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

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

B. Tech. II Sem (R15) Supple. Examinations of April/May 2019

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) Define Pointer? Explain Declaration and Initialization of a Pointer Variable with Example? 7M
   (b) Write a c program to illustrate the use of pointers in arithmetic operations? 7M

(OR)

2. Explain Array of Pointers In C with an Example Program? 14M

UNIT – II

3. List and Explain various input and output functions of Files with its Declaration and Example? 14M

(OR)

4. Describe various Dynamic Allocation functions with an Example program for each? 14M

UNIT – III

5. Define ADT and describe 14M
   i) List ADT ii) Stack ADT iii) Queue ADT

(OR)

6. Define Queue and explain Implementation of Queue using Array with an example program? 14M

UNIT – IV

7. Explain Sparse matrix and Write a C program to find the given matrix is sparse Matrix or Not? 14M

(OR)

8. Explain the following operations that are performed on Doubly linked lists. 14M
   i) Insertion ii) Deletion

UNIT-V

9. Explain with an example about 14M
   i) Selection sort ii) Quick sort

(OR)

10. (a) Explain Binary search in detail? 7M
    (b) Write a c program to implement binary search? 7M

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

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

B. Tech. II Sem (R15) Supple. Examinations of April/May 2019

SUB: ELECTRICAL CIRCUITS (Common to EEE & ECE)

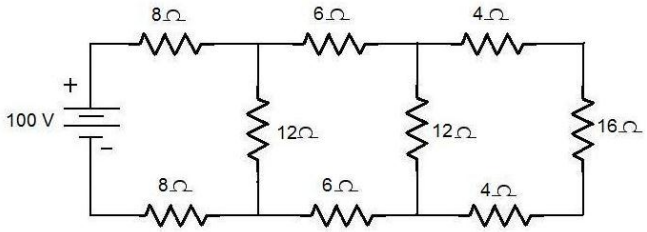
Time : 3 Hours | Max. Marks: 70

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

UNIT - I

1. (a) What are the types of sources? Explain them with suitable diagrams and Characteristics? 7M

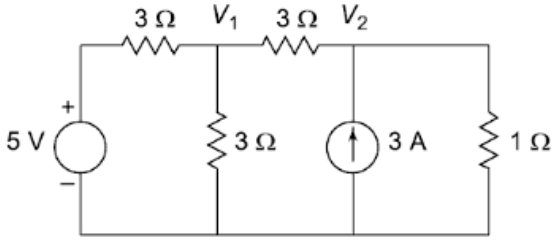
   (b) Calculate the equivalent resistances across the terminals of the supply and total current supplied by the source 7M



(OR)

2. (a) Derive the expression for Delta connected resistances in terms of Star connected resistances? 7M

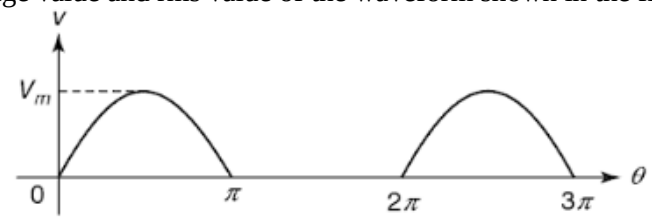
   (b) Using nodal analysis, determine the node voltages in the following network 7M



UNIT – II

3. (a) Illustrate the terms 7M
   i)Impedance ii)Reactance iii)Phase Difference Iv) Power factor

   (b) Determine the average value and rms value of the waveform shown in the fig. 7M



(OR)

4. (a) Show that average power consumed by a pure inductor and capacitor is zero. 7M

   (b) An AC circuit consists of a pure resistance of 10Ω and is connected across an AC supply of 230V, 50Hz. Calculate (i) Current (ii) Power consumed (iii) Power factor (iv) write down the equations for voltage and current. 7M

UNIT – III

5. (a) Obtain the expression for resonant frequency, bandwidth and Q-factor for Series RLC circuit. 7M

   (b) A series RLC circuit has R=20 ohm, L=0.005H and C = 0.2 uF. It is fed from a 100V variable frequency source. Find (i) frequency at which current is maximum 7M
   (ii) impedance at this frequency and (iii) voltage across inductance at this frequency.

