Course Code: B23BS2102

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

II B.Tech. I Semester MODEL QUESTION PAPER

NUMERICAL METHODS AND COMPLEX VARIABLES

For EEE

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)**	Identify the transcendental equation from the equations $x^2 - 4x + 7 = 0, xe^x = 2$ and $x^4 - 3x^2 + x - 5 = 0$ and hence **find** an interval for the root of that equation.	**1**	**3**	**2**
	(b)	**Find** the initial approximation to the root of the equation $x^3 - x - 4 = 0$ by Regula-False method, where the root lies in the interval (1, 2).	**1**	**3**	**2**
	(c)	**State** Trapezoidal rule of integration.	**2**	**1**	**2**
	(d)	**Using** Euler's formula, find $y(0.1)$ given that $\frac{dy}{dx} = x + 2y^2, y(0) = 1$.	**2**	**3**	**2**
	(e)	**State** Cauchy-Riemann equations in polar form.	**3**	**1**	**2**
	(f)	**Write** Cauchy's integral formula and generalize it.	**3**	**2**	**2**
	(g)	**What** is the residue of $f(z)$ at $z = a$, if $f(z)$ has a pole of order n at $z = a$.	**4**	**2**	**2**
	(h)	**Define** essential singularity and a pole of order m.	**4**	**1**	**2**
	(i)	**State** the properties of Bi-Linear transformation.	**5**	**1**	**2**
	(j)	**Find** the invariant points of the transformation $w = \frac{z-1}{z+1}$	**5**	**3**	**2**

5 x 10 = 50 Marks

		UNIT-1			
2	**(a)**	Apply Bisection method to find an approximate root of an equation $x^3 - 4x - 9 = 0$	**1**	**3**	**5**
	(b)	Using Newton – Raphson method, Compute a real root of the equation $xe^x - \cos x = 0$	**1**	**3**	**5**
		OR			
3.	**(a)**	Using Newton's forward difference interpolation formula, find Y (3), from the following table X: 0, 5, 10, 15, 20, 25 Y: 7, 11, 14, 18, 24, 32	**1**	**3**	**5**
	(b)	Apply Lagrange's interpolation method to estimate y (1)from the following data. x: -1, 0, 2, 3 y: -8, 3, 1, 12	**1**	**3**	**5**

		UNIT-2			
4.	**(a)**	Determine the value of $\int_0^2 e^{-x}\,dx$ using Simpson's 1/3rd rule of integration with h=0.5	**2**	**3**	**5**
	(b)	Using Taylor series method, find y (0.1) and y (0.2) correct to 3-decimal places given that $\frac{dy}{dx} = 3x - y^2; y(0) = 1$	**2**	**3**	**5**
		OR			
5.		Apply Runge-Kutta Method of fourth order to find the approximate value y at $x = 0.2$ in steps of 0.1, if $\frac{dy}{dx} = x + y^2$ given that $y = 1$ at $x = 0$	**2**	**3**	**10**
		UNIT-3			
6.	**(a)**	Prove that the function defined by $f(z) = \frac{(1+i)x^3-(1-i)y^3}{x^2+y^2}\,(z \neq 0)$ and $f(0) = 0$ is continuous and the Cauchy- Riemann equations are satisfied at the origin, yet $f'(0)$ do not exist.	**3**	**3**	**10**
		OR			
7.	**(a)**	Find the analytic function whose imaginary part is $e^{-x}(x\cos y + y\sin y)$	**3**	**3**	**5**
	(b)	Prove that $\left[\frac{\partial^2}{\partial x^2} + \frac{\partial^2}{\partial y^2}\right] \log f(z) = 0$	**3**	**3**	**5**
		UNIT-4			
8.	**(a)**	Find the Laurent's expansion of $f(z) = \frac{7z-2}{(z+1)z(z-2)}$ in the region $1 < \lvert z+1 \rvert < 3$.	**4**	**3**	**5**
	(b)	Evaluate $\int_C \frac{1-2z}{z((z-1)(z-2)}\,dz$, C: $\lvert z \rvert = 1.5$	**4**	**3**	**5**
		OR			
9.		Using the method of calculus of residues, prove that $\int_0^{\pi} \frac{d\theta}{17-8Cos\theta} = \frac{\pi}{15}$	**4**	**3**	**10**
		UNIT-5			
10.	**(a)**	Determine the region of the w-plane in which the first quadrant of the z-plane is mapped by the transformation $w = z^2$.	**5**	**3**	**5**
	(b)	Find the image of $\lvert z - 2i \rvert = 2$ under the transformation $w = \frac{1}{z}$	**5**	**3**	**5**
		OR			
11.		Find the bilinear transformation which maps the points z=1,i,-1into the points w=0,1,∞	**5**	**3**	**10**

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

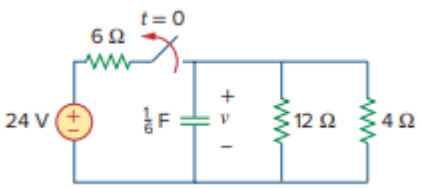
NOTE: Questions can be given as A,B splits or as a single Question for 10 marks

