

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B. Tech. VI Semester (R18) Regular Examinations of August – 2021
SUB: Surveying

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) A 20 m chain was found to be 15 cm too long after chaining a distance of 1600 m. It was found to be 30 cm too long at the end of day's work after chaining a total distance of 3200 m. Determine the correct distance if the chain was correct before the commencement of the work. **7M**
- (b) State the reasons for incorrect length of Chain? **7M**

(OR)

2. (a) The following bearings are taken on a closed compass traverse. **7M**

Line	F.B	B.B
AB	S 37° 30' E	N 37° 30' W
BC	S 43° 15' W	N 44° 15' E
CD	N 73° 00' W	S 72° 15' E
DE	N 12° 45' E	S 13° 15' W
EA	N 60° 00' E	S 59° 00' W

Compute the interior angles and correct them for observational errors. Assuming the observed bearing of the line AB to be correct, adjust the bearing of the remaining sides.

- (b) Find the angles between the lines AB and AC, If their respective bearings are 35° 40' and 142° 20'? **7M**

UNIT – II

3. (a) The following staff readings were taken with a level, the instrument having been moved after third, sixth and eight readings. **7M**
 2.225, 1.625, 0.985, 2.095, 2.795, 1.265, 0.605, 1.980, 1.045 and 2.685
 Enter the above reading in a page level field book and calculate the R.L of the points. The first reading was taken on B.M of elevation 100.00m. Use rise and fall method.
- (b) Explain briefly fly leveling and reciprocal leveling **7M**

(OR)

4. (a) Compare Rise and Fall method of leveling with Height of collimation method. **7M**
- (b) The following consecutive readings were taken with a level and 5 meter leveling staff on a continuously sloping ground on a common interval of 20 meters. 0.385 ; 1.030 ; 1.925 ; 2.825 ; 3.730 ; 4.685 ; 0.625 ; 2.005 ; 3.1101 ; 4.485 the R.L of the first point was 208.125 m. Rule out a page of level book and enter the readings. Calculate the R.L._S of the points by rise and fall method. **7M**

UNIT – III

5. (a) The following perpendicular offsets were taken at 10m intervals from a survey line to an irregular boundary line: 3.25, 5.60, 4.20, 6.65, 8.75, 6.20, 3.25, 4.20, 5.65
 Calculate the area enclosed between the survey line, the irregular boundary line and the first and last offsets by Simpsons method. **7M**
- (b) A railway embankment of formation width of 8m and side slope 2:1 is to be constructed. **7M**

Chainage	0	50	100	150	200	250
GL(m)	115.75	114.35	116.80	115.20	118.50	118.25

The ground level along the centre line is as follows:

The embankment has a raising gradient of 1 in 100 and the formation level at zero chainage is 115.00. Assuming the ground is level across the centre line, Compute the volume of the earth work.

(OR)

6. (a) The areas enclosed by the contours in a lake are as follows: 7M

Contour(m)	270	275	280	285	290
Area (m²)	2050	8400	16300	24500	31500

Calculate the volume of water between the contours 270m and 290m by:

(i) Trapezoidal formula and (ii) Prismoidal rule

- (b) What is Simpson's rule? Derive an expression for it 7M

UNIT – IV

7. (a) What are the common difficulties in setting out simple curves? Describe briefly the Methods employed in overcoming them. 5M

- (b) An ordinary theodolite is to be converted into an anallactic tachometer with a multiplier of 100 by an insertion of a new glass stadia diaphragm and an additional convex lens. Focal length of object glass is 15cm, fixed at a distance of 10cm from the trunnion axis. A focusing slide carries the eye-piece. If a suitable lens of 10 cm focal length is available for the anallactic lens, Calculate the fixed distance at which this must be placed from the objective and the spacing of the stadia hairs on the diaphragm. 9M

(OR)

8. (a) What is total station? Mention the advantages of total station over level and theodolite along with the uses of total station. Mention the features of total station 7M

- (b) Write the procedure to find out horizontal and vertical angles using Total station instrument. 7M

UNIT-V

9. (a) List out any 4 important satellite and their sensors. 8M

- (b) What is electromagnetic spectrum? Explain with neat sketch 6M

(OR)

10. Describe the importance of image classification in remote sensing. Explain briefly the categories of image classification used and distinguished among each other. 14M

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA**B. Tech. VI Semester (R18) Regular Examinations of August – 2021*****SUB: MATLAB Programming*****Time: 3 Hours****Max. Marks: 70****Answer any FIVE Questions choosing one question from each unit.****All questions carry Equal Marks.****UNIT - I**

1. Discuss about script M file in writing MATLAB program with suitable examples 14M

(OR)

2. (a) Describe various methods available for creation of arrays in MATLAB. 7M
(b) Write a MATLAB program to illustrate array – array operations. 7M

UNIT – II

3. Illustrate ‘If’ and ‘while’ loop control flow structure with an example. 14M

(OR)

4. List the various relational and logical operators available in MATLAB with detailed description. 14M

UNIT – III

5. Write a MATLAB program to solve the following set of linear equations. 14M

$$2x_1 + 4x_2 - x_3 = 2$$

$$2x_1 + 2x_2 - x_3 = 2$$

$$-2x_1 - x_2 + x_3 = -3$$

(OR)

6. With suitable examples describe the following polynomial functions. 14M

(i) polyder

(ii) polyint

(iii) deconv

(iv) roots

UNIT – IV

7. What is meant by data interpolation? Describe the various methods to interpolate data in one dimension with an example. 14M

(OR)

8. (a) Write a short notes on multiple figures and sub plots 7M
(b) Write short notes on curve fitting 7M

UNIT-V

9. With suitable examples describe the following symbolic functions. a) findsym b) expand c) factor d) simplify e) subs 14M

(OR)

10. Use the symbolic expressions, evaluate the following equations: 14M

a) $\int_0^4 (x^2 + 4x + 3) dx$ b) $\frac{d}{dx} (2x^3 + 2x + 3)$ c) $\int_0^4 (x^4 + 32 + 5) dx$

d) $\frac{d}{dx} (x^3 + 4x^2 + 6)$ e) $\int (x^3 + \exp(x)) dx$

Q.P. Code: 18OE302

SET - 1

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B. Tech. VI Semester (R18) Regular Examinations of August – 2021
SUB: Robotics & Application in Manufacturing

Time: 3 Hours

Max. Marks: 70

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

UNIT - I

1. Define Automation? Contrast the basic elements of an Automated System. 14M
(OR)
2. Classify the material handling equipment. Explain the any two of the material handling equipment 14M

UNIT – II

3. Illustrate the basic components of numerical control system 14M
(OR)
4. (a) Differentiate between NC part programming and Computer assisted part programming 10M
(b) What are the tasks in computer assisted part programming? 4M

UNIT – III

5. Describe 14M
(i) Storage buffers
(ii) Transfer lines
(iii) Automated production lines
(OR)
6. Define the automated assembly systems? Explain about the in-line type and rotary type in detail with applications. 14M

UNIT – IV

7. With neat sketches, explain the various classification of Robots? 14M
(OR)
8. (a) Explain the working principle of Mechanical Gripper and list out its applications also. 8M
(b) How interfacing of the end effector done in Robot? 6M

UNIT-V

9. (a) List out the steps used in DH convention 6M
(b) Explain the forward kinematics and inverse kinematics 8M
(OR)
10. Discuss 14M
(i) Potentiometers
(ii) Resolvers

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B. Tech. VI Semester (R18) Regular Examinations of August – 2021
SUB: Overview of Microcontrollers

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) Draw the general block diagram of microcontroller and explain each block. 7M
(b) Write the differences between Vonneumann Vs Harvard architectures. 7M

(OR)

2. (a) Explain different types of Microcontrollers with examples. 7M
(b) Write the differences between CISC Vs RISC. 7M

UNIT – II

3. (a) Draw and explain neatly the architecture of 8051 microcontroller. 7M
(b) Write short notes on special function registers of 8051. 7M

(OR)

4. (a) Explain internal RAM & ROM memory organizations. 7M
(b) Write short notes on timers and interrupts of 8051 microcontroller. 7M

UNIT – III

5. (a) Explain the pin diagram of MSP430 microcontroller. 7M
(b) Explain central processing unit of MSP430 microcontroller. 7M

(OR)

6. (a) Explain memory mapped input and output of MSP430 microcontroller. 7M
(b) Explain clock generator Interrupts and Resets of MSP430 microcontroller. 7M

UNIT – IV

7. (a) Explain the features and architecture details of PIC 16C6X/7X microcontroller. 7M
(b) Explain i/o ports of PIC microcontroller. 7M

(OR)

8. (a) How Analog to Digital conversion takes place in PIC microcontroller, explain. 7M
(b) Write the features and applications of 16F8XX series. 7M

UNIT-V

9. (a) Explain RISC design philosophy. 7M
(b) Explain the different registers of ARM microcontroller. 7M

(OR)

10. (a) Explain the instruction pipeline of ARM microcontroller. 7M
(b) Write short notes on interrupts and vector table of ARM microcontroller. 7M

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B. Tech. VI Semester (R18) Regular Examinations of August – 2021
SUB: Data Structures

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) List out the differences between array and linked list **4M**
(b) Explain procedure for inserting and deleting a node from the linked list **10M**
(OR)
2. (a) Define Data structure? Explain classification of data structure **5M**
(b) Write procedure for traversing a double linked list and for searching an element in double linked list **9M**

UNIT – II

3. (a) Explain the operations on circular queues **6M**
(b) Convert the following infix expression to postfix $(A+B)*(C*D-E)*F/G$ **8M**
(OR)
4. (a) What are the drawbacks of linear queue? Explain how queues are represented in memory. **7M**
(b) Write an algorithm for Towers of Hanoi. **7M**

UNIT – III

5. Define binary search tree. Create a binary search tree from {7, 4, 12, 2, 6, 9, 19, 8, 15, 11, 3, 20, 5}. How can we delete an element from the binary search tree? After creation of the tree delete elements 6, 12 and 3. Explain the procedure in detail. **14M**
(OR)
6. (a) Explain the ways of representing binary trees in memory. Write short notes on tree traversals. **8M**
(b) Explain Leftist trees and its operations with an example. **6M**

UNIT – IV

7. (a) Why we need to balance tree? Explain how balancing is done in AVL Trees **8M**
(b) Explain Graph traversal techniques **6M**
(OR)
8. (a) Explain insertion and deletion operations in Red- black trees **10M**
(b) Explain representation of graphs in memory **4M**

UNIT-V

9. (a) Write an algorithm to search for an element using binary search and give example **7M**
(b) Explain how to sort elements using selection sort give algorithm and example for same. **7M**
(OR)
10. (a) Write an algorithm for Quick sort. Trace the algorithm for the following set of numbers: 54, 26, 93, 17, 77, 31, 44, 55 and 20. **8M**
(b) Compare binary search and linear search techniques **6M**

