



# LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING (AUTONOMOUS)

L.B. Reddy Nagar :: Ylavaram-521 230 :: Krishna Dist. :: A.P  
Approved by AICTE, New Delhi. Affiliated to JNTUK, Kakinada

## B.Tech.(VII-Semester) (R14) Supplementary Examinations, August 2021

### TIME TABLE

TIME :02.00 PM to 05.00 PM

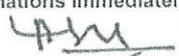
A.Y. 2020-21

DATE	ASE	CE	CSE	ECE	EEE	EIE	IT	ME
03-08-2021 (Tuesday)	S405-Theory of Vibrations	S244-Estimation and Quantity Surveying	S177-Data Mining and Data Warehousing	S314-Microwave Engineering	S346-Power System Operation and Control	S313-Microprocessors and Microcontrollers	S175-Cryptography and Network Security	S250-Finite Element Method
04-08-2021 (Wednesday)	S154-CAD/CAM S289 - Linear Control Systems	S348-Prestressed Concrete Structures	S316-Mobile Computing	S330-Optical Communications	S385-Solid State Drives	S419-VLSI Design	S157-Cloud Computing	S154-CAD/CAM
05-08-2021 (Thursday)	S275-Instrumentation, Measurements and Experiments in Fluids	S184-Design of Reinforced Concrete Structures – II	S186-Design Patterns	S155-Cellular and Mobile Communications	S347-Power System Protection	S148-Bio Medical Instrumentation	S186-Design Patterns	S367-Refrigeration and Air Conditioning
06-08-2021 (Friday)	S281-Introduction to Computational Fluid Dynamics	S172-Construction Management	S153-C# and .NET Programming	S356 - Programmable Logic Devices S318 - Nano Electronics S193- Digital Signal Processors	S218-Electrical Power Quality S379 – Smart Grid S188-Digital Control Systems	S340-PLC and SCADA	S130-Android Application Development	S310-Metrology and Instrumentation
07-08-2021 (Saturday)	S124 - Airframe Repair and Maintenance S358 – Propellant Technology S387 - Space Mechanics	S432-Environmental Pollution Control	S205-E-Commerce	S168-Computer Networks S322 - Neural Networks and Fuzzy Logic	S168-Computer Networks S295-Managerial Economics and Financial Analysis S324-Object Oriented Programming through C++	S344-Power Plant Instrumentation	S382-Software Project Management	S138-Automation in Manufacturing S231-Energy Conservation and Management
09-08-2021 (Monday)	S329-Operations Research	S369-Remote Sensing and Geographical Information System	S270-Industrial Management	S270-Industrial Management	S270-Industrial Management	S319-Nano Technology S270- Industrial Management	S395-Supply Chain Management	S370-Renewable Energy Sources S357- Project Management

Note: Any omissions or clashes in the time table may please be informed to the Controller of Examinations immediately.

Date: 20-07-2021

Copy to: 1. Vice-Principal, Deans & HoDs 2. Transport in-charge & Librarian  
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CONTROLLER OF EXAMINATIONS

  
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**LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING  
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L.B. Reddy Nagar :: Mylavaram – 521 230 :: Krishna Dist.:: A.P.

B.Tech. (VII Semester) Regular/Supplementary Examinations

**S329-OPERATIONS RESEARCH**

(ASE)

Time : 3 hours

Max. Marks : 75

**PART-A**

(Compulsory question)

Q.No	Questions	Marks																									
1(a)	Write the role of pivot or key element in a simplex table.	1M																									
(b)	Which method gives the best initial solution in transportation problem?	1M																									
(c)	What is carrying or holding cost?	1M																									
(d)	What are performance measures of a queuing system?	1M																									
(e)	What is meant by Decision variable?	1M																									
(f)	Write a historical note in brief about Operation Research.	2M																									
(g)	Write short note on travelling salesman problem.	2M																									
(h)	What is meant by fair game?	2M																									
(i)	Write about the static Queuing Disciplines.	2M																									
(j)	State Bellman's principle of optimality.	2M																									
<b>PART-B</b>																											
(Answer any FOUR questions. All questions carry equal marks)																											
2(a)	Explain the step-by-step procedure for a simplex method.	7M																									
(b)	Use the graphical method to solve Maximize $Z = 6x_1 + 8x_2$ subjected to $5x_1 + 10x_2 \leq 60$ , $4x_1 + 4x_2 \leq 40$ , and $x_1, x_2 \geq 0$ .	8M																									
3(a)	Solve the travelling salesman problem given by the following data	7M																									
	<table border="1" style="width: 100%; text-align: center;"> <thead> <tr> <th></th> <th>A</th> <th>B</th> <th>C</th> <th>D</th> </tr> </thead> <tbody> <tr> <th>A</th> <td><math>\infty</math></td> <td>30</td> <td>80</td> <td>50</td> </tr> <tr> <th>B</th> <td>40</td> <td><math>\infty</math></td> <td>140</td> <td>30</td> </tr> <tr> <th>C</th> <td>40</td> <td>50</td> <td><math>\infty</math></td> <td>20</td> </tr> <tr> <th>D</th> <td>70</td> <td>80</td> <td>130</td> <td><math>\infty</math></td> </tr> </tbody> </table>			A	B	C	D	A	$\infty$	30	80	50	B	40	$\infty$	140	30	C	40	50	$\infty$	20	D	70	80	130	$\infty$
	A		B	C	D																						
A	$\infty$		30	80	50																						
B	40		$\infty$	140	30																						
C	40	50	$\infty$	20																							
D	70	80	130	$\infty$																							
(b)	Explain variation of the assignment problem.	8M																									
4(a)	Explain the theory of dominance in the solution of rectangular games.	7M																									
(b)	Use graphical method in solving the following game and find the value of the game	8M																									
	<table border="1" style="width: 100%; text-align: center;"> <thead> <tr> <th colspan="2"></th> <th colspan="4">Player B</th> </tr> <tr> <th>Player A</th> <th></th> <th>B1</th> <th>B2</th> <th>B3</th> <th>B4</th> </tr> </thead> <tbody> <tr> <th>A1</th> <td></td> <td>2</td> <td>2</td> <td>3</td> <td>-2</td> </tr> <tr> <th>A2</th> <td></td> <td>4</td> <td>3</td> <td>2</td> <td>6</td> </tr> </tbody> </table>				Player B				Player A		B1	B2	B3	B4	A1		2	2	3	-2	A2		4	3	2	6	
			Player B																								
Player A			B1	B2	B3	B4																					
A1		2	2	3	-2																						
A2		4	3	2	6																						
5(a)	The cost of a machine is Rs.6, 100 and its scrap value is Rs 100. The maintenance costs found from experience are as following. When should the machine be replaced?	7M																									
	<table border="1" style="width: 100%; text-align: center;"> <thead> <tr> <th>Years</th> <th>1</th> <th>2</th> <th>3</th> <th>4</th> <th>5</th> <th>6</th> <th>7</th> <th>8</th> </tr> </thead> <tbody> <tr> <th>Maintenance Cost(Rs.)</th> <td>100</td> <td>250</td> <td>400</td> <td>600</td> <td>900</td> <td>1,200</td> <td>1,600</td> <td>2,000</td> </tr> </tbody> </table>		Years	1	2	3	4	5	6	7	8	Maintenance Cost(Rs.)	100	250	400	600	900	1,200	1,600	2,000							
Years	1	2	3	4	5	6	7	8																			
Maintenance Cost(Rs.)	100	250	400	600	900	1,200	1,600	2,000																			
(b)	Summarize the types of failures in Replacement.	8M																									
6(a)	By using dynamic programming find the values of $v_1, v_2$ and $v_3$ so as to Maximization ( $Z$ ) = $v_1 * v_2 * v_3$ subjected to the constraints $v_1 + v_2 + v_3 = 15$ and $v_1, v_2$ and $v_3 \geq 0$ .	7M																									
(b)	How Bellman's "principle of optimality" can be used to solve a multistage decision problem?	8M																									
7(a)	A company has a demand of 12000 units per year for an item and it can produce 2000 such items per month. The cost of one setup is Rs. 400 and the holding cost per unit per month is Rs. 0.15. Find the optimum lot size and the total cost per year, assuming the cost of 1 unit as Rs. 4. Also find the maximum inventory, manufacturing time and total time.	7M																									
(b)	What are inventory models? Enumerate various types of inventory models and describe them briefly.	8M																									
8(a)	Solve by using Big-M method the following LP problem Max. $Z = 3x_1 - x_2$ subjected to $2x_1 + x_2 \leq 2$ , $x_1 + 3x_2 \geq 3$ , $x_2 \leq 4$ and $x_1, x_2 \geq 0$ .	7M																									
(b)	Explain the procedure of Big-M method in LP problem.	8M																									

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B.Tech. (VII Semester) ~~Regular~~/Supplementary Examinations

**S281-INTRODUCTION TO COMPUTATIONAL FLUID DYNAMICS**

(ASE)

Time : 3 hours

Max. Marks : 75

**PART-A**

(Compulsory question)