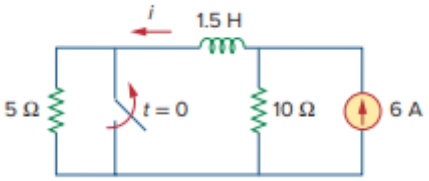
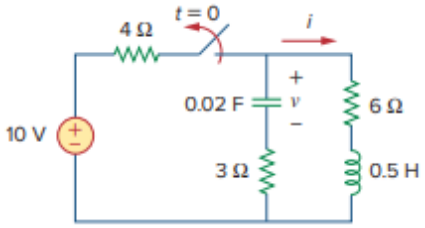
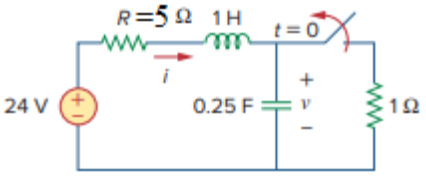
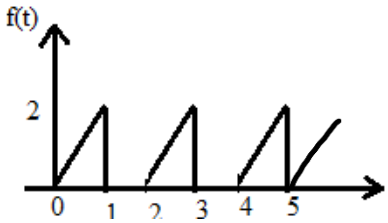
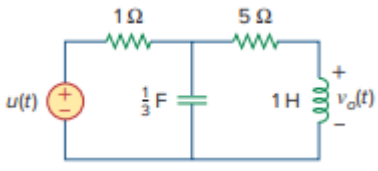
		Course Code: B23HS2101			
		SAGI RAMA KRISHNAM RAJU ENGINEERING COLLEGE (A)			**R23**
		II B.Tech. I Semester MODEL QUESTION PAPER			
		UNIVERSAL HUMAN VALUES-2: UNDERSTANDING HARMONY AND ETHICAL HUMAN CONDUCT			
		(Common to all programmes of Engineering)			
Time: 3 Hrs.					**Max. Marks: 70 M**
		Answer 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 are the basic guidelines for value education?	**1**	**2**	**2**
	b).	What is MBTI personality test?	**1**	**2**	**2**
	c).	How can we differentiate between the needs of the Self and the needs of the Body?	**2**	**2**	**2**
	d).	What are the characteristics and activities of the Self (I)?	**2**	**2**	**2**
	e).	How is 'respect' defined in the context of human interaction?	**3**	**2**	**2**
	f).	How is society described in relation to the family?	**3**	**2**	**2**
	g).	How are the four orders of nature interconnected?	**4**	**2**	**2**
	h).	How does the idea of self-regulation in nature contribute to its harmony?	**4**	**2**	**2**
	i).	Define definitiveness of (ethical) human conduct.	**5**	**2**	**2**
	j).	Explain how humanistic education can influence professional ethics.	**5**	**2**	**2**
					5 x 10 = 50 Marks
		UNIT - I	**CO**	**KL**	**M**
2.	**a).**	Discuss natural acceptance	**1**	**2**	**5**
	b).	Differentiate prosperity and deprivation	**1**	**2**	**5**
		OR			
3.	**a).**	Deliberate the right understanding in perspective to self exploration.	**1**	**2**	**5**
	b).	What are the key functions of the MBTI? Explain.	**1**	**2**	**5**
		UNIT - II			
4.	**a).**	Illustrate coexistence of "I" and "Body ".	**1**	**2**	**5**
	b).	Distinguishing between the Needs of the Self and the Body	**1**	**2**	**5**
		OR			
5.	**a).**	Discuss Characteristic activities of Harmony with "I".	**1**	**2**	**5**
	b).	Explain Sanyam and Health.	**1**	**2**	**5**