Q.P. Code: 18OE502

SET - 1

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B. Tech. VI Semester (R18) Regular Examinations of August – 2021
SUB: Database Management Systems

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 Database architecture with a neat diagram. 7M
(b) Explain briefly different database languages. 7M

(OR)

2. (a) Write about different relational operations with examples. 7M
(b) Draw ER diagram for college library management system. 7M

UNIT – II

3. (a) Write about basic structure of SQL query 7M
(b) Explain about set operations with examples 7M

(OR)

4. (a) Explain about triggers with an example 7M
(b) Write about SQL data types 7M

UNIT – III

5. (a) What is redundancy and write about problems caused by redundancy 7M
(b) Explain loss less join decomposition and dependency preserving decomposition. 7M

(OR)

6. (a) Explain BCNF with an example 7M
(b) Explain multi valued dependency and 5NF with examples 7M

UNIT – IV

7. (a) Define transaction and explain transaction properties. 7M
(b) Write about transaction isolation levels 7M

(OR)

8. (a) Explain query cost optimization measures. 7M
(b) Explain serializability concept with example. 7M

UNIT-V

9. (a) Explain about deadlock handling. 7M
(b) Write about recovery algorithms. 7M

(OR)

10. (a) Write about timestamp based protocol. 7M
(b) Describe multi version schemes and snapshot isolation briefly. 7M

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B. Tech. VI Semester (R18) Regular Examinations of August – 2021
SUB: Advanced Numerical Methods

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) Evaluate $(30)^{\frac{-1}{5}}$ by Newton's iteration method. 7M
 (b) Solve the following system of equations by using Gauss-Jordan method: 7M
 $2x + y + z = 10, 3x + 2y + 3z = 18, x + 4y + 9z = 16.$

(OR)

2. Solve the equations $3x - 0.1y - 0.2z = 7.85, 0.1x + 7y - 0.3z = -19.3, 0.3x - 0.2y + 10z = 71.4$ by using Gauss-Seidel iteration method correct to three decimal places. 14M

UNIT - II

3. (a) Derive the Newton's forward interpolation formula. 7M
 (b) The following table gives the distance in nautical miles of the visible horizon for the given heights in feet above the earth's surface: 7M

$x = \text{height}$	100	150	200	250	300	350	400
$y = \text{distance}$	10.63	13.03	15.04	16.81	18.42	19.90	21.27

Find the values of y when $x = 218$ ft.**(OR)**

4. Find the missing term in the following table using interpolation: 14M

$x :$	0	1	2	3	4
$y :$	1	3	9	---	81

UNIT - III

5. From the following table, find $\frac{dy}{dx}, \frac{d^2y}{dx^2}$ at (i) $x = 1.5$ (ii) $x = 4.0$. 14M

x	1.5	2	2.5	3.0	3.5	4.0
y	3.375	7.000	13.625	24.000	38.875	59.000

(OR)

6. A solid of revolution is formed by rotating about the x -axis, the area between the x -axis, the lines $x = 0$ and $x = 1$ and a curve through the points with the following coordinates: 14M
 $x : 0.00 \quad 0.25 \quad 0.50 \quad 0.75 \quad 1.00$
 $y : 1.0000 \quad 0.9896 \quad 0.9589 \quad 0.9089 \quad 0.8415$. Estimate the volume of the solid formed using Simpson's rule.

UNIT - IV

7. (a) Using Taylor series method correct to four decimal places, find the value of $y(0.1)$, 7M
 given that $\frac{dy}{dx} = x + y^2$ with $y(0) = 1$.
 (b) Using Milne's predictor and corrector method, find $y(0.8)$ from $\frac{dy}{dx} = y - x^2$ and 7M
 $y(0) = 1, y(0.2) = 1.12186, y(0.4) = 1.46820$ and $y(0.6) = 1.7379$.

(OR)

8. Using Runge-Kutta method of fourth order, solve $\frac{dy}{dx} = \frac{y^2 - x^2}{y^2 + x^2}$, $y(0) = 1$ at $x = 0.2, 0.4$. **14M**

UNIT-V

9. Solve $\frac{\partial^2 u}{\partial x^2} + \frac{\partial^2 u}{\partial y^2} = 0$ in $0 \leq x \leq 4, 0 \leq y \leq 4$ given that $u(0, y) = 0$, $u(4, y) = 4 + y$, **14M**

$$u(x, 0) = 3x^2, \quad u(x, 4) = \frac{x^2}{3} \quad \text{with } \Delta x = \Delta y = 1.$$

(OR)

10. Solve the boundary value problem $y'' - y = 0$ with $y(0) = 0$, $y(2) = 3.62686$. The exact solution of this problem is $y = \sinh x$. **14M**

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B. Tech. VI Semester (R18) Regular Examinations of August – 2021
SUB: Write IT Right

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) List out various Characteristics of effective writing 7M
(b) Do you think the Punctuation marks are important in written communication? Explain any four of them 7M

(OR)

2. (a) What is logical flow in communication? How can we achieve it? 7M
(b) Write a job application letter to the advertisement given below: 7M
“Microsoft would like to recruit software engineers with B.Tech.and Minimum of five years of experience. Interested candidates need to apply within fifteen days”.

UNIT – II

3. (a) Explain the process of pre-writing 7M
(b) Why are writing skills so important? 7M

(OR)

4. (a) Explain various principles of effective paragraph 7M
(b) Write an effective paragraph on “Present education system” 7M

UNIT – III

5. Correct the following sentences if necessary 14M
(i) The soup are hot.
(ii) This lights are bright.
(iii)It is raining when I got home last night.
(iv)I have not ate anything.
(v) If I am a child, I would play outside.
(vi)Everyone have seen that movie.
(vii) I fell asleep while I watched Television.
(viii) I have lived in Canada since 10 months.
(ix)The students were not interested in the lesson because it was bored.
(x) She sat in the end of the table.
(xi) I stopped to smoke cigarettes because it was unhealthy.
(xii) It is very good weather.
(xiii) He adviced me to take rest.
(xiv) I can't find nothing in my neighborhood.

(OR)

6. (a) What kind of measures should one adopt to improve their trade as writers? 7M
(b) Write an essay on “Students and Politics” 7M

UNIT – IV

7. (a) Explain the role of definite article in effective writing. 7M
(b) What kind of steps one needs to adopt to become a better writer? 7M

(OR)

8. Why is English such an important language? Illustrate your answer with suitable examples. 14M

UNIT-V

9. (a) Expand “a bad worker always blames tools” 7M
(b) Explain various strategies of Note-making. 7M
- (OR)**
10. (a) Explain various characteristics of a good précis. 7M
(b) Attempt a précis on the following: 7M

Men and women are of equal rank but they are not identical. They are a peerless pair being supplementary to one another, each helps the other so that without one the existence of the other cannot be conceived and, therefore it follows as a necessary corollary from these facts that anything that will impair the status of either of them will involve the equal ruin of them both. In framing any scheme of women's education this cardinal truth must be constantly kept in mind. Man is supreme in the outward activities of a married pair and therefore it is in the fitness of things that he should have a greater knowledge thereof. On the other hand, the life is entirely the sphere of woman and, therefore in domestic affairs, in the upbringing and education of children, woman ought to have more knowledge. Not that knowledge should be divided into water-tight compartments or that so that some branches of knowledge should be closed to anyone, but unless courses of instruction are based on discriminating appreciation of these basic principles, the fullest life of man and woman cannot be developed. Among the manifold misfortunes that may befall humanity, the loss of health is one of the severest. All the joys which life can give cannot outweigh the sufferings of the sick. Among the manifold misfortunes that may befall humanity, the loss of health is one of the severest. All the joys which life can give cannot outweigh the sufferings of the sick.

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B. Tech. VI Semester (R18) Regular Examinations of August – 2021
SUB: Human Capital Management

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 functions of Human resource Management. **7M**
(b) Describe the role HR manager in the present scenario. **7M**

(OR)

2. (a) Define HRM and explain its nature and scope. **7M**
(b) Outline the Evolution of HRM **7M**

UNIT – II

3. What are the techniques of job design? **14M**

(OR)

4. Distinguish between Job Description and Job Specification **14M**

UNIT – III

5. (a) What are the Limitations of Job Evaluation **7M**
(b) Explain the need of HRP. **7M**

(OR)

6. Explain the process of Human Resource Planning **14M**

UNIT – IV

7. (a) What is Recruitment? What are the sources of recruitment? **7M**
(b) Discuss problems in induction **7M**

(OR)

8. Draw the selection process in detail. **14M**

UNIT-V

9. (a) Describe the Objectives of Training, **7M**
(b) Write a short note on Training Process, **7M**

(OR)

10. Classification of Training Methods in detail with suitable examples **14M**

Q.P. Code: 1801602

SET - 1

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B. Tech. VI Semester (R18) Regular Examinations of August – 2021
SUB: Concrete Technology (CE)

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 initial and final setting time of cement. Explain any one in brief **7M**
(b) Explain Bogue's compounds. **7M**

(OR)

2. (a) Mention different types of cement. Explain any one in brief. **7M**
(b) Briefly describe about plasticizers and super plasticizers **7M**

UNIT – II

3. (a) Define segregation, bleeding, workability, and slump test on fresh concrete. **7M**
(b) Explain briefly about the factors affecting the workability. **7M**

(OR)

4. (a) Explain the factors affecting alkali-aggregate reaction. **7M**
(b) Explain the grading of aggregates. **7M**

UNIT – III

5. (a) Explain the impact of W/C ratio on durability. **7M**
(b) Define permeability, poisson's ratio, shrinkage and creep of concrete. **7M**

(OR)

6. (a) Write a short note on dynamic modulus of concrete. **7M**
(b) What are the different thermal properties of concrete.? **7M**

UNIT – IV

7. (a) List the curing methods of concrete. Explain any one in brief. **7M**
(b) Explain high pressure steam curing. **7M**

(OR)

8. (a) Define carbonation of concrete. Explain the rebound hammer test. **7M**
(b) Mention the different mechanical properties test on hardened concrete. Explain any one in brief. **7M**

UNIT-V

9. Explain the ACI method of mix design. **14M**

(OR)

10. Design a concrete mix for construction of an elevated water tank. The specified design strength of concrete (characteristic strength) is 30 MPa at 28 days measured on standard cylinder. Standard deviation can be taken as 4Mpa. The specific gravity of FA and CA are 2.65 and 2.7 respectively. The dry rodded bulk density of CA is 1600 kg/m³ and fineness modulus of FA is 2.8. Ordinary Portland cement will be used. A slump of 50mm is necessary. CA is found to be absorptive to the extent of 1 % and free surface moisture in sand is found to be 2%. Assume any other essential data. **14M**

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B. Tech. VI Semester (R18) Regular Examinations of August – 2021
SUB: Structural Analysis - II (CE)

