MALLA REDDY ENGINEERING COLLEGE (AUTONOMOUS)
(Affiliated to JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD)
Maisammaguda, Dhulapally, (Post Via kompally), Secunderabad-500 100.

IV B.TECH I SEM SUPPLEMENTARY EXAMINATIONS, APRIL – 2017
SUBJECT: UNCONVENTIONAL MACHINING PROCESS
(BRANCH: MECHANICAL)

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

PART-A

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

1. What is the need for unconventional machining processes?
2. What are the different types of abrasives used in AJM?
3. What are the important properties of dielectric fluid in EDM?
4. What type of energy is used in Laser Beam Drilling?
5. Define DROSS with respect to PAM.

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

1. What are the characteristics of UCM processes?
2. What are the basic functions of the suspension media in which abrasive is suspended in USM?
3. What are the factors that influence oxidation in ECM?
4. List the process variables that influence MRR in Abrasive Jet Machining
5. What are the process parameters in EDM?
6. What is the tool materials used in EDM process?
7. Identify the essential constituents of the electron gun.
8. Write the principle of LBM.
9. List the different types of torches used in PAM.
10. What is the basic heating phenomenon that takes place in plasma arc welding?

PART-B

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

1. Narrate the various aspects involved in the selection of an unconventional machining process for a specific application.

(OR)

2. a) What are the applications of UCMP? Explain the present trends in UCMP?   (5)
    b) What are the difference between Conventional and Un Conventional Machining process? (5)

3. Explain with a neat sketch Abrasive jet machining process and write its applications.

(OR)

4. a) What are the materials commonly used for making a tool for the use in ECM? Describe the chemistry involved in ECM process. (5)

    (b) Derive a theoretical relationship for determination of MRR in ECM. (5)

5. a) Discuss the advantages of EDM as compared to other UCMP with regard to (i) MRR (ii) Accuracy (iii) Surface finish. (7)

    b) What are the essential properties of the dielectric fluid used in EDM? (3)

(OR)

6. Discuss the working principle and advances in Wire cut Electrode Discharge Machining Process.

7. (a) Describe with the help of neat sketches the constructional features of an electron gun used for generating an electron beam in EBM. (7)

    (b) Compare EBM with LBM. (3)

(OR)

8. With a neat sketch, explain the process of LBM along with the effect of all process parameters.

9. Explain the principle of PAM. Compare PAM with gas cutting. Discuss about PAM process parameters.

(OR)

10. Explain the working of Magnetic Abrasive Finishing and its Applications.

Code No.: 30331

MR13

MALLA REDDY ENGINEERING COLLEGE (AUTONOMOUS)
(Affiliated to JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD)
Maisammaguda, Dhulapally, (Post Via kompally), Secunderabad-500 100.

IV B.TECH I SEM SUPPLEMENTARY EXAMINATIONS, APRIL – 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 is tertiary mode measurement?

2. Why protection is needed for a sensing element.

3. List out the classification of electrical tachometers.

4. What is Dew Point Temperature?

5. What is a servomechanism?

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

1. Define measurement and explain its significance in our day to day life.

2. Elaborate on the procedure adopted for calibrating instruments.

3. Distinguish between thermistor and RTD.

4. What is the use of a bimetallic strip?

5. Describe Turbine flow meter in detail with neat sketch.

6. Name different mechanical tachometers.

7. What is the function of dummy gauge in strain gauge?

8. What are hygroscopic materials?

9. Briefly explain the different types of control systems.

10. What is a load cell? How do you measure force with the help of a load cell?

PART-B

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

1. Give different types of errors occur during measurement with an instrument. Suggest methods to minimize the same.

(OR)

2. With the help of a suitable example, explain the functional description of various elements of a generalized measuring system.

3. Enumerate the principle of operation of the following:
   (a) Capacitive level indicator
   (b) Ultrasonic level measuring instrument
   (c) Magnetic level indicator
   (d) Cryogenic fuel level indicator

(OR)

4. Explain with a neat sketch the constructional features & working principal of Mcleod gauge used for measurement of low pressure.

