K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B.Tech. II Semester (R23UG) Regular End Examinations of July – 2024
SUB: *Differential Equations & Vector Calculus*
(CE, EEE, ME, ECE, CSE & AI&ML)

Time: 3 Hours   Max. Marks: 70

Instructions:
1. Answer all **10 questions** from **Part – A,** and should be answered **at one Place.** Each question carries **two marks.**
2. Answer one full question from each unit in **Part – B.** Each full question carries **10 marks.**

		PART – A		10*2 = 20M	
1	a	Find the integrating factor of $y' + y = e^{e^x}$	2M	CO1	L1
	b	Solve $x\,dx + y\,dy = \frac{a^2(x\,dy - y\,dx)}{x^2 + y^2}$	2M	CO1	L3
	c	Find the particular integral of $\left(4D^2 - 4D + 1\right)y = 100 + e^{2x}$	2M	CO2	L1
	d	Find the Wronskian for the differential equation $(D^2 - 2D)y = e^x \sin x$	2M	CO2	L1
	e	Construct the partial differential equation by eliminating the arbitrary constants a and b from $z = ax + by + ab$	2M	CO3	L3
	f	Find the general solution of $p + q = 1$	2M	CO3	L1
	g	Determine the angle between the surfaces $x^2 + y^2 + z^2 = 9$ and $z = x^2 + y^2 - 3$	2M	CO4	L5
	h	If $\bar{f} = (x + 3y)\bar{i} + (y - 2z)\bar{j} + (x + pz)\bar{k}$ is solenoid then find p.	2M	CO4	L1
	i	Evaluate $\int_c \bar{F}.d\bar{r}$ where $\bar{F} = x^2\bar{i} + y^2\bar{j}$ and C is the curve $y = x^2$ in the xy-plane from (0,0) to (1,1).	2M	CO5	L5
	j	State the Stoke's theorem.	2M	CO5	L1

		PART – B		5*10 = 50M	
		UNIT – I			
2	a	Solve $(1 + y^2)dx = (\tan^{-1}y - x)dy$	5M	CO1	L3
	b	Solve $(x^2 y - 2xy^2)dx - (x^3 - 3x^2 y)dy = 0$	5M	CO1	L3

(OR)

3	A body is originally at 80°c cools down to 60°c in 20 minutes, the temperature of the air being 40°c. What will be the temperature of the body after 40 minutes from the original?.	10M	CO1	L1

UNIT – II

4	Using the method of variation of parameters, solve $\frac{d^2y}{dx^2} + 4y = \sec 2x$	10M	CO2	L5

(OR)

5	An uncharged condenser of capacity C is charged by applying an e.m.f. $E \sin\frac{t}{\sqrt{LC}}$, through leads of self-inductance L and negligible resistance. Prove that at any time t, the charge on one of the plates is $\frac{EC}{2}\{E \sin\frac{t}{\sqrt{LC}} - \frac{t}{\sqrt{LC}} - \cos\frac{t}{\sqrt{LC}}\}$	10M	CO2	L5

UNIT – III

6	a	Develop a partial differential equation by eliminating the constants from the equation $\frac{x^2}{a^2} + \frac{y^2}{b^2} + \frac{z^2}{c^2} = 1$	5M	CO3	L3
	b	Solve $\left(D^2 - 4D + 3\right)y = \sin 3x \cos 2x$	5M	CO3	L3

(OR)

7	a	Solve $x^2(y-z)p + y^2(z-x)q = z^2(x-y)$	5M	CO3	L3
	b	Construct the partial differential equation by eliminating the arbitrary functions from $z = y^2 + 2f\left(\frac{1}{x} + \log y\right)$	5M	CO3	L3

UNIT – IV

8	a	Find the angle between the surfaces $x^2 + y^2 + z^2 = 9$ and $z = x^2 + y^2 - 3$ at the point $(2, -2, 3)$	5M	CO4	L5
	b	Prove that the vector $(-x^2 + yz)\bar{i} + +(4y - z^2x)\bar{j} + (2xz - 4z)\bar{k}$ is solenoid.	5M	CO4	L5

(OR)

9	Prove that $\nabla^2(r^n) = n(n+1)r^{n-2}$	10M	CO4	L5

UNIT – V

10	Verify Stokes theorem for $\bar{F} = (2x-y)\bar{i} - yz^2\bar{j} - y^2z\,\bar{k}$ over the upper half surface of the sphere $x^2 + y^2 + z^2 = 1$ bounded by the projection of the XY – plane.	10M	CO5	L1

(OR)

11	Evaluate $\int_C\left[\left(3x^2 - 8y^2\right)dx + \left(4y - 6xy\right)dy\right]$ C is the region bounded by $x = 0$, $y = 0$ and $x + y = 1$ by Green's Theorem	10M	CO5	L5

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K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B.Tech. II Semester (R23UG) Regular End Examinations of July – 2024
SUB: *Basic Civil and Mechanical Engineering*
(CE, ME, ECE & EEE – RA)

Time: 3 Hours   Max. Marks: 70

Instructions:
1. Answer all **10 questions** from **Part – A,** and should be answered **at one Place**. Each question carries **two marks.**
2. Answer one full question from each unit in **Part – B**. Each full question carries **10 marks**.

		PART – A		10*2 = 20M	
1	a	Name the disciplines of civil engineering	2M	CO1	BL1
	b	List out the various uses of cement concrete.	2M	CO1	L1
	c	Name the types of cement	2M	CO1	L1
	d	Name two types of compass.	2M	CO2	L1
	e	Define pavement. What are the different types of pavements?	2M	CO3	L1
	f	**Illustrate about Ferrous and non-Ferrous Metals?**	2M	CO3	L2
	g	**Define a boiler? How do you classify it?**	2M	CO4	L1
	h	**What is casting process?**	2M	CO4	L1
	i	**Discuss the Applications of Robotics**	2M	CO5	L6
	j	**Draw the layout of steam power plant.**	2M	CO5	L1

PART – B   5*10 = 50M
UNIT – I

2	a	Brief about the role of civil engineering in society	5M	CO1	L2
	b	List the test carried out on cement. Explain any three tests in detail.	5M	CO1	L1

(OR)

3	a	Define cement. Briefly explain about any 5 types of cements?	5M	CO1	L1
	b	Define cement concrete. Briefly explain about any 2 tests on cement concrete.	5M	CO1	L1

UNIT – II

4	a	Explain about horizontal and angular measurements.	5M	CO2	L2
	b	The staff readings taken at stations A and B are 2.750 and 0.725 m respectively. Find the RL of B if the RL of A is 50.000 and the difference in level between A and B.	5M	CO2	L3

(OR)

5	a	Explain about types of Dams and their functions	5M	CO2	L2
	b	Explain the Site selection process of Dams	5M	CO2	L2

UNIT – III

6	a	What are the water quality specifications and tests?	5M	CO3	L1
	b	Define a Dam and Reservoir? What are the various types of Dams?	5M	CO3	L1

(OR)