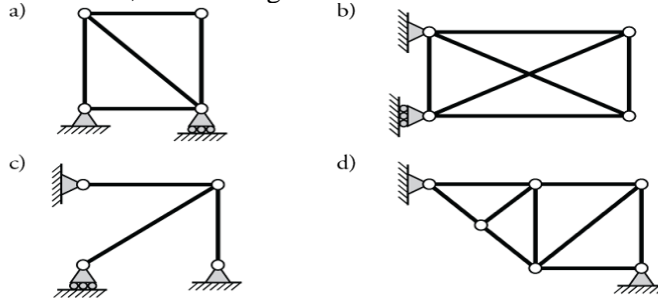
Time: 3 Hours

Max. Marks: 70

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

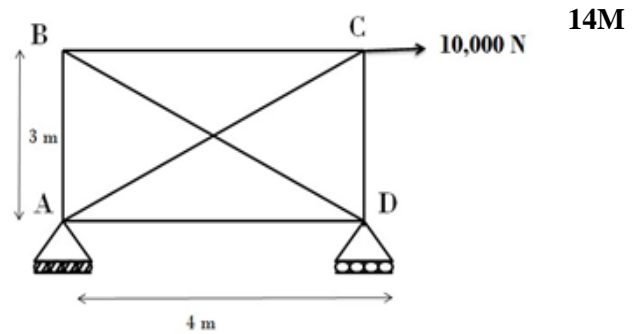
UNIT - I

1. (a) Distinguish between Statically determinate and Indeterminate structures **4M**
 (b) Determine whether each of the trusses below are internally determinate, indeterminate, or unstable. If it is indeterminate, to what degree is it indeterminate? **10M**



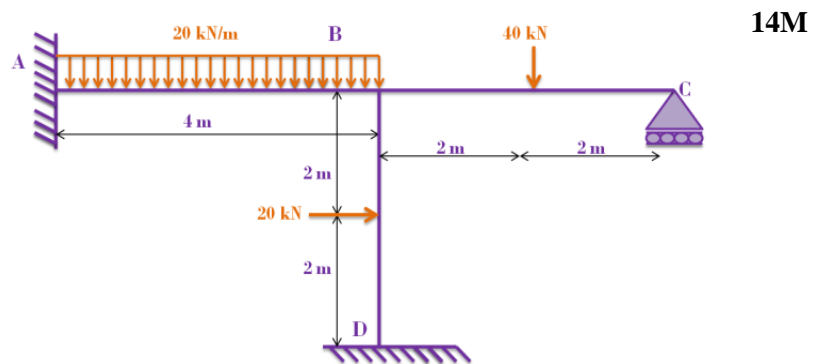
(OR)

2. All the members of the frame shown in figure have same cross-sectional area of 20cm^2 . Find the forces in all members due to applied loading. 'E' Young's modulus is same for all members.



UNIT - II

3. Find the support moments at A, B, C and D for the portal frame by using Slope Deflection Method

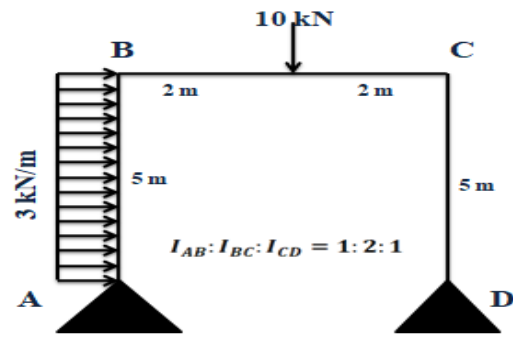


(OR)

4. (a) Derive the expressions for Relative stiffness and distribution factor **4M**

- (b) Analyse a Portal frame at A, B, C and D by using Moment Distribution Method shown in fig

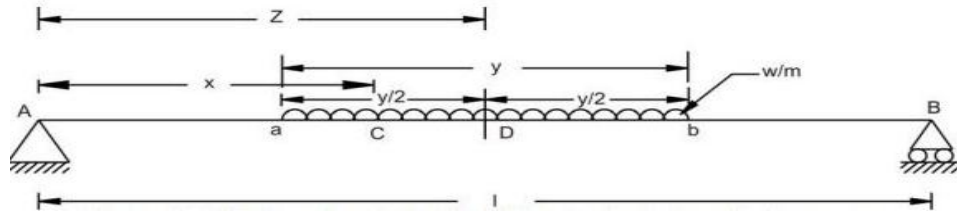
10M



UNIT – III

5. (a) Draw Absolute Maximum Bending Moment diagram for a continuous beam carrying Uniformly distributed load shorter than span

6M



- (b) A live load of 80 kN/m of 5 m long moving on a simple supported girder of span 12 m. Find the Maximum bending moment at a section 4m. from the left support.

8M

(OR)

6. (a) Define the terms Absolute maximum bending moment and shear force

4M

- (b) A uniformly distributed load of 15 kN/m and 6m long crosses a girder of span 20m. Calculate the Absolute maximum bending moment

10M

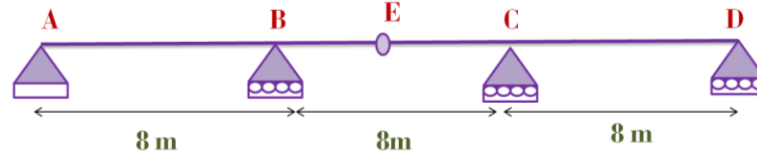
UNIT – IV

7. (a) State the Muller-Breslau's Principle. Draw the influence line for moment at 'B' MB for the two span continuous beam ABC simply supported at A and C, AB=4m, BC = 5m. EI is constant.

7M

- (b) Compute the ordinates at intervals of 2m of the influence line for B.M at the mid-span BC for the continuous beam shown in fig. The beam had uniform moment of inertia throughout its length.

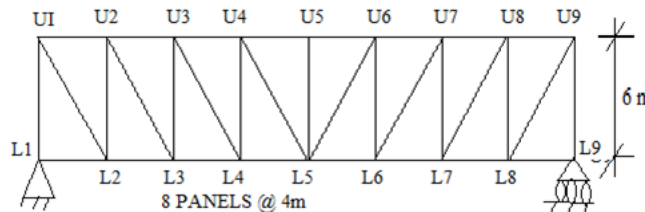
7M



(OR)

8. Draw the ILD for the forces in truss members (L₂-L₃, U₂-U₃, U₃-L₄, U₄-L₄) of Pratt truss

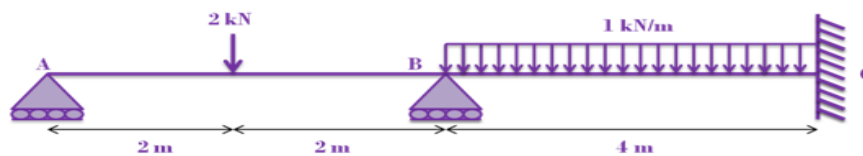
14M



UNIT-V

9. Analyze the Continuous beam as shown in figure using Flexibility Matrix method

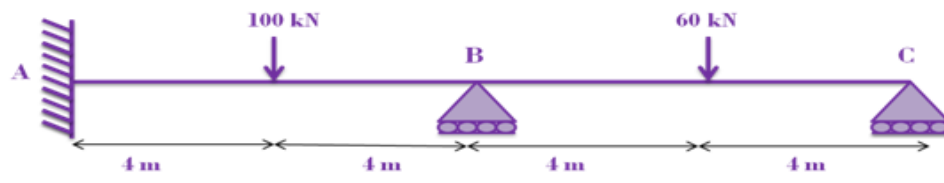
14M



(OR)

10. Analyze the Continuous beam shown in fig using Stiffness method

14M



K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B. Tech. VI Semester (R18) Regular Examinations of August – 2021
SUB: Design of Reinforced Concrete Structures-I (CE)

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

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

UNIT - I

1. (a) Explain the difference between Characteristic Load and Characteristic Strength. Draw the frequency distribution curves for both. **7M**
(b) Draw the idealized stress-strain curve for concrete under compression representing the idealized, characteristic and design curves. Explain the salient points of the plot. **7M**
(OR)
2. (a) Determine the characteristic strength of concrete which has given the following compression test results on 150mm cubes. **7M**
40,45,34,41,30,39,46,37,40 and 48 MPa
(b) Discuss about the partial safety factors recommended by IS 456:2000 with regard to loads and material strength. **7M**

UNIT – II

3. (a) For a singly reinforced rectangular section, derive the stress block parameters. **7M**
(b) Calculate the ultimate moment of resistance of RC beam of rectangular section 300mm wide and 380mm deep for $A_{st} = 6$ Nos of 20mm, $A_{sc} = 2$ Nos of 20mm bars. Assume grade of steel as Fe250 and M20 concrete with an effective cover of 40mm on both sides. **7M**
(OR)
4. Calculate the ultimate moment of resistance of a L-beam for the following data: **14M**
Flange width = 1200mm, Slab depth = 110mm, Effective depth = 600mm, width of web = 300mm. Use M20 grade concrete and Fe 415 grade concrete. Area of tension reinforcement provided is 7 Nos of 25mm bars.

UNIT – III

5. A rectangular beam of section 300mm width and 500mm effective depth, is reinforced with four 20mm bars, out of which two bars are bent at the ends of the beam at 45° . Determine the additional shear reinforcement required, if the factored shear force at the critical section is 320 kN. Consider M25 grade concrete and Fe 415 grade steel. **14M**
(OR)
6. Design a section of a beam 50cm wide and 70cm deep subjected to a bending moment of 130 kNm, twisting moment of 10 kNm and a shear force of 130 kN at ultimate limit states. Use M15 grade concrete and Fe 415 grade steel. **14M**

UNIT – IV

7. Design a simply supported one-way slab provided over a clear span of 3.37m. It carries a live load of 4 kN/m^2 and a floor finish of 1.5 kN/m^2 . The width of the supporting walls is 230mm. Use Fe 415 grade steel and M25 grade concrete. **14M**
(OR)
8. Design a RC slab for a room measuring 6.5m x 5m. The slab is continuous on all four sides and the width of supporting beams is 230mm. The slab carries a live load of 5 kN/m^2 . Use M20 grade concrete and Fe500 grade steel. **14M**

UNIT-V

9. Design the reinforcement in a column of size 450mm x 600mm, subject to an axial load of 2000 kN. The column has an unsupported length of 3m. Use M20 and Fe 415 grade material. **14M**
(OR)
10. A short column 300mm x 400mm has an unsupported length of 3m. It is subjected to a factored axial load of 1100 kN and a factored moment of 230 kNm about the major axis. Determine the longitudinal steel using M25 grade concrete and Fe 415 grade steel. Assume effective cover = 60mm. **14M**

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B. Tech. VI Semester (R18) Regular Examinations of August – 2021
SUB: Foundation Engineering - I (CE)