5. Explain with sketches
   (a) D.C. tachometer generator
   (b) A.C. tachometer generator.   [5+5]

(OR)

6. Explain the principle of hotwire anemometer. What are its merits and limitations.

7. Derive the strain of a cantilever beam by using Half bridge circuit.

(OR)

8. Sketch and explain the constructional details and working of a dew point meter.

9. (a) Explain the method of measuring force using a pneumatic load cell   [5+5]
    (b) Explain the construction and working of the Rope brake.

(OR)

10. Describe a control system to fill a tank with water after it is emptied through an output at the bottom. This system automatically stops the inflow of water when the tank is filled. Draw the block diagram of the system.

MALLA REDDY ENGINEERING COLLEGE (AUTONOMOUS)

(Affiliated to JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD)

Maisammaguda, Dhulapally, (Post Via kompally), Secunderabad-500 100.

IV B.TECH I SEM SUPPLEMENTARY EXAMINATIONS, APRIL – 2017

SUBJECT: Robotics

(BRANCH: ME)

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

PART-A

I. Answer all the questions   5 x1=5M

1. Define a robot.

2. What is meant by Inverse kinematics of Robots?

3. Define path points in trajectory planning.

4. What are actuators used in robotics?

5. List out Machine loading and unloading application.

II Answer all the questions   10 x 2=20M

1. What is Robot work volume?

2. What are the different types of automation? Draw block diagram of automation.

3. What is robot kinematics?

4. List out various transformations used in robotics. And write homogenous transformation matrix.

5. What are the popular robot programming languages?

6. Write the Euler motion equations in robots.

7. Discuss the principle of a Resolver.

8. What are the basic classifications of feedback components?

9. What are the manufacturing applications in robotics?

10. What are the general considerations of robotics?

PART-B

Answer all the questions   5 x 10=50M

1. Describe the function of the four basic components of a robot.   [10]

OR

2. a. Explain the main Robot anatomy with neat sketch.   [5+5]

   b. Classify different types of robots based on coordinate systems with neat sketch.

3. a. How does direct kinematics differ from inverse kinematics? When do you prefer direct kinematics over inverse kinematics?

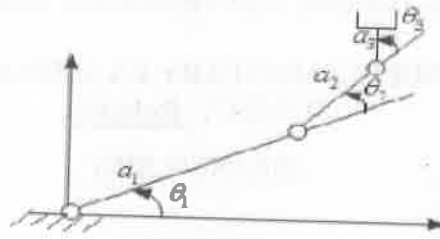   b. Obtain the D-H link parameters for the three link manipulator shown in figure 1.   [5+5]

Figure 1

OR

4. Using the following link parameter table find the T matrix representing the position and orientation of the end-effector.

[10]

Link	θ_i)	α_i	a_i	d_i
1	θ_1	0	a_1	0
2	θ_2	0	a_2	0
3	θ_3	0	0	$-d_3$
4	θ_4	0	0	$-d_4$

5. What are the different steps in trajectory planning? Explain them briefly.   [10]

OR

6. By using Lagrangian Mechanics, find the equations of motions for the following 2-DOF robot manipulator

   shown in the figure 2.

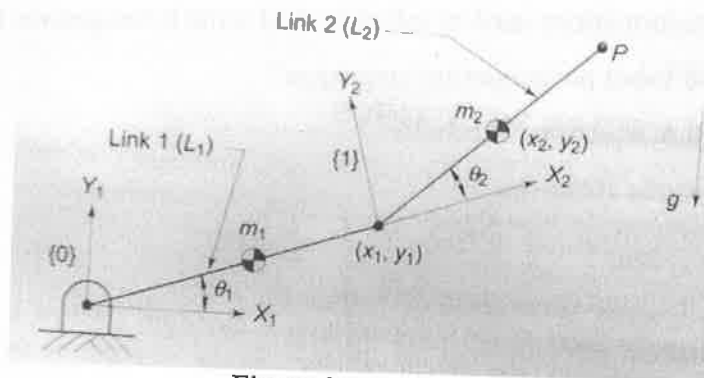[10]

Figure 2

7. a. Explain the working of DC servo motor.

   b. Discuss the principle of a stepper motor with help neat sketch.   [5+5]

OR

8. a. Discuss about hydraulic actuators.

   b. List the advantages and disadvantages of hydraulic and electrical actuators.   [7+3]

9. How robots are applied in assembly operations? Explain in detail.   [10]

OR

10. Explain the use of robots in inspection of parts.

[10]

MALLA REDDY ENGINEERING COLLEGE (AUTONOMOUS)
(Affiliated to JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD)
Maisammaguda, Dhulapally,(Post Via kompally), Secunderabad-500 100.