7	a	Classify Engineering Materials with suitable examples?	5M	CO3	L4
	b	How does Mechanical Engineering contribute to the overall development of Industries and society?	5M	CO3	L1

UNIT – IV

| 8 | a | List out the applications of composite materials? | 5M | CO4 | L1 |
| | b | List out the components of boiler and their functions? | 5M | CO4 | L1 |

(OR)

| 9 | a | Explain the working of two stroke petrol Engine with neat sketch. | 5M | CO4 | L5 |
| | b | Discuss the importance of 3D Printing? | 5M | CO4 | L6 |

UNIT – V

| 10 | a | Describe working principle of Hydroelectric power plant with neat sketch? | 5M | CO5 | L1 |
| | b | List out important Mechanical power Transmission Devices? | 5M | CO5 | L1 |

(OR)

| 11 | a | Outline the applications of Gear Drives? | 5M | CO5 | L2 |
| | b | Write the differences between Chain drive and Belt drive? | 5M | CO5 | L4 |

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K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B.Tech. II Semester (R23UG) Regular End Examinations of July – 2024
SUB: Communicative English (EEE, CSE & AI&ML)

Time: 3 Hours   Max. Marks: 70

Instructions:
1. Answer all **10 questions** from **Part – A,** and should be answered **at one Place.** Each question carries **two marks.**
2. Answer one full question from each unit in **Part – B.** Each full question carries **10 marks.**

		PART – A	10*2 = 20M		
1	a	Write the sentences using both the prefix and suffix for each of the following words: (i) Possible (ii) Comfort.	2M	CO1	L1

	b	(i) Give the antonyms to the following.
		        (a) fertile (b) acquit
		(ii) Give the synonyms to the following.
		        (a) diligent (b) tranquil
			2M	CO1	L2

	c	The final destination of the brook is _____	2M	CO2	L3
	d	**Fill in the blanks with the correct homophone from options given in brackets** (i) I bought a _____ of gloves. (pair, pare) (ii) She wanted to _____ her favourite outfit. (wear, ware)	2M	CO2	L3
	e	Define 'collocation' with example.	2M	CO3	L1
	f	(i) Bread and butter _____ my favourite breakfast. (is/are) (ii) Neither of my brothers _____ any children. (have/has)	2M	CO3	L3
	g	**The moral of "The Gift of the Magi"**	2M	CO4	L4
	h	(i) There has been a huge _____ in petrol prices. (rise, raise) (ii) Priya served for two years on the city_____ (council, counsel)	2M	CO4	L3
	i	What is intrapersonal communication?	2M	CO5	L5
	j	How do you plan for goal setting?	2M	CO5	L4

	PART – B	5*10 = 50M

UNIT – I

2	"The Gift of the Magi"? Discuss	10M	CO1	L1

(OR)

3	a	(i) **Punctuate the following sentences correctly. Capitalize words where required.**
		        "speak telugu and hindi better than english what about you"
		(ii) **Identify the parts of speech of the underlined words given below.**
		        The <u>novel</u> was a beautiful gift, <u>although</u> it was very <u>expensive.</u>
			5M	CO1	L3

	b	i) **Frame any three meaningful sentence based on the pattern:**	5M	CO1	L3

Subject	Verb	Indirect Object	Direct Object
She	gave	him	a laptop

ii) **Rewrite the jumbled words in the correct order.**
    (a) The platform is on the train.
    (b) Sister my coffee loves.

UNIT – II

4	How does Lord Tennyson use the brook to draw a parallel with the life of a man?	10M	CO2	L6

(OR)

5	a	Complete the following sentences by using appropriate articles and prepositions.	5M	CO2	L3

5 a Complete the following sentences by using appropriate articles and prepositions.   5M   CO2   L3

(i) The Minister is attending an international seminar ....England. (in, at,)

(ii) Suman is junior.........your brother. (to, than)

(iii) They live ....aryanagar chowk.(at, in)

(iv) The cat sleeps...........her bed.(under, beneath)

(v) Dinesh left the scooter..........the garage.(behind, beside)

b Compose a paragraph of about 150 words on *procrastination is dangerous*   5M   CO2   L3

UNIT – III

6 How have Tesla and the Hyperloop radically revolutionized transportation?   10M   CO3   L2

(OR)

7 a Write about compound words and collocations with examples.   5M   CO3   L1

b Use the right verb form from the verbs given in brackets.   5M   CO3   L3

(i) Have you been _____? (do)

(ii) Oil _____ (float) on water.

(iii) Look! The old man_____ (cross) the road.

(iv) She was taking dinner when cell phone _____ (ring).

(v) v) Raman _____ (live) in Chennai for 10 years.

UNIT – IV

8 Describe how the children found an exciting way to play with their new non-violent toys.   10M   CO4   L2

(OR)

9 a Write a letter to the Principal of your college requesting a transfer certificate   5M   CO4   L6

b Reframe the following sentences as directed in the brackets.   5M   CO4   L3

(i) The news editor briefed the young reporter.(into passive voice)

(ii) Rice is grown in many parts of the world (into active voice)

(iii) Did you understand the lesson? (into passive voice)

(iv) The manager said, "type this letter immediately"(into Indirect Speech)

(v) Udit asked his wife when she was going out the next day.(into Direct Speech)

UNIT – V

10 Write an essay on "Violence in cinema promotes violence in society". You may argue either for or against the topic.   10M   CO5   L6

(OR)

11 a Convert the following passage into pie chart.   5M   CO5   L3

Out of the 24 hours of the day. A student spent 10 hours at college, 7 hours in sleeping. Out of the remaining 7 hours, 2 hours spent on activities like bathing, eating, dressing and getting ready to go to college, and 3 hours spent on study at home and 2 hours spent on entertainment.

b Rewrite the following sentences correctly.   5M   CO5   L3

(i) One of my friend is coming today.

(ii) I have seen my friend yesterday.

(iii) She married with a doctor.

(iv) He worked hardly, didn't he?

(v) v) Though the machine was new, but it did not work.

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K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B.Tech. II Semester (R23UG) Regular End Examinations of July – 2024
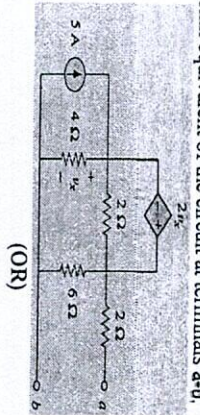### SUB: Engineering Mechanics (CE& ME)

Time: 3 Hours

Max. Marks: 70

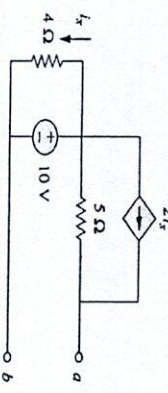**Instructions:**
1. Answer all **10 questions** from **Part – A,** and should be answered **at one Place**. Each question carries **two marks**.
2. Answer one full question from each unit in **Part – B.** Each full question carries **10 marks**.