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) State the objectives of soil exploration and explain the wash boring method of soil investigation. 7 M
(b) Discuss the Standard Penetration test along with corrections applied to it. 7 M

(OR)

2. (a) Describe various methods of drilling bore holes for subsoil investigation. 7 M
(b) Explain the plate load test. 7 M

UNIT – II

3. (a) How does Rankine's approach differ from Coulomb's approach in the estimation of active earth pressure? 7 M
(b) Calculate the total active thrust on a vertical wall 5 m high retaining sand of unit weight 17 kN/m^3 for which $\phi = 35^\circ$. The surface is horizontal, and the water table is below the bottom of the wall. Also, determine the thrust on the wall if the water table rises to a level of 2 m below the surface of the sand. The saturated unit weight of the sand is 20 kN/m^3 . 7 M

(OR)

4. (a) With the help of neat sketch explain Rebhann's graphical method to evaluate the earth pressure on a retaining wall. 7 M
(b) A retaining wall, 8 m high with smooth vertical back, retains a backfill with $c = 15 \text{ kN/m}^2$, $\phi = 15^\circ$, $\gamma = 18 \text{ kN/m}^3$. Calculate the total active thrust and point of application from base of the wall if tension cracks develop. 7 M

UNIT – III

5. (a) Define the various terms related to bearing capacity of soil 7 M
(b) A square footing $1.8 \text{ m} \times 1.8 \text{ m}$ is placed over loose sand of density 16 kN/m^3 and at a depth of 0.8 m. The angle of shearing resistance is 30° . $N_c = 30.14$, $N_q = 18.4$, and $N_\gamma = 15.1$. Determine the total load that can be carried by the footing. 7 M

(OR)

6. (a) Discuss Meyerhof's bearing capacity theory. How does it differ from Terzaghi's theory? 7 M
(b) A footing 2 m square is founded at a depth of 1.5 m in a sand deposit, for which the corrected N value is 27. The water table is at a depth of 2 m from the surface. Determine the net allowable bearing pressure, if the permissible settlement is 40 mm and a factor of safety of 3 is desired against shear failure. 7 M

UNIT – IV

7. (a) Discuss various dynamic formulae for calculating load carrying capacity of pile and what are their limitations? 7 M
(b) A square concrete pile ($30 \text{ cm} \times 30 \text{ cm}$) is driven into a homogeneous sand layer ($\phi = 30^\circ$, $\gamma = 18 \text{ kN/m}^3$) for a depth of 10 m. Calculate the ultimate load. Use Meyerhof's method. Take $K = 1.3$ and $\delta = 18^\circ$. 7 M

(OR)

8. (a) Explain the types of pile foundation based on function and material. 7 M
(b) A square group of 9 piles was driven into soft clay extending to a large depth. The diameter and length of the piles were 30 cm and 9 m respectively. If the unconfined compression strength of the clay is 90 kN/m^2 , and the pile spacing is 90 cm centre to centre, what is the capacity of the group? Assume a factor of safety of 2.5 and adhesion factor of 0.75. 7 M

UNIT-V

9. (a) Explain the Swedish circle method of slope stability analysis for $c - \phi$ soil. 7 M
- (b) An earthen embankment is 12 m in height and is laid at a slope of 30° to the horizontal. 7 M
The soil properties are $c = 25 \text{ kN/m}^2$, $\phi = 15^\circ$, $\gamma = 20 \text{ kN/m}^3$. The stability number for the given slope and friction angle is 0.05. Calculate the factor of safety of the slope with respect to cohesion. What will be the critical height of slope for the soil?
- (OR)**
10. (a) Explain the types of slope failure. 7 M
- (b) A vertical cut is to be made in a clayey soil for which tests gave $c = 30 \text{ kN/m}^2$, $\phi = 0^\circ$, $\gamma = 16 \text{ kN/m}^3$. Find the maximum height for which the cut may be temporarily unsupported. 7 M
For $\phi = 0^\circ$ and $i = 90^\circ$, the value of the stability number is 0.261.

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B. Tech. VI Semester (R18) Regular Examinations of August – 2021
SUB: Water Resources Engineering - I (CE)

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 different methods of application of irrigation water 7M
(b) Explain principle causes and effects of water logging 7M

(OR)

2. Compute the depth and frequency of irrigation required for a certain crop with data given below 14M
Root zone depth = 100 cm; Field capacity= 22%; Wilting point = 12 % ; apparent specific gravity of soil=1.50 ; consumptive use= 25 mm/day ; efficiency of irrigation= 50%. Assume 50% depletion on available moisture before application of irrigation water at field capacity.

UNIT – II

3. (a) How do you classify the canals based on its alignment? Discuss briefly 7M
(b) Write salient features of Kennedy's silt theory 7M

(OR)

4. Design a regime channel for a discharge of 50 cumecs and silt factor 1.1, using Lacey's theory 14M

UNIT – III

5. Draw a neat layout of diversion headwork and briefly explain the function of each component 14M

(OR)

6. (a) Explain the importance of critical exit gradient in the design of hydraulic structure for piping 7M
(b) How does Khosla's theory differ from Bligh's theory with regard to design of foundation on permeable soils 7M

UNIT – IV

7. (a) Classify different types of dams according to the material used for their construction 7M
(b) Explain the advantages and ill effects of constructing a dam 7M

(OR)

8. (a) Describe estimation of storage capacity of a reservoir by mass curve technique 7M
(b) Differentiate between flood control and multipurpose reservoirs 7M

UNIT-V

9. Explain briefly the various forces act on a gravity dam with neat diagrams 14M

(OR)

10. (a) Write a short notes on drainage gallery 7M
(b) What precautions would you take to control seepage through earthen dam 7M

Q.P. Code: 1801610

SET - 1

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B. Tech. VI Semester (R18) Regular Examinations of August – 2021
SUB: Port and Harbour Engineering (CE)

Time: 3 Hours

Max. Marks: 70

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

UNIT - I

1. (a) What is port? Classify various types of ports. 7M
(b) Define dock and describe wet dock with neat sketch. 7M

(OR)

2. (a) Write importance of Inland water transportation in India 7M
(b) Define breakwaters and explain importance of break waters while planning for a harbour 7M

UNIT – II

3. (a) Identify various points to be remembered while selecting a site for a harbour. 7M
(b) Explain storage and inter transport facilities required in a port 7M

(OR)

4. (a) Discuss about i. Entrance channel ii. Turning basin iii. Depth of harbour
iv Anchorage area 8M
(b) Write various characteristics' of a good harbour in detail 6M

UNIT – III

5. (a) Explain classification of harbours based on location 7M
(b) List out various terminal facilities required at port and illustrate anchorage and moorings. 7M

(OR)

6. Explain general design considerations of harbour in detail. 14M

UNIT – IV

7. Classify different types of break waters. Under what condition rubble mound break water is preferred? Briefly describe various methods of rubble mound constructions. 14M

(OR)

8. (a) Explain briefly the effect of natural phenomena on marine structures. 7M
(b) Classify various types of dredging and discuss about capital dredging in detail. 7M

UNIT-V

9. Explain in detail i. Wave action on vertical walls ii. Wave action on piles 14M

(OR)

10. (a) What is a fender? Classify various types of fenders and explain spring fender in detail. 7M
(b) Identify impact on environment from the construction of harbour? 7M

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA**B. Tech. VI Semester (R18) Regular Examinations of August – 2021*****SUB: Power Semiconductor Drives (EEE)*****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) Draw the block diagram of electric drive and explain each component in detail 7M
(b) Explain the working of electric drive with different types of load torques. 7M

(OR)

2. (a) Discuss the different modes of operation of electric drive with suitable examples 7M
(b) What are the advantages of Electric drives? 7M

UNIT – II

3. (a) Describe different braking methods employed for electrical motors. 7M
(b) Explain in detail the operation of a 1-phase full converter feeding a d.c separately excited motor with reference to voltage and current waveforms, assume motor current is continuous. 7M

(OR)

4. (a) Derive the speed-torque expression of class-B chopper operating in time ratio control is supplying the armature of the separately excited dc motor. And draw speed torque characteristics. 7M
(b) A 220v, 24A, 1000rpm separately excited dc motor having an armature resistance of 2Ω is controlled by a chopper. The chopping frequency is 500Hz and the input voltage is 230V. Calculate the duty ratio for a motor torque of 1.2 times rated torque at 500rpm. 7M

UNIT – III

5. (a) Show that variable frequency control of induction motor is more efficient than stator voltage control. 7M
(b) Explain the operation of the VSI fed Induction motor drive 7M

(OR)

6. (a) Write brief notes on direct torque control of Induction Motor 7M
(b) Explain the speed control of the Induction motor by Static Rotor Resistance Control 7M

UNIT – IV

7. (a) Give advantages of self-controlled variable speed synchronous motor drive and applications 7M
(b) Explain the Brushless d.c motor drive and enumerate its applications 7M

(OR)

8. (a) Explain the operation of closed-loop speed control of LCI fed synchronous motor drive 7M
(b) Derive the torque expression for Synchronous motor 7M

UNIT-V

9. (a) Explain the power factor improvement methods 7M
(b) Write short notes on Energy Efficient operation of drives 7M

(OR)

10. (a) Explain the losses in the electrical drive system 7M
(b) What are various methods used for improvement of quality of supply? 7M

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B. Tech. VI Semester (R18) Regular Examinations of August – 2021
SUB: Switchgear & Protection (EEE)

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

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

UNIT - I

1. (a) Describe the protection of stations and sub-stations against direct lightning strokes with neat schematic diagram **7M**
(b) What are the causes of over voltages arising in a power system? **7M**
- (OR)**
2. (a) Distinguish the valve type and zinc oxide lightning arresters **7M**
(b) Illustrate in detail about the insulation coordination **7M**

UNIT – II

3. (a) Explain the principle operation of auto reclosures **7M**
(b) In a 132 kV system, the reactance per phase up to the location of the circuit breaker is 5Ω and capacitance to the earth is $0.03\mu\text{F}$. Calculate:
(i) The maximum value of the restriking voltage.
(ii) The maximum value of RRRV.
(iii) The frequency of transient oscillations **7M**

(OR)

4. (a) Explain in detail about rating of circuit breakers **7M**
(b) A circuit breaker is rated at 1500 A, 2000 MVA, 33 kV, 3 sec and 3-phase oil circuit breaker. Find the normal rated current, breaking current, making current and shot time current rating by defining each term. **7M**

UNIT – III

5. What is universal torque equation? Using this equation derive the characteristics of **14M**
(i) Impedance relay
(ii) Reactance relay.
(iii) Mho relay.

