Q.P. Code: 916012 | **SET - 1**

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA

B. Tech. II Sem. (R15) Supplementary Examinations of August – 2021

SUB: Introduction to Data Structures (CSE)

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

Answer any FIVE Questions choosing one question from each unit.
All questions carry Equal Marks.

UNIT - I

1.	(a)	What is pointer variable? What are the benefits and drawbacks of pointers?	7M
	(b)	Write a c program to access value form memory location through pointer variable.	7M
		(OR)	
2.	(a)	Explain about the different types of pointers with examples?	7M
	(b)	Write a c program to illustrate how the multiple values returned from a function by using pointers**.**	7M

UNIT – II

3.	(a)	What is a file? Write and explain the syntax to open and close a file.	7M
	(b)	Explain with a program to allocate single block of memory using dynamic memory allocation methods?	7M
		(OR)	
4.	(a)	Explain about putc() and getc() operations on files with examples?	10M
	(b)	What is the need to resize the size of a block of memory using realloc() function?	4M

UNIT – III

5.	(a)	What is Data Structure? Explain about the different types of data structures?	5M
	(b)	Explain the applications of Stack with examples?	9M
		(OR)	
6.	(a)	What is linear data structure? Explain the operations of Queue Data structure?	9M
	(b)	Write the steps to convert the postfix expression into prefix expression.	5M

UNIT – IV

7.	(a)	What is linked list? Write the differences between Arrays and Linked Lists.	6M
	(b)	Write the algorithm to Delete the specified node at the specified position in Double linked list.	8M
		(OR)	
8.	(a)	Write the algorithm to insert a new node at the specified position in single linked list.	7M
	(b)	What is Sparse Matrices? Explain the array representation of it with an example?	7M

UNIT-V

9.	(a)	Write the Quick sort algorithm.	8M
	(b)	Write the differences between quick sort and merge sort techniques.	6M
		(OR)	
10.	(a)	Write the Linear search algorithm.	7M
	(b)	Write the benefits and drawbacks of Linear search algorithm	7M

Q.P. Code: 916212 | **SET - 1**

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA

B. Tech. II Sem. (R15) Supplementary Examinations of August – 2021

SUB: Electrical Circuits (EEE & ECE)

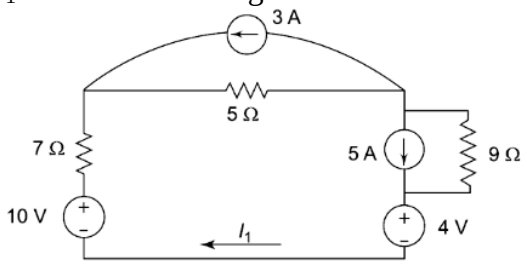
Time: 3 Hours **Max. Marks: 70**

Answer any FIVE Questions choosing one question from each unit.
All questions carry Equal Marks.

UNIT - I

1. (a) Illustrate about: (i) Kirchhoff's laws (ii) Series and parallel circuit 7M

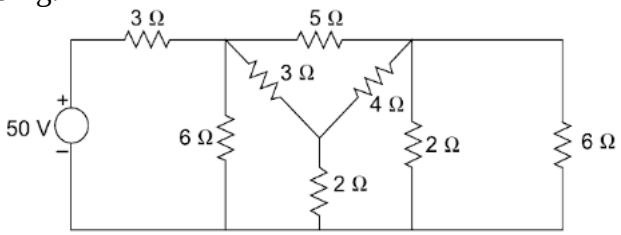
(b) Determine the value of I_1 in the circuit using source transformation technique. 7M



(OR)

2. (a) Summarize the types of energy sources used in electrical circuits. 7M

(b) Using star- delta transformation, determine the current drawn by the source in the circuit shown in the fig. 7M



UNIT – II

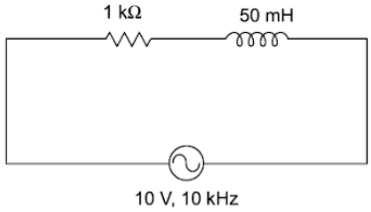
3. (a) Define: i) Instantaneous value ii)Peak Value iii) Cycle iv) Time period 7M