		PART – A		10*2 = 20M	
1	a	Define the term "limiting friction".	2M	CO1	L1
	b	Define Coplanar Forces?	2M	CO1	L1
	c	What is the Triangle Law of Forces?	2M	CO2	L1
	d	State the parallelogram law of forces.	2M	CO2	L1
	e	Define the term centroid?	2M	CO3	L1
	f	Explain how to find the center of gravity of rectangular	2M	CO3	L2
	g	Explain the work energy method.	2M	CO4	L1
	h	Define rectilinear motion.	2M	CO4	L1
	i	Define kinetics in the context of rigid body motion.	2M	CO5	L1
	j	Define plane motion and give an example.	2M	CO5	L1

		PART – B		5*10 = 50M	
		UNIT – I			
2	a	Describe Coulomb's laws of dry friction.	5M	CO1	L2
	b	Explain the concept of moment of a force.	5M	CO1	L2

(OR)

3		Find the coefficient of friction if the 1 kg block is about to move?	10M	CO1	L3
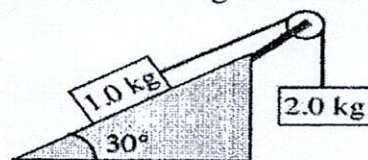
UNIT – II

4			10M	CO2	L3

Find the tensions in T_{AC} & T_{BC} by using Lami's theorem

(OR)

5	a	Illustrate the free body diagram with neat sketch& state the conditions of equilibrium?	5M	CO2	L3
	b	Compare the triangle law of forces and law of polygon of forces?	5M	CO2	L4

UNIT – III

6 Find the Moment of inertial of the given section below with respect to x-axis   10M   CO3   L3
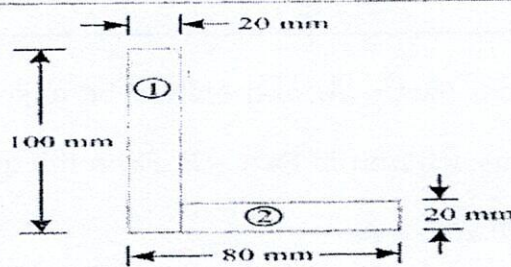
(OR)

7 Explain how locate the Centre of gravity for a (i) Uniform rod (ii) rectangular (iii) triangle (iv) circle, with a neat sketch?   10M   CO3   L4

UNIT – IV

8 **a** Explain the definitions of rectilinear and curvilinear motions with suitable examples.   5M   CO4   L2

    b Describe the basis of D'Alembert's Principle and how it is applied to solve problems in dynamics.   5M   CO4   L2

(OR)

9 **a** Define the Work-Energy Principle and explain its significance in the study of particle motion.   5M   CO4   L2

    b Explain the Impulse-Momentum Method?   5M   CO4   L2

UNIT – V

10 **a** Explain the concepts of translation and rotation in the context of rigid body motion.   5M   CO5   L2

    b Point out the concepts of impulse and momentum and their conservation principles.   5M   CO5   L4

(OR)

11 **a** Define relative motion and explain its importance in analyzing rigid body motion.   5M   CO5   L3

    b Explain the concepts of inertia, mass moment of inertia, and their significance in kinetics.   5M   CO5   L2

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K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B.Tech. II Semester (R23UG) Regular End Examinations of July – 2024
SUB: Electrical Circuit Analysis – I (EEE)

Time: 3 Hours Max. Marks: 70

Instructions:
1. Answer all **10 questions** from **Part – A**, and should be answered **at one Place.** Each question carries **two marks.**
2. Answer one full question from each unit in **Part – B**. Each full question carries **10 marks.**

PART–A

10*2 = 20M

1

a   Calculate the current i and the conductance G.
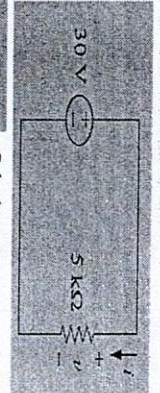
2M CO1 L1

2M CO1 L2

b   Calculate the current I for the given circuit.

2M CO2 L2

c   Calculate the input impedance for the given circuit.
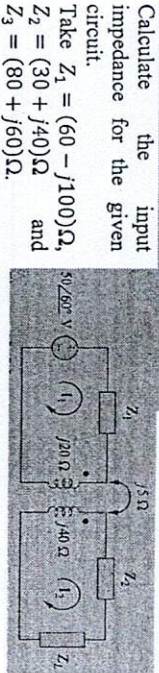
Take $Z_1 = (60 - j100)\Omega$, $Z_2 = (30 + j40)\Omega$ and $Z_3 = (80 + j60)\Omega$.

2M CO2 L2

d   Explain about Faradays law of electromagnetic induction
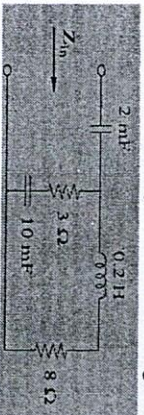
2M CO2 L1

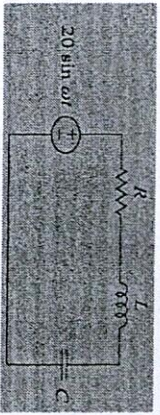e   Find the impedance of the circuit at $\omega = 50$ rad/s;

2M CO3 L2

2M CO3 L1

f   Calculate At what frequency will the output voltage $V_0(t)$ in the given figure will be equal to the input voltage V(t)?
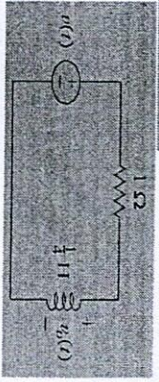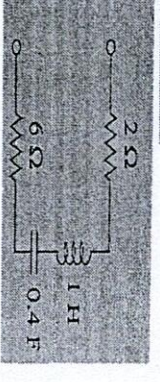

2M CO3 L2

g   For the given circuit, find the resonant frequency with R=2Ω, L = 1mH and C = 0.4 μF.

2M CO4 L3

h   For the circuit, find the resonant frequency?

2M CO4 L1

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b   Find the Thevenin equivalent of the circuit at terminals a-b.

5M CO5 L4

(OR)

11 a   Find the Norton's equivalent of the circuit at terminals a-b.

5M CO5 L3

b   Find the maximum power that can be delivered to the resistor R in the circuit.