Q.No	Questions	Marks	CO	BL
1(a)	State the significance of $\left(\frac{\partial}{\partial t}\right)$ in a substantial derivative.	1M	CO1	L1
(b)	Describe Discretization.	1M	CO2	L2
(c)	Express the first order forward difference representation for the derivative $\left(\frac{\partial u}{\partial x}\right)_{i,j}$	1M	CO3	L2
(d)	Quote the stability criteria for Navier-Stokes Equations.	1M	CO4	L1
(e)	Enumerate the possible boundary conditions for heat transfer through a plane wall.	1M	CO5	L2
(f)	Describe Convective Derivative.	2M	CO1	L2
(g)	Name any two methods for classifying the Partial Differential Equations.	2M	CO2	L1
(h)	Describe Difference Equation.	2M	CO3	L2
(i)	Express the x- and y-momentum equations for Incompressible Viscous flows.	2M	CO4	L2
(j)	Express the finite difference expression for Two-Dimensional unsteady state Conduction equation.	2M	CO5	L1
<b>PART-B</b>				
(Answer any FOUR questions. All questions carry equal marks)				
2(a)	Justify the Computational Fluid Dynamics as a design tool.	7M	CO1	L2
(b)	Describe various physical Boundary conditions used in CFD.	8M	CO1	L2
3(a)	Summarize the behavior of Parabolic Equations with one example.	7M	CO2	L4
(b)	Classify the following PDE using Cramer's rule. $(1 - M_\infty^2) \frac{\partial u'}{\partial x} + \frac{\partial v'}{\partial y} = 0$ and $\frac{\partial u'}{\partial y} - \frac{\partial v'}{\partial x} = 0$	8M	CO2	L3
4(a)	Differentiate between an Explicit and Implicit methods with their advantages and disadvantages.	7M	CO3	L2
(b)	Derive the difference equation for $\frac{\partial T}{\partial t} = \alpha \frac{\partial^2 T}{\partial x^2}$ , where $\alpha$ is constant with grid notation.	8M	CO3	L3

**S281-INTRODUCTION TO COMPUTATIONAL FLUID DYNAMICS**

5(a)	Summarize the numerical procedure for Pressure Correction method implementation in SIMPLE algorithm.	7M	CO4	L2
(b)	Consider the diffusion equation given by $\frac{\partial u}{\partial t} = \frac{\partial^2 u}{\partial x^2}$ ; Derive an implicit Crank- Nicolson formulation.	8M	CO4	L4
6.	Derive the two-dimensional transient heat conduction equation in rectangular coordinates in terms of finite differences with two-dimensional grid representation.	15M	CO5	L3
7(a)	Obtain Continuity, Momentum equations (in x-, y- and z-components) in conservative and non-conservative forms.	7M	CO1	L2
(b)	Describe the behavior of Elliptic Equations.	8M	CO2	L4
8(a)	Derive the Continuity Equation for an Inviscid flow on the basis of "an infinitesimally small element moving with the flow".	7M	CO1	L3
(b)	What is the significance of Integral and Differential forms of equations and discuss with examples?	8M	CO1	L2

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H.T.No

5 AUG 2021

R14

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B.Tech. (VII Semester) ~~Regular~~/Supplementary Examinations

**S275-INSTRUMENTATION, MEASUREMENTS AND EXPERIMENTS IN FLUIDS**

(ASE)

Time : 3 hours

Max. Marks : 75

**PART-A**

(Compulsory question)

Q.No	Questions	Marks	CO	BL
1 (a)	What types of forces are dominant in low speed wind tunnels?	1M	CO1	L1
(b)	List out materials used for oil flow visualization.	1M	CO2	L1
(c)	What is the use of temperature of coefficient of resistance in hot wire anemometer?	1M	CO3	L1
(d)	Define thermal equilibrium.	1M	CO3	L2
(e)	List some examples for uncertainty analysis.	1M	CO4	L1
(f)	How effective Reynolds number is important in wind tunnel?	2M	CO1	L1
(g)	Mention the use of convex lens in schlieren graph.	2M	CO2	L1
(h)	Write the expression for velocity by using pressure measurements.	2M	CO3	L1
(i)	Define seebeck effect in thermo couples.	2M	CO3	L2
(j)	Discuss about internal estimate errors.	2M	CO4	L2
<b>PART-B</b>				
(Answer any FOUR questions. All questions carry equal marks)				
2.	Examine the working procedure of strain gauge balance with suitable diagram.	15M	CO1	L3
3(a)	Analyze the importance of flow visualization in aerodynamic parameters calculation.	7M	CO2	L4
(b)	Enumerate the interferometry principle with neat diagram.	8M	CO2	L4
4(a)	Derive the Doppler shift equation by using incident beam frequency and scattered beam frequency.	8M	CO3	L3
(b)	Determine the Doppler shift caused by an air jet of average velocity 30 m/s. intercepting a helium neon ion laser beam of wave length 6328 angstrom and an angle of 2° with reference to the laser beam (consider refractive index value as n=1).	7M	CO3	L3
5.	Examine the working of manometer and classify the manometers.	15M	CO3	L3
6(a)	Highlight the process of multiplexing with an example.	7M	CO4	L4
(b)	Classify the types of estimation errors with suitable examples.	8M	CO4	L4
7(a)	Enumerate the working of low speed wind tunnels.	7M	CO1	L3
(b)	Highlight the importance of tuft flow visualization in measuring the separation point.	8M	CO2	L3
8(a)	Categorize the steps involved in data conversion.	7M	CO4	L4
(b)	Illustrate the working principle of Laser Doppler anemometer.	8M	CO3	L3

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B.Tech. (VII Semester) Regular/Supplementary Examinations

**S289-LINEAR CONTROL SYSTEMS**

(ASE)

Time : 3 hours

Max. Marks : 75

**PART-A**

(Compulsory question)

Q.No	Questions	Marks
1(a)	What are the two major types of control system?	1M
(b)	Write the standard test signals.	1M
(c)	What is resonant peak?	1M
(d)	Define Gain margin.	1M
(e)	What is diagonalization?	1M
(f)	What are the basic elements used in mechanical translational system?	2M
(g)	What is damped frequency oscillation?	2M
(h)	List the frequency domain specifications.	2M
(i)	What are asymptotes? How will you find the angle of asymptotes?	2M
(j)	Define observability.	2M

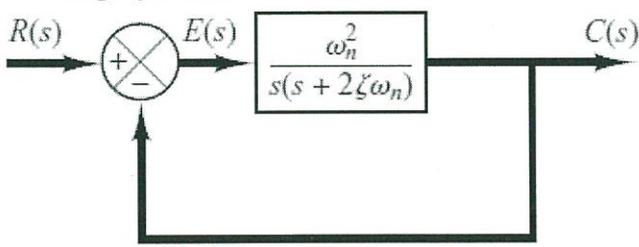
**PART-B**

(Answer any FOUR questions. All questions carry equal marks)

2(a)	Explain the concept of open loop and closed loop systems with example.	7M
(b)	Find the transfer function for the given block diagram.	8M

3.	Analyze the given first order system and obtain the response using standard input test signals. The initial conditions are assumed to be zero. $\frac{C(s)}{R(s)} = \frac{1}{Ts + 1}$	15M
4.	Draw the Bode plot for the following transfer function. $H(S) = 10 \frac{S + 10}{S^2 + 3S}$	15M

**S289-LINEAR CONTROL SYSTEMS**

5(a)	Explain Zeigler-Nichols rules for tuning PID controllers.	7M
(b)	Determine the range of K for stability of the system using RH criteria represented by closed-loop transfer function. $\frac{C(S)}{C(S)} = \frac{K}{s(s^2 + s + 1)(s + 2) + K}$	8M
6(a)	Construct the state space representation of following equation of motion. $m \ddot{h} + S \ddot{\alpha} + k_h h = -L$ $S \ddot{h} + I_\alpha \ddot{\alpha} + k_\alpha \alpha = M$	8M
(b)	Write the properties of state transition matrix.	7M
7.	Draw the Bode plot for the following transfer function $H(S) = 100 \frac{(S + 1)}{(S + 10)(S + 100)}$	15M
8(a)	Consider the following system  <p>Where <math>\zeta = 0.6</math> and <math>\omega_n = 5</math> rad/sec. Obtain the rise time, peak time, maximum overshoot and settling time with unit-step input.</p>	8M
(b)	Explain the concept of controllability and observability.	7M

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H.T.No

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B.Tech. (VII Semester) ~~Regular~~/Supplementary Examinations

**S154-CAD/CAM**  
(AE&ME)

Time : 3 hours

Max. Marks : 75

**PART-A**

(Compulsory question)

Q.No	Questions	Marks	CO	BL
1(a)	List any two applications of computers in engineering design.	1M	CO1	L1
(b)	Give the parametric representation that represents a cone.	1M	CO2	L1
(c)	List any two limitations of automation.	1M	CO3	L1
(d)	Define FMS.	1M	CO4	L1
(e)	List any two objectives of computer-aided quality control.	1M	CO5	L1
(f)	Differentiate Relational and Network database.	2M	CO1	L1
(g)	List any two advantages of implicit representation over parametric representation.	2M	CO2	L1
(h)	Differentiate Fixed and Flexible automation.	2M	CO3	L1
(i)	Explain Design rationalization in the context of Group Technology.	2M	CO4	L1
(j)	List any 4 benefits of CIM.	2M	CO5	L1

**PART-B**

(Answer any FOUR questions. All questions carry equal marks)

2(a)	Explain the computer assisted design process.	7M	CO1	L2
(b)	A triangular lamina has corners PQR. The coordinates of the points P, Q, R are (20, 20), (40, 25), (30,40) respectively. The lamina is rotated about P through 30 degrees in the clockwise direction. Calculate the new coordinates of the triangle.	8M	CO1	L4
3(a)	Differentiate B-rep and CSG solid modelling techniques.	7M	CO2	L3
(b)	Draw a Bezier spline for the following control points (0,0),(4,3) ,(2,4) & ,(12,0).	8M	CO2	L4
4(a)	Describe different types of statements used in APT language.	7M	CO3	L2
(b)	Explain the open-loop and closed-loop feedback system in NC system.	8M	CO3	L2
5(a)	Explain the methods of Parts classification and coding systems.	7M	CO4	L2
(b)	List different FMS Layout configurations and suitable material handling systems with suitable sketches.	8M	CO4	L2
6(a)	Explain the working principle of CNC-CMM with a neat sketch.	7M	CO5	L2
(b)	Discuss the principal elements of CIM systems.	8M	CO5	L2
7(a)	Explain the concept of Homogeneous representation its general mapping to other transformation matrices.	7M	CO1	L2
(b)	Derive the expression for 4-point form of Hermite cubic spline.	8M	CO2	L3
8(a)	List the elements of the NC system.	7M	CO3	L1
(b)	Explain the Flexible inspection system with suitable sketch.	8M	CO4	L2