(b) Determine the following parameters of a voltage v = 200 sin314t. 7M
(i) Frequency (ii) Form factor (iii) Crest factor

(OR)

4. (a) Illustrate the types of powers in an AC circuit. 7M

(b) To the circuit shown in fig. consisting of a 1k ohm resistor connected in series with a 50mH coil, a 10V rms, 10KHz signal is applied. Find i) impedance Z, ii) current I, iii) Phase angle(θ) & iv) Voltage across R & L. 7M



UNIT – III

5. (a) Find the resonant frequency,band width,quality factor of a series a.c circuit consisting of a coil resistance 100Ω and inductance of 10mH and capacitance of 5μF. 7M

(b) Define resonant frequency and derive the equation of resonant frequency of series RLC circuit. 7M

(OR)

6. (a) What is the current locus diagram? Sketch the current locus diagram of series RL circuit as R varies from 0 to Infinity and show that it is a circle. 7M

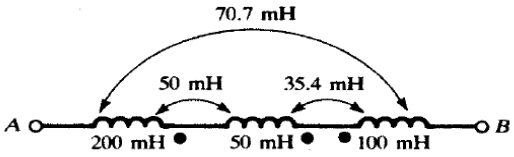
(b) What is the current locus diagram? Sketch the current locus diagram of series RL 7M

circuit as L varies from 0 to Infinity and show that it is a circle.

UNIT – IV

7. (a) Derive the relation between self inductance, mutual inductance and coefficient of coupling. 7M

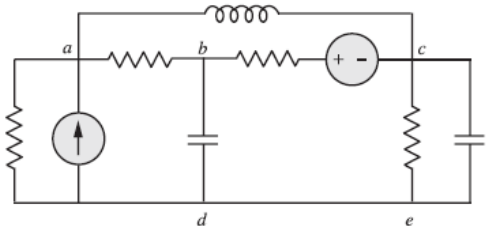
(b) Determine the inductance of the three series connected inductors as shown in given figure 7M



(OR)

8. (a) Distinguish between the series and parallel magnetic circuits. 7M

(b) Draw dual network to the given circuit. 7M

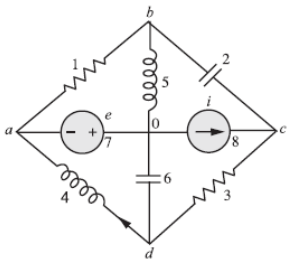


UNIT-V

9. (a) Construct oriented graph to the given reduced incidence matrix. 7M

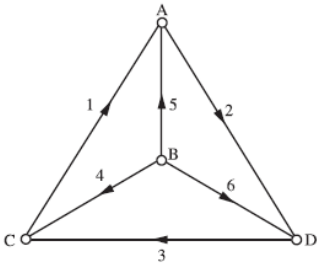
$$\begin{array}{c} \\ a \\ b \\ c \\ d \end{array} \begin{array}{c} \begin{array}{cccccccc} 1 & 2 & 3 & 4 & 5 & 6 & 7 & 8 \end{array} \\ \left[\begin{array}{cccccccc} 1 & 0 & 0 & 0 & 1 & 0 & 0 & 1 \\ 0 & 1 & 0 & 0 & -1 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 & 0 & -1 & 1 & -1 \\ 0 & 0 & 0 & 1 & 0 & 0 & -1 & 0 \end{array}\right] \end{array}$$

(b) Draw oriented graph to the given circuit and write fundamental tie-set matrix, loop equations and branch currents in terms of loop currents. 7M

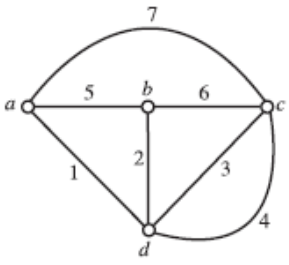


(OR)

10. (a) Write the fundamental tie-set matrix and cut-set matrix to the given graph (Tree branches are:4,5,6). 7M



(b) Write the incidence matrix and tie set matrix to the given graph(Tree branches are:2,5,6). 7M



Q.P. Code: 916412 | **SET - 1**

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA

B. Tech. II Sem. (R15) Supplementary Examinations of August – 2021

SUB: Engineering Drawing - 2 (CE & ME)

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

Answer any FIVE Questions choosing one question from each unit.
All questions carry Equal Marks.