5M CO5 L5

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i   Use the superposition theorem to find V in the circuit. — 2M CO5 L3
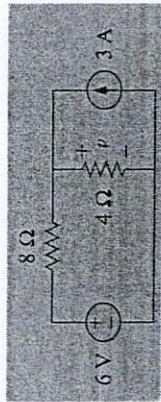
j   Explain briefly about Thevenin's theorem. — 2M CO5 L3

PART – B
5*10 = 50M
UNIT – I

2 a A circuit consists of two parallel resistors having resistance of 20Ω and 30Ω respectively connected in series with 15Ω. If current through 15Ω resistor is 3 A. Find: i) Current in 20Ω and 30Ω resistors ii) The voltage across the whole circuit iii) The total power and power consumed in all resistances. — 5M CO1 L4
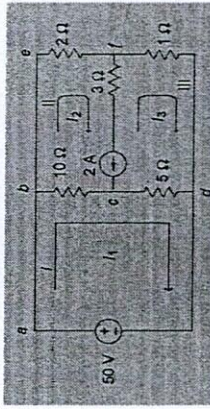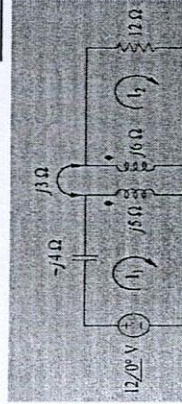
2 b Find I in the circuit given. — 5M CO1 L5

(OR)
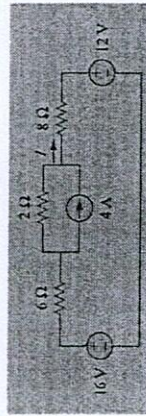
3 a An 8Ω resistor is in series with a parallel combination of two resistors 12Ω and 6Ω. If the current in the 6Ω resistor is 5 A, determine the total power dissipated in the circuit. — 5M CO1 L1

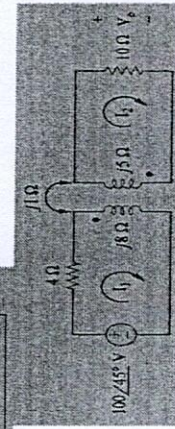3 b Determine the current in 5Ω resistor using mesh analysis. — 5M CO1 L3

UNIT – II

4 a Calculate the phasor currents and in the circuit. — 5M CO2 L3

4 b Determine the voltage V_0 in the given circuit. — 5M CO2 L4

(OR)

5 a An electromagnet is wound with 800 turns. Find the value of average EMF induced and current through coil, if it is moved to that magnetic field is changed from 1 mWb to 0.25 mWb in 0.2 sec. The resistance of the coil is 500 Ω. — 5M CO2 L4

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b A coil of 300 turns wound on a core of non-magnetic material has an inductance of 10 mH. Calculate i) flux produced by a current of 5 A. ii) The average value of the emf induced when a current of 5 A is reversed in 8 milliseconds. — 5M CO2 L5

UNIT – III

6 a For the current wave shown in below figure. Find: (i) Peak current (ii) Average value (iii) Frequency (iv) Periodic time (v) Instantaneous value at t = 3 ms — 5M CO3 L3
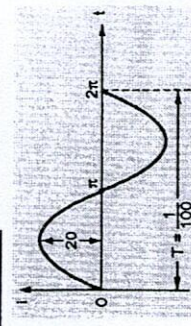
6 b An alternating voltage has an effective value of 70.7106V and frequency of 60 Hz. Find its average value, form factor, peak factor assuming it to be purely sinusoidal. — 5M CO3 L3

(OR)

7 a An inductive coil draws a current of 2 A, when connected to a 230 V, 50 Hz supply. The power taken by the coil is 100 watts. Calculate the resistance and inductance of the coil. — 5M CO3 L3

7 b A circuit having a resistance of 12Ω, in inductance of 0.15H and a capacitance of 100μF in series is connected across a 100V, 50Hz supply. Calculate the impedance, current, the phase difference between the current and supply voltage. — 5M CO3 L5

UNIT – IV

8 a In the circuit shown in figure, R = 2Ω, L = 1mH, and C = 0.4μF. (i) Find the resonant frequency and the half-power frequencies. (ii) Calculate the quality factor and bandwidth. (iii) Determine the amplitude of the current at resonance frequency. — 5M CO4 L6
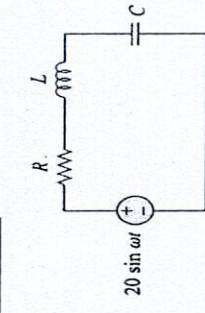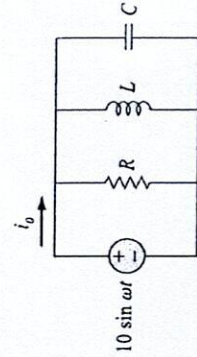
8 b Explain about parallel RLC circuit resonance. — 5M CO4 L5

(OR)

9 a Explain about series RLC circuit resonance. — 5M CO4 L6

9 b In the circuit shown in figure, R=8kΩ, L = 0.2mH, and C = 8μF. (i) Find the resonant frequency and the half-power frequencies. (ii) Calculate the quality factor and bandwidth. — 5M CO4 L4

UNIT – V

10 a Find i_0 in the circuit using super position theorem. — 5M CO5 L6

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B.Tech. II Semester (R23UG) Regular End Examinations of July – 2024
SUB: *Network Analysis (ECE)*

Time: 3 Hours

Max. Marks: 70

Instructions:
1. Answer all **10 questions** from **Part – A,** and should be answered **at one Place.** Each question carries **two marks.**
2. Answer one full question from each unit in **Part – B.** Each full question carries **10 marks.**

PART – A

|			10*2 = 20M	
1	a	What are main properties of inductor and capacitor?	2M	CO1	L1
	b	State Thevenin's theorem.	2M	CO1	L1
	c	Define time constant of RL circuit	2M	CO2	L1
	d	Write Exponential function in Laplace Transform	2M	CO2	L1
	e	Draw the phasor notation of RLC series circuit.	2M	CO3	L1
	f	Write the expressions for star to delta and delta to star conversion.	2M	CO3	L1
	g	Define resonant frequency and write expression for RLC series circuit.	2M	CO4	L1
	h	Define mutual inductance.	2M	CO4	L1
	i	Write the symmetric and reciprocity conditions for Y Parameters.	2M	CO5	L1
	j	Write the relationship between Z and Y parameters.	2M	CO5	L1

PART – B

5*10=50M

UNIT – I

2	a	Describe the Types of Sources and Source Transformations.	5M	CO1	L2
	b	Find the current through the 10Ω resistance in the circuit, as shown in Figure using the mesh analysis.	5M	CO1	L3
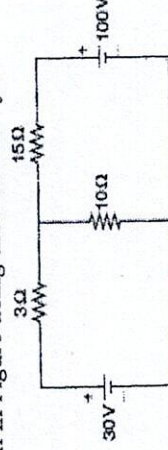
(OR)

|					
3	a	Describe the Maximum power transfer theorem with example.	5M	CO1	L2
	b	Using superposition theorem, calculate the currents in the network shown in Figure.	5M	CO1	L3
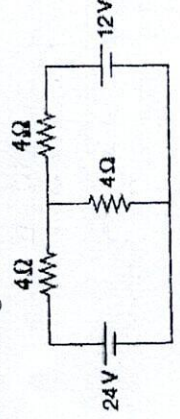
UNIT – II

4 **a** Describe the transient response of a first-order R-L circuit excited by a DC source. — 5M CO2 L2

b A capacitor in an RC circuit with R = 25 Ω and C = 50 μF is being charged with initial zero voltage. Determine the time taken for the capacitor voltage to reach 40 % of its steady state value. — 5M CO2 L3