(OR)

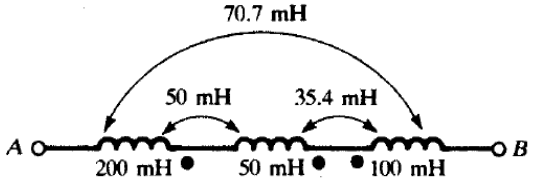
6. (a) Explain the procedure to draw the locus diagram of R-L series circuit when L is varying. 7M

   (b) A voltage of V = $50\angle 0^0$ V is applied to a series circuit of fixed resistance R = 5 ohms and a variable capacitance C. Sketch the admittance and current locus diagrams. 7M

UNIT – IV

7. (a) Derive an expression for equivalent inductance of two coupled coils (i) Coils are connected in series aiding. (ii) Coils are connected in series opposing 7M

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



(OR)

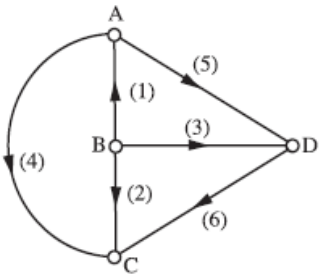
8. (a) Define and explain the Dot convention. 7M

   (b) A mild steel closed magnetic circuit has a mean length of 75 mm and a cross-sectional area of 320.2 mm^2. A current of 0.40A flows in a coil wound uniformly around the circuit and the flux produced is 200mWb. If the relative permeability of the steel at this value of current is 400 find (i) the reluctance of the material and (ii) the number of turns of the coil. 7M

UNIT-V

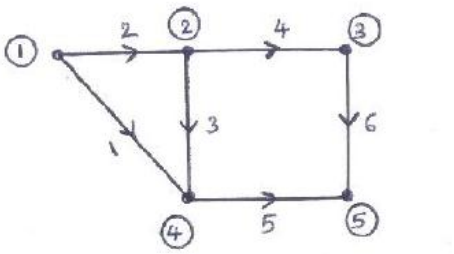
9. (a) Define the following terms, 7M
   (i) Link (ii) Graph (iii) Tree (iv) Node (v) Branch

   (b) From the given graph, select a tree with branches 3, 5, 6 and write the fundamental cut-set matrix and write node equations. 7M

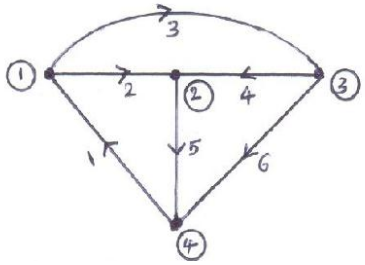


(OR)

10. (a) Write the complete and reduced incidence matrix for the given graph shown 7M



   (b) For the graph shown in Fig, write the incidence matrix. Write a tie-set matrix and express branch currents in terms of loop currents (Tree branches are: 1, 5, 6). 7M



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

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B. Tech. II Sem (R15) Supple. Examinations of April/May 2019
SUB: ENGINEERING DRAWING - II (Common to 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

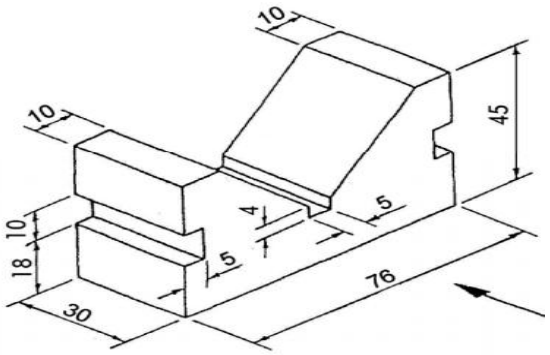
1. A cube of 50mm edge is resting on a face on HP such that a vertical face is inclined at 30^0 to VP. It is cut by a section plane perpendicular to VP and inclined to HP at 30^0 and passing through a point at 12 from the top end of the axis. Develop the lateral surface of the lower portion of the cube. 14M

