CO	KL	M
		UNIT - I			
1.	a).	Explain errors in chaining?	3	2	7
	b).	Explain different types of tape corrections?	3	2	8
		OR			
2.	a).	Outline differences between magnetic dip and magnetic declination.	3	2	7
	b).	The bearings of the lines of a closed traverse are 290º 30‟; 50º 30; 196º 0; 175º30‟; 112º 0‟; 30º 0‟; Determine the included angles and the angular error.	4	5	8
		UNIT - II			
3.	a).	The following consecutive readings were taken with a level and 5 meter leveling staff a continuously sloping ground on a common interval of 20 meters. 0.385 ; 1.030 ; 1.925 ; 2.825 ; 3.730 ; 4.685 ; 0.625 ; 2.005 ; 3.1101 ; 4.485 the R.L of the first point was 208.125 m. Rule out a page of level book and enter the readings. Determine the R.L of the points by rise and fall method.	4	5	15
		OR			
4.	a).	Explain different sources of errors in leveling? How are they eliminated?	3	2	7
	b).	Explain different Characteristics of contour?	4	2	8
		UNIT - III			
5.	a).	What are the various permanent adjustments of Theodolite? Explain in detail.	4	2	15
		OR			
6.	a).	The bearing of one side of a regular pentagon was found to be N300E. Find bearings of other lines. The following angles were observed in clockwise direction in an open traverse angle ABC = 124°15’, angle BCD = 156°30’ angle CDE = 102°0’ angle DEF = 95°15’ angle EFG = 215°30’ magnetic bearing of line AB was 241°30’.Determine the bearing of line FG =?	4	5	15
		UNIT - IV			
7.	a).	Define curve? Explain different types of horizontal circular curves.	4	2	7
	b).	Explain compound curve? With Neat sketches?	4	2	8
		OR			
8.	a).	Explain the advantages of Tachometric surveying.	4	2	7

	b).	Explain the conditions in Trigonometrical levelling when base is accessible and inaccessible.	4	2	8
UNIT - V					
9.	a).	Explain about the different types of EDM instruments.	4	2	7
	b).	Describe about total station and state its advantage over other methods of surveying.	4	2	8
OR					
10.	a).	Explain uses and applications of GPS	4	2	7
	b).	Explain photogrammetric surveying? Write a note on applications and the limitations of photogrammetric survey?	4	2	8

[B19CE2105]

SAGI RAMA KRISHNAM RAJU ENGINEERING COLLEGE (A)

II B. Tech I Semester (R19) Regular Examinations

ENVIRONMENTAL ENGINEERING

MODEL QUESTION PAPER

TIME: 3 Hrs. **Max. Marks: 75 M**

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

All questions carry equal marks

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			CO	KL	M
		UNIT – I			
1.	a).	Explain the necessity of the protected water supply systems.	CO1	K2	7M
	b).	Explain the flow chart of public water supply systems.	CO1	K2	8M
		OR			
2.	a).	Explain the types of water demand.	CO1	K2	7M
	b).	Explain the methods of the population forecasts.	CO1	K2	8M
		UNIT – II			
3.	a).	Explain any two types of Intakes.	CO2	K2	7M
	b).	Explain the types of pipes with advantages and disadvantages.	CO2	K2	8M
		OR			
4.	a).	Explain briefly about the Socket and spigot joint, Flanged joint.	CO2	K2	8M
	b).	Explain the factors governing the selection of the intake structure.	CO2	K2	7M
		UNIT – III			
5.	a).	Explain the physical and chemical characteristics of drinking water.	CO3	K2	8M
	b).	Explain the methods of removal of hardness.	CO3	K2	7M
		OR			
6.	a).	Explain the physical analysis of water.	CO3	K2	7M
	b).	Explain the water quality standards for agriculture and Industries and compare both.	CO3	K2	8M
		UNIT – IV			
7.	a).	Determine the removal of spherical discrete particles of 0.40mm diameter with the specific gravity 1.20 by this tank this settling tank is designed to remove spherical particles of 0.80mm diameter with specific gravity1.20 from the water at 22 degrees centigrade. Assume the ideal settling conditions.	CO4	K5	7M
	b).	Explain the types of sedimentation tanks.	CO4	K2	8M
		OR			
8.	a).	Explain chlorination and list the different methods of disinfection.	CO4	K2	8M
	b).	Explain the different methods used in the softening of water.	CO4	K2	7M
		UNIT – V			
9.	a).	Explain the methods of distribution system.	CO5	K2	7M
	b).	Explain the layout of the distribution system.	CO5	K2	8M
		OR			
10.	a).	Explain the requirement of the good distribution system.	CO5	K2	8M
	b).	Explain different pressures in the distribution layout.	CO5	K2	7M