(OR)

5 In the circuit shown in figure, switch S is in position 1 for a long time and brought to position 2 at time t=0. Determine the circuit current using Laplace transform. — 10M CO2 L3
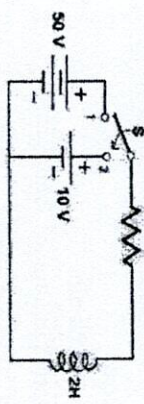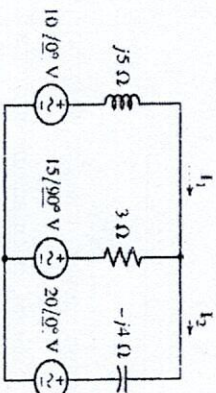

UNIT – III

6 **a** Explain the complex impedance and phasor notation for R-L and R-C series circuits. — 5M CO3 L2

b Determine the equivalent resistance between the terminals A and B as shown in figure. — 5M CO3 L3
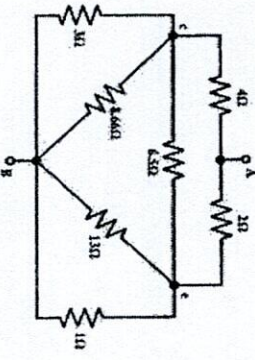
(OR)

7 Determine the currents l₁ and l₂ shown in the figure using nodal analysis. — 10M CO3 L3


UNIT – IV

8 **a** Determine Q factor of parallel resonance circuit. — 5M CO4 L3

b A RLC series circuit consists of R=16 Ω, L=15mH and C=2μF. Determine the quality factor, bandwidth and half-power frequencies at resonance. — 5M CO4 L3

(OR)

9 **a** Develop an expression for coefficient of coupling in terms of mutual and self-inductances of the coils. — 5M CO4 L3

b A coil having an inductance of 100mH is magnetically coupled to another coil having an inductance of 900mH. The coefficient of coupling between the coils is 0.42. Determine the equivalent inductance if the two coils are connected in series opposing. — 5M CO4 L3

UNIT – V

10 For the given two-port network, determine the Z parameters. — 10M CO5 L3
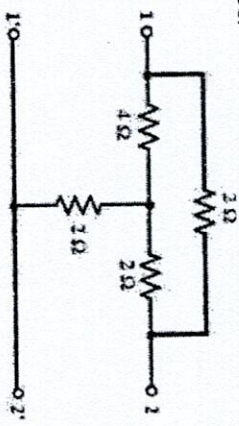
(OR)

11 **a** Determine the Relationships Between transmission line parameters and Y parameters. — 5M CO5 L3

b Two two-port networks are connected in parallel. Prove that the overall Admittance parameter matrix is the sum of individual Admittance parameters matrices. — 5M CO5 L3

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K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B.Tech. II Semester (R23UG) Regular End Examinations of July – 2024
SUB: Data Structures (CSE, AI&ML)

Time: 3 Hours   Max. Marks: 70

Instructions:
1. Answer all **10 questions** from **Part – A,** and should be answered **at one Place**. Each question carries **two marks.**
2. Answer one full question from each unit in **Part – B**. Each full question carries **10 marks**.

PART – A   10*2 = 20M

1	a	What is a data structure?	2M	CO1	L1
	b	How do we determine the complexity of an algorithm?	2M	CO1	L1
	c	What are the types of linked lists?	2M	CO2	L2
	d	How the doubly linked list can be represented?	2M	CO2	L2
	e	What are the operations of the stack?	2M	CO3	L1
	f	Write the differences between stack and queue.	2M	CO3	L3
	g	Define Circular Queue.	2M	CO4	L1
	h	How do you test for an empty queue?	2M	CO4	L3
	i	Define tree?	2M	CO5	L1
	j	List the application of tree.	2M	CO5	L2

PART – B   5*10 = 50M
UNIT – I

2	a	How data structures are classified?	5M	CO1	L2
	b	Define List ADT	5M	CO1	L1

(OR)

3	a	Write Binary Search algorithm and compare it with linear search.	5M	CO1	L2
	b	Write Insertion algorithm and space and time complexity.	5M	CO1	L2

UNIT – II

4	a	Discuss advantages and disadvantages of Double linked list.	5M	CO2	L2
	b	List down the applications of List.	5M	CO2	L3

(OR)

5	a	Explain the operations of circularly linked lists	5M	CO2	L2
	b	Explain the steps involved in insertion and deletion into a singly and doubly linked list.	5M	CO2	L2

UNIT – III

6	a	Convert the infix (a+b)*(c+d)/f into postfix & prefix expression	5M	CO3	L3
	b	Write the routine to push a element into a stack.	5M	CO3	L2

(OR)

7	a	Why we use postfix/prefix expressions than infix form?	5M	CO3	L2
	b	Explain how the stack is implemented by linked list?	5M	CO3	L2

UNIT – IV

8	a	Define Queue and also discuss different types of queue.	5M	CO4	L2
	b	What are enqueue and dequeue operations?	5M	CO4	L1

(OR)

9	a	Describe the main features of priority queues	5M	CO4	L1
	b	Consider a circular queue initially having 3 elements A, B, C inserted in same sequence and having a maximum capacity of 5 elements. Show the current value of FRONT and REAR. Delete 2 elements from the queue and insert 4 elements D,E,F,G in the queue and show final position of FRONT and REAR.	5M	CO4	L4

UNIT – V

10	a	Construct a Binary Search Tree by inserting the following sequence of elements 10,12,5,4,20,8,7,15,13 starting from an empty tree.	5M	CO5	L3
	b	Explain about various Hash functions with suitable example.	5M	CO5	L2

(OR)

11	a	What are the steps to convert a general tree into binary tree?	5M	CO5	L2
	b	Define collision and explain about separate chaining collision resolving technique with an example.	5M	CO5	L2

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K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B.Tech. II Semester (R23UG) Regular End Examinations of July – 2024
SUB: Engineering Chemistry (CE & ME)

Time: 3 Hours **Max. Marks: 70**

Instructions:

1. Answer all **10 questions** from **Part – A,** and should be answered **at one Place**. Each question carries **two marks.**
2. Answer one full question from each unit in **Part – B**. Each full question carries **10 marks**.