(OR)

2. A cone of base 50mm diameter and axis 60mm long is resting on its base on HP. It is cut by a section plane perpendicular to VP and parallel to an extreme generator and passing through a point on the axis at a distance of 20 from the apex. Draw the development of the retained solid. 14M

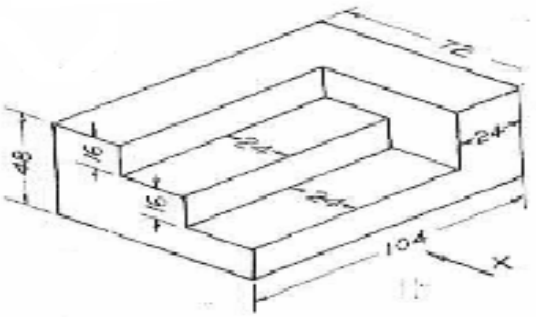
UNIT – II

3. Draw its FV, TV and its LSV. 14M



(OR)

4. Draw its FV, TV and its LSV 14M



UNIT – III

5. A hexagonal pyramid with side of base 30mm and axis 120mm long, is resting on its base on H.P. An edge of the base is parallel to VP.A horizontal section plane passing through a point on the axis, at a distance of 60mm from the base. Draw the isometric projection of the frustum of the pyramid. 14M

(OR)

6. A cylinder with diameter of base 60mm and axis 70mm long is resting on its base on HP. A section plane perpendicular to VP and inclined at 45^0 to HP, passes through the axis at a distance of 20mm from its top end. Draw the isometric projection of the truncated cylinder. 14M

UNIT – IV

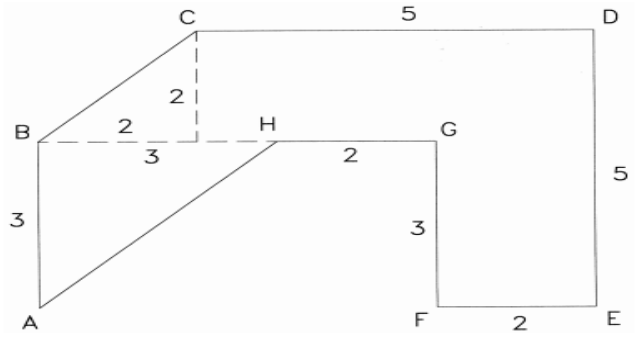
7. A vertical cone with diameter of base 90mm and axis 100mm long is penetrated by a horizontal cylinder of 50mm diameter. The axis of the cylinder intersects the axis of the cone at a point 30mm from the base. Draw the projections of the solids showing the lines of intersection. 14M

(OR)

8. A vertical cylinder of 75mm diameter is penetrated by another cylinder of 50mm diameter the axis of which is parallel to both the HP and VP. The two axes are 9mm apart. Draw the projections showing the curves of intersection. 14M

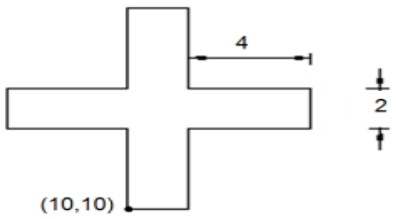
UNIT-V

9. State a series of command steps required to reproduce with the following figure with the help of line command using a combination of Polar and Cartesian coordinates 14M



(OR)

10. State a series of command steps required to reproduce with the following figure with the help of line command using a combination of Absolute coordinate system and Polar coordinate system. 14M



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

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B. Tech. II Sem (R15) Supple. Examinations of April/May 2019
SUB: ENGLISH - II (Common to All Branches)

Time : 3 Hours | Max. Marks: 70

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

UNIT – I

1. Write an essay on the importance of voting in 300 words 14M

(OR)