[B19CE2201]

SAGI RAMA KRISHNAM RAJU ENGINEERING COLLEGE (A)

II B. Tech II Semester (R19) Regular Examinations

ENGINEERING GEOLOGOY

MODEL QUESTION PAPER

TIME: 3 Hrs. **Max. Marks: 75 M**

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

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			CO	KL	M
UNIT - I					
1.	a).	Define Engineering Geology. Describe about branches of geology and its importance in Civil Engineering works.	1	2	**7M**
	b).	Define Weathering and explain the types of Weathering. Mention the civil engineering importance of weathering.	2	2	**8M**
OR					
2.	a).	Describe the landforms produced by running water and describe about its civil engineering importance.	2	2	**8M**
	b).	Explain the importance of Geology in Civil Engineering with case studies.	1	2	**7M**
UNIT - II					
3.	a).	What is mineral? How do you identify minerals with help of physical properties of minerals.	3	3	**8M**
	b).	Explain Feldspars and quartz group minerals	3	2	**7M**
OR					
4.	a).	What are igneous rocks? Write about textures, structures and forms of Igneous rocks and write its engineering importance.	3	3	**8M**
	b).	Explain Granite, Sandstones and Quartzite.	3	2	**7M**
UNIT - III					
5.	a).	Define faults and joints and explain their significance in civil engineering.	4	3	**8M**
	b).	Explain the terms-Strike, Dip, Outcrop	4	2	**7M**
OR					
6.	a).	Define the term fold? Explain parts of the fold with neat sketch.	4	2	**7M**
	b).	Describe about classification of folds with neat sketches and their importance in Civil Engineering.	4	3	**8M**
UNIT - IV					
7.	a).	Describe Engineering properties of rocks.	3	3	**8M**
	b).	Explain the geological control of groundwater movement.	4	3	**7M**
OR					
8.	a).	Explain principles of geophysical methods. How do you identify soil profile using electrical Resistivity method?	4	4	**8M**
	b).	Explain causes , effects and control measures of landslides.	3	3	**7M**
UNIT - V					
9.		Explain Geological Investigations for dams and reservoirs	5	5	**15M**
OR					
10.	a).	Define tunnel and explain the purpose of tunnelling.	5	3	**7M**
	b).	Influence of geology for successful tunnelling .	5	5	**8M**

[B19CE2202]

SAGI RAMA KRISHNAM RAJU ENGINEERING COLLEGE (A)

