Q.P. Code: 2003205 | SET - 1

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

**B. Tech. II Semester (R20) Regular Examinations of October – 2021**

***Sub: Engineering Drawing (Common to ME & CSE)***

**Time: 3 Hours** **Max. Marks: 60**

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

## UNIT - I

1. A fixed point is 75 mm from a fixed straight line. Draw the locus of a point P moving such a way that its distance from the fixed straight line is twice its distance from the fixed point. Name the cure. **12M**

**(OR)**

2. A circle of 50 mm diameter rolls on the circumference of another circle of 175 mm diameter and outside it. Trace the locus of a point on the circumference of the rolling circle for one complete revolution. Name the curve. **12M**

## UNIT – II

3. A line AB, 90 mm long, is inclined at $45^0$ to the H.P. and its top view makes an angle of $60^0$ with the V.P. The end is A is in the H.P. and 12 mm infront of the V.P. Draw its front view and find its true inclination with the V.P. **12M**

**(OR)**

4. A pentagonal lamina of 30 mm side rests on HP on one of its sides such that the plane surface makes an angle 45 degree with HP. Draw its projections when the side on HP makes an angle of 30 degrees with the VP. **12M**

## UNIT – III

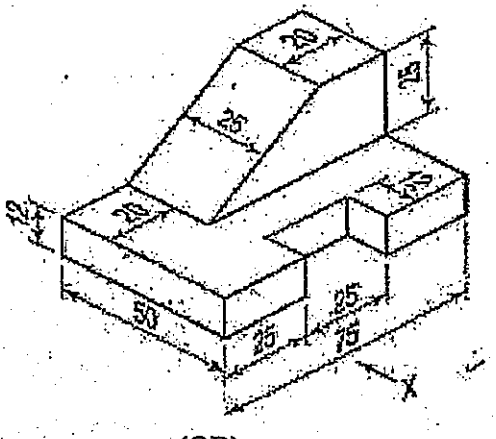
5. A square pyramid, base 40 mm side and axis 65 mm long, has its base on the HP and all the edges of the base equally inclined to the VP. It is cut by section plane, perpendicular to the VP, inclined at 45 degrees to the HP and bisecting the axis. Draw its sectional top view and true shape of the section. **12M**

**(OR)**

6. A cylinder of diameter 40 mm base and 60 mm long is resting on its base on HP. It is cut by section plane, perpendicular to VP and inclined at 45 degrees to HP. The section plane is passing through the top end of an extreme generator of the cylinder. Draw the development of the lateral surface of the cut cylinder. **12M**

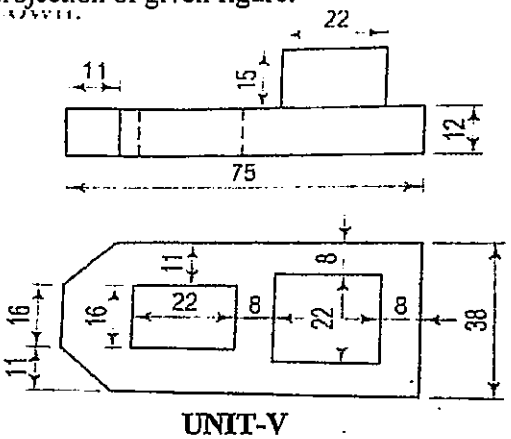
## UNIT – IV

7. Draw (i) front view (ii) top view and (iii) side view for the following isometric figure. **12M**




**(OR)**

8. Draw the isometric projection of given figure. 12M




## UNIT-V

9. Draw the perspective view of a cube of 25 mm edge, lying on a face on the ground plane, with an edge in the picture plane and all vertical faces equally inclined to the picture plane. The station point is 50 mm infront of the picture plane, 35 mm above the ground plane and lies in a central plane which is 10 mm to the left of the centre of the cube. (Vanishing point method). 12M

**(OR)**

10. Draw the perspective view of a circle of 4 cm diameter, having its surface vertical and inclined at $45^0$ to the picture plane. The centre of the circle is 2.5 cm above the ground plane. The position of the station point is 4cm from the picture plane. The horizon level is 5cm from ground plane. (Assume if any data required.) 12M

Q.P. Code: 2003205 | SET - 1

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

**B. Tech. II Semester (R20) Regular Examinations of October – 2021**

***Sub: Engineering Drawing (Common to ME & CSE)***

**Time: 3 Hours** **Max. Marks: 60**

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

## UNIT - I

1. A fixed point is 75 mm from a fixed straight line. Draw the locus of a point P moving such a way that its distance from the fixed straight line is twice its distance from the fixed point. Name the cure. **12M**

**(OR)**

2. A circle of 50 mm diameter rolls on the circumference of another circle of 175 mm diameter and outside it. Trace the locus of a point on the circumference of the rolling circle for one complete revolution. Name the curve. **12M**

## UNIT – II

3. A line AB, 90 mm long, is inclined at $45^0$ to the H.P. and its top view makes an angle of $60^0$ with the V.P. The end is A is in the H.P. and 12 mm infront of the V.P. Draw its front view and find its true inclination with the V.P. **12M**

**(OR)**

4. A pentagonal lamina of 30 mm side rests on HP on one of its sides such that the plane surface makes an angle 45 degree with HP. Draw its projections when the side on HP makes an angle of 30 degrees with the VP. **12M**

## UNIT – III

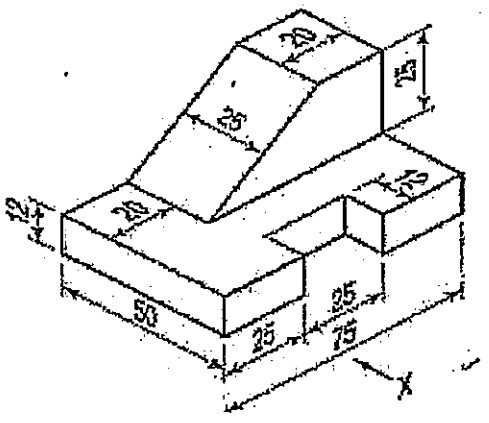
5. A square pyramid, base 40 mm side and axis 65 mm long, has its base on the HP and all the edges of the base equally inclined to the VP. It is cut by section plane, perpendicular to the VP, inclined at 45 degrees to the HP and bisecting the axis. Draw its sectional top view and true shape of the section. **12M**