UNIT - I

1. A hexagonal prism of side of base 30 and axis 75 long, is resting on its base on H.P such that, a rectangular face is parallel to V.P. It is cut by a section plane, perpendicular to V.P and inclined at 30^0 to H.P. The section plane is passing through the top end of an extreme lateral edge of the prism. Draw the development of the lateral surface of the cut prism. 14M

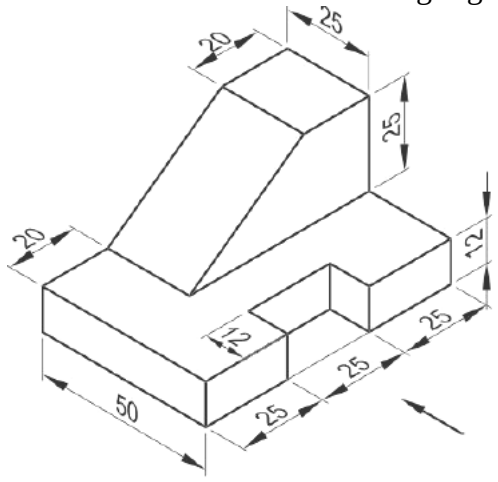
(OR)

2. (a) Draw the development of the lateral surface of a cone of base diameter 48mm and altitude 55mm. 7M

(b) Draw the development of the lateral surface of a right square prism of edge of base 30mm and axis 50mm long. 7M

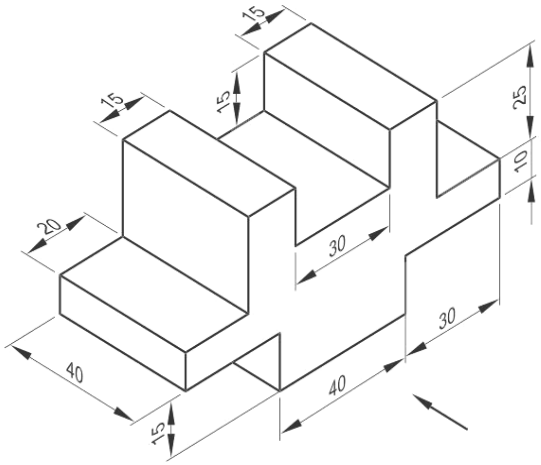
UNIT – II

3. Draw the elevation, plan and side view for the following Fig 14M



(OR)

4. Draw the elevation, plan and side view for the following Fig



UNIT – III

5. Draw an isometric projection of a pentagonal prism of 40 mm base side and 70 mm long axis resting on its base on the H.P. with an edge of the base parallel to the V.P. 14M

(OR)

6. Draw isometric view of a hexagonal prism with side of base 25mm and 60 mm long axis. The prism is resting on its base on the H.P. with an edge of the base parallel to the V.P. 14M

UNIT – IV

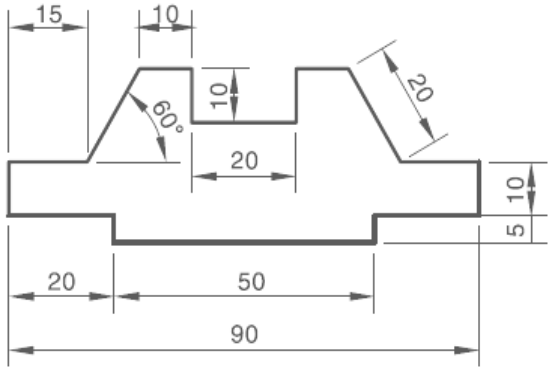
7. A vertical cylinder of 50 mm diameter and 75 mm long is penetrated by a horizontal cylinder of 40 mm diameter and 75 mm long such that their axes bisect each other at right angles. Draw the intersection curve. 14M

(OR)

8. A cone of base diameter 80 mm and height 125 mm stands with its base on the HP. It is penetrated by a horizontal cylinder of diameter 35 mm. If the axes of the two solids intersect at a point on the cone's axis 40 mm above the base, draw the projections of the curves of intersection. 14M