(OR)

6. (a) Derive an expression for torque produced by an induction relay. **7M**
(b) List the advantages of microprocessor based relays over electromechanical relays **7M**

UNIT – IV

7. (a) Explain the percentage differential protection with neat block diagram **7M**
(b) With neat sketch, discuss the differential scheme for bus zone protection **7M**

(OR)

8. What are the protective devices employed for the protection of an alternator against: **14M**
(i) Overvoltage.
(ii) Over speed? Discuss them in brief.

UNIT-V

9. (a) Discuss the operation of differential protection of bus bars with diagram **7M**
(b) Elaborate on various methods for protection of feeders **7M**

(OR)

10. (a) With neat sketch, explain the three zone protection using distance relays **7M**
(b) List out the advantages of distance relays in power system protection. **7M**

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B. Tech. VI Semester (R18) Regular Examinations of August – 2021
SUB: Signals & Systems (EEE)

Time: 3 Hours

Max. Marks: 70

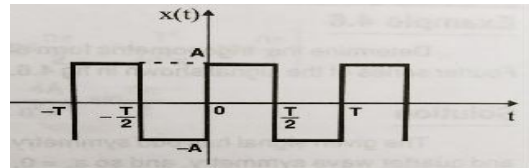
Answer any FIVE Questions choosing one question from each unit.
All questions carry Equal Marks.

UNIT – I

1. (a) Define Energy and power of a signal. Determine whether the following signal is Energy or Power signal and calculate energy or power. 7M
 $x(t) = e^{-2t} u(t)$
- (b) Prove that $\cos n\omega_0 t$ and $\sin m\omega_0 t$ are orthogonal to each other for all integers m, n . 7M

(OR)

2. Determine the trigonometric form of Fourier series of the square wave form shown in Fig. 14M



UNIT – II

3. Find the Fourier transform of the following standard signals 14M
 (i) Signum function (ii) Unit step signal

(OR)

4. (a) State and prove the following Fourier transform properties 7M
 (i) Linearity (ii) Time shifting
- (b) Determine the convolution of $x_1(t) = e^{-2t} u(t)$ and $x_2(t) = e^{-6t} u(t)$ using Fourier transform. 7M

UNIT – III

5. Check whether the following systems are (a) static/dynamic (b) linear/non-linear. 14M
 (i) $y(t) = x(t + 1) - x(t - 1)$ (ii) $y(t) = 10 x(t) + 5$

(OR)

6. (a) Test the causality of the following systems. 7M
 i) $y(t) = x(t) + 3 x(t+4)$ ii) $y(t) = x(2t)$
- (b) Find the condition for the stability of an LTI system. 7M

UNIT – IV

7. State and prove sampling theorem. 14M

(OR)

8. (a) Find the DTFT of the following sequences: 7M
 (i) $\delta(n-m)$ (ii) $u(n+3) - u(n-3)$
- (b) A discrete system is given by the following difference equation: 7M
 $y(n) = x(n) - 2 x(n-1) + x(n-2)$. where $x(n)$ is input and $y(n)$ is the output. Find expression for transfer function.

UNIT-V

9. (a) Determine the Laplace transform of the following continuous time signals and its ROC. $x(t) = t u(t)$ 7M
- (b) Find the inverse Laplace transform of the following s-domain signal. 7M
 $X(s) = (3s^2 + 8s + 23) / (s+3)(s^2 + 2s + 10)$

(OR)

10. (a) State and prove any three properties of Z-transform. 7M
- (b) Determine the inverse z-transform of the following function. 7M
 $X(z) = 1 / (1 + z^{-1})(1 - z^{-1})^2$

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B. Tech. VI Semester (R18) Regular Examinations of August – 2021
SUB: Machine Tools (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) How are lathes specified and classified? 6M
(b) Explain different types of chips that are produced during machining. 8M

(OR)

2. Explain the nomenclature of a single point cutting tool with a neat sketch 14M

UNIT – II

3. (a) Distinguish between a shaper and planer 6M
(b) Define the terms cutting speed, feed, depth of cut and machining time in a shaper 8M

(OR)

4. (a) How are planers specified and classified 6M
(b) What a neat sketch explain the various parts of a double housing planer 8M

UNIT – III

5. How are drilling machines classified and explain any three methods of tool holding devices in a drilling machine with a neat sketch 14M

(OR)

6. Describe the various parts of a jig boring machine with a neat sketch 14M

UNIT – IV

7. How are milling machine classified and explain the construction and working of a plain column and knee type milling machine with a line diagram 14M

(OR)

8. Explain the working mechanism of universal dividing head with a neat sketch 14M

UNIT-V

9. How are grinding machines classified. with the help of a block diagram explain center less grinders and the methods of giving feed in center less grinders 14M

(OR)

10. (a) How are broaching machines classified and with a line diagram explain about broach nomenclature 8M
(b) What is lapping ? How it is performed 6M

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B. Tech. VI Semester (R18) Regular Examinations of August – 2021
SUB: Design of Machine Elements-II (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) What is nipping in a leaf spring? Discuss its role. List the materials commonly used for the manufacture of the leaf springs. 6M
- (b) Design a close coiled helical compression spring for a service load ranging from 2250 N to 2750 N. The axial deflection of the spring for the load range is 6 mm. Assume a spring index of 5. The permissible shear stress intensity is 420 MPa and modulus of rigidity, $G = 84 \text{ kN/mm}^2$. Neglect the effect of stress concentration. Draw a fully dimensioned sketch of the spring, showing details of the finish of the end coils. 8M

(OR)

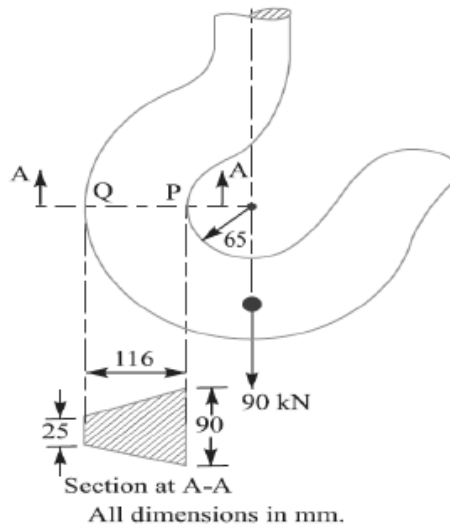
2. (a) Explain the following terms of the spring: 6M
 (i) Free length (ii) Solid height
 (iii) Spring rate (iv) Active and inactive coils
 (v) Spring index and (vi) Stress factor.
- (b) closely coiled helical spring is made of 10 mm diameter steel wire, the coil consisting of 10 complete turns with a mean diameter of 120 mm. The spring carries an axial pull of 200 N. Determine the shear stress induced in the spring neglecting the effect of stress concentration. Determine also the deflection in the spring, its stiffness and strain energy stored by it if the modulus of rigidity of the material is 80 kN/mm^2 . 8M

UNIT - II

3. (a) List out the important characteristics of a good bearing material. 4M
- (b) A full journal bearing 90 mm diameter and 150 mm long has a radial load of 2 MPa per unit projected area. Shaft speed is 500 rpm. The bearing is operating with SAE 20 oil at 50°C . The specific gravity of oil at the operating temperature is 0.985. Calculate the following. (i) Minimum film thickness.(ii) Heat loss due to friction, and(iii) Whether artificial cooling is necessary. 10M

(OR)

4. (a) Define curved beam. What is the difference with respect to straight beam? 4M
- (b) A crane hook has a trapezoidal section at A-A as shown in fig. find the maximum stress at points P and Q. 10M



UNIT - III

5. (a) Discuss the advantages and disadvantages of rolling contact bearings compared to journal bearings. 4M
- (b) Select suitable ball bearing to carry a radial load of 1.5 kN and a thrust load of 1.2 kN at 900 rpm. The bearing is used for 7 hours/day for a service life of 8 years is desired. Consider service factor of 1.5 for selection. Hence, suggest suitable shaft diameter and bearing for this application. 10M

(OR)

6. (a) Derive the expression for the length of an open belt drive. 6M
- (b) An open belt connects two flat pulleys. The pulley diameters are 300 mm and 450 mm and the corresponding angles of lap are 160° and 210° . The smaller pulley runs at 200 r.p.m. The coefficient of friction between the belt and pulley is 0.25. It is found that the belt is on the point of slipping when 3 kW is transmitted. To increase the power transmitted two alternatives are suggested, namely (i) increasing the initial tension by 10%, and (ii) increasing the coefficient of friction by 10% by the application of a suitable dressing to the belt. Which of these two methods would be more effective? Find the percentage increase in power possible in each case. 8M

UNIT – IV

7. A reciprocating compressor is to be connected to an electric motor with the help of spur gears. The distance between the shafts is to be 500 mm. The speed of the electric motor is 900 r.p.m. and the speed of the compressor shaft is desired to be 200 r.p.m. The torque, to be transmitted is 5000 N-m. Taking starting torque as 25% more than the normal torque, determine : 1. Module and face width of the gears using 20 degrees stub teeth, and 2. Number of teeth and pitch circle diameter of each gear. Assume suitable values of velocity factor and Lewis factor. 14M

(OR)

8. Design a pair of helical gears to transmit 18 kW from a pinion at a speed of 4000 rpm. The gear is top rotate at 800 rpm. The helix angle is not to be greater than 30° . The teeth are 20⁰ stub involute in diametrical place. 14M

UNIT-V

9. (a) Write short notes on functions of piston and ally parts. 4M
- (b) Design a cast iron piston for a single acting four stroke engine for the following data: Cylinder bore = 100 mm ,Stroke = 125 mm, Maximum gas pressure = 5 N/mm², Indicated mean effective pressure = 0.75 N/mm² , Mechanical efficiency = 80%, Fuel consumption = 0.15 kg per brake power per hour ; Higher calorific value of fuel = 42×10^3 kJ/kg ,Speed is 2000 r.p.m. Any other data required for the design may be assumed. 10M

(OR)

10. Design a connecting rod for an I.C. engine running at 1200 r.p.m. and developing a maximum pressure of 2.15 N/mm². The diameter of the piston is 100 mm, mass of the reciprocating parts per cylinder 1.25 kg, length of connecting rod 380 mm, stroke of piston 190 mm and compression ratio 6 : 1. Take a factor of safety of 6 for the design. Take length to diameter ratio for big end bearing as 1.3 and small end bearing as 2 and the corresponding bearing pressures as 10 N/mm² and 15 N/mm². The density of material of the rod may be taken as 8000 kg/m³ and the allowable stress in the bolts as 60 N/mm² and in cap as 80 N/mm². The rod is to be of I-section for which you can choose your own proportions. Draw a neat dimensioned sketch showing provision for lubrication. Use Rankine formula for which the numerator constant may be taken as 320 N/mm² and the denominator constant 1 / 7500. 14M

Q.P. Code: 1803603

SET - 1

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B. Tech. VI Semester (R18) Regular Examinations of August – 2021
SUB: Operations Research (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) Compare slack and surplus variable. 7M
(b) List the four assumptions in Linear programming. 7M

(OR)

2. Maximise $Z = 3x + 4y$ Subject to 14M
 $2x + 5y \leq 60,$
 $4x + 2y \leq 40,$
 $x, y \geq 0.$
(i) Solve by Graphical Method and find the optimal solution.
(ii) Compare the solution with Simplex method.