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B.Tech. VII Semester ~~Regular~~/Supplementary Examinations

**S405-THEORY OF VIBRATIONS**

(AE)

Time : 3 hours

Max. Marks : 75

**PART-A**

(Compulsory question)

- 1(a) What is Free Vibration? Give one example. [1M]
- (b) Why dampers are used in mechanical systems? [1M]
- (c) Draw vector representation of forced vibration with damping. [1M]
- (d) State langrange's equation in generalized coordinates. [1M]
- (e) What are influence coefficient? [1M]
- (f) Write equation of motion for simple vibration system. [2M]
- (g) Draw the displacement versus time graph of over-damped and under-damped system. [2M]
- (h) Total response of system is under harmonic force. [2M]
- (i) Differential between vibration isolation and vibration absorber. [2M]
- (j) What is matrix method? [2M]

**PART-B**

(Answer any FOUR questions. All questions carry equal marks)

- 2(a) Derive the expression of equivalent stiffness of spring constant when  
a) spring are in parallel b) springs are in series. [7M]
- (b) Find the natural frequency of the system in figure-1

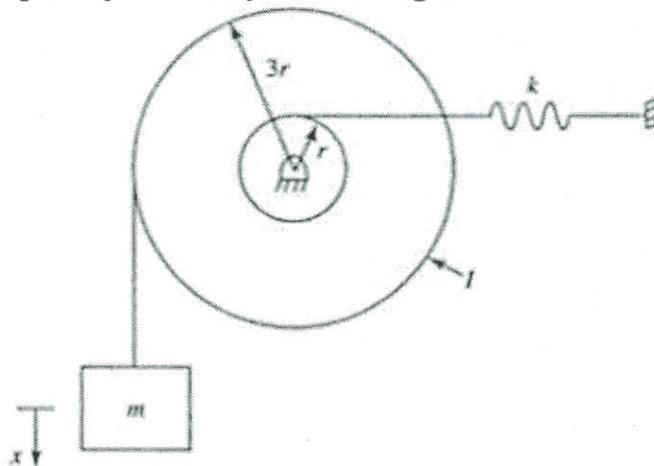


Fig.1

[8M]

- 3(a) Derive an expression for logarithmic decrement for under-damped system. [7M]
- (b) A gun barrel having mass 560 kg is designed with the following data  
initial recoil velocity 36 m/sec, recoil distance on firing 1.5 m.  
Calculate i) spring constant  
ii) damping coefficient  
iii) time required for the barrel to return to a position .12 m  
from its initial position [8M]
- 4(a) Discuss in detail about vibration measuring instrument  
"Accelerometer". [7M]

**S405-THEORY OF VIBRATIONS**

- (b) A machine having a mass of 100 kg and supported on spring of total stiffness  $7.84 \times 10^5$  N/m has a un unbalanced rotating element which results in disturbing force of 392 N at a speed of 3000 rpm. Assuming a damping factor equals to 0.20.

- (i) Determine amplitude of motion due to unbalance,  
 (ii) Transmissibility.

[8M]

- 5(a) Find the natural frequencies of the system in generalized form as shown in figure-2. Assume there is no slip between cord and cylinder.

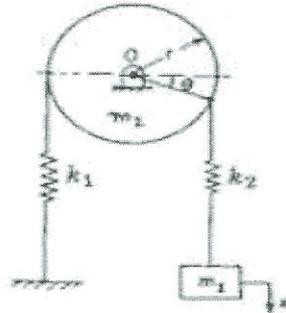


Fig.2

[7M]

- (b) In the above question (figure 2), if  $k_1 = 40$  N/m,  $k_2 = 60$  N/m,  $m_1 = 2$  kg and  $m_2 = 10$  kg, then calculate its Natural frequency.

[8M]

- 6(a) Explain matrix iteration method.

[7M]

- (b) Find the lowest natural frequency of the system by Rayleigh's method  $E = 1.96 \times 10^{11}$  N/m<sup>2</sup>,  $I = 4 \times 10^{-7}$  m<sup>4</sup> in figure 3

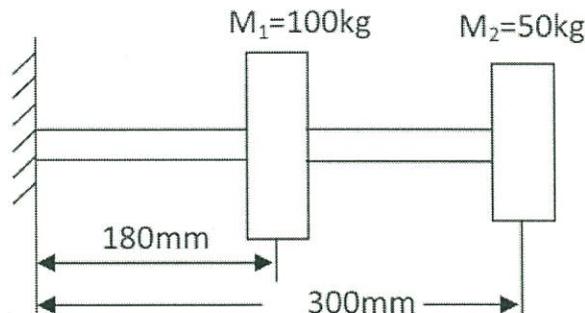


Fig.3

[8M]

- 7(a) Discuss about 'Viscous damping' in detail.

[7M]

- (b) Prove that logarithmic decrement is given by  $\frac{2\pi\epsilon}{\sqrt{1-\epsilon^2}}$ .

[8M]

- 8(a) A circular cylinder of mass 4 kg and radius 15 cm is connected by a spring of stiffness 4000 N/m. it is free to roll without slipping determine its natural frequency.

[7M]

- (b) Write a short note on  
 i) Damped and undamped vibration  
 ii) Torsional vibration  
 iii) A vibratory system  
 iv) Periodic motion versus harmonic motion

[8M]

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B.Tech. VII Semester ~~Regular~~/Supplementary Examinations

**S184-DESIGN OF REINFORCED CONCRETE STRUCTURES-II**

(CE)

Time : 3 hours

Max. Marks : 75

**PART-A**

(Compulsory question)

- |      |  |      |
|------|--|------|
| 1(a) | State one-way footing and two-way footing in foundation.                       | [1M] |
| (b)  | Define Yield Line Theory.  | [1M] |
| (c)  | What are the structural components of the staircases?                          | [1M] |
| (d)  | List out the different types of Retaining Walls.                               | [1M] |
| (e)  | Describe Hoop stress.  | [1M] |
| (f)  | What are the causes of failure of foundation?                                  | [2M] |
| (g)  | Distinguish between one way shear and punching shear in flat slabs.            | [2M] |
| (h)  | What is the minimum rise and tread in residential buildings?                   | [2M] |
| (i)  | Name the two important stability aspects.                                      | [2M] |
| (j)  | Mention the grade of concrete which is used in the construction of water tank. | [2M] |

**PART-B**

(Answer any FOUR questions. All questions carry equal marks)

- |    |  |       |
|----|--|-------|
| 2. | Design a suitable footing for a reinforcement concrete column of size 300 mm x 500 mm supporting a factored axial load of 1500kN. Assume the safe bearing capacity of the soil as 200kN/m <sup>2</sup> . Adopt M-25 grade concrete and Fe-415 HYSD bars. Sketch the details of reinforcements in the footing.  | [15M] |
| 3. | Design a simply supported square slab of 4.5m side length to support a service live load of 4kN/m <sup>2</sup> . adopt M20 grade concrete and Fe415 steel. Assume load factor according to IS: 456-2000.   | [15M] |
| 4. | Design a dog legged stairs for an office building in a room measuring 2.8mx5.8m clear. Vertical distance between the floors is 3.6m. width of flight is to be 1.25m allow a live load of 3kN/m <sup>2</sup> . Sketch the details of the reinforcements. Use M20 concrete and Fe415 steel. Assume the stairs are supported on 230mm walls at the end of outer edges of landing slabs. | [15M] |
| 5. | Design the stem of a cantilever retaining wall to retain an earth embankment 4m high above ground level. The density of earth is 10kN/m <sup>2</sup> and angle of repose is 30 degree. The embankment is horizontal at top. Adopt M20 grade concrete and Fe415 HYSD bars.  | [15M] |
| 6. | A reinforced concrete water tank resting on ground is 6mx2m with a maximum depth 2.5m. Using M20 concrete and grade I steel design the tank walls.   | [15M] |
| 7. | Design the interior panel of a flat slab with drops for an office floor to suit the following data: Size of office floor=25mx25m Size of panels=5mx5m Loading class=4kN/m <sup>2</sup> Materials: M20 grade concrete Fe415 steel.  | [15M] |
| 8. | Design a combined footing for the two columns of a multistory building. The columns of size 400mmx400mm transmit a working load of 800kN each and they are spaced at 5m centers. The safe bearing capacity of soil at site is 200kN/m <sup>2</sup> . Adopt M20 grade concrete and Fe415. Sketch the details of reinforcements in the footing.  | [15M] |

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**LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING  
(AUTONOMOUS)**

L.B. Reddy Nagar :: Mylavaram – 521 230 :: Krishna Dist.: A.P.