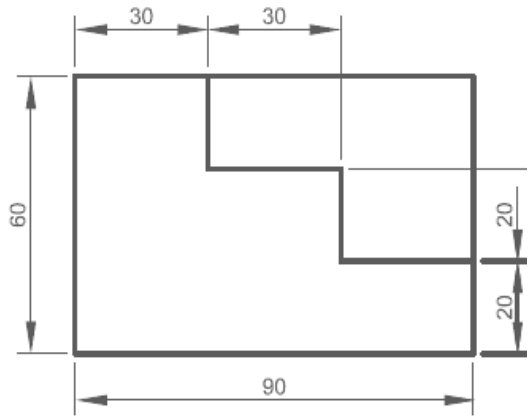
UNIT-V

9. State a series of command steps required to reproduce Fig. with the help of Line command, using relative rectangular polar coordinate system. 14M



(OR)

10. State a series of command steps required to reproduce Fig. with the help of Line command, using absolute coordinate system. 14M



Q.P. Code: 916612 | **SET - 1**

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA

B. Tech. II Sem. (R15) Supplementary Examinations of August – 2021

SUB: English - II (Common to All)

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

Answer any FIVE Questions choosing one question from each unit.
All questions carry Equal Marks.

UNIT - I

1. (a) Write an essay on 'Technology –is it a boon or bane?' 8M

(b) Write a short note on the principles of writing. 6M

(OR)

2. (a) Write an essay on 'the Corona pandemic-its effects on the society'. 8M

(b) Write a short note on the organizing of ideas in an essay. 6M

UNIT – II

3. (a) Identify the syllables in the following words and write a short note on syllable system of English. (i) Telephone (ii) photographer (iii) meet (iv) book 8M

(b) Write a short note on the significance of the knowledge about audience for making an effective speech. 6M

(OR)

4. (a) The following flow chart shows the way community hygiene programme is implemented in tribal area. Convert the following diagram into an essay. 10M

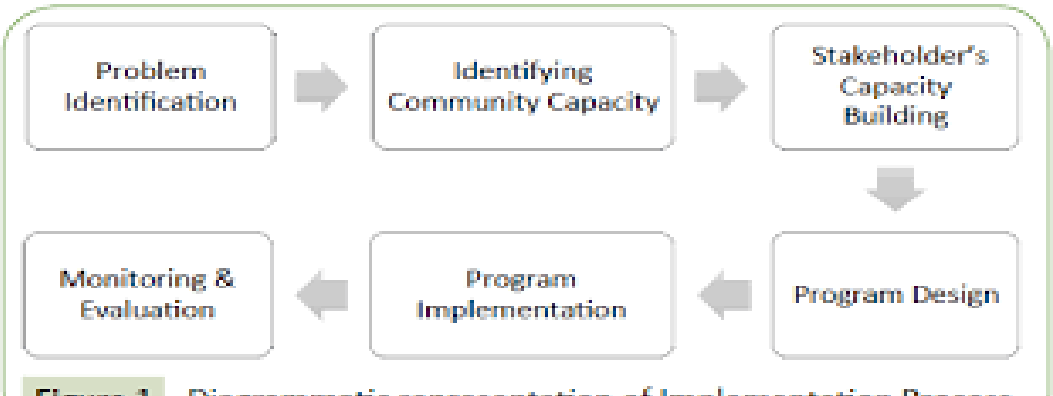


Figure 1 Diagrammatic representation of Implementation Process.

(b) Correct the following sentences 4M

(i) My friend is going for a walk every day.
(ii) Suresh is most efficient employee of the office.
(iii) This town is located on the north of Mumbai.
(iv) I can play football beside golf.

UNIT – III

5. (a) Imagine yourself as a doctor treating a Corona patient, create a dialogue where you are giving necessary instructions to the patient about self quarantining. 7M

(b) A teacher happens to meet her/his former student after a long time. Create a dialogue for this context. 7M

(OR)

6. (a) Imagine yourself as a science teacher talking to your 9^{th} class student about the law of attraction. Create a dialogue for this context. 7M

(b) Two strangers happen to meet at an art exhibition. Create a dialogue between them. 7M

UNIT – IV

7. (a) Write a letter to the admissions in charge of a university enquiring about the 7M

availability of hostel seat.