IV B.TECH I SEM SUPPLEMENTARY EXAMINATIONS, APRIL – 2017
SUBJECT: CAD/CAM
(BRANCH: ME)

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

PART-A

I. Answer all the questions   5 x1=5M

1. List out various memory types.
2. Define Ruled surface.
3. State Features of Machining centres.
4. What is part family?
5. Define CAQC.

II Answer all the questions   10 x 2=20M

1. Write about any Three storage devices
2. What is the need for transformation?
3. What are the various Boolean operations performed in solid modeling?
4. Explain about Extrusion.
5. Describe basic geometric commands.
6. Write advantages of CNC over NC.
7. Explain two basics approach to CAPP.
8. What are the benefits of CAPP?
9. Write short note on Automated Guided Vehicle Systems (AGVS).
10. What is CIM?

PART-B

Answer all the questions   5 x 10=50 Marks

1. Explain the data base structure used in graphics modeling.
                          (OR)
2. Explain product cycle with neat block diagram.
3. Explain Bezier curves & its characteristics with neat Sketch.
                          (OR)
4. What are various Requirement of Geometric modeling? Explain Geometric construction models.

5. Explain various editing commands with examples.
                          (OR)
6. What are the various types of display control commands available in a drafting system? Explain with examples.
7. Discuss (i) Guideline for implementing group technology (ii) Explain the types of coding systems possible
   for group technology.
                          (OR)
8. Discuss the essential elements in a retrieval type CAPP system.
9. Explain the working principle of CMM & scanning laser beam devices with a neat sketch.
                          (OR)
10. Explain about Integration of CAQC with CAD/CAM.

MALLA REDDY ENGINEERING COLLEGE(AUTONOMOUS)

(Affiliated to JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD)
Maisammaguda, Dhulapally,(Post Via kompally), Secunderabad-500 100.

IV B.TECH I SEM SUPPLEMENTARY EXAMINATIONS, APRIL - 2017

SUBJECT: POWER PLANT ENGINEERING

(BRANCH: ME)

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

PART-A

I. Answer all the questions   5 x1=5M

1. On which thermodynamic cycle steam power plant is working.

2. What is super charging of IC engine?

3. What is the purpose of surge tank in a hydroelectric power plant?

4. What are the different types of nuclear fuels.

5. What are the various operating cost of coal fired steam power plant?

II Answer all the questions   10 x 2=20M

1. What are the types of coals used in steam power plant.

2. Write the different types of draught systems used in steam power plant.

3. Difference between dry sump and wet sump lubrications system.

4. What is the major difference between IC engine and Gas turbine.

5. What are the factors to be considered while selecting a site for hydroelectric power plant?

6. How to generate electricity from the sun in solar energy systems?

7. Draw a neat diagram of Nuclear Reactor.

8. What factors control the selection of a particular type of a reactor?

9. Define connected load and average load.

10. What is the significance of two part tariff and three part tariff?

PART-B

Answer all the questions   5 x 10=50M

1. Explain briefly coal storage and its handling in a thermal power plant   [10]

OR

2. What are the different types of cooling towers? Explain with a neat sketch.   [10]

3. Draw and explain the layout of a modern diesel power plant showing the following systems.
   i. Air Intake system
   ii. Cooling system
   iii. Fuel supply system
   iv. Lubrication system and
Exhaust system.   [10]

OR

4. What are the merits and demerits of a gas turbine power plant compared to other thermal power plants?
                                                                                   [10]

5. Explain the working principle of Thermo Electric power generation system with a neat sketch.
                                                                                   [10]

OR

6. Discuss the essential factors which should be considered while selecting a site for a hydroelectric
   Power plant?   [10]

7. With a neat sketch explain the working principle of Boiling Water Reactor.   [10]

OR

8. What are the advantages and disadvantages of nuclear power plant?   [10]

9. A power station has to supply load on daily basis as follows

Time (Hr)	0-6	6-12	12-14	14-18	18-22	22-24
Load (MW)	30	100	60	80	100	60

   a) Draw the load curve
   b) Draw the load duration curve

Calculate load factor, capacity of the plant and plant capacity factor   [10]

OR

10. Explain the following in detail: Capital cost, Investment of fixed charges and operating costs.
                                                                                   [10]

Code No.: **30228**

MALLA REDDY ENGINEERING COLLEGE (AUTONOMOUS)
(Affiliated to JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD)
Maisammaguda, Dhulapally,(Post Via kompally), Secunderabad-500 100.

