Code No.: **403C1/303C1**

MR 14 – Regular & MR 13 - Supply

MALLA REDDY ENGINEERING COLLEGE (AUTONOMOUS)

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

IV B.Tech I Sem Regular & Supplementary Examinations, NOVEMBER-2017

SUBJECT: **UNCONVENTIONAL MACHINING PROCESS**

(Branch: **ME**)

Time: **3 Hours** Max Marks: **75 Marks**

PART-A

I. Answer all the questions **5 x 1 = 5 M**

1. Define USM.
2. What are the limitations of WJM?
3. What are the principle components of EDM process?
4. Tunnel Boring is accomplished by which process?
5. What type of electrolyte is used in ESD?

II Answer all the questions **10 x 2 = 20 M**

1. Differentiate the conventional and unconventional machining processes in terms of principles.
2. What are the applications of USM?
3. Write the applications of electro chemical deburring.
4. Enumerate the main elements of ECM process.
5. What is the difference between EDM and Wire EDM?
6. Describe process circuits of EDM.
7. Summarize the limitations of EBM.
8. List out the applications of LBM.
9. Explain briefly about Magnetic abrasive finishing.
10. What is etch factor?

PART-B

Answer all the questions **5 x 10 = 50 M**

1. Discuss the working principle of ultrasonic machining process. What are the various process parameters?

(OR)

2. With a neat sketch, explain the working principle of ultrasonic machining process (USM).

3. a) What is the Principle of Water Jet Machining? (4)
   b) Write a note on special features of the equipment used in WJM. (3)
   c) Give the practical applications of WJM. (3)

(OR)

4. Describe the process of Abrasive Jet machining along with the effect of all the process parameters.

5. What are the important process parameters that control the material removal rate in electric discharge machining? Explain any four factors.

(OR)

6. a) What are the various types of EDM processes available? Make a flowchart to indicate them. (4)
   b) Describe the principle and working of Wire Cut EDM with a neat sketch. List the advantages, limitations and applications. (6)

7. Explain the working of EBM with neat sketch and list out its applications in various industries

(OR)

8. Describe, with the help of a sketch, the constructional features of a electron gun used for generating an electron beam in EBM.

9. Describe the principle and working of Magnetic Abrasive Finishing with a neat sketch. List the advantages, limitations and applications.

(OR)

10. a) Discuss the important factors that influence the quality of cut in PAM.
    b) Write about MRR of Chemical machining.

Code No.: **403B1**

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IVB.TECH I SEMESTER REGULAR & SUPPLEMNTARY EXAMINATIONS, NOVEMBER - 2017

SUBJECT: **Robotics**

(BRANCH: **ME**)

Time: **3 Hours** Max Marks:**75**

PART-A

I. Answer all the questions **5 x1=5M**

1. What is work volume?
2. "The forward kinematic model of a manipulator depends on the choice of home position of the manipulator." Comment on this statement.
3. Define jacobians matrix.
4. List the different types of velocity sensors.
5. What features are required for robot in spot welding?

II Answer all the questions **10 x 2=20M**

1. What is meant Degrees Of Freedom and how do you evaluate for different joints?
2. What are the types of grippers?
3. Define forward and inverse kinematic with the help of block diagram.
4. Differentiate joint coordinates and world coordinates.
5. What is teach pendant?
6. Write Jacobean matrix for (RR) manipulator.
7. Explain encoders.
8. What is a stepper motor? Explain.
9. What are the problems faced by robots in arc welding.
10. Write are the Benefits of industrial robotics.

PART-B

Answer all the questions **5 x 10=50M**

1. Define Automation? Explain different types of Automation in detail.

OR

2. What is meant by DOF? Explain different types of end effectors with neat diagram.

3. Explain the implementation of D-H convention for a joint coordinate system.

OR

4. Derive the forward and reverse transformation of 2-Degree of freedom and 3- degree of freedom arm (all rotating joints).

5. What are the different steps in trajectory planning? Explain.

OR

6. Explain the Newton- Euler formulation of a robotic system.

7. Explain hydraulic actuator in detail then list out advantages and limits.

OR

8. a. Explain various types of electric motors with neat sketches and features that are used in robotics.
   b. Explain the principle and applications of potentiometer.

9. Explain how robots are applied in loading and unloading functions with any two production operations.

OR

10. a. What are essential characteristics of spot welding manipulator?
    b. Explain the general considerations in robot material handling.

Code No.: **40331/30329**

MR14 –Regular & MR13- Supplementary

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IVB.TECH I SEMESTER REGULAR & SUPPLEMENTARY EXAMINATIONS, OCTOBER - 2017

SUBJECT: **POWER PLANT ENGINEERING**

(BRANCH: **ME**)

Time: **3 Hours** Max Marks: **75 Marks**

PART-A

I. Answer all the questions **5 x1M=5M**

1. What are the different types of coal?
2. How the gas turbine blades are cooled?
3. What are the different types of direct energy conversion systems?
4. Define the term "Breeding".
5. Define diversity factor.