**(OR)**

6. A cylinder of diameter 40 mm base and 60 mm long is resting on its base on HP. It is cut by section plane, perpendicular to VP and inclined at 45 degrees to HP. The section plane is passing through the top end of an extreme generator of the cylinder. Draw the development of the lateral surface of the cut cylinder. **12M**

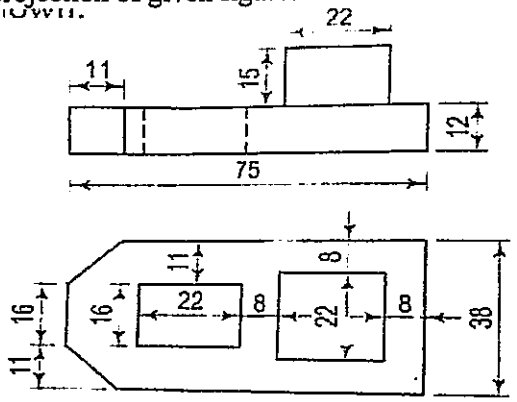
## UNIT – IV

7. Draw (i) front view (ii) top view and (iii) side view for the following isometric figure. **12M**




**(OR)**

8. Draw the isometric projection of given figure. 12M




## UNIT-V

9. Draw the perspective view of a cube of 25 mm edge, lying on a face on the ground plane, with an edge in the picture plane and all vertical faces equally inclined to the picture plane. The station point is 50 mm infront of the picture plane, 35 mm above the ground plane and lies in a central plane which is 10 mm to the left of the centre of the cube. (Vanishing point method). 12M

**(OR)**

10. Draw the perspective view of a circle of 4 cm diameter, having its surface vertical and inclined at $45^0$ to the picture plane. The centre of the circle is 2.5 cm above the ground plane. The position of the station point is 4cm from the picture plane. The horizon level is 5cm from ground plane. (Assume if any data required.) 12M

18-10-2021

**Q.P. Code: 2001204** **SET - 1**

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

**B. Tech. II Semester (R20) Regular Examinations of October – 2021**

***SUB: Strength of Materials (CE)***

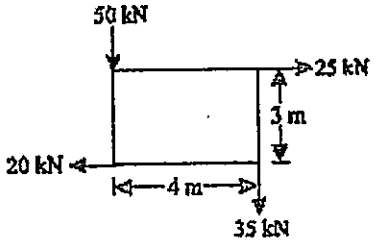
**Time: 3 Hours** **Max. Marks: 60**

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

## UNIT - I

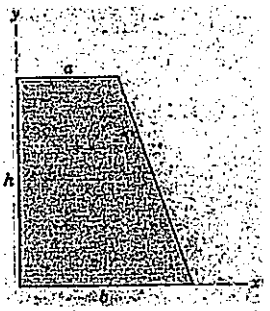
1. (a) Classify different system of forces with suitable examples. 5M

   (b) A system of forces is acting at the corners of a rectangular block as shown in Fig. Determine the magnitude and direction of the resultant force. 7M

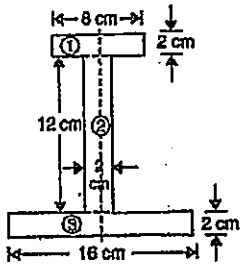



(OR)

2. (a) Determine x- and y-coordinates of the centroid of the trapezoidal area shown in Fig. 6M




   (b) Determine the moment of inertia for the unsymmetrical T-section shown in Fig. 6M



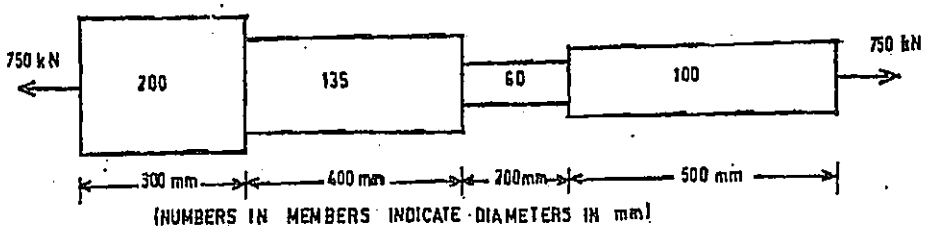

## UNIT – II

3. (a) Derive the relationship between the volumetric strain and elastic moduli. 6M

   (b) What are the various types of stresses and strains? Define each of them. 6M

(OR)

4. (a) Calculate the change in the volume of the bar shown in the Fig. by considering the elastic modulus as 100 kN/mm$^2$ and poison's ratio as 0.25. 9M



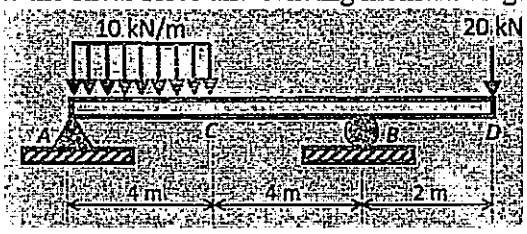

   (b) Define strain energy and temperature stresses. 3M

## UNIT – III

5. (a) Define Beam. What are the various types of loading? Show them schematically. 7M
   (b) Define point of contra flexure. What will be the value of shear force and bending moment at the point of contra flexure. 5M

(OR)

6. Determine the shear force and bending moment for the beam loaded as shown in the fig. Also, draw the shear force and bending moment diagram. 12M

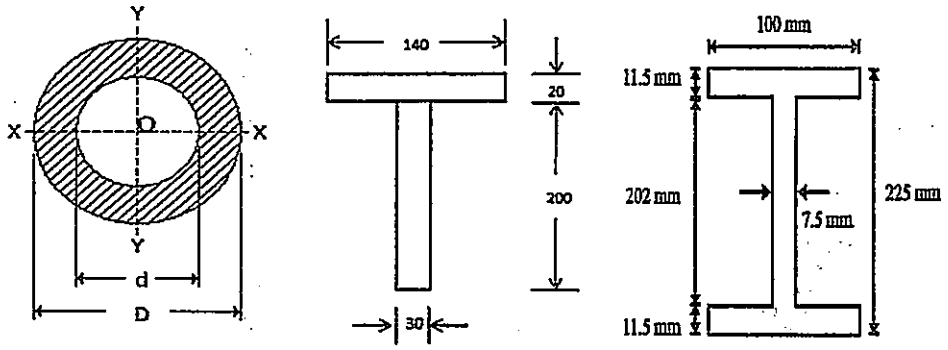



## UNIT – IV

7. (a) Elaborate the steps involved in the design of simple beam sections. 6M
   (b) Discuss about the theorem of simple bending. 6M