B.Tech. (VII Semester) Supplementary Examinations

**S270-INDUSTRIAL MANAGEMENT**

(CSE, ECE, EEE, EIE)

Time : 3 hours

Max. Marks : 75

**PART-A**

(Compulsory question)

Q.No	Questions	Marks
1(a)	Henri fayol laid down how many principles.	1M
(b)	Sketch process layout.	1M
(c)	Explain the use of p-charts and c-charts.	1M
(d)	List out the features of HRM.	1M
(e)	Explain the concept of CPM.	1M
(f)	What is Management?	2M
(g)	Expalin the advantages of funtional layout.	2M
(h)	Define the term Re-order point.	2M
(i)	What is meant by separation?	2M
(j)	Explain freefloat.	2M

**PART-B**

(Answer any FOUR questions. All questions carry equal marks)

2(a)	Mention different needs as identified by Abraham Maslow. Give an example for each.	8M
(b)	What are the assumptions of Douglas McGregor about the behavior of managers?	7M
3(a)	What do you understand by Plant Layout?	7M
(b)	Explain any three types of Plant Layouts.	8M
4.	Explain the purchase procedure followed in store management.	15M
5(a)	What do you mean by manpower planning?	8M
(b)	Enumerate steps involved in manpower planning.	7M
6.	Distinguish between PERT and CPM.	15M
7(a)	Explain Herzberg's Two-Factor Theory of Motivation.	8M
(b)	Draw line and staff organizational structure and give its advantages, limitations and applications.	7M
8(a)	What are the objectives of plant layout?	8M
(b)	Explain the factors influencing plant layout.	7M

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B.Tech. VII Semester ~~Regular~~/Supplementary Examinations

**S205-E-COMMERCE**

(CSE)

Time : 3 hours

Max. Marks:75

**PART-A**

(Compulsory question)

- |      |  |      |
|------|--|------|
| 1(a) | What are the E-Commerce Goals of Company?            | [1M] |
| (b)  | What is MIME based EDI?                              | [1M] |
| (c)  | List the Host Security Considerations.               | [1M] |
| (d)  | List Various security Tools.                         | [1M] |
| (e)  | How “marketing” plays a vital role in advertising?   | [1M] |
| (f)  | What are the pressures that influence the business?  | [2M] |
| (g)  | Discuss any two components of International Trade.   | [2M] |
| (h)  | List any four benefits of Proxies.                   | [2M] |
| (i)  | How E-Cheques are different from Digital Signatures? | [2M] |
| (j)  | Discuss the economics of EP.                         | [2M] |

**PART-B**

(Answer any FOUR questions. All questions carry equal marks)

- |      |   |       |
|------|---|-------|
| 2(a) | Compare and contrast Electronic commerce with traditional commerce.   | [8M]  |
| (b)  | Identify the benefits of E-Commerce.  | [7M]  |
| 3(a) | Identify the costs associated with Value Added Networks(VAN).   | [7M]  |
| (b)  | Classify the business models of E-Commerce.   | [8M]  |
| 4.   | Classify different approaches used in Enterprise Network security for Firewalls and packet filters.             | [15M] |
| 5(a) | What are various legal issues, Business issues and Operational risks in Electronic Cash?                        | [8M]  |
| (b)  | Discuss briefly about the properties of Electronic cash.  | [7M]  |
| 6(a) | Examine the issues in the pricing methods of Electronic Publishing System.                                      | [7M]  |
| (b)  | Give a brief overview of an ideal publishing environment in Web-Commerce.                                       | [8M]  |
| 7(a) | Compare and contrast Information flow with Electronic Data Interchange and without Electronic Data Interchange. | [7M]  |
| (b)  | Assess the Effects of failed transactions and Examine the approaches for recovery from failed transactions.     | [8M]  |
| 8(a) | Determine the functionalities of each component in the elements of electronic commerce applications.            | [8M]  |
| (b)  | Summarize the mechanism for Internet Security for E-Commerce Applications.                                      | [7M]  |

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B.Tech. VII Semester ~~Regular~~/Supplementary Examinations

**S153-C# AND .NET PROGRAMMING  
(CSE)**

Time : 3 hours

Max. Marks : 75

**PART-A**

(Compulsory question)

- 1(a) Write the syntax for each loop in C#. [1M]
- (b) Examine the role of virtual keyword in method overriding. [1M]
- (c) What is the return type of Execute Non Query ()? [1M]
- (d) Describe the usage of XML Data Source control in ASP.Net. [1M]
- (e) Do attributes get inherited. [1M]
- (f) List out special operators available in C#. [2M]
- (g) Explain the role of the following methods in Thread class [2M]
  - a) Sleep()                      b) Join()                      c) Is Alive()
- (h) Describe the purpose of Oracle Data Adapter object in Windows form application. [2M]
- (i) Describe the purpose of the following classes. [2M]
  - a) XML Document              b) XML Element
- (j) What are the benefits of Metadata in .NET framework? [2M]

**PART-B**

(Answer any FOUR questions. All questions carry equal marks)

- 2(a) Develop a C# program to demonstrate the usage of the programming construct struct in C#. [8M]
- (b) Develop a C# program to achieve mutability of strings by using String Builder class. [7M]
- 3(a) Develop a C# program to create multiple threads using Thread class. [8M]
- (b) Distinguish between interfaces and abstract class with an example. [7M]
- 4(a) Distinguish between Data Reader and Data Set with an example program [7M]
- (b) Design a Windows form application to demonstrate Modal & Modeless dialog Box. [8M]
- 5(a) Develop an application to retrieve table data from MS Access database and display it on a web page. [7M]
- (b) Design ASP.Net web application to store web form data into oracle database table with the following fields. [8M]
  - a) Id                                      c) Name
  - b) Age                                      d) address
- 6(a) How can we create custom Attributes? Give an example program. [7M]
- (b) Is it possible to restrict a custom attribute to a method only? If so, give your justification with an example program. [8M]
- 7(a) Explain the concept of Property of a class with an example program. [7M]
- (b) Develop a C# Program to find factorial of a given integer using [8M]
  - a) Recursive method              b) Non Recursive method
- 8(a) Identify the ways of handling exceptions in ASP.Net. [8M]
- (b) Design a web application to display alert message “welcome to ASP.Net” through display button. [7M]

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B.Tech. (VII Semester) ~~Regular~~/Supplementary Examinations

**S186 - DESIGN PATTERNS**  
(CSE & IT)

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Time : 3 hours

Max. Marks:75

**PART-A**  
(Compulsory question)

- 1.(a) Define Design Pattern. [1M]
- (b) Give the meaning of "WYSIWYG". [1M]
- (c) What is "Also Known As" name for Factory Method? [1M]
- (d) Write the intent of "Interpreter" Design Pattern. [1M]
- (e) One of the problem in developing reusable software is. [1M]
- (f) List the Four elements of Design Patterns. [2M]
- (g) What are the Design Problems in Designing a Document Editor? [2M]
- (h) Write any 4 pattern names in Creational Patterns. [2M]
- (i) Where Chain of Responsibility can be applicable? [2M]
- (j) What can you do if you are interested in patterns? [2M]

**PART-B**

(Answer any FOUR questions. All questions carry equal marks)

2. Define various steps of describing the Design Patterns. [15M]
3. Discuss how design patterns can solve the design problems of a Document Editor. [15M]
4. Draw the structure of Abstract Factory Pattern with an example and explain the various participants involved in it. [15M]
- 5(a) Write the uses of Chain of Responsibility Design Pattern along with its Structure. [7M]
- (b) Discuss the Consequences and Implementation issues of Memento Design Pattern. [8M]
6. Describe in detail about the expectations from Design Patterns. [15M]
7. How Design Patterns solve Design Problems? [15M]
- 8(a) How Formatting can be done in Document Editor? [8M]
- (b) List out the Participants in Command Pattern. Discuss them briefly. [7M]

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B.Tech. (VII Semester) ~~Regular~~/Supplementary Examinations

**S316-MOBILE COMPUTING**

(CSE)

Time : 3 hours

Max. Marks : 75

**PART-A**

(Compulsory question)

- 1(a) What is handover? [1M]  
(b) Differentiate Home network and foreign network. [1M]  
(c) Mention any two properties of Mobile Ad-hoc Network. [1M]  
(d) What are intent filters? [1M]  
(e) Write the issues in Voice Over IP. [1M]  
(f) What is handover in GSM system? [2M]  
(g) Write the requirements for mobile IP standard. [2M]  
(h) What are the security problems in ad-hoc mobile systems? [2M]  
(i) Mention the android API levels. [2M]  
(j) Write any two applications of IOS. [2M]

**PART-B**

(Answer any FOUR questions. All questions carry equal marks)

- 2(a) With a neat sketch explain the protocol architecture for signalling in GSM system. [7M]  
(b) Write short notes on the following MAC protocols.  
i) Packet reservation Multiple Access. ii) Multiple access with collision Avoidance. iii) Spread Aloha Multiple Access. [8M]
- 3(a) Explain agent discovery and registration of mobile node in mobile IP network. [8M]  
(b) Discuss in detail about snooping TCP with advantages and disadvantages. [7M]
- 4(a) With an example describe the dynamic source routing protocol in Mobile Ad-hoc Network. [7M]  
(b) Discuss the issues in Ad-hoc wireless network. [8M]
- 5(a) Explain in detail about basic building blocks of android systems. [7M]  
(b) With an example explain the android activity lifecycle. [8M]
- 6(a) With a neat sketch explain the protocol architecture of WAP. [7M]  
(b) Describe in detail about link management in Bluetooth. [8M]
- 7(a) Explain how localization and calling is done in GSM System. [8M]  
(b) Explain about the GPRS architecture reference model. [7M]
- 8(a) Discuss the inefficiencies and improvements of mobile IP in forwarding data from correspondent node to a mobile node. [7M]  
(b) With an example explain the DSDV routing algorithm in ad-hoc wireless network. [8M]

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B.Tech. (VII Semester) ~~Regular~~/Supplementary Examinations

**S177-DATA MINING AND DATA WAREHOUSING**  
(CSE)

Time : 3 hours

Max. Marks : 75

**PART-A**

(Compulsory question)

