

**K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA**  
**B. Tech. VI Semester (R18) Supplementary Examinations of February – 2022**  
**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) Classify and explain in detail about the method of surveying based upon the instruments used. 7M
- (b) A 30m chain was tested, before commencement of the day's work and found to be correct. After measuring 3000m, the chain was found to be 5cm too long. At the end of the day's work, after measuring 5400m, the chain was found to be 10cm long, what was the true distance chained? 7M

**(OR)**

2. (a) The following are the bearings observed in a closed compass traverse. Find the stations affected by local attraction and compute the correct bearings of the lines Line 8M

Line	FB	BB
AB	32° 30'	214° 30'
BC	124° 30'	303° 15'
CD	181° 00'	1° 00'
DA	289° 30'	108° 45'

- (b) Distinguish between 6M
- (i) Fore bearing and Back Bearing
- (ii) Whole circle bearing and reduced bearing
- (iii) Dip and Declination.

**UNIT – II**

3. (a) The following notes refers to reciprocal levels taken with one level; 7M

Instant @	Staff reading on		Remains
	P	Q	
P	1.824	2.748	Distance between P & Q =1010m
Q	0.928	1.606	RL of P =126.386m

Find the (i) True RL of Q (ii) The combined correction for curvature and retraction. Determine the elevation at the foot of the signal if the height of the signal above its base is 3m.

- (b) List the source of Errors in Leveling. 7M

**(OR)**

4. (a) The following readings are successively taken from an instrument in a leveling work. 8M  
 0.224, 0.565, 1.765, 1.890, 2.400, 1.765, 0.330, 0.875, 1.245. The position of instrument was changed after taking the 3<sup>rd</sup> and 6<sup>th</sup> reading. Draw out the level field book. If the RL of first point 100.00, Calculate the RL of all other points using raise and fall method.
- (b) Explain the steps involved in leveling. 6M

**UNIT – III**

5. (a) In order to obtain area of a plot, a series of perpendicular offsets 2.2m, 3.0m, 1.65m, 2.46m, 2.0m, 2.25m and 1.68m were laid from a survey line to an irregular boundary at regular intervals of 5m. Find the desired area using 7M
- (i) Trapezoidal rule
- (ii) Simpson's Rule

- (b) The area within the contour lines at the site of Abandoned Quarry used as the water reservoir and the face of the proposed dam are as follows: 7M

<b>Contour(m)</b>	350	352	354	356	358	360	362
<b>Area(m<sup>2</sup>)</b>	300	10500	76000	145000	270000	415000	470000

Taking 350 as bottom level of reservoir and 362 as the F.R.L. Find the volume of water in the reservoir in cubic meters using Trapezoidal rule.

(OR)

6. (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 Simpson's method. 7M
- (b) Derive an expression for Simpson's rule for computing area between boundary and chain line. 7M

#### UNIT – IV

7. (a) The following notes refer to three level cross-sections at two sections 50 meters apart. 7M

Station	Cross -Section		
A	1.7/7.7	2.8/0	4.6/10.6
B	2.9/8.9	3.7/0	6.9/12.9

The width of cutting at the formation level is 10m. Calculate the volume of cutting between the two stations.

- (b) Describe the method of setting a circular curve by Rankin's deflection angle method 7M

(OR)

8. (a) What are the functions and principles involved in Total station instrument? 7M
- (b) Describe the salient features of a total station and explain how angles are measured using it. 7M

#### UNIT-V

9. (a) Explain methods of image classification. 7M
- (b) Briefly explain the procedure involved in aerial survey. 7M
- (OR)
10. (a) Explain the interaction of Electro Magnetic Waves with atmosphere. 7M
- (b) Explain the various stages of idealized remote sensing system. 7M

**K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA**  
**B. Tech. VI Semester (R18) Supplementary Examinations of February – 2022**  
***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. Sketch various levels of automation in a production plant and illustrate with an example 14M

**(OR)**

2. Describe 14M  
(i) Sensors  
(ii) Actuators  
(iii) Computer process control

**UNIT – II**

3. Illustrate the steps in computer assisted part programming. 14M

**(OR)**

4. (a) Discuss about the applications of NC system 8M  
(b) What are the NC applications characteristics? 6M

**UNIT – III**

5. (a) What are the four factors that favor the use of manual assembly lines? 8M  
(b) What is a manual assembly line? 6M

**(OR)**

6. (a) Prioritize the advantages of the automated production lines 6M  
(b) How the in-line configuration of the work part transport happen? Illustrate. 8M

**UNIT – IV**

7. (a) Summarize the common robot configurations in detail 7M  
(b) List out the joints in the robot 7M

**(OR)**

8. List out the various sensors used in Robots. Differentiate between the contact and non-contact type of sensors. 14M

**UNIT-V**

9. Describe the method of allocation of D-H frames with an example and also mention the link parameters. 14M

**(OR)**

10. (a) Discuss about proximity and range sensor in detail 6M  
(b) Demonstrate various applications of robots in manufacturing 8M

**K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA**  
**B. Tech. VI Semester (R18) Supplementary Examinations of February – 2022**  
**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. Explain about MATLAB basic features and MATLAB help system 14M  
**(OR)**  
 2. (a) Write short notes on code cells and multiple comment lines. 7M  
 (b) Write a MATLAB program to illustrate scalar – array operations. 7M

**UNIT – II**

3. Explain ‘If’ and ‘for’ loop control flow structure with an example. 14M  
**(OR)**  
 4. Describe the syntax of script M file function discuss with suitable example. 14M

**UNIT – III**

5. Write a MATLAB program to solve the linear set of equations using the Cramer’s method. 14M

$$\begin{aligned}x + y + z &= 11 \\2x - 6y - z &= 0 \\3x + 4y + 2z &= 0\end{aligned}$$

**(OR)**

6. With suitable examples describe the following polynomial functions. 14M  
 (i) roots  
 (ii) poly  
 (iii) conv  
 (iv) polyder

**UNIT – IV**

7. Explain plot function. What are the various Line styles, markers and colors used by plot function? 14M  
**(OR)**  
 8. (a) Write a MATLAB program to illustrate grids, axes box, labels and hold functions 7M  
 (b) Write short notes on curve fitting 7M

**UNIT-V**

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

$$\begin{aligned}a) \int_0^2 (2x^2 + 4x + 10) dx & \quad b) \frac{d}{dx} (4x^3 + 5x + 8) \quad c) \int_0^4 (x^4 + 5x^2 + 5) dx \\d) \frac{d}{dx} (x^3 + 2x^2 + 9) & \quad e) \int (3x^3 + \exp(x)) dx\end{aligned}$$

**(OR)**

10. With suitable examples describe the following symbolic functions. a) ezplot b) solve 14M  
 c) factor d) simplify e) subs

**K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA**  
**B. Tech. VI Semester (R18) Supplementary Examinations of February – 2022**  
***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) Explain about Vonneumann architecture. 7M

**(OR)**

2. (a) Explain different types of Microcontrollers with examples. 7M  
(b) Write the applications of Microcontrollers. 7M

**UNIT – II**

3. (a) Explain the pin diagram of 8051 microcontroller. 7M  
(b) Write short notes on internal RAM memory organization. 7M

**(OR)**

4. (a) Explain external memory interfacing of ROM & RAM. 7M  
(b) Write short notes on stack and timers of 8051. 7M

**UNIT – III**

5. (a) With neat sketch explain the functional block 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 Interrupts and Resets of MSP430 microcontroller. 7M

**UNIT – IV**

7. (a) Explain the features of PIC 16C6X/7X microcontroller. 7M  
(b) Explain interrupts of PIC microcontroller. 7M

**(OR)**

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

**UNIT-V**

9. (a) Explain ARM design philosophy. 7M  
(b) Explain about program status register of ARM microcontroller. 7M

**(OR)**

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

**K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA**  
**B. Tech. VI Semester (R18) Supplementary Examinations of February – 2022**  
***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) Explain insertion and deletion operations on double linked list **10M**  
(b) Why we need to use arrays? Write the procedure to insert an element into an array. **4M**

**(OR)**

2. (a) 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 **8M**  
(b) What are different positions that a node can be inserted into a single linked list? Explain them in detail **6M**

**UNIT – II**

3. (a) Construct an empty stack and perform PUSH operation for any five elements. Also perform POP operation for two elements and show the value on the top of stack **8M**  
(b) In how many ways a queue can be stored in memory? Explain them. **6M**

**(OR)**

4. (a) Write an algorithm to implement insert and delete operations in Queue with array implementation for the following elements 88, 25, 67, 15, 56 with diagrammatic representations **8M**  
(b) What is a stack? List the applications of stacks. Explain any two applications with suitable example **6M**

**UNIT – III**

5. (a) Construct a binary tree given the pre-order and in-order sequences as below: **10M**  
Pre order : a b c e I f j d g h k l  
In order : e i c f j b g d k h l a  
(b) What is Binary search tree? Explain how they are represented in memory **4M**

**(OR)**

6. Explain operations on Binary search tree. **14M**

**UNIT – IV**

7. (a) Explain operations on splay trees **8M**  
(b) What is AVL Tree? How to calculate balance factor and list out various imbalances during insertion and deletion operations. **6M**

**(OR)**

8. (a) Write short notes on Red black trees **8M**  
(b) Write an algorithm to traverse a graph using depth first search traversal technique. **6M**

**UNIT-V**

9. (a) Sort the following numbers using insertion sort: 45, 25, 10, 2, 9, 85, 102, 1 **6M**  
(b) Write an algorithm for Merge sort **8M**