(OR)

8. Determine the section modulus for the hollow circular section, T-section and I-section shown in fig. 12M

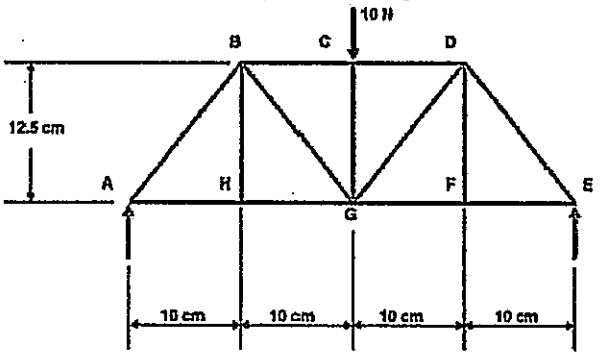



## UNIT-V

9. (a) Derive an expression for the shear stress distribution for triangular section. 6M
   (b) Derive an expression for the shear stress distribution for circular section. 6M

(OR)

10. Analyze the truss shown in the figure using method of joints method. 12M



Q.P. Code: 2004204 | SET - 1

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

**B. Tech. II Semester (R20) Regular Examinations of October – 2021**

***SUB: Electronic Devices and Circuits (Common to EEE & ECE)***

**Time: 3 Hours** **Max. Marks: 60**

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

## UNIT - I

| | | | |
|---|---|---|---|
| 1. | (a) | Explain with neat sketch the structure of an atom and suggest why silicon is widely used than germanium in electronic industry | 6M |
| | (b) | Define Diffusion current and derive an expression for diffusion current density of holes and electrons. | 6M |
| | | (OR) | |
| 2. | (a) | Illustrate V-I characteristics of p-n junction diode. | 8M |
| | (b) | The voltage across a silicon diode at room temperature (300 K) is 0.7 volts when 2 μA reverse saturation current flows through it. Calculate the diode current (assume $V_T$ = 26 mV). | 4M |

## UNIT – II

| | | | |
|---|---|---|---|
| 3. | (a) | With neat sketch explain about zener break down. | 6M |
| | (b) | With the help of a neat circuit diagram, input and output waveforms, describe the operation of Half-wave rectifier (HWR). | 6M |
| | | (OR) | |
| 4. | (a) | With neat diagram explain the operation of PNP transistor. | 6M |
| | (b) | Write the four regions of operation of transistor with respect to junctions and also give their applications at each region of operation. | 6M |

## UNIT – III

| | | | |
|---|---|---|---|
| 5. | (a) | Explain how transistor acts like an Amplifier. | 6M |
| | (b) | Draw the hybrid-$\pi$ common emitter transistor model and explain the significance of each component in the model. | 6M |
| | | (OR) | |
| 6. | (a) | Explain the analysis of common emitter amplifier with neat circuit diagram. | 6M |
| | (b) | Explain self-bias in BJT amplifier circuits. | 6M |

## UNIT – IV

| | | | |
|---|---|---|---|
| 7. | (a) | With neat structure explain the principle of operation of Enhancement type MOSFET also draw drain and transfer characteristics. | 6M |
| | (b) | Write five Comparisons of BJT and MOFET. | 6M |
| | | (OR) | |
| 8. | (a) | Write short notes on CMOS transistor. | 6M |
| | (b) | Explain about Q-point in graphical analysis of MOSFET. | 6M |

## UNIT-V

| | | | |
|---|---|---|---|
| 9. | | Design and analyze Common Source MOSFET amplifier for its gains and impedances. | 12M |
| | | (OR) | |
| 10. | (a) | Draw the T equivalent circuit model of a MOSFET and explain. | 6M |
| | (b) | Define transconductance and derive its expression. | 6M |

Q.P. Code: 2003204 | SET - 1

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

**B. Tech. II Semester (R20) Regular Examinations of October – 2021**

***SUB: Material Science (ME)***

**Time: 3 Hours** **Max. Marks: 60**

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

## UNIT - I

| | | | |
|---|---|---|---|
| 1. | (a) | What is the atomic packing factor for BCC and FCC? | 6M |
| | (b) | Calculate (i) the packing efficiency, and (ii) the density of diamond. | 6M |
| | | (OR) | |
| 2. | (a) | What is an alloy? Explain the necessity of alloying. | 6M |
| | (b) | Explain the Peritectic system with a neat sketch. | 6M |

## UNIT – II

| | | | |
|---|---|---|---|
| 3. | (a) | What are stainless steels? What are their applications? | 6M |
| | (b) | Explain AISI classification of steels. | 6M |
| | | (OR) | |
| 4. | | Draw the micro-structures of nodular cast iron& malleable cast irons and write about their composition, properties and uses. | 12M |

## UNIT – III

| | | | |
|---|---|---|---|
| 5. | (a) | Explain the significance of Time-Temperature-Transformation diagram in heat treatment of steel. | 6M |
| | (b) | Draw Time-Temperature-Transformation diagram for 0.8% C steel and label the phases. | 6M |
| | | (OR) | |
| 6. | | What is annealing? What are the different types of annealing process are employed for different purposes? Explain. | 12M |

## UNIT – IV

| | | | |
|---|---|---|---|
| 7. | (a) | What are the applications of pure copper? | 6M |
| | (b) | What are the advantages of copper alloys? | 6M |
| | | (OR) | |
| 8. | | Explain the properties and applications of Nickel and its alloys. | 12M |

## UNIT-V

| | | | |
|---|---|---|---|
| 9. | (a) | What are the applications of ceramics? | 6M |
| | (b) | What are the properties of ceramics? | 6M |
| | | (OR) | |
| 10. | (a) | What are the properties and applications of nanomaterials? | 6M |
| | (b) | What are the characteristics and applications of Super alloys | 6M |

