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

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

B. Tech. II Sem. (R15) Supple. Examinations of September/October 2020

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)	Explain how the Pointer is Accessed ,initialized and Declared using a variable?	8M
	(b)	Write a C Program to implement add,sub,mul and Div using Pointers?	6M
		(OR)	
2.		With an Example Program Explain how the concept of Array is used in Pointers?	14M

UNIT – II

3.		Define File? With a Exmple Program Describe i) Fopen( ) ii) fclose( )	14M
		(OR)	
4.	(a)	Describe the Implementation of Malloc( ) with Example Program?	7M
	(b)	Describe the Implementation of Realloc( ) with Example Program?	7M

UNIT – III

5.		Define Data Structure and Differentiate the types of Data Structures with Examples?	14M
		(OR)	
6.		Define Stack and Explain the Implementation of Stack using an Array with a Program?	14M

UNIT – IV

7.		Explain the Concept of Sparse Matrices with Example Program?	14M
		(OR)	
8.	(a)	Describe Circular Linked List with Examples?	7M
	(b)	Describe Garbage Collection With Examples?	7M

UNIT-V

9.	(a)	Implement Merge Sort With an Example C Program?	7M
	(b)	Implement Bubble Sort with an Example C Program?	7M
		(OR)	
10.		Explain Two Way Search with an Example Program?	14M

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

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

B. Tech. II Sem. (R15) Supple. Examinations of September/October 2020

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)	Explain how the Pointer is Accessed ,initialized and Declared using a variable?	8M
	(b)	Write a C Program to implement add,sub,mul and Div using Pointers?	6M
		(OR)	
2.		With an Example Program Explain how the concept of Array is used in Pointers?	14M

UNIT – II

3.		Define File? With a Exmple Program Describe i) Fopen( ) ii) fclose( )	14M
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4.	(a)	Describe the Implementation of Malloc( ) with Example Program?	7M
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UNIT – III

5.		Define Data Structure and Differentiate the types of Data Structures with Examples?	14M
		(OR)	
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UNIT – IV

7.		Explain the Concept of Sparse Matrices with Example Program?	14M
		(OR)	
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UNIT-V

9.	(a)	Implement Merge Sort With an Example C Program?	7M
	(b)	Implement Bubble Sort with an Example C Program?	7M
		(OR)	
10.		Explain Two Way Search with an Example Program?	14M

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

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

B. Tech. II Sem. (R15) Supple. Examinations of September/October 2020

SUB: Electrical Circuits (EEE, ECE)

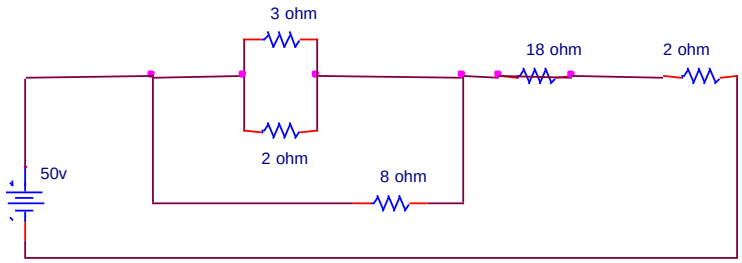
Time : 3 Hours | Max. Marks: 70

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

UNIT – I

1. (a) Illustrate the following 7M
(i) Kirchhoff's Laws , (ii) Series and parallel circuit,
(iii) Source Transformation Technique

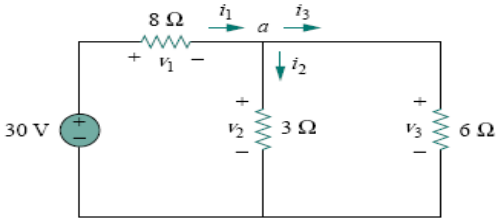
(b) Find the Equivalent resistance and the current in each resistance. 7M



(OR)

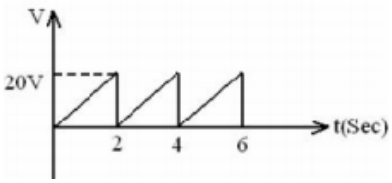
2. (a) Illustrate the classification of Electrical circuit elements. 7M

(b) Find the currents and voltages in the circuit shown in Fig. 7M



UNIT – II

3. (a) Determine the average and effective values of saw-tooth waveform as shown in below figure. 7M

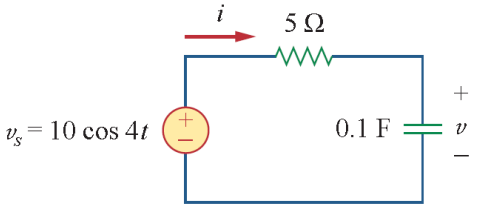


(b) Illustrate the significance of j-operator. What are the different forms of expressing the sinusoidal quantity in complex form? 7M

(OR)

4. (a) Derive an expression for the current, impedance, average power for a series RC circuit excited by a sinusoidally alternating voltage and also find the power factor of the circuit. Draw the phasor diagram. 7M

(b) Find the active power, reactive power and draw the power triangle to the given circuit. 7M



UNIT – III

5. (a) Compare series and parallel resonant circuits. 7M

(b) Given a series RLC circuit with R = 10 ohms, L = 1 mH and C = 1 μF is connected across a sinusoidal source of 20 V with variable frequency. 7M

Find i) The resonant frequency ii) Q factor of the circuit at resonant frequency
iii) Half power frequencies.

(OR)

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

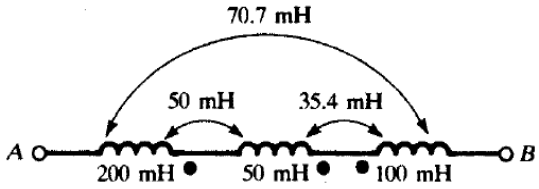
(b) A voltage V = $50\angle 0^0$ V is applied to a series circuit consisting of fixed inductive reactance X_L = 5 ohms and a variable resistance R. Sketch the admittance and current locus diagrams. 7M

UNIT – IV

7. (a) Define the following: 7M

i) Self-inductance ii) Mutual Inductance
iii) Static Induced e.m.f iv) Dynamically induced e.m.f.

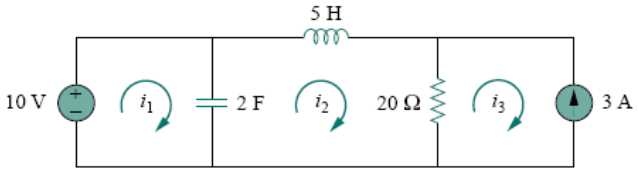
(b) Determine the inductance of the three series connected inductors as shown in given figure 7M



(OR)

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

(b) What is duality and Draw a dual circuit to the given circuit 7M

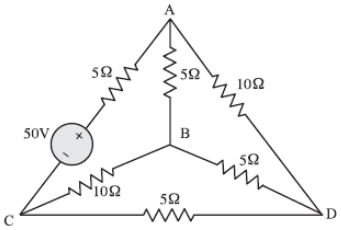


UNIT-V

9. (a) Explain the following terms with respect to graph theory 7M

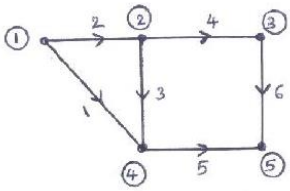
i) Node, ii) Tree , iii) Link , iv) Sub-graph