Q.No	Questions	Marks	CO	BL
1(a)	Define OLAP.	1M	CO1	L1
(b)	List out the methods for data cleaning.	1M	CO2	L1
(c)	Show the two measures of rule interestingness with example.	1M	CO3	L1
(d)	Identify the differences between Classification and Prediction.	1M	CO4	L1
(e)	Define web based mining.	1M	CO5	L1
(f)	Describe data characterization and data discrimination.	2M	CO1	L1
(g)	Tell about attribute relevance analysis.	2M	CO2	L1
(h)	Describe the pruning principle in Apriori algorithm.	2M	CO3	L1
(i)	Define Bayes classification theorem.	2M	CO4	L1
(j)	Show the importance of web usage mining.	2M	CO5	L1

**PART-B**

(Answer any FOUR questions. All questions carry equal marks)

2.	Define Data Cube? And how do you represent your 3-Dimensional data in a data cube? Explain lattice of cuboids for 4-D data.	15M	CO1	L1														
3(a)	Determine the importance of basic statistical measures for data summarization.	7M	CO2	L3														
(b)	Consider the data for analysis includes the attribute age. The age values for the datatuples are (in increasing order) 13, 15, 16, 16, 19, 20, 20, 21, 22, 22, 25, 25, 25, 25, 30, 33,33, 35, 35, 35, 36, 40, 45, 46, 52, 70. (i) Calculate the mean & median of the data. (ii) Calculate the mode of the data.And show the modality of the data (i.e., bimodal, trimodal, etc.). (iii) Calculate the midrange of the data.	8M	CO2	L3														
4.	Consider the following transactional database with min-sup = 50% and min-conf = 75%. <table border="1" style="margin-left: 40px;"> <thead> <tr> <th>TID</th> <th>List of items</th> </tr> </thead> <tbody> <tr> <td>001</td> <td>milk, dal, sugar, bread</td> </tr> <tr> <td>002</td> <td>Dal, sugar, wheat,jam</td> </tr> <tr> <td>003</td> <td>Milk, bread, curd, paneer</td> </tr> <tr> <td>004</td> <td>Wheat, paneer, dal, sugar</td> </tr> <tr> <td>005</td> <td>Milk, paneer, bread</td> </tr> <tr> <td>006</td> <td>Wheat, dal, paneer, bread</td> </tr> </tbody> </table> (i) Find all frequent item sets using Apriori algorithm. (ii) List all the strong association rules.	TID	List of items	001	milk, dal, sugar, bread	002	Dal, sugar, wheat,jam	003	Milk, bread, curd, paneer	004	Wheat, paneer, dal, sugar	005	Milk, paneer, bread	006	Wheat, dal, paneer, bread	15M	CO3	L3
TID	List of items																	
001	milk, dal, sugar, bread																	
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005	Milk, paneer, bread																	
006	Wheat, dal, paneer, bread																	

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**S177-DATA MINING AND DATA WAREHOUSING**

5(a)	Illustrate how to extract classification rules from decision trees with an example.	7M	CO4	L4
(b)	Analyze various types of Clusters with neat diagrams.	8M	CO4	L4
6(a)	Explain that data mining is useful in data retrieval from time series databases.	7M	CO5	L2
(b)	Discuss the basic measures for text retrieval. What is their need in text mining?	8M	CO5	L2
7(a)	List and describe the five primitives for specifying a data mining task.	7M	CO2	L1
(b)	Describe various steps of KDD Process.	8M	CO2	L1
8(a)	Illustrate the steps involved in finding frequent item set by using Apriori algorithm.	7M	CO3	L3
(b)	Show the differences between the three main types of data warehouse usage.	8M	CO1	L3

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L.B. Reddy Nagar :: Mylavaram - 521 230 :: Krishna Dist.::A.P.

B.Tech. (VUSemester) Supplementary Examinations

**S324-OBJECT ORIENTED PROGRAMMING THROUGH C++**

EEE

Time : 3 hours

Max.Marks : 75

**PART-A**

(Compulsory question)

- 1(a) Define Data Encapsulation. [1M]
- (b) By default all the members of the class are ... [1M]  
(i) Private (ii) Public (iii) Protected (iv) none
- (c) A base class is always used to create objects in inheritance. Comment. [1M]
- (d) Through operator overloading, we can add an object of user defined class and a variable of primitive data type. If yes justify. [1M]
- (e) Can you write standard syntax for open() function? [1M]
- (f) How does a type casting work? [2M]
- (g) Can you write the possible solutions for accessing a private member of a class? [2M]
- (h) What is the main advantage of inheritance? [2M]
- (i) What does this pointer point to? [2M]
- (j) Describe the flow of multiple catch statements mechanism. [2M]

**PART-B**

(Answer any FOUR questions. All questions carry equal marks)

- 2(a) How are data and functions organized in an object oriented program? [7M]
- (b) Compare and Contrast C++ structure and C++ class with suitable examples. [8M]
- 3(a) What is a friend function? What are the merits and demerits of using friend functions? [7M]
- (b) Show how to use a friend function to add two complex numbers and display the result, input one complex number from keyboard to each class. [8M]
- 4(a) Illustrate the concept of hybrid inheritance and importance of virtual base class with an example. [7M]
- (b) Develop a C++ program to swap two strings using string class. [8M]
- 5(a) Compare and Contrast function overloading and function overriding. [7M]
- (b) How do you write and implement virtual functions in polymorphism? [8M]
- 6(a) Illustrate the concept of exception handling mechanism with a suitable example. [7M]
- (b) Develop a C++ program to copy the contents of one file into another file. [8M]
7. What are classes? Create a class with the following data members. Name of the class: Vehicle, Data Members: name, model, company, price and variants, Member functions: putdetails() and getdetails() to set and display Vehicle details respectively. [15M]
- 8(a) Illustrate the concept of Multilevel Inheritance with a suitable example. [8M]
- (b) Develop a C++ program to find out the GCD of two numbers using recursion and non-recursion. [7M]

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B.Tech. (VII Semester) ~~Regular~~/Supplementary Examinations

**S347-POWER SYSTEM PROTECTION**

(EEE)

Time : 3 hours

Max. Marks : 75

**PART-A**

(Compulsory question)

Q.No	Questions	Marks	CO	BL																			
1(a)	Define resetting time of a relay.	1M	CO2	L2																			
(b)	What are the components present in the static relays?	1M	CO1	L1																			
(c)	Name the different kinds of over current relays.	1M	CO1	L2																			
(d)	List out two advantages of microprocessor based protective relays.	1M	CO3	L2																			
(e)	List the different circuit breakers used in power systems.	1M	CO2	L3																			
(f)	What are the major causes for failure of main protection in power systems?	2M	CO2	L4																			
(g)	Discuss the plug setting multiplier.	2M	CO2	L2																			
(h)	What are the conditions to be satisfied for the operation of directional over current relay?	2M	CO2	L4																			
(i)	What are the important functions of a microprocessor based relay.?	2M	CO3	L2																			
(j)	Differentiate between a fuse and a circuit breaker.	2M	CO2	L1																			
<b>PART-B</b>																							
(Answer any FOUR questions. All questions carry equal marks)																							
2(a)	Define and discuss the following terms as applied to protective relaying system: (i) Pick-up value (ii) Plug-setting multiplier (iii) Time-setting multiplier.	7M	CO1	L3																			
(b)	Describe the various steps for calculating the actual relay operating time.	8M	CO2	L4																			
3(a)	Illustrate with a neat diagram the construction and working of Non-directional induction type over current relay.	7M	CO2	L3																			
(b)	With a neat sketch, describe the difference between definite time-current characteristics and inverse time-current characteristics(IDMT) of relays.	8M	CO3	L2																			
4(a)	Discuss the protective scheme of transmission lines using impedance relay.	7M	CO2	L1																			
(b)	Determine the time of operation of a 5-Amps, 3-second over current relay having a current setting of 125% and a time multiplier of 0.6 connected to supply circuit through a 400/5 current transformer when the circuit carries a fault current of 4000 Amps. Give the PSM Vs Time of operation of relay in table below.	8M	CO1	L4																			
	<table border="1"> <tr> <td>PSM</td> <td>2</td> <td>4</td> <td>6</td> <td>8</td> <td>10</td> <td>12</td> <td>14</td> <td>16</td> <td>18</td> <td>20</td> </tr> <tr> <td>Time of operation (sec)</td> <td>9</td> <td>5.5</td> <td>4.2</td> <td>3.5</td> <td>3</td> <td>2.8</td> <td>2.5</td> <td>2.2</td> <td>2.1</td> <td>2</td> </tr> </table>				PSM	2	4	6	8	10	12	14	16	18	20	Time of operation (sec)	9	5.5	4.2	3.5	3	2.8	2.5
PSM	2	4	6	8	10	12	14	16	18	20													
Time of operation (sec)	9	5.5	4.2	3.5	3	2.8	2.5	2.2	2.1	2													

### S347-POWER SYSTEM PROTECTION

5(a)	What are the main functions of a microprocessor-based relay, describe each with a block diagram?	7M	CO3	L3
(b)	Describe the procedure for measurement of R & X for microprocessor based distance relay.	8M	CO4	L4
6(a)	Define and discuss the following terms as applied to circuit breakers : (i) Arc voltage (ii) Restriking voltage (iii) Recovery voltage.	7M	CO2	L3
(b)	Write short notes on the following : (i) Resistance switching (ii) Circuit breaker ratings (iii) Circuit interruption problems.	8M	CO2	L2
7(a)	Discuss the fundamental requirements of protective relaying in power systems.	7M	CO2	L4
(b)	Describe briefly with neat diagrams of electromagnetic relay types with applications.	8M	CO3	L2
8(a)	Discuss with a neat diagram the application of Merz-Price circulating current principle for the protection of an alternator.	7M	CO1	L3
(b)	Write short notes about on (i) shaded pole type Induction relay (ii) Watt-hour meter type Induction Relay.	8M	CO2	L2