2. Write an essay on Social Media in 300 words. 14M

UNIT – II

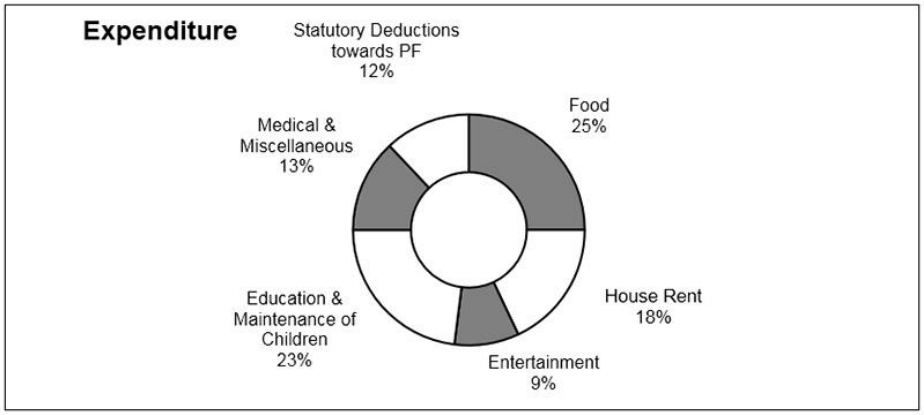
3. (a) What is Intonation? Explain its importance. 6M

(b) Identify the number of syllables in the following words. 3M

Beautiful
Imagination
Important
Surreal
Trophy
Balcony

(c) Analyze the given pie chart and write a paragraph on your inferences from the chart. 5M

Monthly expenditure of an employee



(OR)

4. (a) Write a letter to the editor of a newspaper on the issue of mass copying in some exam centers of SSC examinations in your hometown. 7M

(b) Correct the following sentences 7M

i) The new innovations are amazing.
ii) Is he the student of this university?
iii) Can you repeat again, please?
iv) He went to work despite of his illness.
v) Arjun is busy at the work and won't be here till 11:30.
vi) Raju has decided to quit his job a week ago.
vii) He plays Tennis, isn't he?

UNIT – III

5.		Write a technical report on the lack of employment opportunities in India and suggest a few measures to improve the situation.	14M
		(OR)	
6.	(a)	What is the need for a Curriculum Vitae?	4M
	(b)	Write the curriculum vitae of a 2nd year B.Tech student applying for an internship.	10M

UNIT – IV

7.	(a)	Draft a debate on the pros and cons of using smartphones in the colleges.	10M
	(b)	Explain the various types of interviews.	4M
		(OR)	
8.	(a)	Construct a dialogue between two friends on the effects of playing online games.	7M
	(b)	Draft a paragraph to be sent through e-mail to your HOD asking him for permission to attend a workshop in IIT-Madras.	7M

UNIT-V

9.	(a)	What are the various roles the participants take up during a group discussion?	7M
	(b)	List out the dos and don'ts of a group discussion.	7M
		(OR)	
10.	(a)	What are the things that need to be considered while drafting a speech?	7M
	(b)	Draft a speech that needs to be delivered by you as a speaker on a session on anti-ragging awareness.	7M

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

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

B. Tech. II Sem (R15) Supple. Examinations of April/May 2019

SUB: MATHEMATICS - III (Common to All branches)

Time : 3 Hours | Max. Marks: 70

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

UNIT - I

1. Reduce the following matrix into its normal form and hence find its rank

$$A=\begin{pmatrix} 1 & -1 & 2 & -3 \\ 4 & 1 & 0 & 2 \\ 0 & 3 & 0 & 4 \\ 0 & 1 & 0 & 2 \end{pmatrix}$$

(OR)

2. State Cayley Hamilton theorem. Verify Cayley Hamilton Theorem for the matrix $A=\begin{pmatrix} 2 & -1 & 1 \\ -1 & 2 & -1 \\ 1 & -1 & 2 \end{pmatrix}$ and hence find A^{-1}.

UNIT – II

3. (a) Find the real root of $x^3 - x - 1 = 0$ using bisection method.
   (b) Find the root of the equation $x^3 + x - 1 = 0$ using iterative method.