Q.P. Code: 2005204

SET - 1

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

**B. Tech. II Semester (R20) Regular Examinations of October – 2021**

***SUB: Python Programming (CSE)***

**Time: 3 Hours** **Max. Marks: 60**

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

## UNIT - I

| | | | |
|---|---|---|---|
| 1. | (a) | What are the features of python? Explain in detail. | 6M |
| | (b) | Explain any 5 keywords in python in detail. | 6M |
| | | (OR) | |
| 2. | (a) | Explain in detail about different data types in python. | 6M |
| | (b) | Define identifier and explain identifiers in python with example. | 6M |

## UNIT – II

| | | | |
|---|---|---|---|
| 3. | (a) | Write about continue and break statements with example. | 6M |
| | (b) | Define string in python and explain various methods on string | 6M |
| | | (OR) | |
| 4. | (a) | Define array and explain how to create an array in python with a simple program. | 6M |
| | (b) | What are the two primitive loop commands in python and explain with simple program. | 6M |

## UNIT – III

| | | | |
|---|---|---|---|
| 5. | (a) | What is a function in python and write the features of functions. | 6M |
| | (b) | What is the use of "return" statement in python and explain with a program. | 6M |
| | | (OR) | |
| 6. | (a) | Write differences between formal and actual parameters in python. | 6M |
| | (b) | Write a Python Program to Display Fibonacci sequence Using Recursion. | 6M |

## UNIT – IV

| | | | |
|---|---|---|---|
| 7. | (a) | Define a "set" in python? Explain how to add values to an existing set. | 8M |
| | (b) | Define the following terms<br>i) List ii) Tuple iii) Set iv) Dictionary | 4M |
| | | (OR) | |
| 8. | (a) | Write a short note on different Types of File in Python | 6M |
| | (b) | How to open and close a file in a python explain in detail. | 6M |

## UNIT-V

| | | | |
|---|---|---|---|
| 9. | (a) | Write a note on different types of variables and methods in OOPs in python. | 6M |
| | (b) | Does Python support Multiple Inheritance? If yes, Explain with a suitable python program. | 6M |
| | | (OR) | |
| 10. | (a) | Explain about Polymorphism with Inheritance with a suitable python program. | 6M |
| | (b) | Write a python program for abstract classes contain more subclasses. | 6M |

16-10-2021

Q.P. Code: 2005203

SET - 1

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

**B. Tech. II Semester (R20) Regular Examinations of October – 2021**

***SUB: C Programming and Data Structures (Common to CE & ECE)***

**Time: 3 Hours** **Max. Marks: 60**

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

## UNIT - I

| | | | |
|---|---|---|---|
| 1. | (a) | Difference between if statement and Switch statement. | 6M |
| | (b) | Explain the Loop/ Iteration Statements. | 6M |
| | | **(OR)** | |
| 2. | (a) | Discuss the structure of a C Program | 6M |
| | (b) | List and explain the variable declaration and data types in C. | 6M |

## UNIT – II

| | | | |
|---|---|---|---|
| 3. | (a) | Write a c program to find the Fibanocii series using array. | 6M |
| | (b) | Discuss string any five handling functions in detail. | 6M |
| | | **(OR)** | |
| 4. | (a) | Describe about arrays. Write a program to find sum of array elements. | 6M |
| | (b) | Explain the ways in which we can pass a one dimension arrays to functions. | 6M |

## UNIT – III

| | | | |
|---|---|---|---|
| 5. | (a) | Illustrate the declaring and initialization of pointer variable. | 6M |
| | (b) | Discuss the chain pointer in C. | 6M |
| | | **(OR)** | |
| 6. | | Explain the following:<br>(i) Structure with in structure<br>(ii) Self reference structure | 12M |

## UNIT – IV

| | | | |
|---|---|---|---|
| 7. | | List and explain the operations on a stack. | 12M |
| | | **(OR)** | |
| 8. | (a) | What is binary tree? Elaborate different binary tree traversal techniques. | 6M |
| | (b) | Differentiate between internal sorting and external sorting. | 6M |

## UNIT-V

| | | | |
|---|---|---|---|
| 9. | | List the advantages of double linked list over single linked list. What are the possible positions that a node can be deleted from a double linked list? Explain. | 12M |
| | | **(OR)** | |
| 10. | (a) | Show that the maximum number of nodes in a binary tree of height H is $2^{H+1}$ -1. | 6M |
| | (b) | How can we make an unbalanced tree as a balanced one? Explain various rotations that are involved in it. Give examples for each rotation. | 6M |

Q.P. Code: 2002203 | SET - 1

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

**B. Tech. II Semester (R20) Regular Examinations of October – 2021**

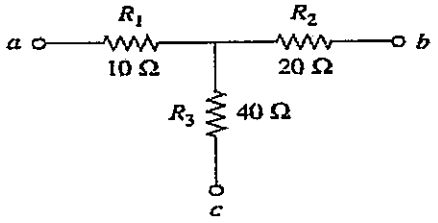
***SUB: Electrical Circuit Analysis - I (EEE)***

**Time: 3 Hours** **Max. Marks: 60**

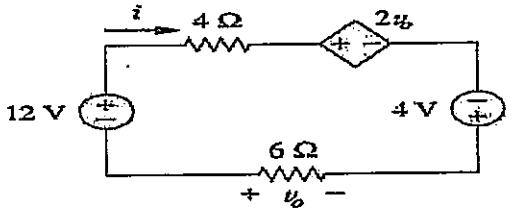
**Answer any FIVE Questions choosing one question from each unit.**
**All questions carry Equal Marks.**

## UNIT - I

1. (a) Transform the wye network shown in fig. to delta connected network. 4M




(b) Find $v_0$ and i in the circuit shown in fig. 8M




**(OR)**

2. (a) State and explain Faraday's law of electromagnetic induction. 6M
   (b) Explain the concept of self and mutual inductance. 6M

## UNIT – II

3. (a) Calculate average value and R.M.S values for a sinusoidal waveform. 8M
   (b) In a series RL circuit, R=5Ω, L=0.2H. Find current through the circuit if a 60Hz voltage, $V = 230\angle 60^{o}$V is applied across the circuit. 4M