UNIT – II

3. (a) Write the steps involved for solving transportation problem using Vogel's 7M
approximation method.
(b) Obtain the initial basic feasible solution for the following TP using North West 7M
Corner method.

	I	II	III	Supply
S1	8	5	6	120
S2	15	10	12	80
S3	3	9	10	150
Demand	150	80	50	

(OR)

4. Solve the following assignment problem. 14M

	I	II	III	IV	V
A	10	5	9	18	11
B	13	19	6	12	14
C	3	2	4	4	5
D	18	9	12	17	15
E	11	6	14	19	10

UNIT – III

5. The cost of machine is Rs. 16,100. And scrap value is Rs. 1,100. Maintenance cost 14M
forms for machine are as follows.

Year	1	2	3	4	5	6	7
Cost	300	450	600	800	100	1200	1500

When should the machine be the replaced?

(OR)

6. Use graphical method to minimize the time needed to process the following jobs on machines A, B, C and D. Find the total time to complete the jobs. 14M

JOB 1	Sequence	A	B	C	D
	Time (hrs)	4	6	8	5
JOB 2	Sequence	D	C	A	B
	Time (hrs)	6	5	8	9

UNIT – IV

7. A Self-service store employs one cashier at its counter. Nine customers arrive on an average every 5 minutes. While the cashier can serve 10 customers in 5 minutes. Assuming Poisson Distribution for arrival rate and Exponential distribution for service 14M

Find the following.

- (i) Average Number of customers in the queue system.
- (ii) Average number of customers in Queue.
- (iii) Average time a customer spends in the system.
- (iv) Average time a customer wait before being served.

(OR)

8. Explain about Monte Carlo simulation techniques. 14M

UNIT-V

9. Alpha industry needs 5400 units per year of a bought out component which will be used in its product. The ordering cost is Rs.250 per order and the carrying cost per unit per year is Rs.30. which is the best order quantity and number of order per year and frequency of orders? 14M

(OR)

10. (a) Explain the inventory model with price break. 4M
- (b) A company requires 200 casting per month. The requirement is assumed to be fixed and known. The set up cost per procurement is Rs.350. The holding cost is 2% of the cost of the item. The price break details are as follows. 10M
- $K_{11} = \text{Rs. } 10 \text{ /- } \quad 0 < q < 500$
- $K_{12} = \text{Rs. } 9.50 \text{ /- } \quad q \geq 500$
- Find the optimal purchase quantity.

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B. Tech. VI Semester (R18) Regular Examinations of August – 2021
SUB: Power Plant Engineering (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) Draw the line diagram and explain the different components used in steam power plant. **8M**
(b) Enumerate and explain the steps involved in coal handling. **6M**

(OR)

2. (a) Why pure water is required in condenser? Explain the method to purify the water in steam power plant. **7M**
(b) What are different types of hoppers used for coal in steam power plants? Explain them. **7M**

UNIT – II

3. (a) Explain the working of a diesel power plant with a neat sketch. **7M**
(b) How does inter cooling helps in improving thermal efficiency of the gas power plant? **7M**

(OR)

4. (a) What is meant by super charging and mention the advantages? **7M**
(b) Describe a simple open cycle gas turbine plant with a simple line diagram. **7M**

UNIT – III

5. (a) What is Hydrological cycle? Explain its significance in locating the site. **8M**
(b) Compare and contrast between storage and pondage. **6M**

(OR)

6. (a) Draw the layout of a nuclear power plant and explain its working. **7M**
(b) Discuss sodium-graphite reactor with a line diagram **7M**

UNIT – IV

7. (a) Describe the working of a fuel cell. **6M**
(b) What are the advantages and disadvantages of concentrating collectors over flat plate collectors? **8M**

(OR)

8. (a) Discuss merits and demerits of wind energy. **6M**
(b) Explain horizontal axis wind turbine with a diagram. **8M**

UNIT-V

9. The annual peak load on a 30 MW power station is 25 MW. The power station supplied loads having maximum demands of 10 MW, 8.5 MW, 5 MW and 4.5MW. The annual load factor is 45 %. Find **14M**
i) Average load
ii) Energy supplied per year
iii) Diversity factor
iv) Demand factor

(OR)

10. (a) A generating station has a connected load of 43MW and a maximum demand of 20 MW; the units generated being 61.5×10^6 per annum. Calculate (i) the demand factor and (ii) load factor. **8M**
(b) Draw the load curve for the power requirement in India and discuss the methods to fulfill the part load conditions. **6M**

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA**B. Tech. VI Semester (R18) Regular Examinations of August – 2021*****SUB: Gas Turbines and Jet Propulsion (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 gas turbine unit has a pressure ratio of 6 and maximum cycle temperature of 610 °C. The isentropic efficiency of the turbine and compressor are 0.82 and 0.8 respectively. Estimate the power output in kW of an electric generator, geared to the turbine, when air enters the compressors at 15 °C at a rate of 16 kg/s. 14M
Take $C_p = 1.005 \text{ kJ/kg.K}$ and $\gamma = 1.4$ for compression process and $C_p = 1.11 \text{ kJ/kg K}$ and $\gamma = 1.333$ for expansion process.

(OR)

2. (a) Describe with neat diagram a closed cycle gas turbine.? State also its merits and demerits. 4M
(b) A gas turbine unit has a pressure ratio of 6:1 and maximum cycle temperature of 610 °C. The isentropic efficiencies of the compressor and turbine are 0.80 and 0.82 respectively. Estimate the power output in KW of an electric generator geared to the turbine when the air enters the compressor at 15 °C at the rate of 16 Kg/sec. 10M

UNIT – II

3. A jet-propelled engine having two jets and working on turbojet has a velocity of 210 m/s, when flying at an altitude of 12000 m. The density of air at this altitude is 0.172 kg/m³. The resistance or drag of the plane is 6670.8 N and propulsive efficiency of the jet is 50%. The overall efficiency of the unit is 18%. Calorific value of the fuel is $4.895 \times 10^4 \text{ kJ/kg}$. Calculate 14M
i. Absolute velocity of jet,
ii. Quantity of air compressed per minute,
iii. Diameter of jet,
iv. Net power output of the plant
v. Thrust specific fuel consumption,
vi. Air-fuel ratio.

(OR)

4. (a) A turbojet is flying with a speed of 850 KMPH at an altitude, where air density is 0.17 kg/m³. The propulsive and overall efficiencies are 55% and 17% respectively. If the drag on air craft is 6000 N, calculate the exit velocity of jet, diameter of jet and propulsive power. 7M
(b) Derive an expression for thrust, thrust power and propulsive efficiency of jet propulsive engine. 7M

UNIT – III

5. (a) Describe briefly about thrust augmentation method used in propulsion. 7M
(b) Explain the working difference between propeller jet, turbo-jet 7M

(OR)

6. A jet propulsion unit consists of compressor, combustion chamber, turbine and 14M

nozzle. The air at 0.65 bar and 272 K is compressed in the compressor to 3 bar. $\eta_c=0.85$. The temperature of the gases at inlet to the turbine is 700 °C, and the $\eta_t=0.80$. The gases coming out of the turbine are expanded in a nozzle to a pressure 0.564 bar. The η of the nozzle is 0.90. Neglecting the pressure and mechanical losses and fuel mass, find the following:

(i) A/F ratio used assuming C.V. of fuel 44000 kJ/kg

(ii) Power required to run the compressor

(iii) Pressure of the gases entering the nozzle

(iv) The thrust developed per kg of air per sec

Take $C_p=1.005$ kJ/kg-K, $\gamma = 1.4$ for air and $C_p = 1.1514$ kJ/kg-K, $\gamma = 1.33$ for gases.

Speed of jet propulsion unit is 720 km/h

UNIT – IV

7. Draw the thermodynamic cycle of ram jet engine and derive the equation. 14M
for thrust.

(OR)

8. (a) What are the essential components of Ram jet engine explain? 7M
(b) With the help of neat sketch explain the principle of operation of pulse jet engine. 7M

UNIT-V

9. (a) List out the applications of rockets. 4M
(b) Explain briefly with a sketch the working principle of a Rocket. 10M

(OR)

10. (a) Explain the working difference among propeller -jet, turbo-jet and turbo- prop 4M
engines.
(b) Describe with a sketch a solid propellant rocket. What is gain? What are the 10M
applications of solid propellant rockets?

Q.P. Code: 1804601

SET - 1

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B. Tech. VI Semester (R18) Regular Examinations of August – 2021
SUB: Embedded Systems (ECE)

Time: 3 Hours

Max. Marks: 70

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

UNIT - I

1. (a) What is an embedded system? What are the components of embedded system? 7M
(b) What are the applications of an embedded system? 7M

(OR)

2. (a) Explain about Custom single purpose processor design (RT-Level) in Embedded Systems? 7M
(b) What is a single purpose processor? What are the benefits of choosing a single purpose processor over a general purpose processor? 7M

UNIT – II

3. (a) Explain about Application specific Instruction Set processors (ASIPs)? 7M
(b) What are the points to be considered while Development environment in General Purpose Processors? 7M

(OR)

4. (a) Draw and explain Basic architecture of General Purpose Processors? 7M
(b) What are the various applications of General Purpose Processors? 7M

UNIT – III

5. (a) What is the difference between Model and languages? 7M
(b) Explain in detail about Concurrent process and its implementation? 7M

(OR)

6. Explain in brief about the following 14M
(i) PSM
(ii) Concurrent process model.
(iii) Data flow model
(iv) Real-time Systems

UNIT – IV

7. (a) Explain the parallel evolution of complication and synthesis? 7M
(b) Explain about Behavioral synthesis? 7M

(OR)

8. (a) Explain Reuse of intellectual property cores? 7M
(b) Explain about System synthesis and hardware/software codesign? 7M

UNIT-V

9. (a) What is mailbox, message queue and message pipe? 7M
(b) What is semaphore? Write down types of semaphores? Mention its uses? 7M

(OR)

10. (a) What is kernel? List the functions of a kernel? 7M
(b) Explain the terms Tasks and Task Scheduler, interrupt service routines? 7M

Q.P. Code: 1804602

SET - 1

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B. Tech. VI Semester (R18) Regular Examinations of August – 2021
SUB: Digital Communications (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) Explain delta modulation in detail with suitable diagram **7M**
(b) With neat block diagram, Explain the process of Sampling and Quantization in digital communication. **7M**

(OR)

2. (a) Explain the working principle of Differential PCM. **7M**
(b) What are the advantages and disadvantages of DM and ADM? Explain **7M**

