

**MALLA REDDY ENGINEERING COLLEGE (AUTONOMOUS)**

(Affiliated to JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD)  
Gundlapochampally (H), Maisammaguda (V), Medchal (M), Medchal-Malkajiri (Dist), Hyderabad

**III B.TECH II SEMESTER SUPPLEMENTARY EXAMINATIONS, MAY-2018**Subject: Embedded Systems

Branch: IT

**Time: 3 hours****Max. Marks: 75**Answer any **FIVE** Questions of the following**5x15M=75M**

1. a) What are the applications of Embedded systems in various areas? [7M]  
b) Explain about Automatic chocolate vending machine. [8M]
2. a) Explain the below registers in 8051 [9M]  
i) Timer0 ii) TMOD iii) TCON  
b) Compare serial versus parallel communication. [6M]
3. a) Briefly explain about the assembly language programming process. [8M]  
b) Write short notes on PAL instructions. [7M]
4. Explain the following instructions related to 8051. [15M]  
i) DA ii) SUBB iii) MUL iv) CPLA v) DIV
5. a) Briefly explain about A/D converter circuit for Adconv program. [8M]  
b) Explain in detail about multiple interrupts. [7M]
6. a) Explain the following [8M]  
i) Timer functions ii) Events  
b) Discuss about interrupt routines in an RTOS environment. [7M]
7. a) What are the basic principles of design using a Real-Time operating systems? [7M]  
b) Discuss about Hard real time scheduling considerations. [8M]
8. Write short notes on the following [15M]  
i) Interrupt enabled systems ii) I<sup>2</sup>C bus iii) CAN bus

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PH.D. PROGRAM IN POLITICAL SCIENCE  
1998-1999

Year	Student	Advisor	Thesis Title
1998	John A. ...	Robert ...	...
1999	...	...	...
2000	...	...	...
2001	...	...	...
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2015	...	...	...
2016	...	...	...
2017	...	...	...
2018	...	...	...
2019	...	...	...
2020	...	...	...

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**III B.TECH II SEMESTER SUPPLEMENTARY EXAMINATIONS, MAY-2018**Subject: Operations Research

Branch: IT

Time: 3 hours

Max. Marks: 75

Answer Any 5 questions of the following

5 x 15M=75 M

1. a) What is operations Research? Write the applications, Advantages, nature, and models of OR? 8+7M  
 b) Solve the following LPP by graphical method Max  $Z = x+y$  subject to  $x-y \geq 0$ ,  $-3x+y \geq 3$ ,  $x, y \geq 0$ .

2. Solve by Big-M method:

15M

Maximize  $Z = x_1 + 4x_2$

Subject to the constraints

$3x_1 + x_2 \leq 3$

$2x_1 + 3x_2 \leq 6$

$4x_1 + 5x_2 \geq 20$

$x_1, x_2 \geq 0$

3. a) Explain briefly about travelling salesman problem and its mathematical formulation. [6+9M]  
 b) Obtain the Initial basic feasible solution to the following transportation problem using  
 (i) Northwest corner rule (ii) Least cost method and  
 (iii) Vogels approximation method.

	Distribution Centre				Supply
	D <sub>1</sub>	D <sub>2</sub>	D <sub>3</sub>	D <sub>4</sub>	
Plant P <sub>1</sub>	2	3	11	7	
P <sub>2</sub>	1	0	6	1	
P <sub>3</sub>	5	8	15	9	
Demand	7	5	3	2	

4. a) Give Johnsons procedure for determining an optimal sequence for processing 'n' jobs through three machines. [6+9]  
 b) Solve the following sequencing problem, giving an optimal solution when passing is not allowed.

Machine	Job				
	A	B	C	D	E
M <sub>1</sub>	11	13	9	16	17
M <sub>2</sub>	4	3	5	2	6
M <sub>3</sub>	6	7	5	8	4
M <sub>4</sub>	15	8	13	9	11

5. a) Explain briefly about the characteristics of a dynamic programming problem.

b) In a cargo loading problem, there are four items of different weights per unit and different value unit as given below.

Item (i)	Weight per unit $w_i$ , Kg/Unit	Value per unit $p_i$ , Rs./Unit
1	1	1
2	3	5
3	4	7
4	6	11

The maximum cargo load is restricted to seventeen units. How many units of each item be loaded to maximize the value.

6. A company is currently involved in negotiations with its union on the upcoming wage contract.

Positive signs in table represent wage increase while negative sign represents wage reduction. What are the optimal strategies for the company as well as the union? What is the game value? 15M

Conditional Costs to the Company (Rs.Lakhs)				
Company Strategy	Union Strategies			
	U1	U2	U3	U4
C1	0.25	0.27	0.35	-0.02
C2	0.20	0.06	0.08	0.08
C3	0.14	0.12	0.05	0.03
C4	0.30	0.14	0.19	0.00

7. A truck has been purchased at a cost of Rs.160000. The value of the truck is depreciated in the first three years by Rs.20000 each year and 16000 per year thereafter. If the maintenance and operating costs for the first three years are Rs.16000, Rs.18000 and Rs.20000 in that order and increase by Rs. 4000 every year. Assume interest rate of 10%. Find the economic life of the truck. 15M

8. a) Explain briefly about ABC analysis. 5 M

b) Derive the optimum inventory policy for an EOQ model with different rates of demand and production rate is infinite stating the assumptions required. 10 M