**(OR)**

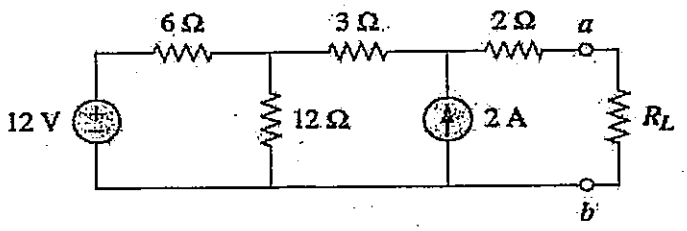
4. (a) Explain about steady state analysis of series RLC circuit for sinusoidal excitation. 8M
   (b) Explain the concept of susceptance and admittance. 4M

## UNIT – III

5. (a) State superposition theorem, 3M
   (b) State and explain maximum power transfer theorem for D.C excitation. 9M

**(OR)**

6. (a) State Thevenin's theorem. 3M
   (b) Find the value of $R_L$ for maximum power transfer in the circuit of fig. 9M



## UNIT – IV

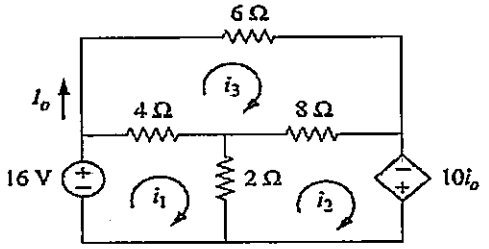
7. (a) Define phase sequence. 3M
   (b) Derive relation between line and phase values in a balanced star connection. 9M

**(OR)**

8. (a) List any three advantages of three phase system over single phase system. 3M
   (b) Derive relations between line and phase values in a balanced delta connection. 9M

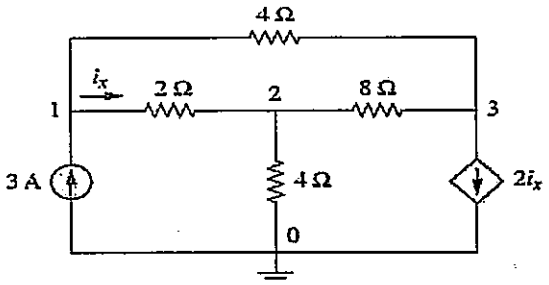
## UNIT-V

9. (a) Define (i) Graph (ii) Oriented graph (iii) Tree 3M
   (b) Using mesh analysis, find the current $I_0$ in the circuit of fig. 9M




**(OR)**

10. (a) Briefly write the procedure to construct dual of a network. 3M
    (b) Using nodal analysis, determine voltages at the nodes in the circuit of fig. 9M



Q.P. Code: 2024203 | SET - 1

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

**B. Tech. II Semester (R20) Regular Examinations of October – 2021**

***SUB: Communicative English (Common to ME & CSE)***

**Time: 3 Hours** **Max. Marks: 60**

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

## UNIT - I

1. (a) What are the complaints William Hazlitt's son has after attending a new school with reference to "*On the Conduct of Life*"? 7M

   (b) Give the meaning of the idioms and phrases and use them in sentences of your own. 5M
   (i) Hit the sack (ii) Pull someone's leg
   (iii) Wrap your head around something (iv) Add insult to injury
   (v) A perfect storm.

**(OR)**

2. (a) Identify the parts of speech of the underlined words in the following sentences.5M 5M
   (i) Elephant is a big animal.
   (ii) He is doing the work perfectly.
   (iii) I want to do Engineering.
   (iv) John is a handsome boy. (v) Don't do others' work, let them complete it.

   (b) Give synonyms and antonyms of the following words as directed. 7M
   (i) praise (synonym) (ii) accelerate (synonym)
   (iii) industrious (antonym) (iv) manipulate (synonym)
   (v) pathetic(antonym) (vi) stubborn (synonym)
   (vi) ferocious(antonym)

## UNIT – II

3. (a) How does Alfred Lord Tennyson convey the central idea of the poem through the journey of the brook? 7M

   (b) Fill in the blanks with the right verb forms from the verbs given in brackets 5M
   (i) Much effort ---------- (bring) its reward.
   (ii) He said that he ------- (see) him last year.
   (iii) The man met with an accident while he _____ (cross) the road.
   (iv) He ---------- (work) in TCS since 2015.
   (v) He ---------- (play) cricket when we visited his home.

**(OR)**

4. (a) Correct the mistakes, if any, and rewrite the following sentences. 5M
   (i) One of the coordinators has attended meeting.
   (ii) Neither the birds nor the animals was active in the zoo.
   (iii) This flat is not advertised for sale but rent.
   (iv) You promised to send me cheque in a few days.
   (v) Professor gave me valuable advice.

   (b) Fill in the blanks with suitable prepositions: 7M
   (i) He smiled ---------- Sreeja.
   (ii) They were good ---------- her.
   (iii) Meena is fond ---------- reading.
   (iv) His clients are happy ---------- Rupa's work
   (v) They fetched water ---------- the river.
   (vi) She went to market---------- vegetables.
   vii) Vijay went ---------- Kanpur to Chennai.

## UNIT – III

5. (a) Write the summary of Oliver Goldsmith's essay, 'A City Night Piece' in about 250 words. 7M

(b) Correct the following sentences : (from concord) 5M

i) One of the students have lost his wallet in the classroom.

ii) Neither the teacher nor the students are present today.

iii) Either Ram or Syam do the work.

iv) Each one of the participants are supposed to submit the project work.

v) My uncle and guardian come to my home tomorrow.

