Code No.: 40331 | MR14

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, NOVEMBER-2019

Subject: **POWER PLANT ENGINEERING**

Branch: **ME**

Time: 3 hours **Max. Marks: 75**

PART – A

I. Answer ALL questions of the following **5x1M=5 M**

1. List out the factors with which the unit size of the power plant is being decided.
2. How the gas turbine blades are cooled?
3. How does a solar panel work?
4. What are the advantages of nuclear power plant?
5. What are the various operating costs of coal fired steam power plant?

II. Answer ALL questions of the following **10x2M=20 M**

1. State the advantage of pulverized fuel firing.
2. What is drift? How is the drift eliminated in the cooling towers?
3. What are the components present in the diesel electric power plants?
4. Why is the maximum cycle temperature of gas turbine plant much lower than that of diesel power plant?
5. What are the factors to be considered while selecting a site for hydroelectric power plant?
6. What are the benefits of wind energy to the power system?
7. Explain the function of moderator.
8. What are the components of pressurized water reactor nuclear power plant?
9. What is the significance of two part tariff and three part tariff?
10. Define "Diversity factor".

PART-B

Answer ALL questions of the following **5x10 M= 50M**

1. What are the different types of cooling towers? Explain with a neat sketch.

OR

2. Explain the different types of coal handling process.
3. Explain the various types of cooling system used in diesel power plant.

OR

4. Explain the working of any one type of combustion chamber used in gas turbine plant.
5. Sketch the layout of hydroelectric power plant and explain the functions of each component in it. Discuss the advantages and limitations of this plant.

OR

6. What are the factors to be considered in selecting the site for the hydel plant? Explain the pumped storage plant with a neat sketch.
7. What are the difference between a pressurized water reactor nuclear power plant and boiling water reactor nuclear power plant?

OR

8. What are the advantages and disadvantages of nuclear power plant?
9. A central power station has annual factors as follows: Load factor = 60%

   Capacity factor = 40%

   Use factor = 45%

   Power station has a maximum demand of 15,000kW.

   Determine Annual energy production, Reserve capacity over and above peak load, Hours per year not in service.

OR

10. Explain the major factors that decide the economics of power plants?

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IV B.TECH I SEMESTER SUPPLEMENTARY EXAMINATIONS, NOVEMBER-2019

Subject: **ROBOTICS**

Branch: **ME**

Time: 3 hours **Max. Marks: 75**

PART – A

I. Answer ALL questions of the following **5x1M=5 M**

1. What is mean by automation?
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. What is potentiometer?
5. List out Machine loading and unloading application.

II. Answer ALL questions of the following **10x2M=20 M**

1. What are the present applications of industrial robot?
2. What are the advantages of industrial robot?
3. Explain about different parameters in D-H notations with a neat sketch.
4. Define the homogeneous transformations with example.
5. What are the popular robot programming languages?
6. What is teach pendant?
7. Explain encoders.
8. Explain stepper motors.
9. What are the general considerations of robotics?
10. What are steps involved in loading and unloading processing with robots?

PART-B

Answer ALL questions of the following **5x10 M= 50M**

1. a) Explain the main Robot anatomy with neat sketch.
   b) Classify different typea of robots based on coordinate systems with neat sketch.

(OR)

2. What are the different types of end effecters and Describe mechanical grippers with line sketches?

3. Compute the manipulator transformation matrix for the 3 D.O.F manipulator arm with Cartesian (PPP) configuration. Three prismatic joints are perpendicular to each other and a possible frame assignment is given in the figure.

(OR)

4. (a) With neat sketches explain about pure translation and pure rotation in homogeneous transformation.
   (b) Find the transformation matrices for the following operations on the point $-5i + 4j + 7k$.
   (i) Rotate 45 degrees about z-axis and then translate 4 units along y-axis,
   (ii) Translate 2 units along z-axis and rotate 60 degrees about y-axis.

5. For the manipulator shown in figure 1 below, obtain the Jacobian to express the Cartesian velocities in terms of the joint velocities.

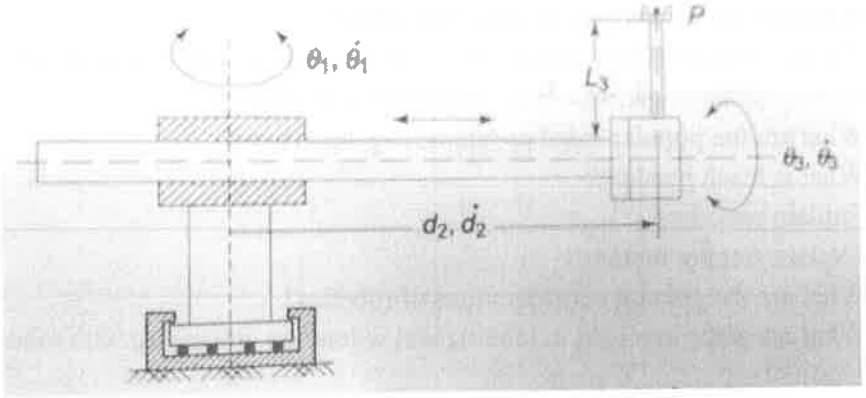

Figure 1

(OR)

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

7. List and explain the different types of position sensors with neat sketches.

(OR)

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

9. Discuss the applications of robots in assembly and inspection.

(OR)

10. Enumerate the advantages and limitation of using robots in following applications.
    (i) Welding (ii) Spray painting.