II B. Tech I Semester (R19) Regular Examinations

STRUCTURAL ANALYSIS - I

MODEL QUESTION PAPER

TIME: 3 Hrs. **Max. Marks: 75 M**

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

All questions carry equal marks

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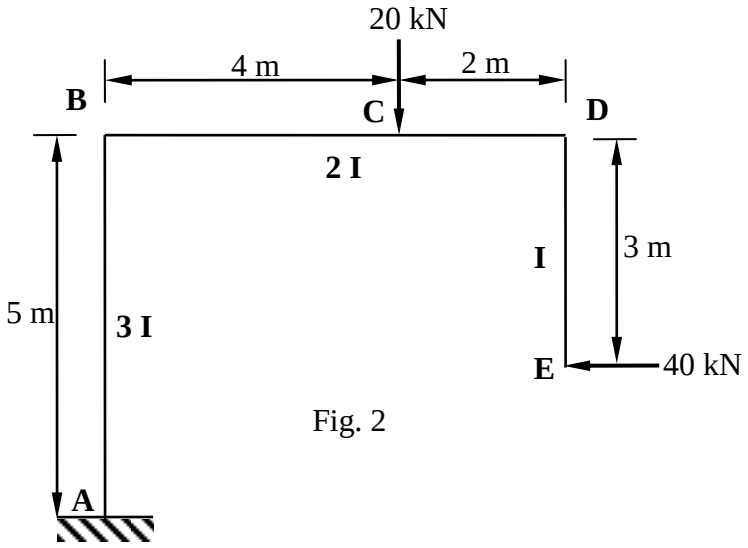
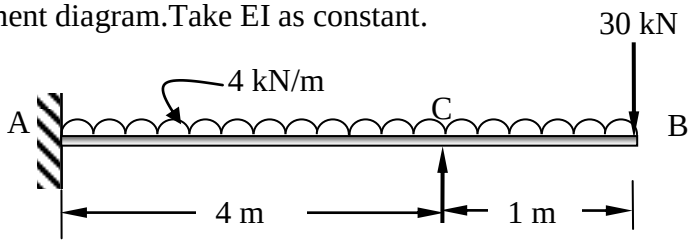
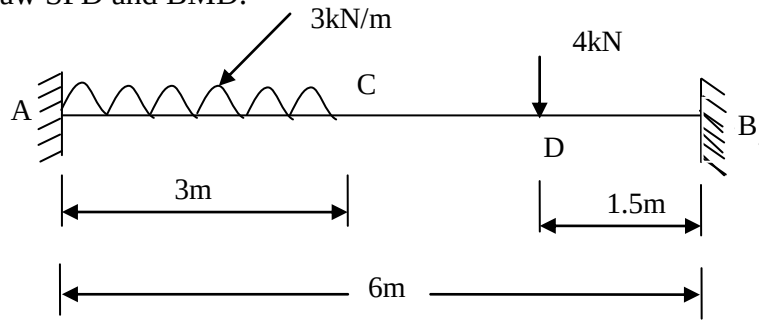
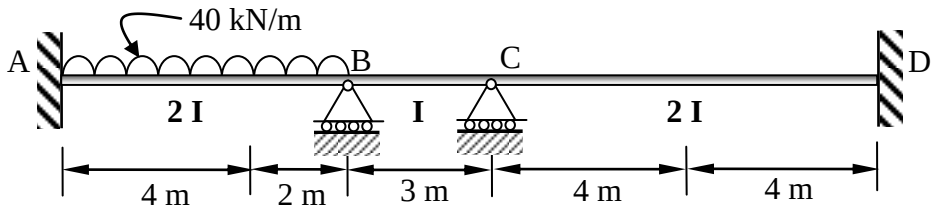
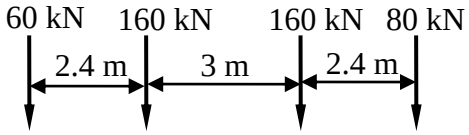
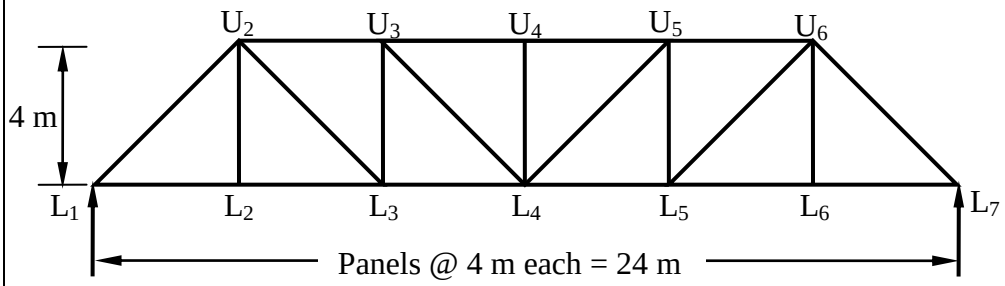
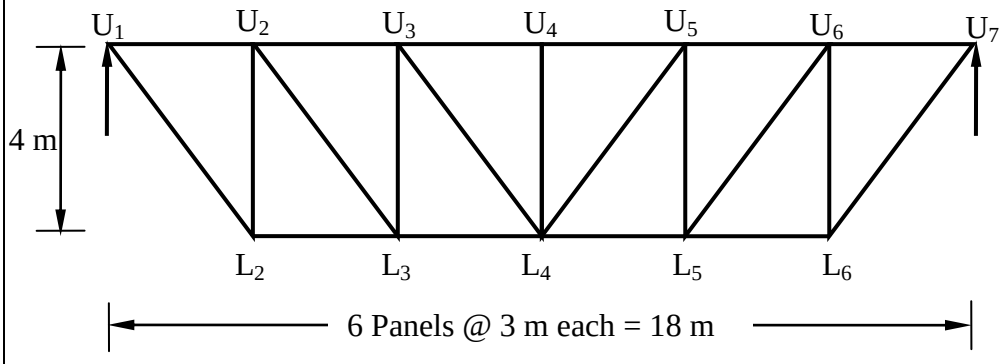
			CO	KL	M
UNIT - I					
1.	a).	A beam of constant cross section 4m long is free supported at its ends. It is loaded at points 1m from each end with a load of 2kN. Find the ratio of the deflections in the centre of the beam to the deflection at the point under one of the loads. Use conjugate beam method.	1	3	8
	b).	A tension bar 5m is made up of two parts 3m of its length has cross sectional area of 10cm^2 while the remaining 2m has a cross sectional area of 20 cm^2. An axial load of 80 kN is gradually applied. Find the total strain energy produced in bar and compare this value with that obtained in a uniform bar of same length and having the same volume, when under the same load. Take E = 2 x 10^5 N/mm^2.	1	3	7
OR					
2.		Determine the horizontal deflections at 'E' in the frame shown in the fig. 2 using unit load method. Take EI as 2 × 10^4 kN m^2.  Fig. 2	1	3	15
UNIT - II					