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B.Tech. (VII Semester) ~~Regular~~/Supplementary Examinations

**S385-SOLID STATE DRIVES  
(EEE)**

Time : 3 hours

Max. Marks : 75

**PART-A**

(Compulsory question)

Q.No	Questions	Marks
1(a)	What are the types of electric drives?	1M
(b)	Mention the types of braking.	1M
(c)	How is the speed of a motor sensed?	1M
(d)	What is meant by sub synchronous speed operation?	1M
(e)	Give the application of self controlled synchronous motor.	1M
(f)	List out advantages of electric drives.	2M
(g)	What are the different types of chopper?	2M
(h)	What is meant by stator voltage control?	2M
(i)	What is meant by slip power recovery system?	2M
(j)	What are the disadvantages of VSI fed synchronous motor drive?	2M
<b>PART-B</b>		
(Answer any FOUR questions. All questions carry equal marks)		
2(a)	Describe the operation of 1-phase semi converter fed to DC series motor and derive speed torque expressions.	7M
(b)	Discuss the effects of armature current ripple on the performance of DC motor.	8M
3(a)	Describe regenerative braking of a chopper fed separately excited DC motor.	7M
(b)	What are the advantages of regenerative braking over other methods of braking?	8M
4(a)	With the help of circuit diagram and waveforms describe the induction motor with current source inverter.	7M
(b)	Compare Voltage source inverter and current source inverter fed drives.	8M
5(a)	Describe about the static Kramer drive with neat sketch. Why it has a low range of speed control?	7M
(b)	Describe static rotor resistance control method for speed control of induction motor.	8M
6(a)	Describe the operation of cyclo converter fed synchronous motor.	7M
(b)	How the operation of a synchronous motor shifts from motoring to regenerative braking?	8M
7(a)	List the various methods of controlling the induction motor by variable frequency control and discuss.	7M
(b)	Compute the torque-speed curves of an induction motor by varying stator frequency control.	8M
8(a)	When operating in true synchronous mode, why the frequency must be changed in small steps?	7M
(b)	Explain closed loop speed control of synchronous motor drive fed from CSI.	8M

**LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING  
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L.B. Reddy Nagar :: Mylavaram – 521 230 :: Krishna Dist.: A.P.

B.Tech. VII Semester ~~Regular~~/Supplementary Examinations

**S346-POWER SYSTEM OPERATION AND CONTROL**  
(EEE)

Time : 3 hours

Max. Marks : 75

**PART-A**

(Compulsory question)

- |      |   |      |
|------|---|------|
| 1(a) | Draw the input-output characteristics of a steam unit.        | [1M] |
| (b)  | Discuss the importance of unit commitment.                    | [1M] |
| (c)  | What is area control error (ACE)?                             | [1M] |
| (d)  | Write the full forms of UPFC & IPFC.                          | [1M] |
| (e)  | What is meant by deregulation?                                | [1M] |
| (f)  | Define penalty factor.  | [2M] |
| (g)  | Write the recursive relation of dynamic programming method.   | [2M] |
| (h)  | Draw the dynamic response of two area load frequency control. | [2M] |
| (i)  | List the specifications of load compensation.                 | [2M] |
| (j)  | Draw the deregulated power utility structure.                 | [2M] |

**PART-B**

(Answer any FOUR questions. All questions carry equal marks)

- |      |   |       |
|------|---|-------|
| 2.   | Discuss the different characteristics of thermal power stations.  | [15M] |
| 3(a) | Obtain the solution of UC problem by constructing a priority list for the following units<br>Unit-1: $C_1 = 0.002842P_{G1}^2 + 8.46P_{G1} + 600.0$ Rs/hr , $200 \leq P_{G1} \leq 650$<br>Unit-2: $C_2 = 0.002936P_{G2}^2 + 8.32P_{G2} + 420.0$ Rs/hr , $150 \leq P_{G2} \leq 450$<br>Unit-3: $C_3 = 0.006449P_{G3}^2 + 9.884P_{G3} + 110.0$ Rs/hr , $100 \leq P_{G3} \leq 300$ .  | [7M]  |
| (b)  | Illustrate the importance of dynamic programming method. Also draw the flow chart of DP method.   | [8M]  |
| 4.   | Derive the complete block diagram of two area load frequency control along with tie-line powers.  | [15M] |
| 5(a) | Discuss the reduction of voltage drop with series compensation.   | [7M]  |
| (b)  | Evaluate the reactive power flow in an uncompensated transmission line.   | [8M]  |
| 6(a) | Describe the market settlements in deregulated power systems.   | [7M]  |
| (b)  | Illustrate about the forward market in power industry.  | [8M]  |
| 7(a) | The IFC for two plants are<br>$\frac{dC_1}{dP_{G_1}} = 0.075P_{G_1} + 18 \quad \text{Rs./MWh}$<br>$\frac{dC_2}{dP_{G_2}} = 0.08P_{G_2} + 16 \quad \text{Rs./MWh}$<br>The loss coefficients are given as $B_{11} = 0.0015/\text{MW}$ , $B_{12} = B_{21} = -0.0004/\text{MW}$ , and $B_{22} = 0.0032/\text{MW}$ for $\lambda = 25$ Rs/MWh. Find the real-power generations, total load demand, and the transmission power loss. | [8M]  |
| (b)  | Describe the dynamic response of single area load frequency control without PI controller.  | [7M]  |
| 8(a) | Discuss the advantages of FACTS devices.  | [7M]  |
| (b)  | Illustrate the Procedure for preparing the UC table using dynamic programming approach.   | [8M]  |

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B.Tech. (VII Semester) ~~Regular~~/Supplementary Examinations

**S148-BIOMEDICAL INSTRUMENTATION  
(EIE)**

Time : 3 hours

Max. Marks : 75

**PART-A**

(Compulsory question)

- 1(a) Define linearity. [1M]
- (b) Draw the Einthoven triangle. What are the indirect methods used in BP measurement? [1M]
- (c) What are the indirect methods used in BP measurement? [1M]
- (d) What is auscultation? [1M]
- (e) Define dialysis. [1M]
- (f) What is the purpose of electrode paste? [2M]
- (g) List the brain waves and their frequencies. [2M]
- (h) Mention the principle of electromagnetic flow meter. [2M]
- (i) Differentiate Micro shock and macro shock. [2M]
- (j) What is the application of atrial synchronous pacemaker? [2M]

**PART-B**

(Answer any FOUR questions. All questions carry equal marks)

- 2(a) Draw the structure of human cell and explain its constituents. [7M]
- (b) What are the difficulties in measuring living system? Explain in detail. [8M]
- 3(a) With neat sketch, Describe the operation of EMG. [7M]
- (b) Give the types of ECG Recorders. Discuss any two types of recorders in detail. [8M]
- 4(a) Write a short note on systolic and diastolic pressures in Blood Pressure measurement. [7M]
- (b) Draw the block diagram and discuss the blood flow measurement using electromagnetic flow meter principle. [8M]
5. Write a technical note on physiological effects on electrical currents. [15M]
6. Write a notes on the following [15M]  
(i) Respiration system (ii) Ventilator
- 7(a) With a neat constructional diagram and equivalent circuit explain the function of skin surface electrodes. [7M]
- (b) Differentiate bio-potential and bio-chemical electrodes. Mention their advantages and disadvantages. [8M]
- 8(a) Describe the cardiac pacemaker waveforms and explain the different modes of operation of cardiac pacemakers. [7M]
- (b) Give the importance of use of pacemakers and mention advantages and disadvantages of pacemakers. [8M]

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B.Tech. (VII Semester) ~~Regular~~/Supplementary Examinations

**S313-MICROPROCESSORS AND MICROCONTROLLERS**  
(EIE)

Time : 3 hours

Max. Marks : 75

**PART-A**

(Compulsory question)

- 1(a) Find the physical address of the top of the stack if SS =0777H, and SP =1234H. [1M]
- (b) How many number of address lines required to interface memory of 256KB with 8086? [1M]
- (c) Discuss the purpose of data bus buffer in 8255. [1M]
- (d) Discuss the function of  $C/\bar{D}$  pin in 8251A. [1M]
- (e) Explain the function of IE register in 8051. [1M]
- (f) Illustrate any two data transfer instructions of 8086. [2M]
- (g) Explain is the purpose of ALE in 8086. [2M]
- (h) Explain the function of mode set register in 8257. [2M]
- (i) List the input and output control signals used in mode1 of 8255. [2M]
- (j) How the Interrupt priority is set in 8051? Give the Interrupt priority order in 8051. [2M]

**PART-B**

(Answer any FOUR questions. All questions carry equal marks)

- 2(a) Illustrate the memory segmentation concept of 8086. [8M]
- (b) Describe the functionality of the following pins of 8086. [7M]
  - i)  $DT/R^{\downarrow}$     ii) ALE    iii)  $DEN^{\downarrow}$     iv)  $BHE^{\downarrow}/S7$ .
- 3(a) Explain the memory read cycle with the help of a timing diagram. [8M]
- (b) Describe the function of pins that are unique to minimum mode of 8086. [7M]
- 4(a) Determine the operation of 8257 with a block diagram. [8M]
- (b) Develop an assembly language program to read a key of a 3X8 matrix key board and construct a 5 bit code. [7M]
- 5(a) Design an 8086 based system with 8259 PIC interfaced at the address 0740H. [8M]
- (b) Examine the block diagram of 8251 for Serial communication. [7M]
- 6(a) Describe the addressing modes of 8051. [8M]
- (b) Generate an 8051 ALP to multiply the data in RAM location 22H with the data in RAM location 23H. Store the result in locations from 19H. [7M]
- 7(a) Design an 8086 based system with a 4 digit seven segment multiplexed display interfaced to 8255 PPI. [8M]
- (b) Develop an ALP to read P0.5 and out on to P1.2 on INTO and INT1 respectively. [7M]
- 8(a) Classify the register set of 8086 according to their functionality and explain. [8M]
- (b) Interpret the initialization command words required for a single 8259 in an 8086 based system. [7M]