(b) Write a fundamental tie-set schedule and write loop equations to the given circuit. 7M

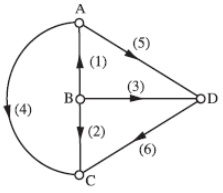


(OR)

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



(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



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

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

B. Tech. II Sem. (R15) Supple. Examinations of September/October 2020

SUB: Engineering Drawing - 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 square pyramid of side of base 30 and axis 50 long is resting on its base on H.P with an edge of the base parallel to V.P. A section plane, perpendicular to V.P and inclined at 45^0 to H.P bisects the axis. Draw the development of the lateral surface of the cut pyramid. 14M

(OR)

2. A cone of base 50 diameter and height 65 rests with its base on H.P. A section plane perpendicular to V.P and inclined at 30^0 to H.P bisects the axis of the cone. Draw the development of the lateral surface of the truncated cone. 14M

UNIT – II

3. Draw the view from the front, view from the top and view from the left for figure (1). 14M

(OR)

4. Draw the view from the front, view from the top and view from the right for figure (2). 14M

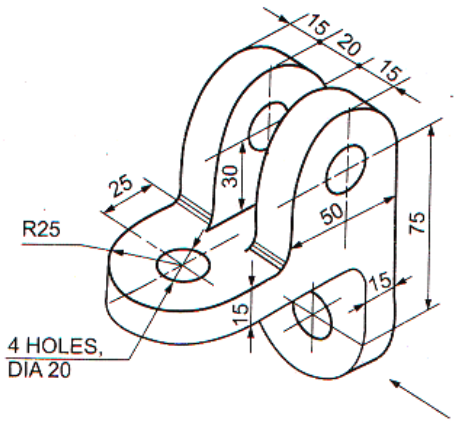


Figure 1

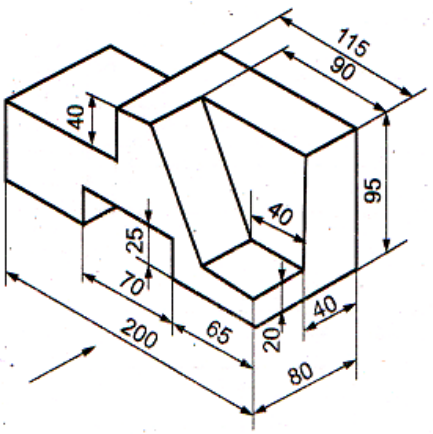


Figure 2

UNIT – III

5. A sphere of radius 20 is kept on the top face of a square prism of side of base 40 mm and height 20 mm. The latter is placed on the top face of a cylinder of 65 diameter and 25 mm height. Draw the isometric projection of the combination of solids having common axis. 14M

(OR)

6. Draw an isometric view of the object for the views shown in figure 3. 14M

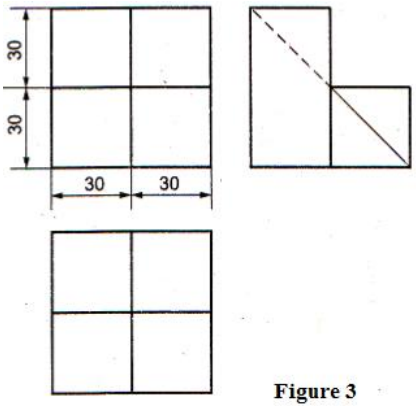


Figure 3

UNIT – IV

7. A vertical cylinder of diameter 60 mm is penetrated by another cylinder of diameter 45 mm. The axes of the two cylinders are intersecting at right angle. Draw the projections of the two cylinders, showing the lines (curves) of intersection. 14M

(OR)

8. A vertical cone, base diameter 75 mm and axis 100 mm long, is completely penetrated by a cylinder of diameter 45 mm. The axis of the cylinder is parallel to HP and VP and intersects axis of the cone at a point 28 mm above the base. Draw projections showing curves of intersection. 14M

UNIT-V

9. Write the sequence of command steps required to draw the object shown in figure 4 with the help of LINE command using absolute coordinate system. 14M

(OR)

10. Write the sequence of command steps required to draw the object shown in figure 5 with the help of LINE command using relative rectangular coordinate system. 14M

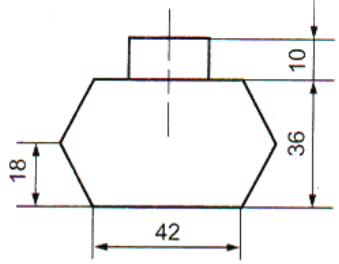


Figure 4

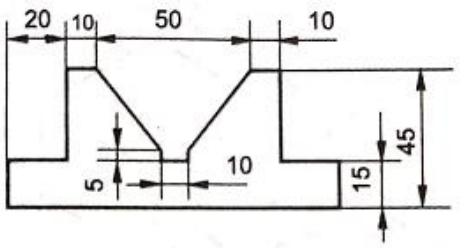


Figure 5

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

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

B. Tech. II Sem. (R15) Supple. Examinations of September/October 2020

SUB: English - 2 (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.