3.		Analyze the propped cantilever beam shown in the figure 3 and draw the bending moment diagram.Take EI as constant.  Fig. 3	2	3	15
		OR			
4.		A beam AB of uniform section and 6m span is built in at the ends. A uniformly distributed load of 3 kN/m runs over the left half of the span and there is in addition a concentrated load of 4kN at right quarter as shown in fig. 4 .Draw SFD and BMD.  Fig.4	2	3	15
		UNIT - III			
5.		A beam ABCD is continuous over three spans AB = 8m, BC = 4m and CD = 8m. The beam AB and BC is subjected to a uniformly distributed load of 1.5kN/m, whereas there is a central point load of 4kN in CD. The moment of inertia of AB and CD is 2I and that of BC is I. The end A and D are fixed. During loading the support A sinks down by 10mm. Determine the fixed end moments by moment distribution method and draw BMD. Take E = 200Gpa and I = 16×10^{6}mm^{4}	3	3	15
		OR			
6.		Analyse the continuous beam shown in Figure 6 by Kani's method if the support 'C' sinks by 10 mm. Take E = 200 GPa and I = 6×10^{8} mm^{4}. Sketch the bending moment diagram.  Fig. 6	3	3	15

		UNIT - IV			
7.		A uniformly distributed load of 90 kN/m and 6 m long rolls across a simply supported beam of 16 m long. Calculate the maximum shear force and maximum bending moment at a section 4 m from the left hand support and at the mid span using influence line diagram. Also determine absolute maximum bending moment.	4	3	15
		OR			
8.		A system of 4 loads separated by a specified distance as shown in fig 8 crosses a simply supported beam of 18 m span from left to right. Determine the absolute maximum bending moment on the beam and maximum bending moment under the load 60kN using ILD's.  Fig. 8	4	3	15
		UNIT - V			
9.		Draw the influence diagrams for the forces in the members of the through type bridge truss shown in fig.9  Fig. 9	5	3	15
		OR			
10.		Draw the influence diagrams for various members of the Deck type girder shown in fig.10  Fig. 10	5	3	15

[B19CE2203]

SAGI RAMA KRISHNAM RAJU ENGINEERING COLLEGE (A)