	(b)	Write an email to your teacher requesting him/her to help you to edit your resume	7M

(OR)

8.	(a)	Imagine yourself as a resident of Hyderabad, write a letter the GHMC commissioner enquiring about the Corona restriction in the city.	7M
	(b)	What is the role of nonverbal communication in a group discussion?	7M

UNIT-V

9.	(a)	Write a short a note on the do's and don'ts of a debate.	7M
	(b)	Write a report of your college annual day celebration.	7M

(OR)

10.	(a)	Write a resume for your dream job.	10M
	(b)	Write a note on the netiquette related to email.	4M

Q.P. Code: 916812 | **SET - 1**

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA

B. Tech. II Sem. (R15) Supplementary Examinations of August – 2021

SUB: Mathematics - III (Common to All)

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

Answer any FIVE Questions choosing one question from each unit.
All questions carry Equal Marks.

UNIT - I

1. (a) Compute A^{-1} for the matrix $A=\begin{bmatrix}2&1&1\\0&1&0\\1&1&2\end{bmatrix}$ using Caley-Hamilton theorem. Also, find the matrix represented by $A^8-5A^7+7A^6-3A^5+A^4-5A^3+8A^2-2A+I$. 7M

(b) Find the Eigen vales and Eigen vectors of the matrix $\begin{bmatrix}6&-2&2\\-2&3&-1\\2&-1&3\end{bmatrix}$ 7M

(OR)

2. (a) Find non-singular matrices P and Q such that PAQ is in the normal form for the matrix 7M

$\begin{bmatrix}1&1&2\\1&2&3\\0&-1&-1\end{bmatrix}$

(b) Reduce the following matrix into its normal form and hence find its rank 7M

$\begin{bmatrix}5&6&7&8\\6&7&8&9\\11&12&13&14\\16&17&18&19\end{bmatrix}$

UNIT – II

3. (a) Find the real root of the equation $x=e^{-x}$ using Newton-Raphson method. 7M

(b) Find a real root of the equation $x^3-3x-5=0$ by the method of false position correct to three decimal places. 7M

(OR)

4. Solve the equations $28x+4y-z=32,\ x+3y+10z=24,\ 2x+17y+4z=35$ by using Gauss-Seidel iteration method 14M

UNIT – III

5. (a) The population of a town in the decennial census was given below 7M

Year : x	1891	1901	1911	1921	1931
Population: y (in thousands)	46	66	81	93	101

Estimate the population for the year 1895.

(b) Use Lagrange's interpolation formula to find the value of y when $x=3.5$ from the following table 7M

x	0	1	3	4
y	-12	0	12	24

(OR)

6. Find the values of a, b and c so that $y=a+bx+cx^2$ is the best fit to the data 14M

x	0	1	2	3	4
y	1	0	3	10	21

UNIT – IV

7. Find $\frac{dy}{dx}$ *and* $\frac{d^2y}{dx^2}$ at $(i)\,x=1.2,\ (ii)\,x=1.6$ for the following data 14M

x	1.0	1.2	1.4	1.6	1.8	2.0	2.0
y	2.7183	3.3201	4.0552	4.9530	6.0496	7.3891	9.0250

(OR)

8. Evaluate $\int_0^1 \frac{dx}{1+x^2}$ by using (i) Trapezoidal rule (ii) Simpson's $\frac{1}{3}$ rule and (iii) Simpson's $\frac{3}{8}$ rule. with $h=0.5,\ 0.25\ and\ 0.125$ 14M

UNIT-V

9. Given $\frac{dy}{dx}=1+y^2$, with initial condition $y(0)=0$, find $y(0.2),\ y(0.4)\ and\ y(0.6)$ using Runge-Kutta fourth order method. 14M

(OR)

10. Determine the value of y when $x=0.1$ given that $y'=x^2+y$ using modified Euler's method with $h=0.05$. 14M

Q.P. Code: 917012 **SET - 1**

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA

B. Tech. II Sem. (R15) Supplementary Examinations of August – 2021

SUB: Environmental Studies (CE & ME)

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

Answer any FIVE Questions choosing one question from each unit.
All questions carry Equal Marks.