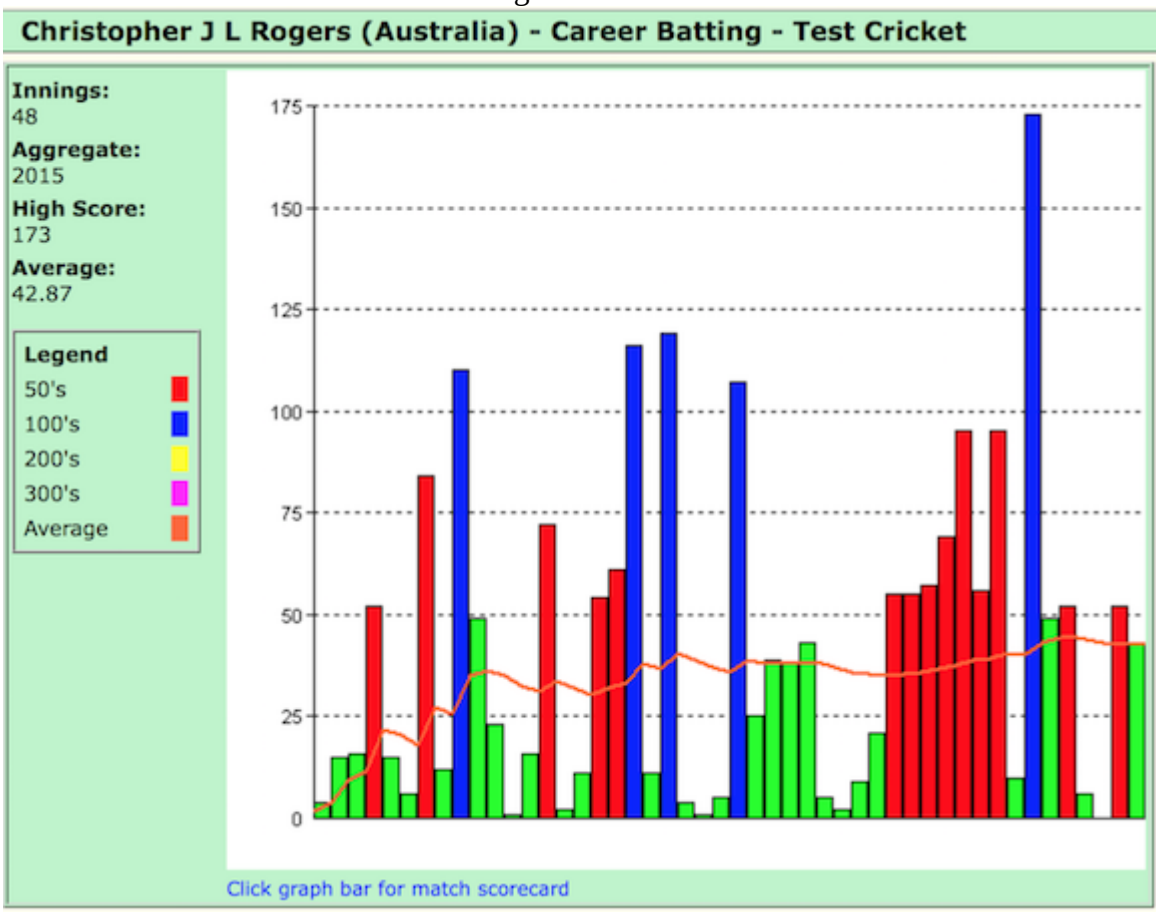
UNIT - I

1. (a) Write an essay on the **Covid-19 pandemic**.

   (b) What are the salient features of a good essay?

(OR)

2. (a) Transfer the information in the following Chart.



   (b) Assuming your father got down in Bus station give directions to him to reach your college.

UNIT – II

3. (a) Three students are going on a bike without face masks, helmets and necessary documents on a busy road on a lockdown day. They were stopped by a traffic police officer. Prepare a dialogue of nearly twenty exchanges between the police officer and the students.

   (b) What are the things to be kept in mind while writing an interesting dialogue?

(OR)

4. (a) Write about the roles and responsibilities of the Members of Interview Board.

   (b) Write ten frequently asked questions in job interviews with answers.

UNIT – III

5. (a) Write about the Do's and Don'ts during a Group Discussion.

   (b) Discuss the several useful strategies to do well in a Group Discussion.

(OR)

6. (a) Why are Debates important?

   (b) What are the strategies to do well in a Debate?

UNIT – IV

7. (a) Prepare a report on the need for constructing an indoor stadium in your college.

   (b) Assuming that you are in a Gulf Country, write a letter to your father about the difficulties faced by you during the present situation.

8. (a) What are the things to be kept in mind to deliver a good speech?

   (b) Assuming yourself as the District Collector, prepare the text of your speech to be delivered to the students of an Engineering college as the Chief Guest for the Annual day celebrations.

UNIT-V

9. (a) Assuming your self as the President of Wipro India, draft an e-mail to all your employees conveying the good news of announcing Deepavali bonus of one-month salary.

   (b) What is the generally accepted format of a CV? Also, write about the parts of a CV.

(OR)

10. (a) Correct the following sentences.
    (i) John is one of my best friend.
    (ii) We did not opened the account in the bank.
    (iii) The price of apples are very high.
    (iv) The students always prefer Coffee than Tea.
    (v) The cricket players always prefers practice with security.
    (vi) No man can serves two masters.
    (vii) Brett Lee bowls fast than Lillee.

    (b) What are problems faced when translating an English text into an Indian Language?

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

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

B. Tech. II Sem. (R15) Supple. Examinations of September/October 2020

SUB: Mathematics - 3 (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. (a) Reduce the following matrix into normal form and hence find its rank. 7M

$$\begin{bmatrix} 4 & 6 & 6 \\ 1 & 3 & 2 \\ -1 & -4 & -3 \end{bmatrix}$$

(b) Find the Eigen values of the matrix $A = \begin{bmatrix} 2 & 3+4i \\ 3-4i & 2 \end{bmatrix}$. 7M

(OR)

2. Find A^{-1} and A^4 for the matrix $A = \begin{bmatrix} 7 & 2 & -2 \\ -6 & -1 & 2 \\ 6 & 2 & -1 \end{bmatrix}$ by using Cayley-Hamilton theorem. 14M

UNIT – II

3. Define algebraic and transcendental equation and also compute a real root of the equation $3x = \cos x + 1$. 14M

(OR)

4. Solve the equations $x + 2y + z = 4, 2x - 3y - z = -3, 3x + y + 2z = 3$ by using Crout's method. 14M

UNIT – III

5. Construct Newton's forward interpolation polynomial for the following data and hence find the value of y for $x = 5.5$. 14M

x	3	5	7	9	11
y	27	125	343	729	1331

(OR)

6. Fit a curve $y = ax^b$ to the following data: 14M

x	1	2	3	4	5	6
y	2.98	4.26	5.21	6.10	6.80	7.50

UNIT – IV

7. Find $\frac{dy}{dx}$ and $\frac{d^2y}{dx^2}$ at $x = 1.5$ for the following data 14M

x	1.5	2.0	2.5	3.0	3.5	4.0
y	3.375	7.000	13.625	24.000	38.875	59.000

(OR)

8. Evaluate $\int_0^{\frac{\pi}{2}} \sin x\,dx$ by using (i) Trapezoidal rule and (ii) Simpson's $\frac{1}{3}$ rule. 14M

UNIT-V

9. Find $y(0.3)$ given $\frac{dy}{dx} + y + xy^2 = 0, y(0) = 1$ by taking $h = 0.1$ using Runge-Kutta method. 14M

(OR)

10. Given $\frac{dy}{dx} = x + y, y(0) = 1$, find y at $x = 0.1, 0.2$ and 0.3 by Taylor's series method. 14M

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

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B. Tech. II Sem. (R15) Supple. Examinations of September/October 2020
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 scope of environmental education	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 effects of deforestation	7M
	(b)	Role of individual in conservation of natural resources	7M

UNIT – II

3.		Give a detailed account of introduction, types, characteristics, features, structure and functions of grassland ecosystem	14M
		(OR)	
4.		What are food chains, food webs and ecological pyramids? Give examples and discuss their significance.	14M

UNIT – III

5.	(a)	Define biodiversity. Explain the types of biodiversity.	7M
	(b)	Write a short note on bio-geographical classification of India.	7M
		(OR)	
6.	(a)	What are the major threats to biodiversity?	7M
	(b)	Write notes on endangered and endemic species of India	7M

UNIT – IV

7.	(a)	Define Water pollution and discuss its effects and control measures	7M
	(b)	Define Noise pollution and discuss its effects and control measures	7M
		(OR)	
8.	(a)	Write about solid waste management.	9M
	(b)	Write notes on Darkening effect of Taj - Mahal	5M

UNIT-V

9.	(a)	Urban problems related to energy.	7M
	(b)	Write notes on Rain water harvesting.	7M
		(OR)	
10.	(a)	Write about role of Information Technology in Environment and Human health.	9M
	(b)	Write notes on Human rights	5M

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

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B. Tech. II Sem. (R15) Supple. Examinations of September/October 2020
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 Variable? Explain declaration and initialization of variables in detail?	7M
	(b)	Define Algorithm? Write an algorithm to find whether a number is ArmStrong number or not?	7M
		(OR)	
2.	(a)	Explain System Development Tools in detail?	7M
	(b)	Explain the structure of C Program? Justify with an example program.	7M