UNIT – II

3. (a) Explain Nyquist criterion **7M**
(b) Explain modified duobinary signal scheme with the help of diagram **7M**

(OR)

4. (a) Write short notes on cross talk and eye diagram **7M**
(b) Represent the binary sequence 100111010 using the following formats **7M**
i) Bipolar ii) Split Manchester code

UNIT – III

5. (a) Explain coherent ASK and non coherent ASK schemes **7M**
(b) Discuss the coherent detection of signals in the presence of noise **7M**

(OR)

6. (a) With neat diagrams and equations, explain about PSK system. **7M**
(b) Explain the model of band pass data transmission systems. **7M**

UNIT – IV

7. (a) Write short notes on Hartley theorem and Fano coding **7M**
(b) State and prove the properties of mutual information. **7M**

(OR)

8. (a) Explain briefly about unit of information and Rate of information. **7M**
(b) Explain the channel capacity of a Gaussian channel. **7M**

UNIT-V

9. (a) Compare linear block codes and cyclic codes with an example. **7M**
(b) Briefly describe about the Code tree, Trellis and State Diagram for a Convolution Encoder **7M**

(OR)

10. (a) What are hamming codes? Discuss the error correction and detection capability of hamming code **7M**
(b) Explain the procedure of Binary cyclic codes with one example **7M**

Q.P. Code: 1804603

SET - 1

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B. Tech. VI Semester (R18) Regular Examinations of August – 2021
SUB: Microwave Engineering (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) Draw the field patterns of the dominant mode in a rectangular waveguide and also derive an expression for the cutoff frequency of the same mode. 8M
 - (b) Derive the field expressions of a circular waveguide for the dominant mode. 6M
- (OR)**
2. (a) With the help of neat diagrams, clearly explain the principle and operation of rotary phase shifter. 6M
 - (b) What is reciprocal effect? Explain the construction and working of a rotation isolator using reciprocal effect. 8M

UNIT – II

3. (a) Write short notes on M type and O type tubes. 7M
 - (b) Draw the circuit diagram of a Reflex Klystron and explain. 7M
- (OR)**
4. (a) What is velocity modulation? Explain how amplification takes place in a two cavity Klystron amplifier. 7M
 - (b) What are limitations of conventional tubes at microwave frequencies? 7M

UNIT – III

5. (a) Explain how the amplification takes place in TWT. Compare its bandwidth with Klystron amplifier. 7M
 - (b) How is bunching achieved in a cavity magnetron? Explain the phase focusing effect. 7M
- (OR)**
6. (a) Why pi-mode operation is preferred in cylindrical type magnetron? Give its working principle with neat sketches. 7M
 - (b) With neat sketch, illustrate the concept of Hartree condition in magnetron. 7M

UNIT – IV

7. (a) What are the bulk properties of GUNN diode that give rise to negative resistance? 7M
 - (b) Explain the physical structure and construction of IMPATT diodes. 7M
- (OR)**
8. (a) Explain the operation and applications of Varactor Diode, with neat diagrams. 7M
 - (b) Explain the measurement of 'Q' by Reflectometer method. 7M

UNIT-V

9. (a) Explain the impedance measurement by Reflectometer. 7M
 - (b) What is VSWR? Explain the method measurement for low and high VSWR? 7M
- (OR)**
10. (a) Using slotted line, draw a typical microwave bench setup for measurement of unknown load and explain. 7M
 - (b) Explain the method of microwave power measurement using Bolometer. 7M

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B. Tech. VI Semester (R18) Regular Examinations of August – 2021
SUB: Fiber Optic Communication (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) Explore the Historical Development of Fiber-optic communication. 7M
(b) List and explain the advantages of Fiber Optic Transmission. 7M

(OR)

2. (a) Describe the waveguiding properties of graded index fiber with a parabolic refractive index profile core. 7M
(b) What is Skew Ray? Discuss the basic concepts of it. 7M

UNIT – II

3. (a) Explain the following three Absorption mechanisms: 9M
i). Absorption by Atomic Defects (ii). Extrinsic Absorption (iii). Intrinsic Absorption
(b) For a 30 km long fiber attenuation 0.8 dB/km at 1300nm. If a 200 μ watt power is launched into the fiber, find the output power. 5M

(OR)

4. (a) Discuss polarization mode dispersion and its limitations. 7M
(b) When mean optical power launched into an 8 km length of fiber is 12 μ W, the mean optical power at the fiber output is 3 μ W. Determine – Overall signal attenuation in dB. The overall signal attenuation for a 10 km optical link using the same fiber with splices at 1 km intervals, each giving an attenuation of 1 dB. 7M

UNIT – III

5. (a) List and explain the advantages and disadvantages of LED. 7M
(b) The radiative and non radiative recombination life times of minority carriers in the active region of a double heterojunction LED are 60 nsec and 90 nsec respectively. Determine the total carrier recombination life time and optical power generated internally if the peak emission wavelength is 870 nm and the drive current is 40 mA. 7M

(OR)

6. (a) Draw the structures of PIN and APD photo detectors and explain their operations. 8M
(b) Explain briefly the three key processes involved in the LASER action. 6M

UNIT – IV

7. (a) Explain the concept of equilibrium numerical aperture. 6M
(b) List the factors involved in launching optical power from a light source to an optical fiber. 8M

(OR)

8. (a) Describe the various types of fiber connectors. 7M
(b) Explain about lensing schemes for coupling efficiency improvement. 7M

UNIT-V

9. (a) Explain the significance of link power budget and rise time budget with one illustration for each. 8M
(b) For a multimode fiber following parameters are recorded: 6M
LED with drive circuit has rise time of 15 ns, LED spectral width = 40 nm
Material dispersion related rise time degradation = 21 ns over 6 km link.
Receiver bandwidth = 235 MHz, Modal dispersion rise time = 3.9 nsec
Calculate system rise time.

(OR)

10. (a) Explain the Attenuation measurement using cut back techniques. 6M
(b) Describe the operation of unidirectional and bidirectional WDM. 8M

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B. Tech. III Sem. (R18) Supplementary Examinations of September – 2021
SUB: Discrete Mathematics (CSE)

Time: 3 Hours

Max. Marks: 70

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

UNIT - I

1. (a) Show that $R \rightarrow (S \rightarrow Q), \sim P \vee R$ and $S \Rightarrow P \rightarrow Q$ 7M
 (b) Show that $(P \rightarrow (Q \rightarrow R)) \Rightarrow (P \rightarrow Q) \rightarrow (P \rightarrow R)$ by using truth table 7M

(OR)

2. (a) What is Normal Form? Without constructing the truth table find the PDNF and PCNFs of the given formula A: $(P \wedge Q) \vee (\sim P \wedge Q) \vee (Q \wedge R)$ 7M
 (b) Show that the following premises are inconsistent. 7M
 i. If Jack misses many classes through illness, then he fails high school.
 ii. If Jack fails high school, then he is uneducated.
 iii. If Jack reads a lot of books, then he is not uneducated.
 iv. Jack misses many classes through illness and reads a lot of books.

UNIT – II

3. (a) What is Lattice? Explain with example. 7M
 (b) What is primitive recursive function? Show that the function $f(x, y) = x + y$ is primitive recursive. 7M

(OR)

4. (a) Define composition of relations. Let $R = \{(1,2) (3,4) (2,2)\}$ $S = \{(4,2)(2,5)(3,1)(1,3)\}$ then find $R \circ R, R \circ S, S \circ R, R \circ (S \circ R), (R \circ S) \circ R$. 7M
 (b) Define equivalence relation and equivalence class? Give example for same 7M

UNIT – III

5. (a) In how many ways can 7 women and 3 men can be arranged in a row if 3 men must always stand next to each other. 7M
 (b) State the Lagrange’s theorem. 7M

(OR)

6. (a) Explain Binomial theorem 7M
 (b) How many numbers are divisible by 2 or 3 or 5 in $1 \leq N \leq 100$ 7M

UNIT – IV

7. (a) Solve the recurrence relation $f_n = f_{n-1} + f_{n-2}$ with $f_0 = 0, f_1 = 1$ 7M
 (b) Determine characteristic roots of the matrix 7M

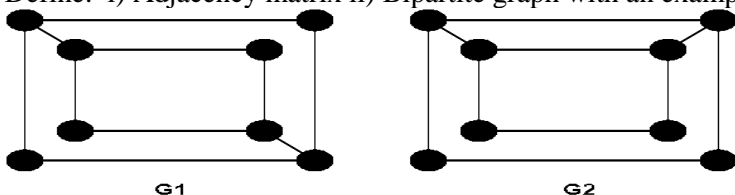
$$\begin{matrix} 5 & 0 & 1 \\ 0 & -2 & 0 \\ 1 & 0 & 5 \end{matrix}$$

(OR)

8. (a) How many numbers can be formed using the digits 1,3,4,5,6,8 and 9, if no repetitions are allowed 7M
 (b) Find the number of words, with or without meaning that can be formed with the letters of the word ‘INDIA’. 7M

UNIT-V

9. (a) Define: i) Adjacency matrix ii) Bipartite graph with an example. 7M
 (b) 7M



Are the two graphs isomorphic?

(OR)

10. (a) What is Spanning Tree? Discuss any one application of spanning tree with examples. 7M
 (b) Define isomorphism of graph, explain with example? 7M

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B. Tech. VI Semester (R18) Regular Examinations of August – 2021
SUB: Internet of Things (CSE)

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

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

UNIT - I

1. (a) Explain the characteristics of IoT? 7M
- (b) Explain various IoT enabling technologies 7M

(OR)

2. Explain IoT communication models? 14M

UNIT – II

3. Write about the energy management in home appliances 14M

(OR)

4. What are the various applications used in Smart cities 14M

UNIT – III

5. Explain about M2M technology 14M

(OR)

6. Explain the Case Study on IoT System for Weather Monitoring 14M

UNIT – IV

7. Write an arduino program to set the LED to a brightness specified by the value of the analogue input. 14M

(OR)

8. Explain the Arduino platform. 14M

UNIT-V

9. Explain the Programming Raspberry Pi with Python 14M

(OR)

10. List and explain the raspberry Pi interfaces 14M

Q.P. Code: 1805602

SET - 1

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

B. Tech. VI Semester (R18) Regular Examinations of August – 2021

SUB: Data Mining (CSE)

Time: 3 Hours

Max. Marks: 70

Answer any FIVE Questions choosing one question from each unit.

All questions carry Equal Marks.