**(OR)**

6. (a) What kinds of metaphors does Goldsmith use in his descriptions of the city? Explain in detail. 5M

(b) Transform the following sentences as directed: 7M

i) Susana is a charming girl in the class.(change to Superlative Degree)

ii) Mohan is as good as my cousin. (change to Positive Degree)

iii) Smart phone is the best gadget. (change to Comparative Degree)

iv) Advertise the post. (change to Passive Voice)

v) I was given promotion last month. (change to Active Voice)

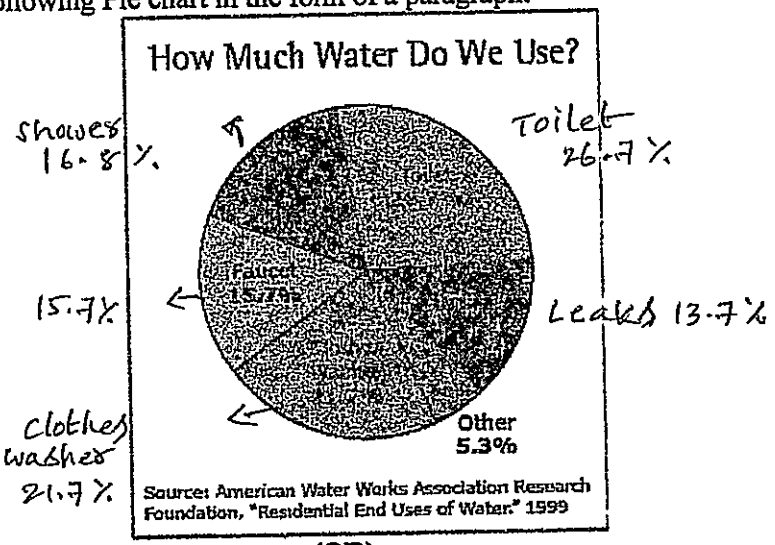
vi) He said "I want to earn money". (convert into Indirect Speech)

vii) She said that she wanted to become a lawyer. (convert into Direct Speech)

## UNIT – IV

7. (a) Do you agree with Chetan Bhagath's essay *'Being rich, Being good'*? Justify your answer. 7M

(b) Covert the following Pie chart in the form of a paragraph. 5M




**(OR)**

8. (a) Convert the following sentences as directed. 6M

(i) She is too busy to do the work. (convert into Complex Sentence)

(ii) Although he failed the exam, he did not try to blame the system. (convert into Compound sentence)

(iii) Work hard otherwise he will fail in this competitive exam. (convert into Simple Sentence)

(iv) Money can't make many. (convert into Complex Sentence)

(v) I am beautiful, _____? (Add question tags to the sentence)

(vi) She completed the work, _____? (Add question tags to the sentence)

(b) Write a short essay on Chetan Bhagath's language and style with reference to *Being rich, Being good'*. 6M

## UNIT-V

9. (a) Write a note on George Orwell's essay "Politics and the English Language" in about 250 words. 7M

(b) Read the passage given below and answer the questions that follow: 5M

In every country, people imagine that they are the best and the cleverest and the others are not as good as they are. The Englishman thinks that he and his country are the best; the Frenchman is proud of France and everything that is French. The Germans and Italians think no less of their countries and many Indians imagine that India is in many ways the greatest country in the world. This is wrong. Everyone wants to think well of himself and his country. But really there is no person who has not got some good and some bad qualities. In the same way, there is no country which is not partly good and partly bad. We must take the good wherever we find it and try to remove the bad wherever it may be. We are, of course, most concerned with our own country, India. Unhappily, it is in a bad state today. Most of our people are poor and unhappy. They have no joy in their lives; we have to find out how we can make them happier. We have to see what is good in our ways and customs and try to keep it, and whatever bad is there we have to throw away. If we find anything good in other countries, we should certainly take it.

i) What is the general belief of people in every country?
ii) What do you understand by the words 'no less of other countries'?
iii) What do many Indians imagine?
iv) What is it we must do?
v) Why does Nehru say that 'it is in a bad state today'?

**(OR)**

10. (a) Correct the following sentences if necessary. 7M

(i) One should not waste his time
(ii) He prayed to the God
(iii) He did not went to school yesterday.
(iv) I congratulate you for your success.
(v) Rama is cleverest boy is in the class.
(vi) He regretted for his mistake.
(vii) I have left smoking.

(b) Write the conversation between the Principal and the HoD on making a decision about sending students to an Industrial Tour? 5M

14-10-2021

Q.P. Code: 20EC202

SET - 1

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

**B. Tech. II Semester (R20) Regular Examinations of October – 2021**

***SUB: Engineering Chemistry (CE)***

**Time: 3 Hours** **Max. Marks: 60**

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

## UNIT - I

| | | | |
|---|---|---|---|
| 1. | (a) | What is desalination? Name the different methods involved in desalination. Describe any one in detail. | 8M |
| | (b) | What are the WHO standards for drinking water? | 4M |
| | | (OR) | |
| 2. | (a) | Explain the chemical reactions take place in the determination of dissolved oxygen. | 6M |
| | (b) | Define hardness of water and write the principle involved in the estimation of hardness of water by EDTA method? | 6M |

## UNIT – II

| | | | |
|---|---|---|---|
| 3. | (a) | Explain how nature of Environment influencing corrosion | 6M |
| | (b) | Explain differential aeration corrosion | 6M |
| | | (OR) | |
| 4. | (a) | Define Secondary battery. Explain working principle of Ni-Cad battery | 6M |
| | (b) | Define cell potential and derive Nernst equation. | 6M |

## UNIT – III

| | | | |
|---|---|---|---|
| 5. | (a) | Describe the synthesis of Bakelite | 8M |
| | (b) | Differences between Thermo plastics and Thermo setting plastics. | 4M |
| | | (OR) | |
| 6. | (a) | Describe the proximate analysis of coal | 6M |
| | (b) | Explain the mechanism of Cationic polymerization with an example. | 6M |

## UNIT – IV

| | | | |
|---|---|---|---|
| 7. | (a) | What are Refractories? How are they Classified? Give examples | 6M |
| | (b) | Write notes on Setting and Hardening of Cement | 6M |
| | | (OR) | |
| 8. | (a) | What are the functions of the lubricants? | 6M |
| | (b) | Explain the Boundary line lubrication | 6M |

## UNIT-V

| | | | |
|---|---|---|---|
| 9. | (a) | Write a short on micelle formation | 6M |
| | (b) | Explain the synthesis of colloids by Electro dispersion method. | 6M |
| | | (OR) | |
| 10. | (a) | Explain the synthesis of nanomaterials by Chemical method. | 6M |
| | (b) | How stabilizing agents are utilized in stabilizing colloids. | 6M |

Q.P. Code: 2023202 | SET - 1

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

**B. Tech. II Semester (R20) Regular Examinations of October – 2021**

***SUB: Chemistry (Common to EEE & ECE)***

**Time: 3 Hours** **Max. Marks: 60**

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

**UNIT - I**

1. Apply the Schrödinger wave equation to the electron present in the hydrogen atom. 12M

**(OR)**

2. (a) Calculate the bond order of carbon monoxide molecule based on its energy level diagram. 8M
   (b) Write short note on Planck's quantum theory 4M