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B.Tech. (VII Semester) ~~Regular~~/Supplementary Examinations

**S370-RENEWABLE ENERGY SOURCES**

(ME)

Time : 3 hours

Max. Marks : 75

**PART-A**

(Compulsory question)

Q.No	Questions	Marks	CO	BL
1(a)	Name the components of flat plate collectors.	1M	CO1	L1
(b)	State the function of the gear box in a wind turbine.	1M	CO2	L1
(c)	Classify tidal energy conversion systems.	1M	CO3	L1
(d)	Mention different types of biomass sources.	1M	CO4	L1
(e)	Represent the direct energy conversion system flowchart.	1M	CO5	L1
(f)	Define the term "Solar Constant".	2M	CO1	L1
(g)	Outline the principle of wind energy conversion system.	2M	CO2	L2
(h)	List the ocean thermal energy conversion systems.	2M	CO3	L1
(i)	Write two important applications of biogas in IC engines.	2M	CO4	L1
(j)	Draw the sketch of MHD power generation principle.	2M	CO5	L2

**PART-B**

(Answer any FOUR questions. All questions carry equal marks)

2(a)	Elaborate the working principle of solar furnace.	7M	CO1	L2
(b)	Calculate the number of daylight hours in Srinagar for 1 January and 1 July. Take the latitude of Srinagar as 34°05' N.	8M	CO1	L3
3(a)	Differentiate between the HAWT and VAWT.	7M	CO2	L2
(b)	List the factors that are taken into consideration in site selection for wind turbine.	8M	CO2	L1
4(a)	Summarize the advantages and disadvantages of wave energy.	7M	CO3	L2
(b)	A tidal power plant has reservoir of area $50 \times 10^6$ m <sup>2</sup> . The tidal range of 10 m. The turbine can be operated with a head of 3 m. The turbine generator has efficiency of 80%. Estimate the total power in one filling and emptying cycle.	8M	CO3	L3
5(a)	Why aerobic and anaerobic processes are used in biogas power generation? Examine the design issues.	7M	CO4	L3
(b)	Compare and contrast the floating drum and fixed dome biogas plants.	8M	CO4	L2
6(a)	Classify the different types of fuel cells and explain the working of hydrogen-oxygen fuel cell.	7M	CO5	L2
(b)	Elucidate the working and construction details of a thermionic power generator.	8M	CO5	L2
7(a)	Describe the working of solar thermal water pump with neat sketch.	7M	CO1	L2
(b)	Explain the working principle of single basin tidal power generation.	8M	CO3	L2
8(a)	Illustrate the continuous biogas plant with diagram.	7M	CO4	L4
(b)	Distinguish the principles of Seebeck, Peltier and Thomson effects with respect to the thermoelectric power conversion.	8M	CO5	L2

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B.Tech. (VII Semester) ~~Regular~~/Supplementary Examinations

**S138-AUTOMATION IN MANUFACTURING  
(ME)**

Time : 3 hours

Max. Marks : 75

**PART-A**

(Compulsory question)

- |      |   |      |
|------|---|------|
| 1(a) | What are the basic elements of automated system?  | [1M] |
| (b)  | Define Monorail and conveyer.   | [1M] |
| (c)  | Define single station automated cells.  | [1M] |
| (d)  | Trace out the importance of precedence diagram in the line balancing.                                       | [1M] |
| (e)  | State the principal difference between adaptive control system and conventional closed loop control system. | [1M] |
| (f)  | List out the advantages of automation.  | [2M] |
| (g)  | List out the functions of material handling system.   | [2M] |
| (h)  | Write the components of a manufacturing system.   | [2M] |
| (i)  | How a flexible assembly line works?   | [2M] |
| (j)  | State the advantages of adaptive control system.  | [2M] |

**PART-B**

(Answer any FOUR questions. All questions carry equal marks)

- |      |  |      |
|------|--|------|
| 2(a) | What is automation? Discuss various types of automation.   | [7M] |
| (b)  | What are the important pneumatic components used in automated system? Describe briefly.  | [8M] |
| 3(a) | Explain the conventional storage methods.  | [7M] |
| (b)  | Explain the ten principles of material handling.   | [8M] |
| 4(a) | Explain the classification of manufacturing system.  | [7M] |
| (b)  | What are the factors affecting single station automated cells? Give its applications.  | [8M] |
| 5(a) | Mention the objectives of automated flow line and discuss about in-line and rotary type configuration lines.   | [7M] |
| (b)  | Explain the analysis of transfer lines without storage.  | [8M] |
| 6(a) | Differentiate between ACO and ACC types of adaptive control.   | [7M] |
| (b)  | Explain the adaptive control for grinding operation with block diagram.  | [8M] |
| 7(a) | An overhead trolley conveyor is configured as a continuous closed loop. The delivery loop has a length of 120 m and the return loop = 80 m. All parts loaded at the load station are unloaded at the unload station. Each hook on the conveyor can hold one part and the hooks are separated by 4 m. Conveyor speed = 1.25 m/s. Determine<br>i) maximum number of parts in the conveyor system,<br>ii) parts flow rate; and<br>iii) maximum loading and unloading times that are compatible with the Operation of the conveyor system. | [7M] |
| (b)  | Write the function of following material handling equipment.<br>i) Industrial trucks<br>ii) Pallet trucks<br>iii) Roller conveyer.   | [8M] |
| 8(a) | Explain with neat block diagram typical configuration of Adaptive control Machining system.  | [7M] |
| (b)  | Describe adaptive control with constraint for turning with a neat sketch.  | [8M] |

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L.B. Reddy Nagar :: Mylavaram – 521 230 :: Krishna Dist.:: A.P.

B.Tech. (VII Semester) ~~Regular~~/Supplementary Examinations

**S310-METROLOGY AND INSTRUMENTATION**

(ME)

Time : 3 hours

Max. Marks : 75

**PART-A**

(Compulsory question)

- 1(a) What do you mean by backlash? [1M]
- (b) What are line standards? [1M]
- (c) What do you mean by Tolerance? [1M]
- (d) Define Gauge factor. [1M]
- (e) What is seebeck effect? [1M]
- (f) Differentiate between precision and accuracy. [2M]
- (g) Differentiate between line and End standards. [2M]
- (h) What is interferometry? [2M]
- (i) Explain the principle of electrical resistance strain gauge. [2M]
- (j) What is the use of Rotameter? [2M]

**PART-B**

(Answer any FOUR questions. All questions carry equal marks)

- 2(a) Explain the causes and types of experimental errors. [8M]
- (b) Write about the curve fitting technique using least square method. [7M]
- 3(a) Write about (i) Line standards (ii) End standards (iii) slip gauges. [7M]
- (b) Explain any 2 methods of using sine bar. [8M]
- 4(a) Evaluate surface roughness measurement using Tomlinson Surface meter. [7M]
- (b) Explain about (a) Unilateral and bilateral system (b) Interchangeability and selective assembly. [8M]
- 5(a) Explain the use of Pneumatic gauge for measuring displacement. [7M]
- (b) Explain strain gauge load cell for force measurement. [8M]
- 6(a) Explain the principle of Bordon tube pressure gauge. [8M]
- (b) Write a short note on Thermocouples and thermisters. [7M]
- 7(a) Explain the working of Tool Makers microscope. [7M]
- (b) Explain the use of rollers for taper measurement. [8M]
- 8(a) Explain the testing procedure of surface finish using Tomlinson surface meter. [7M]
- (b) Write about CLA method and RMS method for measuring surface roughness. [8M]

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B.Tech. (VII Semester) ~~Regular~~/Supplementary Examinations

**S367-REFRIGRATION AND AIR CONDITIONING**

(ME)

Time : 3 hours

Max. Marks : 75

**PART-A**

(Compulsory question)

- 1(a) Define Ton of Refrigeration. [1M]  
 (b) Write the Equation of COP for VCR system. [1M]  
 (c) Give two examples for ideal Refrigerant and Absorbent Combination. [1M]  
 (d) What is meant by comfort zone. [1M]  
 (e) Define Sensible Heat Factor. [1M]  
 (f) Differentiate Heat Engine, Refrigerator and Heat Pump. [2M]  
 (g) Represent VCR cycle on T-s and P-H chart. [2M]  
 (h) What are the advantages and disadvantages of Steam Jet Refrigeration System? [2M]  
 (i) Define Dry Bulb Temperature and Dew Point Temperature. [2M]  
 (j) How do you classify Air Conditioning Systems? [2M]

**PART-B**

(Answer any FOUR questions. All questions carry equal marks)

- 2(a) What are desirable properties of ideal Refrigerant and Explain how refrigerants are designated? [7M]  
 (b) A refrigerator working in Bell Coleman cycle, the air is drawn into the cylinder of the compressor from the cold chamber at a pressure of 1.03 bar and temperature of 12°C. After isentropic compression to 5.5 bar the air is cooled at a constant pressure to a temperature of 22°C. The Polytrophic expansion  $p v^{1.25} = C$ . Then follows and the air is expanded to 1.03 bar is passed to cold chamber. Determine  
 i). Work done per kg of air flow.  
 ii). Refrigeration effect per kg of air.  
 iii). COP.  
 Ic). Refrigerating capacity of the plant in tones for a mass flow rate of 90kg air.  
 Take  $\gamma = 1.4$ ,  $C_p = 1.003 \text{ kJ/kg K}$ . [8M]
- 3(a) Explain the working principle of thermostatic expansion valve with the help of a neat diagram. [7M]  
 (b) A vapour compression refrigerator works between the pressure limits of 60 bar and 25 bar. The working fluid is just dry at the end of compression and there is no under cooling of the liquid before the expansion valve. Determine 1. COP of the cycle 2. Capacity of the refrigerator if the fluid flow is at the rate of 5 kg/min.