PART – A
10*2 = 20M

1	a	Recall the various units of hardness.	2M	CO1	L1
	b	List any four BIS and WHO specifications of drinking water.	2M	CO1	L1
	c	Define electrochemical cell.	2M	CO2	L1
	d	State Pelling-Bedworth rule.	2M	CO2	L1
	e	What are elastomers? Give an example.	2M	CO3	L1
	f	Define calorific value.	2M	CO3	L1
	g	What are composite materials?	2M	CO4	L1
	h	What is Portland cement? Write its composition.	2M	CO4	L1
	i	Recall the applications of colloids.	2M	CO5	L1
	j	Write BET equation.	2M	CO5	L1

PART – B
5*10 = 50M

UNIT – I

2	Illustrate the ion-exchange process with a neat diagram.	10M	CO1	L2

(OR)

3	Discuss the various boiler troubles.	10M	CO1	L2

UNIT – II

4	Explain the construction, working and applications of lithium-ion battery.	10M	CO2	L2

(OR)

5	Discuss the various factors affecting corrosion.	10M	CO2	L2

UNIT – III

6	Describe the preparation, properties and applications of Bakelite.	10M	CO3	L2

(OR)

7	a	Explain proximate analysis of coal.	6M	CO3	L2
	b	Calculate the gross calorific value of a fuel containing the following compositions carbon = 85%, hydrogen = 8%, sulphur = 1%, nitrogen = 2%, ash = 4%.	4M	CO3	L3

UNIT – IV

8	Illustrate the various properties of refractories.	10M	CO4	L2

(OR)

9	Discuss the classification of lubricants.	10M	CO4	L2

UNIT – V

10	a	Explain about Freundlich and Longmuir adsorption isotherm.	5M	CO5	L2
	b	Describe about micelle formation.	5M	CO5	L2

(OR)

11	Explain the applications of nanomaterials in various fields.	10M	CO5	L2

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K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B.Tech. II Semester (R23UG) Regular End Examinations of July – 2024
SUB: Chemistry (ECE & EEE – ~~~)

Time: 3 Hours   Max. Marks: 70

Instructions:

1. Answer all **10 questions** from **Part – A,** and should be answered **at one Place**. Each question carries **two marks.**
2. Answer one full question from each unit in **Part – B.** Each full question carries **10 marks.**

		PART – A	10*2 = 20M		
1	a	Outline the significance of Ψ and Ψ^2.	2M	CO1	L2
	b	Calculate the bond order of N_2 molecule.	2M	CO1	L4
	c	List any four applications of Super capacitors.	2M	CO2	L1
	d	Write short notes on Fullerenes.	2M	CO2	L1
	e	Define Fuel cell. Give an example for fuel cell.	2M	CO3	L1
	f	What is meant amperometric sensor? Give an example.	2M	CO3	L1
	g	Define polymer. What is meant by functionality of a polymer?	2M	CO4	L1
	h	Define Biodegradable polymer with example.	2M	CO4	L1
	i	What is meant by Absorption and Emission spectra?	2M	CO5	L1
	j	Explain the basic principle of Chromatography.	2M	CO5	L2

		PART – B	5*10=50M		
		UNIT – I			
2		Apply Schrodinger wave equation for Particle in One Dimensional box.	10M	CO1	L6
		(OR)			
3	a	Discuss the postulates of Molecular Orbital Theory.	5M	CO1	L6
	b	Explain π-Molecular orbitals of Butadiene.	5M	CO1	L5
		UNIT – II			
4	a	Write an account of types of semiconductors.	5M	CO2	L1
	b	Discuss the important applications of Super conductors.	5M	CO2	L6
		(OR)			
5	a	What are carbon nanotubes? Write their properties.	5M	CO2	L1
	b	Discuss the important applications of Graphine nanoparticles.	5M	CO2	L6
		UNIT – III			
6	a	Derive Nernst equation.	5M	CO3	L3
	b	Write an account of Potentiometric titrations.	5M	CO3	L2
		(OR)			
7		Explain construction and working of Lead-Acid storage battery.	10M	CO3	L5
		UNIT – IV			
8	a	Define coordination polymerization and explain the mechanism involved in it.	5M	CO4	L5
	b	Distinguish between Thermoplastic and Thermosets.	5M	CO4	L4
		(OR)			

| 9 | a | Explain the synthesis & applications of Bakelite. | 5M | CO4 | L5 |
| | b | Discuss the mechanism of conductivity of poly aniline | 5M | CO4 | L6 |

UNIT – V

| 10 | a | Write a short note on Beer Lambert's Law. | 5M | CO5 | L1 |
| | b | Discuss in brief about basic principle and instrumentation involved in UV-Visible spectroscopy. | 5M | CO5 | L6 |

(OR)

| 11 | | Explain Principle, Instrumentation and applications of Gas chromatography. | 10M | CO5 | L5 |

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K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B.Tech. II Semester (R23UG) Regular End Examinations of July – 2024
SUB: Engineering Physics (EEE, CSE, AI&ML)

Time: 3 Hours   Max. Marks: 70

Instructions:
1. Answer all **10 questions** from **Part – A,** and should be answered **at one Place.** Each question carries **two marks.**
2. Answer one full question from each unit in **Part – B**. Each full question carries **10 marks**.

PART – A   10*2 = 20M

1	a	State the principle of superposition.	2M	CO1	L2
	b	Mention the thickness of quarter wave plate.	2M	CO1	L2
	c	Define space lattice & unit cell.	2M	CO2	L1
	d	State Bragg's diffraction condition.	2M	CO2	L1
	e	Susceptibility of iron is more than that of copper. Why?	2M	CO3	L2
	f	What are internal fields?	2M	CO3	L1
	g	Mention the physical significance of a wave function.	2M	CO4	L1
	h	Explain the merits and demerits of classical free electron theory	2M	CO4	L1
	i	Define intrinsic semiconductor.	2M	CO5	L1
	j	List two applications of Hall Effect.	2M	CO5	L1

PART – B   5*10=50M
UNIT – I

2		Explain the formation of Newton's rings. Determine the expression for wavelength of a monochromatic light using Newton's ring.	10M	CO1	L3

(OR)

3	a	Describe the construction and working of Nicol's prism and explain how it is used as polarizer and analyzer.	8M	CO1	L3
	b	Calculate the thickness of a quarter-wave plate made of quartz to be used with sodium light $\lambda = 6000$ Å, $\mu_o = 1.544$ and $\mu_e = 1.553$.	2M	CO1	L3

UNIT – II

4		Show that FCC crystals are closely Packed than SC and BCC crystals.	10M	CO2	L3

(OR)

5		Describe with suitable diagram, the Laue's method of determination of crystal structure. Also, Explain Debye-Scherrer method (Powder method).	10M	CO2	L3

UNIT – III

6		Explain the types of polarization in dielectrics.	10M	CO3	L2

(OR)

7	a	Describe the classifications of magnetic materials.	8M	CO3	L3
	b	Write the applications of magnetic materials.	2M	CO3	L4

UNIT – IV

8		Describe the behavior of particle in a 1-dimentional infinite potential well.	10M	CO4	L3

(OR)

9	a	Describe the electrical conductivity in metals using quantum free electron theory.	7M	CO4	L3
	b	Explain the Fermi-Dirac distribution function.	3M	CO4	L2

UNIT – V

10	a	Derive the expressions for intrinsic carrier concentration and Fermi energy level of semiconductors.	6M	CO5	L3
	b	Distinguish between intrinsic and extrinsic semiconductors.	4M	CO5	L4

(OR)

11	a	Discuss drift and diffusion currents.	4M	CO5	L2
	b	Derive Einstein's relation for semiconductors.	6M	CO5	L3

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K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B.Tech. II Semester (R23UG) Regular End Examinations of July – 2024
SUB: Introduction to Programming (CE, ME & ECE)

Time: 3 Hours   Max. Marks: 70

Instructions:
1. Answer all **10 questions** from **Part – A,** and should be answered **at one Place**. Each question carries **two marks**.
2. Answer one full question from each unit in **Part – B**. Each full question carries **10 marks**.