II B. Tech I Semester (R19) Regular Examinations

CONCRETE TECHNOLOGY

MODEL QUESTION PAPER

TIME: 3 Hrs. **Max. Marks: 75 M**

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

All questions carry equal marks

*****

			CO	KL	M
		UNIT - I			
1.	a).	Write about Bogue's compounds	1	3	7
	b).	What is hydration? Explain it.	1	3	8
		OR			
2.	a).	Explain AAR. What are the factors promoting AAR? Explain.	1	3	8
	b).	Explain bulking of fine aggregate. How do you determine it?	1	3	7
		UNIT - II			
3.	a).	Explain workability of concrete and its influencing factors.	2	2	8
	b).	Explain how the setting time of concrete will be determined	2	2	7
		OR			
4.	a).	Describe briefly the process of manufacture of Concrete	2	2	7
	b).	Explain in brief Segregation and Bleeding	2	2	8
		UNIT - III			
5.	a).	What are the factors effecting strength of concrete Explain them.	3	2	7
	b).	What is curing? What are the different types of curing.	3	2	8
		OR			
6.	a).	List out different Non-Destructive evaluation techniques to assess the strength of Concrete.	3	3	7
	b).	Explain Radioactive method of assessment of strength of concrete	3	3	8
		UNIT - IV			
7.	a).	Explain the elastic properties of concrete.	4	2	7
	b).	Explain the shrinkage of concrete. How it is classified? Explain any one of them.	4	2	8
		OR			
8.	a).	What is creep? Explain factors influencing creep.	4	2	8
	b).	What is shrinkage? Explain plastic shrinkage.	4	2	7
		UNIT - V			
9.		Design mix proportions with the following data using IS code method. Characteristic compressive strength of concrete 25Mpa. 20mm Maximum size crushed aggregate. Medium degree of workability. Specific gravity of cement 3.10. Specific gravity of coarse and fine aggregates 2.72 and 2.61. Zone II sand. Average quality control.	5	3	15
		OR			
10.	a).	What do you mean by GGBS? Explain it.	5	3	7
	b).	What do you mean by fiber reinforced concrete? Explain it.	5	3	8

[B19CE2204]

SAGI RAMA KRISHNAM RAJU ENGINEERING COLLEGE (A)

II B. Tech I Semester (R19) Regular Examinations

HYDRAULICS & HYDRALIC MACHINERY

MODEL QUESTION PAPER

TIME: 3 Hrs. **Max. Marks: 75 M**

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

All questions carry equal marks

*****

			CO	KL	M
		UNIT - I			
1.	a).	Define the terms dimensional analysis and model analysis	1	2	7
	b).	The resistance 'R' to the motion of a completely sub merged body depends upon the length of the body 'L' velocity of flow 'V' mass density of fluid 'ρ' and kinematic viscosity of fluid 'ν' . By dimensional analysis prove that $R = \rho V^2 L^2 \varphi(VL/\nu)$	1	3	8
		OR			
2.	a).	Explain the phenomena of boundary layer separation and methods of controlling Boundary layer separation	2	3	7
	b).	The velocity distribution in the boundary layer is given by $\frac{u}{U} = \frac{3}{2}(\frac{y}{\delta}) - \frac{1}{2}\left(\frac{y}{\delta}\right)^3$, being the boundary layer thickness. Calculate (i) Displacement thickness. (ii) Momentum Thickness and Energy thickness.	2	3	8
		UNIT - II			
3.	a).	Explain the Variation of Drag coefficient with Reynolds number on circular cylinder	2	3	7
	b).	A kite of Surface are 0.4 m^2 flies in the air making an angle of 8° with the horizontal .The weight of the kite is 1.5 N and string tension is 5N.The string makes an angle of 53° with plane of the kite . If the wind velocity is 20 kmph , find the drag and lift coefficients of the kite. Density of air =1.25 kg/m^3	2	3	8
		OR			
4.	a).	Prove that the force exerted by a jet of water on a fixed semi-circular plate in the direction of jet when the jet strikes at the centre of semi circular plate is two times the force exerted by the jet on the fixed vertical plate.	2	3	7
	b).	A jet of water 50 mm in diameter having a velocity of 20 m/s, strikes normally a flat smooth plate. Determine the thrust on the plate (a) if the plate is at rest; (b) if the plate is moving in the same direction as the jet with a velocity of 8m/s. Also find the work done per second on the plate and the efficiency of the jet when the plate is moving.	2	3	8
		UNIT - III			
5.	a).	Define specific speed of a hydraulic turbine. Derive an equation for specific speed in terms of operating speed, power and head	5	3	7
	b).	The runner of a pelton turbine has tangential velocity of 20 m/s and works under head of 60m. The jet in turned through 165^0. The discharge through	5	3	8