(OR)

4. Find the real root of the equation $x = e^{-x}$ using Newton-Raphson method.

UNIT – III

5. The population of a town in decennial census was as given below.
Estimate the population for the year 1895.

Year X	1891	1901	1911	1921	1931
Population Y in thousands	46	66	81	93	101

(OR)

6. The table below gives the temperature **T** in centigrade and lengths ***l*** in mm of a heated rod. If $l = a_0 + a_1 T$, find a_0 and a_1 using least square method.

T	40	50	60	70	80
l	600.5	600.6	600.8	600.9	601

UNIT – IV

7. From the following table obtain **dy/dx** and $\mathbf{d^2y/dx^2}$ at x = 1.2

x	1	1.2	1.4	1.6	1.8	2	2.2
y	2.7183	3.3201	4.0552	4.9530	6.0496	7.3891	9.0250

(OR)

8. Evaluate $\int_0^1 1/(1+x^2)\,dx$ using Simpson's 1/3 and 3/8 rule- Hence obtain the approximate value of π in each.

UNIT-V

9. Given $dy/dx = x^2 + y$, $y(0) = 1$ determine $y(0.02)$, $y(0.04)$, $y(0.06)$ by Euler's modified method.

(OR)

10. Given $dy/dx = x + y$, $y(0) = 1$ find y at x = 0.1, 0.2 and 0.3 by Taylor's series method and compute y(0.4) by Milne's method.

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

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

B. Tech. II Sem (R15) Supple. Examinations of April/May 2019

SUB: ENVIRONMENTAL STUDIES (Common to 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)	Explain efforts to increase food production to meet population explosion?	7M
	(b)	List out the problems associated with forest exploitation?	7M
		(OR)	
2.	(a)	What are the major functions of forests and why are they such important ecosystem?	7M
	(b)	Describe the major land degradation problems.	7M
		UNIT – II	
3.	(a)	Explain about the aquatic ecosystem functioning.	7M
	(b)	What efforts are being made to restore ecosystem damaged by human activities?	7M
		(OR)	
4.	(a)	Discuss the characteristic features forest ecosystem in detail.	7M
	(b)	Describe the structural and functional aspects of an ecosystem.	7M
		UNIT – III	
5.	(a)	What is conservation biology and why is important.	7M
	(b)	List out the different services that are contributed in various ways by biodiversity?	7M
		(OR)	
6.	(a)	What activities and characters of human endanger wildlife?	7M
	(b)	Explain the reasons for loss of our biodiversity.	7M
		UNIT – IV	
7.	(a)	Describe the strategies that would help to encourage the growth of recycling.	7M
	(b)	What are the main Sources and Effects of the Noise Pollution?	7M
		(OR)	
8.	(a)	Describe the Sources and Effects of Marine Pollution.	7M
	(b)	List out the effects and control measures of industrial solid wastes?	7M
		UNIT-V	
9.	(a)	What would the consequences be if the ozone layer surrounding the earth was destroyed?	7M
	(b)	Write in detail note on role of information Technology in Environment.	7M
		(OR)	
10.	(a)	Discuss about the problem and concern about the resettlement and rehabilitation of people.	7M
	(b)	What concerns are associated with sustainable development?	7M

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

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B. Tech. II Sem (R15) Supple. Examinations of April/May 2019
SUB: PROGRAMMING IN C (Common to 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 3 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?	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 types of 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)	Define Pointer? List out the advantages and disadvantages of pointers?	7M
		(OR)	
10.	(a)	Define 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) Supple. Examinations of April/May 2019

SUB: MATHEMATICS – II (Common to 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 $\nabla(r^n) = nr^{n-2}\bar{r}$ 7M

   (b) Show that the vector $(y+z)\bar{i} + (z+x)\bar{j} + (x+y)\bar{k}$ is irrotational and find its scalar potential. 7M

(OR)

2. Verify Divergence theorem for $\bar{F} = x^2 i + y^2 j + z^2 k$ over the surface S of the solid cut off by the plane $x + y + z = a$ in the first octant. 14M

UNIT – II

3. (a) Find $L\left\{\int_0^t te^{-t}\sin 4t\,dt\right\}$ 7M

   (b) Find $L\left[t^2 e^{-2t}\cos t\right]$ 7M

(OR)