**(OR)**

10. (a) Write an algorithm for linear search and trace the algorithm with an example **7M**  
(b) What is heap sort? Explain how to sort elements using heap sort **7M**

**K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA**  
**B. Tech. VI Semester (R18) Supplementary Examinations of February – 2022**  
***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) Write about database users and administrators. 7M  
(b) Define database system and explain purpose of data base systems. 7M

**(OR)**

2. (a) Explain ER model with an example. 7M  
(b) Explain overview of database design process. 7M

**UNIT – II**

3. (a) Explain aggregate functions with examples. 7M  
(b) What is nested sub query and explain it with an example 7M

**(OR)**

4. (a) Explain about integrity constraints with examples. 7M  
(b) Explain about procedures with an example. 7M

**UNIT – III**

5. (a) What is decomposition and what are the problems related to decomposition. 7M  
(b) Explain schema refinement in database design. 7M

**(OR)**

6. (a) Define Functional dependency and explain 2NF and 3NF. 7M  
(b) Write about join dependencies with examples. 7M

**UNIT – IV**

7. Write and explain about query processing with neat diagram. 14M

**(OR)**

8. (a) Write about simple transaction model with neat sketch. 7M  
(b) Define transaction and explain transaction properties. 7M

**UNIT-V**

9. (a) Write about two-phase locking protocol. 7M  
(b) Explain the concept of multiple granularity. 7M

**(OR)**

10. (a) Explain validation based protocol. 7M  
(b) Briefly explain predicate reads. 7M

**K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA**  
**B. Tech. VI Semester (R18) Supplementary Examinations of February – 2022**  
***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) Using Newton's Raphson method, find the real root of  $x \log_{10} x = 1.2$  correct to three decimal places. **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  $7x + 52y + 13z = 104, 83x + 11y - 4z = 95, 3x + 8y + 29z = 71$  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) From the following table, estimate the number of students who obtained marks between 40 and 45: **7M**

<i>Marks</i>	:	30–40	40–50	50–60	60–70	70–80
<i>No. of students:</i>		31	42	51	35	31

**(OR)**

4. Find the distance moved by a particle and its acceleration at the end of 4 seconds, if the time versus velocity data as follows: **14M**

<i>t</i>	0	1	3	4
<i>v</i>	21	15	12	10

**UNIT – III**

5. From the following table, find  $\frac{dy}{dx}, \frac{d^2y}{dx^2}$  at (i)  $x = 1.2$  (ii)  $x = 2.2$ . **14M**

<i>x</i>	1	1.2	1.4	1.6	1.8	2.0	2.2
<i>y</i>	2.7183	3.3201	4.0552	4.9530	6.0496	7.3891	9.0250

**(OR)**

6. Evaluate  $\int_0^6 \frac{dx}{1+x^2}$  using (i) Trapezoidal rule (ii) Simpson's  $\frac{1}{3}$ rd rule and (iii) Simpson's  $\frac{3}{8}$ th rule. **14M**

**UNIT – IV**

7. (a) Employ Taylor's method to obtain approximate value of  $y$  at  $x = 0.2$  for  $\frac{dy}{dx} = 2y + 3e^x, y(0) = 0$ . **7M**  
 (b) Using Runge-Kutta method of fourth order, solve  $\frac{dy}{dx} = x + y^2, y(0) = 1$  at  $x = 0.2$  in two steps. **7M**

**(OR)**



8. Given  $\frac{dy}{dx} = x(x^2 + y^2)e^{-x}$ ,  $y(0) = 1$ , find  $y$  at  $x = 0.1, 0.2$  and  $0.3$  by Taylor's series method and compute  $y(0.4)$  by Milne's method **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  $u(0, y) = 0$ ,  $u(4, y) = 4 + y$ ,  $u(x, 0) = \frac{x^2}{2}$ ,  $u(x, 4) = x^2$  with  $\Delta x = \Delta y = 1$ . **14M**

**(OR)**

10. Solve the boundary value problem  $y'' - y = 0$  with  $y(0) = 0$ ,  $y(2) = 2.62686$ . 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) Supplementary Examinations of February – 2022**  
***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) Should the students of technical background have effective writing skills? Give reasons with examples 7M
- (b) Write a job application letter to the advertisement given below: 7M  
“ Infosys is recruiting software engineers who have rich knowledge on JAVA/Oracle/Testing Tools platform. The candidates should have abundant experience in above mentioned areas with B.Tech. background. Interested candidates can apply within 15 days”.

**(OR)**

2. (a) Write a short note on the following: 7M  
(i) Comma (ii) colon (iii) Capital letters
- (b) Write a convincing paragraph on the given situation: 7M  
“ You wish to go abroad for your further studies, but your parents refuse your proposal and ask you to stay back and look after the business”.

**UNIT – II**

3. (a) Describe an event that was conducted in your college recently. 7M
- (b) What are various strategies of pre-writing? Explain them clearly. 7M

**(OR)**

4. (a) What are cohesive devices? Why are they so important in paragraph writing? 7M
- (b) Write a paragraph on ‘Newspaper’. 7M

**UNIT – III**

5. Correct the following sentences if necessary 14M
- (i) Nobody accept the responsibility.
- (ii) No one among the players are going to write the exam.
- (iii) Neither the Ministers nor the Chief Minister have attended the party.
- (iv) The committee have decided to expel them.
- (v) I have visited England last August.
- (vi) Rat or cat run everyday in the room.
- (vii) Mohan repeated the advice again.
- (viii) Prof. Suresh is teaching Soil Mechanice since two years.
- (ix) He is writin g since morning.
- (x) I did not finish my work yet.
- (xi) Mount Everest is the most highest peak in the world.
- (xii) This photograph is the best of the two.
- (xiii) He is senior than me by three years.
- (xiv) Everybody, including the receptionist, were present for the meeting.

**(OR)**

6. (a) List out various characteristics of a good essay and explain them. 7M  
(b) Write an essay on “Films influence youth”. 7M

**UNIT – IV**

7. (a) When is definite article used? Explain with appropriate examples. 7M  
(b) Is English so awkward? Support your answer with suitable reasons. 7M

**(OR)**

8. Why should writers possess effective writing skills? Expand your answer with suitable examples. 14M

**UNIT-V**

9. (a) Define précis writing. List out Dos and Don'ts of pre-writing. 7M  
(b) What are various techniques of Note-Making? Explain them. 7M

**(OR)**

10. (a) Expand the statement ‘Don't judge a book by its cover’. 7M  
(b) Attempt a précis on the following. 7M

Education ought to teach us how to be in love always and what to be in love with. The great things of history have been done by the great lovers, saints, men of science and artists, and the problem of civilization is to give every man a chance of being a saint, a man of science or an artist. But this problem cannot be solved unless men desire to be saints, men of science and artists. And if they are to desire that continuously they must be taught what it means to be these things. We think of the man of science, or the artist if not of the saint, as a being with peculiar gifts who exercises more precisely and incessantly perhaps, activities which we all ought to exercise. It is a commonplace belief that art has ebbed away out of our ordinary life, out of all the things which we use, and that it is practiced no longer recognize the aesthetic activity as an activity of the spirit and common to all men. We do not know that when a man makes anything he ought to make it beautiful for the sake of doing so, and that when a man buys anything he ought to demand beauty in it for the sake of that beauty in it for the sake of that beauty. We think of beauty if we think of it at all, as a mere source of pleasure, and therefore it means to us an ornament added to things for which we can pay extra as we choose. But neatly is not an ornament to life, or the things made by man. It is an essential part of both.

**K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA**  
**B. Tech. VI Semester (R18) Supplementary Examinations of February – 2022**  
***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. Define HRM and explain its nature and scope. **14M**
- (OR)**
2. (a) Evolution of the concept of HRM, **7M**  
(b) Give the examples how to Practice Of HRM in Industry **7M**

**UNIT – II**

3. (a) Define Job Analysis?- Explain Uses and Process of job analysis. **7M**  
(b) What are the factors affecting job design? **7M**
- (OR)**
4. Discuss various techniques of job design. **14M**

**UNIT – III**

5. (a) What are the Objectives of Job Evaluation? **7M**  
(b) Explain merits of job Evaluation. **7M**
- (OR)**
6. Explain the process of Human Resource Planning. **14M**

**UNIT – IV**

7. (a) What are the various types of interviews? **7M**  
(b) Outline the Induction Program **7M**
- (OR)**
8. Evaluate various Methods of selection with suitable examples **14M**

**UNIT-V**

9. (a) Discuss Importance of Training **7M**  
(b) Write any two on the job training methods **7M**
- (OR)**
10. Draw the Training Process In detail **14M**

**K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA**  
**B. Tech. VI Semester (R18) Supplementary Examinations of February – 2022**  
***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) List the different mineral and chemical admixture **7M**  
(b) Explain briefly about heat of hydration. **7M**

**(OR)**

2. (a) Describe briefly about Accelerators and Accelerating Plasticizers **7M**  
(b) Mention the different grades of cement. How the grades are fixed. **7M**

**UNIT – II**

3. (a) Explain grading of coarse aggregates. **7M**  
(b) Explain about the classification of aggregates. **7M**

**(OR)**

4. (a) Mention different tests for the measurement of workability. Explain any one in brief. **7M**  
(b) Explain the effect of time and temperature on the workability of concrete. **7M**

**UNIT – III**

5. (a) Mention any 5 different durability tests on concrete. Explain Efflorescence. **7M**  
(b) Explain resistance of concrete to fire. **7M**

**(OR)**

6. (a) Explain briefly about poisson's ratio. **7M**  
(b) Explain the factors affecting creep. **7M**

**UNIT – IV**

7. (a) Explain the influence of temperature on curing. **7M**  
(b) Explain high pressure steam curing. **7M**