UNIT - I

1. (a) What is Data Mining functionality? Explain different types of Data Mining functionality with examples. **7M**
(b) Discuss the issues in Data Mining in detail. **7M**

(OR)

2. (a) With a neat diagram explain the architecture of Data Mining. **7M**
(b) What kinds of data can be mined using Data Mining? Explain them. **7M**

UNIT – II

3. (a) Discuss the activities of data cleaning with the process associated with it. **7M**
(b) Discuss issues to be considered during data integration. **7M**

(OR)

4. (a) What is data preprocessing? Explain its importance. **7M**
(b) Explain the various data reduction techniques in the preprocessing step of Data Mining. **7M**

UNIT – III

5. (a) Write an algorithm for FP-Tree Construction and discuss how frequent itemsets are generated from FP-Tree. **7M**
(b) Examine in detail about the Pattern Mining in Multilevel Associations. **7M**

(OR)

6. (a) Explain and Apply the Apriori algorithm for discovering frequent item sets of the below table. **7M**

Trans Id	Item Purchased
101	milk, bread, eggs
102	milk, juice
103	juice, butter
104	milk, bread, eggs
105	coffee, eggs
106	coffee
107	coffee, juice
108	milk, bread, cookies, eggs
109	cookies, butter
110	milk, bread

Use 2 for the minimum support value. Illustrate each step of the Apriori Algorithm.

- (b) Analyze the various Frequent Itemset mining methods with examples. **7M**

UNIT – IV

7. (a) Develop an algorithm for classification using decision trees. Illustrate the algorithm with a relevant example. **7M**
(b) What approach would you use to apply decision tree induction? Explain in detail. **7M**

(OR)

8. (a) What is Classification? What are the features of Bayesian classification? Explain in detail with an example. **7M**
(b) Explain rule based classification techniques in detail. **7M**

UNIT-V

- 9. (a)** Explain different Partitioning and Hierarchical clustering methods in detail. **14M**
- (OR)**
- 10. (a)** How would you discuss the outlier analysis in detail? **7M**
- (b)** Explain the Grid based method for cluster analysis. **7M**

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B. Tech. VI Semester (R18) Regular Examinations of August – 2021
SUB: Artificial Intelligence (CSE)

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

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

UNIT - I

1. (a) What is an AI Technique and Represent it in a TIC-TAC-TOE Application? 7M
(b) Describe State Space Search with an Example Problem? 7M

(OR)

2. Explain different Heuristic Search Techniques with Examples? 14M

UNIT – II

3. (a) Describe Knowledge Representation Framework? 7M
(b) Write in brief about Predicate Logic with Examples? 7M

(OR)

4. Describe different rules used by Natural Deduction Procedure? 14M

UNIT – III

5. Describe i) Formal Reasoning ii) Procedural Reasoning iii) Reasoning by Analogy iv) Generalization and Abstraction v) Meta level Reasoning 14M

(OR)

6. Explain the Conditional Probabilities of Bayesian Network with Truth table? 14M

UNIT – IV

7. (a) Write in brief about Semantic Nets with Examples? 7M
(b) Describe the Primitive Acts of Conceptual Dependency Theory? 7M

(OR)

8. Explain Different Components of a Script and write Advantages and Disadvantages of Scripts? 14M

UNIT-V

9. (a) Describe Goal stack planning method with examples? 7M
(b) Write in brief about Block World Problem? 7M

(OR)

10. Demonstrate various steps involved in Natural Language Processing (NLP) with an example for each step? 14M

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA**B. Tech. VI Semester (R18) Regular Examinations of August – 2021*****SUB: Mobile Application Development (CSE)*****Time: 3 Hours****Max. Marks: 70****Answer any FIVE Questions choosing one question from each unit.****All questions carry Equal Marks.****UNIT - I**

1. (a) Explain the Android Debug Bridge. 7M
(b) Discuss the Launching Android Applications on a Handset. 7M

(OR)

2. (a) Elaborate the Android SDK in detail. 7M
(b) How to launching android applications on a handset? Explain in detail. 7M

UNIT – II

3. (a) Explain the Role of the Android Manifest File. 7M
(b) Describe the Utility of Android API. 7M

(OR)

4. (a) Give a brief note on Using the Edit Text Control. 7M
(b) How to display the messages through Toast? Explain 7M

UNIT – III

5. (a) Discuss the switching states with Toggle Buttons write one example. 7M
(b) List and explain the different types of layouts in Android 7M

(OR)

6. (a) Describe the android application for playing audio. 7M
(b) Write the procedure for Displaying Progress with Progress Bar. 7M

UNIT – IV

7. (a) Explain the Creating Fragments with java Code. 7M
(b) How do you instantiate a spinner control? Explain 7M

(OR)

8. (a) Give a brief note on Fragments. 7M
(b) How can we convert data from database to spinner in Android? Discuss 7M

UNIT-V

9. (a) List and explain the different types of menus in Android. 7M
(b) How to applying s context menu to a List View? Explain 7M

(OR)

10. (a) Discuss the Interface Menus and Action Bars. 7M
(b) How can create menu in Android? Explain with suitable example. 7M

Q.P. Code: 1814601

SET - 1

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B. Tech. VI Semester (R18) Regular Examinations of August – 2021
SUB: Basics Electronics & Sensor Technology (CE)

Time: 3 Hours

Max. Marks: 70

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

UNIT - I

1. (a) Explain the working of P-N Junction diode in forward and reverse bias conditions 7M
(b) Discuss the applications of PN junction diode 7M

(OR)

2. (a) With circuit and necessary waveforms explain the operation of bridge rectifier 7M
(b) Describe the operation and characteristics of Light Emitting Diode. 7M

UNIT – II

3. (a) Explain the construction and operation of PNP Transistor with neat sketch. 7M
(b) Describe a setup to obtain the output characteristics of a transistor in CE configuration. Indicate the various regions of operation on the output characteristics 7M

(OR)

4. (a) Determine I_C , I_E and α for a transistor circuit having $I_B=15\mu A$ and $\beta=150$ 7M
(b) Write a short note on transistor as an amplifier 7M

UNIT – III

5. (a) Explain construction of n-channel JFET with neat diagram and symbol. 7M
(b) An n-channel JFET has $I_{DSS}=10mA$ and $V_P= -2V$. Determine the drain source resistance r_{DS} for (i) $V_{GS}=0V$. (ii) $V_{GS}= -0.5V$ 7M

(OR)

6. (a) Draw the circuit and explain the drain and gate characteristics of a JFET in CS configuration 7M
(b) Give the comparison between BJT and FET 7M

UNIT – IV

7. (a) Explain the classification of transducers based on the power requirements and electrical parameters involved. 7M
(b) Briefly explain the operation of linear and angular motion potentiometer with neat diagram 7M

(OR)

8. (a) Draw a functional block diagram of a Bourdon tube and explain the function of each block 7M
With neat diagrams, explain the working of capacitive transducers based on 7M
(b) i) Change in area of the plates
ii) Change in distance between the plates

UNIT-V

9. (a) What are the temporary adjustments to be done for Surveyor's Compass & Prismatic compass? Explain. 7M
(b) What is gyroscope? How gyroscopic principle are used to measure force and torque? Explain with relevant diagrams 7M

(OR)

10. (a) Discuss about solid and liquid density measurements 7M
(b) Write a short note on micro tomography. 7M

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B. Tech. VI Semester (R18) Regular Examinations of August – 2021
SUB: Management Science (EEE)

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 'Line and Staff' organization structure. What are its merits and demerits? 7M
(b) Discuss about motivational theories of X and Y. 7M

(OR)

2. (a) Describe Maslow's theory of Motivation. 7M
(b) Write a note on the following: 7M
(i) Functional organization structure
(ii) Matrix organization structure

UNIT – II

3. (a) What is Strategy formulation? Explain the strategy formulation process. 7M
(b) Why Environmental scanning is important in Strategy development? 7M

(OR)

4. (a) Explain the elements of corporate planning process in the industrial environment. 7M
(b) "Strategy implementation is as good as starting a new business". Discuss strategy implementation in detail in the above context. 7M

UNIT – III

5. (a) Define Merit Rating. Explain any three methods of Merit Rating. 7M
(b) Discuss in detail about various Incentive plans. 7M

(OR)

6. (a) Explain the Job Evaluation process. 7M
(b) Explain in detail the costs involved in EOQ. 7M

UNIT – IV

7. (a) Define the term quality as it relates to products and as it relates to services. Discuss the determinants of quality. 7M
(b) Explain the procedure for taking a Time study and the Method of calculation of standard time. 7M

(OR)

8. (a) Define Productivity. List the various factors affecting productivity. 7M
(b) State the control charts of Attributes along with a diagram. 7M

UNIT-V

9. (a) How is aggregate planning done in the service sector? Compare MRP with JIT. 7M
(b) How the concept of performance management emerged? What is the scope of performance bench mark? 7M

(OR)

10. (a) What is MIS? Explain its advantages and disadvantages. 7M
(b) Write in detail about Supply Chain Management. 7M

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B. Tech. VI Semester (R18) Regular Examinations of August – 2021
SUB: Management Science (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, with suitable diagram and examples, Abraham Maslow's Hierarchy of Needs in a business organization. **7M**
(b) "Management is getting things done through the efforts of other people". Discuss. **7M**

(OR)

2. (a) Discuss the concept of Social responsibilities of Management. **7M**
(b) Explain 'Line and Staff' organization structure. What are its merits and demerits? **7M**

UNIT – II

3. (a) Identify and discuss the stages in the process of strategy formulation and implementation. **7M**
(b) What do you mean by Mission? Discuss the characteristics of Mission Statement. **7M**

(OR)

4. (a) What do you understand by Plant Layout? Explain the types of Plant layout. **7M**
(b) Explain the importance of Environmental Scanning. **7M**

UNIT – III

5. (a) Write about the different methods of job evaluation? **7M**
(b) What is Manpower Planning? What factors do you consider while forecasting Manpower needs of an organization? **7M**

(OR)

6. (a) Define Merit Rating. Explain any four methods of merit rating. **7M**
(b) The following information is about the shock absorbers used by automobile work shop. **7M**

Annual demand 4800 units

Unit price Rs 300

Cost of placing an order Rs 50

Storage cost 3 Percent per annum

Interest rate 10 percent per annum

Calculate EOQ and also find the number of orders to be placed.

UNIT – IV

7. (a) Briefly describe the various steps involved in Method Study Procedure. **7M**
(b) What is Quality control? Explain the Control Charts for Attributes. **7M**

(OR)

8. (a) What is meant by Inventory? What is the need for inventory control at different stages of production? **7M**
(b) Discuss in detail about Purchase procedure. **7M**

UNIT-V

9. (a) What are the steps involved in identifying critical path for Project Management. **7M**

(b) How does the PERT technique help a business manager in decision making? **7M**

(OR)

10. (a) Identify the critical path **7M**

JOB	Optimistic time (to)	Most likely (tm)	Pessimistic time (tp)
1-2	3	6	15
1-6	2	5	14
2-3	6	12	20
2-4	2	5	08
3-5	5	10	17
4-5	3	6	15
6-7	3	8	27
5-8	1	4	07
7-8	4	9	48

(b) What is Network analysis? When it is used? Why should we want to know which activities are critical and which are not? **7M**