PART – A   10*2 = 20M

1	a	List out applications of C language.	2M	CO1	L1
	b	What is a flowchart? Explain with one example.	2M	CO1	L1
	c	Write a program to find out whether a given number is even or odd.	2M	CO2	L1
	d	Describe the syntax of for loop.	2M	CO2	L1
	e	What is an array and its types?	2M	CO3	L1
	f	How string is declared and initialized?	2M	CO3	L2
	g	What are the various dynamic memory allocation functions?	2M	CO4	L1
	h	What is meant by extern variable? Give an example.	2M	CO4	L1
	i	Distinguish between Actual and formal arguments.	2M	CO5	L2
	j	What is meant by library function?	2M	CO5	L1

PART – B   5*10=50M
UNIT – I

2		Explain the basic organization of a computer focusing on ALU, Memory, I/O Units and the program counter	10M	CO1	L2

(OR)

3	a	Define algorithm? Write the characteristics of an algorithm.	5M	CO1	L1
	b	What are variables and constants? What are the rules for declaring the variables?	5M	CO1	L1

UNIT – II

4		Explain in detail about different conditional control structures in C.	10M	CO2	L2

(OR)

5		Discuss about switch statement and Develop a program that asks user an arithmetic operator ('+', '-', '*' or '/') and two operands and perform the corresponding calculation on the operands. Use a switch statement.	10M	CO2	L2

UNIT – III

6	a	Demonstrate the array definition, assignment, and initialization with examples.	5M	CO3	L2
	b	Write a C program to print the elements of an array in reverse order.	5M	CO3	L1

(OR)

7		List out String handling functions and explain any four functions with example.	10M	CO3	L1

UNIT – IV

8	a	What is pointer? How to initialize and declare pointer variables? Explain with examples.	5M	CO4	L1
	b	Explain array manipulation with pointers with suitable example.	5M	CO4	L2

(OR)

9		List out the differences between structures and unions with an example.	10M	CO4	L1

UNIT – V

10		Write a C program to exchange the value of two integers using call by value and call by reference.	10M	CO5	L1

(OR)

11	a	Define function. Describe different categories of functions.	5M	CO5	L1
	b	What is recursion? What are the advantages and Disadvantages of recursion?	5M	CO5	L1

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K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B.Tech. II Semester (R23UG) Regular End Examinations of July – 2024
SUB: Basic Electrical & Electronics Engineering (EEE, CSE, AI&ML)

Time: 3 Hours   Max. Marks: 70

Instructions:
1. Answer all **10 questions** from **Part – A,** and should be answered **at one Place**. Each question carries **two marks.**
2. Answer one full question from each unit in **Part – B**. Each full question carries **10 marks.**

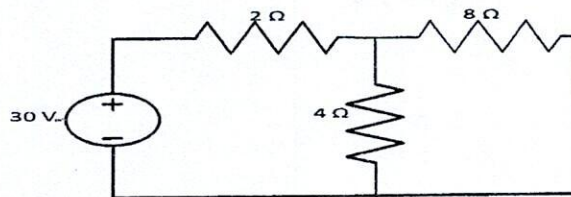|		**PART – A**		**10*2 = 20M**	
1	a	Write the expression for equivalent resistance in a parallel circuit	2M	CO1	L1
	b	Define Form Factor and Peak Factor.	2M	CO2	L1
	c	What are the applications of DC Generator?	2M	CO2	L1
	d	Why the scale of a permanent moving iron instrument is not uniform?	2M	CO2	L1
	e	What is Fuse and write its principle.	2M	CO3	L1
	f	How would you classify semiconductors?	2M	CO1	L2
	g	List the applications of diode.	2M	CO2	L1
	h	Why the voltage gain of a CE amplifier varies with frequency?	2M	CO2	L1
	i	Find excess-3code of the decimal number 81.61	2M	CO3	L2
	j	Define Register and Counter.	2M	CO3	L1

		PART – B		**5*10 = 50M**	

UNIT – I

2	a	Find the currents in each branch and the voltages across each resistance using nodal analysis.	5M	CO1	L4

	b	Determine the equivalent resistance between A&B to the following figure?	5M	CO2	L4
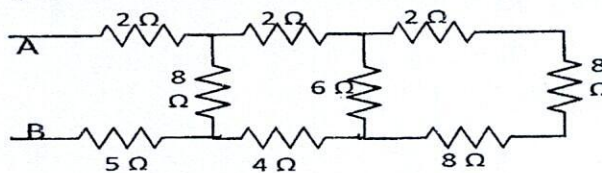
(OR)

3	a	Define Average Value. Also derive the expression for Average value of Sinusoidal Voltage Wave form.	5M	CO1	L3
	b	A resistance of 20Ω and an inductance of 0.2H are connected in series and are fed by a 230V, 50Hz, 1- ø, AC supply. Find (i) inductance reactance (XL) (ii) impedance (Z) (iii) current supplied by the source (I) (iv) Active power drawn by the load (P).	5M	CO1	L4

UNIT – II

4	a	Discuss the principle of operation of an Induction Motor.	5M	CO2	L2
	b	Explain the construction and working principle of permanent magnet of moving coil.	5M	CO2	L2

(OR)

5	a	Derive the expression for balanced condition of wheat Stone bridge.	5M	CO2	L3
	b	Discuss briefly about different earthing methods.	5M	CO3	L3

UNIT – III

6	a	With neat diagram, explain about Hydro Power Station.	5M	CO3	L3
	b	A consumer has a maximum demand of 200 kW at 40% load factor. If the tariff is Rs. 100 per kW of maximum demand plus 10 paise per kWh, find the overall cost per kWh.	5M	CO3	L4

(OR)

7	Explain VI Characteristics of PN diode	10M	CO1	L3

UNIT – IV

8	Discuss various configurations of Transistor as amplifier along with their characteristics.	10M	CO1	L3

(OR)

9	With neat block diagram explain full wave bridge rectifier and it's working.	10M	CO2	L3

UNIT – V

10	a	Explain Zener diode works as voltage regulator.	5M	CO2	L2
	b	Explain briefly about dc power supply with a block diagram.	5M	CO2	L2

(OR)

11	a	Obtain the basic logic gates AND, NOT and OR using Universal gate.	3M	CO3	L3
	b	Explain flip-flops with logic diagrams and truth tables.	7M	CO3	L3

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K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B.Tech. II Semester (R23UG) Regular End Examinations of July – 2024
SUB: *Basic Civil and Mechanical Engineering (CSE – RA)*

Time: 3 Hours   Max. Marks: 70

Instructions:
1. Answer all **10 questions** from **Part – A**, and should be answered **at one Place**. Each question carries **two marks**.
2. Answer one full question from each unit in **Part – B**. Each full question carries **10 marks**.