UNIT – II

3.	(a)	Define Expression? Explain Operator Precedence and Associativity?	5M
	(b)	Write a C Program to find largest number among 4 numbers?	9M
		(OR)	
4.	(a)	Write a C Program to print Fibonacci Series?	7M
	(b)	Define Operator? Explain various Operators in C?	7M

UNIT – III

5.	(a)	Explain various Loop Control Statements in C?	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)	Write a C program for concatenating two Strings?	7M
	(b)	Define String? Explain various String Handling Functions in C with examples?	7M
		(OR)	
8.	(a)	Explain Linear Search with example?	7M
	(b)	Explain Exchange Sort with example?	7M

UNIT-V

9.	(a)	Define Structure? Explain declaration and initialization of a Structure?	7M
	(b)	Explain Logical, Bitwise and Shift Operators?	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 September/October 2020

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) Find the directional derivative of $f(x,y,z) = xy^2z + x^2yz^3$ at the point (2, -1, 1) in the direction of the vector $i + 2j + 2k$ — 7M

   (b) If $\overline{f} = (2x+3y)i + (4y-2z)j + (x+pz)k$ is Solenoidal, find p — 7M

(OR)

2. (a) Prove that $\nabla(r^n) = nr^{n-2}\overline{r}$ — 7M

   (b) Evaluate by Green's theorem $\int_C (y - \sin x)dx + \cos x dy$ Where C is the triangle enclosed by the lines $y = 0, x = \frac{\pi}{2}, \pi y = 2x$ — 7M

UNIT – II

3. (a) Find $L\left(\frac{\sin 3t \cos t}{t}\right)$ — 7M

   (b) Evaluate $\int_0^\infty te^{-3t} \sin t\, dt$ using Laplace Transform — 7M

(OR)

4. (a) Find $L\left(t^2u(t-2)\right)$ — 7M

   (b) Find the Laplace transform of the full-wave rectifier $f(t) = E\sin\omega t, 0 < t < \frac{\pi}{\omega}$, having period $\frac{\pi}{\omega}$ — 7M

UNIT – III

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

   (b) Find $L^{-1}\left(\frac{1}{s(s^2+a^2)}\right)$ using partial fractions — 7M

(OR)

6. (a) Use Convolution theorem, find $L^{-1}\left(\frac{1}{(s+a)(s+b)}\right)$ — 7M

   (b) Use Laplace transform method, solve $(D^2+4D+5)y = 5$, given $y(0) = 0, y'(0) = 0$ — 7M

UNIT – IV

7. (a) Expand $f(x) = x$ as half range sine series in $0 < x < 2$ — 7M

   (b) Obtain the Fourier cosine series of $x\sin x$ in $0 \le x \le \pi$ — 7M

(OR)

8. Find the Fourier series expansion for f(x), if $f(x) = -\pi, -\pi < x < 0$ $= x, 0 < x < \pi$ Deduce that $\frac{1}{1^2} + \frac{1}{3^2} + \frac{1}{5^2} + \ldots\ldots\ldots = \frac{\pi^2}{8}$ 14M

UNIT-V

9. (a) Form the Partial Differential Equation by eliminating arbitrary constants for $2z = \frac{x^2}{a^2} + \frac{y^2}{b^2}$ 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 September/October 2020

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) What are the types of inquiries?
   (b) What are the roots of your personal ethics?

(OR)

2. (a) What are Engineering ethics?
   (b) Explain Kohlberg's Theory.

UNIT – II

3. (a) Discuss Research Ethics in detail.
   (b) What is Morality?

(OR)

4. (a) What are the Three types of Enquiry?
   (b) What is Moral Dilemma?

UNIT – III

5. (a) What are the responsibilities of a safety engineer?
   (b) What are the factors for safety and risk?

(OR)

6. (a) Explain the concept of Risk-Benefit Analysis?
   (b) Discuss the Bhopal gas tragedy.

UNIT – IV

7. (a) Discuss the Intellectual Property Rights (IPR).
   (b) How do engineers help society?

(OR)

8. (a) What are Professional rights?
   (b) What are the social responsibilities of engineers?

UNIT-V

9. (a) Write a detailed note on Business Ethics
   (b) What is the role of an engineering manager?

(OR)

10. (a) What are the advantages of computer ethics?
    (b) What are the 4 primary issues of computer ethics?

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

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

B. Tech. II Sem. (R15) Supple. Examinations of September/October 2020

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.		Explain the softened of water by Ion-exchange process and explain the advantages over other methods.	14M
		(OR)	
2.	(a)	Define hardness and explain types of hardness	7M
	(b)	Write a short note on disadvantages of water.	7M

UNIT – II

3.	(a)	Differences between Addition polymerisation and Condensation polymerisation	7M
	(b)	Differences between Thermo plastics and Thermosetting plastics	7M
		(OR)	
4.	(a)	Write a short note on preparation, properties and applications of Bakelite	7M
	(b)	Write a short note on inorganic polymers	7M

UNIT – III

5.		Define secondary battery and explain working nature of lead acid battery with neat diagram	14M
		(OR)	
6.	(a)	Define corrosion and explain the mechanism of the dry corrosion.	8M
	(b)	Write a short note on sacrificial anode cathodic protection	6M

UNIT – IV

7.		What are the characteristics of metallurgical coke? Describe the manufacture of metallurgical coke by Otto Haffman's method?	14M
		(OR)	
8.		Define lubricant& explain properties of lubricants	14M

UNIT-V

9.		Write 12 principles of green chemistry and its applications.	14M
		(OR)	
10.	(a)	Write a short note on Laws of photo chemistry	7M
	(b)	Explain action of catalyst & applications of catalyst	7M

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

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B. Tech. II Sem. (R15) Supple. Examinations of September/October 2020
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 with necessary theory, Fraunhofer diffraction due to a double slit. 10M
   (b) Newton's rings are formed in reflected light with red light of λ=670 nm and with air film. The radius of the 20^{th} dark ring is found to be 1.1×10^{-2} m. Find the radius of curvature of the lens and the radius of 30^{th} dark ring. 4M

(OR)

2. (a) What are Einstein's coefficients? Obtain the relation between them. 10M
   (b) If the Acceptance Angle and fractional change in the refractive index of a fibre material are 23^0 and 0.05 respectively. Calculate the refractive indices of the Core and Cladding of that fibre. 4M

UNIT – II

3. (a) Describe the Powder method for X-ray diffraction. Discuss the formation of diffraction pattern on the photographic plate. 10M
   (b) The radius of Cu (fcc) is 1.278 A^0. The first order Bragg reflection from (111) planes appear at an angle of 21.7^0. Determine the Wavelength of X-rays used. 4M

(OR)

4. (a) Write any six properties of Ultrasonics. Explain how Ultrasonics are used to detect the flaws in a body, using Non-destructive testing. 10M
   (b) An ultrasonic generator has a quartz crystal whose thickness is 2 mm, density is 2650 kgm^{-3} and Young's modulus is $7.9X10^{10}$ $Nm^{-2.}$ Find the fundamental frequency of the generator. 4M

UNIT – III

5. (a) What are the properties of matter waves? Derive the de-Broglie equation for an electron, accelerated through a potential difference of V volts. 10M
   (b) Calculate the minimum energy in eV that an electron can possess in an infinitely deep potential well of 4nm width. 4M

