

**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 SEMESTER SUPPLEMENTARY EXAMINATIONS, APRIL-2019**Subject: Unconventional Machining Process

Branch: ME

Time: 3 hours

Max. Marks: 75

**PART – A****I. Answer ALL questions of the following****5x1Mark=5 Marks**

1. What is the need for unconventional machining processes?
2. What are the limitations of AJM?
3. The transfer media applied in EDM during machining process is
4. What are the applications of EBM?
5. What is meant PAM.

**II. Answer ALL questions of the following****10x2Marks=20 Marks**

1. Differentiate the conventional and unconventional machining processes in terms of principles
2. What are the various types of energy sources uses in non-traditional machining techniques?  
Give examples for each.
3. Why AJM is not suitable for soft materials?
4. What are the applications of electro chemical deburring?
5. What is the difference between EDM and wire cut EDM?
6. Name the best electrode material for finish machining a small die made of WC by EDM process.
7. Identify the essential constituents of the electron gun?
8. What are the thermal features LBM?
9. What is etch factor?
10. Write short notes on electro-stream drilling.

**PART-B****Answer ALL questions of the following****5x10 Marks= 50Marks**

1. Narate the various aspects involved in the selection of an unconventional matching process for a specific applications?
2. a) Briefly discuss about U.S.M with neat sketch(7 M)  
b) What ate applications and limitations of U.S.M? (3 M)

**(OR)**

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

**OR**

4. Describe the principle and working of a ECM with a neat sketch. List the advantages, Limitations and applications of ECM ?

5. Describe the principle and working of Electric Discharge Machining (EDM) with a neat sketch. List the advantages, limitations and applications.

OR

6. (a) Discuss the advantages of EDM as compared to other UCMP with regard to (i) MRR (ii) Accuracy (iii) Surface finish. (7M)  
(b) What are the essential properties of the dielectric fluid used in EDM? (3M)
7. Describe the theory of electron beam machining its advantages and its applications in various industries?

OR

8. Describe the general principle and working of laser beam machining. What are the advantages and applications of laser beams.
9. Explain the principle of PAM. Compare PAM with gas cutting. Discuss about PAM process parameters.

OR

10. Describe the working principle of magnetic abrasive finishing process using a schematic diagram.

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GundlapochampALLY (H), Maisammaguda (V), Medchal (M), Medchal-Malkajiri (Dist), Hyderabad**IV B.TECH I SEMESTER SUPPLEMENTARY EXAMINATIONS, APRIL-2019**Subject: Robotics

Branch: ME

Time: 3 hours

Max. Marks: 75

**PART – A****I. Answer ALL questions of the following****5x1Mark=5 Marks**

1. Define automation.
2. What is differential kinematics?
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 questions of the following****10x2Marks=20 Marks**

1. Explain 3 DOF associated with wrist.
2. List the coordinates used in industrial robots.
3. Define manipulator kinematics.
4. Write homogeneous transformation matrix.
5. List out jacobian singularities.
6. Compare Joint-space Vs Cartesian-space descriptions.
7. What is the advantage of incremental encoder as compared to absolute encoder?
8. What are the basic classifications of feedback components?
9. What are the problems faced by robots in arc welding.
10. Writ the importance of robot in inspection.

**PART-B**

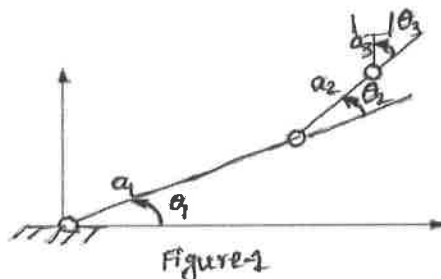
Answer ALL questions of the following

**5x10 Marks= 50Marks**

1. Describe the function of the four basic components of a robot.

**(OR)**

2. Explain mechanical grippers and their linkage mechanisms with neat sketches.
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.



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

5. Discuss about the manipulator jacobian. Derive jacobian matrix for two link (RR) manipulator.

**(OR)**

6. What are the different steps in trajectory planning? Explain them briefly.

7. 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.

**(OR)**

8. Explain hydraulic actuator in detail.

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

**(OR)**

10. Explain use of Robots in the fields of welding and painting.

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**IV B.TECH I SEMESTER SUPPLEMENTARY EXAMINATIONS, APRIL-2019**Subject: Instrumentation and Control Systems

Branch: ME

Time: 3 hours

Max. Marks: 75

**PART – A**

I. Answer ALL questions of the following

5x1Mark=5 Marks

1. Distinguish between resolution and threshold.
2. Explain absolute pressure and vacuum pressure.
3. State the basic principle behind tachogenerator.
4. Define gauge factor.
5. Draw a block diagram of a system using the labels input, output and control.

II. Answer ALL questions of the following

10x2Marks=20 Marks

1. Explain the various types of errors in measurement systems.
2. List out the advantages of inductive transducer.
3. Explain the various types of temperature measurement system.
4. State the laws of thermocouple.
5. Why is a rotameter called variable area flow meter.
6. Explain the difference between the speed counter, tachoscope & tachometer.
7. What are the requirements of a strain gauge?
8. What are hygroscopic materials?
9. Classify the types of Dynamometers.
10. Explain the advantages of open loop.