UNIT – I

1.	(a)	Define Environment and explain multidisciplinary nature of environmental studies.	7M
	(b)	What are the different activities that can be taken upto increase public awareness of environmental issues	7M
		(OR)	
2.	(a)	Write notes on Dams-benefits and problems.	7M
	(b)	Write notes on effects of deforestation	7M
		UNIT – II	
3.	(a)	Define ecosystem and explain structure & functions of ecosystem.	7M
	(b)	Write notes on energy flow in ecosystem	7M
		(OR)	
4.		What are food chain, food web and ecological pyramids? Give examples and discuss their significance.	14M
		UNIT – III	
5.	(a)	Write a short note on bio-geographical classification of India.	7M
	(b)	Discuss the hot spots of biodiversity.	7M
		(OR)	
6.	(a)	Define biodiversity. Explain the types of biodiversity.	7M
	(b)	Write notes on endangered and endemic species of India	7M
		UNIT – IV	
7.		Define Air pollution .Give an account of causes and effects of air pollution. Enumerate various methods for control of air pollution.	14M
		(OR)	
8.	(a)	Role of an individual in prevention of pollution.	6M
	(b)	Write notes on (i) Cyclones (ii) Earthquake	8M
		UNIT-V	
9.	(a)	Write notes on Women and Child Welfare	7M
	(b)	Write notes on HIV (or) AIDS.	7M
		(OR)	
10.	(a)	Write notes on Rain water harvesting.	7M
	(b)	Urban problems related to energy.	7M

Q.P. Code: 917212 | **SET - 1**

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA

B. Tech. II Sem. (R15) Supplementary Examinations of August – 2021

SUB: Programming in C (CE & ME)

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

Answer any FIVE Questions choosing one question from each unit.
All questions carry Equal Marks.

UNIT – I

1.	(a)	Define Algorithm? Write an algorithm for finding largest number among 4 numbers?	7M
	(b)	Define Variable? Explain declaration and initialization of variables in detail?	7M
		(OR)	
2.	(a)	Explain System Development tools in detail?	7M
	(b)	Explain the process of creating and executing a C Program?	7M
		UNIT – II	
3.	(a)	Define Expression? Explain the procedure for evaluating expressions with an example?	5M
	(b)	Explain the types of Selection Statements with examples?	9M
		(OR)	
4.	(a)	Write a C Program to print series of N prime numbers?	7M
	(b)	Define Operator? Explain Operators in C?	7M
		UNIT – III	
5.	(a)	Define Loop? Explain Pre-Test and Post-Test Loops with examples?	5M
	(b)	Write a C Program to find factorial of a given number using recursion?	9M
		(OR)	
6.	(a)	Write a C Program to print N Natural numbers using ‘for’ Loop?	5M
	(b)	Explain User Defined Functions in C?	9M
		UNIT – IV	
7.	(a)	Define Array? Explain declaration and initialization of arrays with examples?	7M
	(b)	Define String? Explain various String Handling Functions in C with examples?	7M
		(OR)	
8.	(a)	Explain Exchange Sort with example?	7M
	(b)	Write a C program for concatenating two Strings?	7M
		UNIT-V	
9.	(a)	Define Structure? Explain declaration and initialization of a Structure?	7M
	(b)	What is Pointer? List out the advantages and disadvantages of pointers?	7M
		(OR)	
10.	(a)	What is Union? Explain declaration and initialization of a Union?	7M
	(b)	Write a C Program to find addition of 2 Numbers using pointers?	7M

Q.P. Code: 917612 | **SET - 1**

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA

B. Tech. II Sem. (R15) Supplementary Examinations of August – 2021

SUB: Mathematics – II (CE & ME)

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

Answer any FIVE Questions choosing one question from each unit.
All questions carry Equal Marks.