IV B.TECH I SEM SUPPLEMENTARY EXAMINATIONS, APRIL - 2017

SUBJECT: OPERATIONS RESEARCH

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

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

PART-A

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

1. What are the different methods of solving linear programming problem?
2. Give an example of sequencing model.
3. What is mean by Reneging?
4. Define Inventory control.
5. What is backward recursive approach in dynamic programming?

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

1. What is degeneracy in transportation problem?
2. State the phases of OR.
3. What is a replacement problem? When does it arise?
4. Write short note on applications of game theory.
5. A branch of Punjab National Bank has only one typist. Since the typing work varies in length, the Mean service rate 8 letters per hour. The letters arrive at a rate of 5 per hour during the entire 8 hours workday. Determine Equipment utilization.
6. Explain the Kendalls notation in queueing system.
7. Discuss the EOQ problem with one price break.
8. Explain probabilistic models.
9. State Bellman's principle of optimality.
10. What is dynamic programming?

PART-B

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

1. Maximize $Z = 2x - y + z$
   Such that $3x - 2y + 2z \le 15$, $-x + y + z \le 3$, $x - y + z \le 4$ & $x, y, z \ge 0$.

(OR)

2. Maximize $z = 3x_1 + 2x_2 + 5x_3$
   Subject to the constraints:
   $$x_1 + 2x_2 + x_3 \le 430$$
   $$3x_1 + 2x_3 \le 460$$
   $$x_1 + 4x_2 \le 420$$
   $$x_1 \ge 0; x_2 \ge 0; x_3 \ge 0$$

3. A truck owner finds from his past records that the maintenance costs per year of a truck whose purchase price is Rs. 8000, are given below:

	1	2	3	4	5	6	7	8
Maintenance cost (Rs)	1000	1300	1700	2200	2900	3800	4800	6000
Resale Price (Rs)	4000	2000	1200	600	500	400	400	400

Determine at what time it is profitable to replace the truck.

(OR)

4. Solve the following game by graphical Method.

Player B

		1	2	3	4
Player	1	19	6	7	5
A	2	7	3	14	6
	3	12	8	18	4
	4	8	7	13	-1

5. A T.V repairman repair the sets in the order in which they arrive and expects that the time required to repair a set has an ED with mean 30mins. The sets arrive in a Poisson fashion at an average rate of 10/8 \ hrs a day.
   a) What is the expected idle time / day for the repairman?
   b) How many TV sets will be there waiting for the repair?

(OR)

6. At a public telephone booth arrivals are considered to be Poisson with an average interarrival time of 10 minutes. The length of a phone call may be treated as service, assumed to be distributed exponentially with mean = 2.5 minutes. Calculate the following:
   (a) Average number of customers in the booth
   (b) Probability that a fresh arrival will have to wait for a phone call.
   (c) Probability that a customer completes the phone call in less than 10 minutes and leave. Probability that queue size exceeds at least 5.

7. The demand for a product is 2400 units over 360 days. The storage cost is 0.06% of unit cost of the product and ordering cost is Rs. 35000. find the optimal order quantity if the price breaks are as follows:

Quantity range	purchasing cost (Rs)
$0 \leq q \leq 1000$	1000
$1000 \leq q < 4000$	925
$4000 \leq q$	850

(OR)

8. The annual demand for a product is 64000 units. The cost per order is Rs 10 and the estimated cost of carrying one unit stock for a year is 20%. The normal price of the product is Rs 10 per unit. However the supplier offers a quantity discount of 2% on order at least 1000 units at a time and a discount of 5% if the order is at least 5000 units. Suggest the most economical purchase quantity per order.

9. What is the dynamic programming? Explain the advantages and disadvantages of the dynamic programming?

(OR)

10. What are the applications of simulation?