(OR)

6. (a) What are the salient features of Fermi-Dirac statistics? Illustrate the effect of temperature on the F-D distribution function. 10M
   (b) Calculate the electrical conductivity of Copper, if the relaxation time of electrons at 300K is 10^{-14} Sec. (Concentration of free electrons in Copper is 8.44×10^{28}) 4M

UNIT – IV

7. (a) Explain the origin of Magnetic moment. Find the magnetic dipole moments due to orbital and spin motions of an electron. 10M
   (b) The magnetic field strength of Copper is 10^6 A/m. If the Magnetic Susceptibility of Copper is $-0.8 \times 10^{-5.}$ Calculate the flux density and magnetization in Copper. 4M

(OR)

8. (a) Explain DC and AC Josephson effects. 10M
   (b) Write notes on any four applications of Superconductors. 4M

UNIT-V

9. (a) Derive the expressions for Drift and Diffusion currents in a Semiconductors. 8M
   (b) Explain the formation of P-N junction diode. 6M

(OR)

10. (a) Explain any Eight physical properties of nanoparticles. 8M
    (b) Describe Chemical Vapour Deposition method of synthesis of nanomaterials. 6M

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

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

B. Tech. II Sem. (R15) Supple. Examinations of September/October 2020

SUB: Electrical Circuits (EEE, ECE)

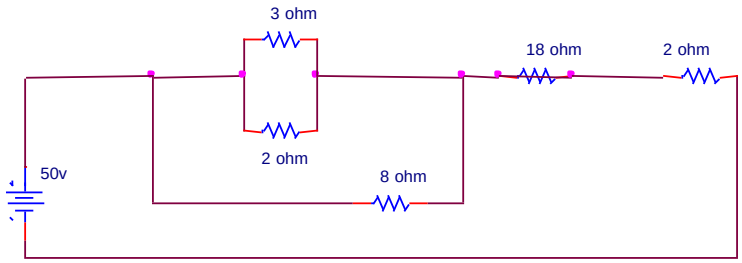
Time : 3 Hours | Max. Marks: 70

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

UNIT – I

1. (a) Illustrate the following 7M
(i) Kirchhoff's Laws , (ii) Series and parallel circuit,
(iii) Source Transformation Technique

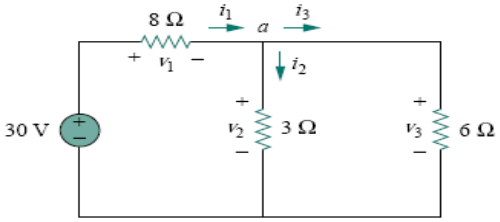
(b) Find the Equivalent resistance and the current in each resistance. 7M



(OR)

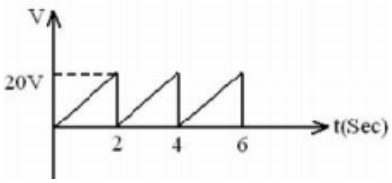
2. (a) Illustrate the classification of Electrical circuit elements. 7M

(b) Find the currents and voltages in the circuit shown in Fig. 7M



UNIT – II

3. (a) Determine the average and effective values of saw-tooth waveform as shown in below figure. 7M

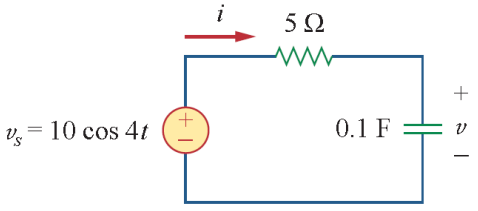


(b) Illustrate the significance of j-operator. What are the different forms of expressing the sinusoidal quantity in complex form? 7M

(OR)

4. (a) Derive an expression for the current, impedance, average power for a series RC circuit excited by a sinusoidally alternating voltage and also find the power factor of the circuit. Draw the phasor diagram. 7M

(b) Find the active power, reactive power and draw the power triangle to the given circuit. 7M



UNIT – III

5. (a) Compare series and parallel resonant circuits. 7M

(b) Given a series RLC circuit with R = 10 ohms, L = 1 mH and C = 1 μF is connected across a sinusoidal source of 20 V with variable frequency. 7M

Find i) The resonant frequency ii) Q factor of the circuit at resonant frequency
iii) Half power frequencies.

(OR)

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

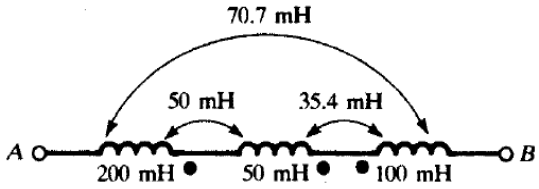
(b) A voltage V = $50\angle 0^0$ V is applied to a series circuit consisting of fixed inductive reactance X_L = 5 ohms and a variable resistance R. Sketch the admittance and current locus diagrams. 7M

UNIT – IV

7. (a) Define the following: 7M

i) Self-inductance ii) Mutual Inductance
iii) Static Induced e.m.f iv) Dynamically induced e.m.f.

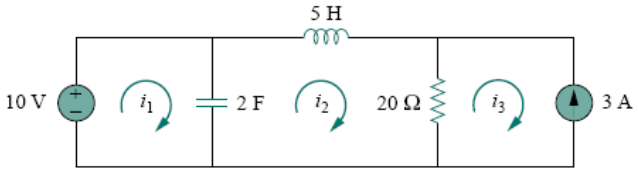
(b) Determine the inductance of the three series connected inductors as shown in given figure 7M



(OR)

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

(b) What is duality and Draw a dual circuit to the given circuit 7M

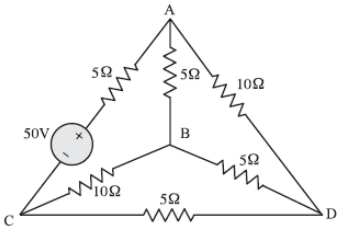


UNIT-V

9. (a) Explain the following terms with respect to graph theory 7M

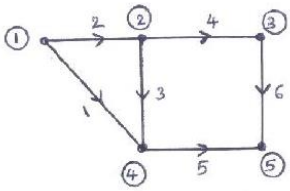
i) Node, ii) Tree , iii) Link , iv) Sub-graph

(b) Write a fundamental tie-set schedule and write loop equations to the given circuit. 7M

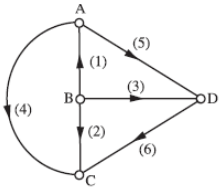


(OR)

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



(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



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

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

B. Tech. II Sem. (R15) Supple. Examinations of September/October 2020

SUB: Engineering Drawing - 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 square pyramid of side of base 30 and axis 50 long is resting on its base on H.P with an edge of the base parallel to V.P. A section plane, perpendicular to V.P and inclined at 45^0 to H.P bisects the axis. Draw the development of the lateral surface of the cut pyramid. 14M

(OR)

2. A cone of base 50 diameter and height 65 rests with its base on H.P. A section plane perpendicular to V.P and inclined at 30^0 to H.P bisects the axis of the cone. Draw the development of the lateral surface of the truncated cone. 14M

UNIT – II

3. Draw the view from the front, view from the top and view from the left for figure (1). 14M

(OR)