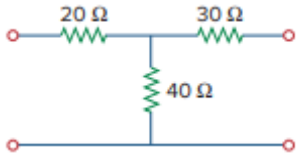
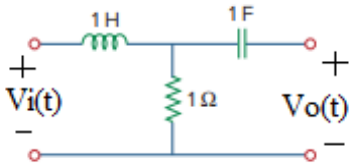
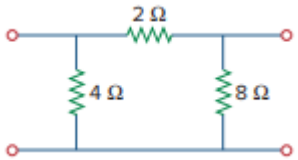
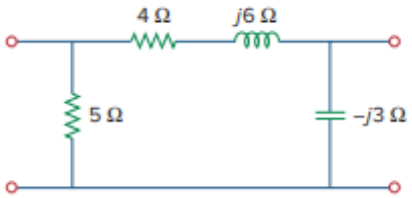
		UNIT - III			
6.	**a).**	Write a note on human-human relationship as regarding harmony.	**2**	**2**	**5**
	b).	Differentiate intention and competence.	**2**	**2**	**5**
		OR			
7.	**a).**	Discuss salient values in relationship.	**3**	**2**	**5**
	b).	Illustrate universal Harmonious Society - an Undivided society.	**3**	**2**	**5**
		UNIT - IV			
8.		Discuss orders of life in nature and its significance self regulation of individual	**4**	**2**	**10**
		OR			
9.		Illustrate existence of human being as coexistence with universe in perspective of space	**4**	**2**	**10**
		UNIT - V			
10.		Discuss importance of professional competence for augmenting universal human order.	**5**	**2**	**10**
		OR			
11.	**a).**	Case study of typical holistic technologies.	**5**	**2**	**5**
	b).	Role of engineer in promoting harmony in society	**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: B23EE2101
		SAGI RAMA KRISHNAM RAJU ENGINEERING COLLEGE (A)			**R23**
		II B.Tech. I Semester MODEL QUESTION PAPER			
		ELECTRICAL CIRCUIT ANALYSIS - II			
		For EEE			
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 = 20Marks
			CO	**KL**	**M**
1.	**a).**	Explain the statement "Inductor does not allow sudden change of current through it".	**1**	**2**	**2**
	b).	If the unit step function is delayed by 't_o' seconds, plot its graph and show the mathematical expression of the delayed step function.	**1**	**2**	**2**
	c).	Draw an example of second order circuit and write its differential equation.	**2**	**2**	**2**
	d).	Draw the voltage responses related to over damped, under damped and critically damped cases for a source free parallel RLC circuit.	**2**	**2**	**2**
	e).	Determine the Laplace transform of $f(t) = u(t) - u(t-2)$	**3**	**3**	**2**
	f).	Determine the final value of $f(t)$ if $F(s) = \frac{1000}{s(s^2+40s+300)}$	**3**	**3**	**2**
	g).	Define transfer function.	**4**	**1**	**2**
	h).	Draw the ideal frequency response of a band pass filter.	**4**	**2**	**2**
	i).	Write the units for the four h-parameters of a two-port network?	**5**	**2**	**2**
	j).	In terms of t - parameters, what is the condition for reciprocal nature of a two-port network?	**5**	**2**	**2**
					5 x 10 =50Marks
		UNIT-1			
2.	**a).**	Obtain the current response expression of a source free RL circuit and with the help of graph analyze the effect of time constant on the current response.	**1**	**4**	**5**
	b).	For the circuit shown in Fig calculate v(t) for t ≥ 0. 	**1**	**3**	**5**
		OR			
3.	**a).**	Compare the circuit behaviour of inductance and capacitance elements.	**1**	**4**	**5**

	b).	For the circuit shown in Fig determine i(t) for t ≥ 0. 	**1**	**3**	**5**
		UNIT-2			
4.	**a).**	Obtain the current response expression for a source free series RLC circuit which is overdamped.	**2**	**3**	**5**
	b).	For t > 0, verify whether the circuit shown in Fig is overdamped or underdamped 	**2**	**3**	**5**
		OR			
5.		For the circuit shown in Fig determine v(t) and plot the voltage response. 	**2**	**3**	**10**
		UNIT-3			
6.	**a).**	Determine the Laplace transform of the periodic function shown 	**3**	**3**	**5**
	b).	Determine the inverse Laplace transform of $F(s) = \frac{2s+3}{s^2+3s+2}$	**3**	**3**	**5**
		OR			
7.		Determine $v_o(t)$ for the circuit shown in Fig. Assuming zero initial conditions. 	**3**	**3**	**10**

		UNIT-4			
8.	**a).**	For the transfer function $\frac{10(S+2)(S+3)}{S^2+8S+10}$ determine poles and zeros. Draw pole zero plot.	**4**	**3**	**5**
	b).	Determine transfer impedance for the circuit shown in Fig 	**4**	**3**	**5**
		OR			
9.	**a).**	Determine the transfer function $\frac{V_o(s)}{V_i(s)}$ for the circuit shown in Fig 	**4**	**3**	**5**
	b).	Discuss about different types of filters. Draw a simple low pass filter circuit.	**4**	**3**	**5**
		UNIT-5			
10.	**a).**	Determine h-Parameters for the network shown in Fig 	**5**	**3**	**5**
	b).	Determine ABCD-Parameters of a two-port network whose Z parameters are Z_{11}= Z_{22}= 6 ohms and Z_{12}= Z_{21}= 4 Ohms.	**5**	**3**	**5**
		OR			
11.	**a).**	Determine Y-Parameters for the network shown in Fig. 	**5**	**3**	**5**
	b).	Determine Z-Parameters for a series connection of two two-port networks described by Z parameters.	**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

					CourseCode:B23EE2102
SAGIRAMAKRISHNAMRAJU ENGINEERINGCOLLEGE(A)					**R23**
II B.Tech. I Semester MODEL QUESTION PAPER					
DC MACHINES & TRANSFORMERS					
For EEE					
Time:3Hrs.					**Max.Marks:70M**
Answer Question No.1 compulsorily					
Answer **ONE** Question from **EACH UNIT**					
Assume suitable data if necessary					
					10x 2 =20 Marks
			CO	**KL**	**M**
1.	**a).**	What is meant by Armature Reaction?	**1**	**1**	**2**
	b).	Define critical resistance.	**1**	**1**	**2**
	c).	Write the necessity of a starter in DC motor.	**2**	**2**	**2**
	d).	Write the applications of DC series motor.	**2**	**2**	**2**
	e).	Write the EMF equation of a single-phase transformer.	**3**	**2**	**2**
	f).	Find the transformation ratio of 1 KVA, 110V/230V single-phase transformer.	**3**	**3**	**2**
	g).	Mention the differences between Auto-transformer and two winding transformer.	**4**	**2**	**2**
	h).	What type losses will be determined from O.C and S.C test.	**4**	**2**	**2**
	i).	Mention the different connections of three-phase transformer.	**5**	**2**	**2**
	j).	Draw the connection diagram of open delta transformer.	**5**	**2**	**2**
					5x 10 =50 Marks
		UNIT-1			
2.	**a)**	Explain the construction and principle of DC generator with neat sketch.	**1**	**3**	**5**
	b)	A6-pole DC machine has an armature with 90 slots and 8conductors per slot and runs at l000 rpm. Thefluxperpoleis0.05wb. Determine the induced emf if windings are i) Lap connected ii) Wave connected	**1**	**3**	**5**
		OR			
3.	**a)**	Illustrate the process of commutation in detail.	**1**	**3**	**5**
	b)	Illustrate the characteristics of DC shunt generator.	**1**	**3**	**5**
		UNIT-2			
4	**a)**	Illustrate the characteristics of dc series and shunt motor?	**2**	**3**	**5**
	b)	A500Vdcshuntmotortakes8amperesonno-loadthearmatureandfield resistances are 0.2ohms and 250 ohms respectively. Find the efficiency of the machine when running as a motor taking a current of 90 amperes from the supply.	**2**	**3**	**5**
		OR			