**(OR)**

8. (a) Explain ultrasonic pulse velocity test for different cases. **7M**  
(b) Explain three point loading flexural strength test. **7M**

**UNIT-V**

9. Brief about different zones of coarse aggregates as per IS **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/m<sup>3</sup> 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) Supplementary Examinations of February – 2022**  
**SUB: Structural Analysis - II (CE)**

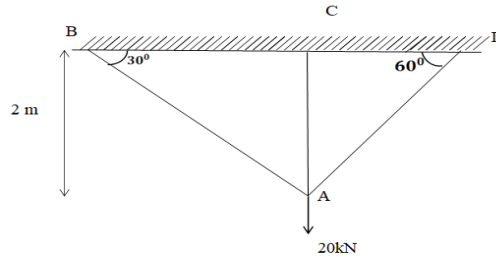
**Time: 3 Hours**

**Max. Marks: 70**

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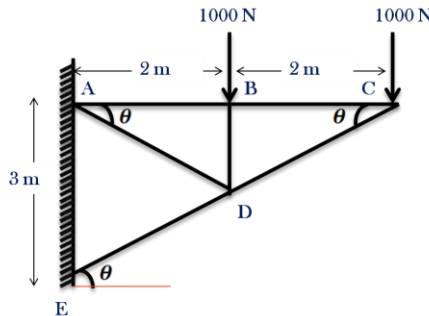
**UNIT - I**

1. (a) Describe the terms: Perfect frame, Imperfect frame, Deficient frame and a Redundant frame **4M**
- (b) Analyze the frame shown in figure. Members AB and AD have area of  $8 \text{ cm}^2$  and member AC has area of  $4 \text{ cm}^2$ . Determine deflection of 'A'. Take  $e=2.1 \times 10^5 \text{ N/mm}^2$  **10M**



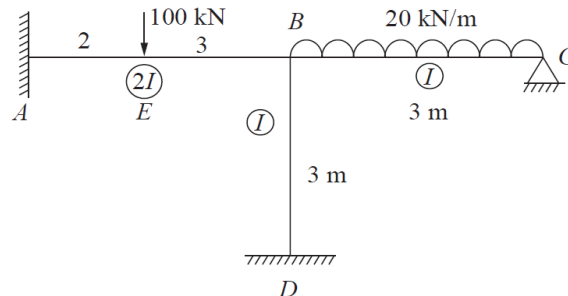
**(OR)**

2. Determine the forces in all the members of a cantilever truss shown in figure **14M**



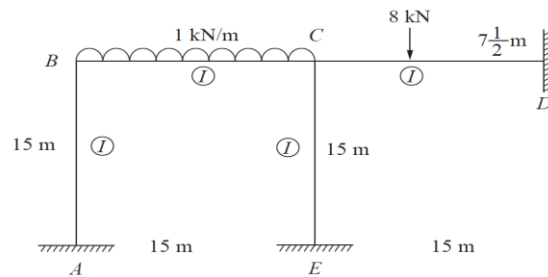
**UNIT – II**

3. Compute the support moments at A, B, C and D for the portal frame by using Slope Deflection Method shown in fig **14M**



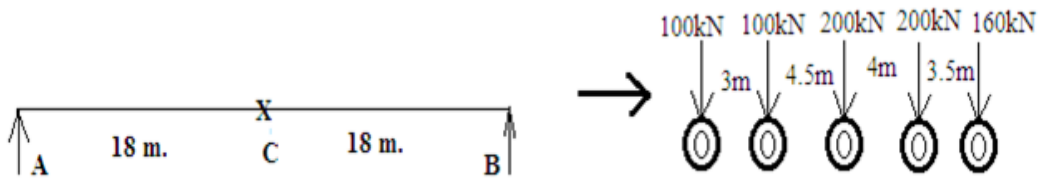
**(OR)**

4. Find the support moments at A, B, C and D for the portal frame by using Moment Distribution Method shown in fig **14M**



### UNIT – III

5. A system of 5 wheel loads 100 kN, 100 kN, 200 kN, 200 kN and 160 kN crosses a beam of 36 m. span with 160 kN load leading. The distances between the loads are 3.5m, 4.0 m, 4.5 m, and 3.0 m respectively, which is shown in Fig.5 Calculate the position and value of the Absolute maximum bending moment **14M**

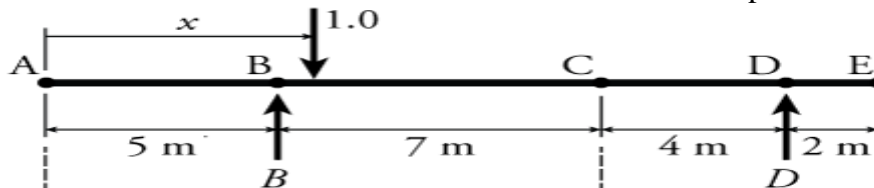


(OR)

6. (a) Consider a beam AB of span  $l$  carrying a uniformly distributed load of  $w$  per unit run on the span from left to right. The length of the load is greater than the span. Draw maximum positive and negative shear force diagram **7M**
- (b) A train of three wheel loads of magnitude 45 kN, 90 kN, and 90 kN passes over a span of 40m. The horizontal distance between the loads is 5m and 10m. Find the greatest bending moment **7M**

### UNIT – IV

7. (a) Distinguish Influence line diagrams and Bending moment diagram **4M**
- (b) Find the influence lines for the internal shear and moment at point C. **10M**

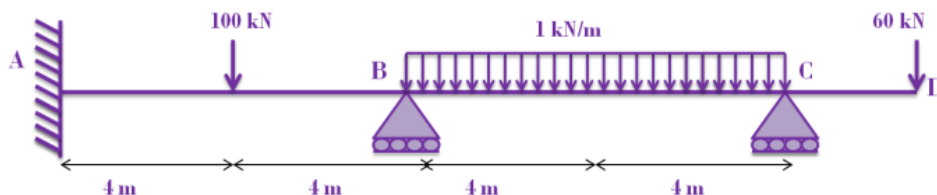


(OR)

8. (a) Derive the expression of influence line diagram for the Bending moment at a given section **4M**
- (b) A uniformly distributed live load of 60 kN per metre run of length 5 metres moves on a girder of span 16 metres. Find the maximum positive and negative shear force at a section 6 metres from the left end **10M**

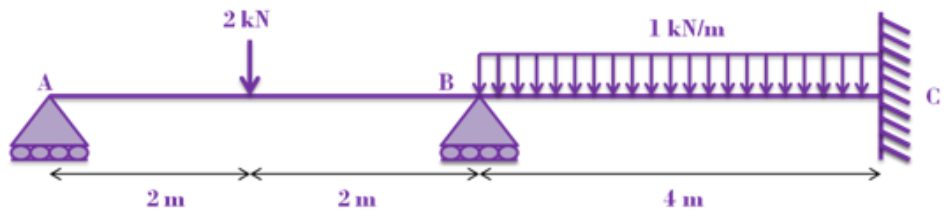
### UNIT-V

9. Analyze the Continuous beam as shown in figure using Flexibility Matrix method **14M**



(OR)

10. Analyze the Continuous beam as shown in figure using Stiffness method **14M**





**K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA**  
**B. Tech. VI Semester (R18) Supplementary Examinations of February – 2022**  
***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) Define Limit State. Discuss the Ultimate limit states of safety and Serviceability Limit states. **7M**  
(b) Explain the process of cold working of HYSD bars. How is the yield strength of such bars determined? Draw the stress-strain plot for the same. **7M**

**(OR)**

2. (a) Write notes on Modular Ratio and Long-term modulus of elasticity of concrete. **7M**  
(b) Write notes on the Acceptance criteria for concrete with respect to **7M**  
i) Flexural Strength  
ii) Compressive Strength

**UNIT – II**

3. (a) For a singly reinforced rectangular section, derive the stress block parameters. **7M**  
(b) A singly reinforced beam of grade M20 has to resist an ultimate moment of 36 kNm. Design the section using 0.45% steel of grade Fe 250. Assume  $b = 230\text{mm}$ . **7M**

**(OR)**

4. Calculate the area of reinforcement required for an L-beam of flange width 1000mm, flange thickness 120mm, width of rib 250mm, total depth 750mm and effective cover 70mm, to resist an ultimate bending moment of 750 kNm. Assume M20 grade concrete and Fe 415 grade steel. **14M**

**UNIT – III**

5. (a) Discuss about critical sections for calculation of Design shear, as per IS 456-2000. Draw neat diagrams to represent the location of critical sections. **4M**  
(b) A simply supported RC beam, 380mm wide and 750mm deep, carries a uniformly distributed load of 84 kN/m (including self-weight) over a span of 6m. The beam is reinforced with 6 Nos of 22mm diameter bars of grade Fe 500 on tension face. Design the shear reinforcement using vertical stirrups only. Assume M20 grade concrete and effective cover 50mm, with a load factor of 1.5. Consider the width of support = 380mm **10M**

**(OR)**

6. 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  $45^\circ$ . Determine the additional shear reinforcement required, if the factored shear force at the critical section is 320kN. Consider M25 grade concrete and Fe 415 grade steel. **14M**

**UNIT – IV**

7. Design a simply supported roof slab for a room 8m x 3.5m clear in size if the live load is  $5\text{kN/m}^2$ . Use M15 mix and Fe 415 grade steel. **14M**

**(OR)**

8. Explain the steps involved in the design of Two-way slab as per IS Code 456:2000. Also mention the recommendations of the code with respect to torsion in corners. Draw neat diagrams to explain the above. **14M**