4. Draw the view from the front, view from the top and view from the right for figure (2). 14M

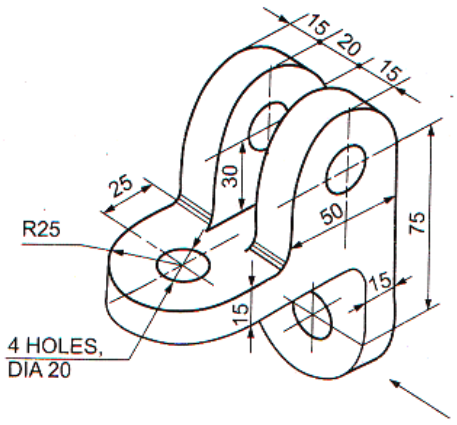


Figure 1

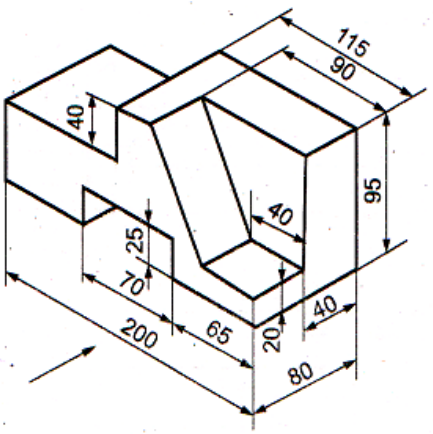


Figure 2

UNIT – III

5. A sphere of radius 20 is kept on the top face of a square prism of side of base 40 mm and height 20 mm. The latter is placed on the top face of a cylinder of 65 diameter and 25 mm height. Draw the isometric projection of the combination of solids having common axis. 14M

(OR)

6. Draw an isometric view of the object for the views shown in figure 3. 14M

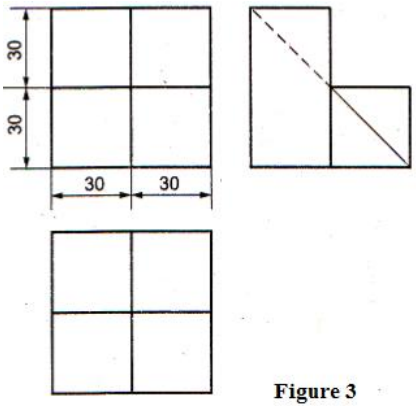


Figure 3

UNIT – IV

7. A vertical cylinder of diameter 60 mm is penetrated by another cylinder of diameter 45 mm. The axes of the two cylinders are intersecting at right angle. Draw the projections of the two cylinders, showing the lines (curves) of intersection. 14M

(OR)

8. A vertical cone, base diameter 75 mm and axis 100 mm long, is completely penetrated by a cylinder of diameter 45 mm. The axis of the cylinder is parallel to HP and VP and intersects axis of the cone at a point 28 mm above the base. Draw projections showing curves of intersection. 14M

UNIT-V

9. Write the sequence of command steps required to draw the object shown in figure 4 with the help of LINE command using absolute coordinate system. 14M

(OR)

10. Write the sequence of command steps required to draw the object shown in figure 5 with the help of LINE command using relative rectangular coordinate system. 14M

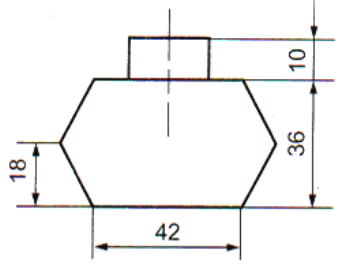


Figure 4

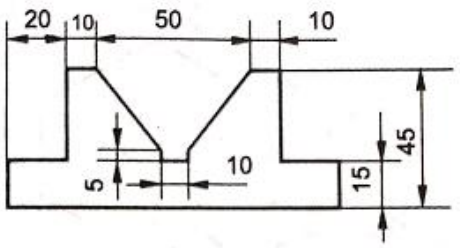


Figure 5

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

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

B. Tech. II Sem. (R15) Supple. Examinations of September/October 2020

SUB: English - 2 (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.

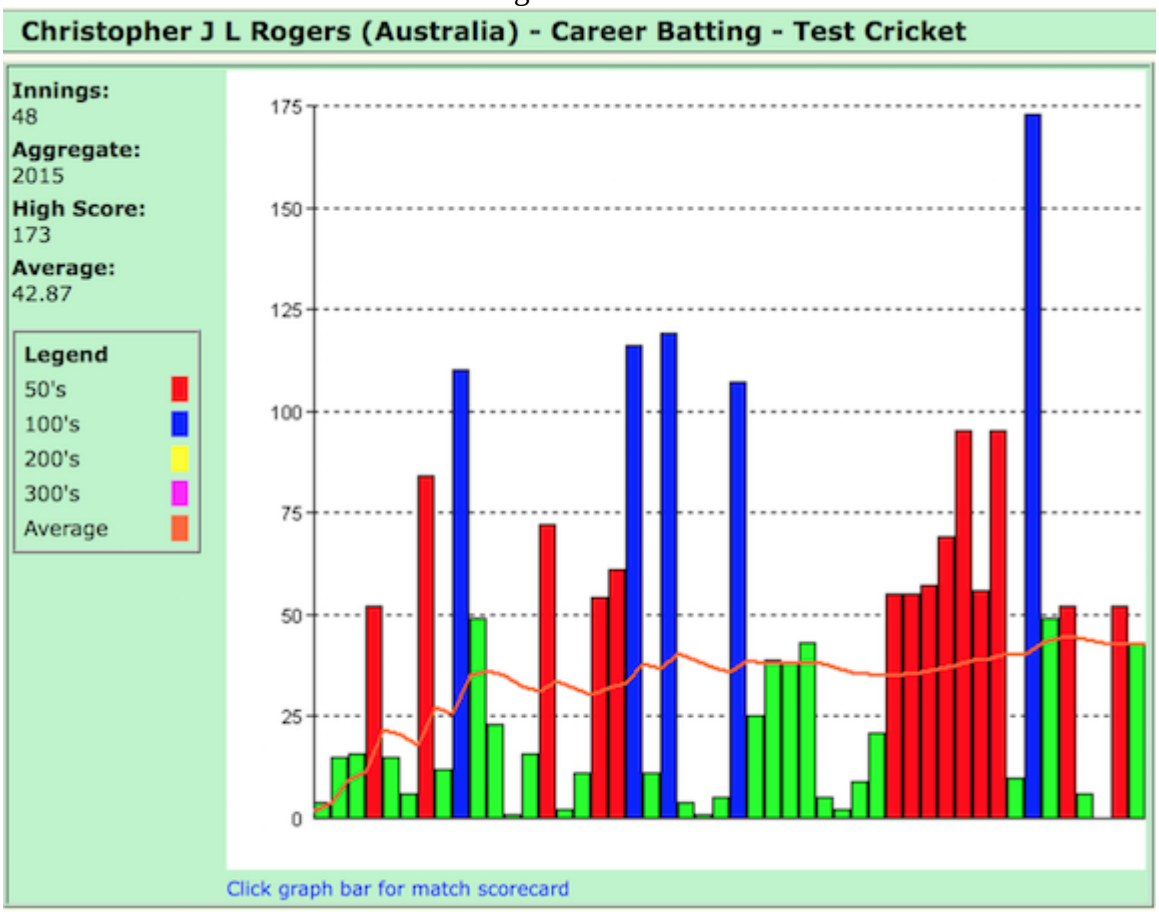
UNIT - I

1. (a) Write an essay on the **Covid-19 pandemic**.