II Answer all the questions **10 x 2M=20M**

1. What are the methods used for handling of coal?
2. Write the different working circuits of a steam power plant.
3. What are the different types of nuclear fuels?
4. List out the application of gas turbine power plant.
5. What are the benefits of wind energy to the power system?
6. What are the three main factors for power output of hydroelectric plant?
7. Explain the function of moderator?
8. What are the various radiation hazards from nuclear power plant?
9. What are the basic elements exhausted with the flue gases?
10. What is meant by load curve?

PART-B

Answer all the questions **5 x 10M=50M**

1. Briefly explain the different systems and components that constitute a Thermal Power Plant with neat diagrams

(OR)

2. With neat sketch explain in detail about over feed and under feed fuel beds.

3. With suitable sketches, explain the working of combined steam turbine and gas turbine power plant.

(OR)

4. Draw a neat diagram of a regenerative gas turbine and reheater and also explain it working with a help of a p-v diagram.

5. What are the factors to be considered in selecting the site for the hydel plant? Explain the pumped storage plant with a neat sketch.

(OR)

6. What are the factors to be considered for site selection and location of a hydroelectric power plant?

7. a) What are the general problems of reactor operation? **[5M]**
   b) List out the advantages and disadvantages of pressurized water reactor. **[5M]**

(OR)

8. Describes the boiling water reactor with the help of neat sketch and explain its chief characteristics.

9. What the different types of effluents from power plants and impact on environment. Explain in detail

(OR)

10. Find the cost of generation per kW-hr from the following data.

Capacity of the plant	- 120MW
Capital cost	- Rs.1,200 per kW installed
Interest and depreciation	- 10 %on capital
Fuel consumption	- 1.2 kg / kW-hr
Fuel cost	- Rs. 40 tone
Salaries, wages, repairs and maintenance	- 6, 00,000 / year

The maximum demand is 80 MW and load factor is 40 %.

Code No.: **40332/30330**

MR14 –Regular & MR13- Supply

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IV B.TECH I SEMESTER REGULAR & SUPPLEMENTARY EXAMINATIONS, OCTOBER- 2017

SUBJECT: **CAD/CAM**

(BRANCH: **ME**)

Time: **3 Hours** Max Marks:75

PART-A

I. Answer all the questions **5 x1=5M**

1. What is Liquid crystal Display?
2. Define surface modeling.
3. What is G-code and M-code?
4. Define CAPP.
5. Define CAQC.

II Answer all the questions **10 x 2=20M**

1. Define clipping? Give algorithms for clipping.
2. Write about any three storage devices.
3. Explain briefly various surfaces used in geometric modeling.
4. Define geometrical modeling.
5. List few Editing commands.
6. Define NC Machine Tool.
7. What are part families? How parts are classified.
8. Explain about Classification & coding.
9. Define Machine vision.
10. Differentiate between inspection and testing.

PART-B

Answer all the questions **5 x 10=50 Marks**

1. What are the different types of data models used in database structures?

(OR)

2. Explain Transformations of Geometry in detail.
3. Explain B- Spline curves in detail.

(OR)

4. Explain surface representation in detail.
5. Briefly describe basic Geometric commands.

(OR)

6. Explain the working of CNC machine with a neat sketch. What are its main features.
7. Explain concept of Production Flow Analysis

(OR)

8. What are various essential elements in a Retrieval & Generative CAPP System?
9. Define CIM & its Benefits in detail.

(OR)

10. Describe various elements in CIM. How FMS is different from CIM.

Code No.: **40333/30331**

MR14 - Regular & MR13 - Supply

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IVB.TECH I SEMESTER REGULAR & SUPPLEMENTARY EXAMINATIONS, NOVEMBER - 2017

SUBJECT: **Instrumentation & control systems**

(BRANCH: **ME**)

Time: **3 Hours** Max Marks:75

PART-A

I. Answer all the questions **5 x1=5M**

1. What do you mean by static calibration?
2. What are pyrometers?
3. State the basic principle behind tachogenerator.
4. Define a bonded strain gauge.
5. What is a proving ring? How is it used to measure force?

II Answer all the questions **10 x 2=20M**

1. What are different sources of errors in measurements and measuring instruments? Explain?
2. Classify inductive transducers.
3. Define absolute and differential pressures.
4. Classify the types of pressure measurement devices.
5. Explain how a vibrometer is calibrated to measure acceleration.
6. List out various equipment for flow measurement.
7. Define gauge factor.
8. How is dew point temperature measured?
9. Classify the types of Dynamometers.
10. Justify how elastic sensing elements can be used for measuring force.

PART-B

Answer all the questions **5 x 10=50M**

1. What do you mean by Functional elements? Explain one such scheme of dividing an instrument into Functional elements with example.

(OR)

2. What are the various ways in which variation in Capacitance principle can be used to construct displacement transducers? Explain with neat sketches.

3. (a)Describe the working principle of Ultrasonic liquid level gauge [5+5]

(b) Explain with a neat sketch the constructional features & working principle of thermocouple.