4. Find the Laplace Transform of the function $f(t) = \begin{cases} \sin wt, & 0 < t < \frac{\pi}{w} \\ 0, & \frac{\pi}{w} < t < \frac{2\pi}{w} \end{cases}$ 14M

UNIT – III

5. (a) Find the inverse Laplace transform of $\frac{s+2}{s^2 - 4s + 13}$ 7M

   (b) Apply convolution theorem to evaluate $L^{-1}\left[\frac{s^2}{(s^2+a^2)(s^2+b^2)}\right]$ 7M

(OR)

6. Using Laplace transform, solve $(D^2 + n^2)x = a\sin(nt+2), y(0) = 0, y'(0) = 0$ 14M

UNIT – IV

7. (a) Find a Fourier series to represent $x - x^2$ from $x = -\pi$ to $x = \pi$ 10M

   (b) Express $f(x) = x$ as half range sine series in $0 < x < 2$ 4M

(OR)

8. (a) Expand $f(x) = e^{-x}$ as a Fourier series in $(-1,1)$ 7M

   (b) Find the Fourier series of the Triangular wave function defined by $f(x) = |x|$ for $-1 \le x \le 1$ and $f(x+2) = f(x)$ for all x 7M

UNIT-V

9. (a) Form the differential equation by eliminating the arbitrary functions from $z = f_1(y+2x) + f_2(y-3x)$ 7M

(b) Using the method of separation of variables, solve $2x\frac{\partial z}{\partial x} - 3y\frac{\partial z}{\partial y} = 0$ 7M

(OR)

10. A tightly stretched string with fixed end points $x = 0$ and $x = l$ is initially in a position given by $y = y_0 \sin^3\left(\frac{\pi x}{l}\right)$ .If it is released from rest from this position, find the displacement $y(x,t)$ 14M

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

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

B. Tech. II Sem (R15) Supple. Examinations of April/May 2019

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

Time: 3 Hours Max. Marks: 70

Note: Answer any FIVE Questions. All questions carry Equal Marks.

1.	(a)	What is the aim of engineering ethics?	14M
	(b)	Differentiate between profession and professionalism.	
	(c)	List the responsibilities of engineers to the society.	
	(d)	What is meant by learning from the past? Give at least two examples.	
	(e)	Define the term acceptability of risk.	
	(f)	What is discrimination?	
	(g)	Explain the role of engineer as an Adviser.	
2.	(a)	What is an inquiry? Explain different types of inquiries.	7M
	(b)	What is moral autonomy? Explain the skills needed by an engineer to improve moral autonomy.	7M
3.	(a)	Discuss various roles of codes of ethics in an organization.	7M
	(b)	Compare and contrast engineering experiments with standard Experiments.	7M
4.	(a)	Describe the responsibility of engineers towards the safety of product or design.	7M
	(b)	What are job related risks?	7M
5.	(a)	Explain the two kinds of loyalty.	7M
	(b)	Discuss the aspects of Indian Patent act.	7M
6.		'Weapon development needs a stipulated system of ethical values'. Justify your answer.	14M
7.		Discuss the importance of Eco-centric Ethics that protect the Environment.	14M
8.		Is absolute safety of any product possible? Discuss.	14M

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

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B. Tech. II Sem (R15) Supple. Examinations of April/May 2019
SUB: ENGINEERING CHEMISTRY (Common to 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)	Why do we express hardness of water in terms of $CaCO_3$ equivalent? Give relationship between the units of hardness	7M
	(b)	Describe the desalination of brakish water by electro-dialysis	7M
		(OR)	
2.	(a)	What is meant by hardness of water? How hardness of water is estimated by EDTA method	7M
	(b)	How the hard water is soften by Ion exchange process	7M

UNIT – II

3.	(a)	What is meant by polymerization process? Distinguish between addition and condensation polymerization.	7M
	(b)	What are the drawbacks of raw rubber? How the properties of rubber improved?	7M
		(OR)	
4.	(a)	Write short notes on Compounding of rubber	7M
	(b)	Write Preparation, properties and engineering applications of Silicones	7M