   (b) What are the salient features of a good essay?

(OR)

2. (a) Transfer the information in the following Chart.



   (b) Assuming your father got down in Bus station give directions to him to reach your college.

UNIT – II

3. (a) Three students are going on a bike without face masks, helmets and necessary documents on a busy road on a lockdown day. They were stopped by a traffic police officer. Prepare a dialogue of nearly twenty exchanges between the police officer and the students.

   (b) What are the things to be kept in mind while writing an interesting dialogue?

(OR)

4. (a) Write about the roles and responsibilities of the Members of Interview Board.

   (b) Write ten frequently asked questions in job interviews with answers.

UNIT – III

5. (a) Write about the Do's and Don'ts during a Group Discussion.

   (b) Discuss the several useful strategies to do well in a Group Discussion.

(OR)

6. (a) Why are Debates important?

   (b) What are the strategies to do well in a Debate?

UNIT – IV

7. (a) Prepare a report on the need for constructing an indoor stadium in your college.

   (b) Assuming that you are in a Gulf Country, write a letter to your father about the difficulties faced by you during the present situation.

8. (a) What are the things to be kept in mind to deliver a good speech?

   (b) Assuming yourself as the District Collector, prepare the text of your speech to be delivered to the students of an Engineering college as the Chief Guest for the Annual day celebrations.

UNIT-V

9. (a) Assuming your self as the President of Wipro India, draft an e-mail to all your employees conveying the good news of announcing Deepavali bonus of one-month salary.

   (b) What is the generally accepted format of a CV? Also, write about the parts of a CV.

(OR)

10. (a) Correct the following sentences.
    (i) John is one of my best friend.
    (ii) We did not opened the account in the bank.
    (iii) The price of apples are very high.
    (iv) The students always prefer Coffee than Tea.
    (v) The cricket players always prefers practice with security.
    (vi) No man can serves two masters.
    (vii) Brett Lee bowls fast than Lillee.

    (b) What are problems faced when translating an English text into an Indian Language?

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

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

B. Tech. II Sem. (R15) Supple. Examinations of September/October 2020

SUB: Mathematics - 3 (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. (a) Reduce the following matrix into normal form and hence find its rank. 7M

$$\begin{bmatrix} 4 & 6 & 6 \\ 1 & 3 & 2 \\ -1 & -4 & -3 \end{bmatrix}$$

(b) Find the Eigen values of the matrix $A = \begin{bmatrix} 2 & 3+4i \\ 3-4i & 2 \end{bmatrix}$. 7M

(OR)

2. Find A^{-1} and A^4 for the matrix $A = \begin{bmatrix} 7 & 2 & -2 \\ -6 & -1 & 2 \\ 6 & 2 & -1 \end{bmatrix}$ by using Cayley-Hamilton theorem. 14M

UNIT – II

3. Define algebraic and transcendental equation and also compute a real root of the equation $3x = \cos x + 1$. 14M

(OR)

4. Solve the equations $x + 2y + z = 4, 2x - 3y - z = -3, 3x + y + 2z = 3$ by using Crout's method. 14M

UNIT – III

5. Construct Newton's forward interpolation polynomial for the following data and hence find the value of y for $x = 5.5$. 14M

x	3	5	7	9	11
y	27	125	343	729	1331

(OR)

6. Fit a curve $y = ax^b$ to the following data: 14M

x	1	2	3	4	5	6
y	2.98	4.26	5.21	6.10	6.80	7.50

UNIT – IV

7. Find $\frac{dy}{dx}$ and $\frac{d^2y}{dx^2}$ at $x = 1.5$ for the following data 14M

x	1.5	2.0	2.5	3.0	3.5	4.0
y	3.375	7.000	13.625	24.000	38.875	59.000

(OR)

8. Evaluate $\int_0^{\frac{\pi}{2}} \sin x\,dx$ by using (i) Trapezoidal rule and (ii) Simpson's $\frac{1}{3}$ rule. 14M

UNIT-V

9. Find $y(0.3)$ given $\frac{dy}{dx} + y + xy^2 = 0, y(0) = 1$ by taking $h = 0.1$ using Runge-Kutta method. 14M

(OR)

10. Given $\frac{dy}{dx} = x + y, y(0) = 1$, find y at $x = 0.1, 0.2$ and 0.3 by Taylor's series method. 14M

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

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B. Tech. II Sem. (R15) Supple. Examinations of September/October 2020
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 scope of environmental education	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 effects of deforestation	7M
	(b)	Role of individual in conservation of natural resources	7M

UNIT – II

3.		Give a detailed account of introduction, types, characteristics, features, structure and functions of grassland ecosystem	14M
		(OR)	
4.		What are food chains, food webs and ecological pyramids? Give examples and discuss their significance.	14M

UNIT – III

5.	(a)	Define biodiversity. Explain the types of biodiversity.	7M
	(b)	Write a short note on bio-geographical classification of India.	7M
		(OR)	
6.	(a)	What are the major threats to biodiversity?	7M
	(b)	Write notes on endangered and endemic species of India	7M

UNIT – IV

7.	(a)	Define Water pollution and discuss its effects and control measures	7M
	(b)	Define Noise pollution and discuss its effects and control measures	7M
		(OR)	
8.	(a)	Write about solid waste management.	9M
	(b)	Write notes on Darkening effect of Taj - Mahal	5M

UNIT-V

9.	(a)	Urban problems related to energy.	7M
	(b)	Write notes on Rain water harvesting.	7M
		(OR)	
10.	(a)	Write about role of Information Technology in Environment and Human health.	9M
	(b)	Write notes on Human rights	5M

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

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B. Tech. II Sem. (R15) Supple. Examinations of September/October 2020
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 Variable? Explain declaration and initialization of variables in detail?	7M
	(b)	Define Algorithm? Write an algorithm to find whether a number is ArmStrong number or not?	7M
		(OR)	
2.	(a)	Explain System Development Tools in detail?	7M
	(b)	Explain the structure of C Program? Justify with an example program.	7M

UNIT – II

3.	(a)	Define Expression? Explain Operator Precedence and Associativity?	5M
	(b)	Write a C Program to find largest number among 4 numbers?	9M
		(OR)	
4.	(a)	Write a C Program to print Fibonacci Series?	7M
	(b)	Define Operator? Explain various Operators in C?	7M

UNIT – III

5.	(a)	Explain various Loop Control Statements in C?	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)	Write a C program for concatenating two Strings?	7M
	(b)	Define String? Explain various String Handling Functions in C with examples?	7M
		(OR)	
8.	(a)	Explain Linear Search with example?	7M
	(b)	Explain Exchange Sort with example?	7M

UNIT-V

9.	(a)	Define Structure? Explain declaration and initialization of a Structure?	7M
	(b)	Explain Logical, Bitwise and Shift Operators?	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 September/October 2020

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) Find the directional derivative of $f(x,y,z) = xy^2z + x^2yz^3$ at the point (2, -1, 1) in the direction of the vector $i + 2j + 2k$ — 7M

   (b) If $\overline{f} = (2x+3y)i + (4y-2z)j + (x+pz)k$ is Solenoidal, find p — 7M

(OR)