**UNIT-V**

9. Design a short RC column using M25 grade concrete and Fe 415 grade steel to carry an ultimate load of 1050 kN. Unsupported length = 4.15m **14M**

**(OR)**

10. A short column 230mm x 450mm has an unsupported length of 3.2m. It is subjected to a factored axial load of 1700 kN and a factored moment of 180 kNm about the major axis. Determine the longitudinal steel using M20 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) Supplementary Examinations of February – 2022**  
***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) Explain the various types of soil samplers. 7 M  
(b) Briefly explain the pressure meter test. 7 M

**(OR)**

2. (a) Discuss the salient features of soil investigation report along with borehole log sheet. 7 M  
(b) Enumerate the seismic refraction method of soil investigation. 7 M

**UNIT – II**

3. (a) Explain the stability considerations of the gravity retaining wall. 7 M  
(b) A retaining wall, 8 m high, with a smooth vertical back and surface of the fill is horizontal. Determine the thrust on the wall per unit length. Take  $c = 10 \text{ kN/m}^2$ ,  $\phi = 20^\circ$ ,  $\gamma = 19 \text{ kN/m}^3$ . Neglect the tension. 7 M

**(OR)**

4. (a) Explain different types of earth pressure and obtain the expression for active earth pressure by Rankine's theory. 7 M  
(b) A 6 m high retaining wall with smooth vertical back retains a cohesionless backfill. The unit weight of soil is  $19 \text{ kN/m}^3$  and angle of internal friction is  $30^\circ$ . The backfill carries a surcharge intensity of  $40 \text{ kN/m}^2$ . Determine the magnitude and point of application of passive earth force. 7 M

**UNIT – III**

5. (a) Discuss the Terzaghi's bearing capacity theory for a shallow foundation. Explain how the bearing capacity equation is modified for (i) local shear failure and (ii) shapes of the footing. 8 M  
(b) Explain the types of shear failure. 6 M

**(OR)**

6. (a) What are the allowable settlements of foundations? How the bearing capacity of soil is estimated based on settlement criteria? 7 M  
(b) A square footing of 1.8 m size is placed over a sand of bulk density  $20 \text{ kN/m}^3$  and saturated density of  $22 \text{ kN/m}^3$ , at a depth of 1.0 m below ground. The angle of shearing resistance is  $30^\circ$ . The Terzaghi's bearing capacity factors are  $N_c = 30.14$ ,  $N_q = 18.4$ , and  $N_\gamma = 15.1$ . Determine the ultimate bearing capacity of the soil when there is no effect of water table and when the water table is at the base. 7 M

**UNIT – IV**

7. (a) Outline the procedure to determine the load carrying capacity of a single pile in (i) sand, and (ii) clay. 7 M  
(b) Briefly explain the types of pile foundation. 7 M

**(OR)**

8. (a) Explain the pile load test to evaluate the load carrying capacity of pile. 8 M  
(b) A reinforced concrete pile weighing 30 kN (including helmet and dolly) is driven by a drop hammer weighing 40 kN with an effective fall of 0.9 m. The average penetration per blow is 18 mm. The total temporary elastic compression of the pile, pile cap and soil may be taken as 16 mm. Coefficient of restitution is 0.36. What is the allowable load on the pile with a factor of safety of 2? Use Hiley's formula. 6 M

**UNIT-V**

9. (a) What is a stability number and how it is used in the analysis of stability of slopes? 7 M  
(b) Explain the stability of slopes of earth dams during steady seepage and sudden draw down condition. 7 M

**(OR)**

10. (a) Explain the method of slices to determine the factor of safety of finite slopes. 7 M  
(b) Calculate the factor of safety with respect to cohesion of clayey soil slope laid at 1 in 2 to a 7 M

height of 10 m, if  $c = 25 \text{ kN/m}^2$ ,  $\phi = 10^\circ$ ,  $\gamma = 20 \text{ kN/m}^3$ . What will be the critical height of slope in this soil? Assume stability number  $S_n = 0.064$ .

**K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA**  
**B. Tech. VI Semester (R18) Supplementary Examinations of February – 2022**  
***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) Derive relation between duty, delta and base period 7M  
(b) Explain different factors affecting the duty of water 7M

**(OR)**

2. A stream of 130 lit/sec was diverted from a canal and 100 lit/sec were delivered to the field. An area of 1.6 hectares was irrigated in 8 hours. The effective depth of root zone was 1.7m. The runoff loss in the field was 420 m<sup>3</sup>. The depth of water penetration varied linearly from 1.7 m at the head end of the field to 1.1 m at the tail end. Available moisture holding capacity of the soil is 20 cm per meter depth of soil. It is required to determine the water conveyance efficiency, water application efficiency, water storage efficiency, and water distribution efficiency. Irrigation was started at a moisture extraction level of 50% of the available moisture 14M

**UNIT – II**

3. Design an irrigation channel to carry 40 cumecs of discharge, with B/D, i.e base width to depth ratio as 2.5. The critical velocity ratio is 1.0. Assume a suitable value of Kutter's rugosity coefficient and use Kennedy's method 14M

**(OR)**

4. (a) Write a short notes on alluvial and non-alluvial canals 7M  
(b) Explain the necessity of canal lining 7M

**UNIT – III**

5. (a) Discuss the causes of failures of hydraulic structures laid on permeable foundations 7M  
(b) Write short notes on concept of flow net in Khosla's theory 7M

**(OR)**

6. (a) Explain the importance of fish ladder and silt regulation works in diversion head works 7M  
(b) What is critical exit gradient? Explain with neat sketch 7M

**UNIT – IV**

7. (a) What factors will govern the selection of suitable site for a reservoir 7M  
(b) Differentiate between flood control and multipurpose reservoirs 7M

**(OR)**

8. (a) How do you choose a suitable site for dam construction 7M  
(b) What is a gravity dam explain with neat sketch 7M

**UNIT-V**

9. (a) What do you mean by elementary profile of a dam 7M  
(b) Differentiate between high and low gravity dam 7M

**(OR)**

10. What is a phreatic line? Write the steps to determine phreatic line in a homogeneous earth dam with horizontal filter 14M

**K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA**  
**B. Tech. VI Semester (R18) Supplementary Examinations of February – 2022**  
***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) Define i. Jetties ii. Wharves iii. Quays and iv: Fenders 8M  
(b) Illustrate moorings and anchorages when a vessel is at berth 6M

**(OR)**

2. (a) Discuss how tides and winds will occurs and explain importance of understanding their effect while planning for a harbour 7M  
(b) Outline various types of breakwaters and explain any one type of breakwaters with neat sketch. 7M

**UNIT – II**

3. (a) Outline classification of harbour based on natural protection with neat sketches. 7M  
(b) List out various components that are required to provide in a harbour and write importance of each in single line 7M

**(OR)**

4. (a) What do you understand by size and shape of a harbour? Explain how depth of harbour can be decided 7M  
(b) Describe a general layout of a harbour with neat sketch. 7M

**UNIT – III**

5. How do you design harbour entrance and turning basin? Give relations to each. 14M

**(OR)**

6. (a) Outline various marine surveys to be conducted while planning for a harbour 7M  
(b) Discuss about loading and unloading facilities to be provided in harbour 7M

**UNIT – IV**

7. (a) Outline various structures required to protect coast from effect of natural phenomena near harbour 7M  
(b) Illustrate vertical wall break waters with neat sketch 7M

**(OR)**

8. (a) Explain how a fender will protect vessels from wave action and discuss the various types of fenders. 7M  
(b) Outline various methods of dredging and explain hydraulic suction dredging process. 7M

**UNIT-V**

9. (a) What is pier? Illustrate construction of a pier with a neat sketch. 7M  
(b) Explain purpose and construction procedure of a ware house 7M

**(OR)**

10. Discuss about different environment conditions required for port operations ? 14M

**K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA**  
**B. Tech. VI Semester (R18) Supplementary Examinations of February – 2022**  
***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) Write Short notes on load equalization. 7M  
(b) Explain the four quadrant operation of a motor driving a hoist load 7M

**(OR)**

2. (a) Derive the torque expression for loads with rotational motion 7M  
(b) Discuss the different modes of operation of electric drive with suitable examples 7M

**UNIT – II**

3. (a) Class-A chopper, operating in time-ratio control, is supplying the armature of the separately excited dc motor. Derive the motor speed-torque relation 7M  
(b) Describe different braking methods employed for D.C. motors 7M

**(OR)**

4. (a) Explain in detail the operation of a 3-phase full converter feeding a d.c separately excited motor with reference to voltage and current waveforms, assume motor current is continuous. 7M  
(b) A 200V, 875rpm, 150A separately excited dc motor has an armature resistance of 0.06ohm. It is fed from a three phase fully controlled rectifier with an ac source of 220V, 50Hz. Assuming continuous conduction, calculate 7M  
(i) Firing angle for rated motor torque and 750rpm.  
(ii) Motor speed for  $\alpha=160^\circ$  and rated torque.