**UNIT – II**

3. (a) Discuss the crystal field splitting in octahedral complex with suitable example 7M
   (b) List the modern applications of nanomaterials 5M

**(OR)**

4. (a) Write a note on fullerenes and carbon tubes 8M
   (b) Outline the oxidation states of coordination compounds 4M

**UNIT – III**

5. (a) Give the differences between primary and secondary cell? 4M
   (b) Discuss the construction and working of $H_2O_2$ fuel cell 8M

**(OR)**

6. (a) Discuss the principle involved in conductometric titration and write the advantage of this titration. 4M
   (b) Describe the construction and working of lithium ion battery and list its advantages. 8M

**UNIT – IV**

7. How are the following produced? i) Teflon ii) Nylon-6,6. Mention their properties and applications. 12M

**(OR)**

8. What are Conducting polymers? Explain their mechanism of conduction with suitable example. 12M

**UNIT-V**

9. (a) Discuss the principle and applications of UV- Visible spectrometer. 7M
   (b) Summarize your knowledge on Thin layer Chromatography 5M

**(OR)**

10. (a) Explain different types of fundamental modes of vibrations. 8M
    (b) Recall the applications of IR spectroscopy 4M

Q.P. Code: 20EP202

SET - 1

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

**B. Tech. II Semester (R20) Regular Examinations of October – 2021**

***SUB: Engineering Physics (ME)***

**Time: 3 Hours** **Max. Marks: 60**

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

**UNIT - I**

| | | | |
|---|---|---|---|
| 1. | (a) | Explain the principle of superposition of waves | 4M |
| | (b) | With the help of a diagram, explain how wavelength of light source is determined by forming Newton's rings. | 8M |
| | | **(OR)** | |
| 2. | (a) | Distinguish between Fresnel and Fraunhofer diffractions | 4M |
| | (b) | Discuss the phenomena of diffraction in a plane grating and obtain the grating equation. | 8M |

**UNIT – II**

| | | | |
|---|---|---|---|
| 3. | (a) | What are the important characteristics of a LASER ? | 4M |
| | (b) | Explain how population inversion takes place in producing a laser beam in a He-Ne laser? | 8M |
| | | **(OR)** | |
| 4. | (a) | Define (i). Acceptance angle and (ii). Numerical aperture | 4M |
| | (b) | Draw the block diagram and explain the optical fiber communication system | 8M |

**UNIT – III**

| | | | |
|---|---|---|---|
| 5. | (a) | Explain the classification of Magnetic materials | 4M |
| | (b) | With suitable diagram, discuss the concept of "Domain" in the Ferromagnetic materials | 8M |
| | | **(OR)** | |
| 6. | (a) | What are Nano materials? Give examples | 4M |
| | (b) | Discuss the Top-down approach in the synthesis of Nano-materials | 8M |

**UNIT – IV**

| | | | |
|---|---|---|---|
| 7. | (a) | Explain how acoustics play an important role in the design of a cinema hall. | 4M |
| | (b) | Derive Sabine's formula and explain its significance | 8M |
| | | **(OR)** | |
| 8. | (a) | Explain the properties of Ultrasonic waves | 4M |
| | (b) | What is an acoustic grating? Briefly explain the principle of working of pulse-echo system | 8M |

**UNIT-V**

| | | | |
|---|---|---|---|
| 9. | (a) | What is Bravais lattice? Explain | 4M |
| | (b) | Explain; (i). Packing fraction and (ii). Miller indices | 8M |
| | | **(OR)** | |
| 10. | (a) | State and explain Bragg's law in X-ray diffraction | 4M |
| | (b) | Explain how the structure of poly crystalline material is determined by powder method. | 8M |

Q.P. Code: 20AP202 | SET - 1

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

**B. Tech. II Semester (R20) Regular Examinations of October – 2021**

***SUB: Applied Physics (CSE)***

**Time: 3 Hours** **Max. Marks: 60**

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

## UNIT - I

| | | | |
|---|---|---|---|
| 1. | (a) | With ray diagram discuss the theory of Thin films and the condition for constructive and Destructive Interference in the case of reflected system. | 8M |
| | (b) | Calculate the thickness of air film at $10^{th}$ dark ring in a Newton's rings system viewed normally by a reflected light of wavelength 500nm.The Diameter of the $10^{th}$ dark ring is 2mm. | 4M |
| | | (OR) | |
| 2. | (a) | What are the types of diffraction and give the Difference between them. | 4M |
| | (b) | Explain the Fraunhofer diffraction due to double slit | 8M |

## UNIT – II

| | | | |
|---|---|---|---|
| 3. | (a) | What is Population Inversion ? Describe any two methods of achieving Population Inversion. | 4M |
| | (b) | Describe the Principle, Construction and working of a Semiconductor Laser. | 8M |
| | | (OR) | |
| 4. | (a) | With the help of a suitable diagram explain the principle , construction and working of an optical fiber as a wave guide. | 6M |
| | (b) | Draw the block diagram of Fiber Optic communication system and explain the function of each block. | 6M |

## UNIT – III

| | | | |
|---|---|---|---|
| 5. | (a) | Define Dielectric constant and susceptibility. Derive the relation between them. | 6M |
| | (b) | What is Electronic polarization? Derive the expression for electronic polarizability in terms of the radius of the atom. | 6M |
| | | (OR) | |
| 6. | (a) | Distinguish between Dia, Para and Ferro magnetic materials. | 6M |
| | (b) | What is Hystersis? Discuss soft and hard magnetic materials along with its Applications. | 6M |

## UNIT – IV

| | | | |
|---|---|---|---|
| 7. | (a) | Show that the energies of a particle in a square potential box are quantized. | 8M |
| | (b) | Derive an expression for density of energy states. | 4M |
| | | (OR) | |
| 8. | (a) | Explain Merits and Demerits of classical free electron theory | 4M |
| | (b) | Derive time dependent Schrodinger's wave equation. What is the physical significance of the wave function used in the above equation. | 8M |