5	**a)**	Compare the speed control methods of DC shunt motor.	**2**	**4**	**5**
	b)	Illustrate the Hopkinson's test on DC shunt machine.	**2**	**4**	**5**
		UNIT-3			
6	**a)**	Explain the construction and working principle of 1- Φ Transformer.	**3**	**3**	**5**
	b)	Draw the phasor diagram of a single transformer with resistive and inductive load.	**3**	**3**	**5**
		OR			
7	**a)**	Derive an expression for regulation of a single-phase transformer.	**3**	**3**	**5**
	b)	A 30 KVA, 2400/120V, 50 Hz transformer has a high voltage winding resistance of 0.1Ω and leakage reactance of 0.22 Ω. The low voltage winding resistance of 0.035 Ω and leakage reactance of 0.0122 Ω. Calculate equivalent winding resistance, reactance and impedance referred to the (i) high voltage side and (ii) low voltage side.	**3**	**3**	**5**
		UNIT-4			
8	**a)**	Derive an expression for saving of copper in auto-transformer when compared to ordinary two winding transformer.	**4**	**3**	**5**
	b)	Explain the sumpner's test with neat diagram.	**4**	**3**	**5**
		OR			
9	**a)**	Explain the parallel operation of single-phase transformer with neat diagram.	**4**	**3**	**5**
	b)	Consider 4-KVA, 200/400V single-phase transformer supplying full load current at 0.8 P. F lagging. O.C. Test: 200V, 0.8A, 70W (L.V side): S.C. Test: 20V, 10A, 60W (H.V side). Calculate efficiency and regulation.	**4**	**3**	**5**
		UNIT-V			
10	**a)**	Illustrate the different configurations of poly phase transformer and also mention its advantages.	**5**	**4**	**5**
	b)	A 3-Φ transformer bank consisting of three 1-Φtransformers is used to step down the voltage of a 3-Φ, 6600 V transmission line. If primary line current is 10A, calculate the secondary line voltage, line current and output KVA for the following connection: Y/Δ. The turns ratio is 12. Neglect losses.	**5**	**3**	**5**
		OR			
11	**a)**	Draw and explain the experimental setup for Scott connection of transformers for converting three phase to two phase supply.	**5**	**3**	**5**
	b)	Explain about off-load and on load tap changing transformers.	**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: B23EE2103
		SAGI RAMA KRISHNAM RAJU ENGINEERING COLLEGE (A)			**R23**
		II B. Tech I Semester MODEL QUESTION PAPER			
		ANALOG ELECTRONIC CIRCUITS			
		For EEE			
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 stability factors S, S^I, S^{II}	**1**	**1**	**2**
	b).	Draw the h-parameter equivalent circuit of the CE amplifier.	**1**	**2**	**2**
	c).	List feedback topologies.	**2**	**1**	**2**
	d).	State Barkhausen Criterion.	**3**	**2**	**2**
	e).	Draw the pin diagram of 741 op-amp.	**3**	**2**	**2**
	f).	List out ideal characteristics of op-amp.	**3**	**1**	**2**
	g).	State advantages of instrumentation amplifier.	**3**	**2**	**2**
	h).	Classify multi vibrators.	**4**	**2**	**2**
	i).	Draw pin diagram of 555 timer.	**4**	**2**	**2**
	j).	List out A-D converters.	**5**	**1**	**2**
					5 x 10 = 50 Marks
		UNIT-1			
2.		Draw and explain the Self-biasing circuit. Derive an expression for Stability factor S.	**1**	**3**	**10**
		OR			
3.		Analysis of CE amplifier using approximate h-parameter model.	**1**	**3**	**10**
		UNIT-2			
4.		Discuss General Characteristics of Negative feedback amplifiers.	**2**	**2**	**10**
		OR			
5.		Analyze Voltage Series Negative feedback amplifier.	**2**	**4**	**10**
		UNIT-3			
6.		Explain the working of RC phase shift oscillator using BJT and derive frequency of oscillations.	**3**	**3**	**10**
		OR			
7.	**a).**	Discuss DC characteristics of 741 Op-amp.	**3**	**3**	**5**