**UNIT – III**

5. (a) Explain why in an Induction Motor V/f ratio is maintained constant when the motor is operated below the base speed. 7M  
(b) Write a short note on Vector control of Induction motor 7M

**(OR)**

6. (a) Explain with the help torque-speed characteristics, why stator voltage control is suitable for speed control of induction motors in fan and pump drives. Draw a neat circuit diagram for speed control of scheme of 3 phase induction motor using AC voltage controller 7M  
(b) Explain the operation of the VSI fed Induction motor drive 7M

**UNIT – IV**

7. (a) Discuss in detail self-controlled synchronous motor drive employing load commutated thyristor inverter. 7M  
(b) Describe the open-loop and closed loop methods of speed control of a synchronous motor using VSI. 7M

**(OR)**

8. (a) Explain the operation of Brushless d.c motor drive and write its applications 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 the usage of converters in electric drives 7M

**(OR)**

10. (a) Write a short note on Energy Efficient operation of drives 7M  
(b) Explain the losses in the electrical drive system 7M

**K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA**  
**B. Tech. VI Semester (R18) Supplementary Examinations of February – 2022**  
***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) Discuss the internal and external causes of over voltages in a power system **7M**  
(b) Explain in detail how insulation levels are coordinated in a typical power system **7M**
- (OR)**
2. (a) Explain the term insulation coordination. Describe the construction of volt-time curve and the terminology associated with impulse testing **7M**  
(b) Write short note on basic impulse insulation level **7M**

**UNIT – II**

3. (a) With the help of neat sketches, describe the principle of operation of Air blast circuit breaker **7M**  
(b) Describe the construction and advantages & disadvantages of vacuum circuit breaker **7M**
- (OR)**
4. (a) What are advantages and disadvantages of SF6 circuit breaker and also explain the working of a SF6 circuit breaker? **7M**  
(b) A 11 KV, 400 MVA circuit breaker suddenly closes on to a fault. Determine: **7M**  
(i) Symmetrical breaking current.  
(ii) Asymmetrical breaking current assuming 50% DC component.  
(iii) Peak making current.

**UNIT – III**

5. (a) Discuss about the principle operation of static relays and list out the components that are present in static relay. **7M**  
(b) Explain the characteristics of over current relay **7M**
- (OR)**
6. (a) What are the types of differential relays? Explain in detail. **7M**  
(b) List and explain the essential qualities of a protective relay and also explain what are the advantages of static relays over electromechanical relays **7M**

**UNIT – IV**

7. (a) Describe with a neat diagram of restricted Earth fault protection of alternator **7M**  
(b) A three phase, 11 kV/132 kV,  $\Delta/Y$  connected power transformer is protected by differential protection. The CT's on the LV side have a current ratio of 500/5. What must be the current ratio of the CT's on the HV side and how should they be connected **7M**
- (OR)**
8. (a) Discuss about various protection systems for transformers **7M**  
(b) A star connected, 3-phase, 10 MVA, 6.6 kV alternator has a per phase reactance of 10%. It is protected by Merz-price circulating-current principle which is set to operate for fault currents not less than 175 A. Calculate the value of earthing resistance to be provided in order to ensure that only 10% of the alternator winding remains unprotected. **7M**

**UNIT-V**

9. (a) Explain the directional comparison method of carrier current protection. **7M**  
(b) Illustrate the distant protection of transmission lines. **7M**
- (OR)**
10. (a) How do time-delay over current relay work on a radial system? **7M**  
(b) Explain briefly about carrier current protection of bus bars. **7M**

**K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA**  
**B. Tech. VI Semester (R18) Supplementary Examinations of February – 2022**  
***SUB: Signals & Systems (EEE)***

Time: 3 Hours

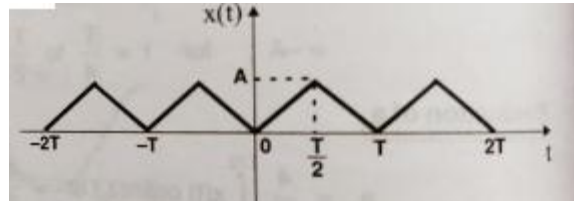
Max. Marks: 70

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

**UNIT – I**

1. (a) Define periodic and non-periodic signals. Verify whether the following continuous time signal is periodic. If periodic, find the fundamental period. 7M  

$$x(t) = 2 \cos (2\pi t/3) + 3 \cos (2\pi t/7)$$
- (b) Enumerate any two basic operations on signals with suitable examples. 7M
- (OR)**
2. Find the trigonometric form of Fourier series of the waveform shown in Fig. 14M

**UNIT – II**

3. State and prove the following Fourier transform properties. 14M  
 (i) Linearity (ii) Time shifting (iii) time scaling (iv) Frequency differentiation
- (OR)**
4. (a) Determine the Fourier transform of the continuous time signal. 7M  

$$x(t) = 1 - t^2 \quad ; \text{ for } |t| < 1$$

$$= 0 \quad ; \text{ for } |t| > 1$$
- (b) Determine the Fourier transform of rectangular pulse 7M  
 $x(t) = 1; \text{ for } t = -T \text{ to } +T$

**UNIT – III**

- 5 (a) Find whether the following systems are linear or not. 7M  
 (i)  $y(t) = t x(t)$  (ii)  $y(t) = x(t^2)$
- (b) Evaluate whether the following system is time-variant or time-invariant. 7M  

$$y(n) = 2 x(n) + \frac{1}{x(n-1)}$$

**(OR)**

6. Discuss about Distortion less transmission through LTI system. 14M

**UNIT – IV**

7. What are the basic operations that can be applied on discrete signals? Explain any three operations with suitable examples. 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  
 $y(n) - 5y(n-1) = x(n) + 4 x(n-1)$ . where  $x(n)$  is input and  $y(n)$  is the output. Find expression for transfer function.



**UNIT-V**

9. (a) State and prove any three Laplace transform properties. 7M  
(b) Find the inverse Laplace transform of 7M

$$(i) X(s) = \frac{s}{(s^2 + 9)} \quad \text{Re}\{s\} > 0 \quad (ii) X(s) = \frac{s}{(s^2 + 9)} \quad \text{Re}\{s\} < 0$$

**(OR)**

10. (a) State and prove initial value theorem. 7M  
(b) Find the inverse z-transform of 7M

$$X(z) = \frac{1 + z^{-1}}{(1 - z^{-1} + 0.5 z^{-2})}$$

**K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA**  
**B. Tech. VI Semester (R18) Supplementary Examinations of February – 2022**  
***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. List out the work holding devices that are used on a lathe and explain any four work holding devices with a neat sketch 14M

**(OR)**

2. Define taper. What are various methods of turning taper and explain about taper turning by Setting over the tail stock 14M

**UNIT – II**

3. (a) How are shapers specified and classified 6M  
(b) Explain the various parts of a shaper with a line diagram 8M

**(OR)**

4. Explain the working principle of shaper and planer with a neat sketch 14M

**UNIT – III**

5. With the help of neat sketch describe the twist drill nomenclature 14M

**(OR)**

6. List out the operations that are performed on a drilling machine and explain any four operations with a neat sketch 14M

**UNIT – IV**

7. List out the operations that are performed on a milling machine and explain any four operations with a neat sketch 14M

**(OR)**

8. (a) Distinguish between up milling and down milling 7M  
(b) Index 96 divisions 7M

**UNIT-V**

9. Describe Indian standard marking system of a grinding wheel

**(OR)**

10. (a) Write a short note on wheel truing and wheel dressing 6M  
(b) What is honing? How it is performed 8M

**K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA**  
**B. Tech. VI Semester (R18) Supplementary Examinations of February – 2022**  
***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) Discuss the materials and practical applications for the various types of springs. 4M  
(b) A railway wagon weighing 50 kN and moving with a speed of 8 km per hour has to be stopped by four buffer springs in which the maximum compression allowed is 220 mm. Find the number of turns in each spring of mean diameter 150 mm. The diameter of spring wire is 25 mm. Take  $G = 84 \text{ kN/mm}^2$ . 10M

**(OR)**

2. (a) State A.M. Wahl's factor importance in the design of helical springs? 4M  
(b) A composite spring has two closed coil helical springs, The outer spring is 15 mm larger than the inner spring. The outer spring has 10 coils of mean diameter 40 mm and wire diameter 5mm. The inner spring has 8 coils of mean diameter 30 mm and wire diameter 4 mm. When the spring is subjected to an axial load of 400 N, find i) compression of each spring, ii) load shared by each spring, and iii) shear stress induced in each spring. The modulus of rigidity may be taken as  $84 \text{ kN/mm}^2$ . 10M

**UNIT – II**

3. (a) What are rolling contact bearings? Discuss their advantages over sliding contact bearings. 4M  
(b) A ball bearing subjected to a radial load of 5KN is expected to have a life of 8000 hours at 1450 rpm with a reliability of 99 percent. Calculate the dynamic load capacity of the bearing so that it can be selected from manufactures catalogue based on a reliability of 90 percent. 10M

**(OR)**

4. (a) Why Trapezoid cross-section is preferred for crank hook? 4M  
(b) A curved bar of rectangular section, initially unstressed, is subjected to bending moment of 1400 N-m which tends to straighten the bar. The section is 4 cm wide by 5 cm deep in the plane of bending, and the mean radius of curvature is 10 cm. Find the position of the neutral axis and magnitudes of the greatest bending stress and draw a diagram to show approximately how the stress varies across the section. 10M

**UNIT – III**

5. (a) Define the following terms. 4M  
    i. Static load carrying capacity. ii. Dynamic load carrying capacity.  
(b) Select suitable ball bearing required to be mounted on a shaft of diameter 45 mm to withstand load of 6 kN and a thrust load of 3 kN at a rated speed of 300 rpm. The bearing capacity works for 50 hours per week for 3 years. Assume light shocks. 10M

**(OR)**

6. A 100 mm wide and 10 mm thick belt transmits 5 KW between two parallel shafts. The distance between the shaft centers is 1.5 m and the diameter of the smaller pulley is 440 mm. The driving and driven shafts rotate at 60 rpm and 150 rpm respectively. Find the stress in the belt, if the two pulleys are connected by i) open belt ii) a cross belt. The coefficient of friction is 0.22. 14M