## UNIT-V

| | | | |
|---|---|---|---|
| 9. | (a) | Describe the Drift and Diffusion currents in a semiconductor. | 8M |
| | (b) | Distinguish between Direct and Indirect band gap of Semiconductors. | 4M |
| | | (OR) | |
| 10. | (a) | What is meant by super conductivity? Explain the properties of super conductors. | 6M |
| | (b) | What are Cooper Pairs? Discuss the BCS Theory of Superconductivity. | 6M |

12-10-2021 FN

**Q.P. Code: 2021201** | **SET - 1**

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

**B. Tech. II Semester (R20) Regular Examinations of October – 2021**

***SUB: Differential Equations and Vector Calculus (Common to all branches)***

**Time: 3 Hours** **Max. Marks: 60**

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

**UNIT - I**

1. Solve $(D^2-2D+1)y=x^2e^{3x}-\sin 2x+3$. 12M

**(OR)**

2. Solve the differential equation $(D^2+4)y=\sec 2x$ by the method of variation of parameters. 12M

**UNIT – II**

3. (a) Form the differential equation by eliminating $a$ and $b$ from $\log(az-1)=x+ay+b$ . 6M
   (b) Form the partial differential equation by eliminating the arbitrary function $f$ from $z=xy+f(x^2+y^2)$ . 6M

**(OR)**

4. (a) Solve the differential equation: $x^2(y-z)p+y^2(z-x)q=z^2(x-y)$. 6M
   (b) Solve : $pz-qz=z^2+(x+y)^2$ 6M

**UNIT – III**

5. Solve $\frac{\partial^2 u}{\partial x^2}=\frac{\partial u}{\partial y}+2u$ in the form $u=f(x)g(y)$. Obtain the solution satisfying $u=0$, $\frac{\partial u}{\partial x}=1+e^{-3y}$ When $x=0$ for all values of $y$. 12M

**(OR)**

6. A tightly stretched sting with fixed end points $x=0$ *and* $x=l$ is initially in a position given by $y=y_0\sin^3\frac{\Pi x}{l}$. If it is released from rest from this position, find the displacement $y(x,l)$ . 12M

**UNIT – IV**

7. (a) Find the directional derivative of $\phi=x^2yz+4xz^2$ at $(1,-2,1)$ in the direction $2i-j-2k$. 6M
   (b) Show that the vector $(x^2-yz)\bar{i}+(y^2-zx)\bar{j}+(z^2-xy)\bar{k}$ is Irrotational and find its scalar potential function. 6M

**(OR)**

8. Find constants $a,b,c$ so that the vector $\bar{A}=(x+2y+az)\bar{i}+(bx-3y-z)\bar{j}+(4x+cy+2z)\bar{k}$ is Irrotational. Also find $\phi$ such that $\bar{A}=\nabla\phi$. 12M

**UNIT-V**

9. If $\bar{F}=(x^2-27)\bar{i}-6yz\bar{j}+8xz^2\bar{k}$, evaluate $\int_c \bar{F}.d\bar{r}$ from the point $(0,0,0)$ to the point $(1,1,1)$ along the straight line from $(0,0,0)$ to $(1,0,0)$, $(1,0,0)$ to $(1,1,0)$ and $(1,1,0)$ to $(1,1,1)$. 12M

**(OR)**

10. Verify Greens theorem in the plane for $\int_c (x^2-xy^3)dx+(y^2-2xy)dy$ where C is a square with vertices $(0,0),(2,0),(2,2),(0,2)$ . 12M

**Q.P. Code: 2021201** | **SET - 1**

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

**B. Tech. II Semester (R20) Regular Examinations of October – 2021**

***SUB: Differential Equations and Vector Calculus (Common to all branches)***

**Time: 3 Hours** **Max. Marks: 60**

**Answer any FIVE Questions choosing one question from each unit.**

**All questions carry Equal Marks.**

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1. Solve $(D^2-2D+1)y=x^2e^{3x}-\sin 2x+3$. 12M

**(OR)**

2. Solve the differential equation $(D^2+4)y=\sec 2x$ by the method of variation of parameters. 12M

**UNIT – II**

3. (a) Form the differential equation by eliminating $a$ and $b$ from $\log(az-1)=x+ay+b$ . 6M

   (b) Form the partial differential equation by eliminating the arbitrary function $f$ from $z=xy+f(x^2+y^2)$. 6M

**(OR)**

4. (a) Solve the differential equation: $x^2(y-z)p+y^2(z-x)q=z^2(x-y)$. 6M

   (b) Solve : $pz-qz=z^2+(x+y)^2$ 6M

**UNIT – III**

5. Solve $\frac{\partial^2 u}{\partial x^2}=\frac{\partial u}{\partial y}+2u$ in the form $u=f(x)g(y)$. Obtain the solution satisfying $u=0$, $\frac{\partial u}{\partial x}=1+e^{-3y}$ When $x=0$ for all values of $y$. 12M

**(OR)**

6. A tightly stretched sting with fixed end points $x=0$ *and* $x=l$ is initially in a position given by $y=y_0\sin^3\frac{\Pi x}{l}$. If it is released from rest from this position, find the displacement $y(x,l)$ . 12M

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   (b) Show that the vector $(x^2-yz)\bar{i}+(y^2-zx)\bar{j}+(z^2-xy)\bar{k}$ is Irrotational and find its scalar potential function. 6M

**(OR)**

8. Find constants $a,b,c$ so that the vector $\bar{A}=(x+2y+az)\bar{i}+(bx-3y-z)\bar{j}+(4x+cy+2z)\bar{k}$ is Irrotational. Also find $\phi$ such that $\bar{A}=\nabla\phi$. 12M

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9. If $\bar{F}=(x^2-27)\bar{i}-6yz\bar{j}+8xz^2\bar{k}$, evaluate $\int_c \bar{F}.d\bar{r}$ from the point $(0,0,0)$ to the point $(1,1,1)$ along the straight line from $(0,0,0)$ to $(1,0,0)$, $(1,0,0)$ to $(1,1,0)$ and $(1,1,0)$ to $(1,1,1)$. 12M

**(OR)**

10. Verify Greens theorem in the plane for $\int_c (x^2-xy^3)dx+(y^2-2xy)dy$ where C is a square with vertices $(0,0),(2,0),(2,2),(0,2)$ . 12M