PART – A   10*2 = 20M

1	a	List some common structural materials.	2M	CO1	L1
	b	Name the uses of Surveying.	2M	CO2	L1
	c	Define Leveling.	2M	CO3	L1
	d	What are the Sources of water.	2M	CO3	L1
	e	Explain Hydrological cycle with a neat sketch.	2M	CO3	L2
	f	List of the mechanical engineering work on marine sector.	2M	CO3	L1
	g	Define casting. List the casting defects.	2M	CO4	L1
	h	Compare four stock engines with 2 stroke engines.	2M	CO4	L2
	i	State the importance of power plant.	2M	CO5	L6
	j	Write a note on moments of robots.	2M	CO5	L1

PART – B   5*10 = 50M
UNIT – I

2	a	Write a short note on Prefabricated structures.	5M	CO1	L1
	b	What are the criteria for selection of construction materials?	5M	CO1	L1

(OR)

3	a	Describe the different modes of transportation.	5M	CO1	L2
	b	Explain the future of structural engineering.	5M	CO1	L2

UNIT – II

4   Find the Included angles of a Closed traverse ABCDE The observed   10M   CO2   L3
Bearings are given below

Line	FB	BB
AB	$305^0\,00'$	$125^0\,00'$
BC	$74^0\,00'$	$254^0\,00'$
CD	$115^0\,30'$	$295^0\,30'$
DE	$165^0\,30'$	$345^0\,30'$
EA	$224^0\,00'$	$44^0\,00'$

(OR)

5   List the methods of leveling, explain any Two.   10M   CO2   L1

UNIT – III

6   Explain the site selection process of a dam   10M   CO3   L2

(OR)

7	a	List engineering materials on basics of natural learning manmade existence	5M	CO3	L1
	b	What is mechanical Engineering? Explain the roles of Mechanical Engineering in industries.	5M	CO3	L1

UNIT – IV

8	a	Write a short note on 3D printing.	5M	CO4	L1
	b	List the components of hybrid vehicles? Explain.	5M	CO4	L1

(OR)

9	a	Explain the manufacturing process of forming	5M	CO4	L2
	b	Explain the working of 4-stroke petrol engine with neat sketch.	5M	CO4	L2

UNIT – V

10	a	List the types of robot configuration? Explain anyone with need sketch.	5M	CO5	L1
	b	Derive the expression to find the efficiency of an diesel engine.	5M	CO5	L1

(OR)

11	a	Draw general layout of hydroelectric power plant showing all components with neat sketch.	5M	CO5	L2
	b	Explain the use of robots in medical & industrial applications.	5M	CO5	L4

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K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B.Tech. II Semester (R23UG) Regular End Examinations of July – 2024
SUB: Engineering Graphics (EEE, CSE & AI&ML)

Time: 3 Hours

Max. Marks: 70

Instructions: Answer one full question from each unit. Each full question carries 14 marks.

UNIT – I

1 Construct an ellipse when the distance of the focus from the directrix is equal to 50 mm and eccentricity is 2/3. 14M CO1 L5

(OR)

2 Draw a hypocycloid when the radius of the directing circle is twice the radius of generating circle and radius of the generating circle is 35 mm. 14M CO1 L5

UNIT – II

3 The front view of a line, inclined at 30^0 to the V.P. is 65 mm long. Draw the projection of the line, when it is parallel to and 40 mm above the VP, its one end being 30 mm in front of the V.P. 14M CO2 L4

(OR)

4 Draw the projections of a regular hexagon of 30 sides with its surface making an angle of 45° with HP. One of the sides of the hexagon is paralleltoHPand20awayfromit. 14M CO2 L5

UNIT – III

5 Hexagonal pyramid side of base 25 mm and axis 50 mm long rests with one of the corners of its base on H.P. Its axis is inclined at 30^0 to H.P. and 45^0 to V.P. Draw its projections. 14M CO3 L5

(OR)

6 A pentagonal pyramid with side of base 25mm and axis 60mm long is resting on one of its faces on HP such that its axis is parallel to VP. Draw the projections. 14M CO3 L5

UNIT – IV

7 A cylinder, with a 50 mm diameter and a 70 mm long axis, is resting on its base on the H.P. It is cut by a section plane inclined at 45^0 to the H.P. and perpendicular to the V.P. such that the plane bisects the axis. Draw its front view and sectional top view. 14M CO4 L5

(OR)

8 A pentagonal prism of 30 mm base edge and 70 mm height standing on its base is cut by a sectional plane inclined at 45^0 to HP which bisects its axis. Show the complete development of the truncated prism. 14M CO4 L4
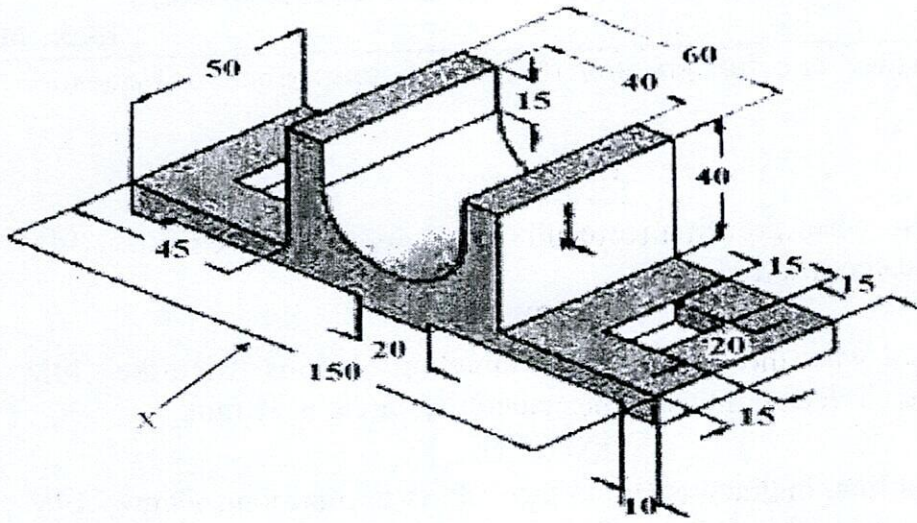
UNIT – V

9 A sphere of 60 mm diameter is placed centrally on the top of a frustum of a square pyramid. The base of the frustum is 60mm square, top is 40mm square, and its height 50 mm. Draw the isometric projection of the arrangement. 14M CO5 L5

(OR)
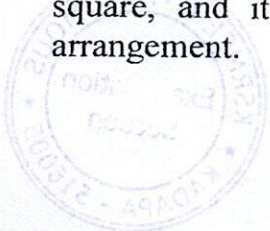
10　The isometric view is shown in the figure below. Draw the front view, top　14M　CO5　L5
view and side view (looking from right). All dimensions are in mm.

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