Pressure (bar)	Temperature (K)	Enthalpy (kJ/kg)		Entropy (kJ/kg K)	
		Liquid	Vapour	Liquid	Vapour
60	295	151.96	293.29	0.554	1.0332
25	261	56.32	322.58	0.226	1.2464

[8M]

## S367-REFRIGRATION AND AIR CONDITIONING

- 4(a) With a neat sketch working of Lithium Bromide - Water absorption refrigeration system and what are its Limitations. [7M]
- (b) Explain Steam Jet Refrigeration system with a neat sketch. [8M]
- 5(a) The dry- and the wet-bulb temperatures of atmospheric air at 1 atm (101.325kPa) pressure are measured with a sling psychrometer and determined to be 25 and 15°C, respectively. Determine (a) the specific humidity, (b) the relative humidity, and (c) the enthalpy of the air. [7M]
- (b) Define Effective Temperature and explain various factors governing Effective temperature. [8M]
- 6(a) Explain the difference between summer air conditioning and winter air conditioning system. [7M]
- (b) A cinema hall of seating capacity 1500 persons has been provided with an air conditioned plant with the following data: Outdoor conditions = 40°C DBT and 20°C WBT; Required indoor conditions = 20°C DBT and 60% RH; Amount of outdoor air supplied = 0.3 m<sup>3</sup>/min/person. If the required condition is achieved first by adiabatic humidifying and then by cooling, find: i) The capacity of cooling coil and surface temperature of the coil if by pass factor is 0.25; and ii) The capacity of humidifier and its efficiency. [8M]
- 7(a) With a neat sketch explain the working of Bell Coleman Cycle and derive an expression for its COP. [7M]
- (b) Name any three refrigerants suitable for ice plants giving their merits and demerits. [8M]
- 8(a) Explain the working of Thermo Electric Refrigeration system. Compare the working of components of Thermo Electric Refrigeration System with working of Components of Vapour Compression Refrigeration System. [7M]
- (b) A hall is to be maintained at 24°C DBT and 60% RH under the following conditions  
Outdoor conditions – 38°C DBT and 28°C WBT  
Room SH load = 46.4 kW, Room LH load = 11.6kW  
Quantity of infiltration = 1200 m<sup>3</sup>/h, ADP = 10°C  
Quantity of recirculated air = 60%  
If the quantity of recirculated air is mixed with conditional air after the cooling coil, find the following  
(i) Condition of air leaving the coil.  
(ii) Condition of air entering the coil.  
(iii) The mass flow rate of air entering the cooler.  
(iv) The mass flow rate of total air passing through the hall.  
(v) Bypass factor  
The refrigeration load on the cooling coil in TR. [8M]

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B.Tech. ~~VII~~ Semester Regular/Supplementary Examinations

**S250-FINITE ELEMENT METHOD**

(ME)

JCT

Time : 3 hours

Max.Marks:75

**PART-A**

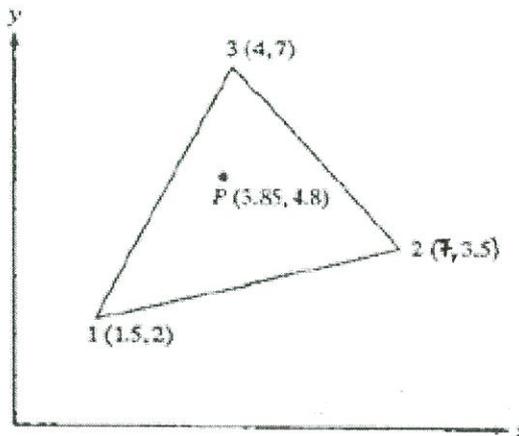
(Compulsory question)

- 1(a) Write the strain energy expression for a liner elastic material. [1M]
- (b) Write the shape functions for a line element. [1M]
- (c) What is the Shape function at the centroid of the triangle? [1M]
- (d) What is the equation for  $r_{\infty}$  for heat transfer problems? [1M]
- (e) What is Lagrangean Equation? [1M]
- (f) What is Plane Strain problem? [2M]
- (g) Name two One-Dimensional elements used in FEM. [2M]
- (h) Write the shape function matrix [N] for 2-D quadrilateral element. [2M]
- (i) What is the thermal conductivity matrix [k] for 3-D heat conduction? [2M]
- (j) Define Eigen Vector. [2M]

**PART-B**

(Answer any FOUR questions all question carry equal marks)

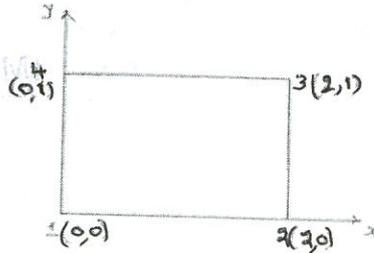
- 2(a) Derive the Stress-Strain relationship for a Plane Strain problem. [7M]
- (b) What is Potential Energy? Write the Potential Energy equation and describe the significance of Strain Energy and Work Potential. [8M]
- 3(a) Evaluate the shape functions N1, N2 and N3 at the interior point P for the triangular element as shown in the Figure 1. [7M]



- (b) Consider a beam element of length 1m from its fixed end. The point load of 15kN is applied on a beam at a length of 0.5m from its fixed end. Calculate the deflection under the load.  $E= 20 \times 10^6 \text{ N/cm}^2$  and  $I= 2500 \text{ cm}^4$ . (Take,  $u1=u2=u5=0$ ). [8M]

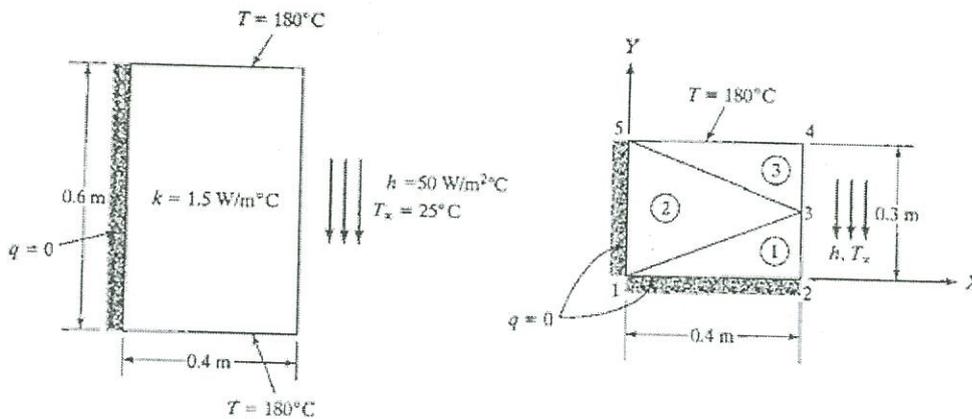
**S250-FINITE ELEMENT METHOD**

4. Apply plane stress condition for a rectangular element shown in Figure 2 and take  $E=2 \times 10^5 \text{ N/mm}^2$ ,  $\nu=0.3$ , and  $Q=[0, 0, 0.45, 0.075, 0.15, 0.08, 0, 0]^T$  in  $\text{mm}$ . Evaluate J matrix, B matrix and stresses in element where  $\xi=0$  &  $\eta=0$  nodal coordinates given as  $(0,0)$   $(2,0)$   $(2,1)$   $(0,1)$ .



[15M]

5. A long bar of rectangular cross section, having thermal conductivity of  $1.5 \text{ W/m}^\circ\text{C}$  is subjected to the boundary conditions shown in Figure 3. Two opposite sides are maintained at a uniform temperature of  $180^\circ\text{C}$ ; one side is insulated, and the remaining side is subjected to a convection process with  $T_\infty = 25^\circ\text{C}$  and  $h = 50 \text{ W/m}^2\text{C}$ . Determine the temperature distribution in the bar.



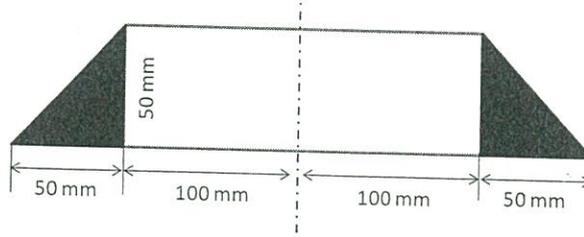
[15M]

- 6(a) Derive the elemental mass matrix for beam element?  
 (b) Derive the elemental mass matrix for quadrilateral element?
- 7(a) Derive the Material matrix [D] for a Plane Stress problem.  
 (b) An axisymmetric link element is shown in Figure 4. Evaluate the matrices [B] and [D]. Take  $E = 2 \times 10^5 \text{ N/mm}^2$  and  $\mu = 0.33$ .

[7M]

[8M]

[7M]



[8M]

- 8(a) Derive the 1-D heat conduction equation and write the proper boundary conditions.  
 (b) Derive the conductivity matrix for 2-D triangular element; if one face is exposed to a heat transfer coefficient 'h' at ambient temperature of  $T_\infty$ .

[7M]

[8M]

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