	b).	Draw and explain the block diagram of Op-amp.	**3**	**2**	**5**
		UNIT-4			
8.		Draw the Instrumentation amplifier circuit and derive its output expression.	**3**	**2**	**10**
		OR			
9.		Draw and explain square wave generator using Op-amp.	**3**	**2**	**10**
		UNIT-5			
10.		Draw and explain functional diagram of 555 Timer IC.	**4**	**2**	**10**
		OR			
11.	**a).**	Draw and explain R-2R ladder DAC.	**5**	**2**	**5**
	b)	Draw and explain R-2R ladder Dual Slope ADC.	**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: B23HS2201
SAGI RAMA KRISHNAM RAJU ENGINEERING COLLEGE (A)					**R23**
II B.Tech. II Semester MODEL QUESTION PAPER					
MANAGERIAL ECONOMICS AND FINANCIAL ANALYSIS					
(Common to AIDS, CSE, CIC, CSG, CSIT, CE, ECE, EEE, ME)					
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 Managerial Economics.	**1**	**1**	**2**
	b)	State the Importance of Demand forecasting.	**1**	**1**	**2**
	c)	Write about Fixed cost and Variable cost.	**2**	**1**	**2**
	d)	List out the Applications of Break-even analysis.	**2**	**1**	**2**
	e)	Define Double Entry System of Accounting.	**3**	**1**	**2**
	f)	List the items under Current assets and Current liabilities.	**4**	**1**	**2**
	g)	Name the types of Imperfect Competition.	**5**	**1**	**2**
	h)	Identify the methods of Internet Pricing.	**5**	**1**	**2**
	i)	Show the components of working capital cycle.	**6**	**1**	**2**
	j)	Write the importance of Depreciation.	**6**	**1**	**2**
					5 x 10 =50Marks
		UNIT-1	**CO**	**KL**	**M**
2.	a)	Compare the differences between Micro and Macro Economics.	**1**	**2**	**5**
	b)	Explain the Scope of Managerial Economics.	**1**	**2**	**5**
		OR			
3.	**a)**	Explain the determinants of Demand.	**1**	**2**	**5**
	b)	Describe the types of Elasticity of Demand.	**1**	**2**	**5**
		UNIT-2			
4.	**a)**	Illustrate the Elements of costs with suitable examples.	**2**	**2**	**5**
	b)	Define Cost. Explain the types of Costs.	**2**	**2**	**5**
		OR			
5.	**a)**	Interpret the determination of Break-even point with graphical representation.	**2**	**2**	**5**
	b)	Identify the Assumptions and Limitations of Break-even analysis.	**2**	**2**	**5**
		UNIT-3			
6.		Write the importance of Accounting and explain the types of accounts	**3**	**2**	**10**

		with rules governing each account.			
		OR			
7.		Illustrate the proforma for Trading and Profit and loss account and Balance sheet including items in each account.	**4**	**2**	**10**
		UNIT-4			
8.	**a)**	Outline the salient features of Perfect competition.	**5**	**2**	**5**
	b)	Discuss the features of Oligopoly.	**5**	**2**	**5**
		OR			
9.	**a)**	Explain different methods of Cost Based Pricing.	**5**	**2**	**5**
	b)	Describe the Competition Based pricing methods.	**5**	**2**	**5**
		UNIT-5			
10.	**a)**	Discuss the factors influencing Working capital.	**5**	**2**	**5**
	b)	Explain the Sources of Raising finance in long term.	**5**	**2**	**5**
		OR			
11.	**a)**	Define Depreciation. Explain the causes of Depreciation in detail.	**6**	**2**	**5**
	b)	Explain the methods of Depreciation.	**6**	**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: B23EE2201	
		SAGI RAMA KRISHNAM RAJU ENGINEERING COLLEGE (A)			**R23**
		II B.Tech. II Semester MODEL QUESTION PAPER			
		ELECTRICAL MEASUREMENTS AND INSTRUMENTATION			
		For EEE			
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 = 20Marks	
			CO	**KL**	**M**
1.	**a).**	Describe the role of controlling torque in analog measuring instruments.	**1**	**2**	**2**
	b).	List the advantages and disadvantages of moving iron instrument	**1**	**1**	**2**
	c).	How does power factor affect wattmeter readings in the two-wattmeter method?	**2**	**3**	**2**
	d).	What is the primary advantage of digital energy meters over traditional electromechanical meters?	**2**	**2**	**2**
	e).	Draw the general form of an A.C. bridge and derive the general equation for its balance.	**3**	**2**	**2**
	f).	What are the instrument transformers? How do they differ from power transformer	**3**	**2**	**2**
	g).	List the advantages of Digital voltmeters.	**4**	**1**	**2**
	h).	What are Lissajous patterns and how are they used on a CRO?	**4**	**2**	**2**
	i).	What are factors to be consider for selection of a transducer.	**5**	**2**	**2**
	j).	Illustrate the difference between Accuracy and precision.	**5**	**2**	**2**
				5 x 10 =50Marks	
		UNIT-1			
2.	**a).**	Explain the Construction and working principle of PMMC instrument with neat diagram.	**1**	**3**	**5**
	b).	The expected value of the voltage across a resistor is 80 V. However, the measurement gives a value of 79 V. Calculate (i) absolute error(ii) % error, (iii) relative accuracy and (iv)% of accuracy.	**1**	**3**	**5**
		OR			
3.	**a).**	Illustrate the different types of torques in measuring instruments	**1**	**3**	**5**
	b).	A milli-ammeter of 2.5 ohms resistance reads up to 100 milli-amperes. Calculate the resistance which is necessary to enable it to use as: (i) A voltmeter reading up to 10 V (ii) An ammeter reading up to 10 A	**1**	**3**	**5**