UNIT - I

1. (a) Prove that $\nabla r^n = nr^{n-2}\bar{r}$ where $\bar{r} = x\bar{i} + y\bar{j} + z\bar{k}$. 7M

(b) Find the directional derivative of $f = xy + yz + zx$ in the direction of vector $\bar{i} + 2\bar{j} + 2\bar{k}$ at the point $(1, 2, 0)$. 7M

(OR)

2. Verify Green's theorem for $\int_c (xy + y^2)dx + x^2 dy$ where c is bounded by $y = x$ and $y = x^2$. 14M

UNIT – II

3. (a) Find $L[t^2 e^t \cos 4t]$. 7M

(b) Find $L\left[\left(\sqrt{t} - \frac{1}{\sqrt{t}}\right)^3\right]$. 7M

(OR)

4. (a) Evaluate $\int_0^\infty t\, e^{-3t} \sin t\, dt$. 7M

(b) Find the $L\left[e^{-t}\int_0^t \frac{\sin t}{t} dt\right]$. 7M

UNIT – III

5. Solve $\frac{d^2x}{dt^2} + x = 6\cos 2t$, if $x(0) = 3, x'(0) = -1$. 14M

(OR)

6. Apply Convolution theorem to evaluate $L^{-1}\left[\frac{s}{(s^2 + a^2)^2}\right]$ 14M

UNIT – IV

7. Find a Fourier series to represent $x - x^2$ from $x = -\pi$ to $x = \pi$, 14M

(OR)

8. Obtain half range cosine series for $f(x) = \begin{cases} kx & ,0 \le x \le \frac{l}{2} \\ k(l - x), & \frac{l}{2} \le x \le l \end{cases}$. 14M

UNIT-V

9. (a) Form the partial differential equation $z = f\left(\frac{xy}{z}\right)$ by eliminating the arbitrary function. 7M

(b) Using the method of separation of variables, solve $\frac{\partial u}{\partial x} = 2\frac{\partial u}{\partial t} + u$ where $u(x,0) = 6e^{-3x}$. 7M

(OR)

10. A String is stretched and fastened to two points l apart. Motion is started by displacing the string in the form $y = k(lx - x^2)$ from which it is released at a time $t = 0$. Find the displacement of any point on the string at a distance x from one end at time t. 14M

Q.P. Code: 917812 | **SET - 1**

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA

B. Tech. II Sem. (R15) Supplementary Examinations of August – 2021

SUB: Human Values and Professional Ethics (EEE, ECE & CSE)

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

Answer any FIVE Questions choosing one question from each unit.
All questions carry Equal Marks.

UNIT - I

1.	(a)	Discuss the importance of engineering ethics to become an ideal engineer in the society.	7M
	(b)	What is integrity? How is integrity related to professionals?	7M
		(OR)	
2.	(a)	What is valuing time? How valuing time makes a person greater in society?	7M
	(b)	Compare ethics and morals.	7M
		UNIT – II	
3.		Define code of ethics? Explain role of code of ethics in promoting professionalism.	14M
		(OR)	
4.		Describe the major ethical issues involved in research.	14M
		UNIT – III	
5.		Discuss the importance of the designing for safety. Do you think that safety of a design is the moral responsibility of an engineer? Explain.	14M
		(OR)	
6.	(a)	What are the types of risks? Explain with examples.	7M
	(b)	Analyze the attitude of different types of consumers with regard to safety.	7M
		UNIT – IV	
7.	(a)	What is Whistle blowing? Discuss the process of Whistle blowing prevention.	7M
	(b)	Write a note on collective bargaining.	7M
		(OR)	
8.	(a)	Define loyalty. Explain two senses of loyalty.	7M
	(b)	Discuss the impact of compensation on collegiality.	7M
		UNIT-V	
9.		Define Intellectual Property Rights (IPR). Explain various issues relating to IPR.	14M
		(OR)	
10.	(a)	How is a computer used as an instrument of unethical behavior?	7M
	(b)	Discuss the skills required for an engineer to take up management.	7M

Q.P. Code: 918412 | **SET - 1**

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA

B. Tech. II Sem. (R15) Supplementary Examinations of August – 2021

SUB: Engineering Chemistry (EEE, ECE & CSE)

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

Answer any FIVE Questions choosing one question from each unit.
All questions carry Equal Marks.