**UNIT – IV**

7. A cast steel spur gear pinion having 21 teeth and rotating at 1500 rpm is required to transmit 9kW to a high grade CI gear to run at 500 rpm. The teeth are 14.50 involute form. Design the gears completely. 14M

**(OR)**

8. A pair of helical gears with 300 helix angle is used to transmit 15 KW at 10000 rpm of the pinion. The velocity ratio is 4:1. Both gears are to be made of hardened steel of static strength 100 MPa. The gears are 200 stub and the pinion is to have 24 teeth. The face width may be taken as 14 times the module. Find the module and face width from the stand point of strength and check the gears for wear. 14M

**UNIT-V**

9. (a) List out various forces acting on the connecting rod. 4M  
(b) Determine the dimensions of cross section of the connecting rod for a diesel engine with the following data, cylinder bore = 100 mm, length of connecting rod = 350 mm, maximum gas pressure = 4 MPa, factor of safety = 6. 10M

**(OR)**

10. (a) State the function of the following for an internal combustion engine piston: (i.) Ribs (ii.) Piston rings (iii.) Piston skirt and (iv.) Piston pin. 4M  
(b) Following data is given for the grey cast iron piston of a 4-stroke diesel engine cylinder bore=250 mm, allowable tensile stress = 100MPa, allowable radial pressure on cylinder wall = 0.03MPa, thickness of piston head = 42 mm, number of piston rings = 4. Determine: i) radial width of piston rings. ii) axial thickness of piston rings. Iii) Gap between the free ends of piston ring before, iv) Gap between the free ends of piston ring after assembly. v) width of top land, vi) Width of ring grooves, vii) thickness of piston barrel and viii) thickness of barrel at open end. 10M

**K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA**  
**B. Tech. VI Semester (R18) Supplementary Examinations of February – 2022**  
**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) Define Linear Programming Problem. Mention its applications. 7M  
 (b) Demonstrate the unbounded solution of LPP problems graphically. 7M

(OR)

2. Examine the following LPP by simplex method. 14M  
 Maximize  $Z = 3X_1 + 2X_2$  Subject to  
 $2X_1 + 4X_2 \geq 12$ ,  
 $3X_1 + 4X_2 \leq 0$  &  
 $X_1, X_2 \geq 0$ .

**UNIT – II**

3. Solve the following travelling salesman problem so as to minimize the cost per cycle. Determine whether path is satisfied. 14M

		TO				
		A	B	C	D	E
FROM	A	-	3	6	2	3
	B	3	-	5	2	3
	C	6	5	-	6	4
	D	2	2	6	-	6
	E	3	3	4	6	-

(OR)

4. Solve the assignment problem given below. 14M

	1	2	3	4	5	6
A	12	10	15	22	18	8
B	10	18	25	15	16	12
C	11	10	3	8	5	9
D	6	14	10	13	13	12
E	8	12	11	7	13	10

**UNIT – III**

5. Evaluate the sequence that minimizes the total elapsed time (hours) to complete the following jobs on two machines M1 and M2 in the order M1- M2. Find also the idle time. 14M

JOB	M1	M2
A	5	2
B	1	6
C	9	7
D	3	8
E	10	4

(OR)

6. The cost of a machine is Rs. 6100/- and its scrap value is Rs.100/-. The maintenance costs found from experience are as follows. 14M

Year	1	2	3	4	5	6	7	8
Maintenance Cost	100	250	400	600	900	1200	1600	2000

When should the machine be replaced?

**UNIT – IV**

7. A Self-service store employs one cashier at its counter. Nine customers arrive on an average every 10 minutes. While the cashier can serve 20 customers in 10 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 waits before being served.

**(OR)**

8. A department store has a single cashier. During the rush hours customers arrive at a rate of 20 customers per hour. The average number of customers that can be processed by the cashier is 24 per hour. Assume that the conditions for use of the single channel queuing model apply. 14M

- (i) What is the probability that the cashier is idle?
- (ii) What is the average number of customers in the queuing system?
- (iii) What is the average time a customer spends in the system?
- (iv) What is the average number of customers in the queue?

**UNIT-V**

9. Demand of an item in a company is 18,000 units per year. The company can produce the items at a rate of 3000 units per month. The cost of one setup is Rs. 500 and the holding cost of one unit per month is 15 paise. Shortage cost of one unit is Rs. 20 per year. Analyze and find the optimum manufacturing quantity and number of shortages, frequency of production run. 14M

**(OR)**

10. A company requires 150 casting per month. The requirement is assumed to be fixed and known. The set-up cost per procurement is Rs. 300. The holding cost is 2% of the item. The price break details are as follows. 14M

$$K_{11} = \text{Rs. } 12 \text{ /- } \quad 0 < q < 500$$

$$K_{12} = \text{Rs. } 11 \text{ /- } \quad q \geq 500$$

Find the optimum purchase quantity.

**K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA**  
**B. Tech. VI Semester (R18) Supplementary Examinations of February – 2022**  
***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) Describe different types of coal conveyors. **6M**  
(b) Sketch and explain the working of any two types of stokers. **8M**

**(OR)**

2. (a) What are the different types of cooling towers? Explain anyone with a neat sketch. **7M**  
(b) Explain the general layout of ash handling and dust collection systems. **7M**

**UNIT – II**

3. (a) Explain the working details of gas turbine power plant indicating all auxiliaries. **8M**  
(b) Compare a closed cycle gas turbines with open cycle gas turbine. **6M**

**(OR)**

4. (a) List the factors to be considered for selecting a site for diesel power plant. **7M**  
(b) Discuss the wet sump lubrication system pertaining to a diesel engine. **7M**

**UNIT – III**

5. (a) Describe the working of a pumped storage power plant. **7M**  
(b) What is the importance of spill ways in hydro electric power projects? Explain their practical applications. **7M**

**(OR)**

6. (a) Describe with neat sketch, the construction and working of a Pressurized Water Reactor (PWR). **8M**  
(b) Define shielding and its purpose. **6M**

**UNIT – IV**

7. (a) Explain the working details with line diagram of MHD generation. **7M**  
(b) Explain the principle of conversion of solar energy in to heat. **7M**

**(OR)**

8. (a) Explain wind electric generating power plant with a neat sketch. **8M**  
(b) Elaborate the components of tidal power plants. **6M**

**UNIT-V**

9. A power generating station has a maximum demand of 30 MW, a load factor of 0.6, a plant capacity of 0.48 and a plant use factor of 0.82. Find, **14M**  
(i) The daily energy produced.  
(ii) The reserve capacity of the plant.  
(iii) The maximum energy that can be produced if the plant were running all the time.  
(iv) The maximum energy that can be produced daily, if the plant when running according to operating schedule were fully loaded.

**(OR)**

10. (a) A generating station has a maximum demand of 25MW, a load factor of 60%, a plant capacity factor of 50% and a plant use factor of 72%. Find (i) the reserve capacity of the plant (ii) the daily energy produced and (iii) maximum energy that could be produced daily if the plant while running as per schedule, were fully loaded. **8M**  
(b) What is the impact on the environment and human health for the effluents released from the thermal power plants? Explain how to control them. **6M**

**K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA**  
**B. Tech. VI Semester (R18) Supplementary Examinations of February – 2022**  
***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. Explain the significance of multistage compression in gas turbine and how the working is done explain with neat sketch? 14M

**(OR)**

2. (a) Explain the deviation of actual gas turbine cycle from ideal Brayton cycle. 7M  
(b) A gas turbine takes in air at 27 °C and 1 bar. The pressure ratio is 4. The maximum temperature of the cycle is 560 °C. The efficiency of the compressor and turbine is 0.83 and 0.85 respectively. Find the overall efficiency, if the regenerator effectiveness is 0.75. 7M

**UNIT – II**

3. (a) Explain Thrust, Thrust Power, efficiency and Thermal efficiency of Turbo Jet. 7M  
(b) What is the need for thermal jet engines and write its applications? 7M

**(OR)**

4. In a jet propulsion cycle air enters the compressor at 1 bar, 15 °C. The pressure leaving the compressor is 5 bar and the maximum temperature is 900 °C. The air expands in the turbine to such a pressure that the turbine work is just equal to the compressor work. On leaving the turbine, the air expands in a reversible adiabatic process in a nozzle to 1 bar. Calculate the velocity leaving the nozzle. Take  $C_p=1.0035$  and  $\gamma = 1.4$  for compressor and expansion processes. 14M

**UNIT – III**

5. Describe with a sketch & turbojet engine and explain its thermodynamic cycle. 14M

**(OR)**

6. With the aid of the schematic diagram and thermodynamic cycle, explain the working of a turbo prop engine. 14M

**UNIT – IV**

7. (a) With the help of neat sketch explain the working of Ram-jet Engine? 7M  
(b) Write the Comparison between Ram-jet engine and Pulse jet engine. 7M

**(OR)**

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

**UNIT-V**

9. (a) What are the requirements of an ideal Rocket propellant and applications of Rockets? 7M  
(b) Explain different types of propellants used in solid propellant rockets. 7M

**(OR)**

10. (a) What are the important properties of a good propellant? 7M  
(b) What Is Rocket Staging? Explain about the Different Purposes of Each Rocket Stage. 7M



**K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA**  
**B. Tech. VI Semester (R18) Supplementary Examinations of February – 2022**  
***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) Explain What are the main components of an embedded system? 7M  
(b) Explain what are the Design challenges in embedded systems? 7M

**(OR)**

2. (a) Explain the basic processors and hardware units in the embedded system? 7M  
(b) Write the types of timers and explain any two types of timers? 7M

**UNIT – II**

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

**(OR)**

4. (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

**UNIT – III**

5. (a) Explain in brief about the following. a) FSM b) FSMD c) HCFSM and state charts? 7M  
(b) Write the steps involved in describing a system's behavior as a state Machine? 7M