		UNIT-2			
4.	**a).**	Explain with a neat circuit of single-phase Dynamometer type Wattmeter and derive the equation for deflection torque.	**2**	**3**	**5**
	b).	Explain the operation of Power Factor meter with neat diagram.	**2**	**3**	**5**
		OR			
5.	**a).**	Explain measurement of single-phase energy by induction type energy meter with suitable diagram.	**2**	**3**	**5**
	b).	Explain the measurement of power using Two wattmeter method using Phasor diagram.	**2**	**3**	**5**
		UNIT-3			
6.	**a).**	Explain the measurement of inductance by Hays bridge with necessary phasor diagram.	**3**	**3**	**5**
	b).	Explain the working principle of current transformer with a phasor diagram.	**3**	**3**	**5**
		OR			
7.	**a).**	Explain how capacitance is measured with Schering Bridge.	**3**	**3**	**5**
	b).	Derive the expression of ratio error and phase angle error of potential transformer.	**3**	**3**	**5**
		UNIT-4			
8.	**a).**	Explain the operating principle of a Ramp type Digital voltmeter.	**4**	**3**	**5**
	b).	Explain the operating principle of Digital Multimeter.	**4**	**3**	**5**
		OR			
9.	**a).**	A Lissajous pattern on the oscilloscope is stationary having 8 vertical maximum values and 6 horizontal maximum values. Calculate the frequency of vertical input if the frequency of horizontal input is 1800 Hz.	**4**	**3**	**5**
	b).	Draw and explain the block diagram of DSO. Describe the various modes of operation.	**4**	**3**	**5**
		UNIT-5			
10.	**a).**	Explain the measurement of displacement using LVDT.	**5**	**3**	**5**
	b).	Explain the operating principle of Electromagnetic Flow meter with neat sketch	**5**	**3**	**5**
		OR			
11.	**a).**	Explain the construction of wire wound strain gauges and derive the expression for gauge factor.	**5**	**3**	**5**
	b).	Explain the operating principle of Thermo couple with neat sketch.	**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: B23EE2202	
		SAGI RAMA KRISHNAM RAJU ENGINEERING COLLEGE (A)			**R23**
		II B.Tech. II Semester MODEL QUESTION PAPER			
		ELECTROMAGNETIC FIELD THEORY			
		For EEE			
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).**	Write the unit vectors of spherical & cylindrical coordinates	**1**	**2**	**2**
	b).	Write expression for Vector form of Coulomb's law, and limitations of that law	**1**	**2**	**2**
	c).	Distinguish Potential Difference and Absolute potential	**2**	**2**	**2**
	d).	Given $\vec{E} = xy^{-2}\overrightarrow{a_x} + x^2\overrightarrow{a_y}$, Find Electric flux density $\vec{D}$	**2**	**2**	**2**
	e).	Write divergence theorem	**3**	**2**	**2**
	f).	Define stokes theorem	**3**	**1**	**2**
	g).	Write the expressions for Scalar and Vector Magnetic potentials	**4**	**2**	**2**
	h).	Distinguish Self & Mutual Inductances	**4**	**2**	**2**
	i).	Discriminate conduction current density& displacement current density	**5**	**2**	**2**
	j).	Distinguish Poynting Vector & Poynting theorem	**5**	**2**	**2**
					5 x 10 = 50 Marks
		UNIT-1			
2.	**a).**	Find the total charge inside which of the volume indicated $\rho_v = 10Z^2e^{-0.1x}\ sin\ sin\frac{\pi}{y}$; -1≤ $x \leq 2$, 0≤ $y \leq 1$, 3≤ $Z \leq 3.6$	**1**	**3**	**5**
	b).	Four-point charges each of 10 μC are placed in free space at the points (1,0,0), (-1,0,0), (0, 1, 0) and (0, -1, 0) m respectively. Determine the force on a point charge of 30 μC located at a point (0, 0, 1) m.	**1**	**3**	**5**
		OR			
3.	**a).**	Derive an expression for Electric field intensity due to infinite line charge distribution?	**1**	**3**	**5**
	b).	Uniform line charges of 120nC/m lie along the entire extent of three coordinate axes. Assuming free space conditions. Find Electric field Intensity E at P (-3,2,-1).	**1**	**3**	**5**
		UNIT-2			
4.	**a).**	Given the potential field, $V = 2x^2y - 5z$, and a point P (−4, 3, 6), Find numerical values at point P: a. potential $\boldsymbol{V}$,	**2**	**3**	**5**