UNIT - I

1.	(a)	Explain the softened of water by Ion-exchange process and explain the advantages over other methods	9M
	(b)	Write notes on Reverse Osmosis	5M
		(OR)	
2.	(a)	Define hardness and explain units of hardness	6M
	(b)	i) Impurities in water ii) Disadvantages of hard water	8M
		UNIT – II	
3.	(a)	Preparation, properties and applications of Bakelite	8M
	(b)	Preparation, properties and applications of Buna-S	6M
		(OR)	
4.		Define polymerization and explain types of polymerization with examples	14M
		UNIT – III	
5.	(a)	Write notes on H_2-O_2-fuel cell with neat diagram	7M
	(b)	Explain Electro chemical cell with neat diagram	7M
		(OR)	
6.		Give an account of the various factors influencing the rate of corrosion by giving suitable examples.	14M
		UNIT – IV	
7.	(a)	Define refractory and write the classification of refractories with examples.	7M
	(b)	Define the lubricant and explain the functions of lubricants	7M
		(OR)	
8.		What are the characteristics of metallurgical coke? Describe the manufacture of metallurgical coke by Otto Haffman's method.	14M
		UNIT-V	
9.	(a)	Write principles of green chemistry and its applications.	7M
	(b)	Write a short note on Laws of photo chemistry	7M
		(OR)	
10.	(a)	Define catalyst. Explain types of catalysis and its applications.	9M
	(b)	Write a short note on phosphorescence.	5M

Q.P. Code: 918612 | **SET - 1**

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA

B. Tech. II Sem. (R15) Supplementary Examinations of August – 2021

SUB: Engineering Physics (EEE, ECE & CSE)

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

Answer any FIVE Questions choosing one question from each unit.
All questions carry Equal Marks.

UNIT - I

1.	(a)	Describe the different processes when light interacts with matter using a neat energy level diagrams. Which process is more prominent to produce light source. Mention the reasons. Derive the relation between the processes using Einstein coefficients.	10M
	(b)	What is interference? Discuss the conditions to be satisfied to produce stable and clear interference pattern.	4M
		(OR)	
2.	(a)	What is the principle behind the formation of rings in Newton's ring experiment? Discuss the construction and working of Newton's ring experiment. Derive the expressions to find the radius of curvature of plano-convex lens using this experiment.	10M
	(b)	What is the principle of light propagation in optical fibers? Explain using the ray diagrams.	4M
		UNIT – II	
3.	(a)	Define Unit cell. Mention the different parameters of the unit cell to classify the crystal systems. State and Explain Brag's law of X-ray diffraction.	8M
	(b)	Discuss any three different detection methods of ultrasonics in detail.	6M
		(OR)	
4.	(a)	Discuss the properties of ultrasonics. Explain the construction and working of piezoelectric electric method and derive the frequency of ultrasonic waves produced using this method.	10M
	(b)	Derive the expression for interplanar distance in cubic crystalline systems.	4M
		UNIT – III	
5.	(a)	Discuss dual nature of matter. Using the de Broglie hypothesis, determine the wavelength of matter waves.	6M
	(b)	What are the sources of resistivity? Derive the Equation for electrical conductivity of metals.	8M
		(OR)	
6.	(a)	Discuss the boundary conditions of the particle in an infinite potential well. Derive the probability of finding the particle and energy of a particle in the potential well using the quantum mechanics principles.	10M
	(b)	Mention the success the failures of classical free electron theory.	4M
		UNIT – IV	
7.	(a)	Discuss the classification of magnetic materials based on the interaction with the external magnetic field and discuss their properties.	10M
	(b)	What are the various applications of superconductors in science and technology?	4M
		(OR)	
8.	(a)	What are the postulates of BCS theory of superconductivity and discuss how the postulates explained the properties of superconductors in detail.	8M
	(b)	Explain the hysteresis curve observed in ferromagnetic materials on the application of magnetic field.	6M
		UNIT-V	
9.	(a)	What are drift and diffusion processes observed in semiconductors? Derive the currents associated with these processes.	8M
	(b)	Explain the synthesis of nanomaterials using Ball milling method in detail.	6M
		(OR)	
10.	(a)	State and explain Hall effect with the experimental setup and derive the hall coefficient.	10M

(b) Discuss the significance of surface to volume ratio in the case of nanomaterials. 4M