**PART-B**

Answer ALL questions of the following

5x10 Marks= 50Marks

1. Draw the block diagram of a generalized measurement system and explain its various elements?

**(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. Enumerate the principle of operation of the following:
  - (a) Ultrasonic level measuring instrument
  - (b) Magnetic level indicator

**(OR)**

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

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

**(OR)**

6. a) Sketch and explain working principle of eddy current tachometer.  
b) Explain how a vibrometer is calibrated to measure acceleration.

7. (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.

**(OR)**

8. (a) Explain the function of a dummy gauge in a strain gauge load cell.  
(b) Sketch and explain the constructional details and working of a dew point meter.

9. Classify the Dynamometers and explain the working of a Block type prony brake dynamometer?

**(OR)**

10. a) Discuss Open and closed systems Servomechanisms in detail.  
b) Explain with the working of position control system.

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Gundlapochampally (H), Maisammaguda (V), Medchal (M), Medchal-Malkajgiri (Dist), Hyderabad**IV B.TECH I SEMESTER SUPPLEMENTARY EXAMINATIONS, APRIL-2019**Subject: Operations Research

Branch: ME

Time: 3 hours

Max. Marks: 75

**PART – A****I.** Answer ALL questions of the following**5x1Mark=5 Marks**

1. Write usage of artificial variable.
2. Define fair game.
3. Give any two applications of Queuing theory.
4. Define Economic Order Quantity.
5. What is Monte-Carlo method of simulation? Why is it called so?

**II.** Answer ALL questions of the following**10x2Marks=20 Marks**

1. What do you mean by the two- phase method for solving a given L.P.P? Why is it used?
2. Distinguish between the time minimization and cost minimization transportation problems.
3. Write a short note on dominance principle.
4. Distinguish group and individual replacements.
5. Write the elements of queuing systems.
6. Explain the terms balking and queue discipline.
7. Explain purchasing model with shortage.
8. Explain probabilistic models.
9. What are the applications of dynamic programming?
10. Explain why is simulation used?

**PART-B**

Answer ALL questions of the following

**5x10 Marks= 50Marks**

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

**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) 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) Find the sequence that minimizes the total elapsed time (in hours) required to complete on the following two machines.

Task	A	B	C	D	E	F	G
Machine I	2	5	4	9	6	2	7
Machine II	6	8	7	4	3	9	3

- 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) 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?

- 7) A commodity is to be supplied at a constant rate of 200 units per day. Supplies of any amount can be had at any required time, but each ordering costs Rs.50: costs of holding the commodity in inventory is Rs.2.00 per unit per day while the delay in the supply of the items includes a penalty of Rs.10 per unit per day. Find the optimal policy (Q,t), where 't' is the reorder cycle period and Q is the inventory level after reorder. Also find the optimal inventory level and shortage units. What would be the best policy if the penalty cost becomes infinity?

OR

- 8) An automobile company uses 6000 pistons per year. The company can manufacture the pistons at the rate of 36000 units per year with a set-up cost of Rs.2000. The cost of holding inventory per year is estimated to be Rs.8/- per unit and unit cost is Rs.40. If the company has a provision to allow shortage at the cost of Rs.20 per unit per year, find

- a) Optimal lot size b) No. of shortages c) Manufacturing time d) Time between set ups  
e) also find total cost (including material cost).

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

OR

- 10) What are the advantages and limitations of using simulation?



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**IV B.TECH I SEMESTER SUPPLEMENTARY EXAMINATIONS, APRIL-2019**Subject: Power Plant Engineering

Branch: ME

Time: 3 hours

Max. Marks: 75

**PART – A****I. Answer ALL questions of the following****5x1Mark=5 Marks**

1. What are the basic energy resources in India?
2. What is super charging of IC engine?
3. What is the purpose of surge tank in a hydroelectric power plant?
4. Define the term "Breeding"
5. Draw the load duration curve.

**II. Answer ALL questions of the following****10x2Mark=20 Marks**

1. What are the types of ash handling systems used in steam power plant.
2. Write the different types of draught systems used in steam power plant.
3. What are the methods used for starting a diesel engine?
4. Discuss the effect of inter cooling in a gas turbine plant.
5. What are the characteristics of drainage area
6. Expand HAWT, VAWT
7. Explain the function of nuclear reactor.
8. What factors control the selection of a particular type of a reactor?
9. What are the different methods of pollution control systems.
10. Define connected load, maximum demand and demand factor.

**PART-B****Answer ALL questions of the following****5x10 Marks= 50Marks**

1. With a neat sketch explain the different circuits of steam power plant.

**OR**

2. With neat sketch explain in detail about over feed and under feed fuel beds.
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
  - v. Exhaust system.

**(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 for site selection and location of a hydroelectric power plant

**[OR]**

6. What is solar radiation? Explain solar collector types and their technology.
7. Describes the boiling water reactor with the help of neat sketch and explain its chief characteristics.

**(OR)**

8. Explain the working of a typical fast breeder nuclear reactor power plant, with the help of neat diagram.
9. What the different types of pollution standards in India. Explain in detail.

**OR**

10. How to control the emissions from power plants. What is the effect on the environment (ozone layer). Explain in detail.