**(OR)**

6. (a) Explain the Synchronization among process with examples? 7M  
(b) Write a brief note on concurrent process model and communication among the process? 7M

**UNIT – IV**

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

**(OR)**

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

**UNIT-V**

9. (a) Define Kernel? Explain about Architecture of the Kernel? 7M  
(b) What is semaphore? Mention its uses? Explain types of semaphores? 7M

**(OR)**

10. (a) What is Task scheduler? Explain interrupt service routines? 7M  
(b) What are the task states? Draw the state diagram of task? 7M

**K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA**  
**B. Tech. VI Semester (R18) Supplementary Examinations of February – 2022**  
***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) Derive the expression for the Quantization error. **7M**  
(b) Explain about the noise in PCM systems. **7M**

**(OR)**

2. (a) Explain in detail about sampling theorem. **7M**  
(b) Explain the comparison between TDM and FDM **7M**

**UNIT – II**

3. (a) Explain duobinary signal scheme with the help of diagram **7M**  
(b) Explain M-ary signaling scheme. Give comparison between binary Vs M-ary signaling schemes **7M**

**(OR)**

4. (a) Define eye diagram. Draw the eye diagram for FSK. **7M**  
(b) Explain the Nyquist's criterion for distortion less binary data. **7M**

**UNIT – III**

5. (a) Explain the geometric representation of digital signals **7M**  
(b) Give a comparison between FSK and PSK schemes. **7M**

**(OR)**

6. (a) Compare the difference between digital modulation schemes and M-ary signaling schemes **7M**  
(b) Explain the Gram-Schmidt orthogonal procedure for band pass data transmission **7M**

**UNIT – IV**

7. (a) Define joint and conditional entropies. Obtain the relation between them. **7M**  
(b) Define the following: **7M**  
i) Shannon's Source Coding Theorem ii) Channel Capacity

**(OR)**

8. (a) Explain about Huffman coding. **7M**  
(b) Explain the tradeoff between bandwidth and signal to noise ratio. **7M**

**UNIT-V**

9. (a) What is a convolutional code? How is it generated? **7M**  
(b) Write notes on syndrome decoding **7M**

**(OR)**

10. (a) Describe the algebraic structure of cyclic codes. **7M**  
(b) Derive the steps involved in generation of linear block codes **7M**

**K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA**  
**B. Tech. VI Semester (R18) Supplementary Examinations of February – 2022**  
***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) What is a cavity resonator? Explain the principle of operation of a rectangular cavity resonator? 7M  
(b) Discuss about TM waves propagation in rectangular wave guide with field components. 7M

**(OR)**

2. (a) Write the differences between rectangular and cylindrical cavity resonators. 7M  
(b) Discuss about Microwave frequency bands and their applications.

**UNIT – II**

3. (a) Describe operation of two cavity klystron amplifier with Applegate diagram. 7M  
(b) Describe the principle of operation and applications of phase shifter with sketches.

**(OR)**

4. (a) Draw the schematic diagram of travelling wave tube with its simplified circuit and explain about the amplification process. 7M  
(b) Write the principle and operation of magic tee and derive its scattering matrix. 7M

**UNIT – III**

5. (a) Differentiate between O type and M type tubes. 7M  
(b) What is Hull-voltage in a magnetron? Explain its significance. 7M

**(OR)**

6. (a) Write short notes on: 7M  
(i) Waveguide Irises.  
(ii) Rat Race hybrid.  
(iii) Dielectric phase shifters.  
(b) Explain how the amplification takes place in TWT. Compare its bandwidth with Klystron amplifier. 7M

**UNIT – IV**

7. (a) Draw the equivalent circuit of a parametric amplifier and explain its operation. 7M  
(b) Discuss the advantages and disadvantages of the parametric amplifier. 7M

**(OR)**

8. (a) Explain the principle of operation of TRAPATT diode with suitable diagram. 7M  
(b) Draw V-I characteristics of Gunn diode and explain its operation with a neat diagram. 7M

**UNIT-V**

9. (a) Explain the method of microwave power measurement using Bolometer. 7M  
(b) Draw the block diagram of network analyzer and explain the function of each block. 7M

**(OR)**

10. (a) Explain the measurement of 'Q' by Reflectometer method. 7M  
(b) Define : (i) VSWR meter. (ii) Bolometer. (iii) Calorimeter. (iv) Wave meter 7M

**K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA**  
**B. Tech. VI Semester (R18) Supplementary Examinations of February – 2022**  
***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) Draw and explain the block Diagram of Optical Fiber Communication System. 8M  
(b) List and explain the dis-advantages of Fiber Optic Transmission. 6M

**(OR)**

2. (a) In a step-index fiber in the ray approximation, the ray propagating along the axis of the fiber has the shortest route, while the ray incident at the critical angle has the longest route. Determine the difference in travel time (in ns/km) for the modes defined by those two rays for a fiber with  $n_{\text{core}} = 1.5$  and  $n_{\text{cladding}} = 1.485$ . 4M  
(b) List and explain the applications of Optical Fiber Communications. 6M  
(c) Define the Acceptance angle and Numerical Aperture. 4M

**UNIT – II**

3. (a) Discuss in detail the intermodal dispersion with relevant expressions and diagram. 7M  
(b) A continuous 12 km long optical fiber link has a loss of 1.5 dB/km. 7M  
i). What is the minimum optical power level that must be launched into the fiber to maintain as optical power level of  $0.3 \mu\text{W}$  at the receiving end?  
ii). What is the required input power if the fiber has a loss of 2.5 dB/km?

**(OR)**

4. (a) Describe the following: 9M  
i). Waveguide Dispersion (ii). Chromatic Dispersion (iii). Modal Dispersion  
(b) Explain the mechanical Properties of Fibers. 5M

**UNIT – III**

5. (a) With the help of a neat diagram explain the construction and working of a surface emitting LED. 7M  
(b) Compare LED with a LASER diode in all aspects. 7M

**(OR)**

6. (a) Draw and compare the construction and characteristics of PIN and Avalanche photo diode. 9M  
(b) For an alloy  $\text{In}_{0.74} \text{Ga}_{0.26} \text{As}_{0.57} \text{P}_{0.43}$  to be used in LED. Find the wavelength emitted by this source. 5M

**UNIT – IV**

7. (a) Explain the source output pattern in power launching from source to fiber. 7M  
(b) With the help of diagram, explain the 2x2 fiber coupler. 7M

**(OR)**

8. (a) Describe various fiber splicing techniques with their diagrams. 8M  
(b) Explain about laser diode-to-fiber coupling. 6M

**UNIT-V**

9. (a) Design as optical fiber link for transmitting 15 Mb/sec of data for a distance of 4 km with BER of  $10^{-9}$ . Assume necessary data. 8M  
(b) Explain the operational principles of WDM. 6M

**(OR)**

10. (a) Describe the dispersion measurement of fiber. 6M  
(b) With suitable diagram, explain optical receiver operation and its performance. 8M

**Q.P. Code: 1825401****SET - 2**

**K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA**  
**B. Tech. VI Sem. (R18) Regular Examinations of**  
***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)	7M
	(b)	7M
(OR)		
2.	(a)	7M
	(b)	7M
UNIT - II		
3.	(a)	7M
	(b)	7M
(OR)		
4.	(a)	7M
	(b)	7M
UNIT - III		
5.		14M
(OR)		
6.	(a)	7M
	(b)	7M
UNIT - IV		
7.	(a)	7M
	(b)	7M
(OR)		
8.	(a)	7M
	(b)	7M
UNIT-V		
9.	(a)	7M
	(b)	7M
(OR)		
10.	(a)	7M
	(b)	7M

**K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA**  
**B. Tech. VI Semester (R18) Supplementary Examinations of February – 2022**  
***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. Explain the design of IoT? 14M

**(OR)**

2. Explain in detail about various IoT levels 14M

**UNIT – II**

3. List and explain IoT applications used for Industries and Agriculture domain. 14M

**(OR)**

4. Explain the importance of IoT in medical sector 14M

**UNIT – III**

5. Explain about SDN and NFV for IoT? 14M

**(OR)**

6. Explain about IoT platform design and methodology 14M

**UNIT – IV**

7. Write a sample program for Arduino. 14M

**(OR)**

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

**UNIT-V**

9. Explain the basic building blocks of an IOT device 14M

**(OR)**

10. Explain the Programming Raspberry Pi with Python 14M

**K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA**  
**B. Tech. VI Semester (R18) Supplementary Examinations of February – 2022**  
***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? Discuss in detail about the steps in knowledge discovery in data bases. **7M**  
 (b) Explain in detail about different techniques used in Data Mining. **7M**  
 (OR)  
 2. (a) Describe in detail about the various applications of data mining. **7M**  
 (b) How Data Mining system can be classified? Explain in detail. **7M**

**UNIT – II**

3. (a) Discuss the following in detail with suitable illustration. **14M**  
 (i) Discretization and concept hierarchy generation.  
 (ii) Data Transformation.  
 (OR)  
 4. (a) Discuss in detail about data integrity preprocessing with suitable illustration. **7M**  
 (b) Explain in detail about the various data transformation techniques with examples. **7M**

**UNIT – III**

5. (a) Discuss about constraint based association rule mining with examples and state how association mining to correlation analysis is dealt with. **14M**  
 (OR)  
 6. (a) A database has five transactions. Let min-support = 60% and min- confidence = 80%. Find all frequent item sets by using Apriori Algorithm. **7M**

<b>T_ID</b>	<b>ITEMS BROUGHT</b>
T100	{M, O, N, K, E, Y }
T200	{D, O, N, K, E, Y }
T300	{M, A, K, E }
T400	{M, U, C, K, Y }
T500	{C, O, O, K, I, E }

- (b) Write and explain the algorithm for mining frequent item sets without candidate generation. **7M**

**UNIT – IV**

7. (a) Demonstrate how Bayesian classification helps in predicting class membership probabilities. **14M**

**(OR)**

8. (a) Explain the algorithm for constructing a decision tree from training samples. **14M**

**UNIT-V**

9. (a) Discuss the following clustering algorithm using examples : **14M**  
 (i) K-means.  
 (ii) K-medoid.