		b. electric field intensity **E**, c. electric flux density **D**, and volume charge density ρ_v			
	b).	Derive the electrostatic boundary conditions between a conductor and free space.	**2**	**3**	**5**
		OR			
5.	**a).**	Derive Poisson's and Laplace's equations from the fundamentals	**2**	**3**	**5**
	b).	Define an electric dipole and derive an expression for E due to electric dipole.	**2**	**3**	**5**
		UNIT-3			
6.	**a).**	State Biot-savart's Law and Derive an expression for magnetic field intensity due to an infinite long straight current carrying conductor.	**3**	**3**	**5**
	b).	A current filament carrying 15 A in the a_z direction lies along the entire z axis. Find H in rectangular coordinates at point P (2, −4, 4)	**3**	**3**	**5**
		OR			
7.	**a).**	Derive an expression for a curl and applying Ampere's Circuital law to an incremental surface	**3**	**3**	**5**
	b).	Calculate the value of the vector current density: a. in rectangular coordinates at PA (2, 3, 4) if **H=$x^2z\overline{a_y} - y^2x\overline{a_z}$;**	**3**	**3**	**5**
		UNIT-4			
8.	**a).**	The Vector magnetic potential, A due to direct current in a conductor in free space is given by $A = (x^2 + y^2)\overline{a_z}\ \mu\omega b/m^2$ .Determine the magnetic field produced by the current element at (1,2,3)	**4**	**3**	**5**
	b).	Derive the expression for energy stored in magnetic field	**4**	**3**	**5**
		OR			
9.	**a).**	Discriminate Inductance and Mutual Inductance, Determine inductance of a solenoid	**4**	**3**	**5**
	b).	An electron has a velocity of 1km/s along a_x in a magnetic field whose magnetic flux density is $\overline{B} = 0.2\,\overline{a_x} - 0.3\,\overline{a_y} + 0.5\,\overline{a_z}$ wb/m^2.Determine the electric field intensity if no force is applied to the electron.	**4**	**3**	**5**
		UNIT-5			
10.	**a).**	Derive an expression for the modified Ampere's circuital law.	**5**	**3**	**5**
	b).	Write down the Maxwell's equations for both static and time varying fields in integral and point form.	**5**	**3**	**5**
		OR			
11.		Compute power flow of electromagnetism's using poynting's theorem	**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: B23EE2203
		SAGI RAMA KRISHNAM RAJU ENGINEERING COLLEGE (A)			**R23**
		II B.Tech. II Semester MODEL QUESTION PAPER			
		INDUCTION AND SYNCHRONOUS MACHINES			
		For EEE			
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 = 20Marks
			CO	**KL**	**M**
1.	**a).**	Define Slip of an Induction motor.	**1**	**1**	**2**
	b).	List any two differences between squirrel cage motor and slip ring motor?	**1**	**1**	**2**
	c).	Explain the phenomenon of cogging.	**2**	**2**	**2**
	d).	What is represented by the circle diagram of an induction motor? What information can be obtained from it?	**2**	**2**	**2**
	e).	List applications of A.C series motor?	**3**	**1**	**2**
	f).	Mention the applications of shaded pole motor.	**3**	**1**	**2**
	g).	What are the factors affecting the terminal voltage of a synchronous generator.	**4**	**1**	**2**
	h).	Define Distribution factor	**4**	**1**	**2**
	i).	Write any few causes of Hunting	**5**	**1**	**2**
	j).	How the synchronous motor can be used as synchronous condenser?	**5**	**2**	**2**
					5 x 10 =50Marks
		UNIT-1			
2.	**a).**	Explain how the rotating magnetic field is produced by three-phase currents in the 3-phase stator.	**1**	**3**	**5**
	b).	A 50 HP, 6–Pole, 50 Hz, slip ring IM runs at 960 rpm on full load with a rotor current of 40A. Allow 300 W for copper loss in S.C. and 1200 W for mechanical losses, Calculate R_2 per phase of the 3- phase rotor.	**1**	**3**	**5**
		OR			
3.	**a).**	Explain in detail the constructional feature of wound rotor three phase induction motor.	**1**	**3**	**5**
	b).	A 3-phase induction motor is wound for 4 poles and is supplied from 50-Hz system. Calculate (i) the synchronous speed (ii) the rotor speed, when slip is 4% and (iii) rotor frequency when rotor runs at 600 rpm.	**1**	**3**	**5**
		UNIT-2			
4.	**a).**	Explain briefly the No-load and Blocked rotor tests on three phase induction motor to get its equivalent circuit?	**2**	**3**	**5**
	b).	For a three-phase induction motor, the rotor ohmic loss at maximum torque is 16 times that at full load torque. The slip at full load torque is	**2**	**4**	**5**