(OR)

4. Describe the construction and working principle of optical pyrometer? List out the limitations and advantages.

5. Explain the principle of seismic instrument. Derive an expression to measure acceleration using this instrument.

(OR)

6. With neat sketch describe the principle of operation, construction, advantages and limitations of Rotameter.

7. Explain with a neat sketch the constructional features & working principal of Sling Psychrometer with advantages and disadvantages?

(OR)

8. (a)List the main advantages of semiconductor strain gauges. [4+6]

(b)Describe the working principle of strain gauge bridge with neat sketch. Indicate their arrangement for measurement of torque on a circular shaft.

9. What are Transmission dynamometers? Explain the constructional detail of any one type of transmission dynamometer.

(OR)

10. (a) Differentiate between open loop and closed loop system. [4+6]

(b) Explain the working of servo mechanism.

Code No: **40330/30328**

MR14 – Regular & MR13-Supply

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IV B.TECH I SEMESTER REGULAR & SUPPLEMENTARY EXAMINATIONS, OCTOBER- 2017

SUBJECT: **OPERATIONS RESEARCH**

(BRANCH: **Common to ME & MINING**)

Time: **3 Hours** Max Marks: **75 Marks**

PART-A

I. Answer all the questions **5 x1=5M**

1. Define linear programming problem.
2. Distinguish between Individual replacement and group replacement policies.
3. Write the formula for determining waiting time in the queue in single server model
4. What is the value of shortage cost /unit if the shortages are not allowed in inventory models?
5. What is simulation?

II Answer all the questions **10 x 2=20M**

1. Differentiate between Degeneracy and non Degeneracy of transportation problem.
2. What do you mean by the two- phase method for solving a given L.P.P? Why is it used?
3. How replacement problems are classified?
4. Find the range of values p and q, of Table1 which will render (2, 2) is a saddle point.

Table 1

		Player B		
		I	2	3
Player A	1	2	4	5
	2	10	7	q
	3	4	p	6

5. Write the elements of queuing systems.
6. Explain the single channel and multi-channel queueing models.
7. Describe the limitations of EOQ Formula.
8. What are the costs involved in Inventory control.
9. Explain the steps in Monte –Carlo simulation.
10. What is dynamic programming?

PART-B

Answer all the questions **5 x 10=50M**

1. A firm manufactures two types of products A and B and sells them at a profit of Rs. 2 on type A and Rs.3 on type B. Each product is processed on two machines G and H. Type A requires one minute of processing time on G and two minutes on H. Type B requires one minute on G and one minute on H. The machine G is available for not more than 6 Hours 40 minutes while machine H is available for 10 Hours during any working day. Solve the problem.

(OR)

2. Solve the following AP and find the optimal assignment Schedule.

	A	*B*	*C*	*D*	*E*
M_1	9	11	15	10	11
M_2	12	9	-	10	9
M_3	-	11	14	11	7
M_4	14	8	12	7	8

3. Use Johnson rule to determine the best sequence for six jobs given in Table4. Each job is processed in the order ACB

Table 4

Job	1	2	3	4	5	6
Machine A	12	8	7	11	10	5
Machine B	7	10	9	6	10	4
Machine C	3	4	2	5	1.5	4

(OR)

4. Find the optimal strategies for the games for which the payoff matrix for the player A is given in Table 4. Also find the value of game.

Table 4:

		Player B	
		I	II
Player A	1	1	3
	II	4	2

5. A branch of Punjab National Bank has only one typist. Since the typing work varies in length (number of pages to be typed). The typing rate is randomly distributed approximately a Poisson distribution with mean service rate of 8 letter per hours. The letters arrive at a rate of 5 per hour during the entire 8 hour workday. If the typewrite is value at Rs. 1.50 per hour, determine (a) equipment utilization (b) the % time as arriving letter has to wait (c) average system time (d) average idle time cost of the typewriter per day.

(OR)

6. People arrive at a theater ticket both in a poisson distribution annual rate of 50 per hour service time is constant at 90 seconds. Calculate
   a. The mean number in waiting time.
   b. The mean waiting time.

7. Find the optimum order quantity for a product for which the price breaks are as follows :

Quantity	**Unit cost (Rs.)**
$0 \leq Q_1 < 500$	10.00
$500 \leq Q_2$	9.25

The monthly demand for the product is 200 units, the cost of storage is 2% of the unit cost and the cost of ordering is Rs. 350.00.

(OR)

8. A particular item has a demand of 9000 unit per year. The unit cost of the item is Rs 100 and holding cost per unit is Rs 2.40 per year. The replacement is instantaneous and shortage cost is Rs 5 per unit per year. Determine
   (i) Total cost per year
   (ii) Economic Lot Size
   (iii) Number of order per year
   (iv) Time between two order
   If the cost of one unit is Rs1.

9. What are the advantages and limitations of using simulation?

(OR)

10. Use DPP method to

Minimize $Z = 3x_1+5x_2$.
Subject to
$x_1 \leq 4$,
$x_2 \leq 6$,
$3x_1 + 2x_2 \leq 18$
$x_1, x_2, \geq 0$.