**(OR)**

10. (a) Discuss the different types of data in cluster analysis methods in detail. **7M**  
 (b) Discuss in detail about the various detection techniques in outlier. **7M**

**K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA**  
**B. Tech. VI Semester (R18) Supplementary Examinations of February – 2022**  
***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. Describe A Production System and Explain the Characteristics of a Production System? 14M

**(OR)**

2. With a neat sketch differentiate different search Algorithms used in AI with examples? 14M

**UNIT – II**

3. Describe: 14M  
(i) Relational Knowledge (ii) inheritable Knowledge  
(iii) inferential Knowledge (iv) Procedural Knowledge

**(OR)**

4. (a) Explain Propositional Resolution? 7M  
(b) Demonstrate Algorithm Unify (L1, L2)? 7M

**UNIT – III**

5. (a) Describe Monolithic Reasoning with Examples? 7M  
(b) Describe Non-Monolithic Reasoning with Examples? 7M

**(OR)**

6. Explain the Implementation of Bayesian Networks with Facts? 14M

**UNIT – IV**

7. (a) Distinguish between SETS and INSTANCES with Examples? 7M  
(b) Describe Strong slots and Filler Structures with Examples? 7M

**(OR)**

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

**UNIT-V**

9. (a) Describe Hierarchical Planning in detail? 7M  
(b) Write a brief note on depth-first and depth limited procedure? 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) Supplementary Examinations of February – 2022**  
***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) Discuss the Text view control with example. 7M  
b) Elaborate the Android Manifest file 7M

**OR**

2. a) Describe the Android Installation procedure in detail. 7M  
b) Explain the Understanding Anatomy of Android Application. 7M

**UNIT-II**

3. a) Discuss the Role of Android Application Components. 7M  
b) Give a brief note on Android Project Files. 7M

**OR**

4. a) Discuss the procedure of the Drawing and Working with Animation. 7M  
b) Elaborate the Choosing Mutually Exclusive Items Using Radio Buttons. 7M

**UNIT-III**

5. a) Describe the Switching States with Toggle Buttons. 7M  
b) Explain the Displaying Progress with Progress Bar. 7M

**OR**

6. a) Give a brief note on Adapting to Screen orientation. 7M  
b) Explain the table layout with example. 7M

**UNIT-IV**

7. a) How to create an image gallery using the view pager control? Discuss 7M  
b) Discuss the application to add two fragments. 7M

**OR**

8. a) Explain the Dalvik Debug Monitor Service. 7M  
b) Illustrate the Debug Perspective. 7M

**UNIT-V**

9. a) Discuss the Creating Menus Through XML. 7M  
b) Difference between action bar and toolbar in Android 7M

**OR**

10. a) Explain the Creating a Drop-Down List Action Bar. 7M  
b) Describe the accessing databases with the ADB. 7M

**K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA**  
**B. Tech. VI Semester (R18) Supplementary Examinations of February – 2022**  
***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) With neat sketch explain the formation of depletion region in an open-circuited PN junction. 7M  
(b) Explain the operation of Full Wave Rectifier with necessary diagrams. 7M

**(OR)**

2. (a) Draw and explain the V-I characteristics of a Zener diode. What are the two breakdown mechanisms in a Zener diode? 7M  
(b) Describe the operation and characteristics of photodiode. 7M

**UNIT – II**

3. (a) Explain the construction and operation of NPN Transistor with neat sketch. 7M  
(b) Explain about input and output characteristics of a transistor when it is connected in common collector configuration. 7M

**(OR)**

4. (a) What is Biasing? Explain the need of it. List out different types of biasing methods. 7M  
(b) With the help of neat circuit diagram explain the single stage CE amplifier 7M

**UNIT – III**

5. (a) Explain construction of P-channel JFET with neat diagram and symbol. 7M  
(b) Explain drain-source characteristics and transfer characteristics of JFET. 7M

**(OR)**

6. (a) Discuss about JFET CG configuration and sketch its related characteristics 7M  
(b) Explain how JFET can be used as switch 7M

**UNIT – IV**

7. (a) Classify the different types of thermocouples and explain the basic working principle of thermocouple 7M  
(b) What is the necessity of strain gauge calibration? Explain the method of Strain gauge calibration 7M

**(OR)**

8. (a) Explain the working of Piezoelectric Transducer and List the advantages, disadvantages and applications. 7M  
(b) Explain the working and principle of an LVDT. Also draw the graph showing variations in amplitude and phase of the output with displacement. 7M

**UNIT-V**

9. (a) Describe the working operation of Theodolite and mention its types. 7M  
(b) Explain the construction and operation of optical square. 7M

**(OR)**

10. (a) Explain different types of level measurements. 7M  
(b) Elucidate Efflux cup viscometers, rotational viscometer with related diagrams 7M

**K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA**  
**B. Tech. VI Semester (R18) Supplementary Examinations of February – 2022**  
**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) What is the need for organization structure? State differences between formal and informal organization structures. 7M  
(b) Define Management. Explain the functions of management with a neat diagram. 7M  
(OR)
2. (a) Explain Fayol's principles of management. 7M  
(b) Define authority and Responsibility. What is the relation between them? 7M

**UNIT – II**

3. (a) What is Plant Location? Discuss the steps taken in choosing a Plant location. 7M  
(b) Discuss how the Strategic alternative choices are formulated. 7M  
(OR)
4. (a) Differentiate between Product and Process Layouts. Also discuss the significance of these layouts. 7M  
(b) Discuss different levels of strategy and explain the importance of strategy in making strategic decisions at different levels. 7M

**UNIT – III**

5. (a) What do you understand by Inventory Control? Mention its main objectives. 7M  
(b) What is meant by Human Resource Management? Discuss the objectives and core elements of Human Resource Management. 7M  
(OR)
6. (a) Define Manpower planning. How can it be made effective? 7M  
(b) Write about the following: 7M  
(i) ABC analysis  
(ii) Purchase procedure

**UNIT – IV**

7. (a) Discuss the various work measurement methods. 7M  
(b) Briefly explain the importance of Control charts. Also state the control charts for variables with diagrams. 7M

**(OR)**

8. (a) Write a note on the following: 7M  
(i) Job Production  
(ii) Mass Production  
(b) Explain in detail about Acceptance Sampling. 7M

**UNIT-V**

9. (a) Discuss the need for performance management in organizations. 7M  
(b) Write in detail about Business Process Re-engineering. 7M

**(OR)**

10. (a) What is the importance of Balanced Score Card in Performance management? Explain in detail about 360 Degree performance appraisal. 7M  
(b) Briefly write an essay on JIT and ERP. 7M

**K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA**  
**B. Tech. VI Semester (R18) Supplementary Examinations of February – 2022**  
***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) What is Management? Explain Fayol's principles of management. **7M**  
(b) Explain in detail about procedure of Taylor Scientific Management theory. **7M**

**(OR)**

2. (a) What is an Organization? Explain the important principles of organizing. **7M**  
(b) Define Motivation. Explain about Theory X and Theory Y. **7M**

**UNIT – II**

3. (a) Explain the importance of SWOT analysis and its uses. **7M**  
(b) Discuss the essential steps in Corporate Planning. **7M**

**(OR)**

4. (a) Identify the factors that are to be diagnosed in the external environment for Strategy formulation. **7M**  
(b) Describe the various factors that are necessary for Plant Location. **7M**

**UNIT – III**

5. (a) A company uses every month 1,500 units of a component costing Rs. 1.20 each. Each purchase order costs Rs. 50 and the inventory carrying cost is 6% per year of the average inventory. Find EOQ. **7M**  
(b) What is the process of Manpower Planning before a factory is commissioned and for an on- going enterprise? **7M**

**(OR)**

6. (a) Define Job Evaluation. Discuss the significance of Job Evaluation. **7M**  
(b) Discuss the classification of ABC analysis in Inventory Management. **7M**

**UNIT – IV**

7. (a) What is work study and explain its benefits. **7M**  
(b) What do you understand by Inventory Control? Mention its main objectives. **7M**

**(OR)**

8. (a) What is Statistical Quality Control? What are its advantages? **7M**  
(b) Explain the concept of Acceptance Sampling. **7M**

**UNIT-V**

9. (a) What you understand by network analysis. How would you compare PERT with CPM? **7M**  
(b) Briefly explain the following in relation to network analysis: **7M**  
(i) Crashing  
(ii) Resource allocation

**(OR)**

10. (a) What do you mean by crashing a Network? State the step by step procedure of Crashing. **7M**

- (b) Draw the PERT network for the following activities and determine the probability of completing the project in 48 days. **7M**

<b>Jobs</b>	<b>Optimistic time (to)</b>	<b>Most likely (tm)</b>	<b>Pessimistic time (tp)</b>
1-2	5	8	1
1-3	1	3	5
2-4	4	6	7
3-4	3	7	9
4-5	10	20	30
4-6	14	18	23
4-7	3	6	10
5-7	5	9	12
6-8	1	4	6
7-8	2	5	9