		the nozzle is 100 liters/s. Determine the power developed by the runner and the efficiency. Take $C_v = 0.97$.			
		OR			
6.	a).	Explain the Classification of turbines briefly with examples	5	3	7
	b).	Design a Francis turbine runner with the following data: Net head 'H' = 68m, 'N' = 750 r p m, out put power 'P' = 330 KW; $\eta_h = 94\%$; $\eta_0 = 85\%$; Flow ratio $\psi = 0.15$; breadth ratio 'n' = 0.1; inner dia = 0.5 outer diameter. Assume 6% of circumferential area of the runner is occupied by thickness of the vanes. Velocity of flow is constant through out and flow is radial at outlet.	5	3	8
		UNIT - IV			
7.	a).	Derive an expression for the work done by the impeller of centrifugal pump.	5	3	7
	b).	A centrifugal pump having outer diameter equal to two times the inner diameter and running at 1000 rpm works against a total head of 40 m. The velocity of flow through the impeller is constant and equal to 2.5 m/s. The vanes are set back at an angle of 45^0 at outlet. If the outer diameter of impeller is 5000 mm and width of outlet is 50 mm, determine (i) Vane angle at inlet; (ii) Manometric efficiency	5	3	8
		OR			
8.	a).	Explain the main components and working of reciprocating pump with sketches.	5	3	7
	b).	A double acting reciprocating pump having piston area 0.1 m^2 has a stroke 0.3m long. The pump is discharging 2.4 m^3 per minute at 45 r.p.m. through a height of 10.0 m. Find the slip of the pump and power required to drive the pump	5	3	8
		UNIT - V			
9.	a).	What is meant by most economical channel section. Obtain an expression for trapezoidal channel section. 6+8=1	3	3	7
	b).	Water enters to a rectangular channel of uniform cross section a 2 t a velocity of 8m/sec. The depth of water is 60 cm. Verify is the flow is sub critical and calculate the critical depth and corresponding velocity Also calculate the specific energy at the inlet and at critical condition	3	3	8
		OR			
10.	a).	Derive an expression for loss of head due to Hydraulic jump in Horizontal channels.	4	3	7
	b).	A hydraulic jump occurs in a 0.5m. wide rectangular channel at the point ,where depth of water flow is 0.15 m. and Froude number is 2.5 . calculate the specific energy ,critical and sequent depths ,loss of head and energy dissipated.	4	3	8

[B19CE2205]

SAGI RAMA KRISHNAM RAJU ENGINEERING COLLEGE (A)

II B. Tech I Semester (R19) Regular Examinations

ENVIRONMENTAL ENGINEERING II

MODEL QUESTION PAPER

TIME: 3 Hrs. **Max. Marks: 75 M**

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

All questions carry equal marks

*****

			CO	KL	M
UNIT - I					
1.	a).	Explain sewerage systems in detail.	CO1	K3	PO1
	b).	Explain the construction and operation of an inverted siphon with a neat sketch.	CO1	K3	PO1
OR					
2.	a).	Explain cleaning and ventilation methods of sewers	CO1	K3	PO1
	b).	Explain the approach for design of a combined sewer.	CO1	K3	PO1
UNIT - II					
3.	a).	Explain the working of a pumping station with a neat sketch.	CO2	K3	PO1
	b).	Explain in detail the house plumbing systems.	CO2	K3	PO1
OR					
4.	a).	Explain about the working of centrifugal and reciprocating pumps.	CO2	K3	PO1
	b).	Explain the floor and gully traps with neat sketches.	CO2	K3	PO1
UNIT - III					
5.	a).	Explain the procedure how do you determine BOD by dilution method.	CO3	K3	PO1
	b).	Explain the working of a grit chamber with a neat sketch.	CO3	K3	PO1
OR					
6.	a).	Explain theory of sedimentation.	CO3	K3	PO1
	b).	Determine the 8-day BOD of 15°C if 5-day BOD has been found to be 150 mg/L at 20°C. Given reaction constant K = 0.20/day at 20°C.	CO3	K3	PO1
UNIT - IV					
7.	a).	Determine the size of a high rate trickling filter for the following data: Flow: 4.5 MLD, Recirculation ratio = 1.4 BOD of raw sewage = 250 mg/L, BOD removal in P.S.T = 25% Final effluent BOD desired = 50 mg/L.	CO4	K3	PO3
	b).	Explain the working principle of a stabilization pond.	CO4	K3	PO3
OR					
8.	a).	Explain activated sludge process in detail with a neat sketch.	CO4	K3	PO3
	b).	Design a septic tank for 200 users.	CO4	K3	PO3
UNIT - V					
9.	a).	Explain about sludge treatment and disposal methods.	CO5	K3	PO3
	b).	Explain different types of sludge generated in various treatment methods.	CO5	K3	PO3
OR					
10.	a).	Explain sewage disposal methods in detail.	CO5	K3	PO3
	b).	Explain about sludge drying methods in detail.	CO5	K3	PO3