2. (a) Prove that $\nabla(r^n) = nr^{n-2}\overline{r}$ — 7M

   (b) Evaluate by Green's theorem $\int_C (y - \sin x)dx + \cos x dy$ Where C is the triangle enclosed by the lines $y = 0, x = \frac{\pi}{2}, \pi y = 2x$ — 7M

UNIT – II

3. (a) Find $L\left(\frac{\sin 3t \cos t}{t}\right)$ — 7M

   (b) Evaluate $\int_0^\infty te^{-3t} \sin t\, dt$ using Laplace Transform — 7M

(OR)

4. (a) Find $L\left(t^2u(t-2)\right)$ — 7M

   (b) Find the Laplace transform of the full-wave rectifier $f(t) = E\sin\omega t, 0 < t < \frac{\pi}{\omega}$, having period $\frac{\pi}{\omega}$ — 7M

UNIT – III

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

   (b) Find $L^{-1}\left(\frac{1}{s(s^2+a^2)}\right)$ using partial fractions — 7M

(OR)

6. (a) Use Convolution theorem, find $L^{-1}\left(\frac{1}{(s+a)(s+b)}\right)$ — 7M

   (b) Use Laplace transform method, solve $(D^2+4D+5)y = 5$, given $y(0) = 0, y'(0) = 0$ — 7M

UNIT – IV

7. (a) Expand $f(x) = x$ as half range sine series in $0 < x < 2$ — 7M

   (b) Obtain the Fourier cosine series of $x\sin x$ in $0 \le x \le \pi$ — 7M

(OR)

8. Find the Fourier series expansion for f(x), if $f(x) = -\pi, -\pi < x < 0$ $= x, 0 < x < \pi$ Deduce that $\frac{1}{1^2} + \frac{1}{3^2} + \frac{1}{5^2} + \ldots\ldots\ldots = \frac{\pi^2}{8}$ 14M

UNIT-V

9. (a) Form the Partial Differential Equation by eliminating arbitrary constants for $2z = \frac{x^2}{a^2} + \frac{y^2}{b^2}$ 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 September/October 2020

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) What are the types of inquiries?
   (b) What are the roots of your personal ethics?

(OR)

2. (a) What are Engineering ethics?
   (b) Explain Kohlberg's Theory.

UNIT – II

3. (a) Discuss Research Ethics in detail.
   (b) What is Morality?

(OR)

4. (a) What are the Three types of Enquiry?
   (b) What is Moral Dilemma?

UNIT – III

5. (a) What are the responsibilities of a safety engineer?
   (b) What are the factors for safety and risk?

(OR)

6. (a) Explain the concept of Risk-Benefit Analysis?
   (b) Discuss the Bhopal gas tragedy.

UNIT – IV

7. (a) Discuss the Intellectual Property Rights (IPR).
   (b) How do engineers help society?

(OR)

8. (a) What are Professional rights?
   (b) What are the social responsibilities of engineers?

UNIT-V

9. (a) Write a detailed note on Business Ethics
   (b) What is the role of an engineering manager?

(OR)

10. (a) What are the advantages of computer ethics?
    (b) What are the 4 primary issues of computer ethics?

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

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

B. Tech. II Sem. (R15) Supple. Examinations of September/October 2020

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.		Explain the softened of water by Ion-exchange process and explain the advantages over other methods.	14M
		(OR)	
2.	(a)	Define hardness and explain types of hardness	7M
	(b)	Write a short note on disadvantages of water.	7M

UNIT – II

3.	(a)	Differences between Addition polymerisation and Condensation polymerisation	7M
	(b)	Differences between Thermo plastics and Thermosetting plastics	7M
		(OR)	
4.	(a)	Write a short note on preparation, properties and applications of Bakelite	7M
	(b)	Write a short note on inorganic polymers	7M

UNIT – III

5.		Define secondary battery and explain working nature of lead acid battery with neat diagram	14M
		(OR)	
6.	(a)	Define corrosion and explain the mechanism of the dry corrosion.	8M
	(b)	Write a short note on sacrificial anode cathodic protection	6M

UNIT – IV

7.		What are the characteristics of metallurgical coke? Describe the manufacture of metallurgical coke by Otto Haffman's method?	14M
		(OR)	
8.		Define lubricant& explain properties of lubricants	14M

UNIT-V

9.		Write 12 principles of green chemistry and its applications.	14M
		(OR)	
10.	(a)	Write a short note on Laws of photo chemistry	7M
	(b)	Explain action of catalyst & applications of catalyst	7M

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

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B. Tech. II Sem. (R15) Supple. Examinations of September/October 2020
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 with necessary theory, Fraunhofer diffraction due to a double slit. 10M
   (b) Newton's rings are formed in reflected light with red light of λ=670 nm and with air film. The radius of the 20^{th} dark ring is found to be 1.1×10^{-2} m. Find the radius of curvature of the lens and the radius of 30^{th} dark ring. 4M

(OR)

2. (a) What are Einstein's coefficients? Obtain the relation between them. 10M
   (b) If the Acceptance Angle and fractional change in the refractive index of a fibre material are 23^0 and 0.05 respectively. Calculate the refractive indices of the Core and Cladding of that fibre. 4M

UNIT – II

3. (a) Describe the Powder method for X-ray diffraction. Discuss the formation of diffraction pattern on the photographic plate. 10M
   (b) The radius of Cu (fcc) is 1.278 A^0. The first order Bragg reflection from (111) planes appear at an angle of 21.7^0. Determine the Wavelength of X-rays used. 4M

(OR)

4. (a) Write any six properties of Ultrasonics. Explain how Ultrasonics are used to detect the flaws in a body, using Non-destructive testing. 10M
   (b) An ultrasonic generator has a quartz crystal whose thickness is 2 mm, density is 2650 kgm^{-3} and Young's modulus is $7.9X10^{10}$ $Nm^{-2.}$ Find the fundamental frequency of the generator. 4M

UNIT – III

5. (a) What are the properties of matter waves? Derive the de-Broglie equation for an electron, accelerated through a potential difference of V volts. 10M
   (b) Calculate the minimum energy in eV that an electron can possess in an infinitely deep potential well of 4nm width. 4M

(OR)

6. (a) What are the salient features of Fermi-Dirac statistics? Illustrate the effect of temperature on the F-D distribution function. 10M
   (b) Calculate the electrical conductivity of Copper, if the relaxation time of electrons at 300K is 10^{-14} Sec. (Concentration of free electrons in Copper is 8.44×10^{28}) 4M

UNIT – IV

7. (a) Explain the origin of Magnetic moment. Find the magnetic dipole moments due to orbital and spin motions of an electron. 10M
   (b) The magnetic field strength of Copper is 10^6 A/m. If the Magnetic Susceptibility of Copper is $-0.8 \times 10^{-5.}$ Calculate the flux density and magnetization in Copper. 4M

(OR)

8. (a) Explain DC and AC Josephson effects. 10M
   (b) Write notes on any four applications of Superconductors. 4M

UNIT-V

9. (a) Derive the expressions for Drift and Diffusion currents in a Semiconductors. 8M
   (b) Explain the formation of P-N junction diode. 6M

(OR)

10. (a) Explain any Eight physical properties of nanoparticles. 8M
    (b) Describe Chemical Vapour Deposition method of synthesis of nanomaterials. 6M