UNIT – III

5.	(a)	What are different kinds of batteries? Discuss Laclanche cell and its applications	7M
	(b)	Write short notes on i). Sacrificial anodic protection and ii). Impressed Current cathodic method	7M
		(OR)	
6.	(a)	What are the basic principles of Electroplating? Explain	7M
	(b)	What is meant by electrochemical cell? Explain basic concepts for construction of Electrochemical cells	7M

UNIT – IV

7.	(a)	What are the fuels? How the fuels are classified and give suitable examples to each	7M
	(b)	Define calorific value of a fuel. Distinguish gross and net calorific value	7M
		(OR)	
8.	(a)	How the Synthetic petrol is synthesized by Bergius?	7M
	(b)	What are the important functions of lubricant	7M

UNIT-V

9.	(a)	What is the main Significance of green chemistry?	7M
	(b)	What is meant by Catalyst? Explain homogeneous catalysis with suitable example	7M
		(OR)	
10.	(a)	What is meant by Green Chemistry? What are 12 principles of Green chemistry?	8M
	(b)	Write short notes on Solar cells	6M

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

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B. Tech. II Sem (R15) Supple. Examinations of April/May 2019
SUB: ENGINEERING PHYSICS (Common to 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) Show that the distance between the Newton's rings decreases outwards. In the Newton's rings experiment the diameter of 10^{th} ring was 0.5 cm. The wavelength of the sources was 5900 ^{0}A . Calculate the radius of the curvature of the lens. 8M
   (b) Explain the double slit diffraction. 6M

(OR)

2. (a) Define spontaneous emission and stimulated emission of radiation. Write any five differences between them. 7M
   (b) Differentiate the optical fibers basing on refractive index. Write any six differences between them. 7M
   Calculate refractive index of the core and the cladding of a fiber when NA is 0.22 and relative refractive index difference (Δ) is 0.012.

UNIT – II

3. (a) Explain different crystal systems. 7M
   (b) What are Miller indices? Write the procedure to determine them. Draw the planes for the Miller indices (110), (002), (111) 7M

(OR)

4. (a) State and prove Bragg's law. 7M
   The X rays of wavelength 1.5418 ^{0}A are diffracted by (111) planes in a crystal at an angle 30^0 in the I order. Calculate the interatomic spacing.
   (b) Explain the piezoelectric method with a neat diagram. Write any two advantages. 7M

UNIT – III

5. (a) What are matter waves? Write the equation for the wavelength of matter waves. Show that wavelength of matter waves is equal to 12.27 $A^0/\sqrt{V}$. 7M
   (b) Derive the equation for the energy of a particle in a box. 7M
   What is the minimum energy of an electron in one dimensional box of size 4 A^0.

(OR)

6. (a) Define i) Drift velocity ii) relaxation time c) mean free path. Derive the expression for electrical conductivity in metals. 7M
   (b) Describe i) density of states ii) Fermi-Dirac distribution. 7M

UNIT – IV

7. (a) Define i) permeability ii) susceptibility. Derive the relation between them. Write any four differences between diamagnetic and ferro magnetic materials. 7M
   (b) Define hysteresis. Write any five differences between hard and soft magnetic materials with examples. 7M

(OR)

8. (a) Write any five differences between type I and type II superconductors. Give two examples for each. 7M
   (b) Define i) flux quantization ii) London penetration depth. Explain Josephson effects. 7M

UNIT-V

9. (a) Define drift and diffuse currents. Write the Einstein relations. Find the diffusion coefficient of electrons in silicon at 300K if μ_e is 0.19 m^2 /Vs. 7M
   (b) Define Hall Effect and derive the Hall coefficient. Write any four applications. 7M

(OR)

10. (a) Explain the CVD method. Give any two advantages. 7M
    (b) Define nanoparticle. Write any 3 factors influencing Nano materials. 7M
    Calculate the surface area to volume ratio if a block of surface area 6 m^2 (1m^2 on one side) and a volume 1 m^3 is divided into 27 equal pieces.