		0.03. If the stator resistance and rotational losses are neglected, then calculate (i) The slip at maximum torque (ii) The max. torque in terms of full load torque (iii) The starting torque in terms of full load torque			
		OR			
5.	**a).**	Explain the V/f and cascade method of speed control of a 3-Φ induction motor.	**2**	**3**	**5**
	b).	What is induction generator? Discuss the principle of operation of induction generator?	**2**	**3**	**5**
		UNIT-3			
6.	**a).**	Explain construction features of single-phase induction motor. Why single-phase induction motor is not self - start?	**3**	**3**	**5**
	b).	Explain with neat diagram the construction and working of AC series motor.	**3**	**3**	**5**
		OR			
7.	**a).**	Illustrate double field revolving theory.	**3**	**3**	**5**
	b).	Give the classification of single-phase induction motors. Explain any one of the single-phase induction motors.	**3**	**3**	**5**
		UNIT-4			
8.	**a).**	Drive EMF equation of a three-phase alternator.	**4**	**3**	**5**
	b).	A 3 phase, 6 pole, star-connected alternator revolves at 1000 r.p.m. The stator has 90 slots and 8 conductors per slot. The flux per pole is 0.05 wb (sinusoidally distributed). Calculate the voltage generated by the machine if the winding factor is 0.96.	**4**	**3**	**5**
		OR			
9.	**a).**	Explain how voltage regulation is determined from E.M.F method	**4**	**3**	**5**
	b).	A 500 kVA, 1,100 V, 50 Hz star connected 3-phase alternator has armature resistance per phase of 0.1 Ω and synchronous reactance per phase of 1.5 Ω. Calculate the e.m.f at 0.9 pf lagging and the voltage regulation.	**4**	**4**	**5**
		UNIT-5			
10.	**a).**	Illustrate V and inverted V curves of a synchronous motor?	**5**	**3**	**5**
	b).	Illustrate the effect of armature reaction in a three-phase synchronous motor.	**5**	**3**	**5**
		OR			
11.	**a).**	Why the synchronous motor is not self-starting and explain any one method to make the motor self-start.	**5**	**3**	**5**
	b).	A 75KW, 400V, 4-pole, 3-phase, 50Hz, star connected synchronous motor has a synchronous reactance of 0.4Ω. Compute torque developed at full load and 0.8pf lagging.	**5**	**4**	**5**

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

NOTE: Questions can be given as A, B splits or as a single Question for 14 marks

					Course Code: B23EE2204
		SAGI RAMA KRISHNAM RAJU ENGINEERING COLLEGE (A)			**R23**
		II B.Tech. II Semester MODEL QUESTION PAPER			
		DIGITAL ELECTRONICS AND LOGIC DESIGN			
		For EEE			
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 = 20Marks
			CO	**KL**	**M**
1.	**a).**	Implement two input X-OR Gate by using only NOR Gates.	**1**	**2**	**2**
	b).	Differentiate between Decoder and Encoder.	**1**	**2**	**2**
	c).	Differentiate between combinational and sequential logic circuits?	**2**	**2**	**2**
	d).	What is race around condition in JK flip flop?	**2**	**2**	**2**
	e).	Explain Fan-in and Fan-out.	**3**	**2**	**2**
	f).	List the different types of ROM?	**3**	**1**	**2**
	g).	List the different types of structural modelling?	**4**	**1**	**2**
	h).	Differentiate between scalar and vector?	**4**	**2**	**2**
	i).	Explain module.	**5**	**2**	**2**
	j).	Write the syntax for number representation in Verilog HDL.	**5**	**2**	**2**
					5 x 10 =50Marks
		UNIT-1			
2.	**a).**	Simplify the following function using K- map. Y (A, B, C) = ∑m (0, 2, 4, 5, 6, 7)	**1**	**3**	**5**
	b).	Show the implementation of Full adder circuit using half adders.	**1**	**3**	**5**
		OR			
3.	**a).**	Implement a circuit using NAND and NOR gates for the given Boolean expression Y = ((A+B) C) D	**1**	**3**	**5**
	b).	Draw and explain the 8×1 MUX.	**1**	**3**	**5**
		UNIT-2			
4.	**a).**	Implement a synchronous Mod-6 binary counter using T flip-flop.	**2**	**3**	**5**
	b).	Explain the operating modes of universal shift register with a neat sketch.	**2**	**3**	**5**
		OR			
5.	**a).**	Draw a circuit diagram of an edge triggered JK flip-flop and explain its operation.	**2**	**3**	**5**
	b).	Convert the JK Flip-flop into RS flip-flop.	**2**	**3**	**5**

		UNIT-3			
6.	**a).**	Draw the circuit of a TTL NAND gate and explain the operation.	**3**	**3**	**5**
	b).	Implement an Excess-3 to BCD code converter using a PLA?	**3**	**3**	**5**
		OR			
7.	**a).**	Draw the circuit of a DTL NAND gate and explain the operation.	**3**	**3**	**5**
	b).	Compare TTL, RTL and ECL logic families	**3**	**3**	**5**
		UNIT-4			
8.	**a).**	Use Verilog HDL Code for describing Half Adder	**4**	**3**	**5**
	b).	Illustrate different types of Verilog modelling.	**4**	**3**	**5**
		OR			
9.	**a).**	Implement 16:1 multiplexer with 4:1 multiplexer in Verilog HDL.	**4**	**3**	**5**
	b).	Illustrate Verilog Data Types and operators.	**4**	**3**	**5**
		UNIT-5			
10.	**a).**	Implement a sequential 3-bit counter using Verilog HDL.	**5**	**3**	**5**
	b).	Implement 4-bit Shift Register using Verilog HDL.	**5**	**3**	**5**
		OR			
11.	**a).**	Illustrate the blocking and non-blocking statements with suitable examples.	**5**	**3**	**5**
	b).	Implement a sequential 4-bit ripple counter using Verilog HDL.	**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