

**6TH SEM./MECH/MECH(PROD.)/ MECH(MAIN.) / DME/MECH(IND.INT)/
MECH(SAND.) /AUTO/ 2022(S)
TH-1 Industrial Engineering & Management**

Full Marks: 80

Time- 3 Hrs

Answer any five Questions including Q No.1& 2
Figures in the right-hand margin indicates marks

1. Answer **All** questions 2 x 10
 - a. What are the three times estimate in PERT analysis?
 - b. Define plant layout.
 - c. State the significance of ISO certification.
 - d. What are the limitations of the graphical method in solving LPP?
 - e. Define CPM.
 - f. State the uses of inventory.
 - g. What is the need of inspection?
 - h. Define Quality & Control.
 - i. What do you mean by operation research?
 - j. State the three objectives of plant maintenance.

2. Answer **Any Six** Questions 6 x 5
 - a. State the advantages & disadvantages of master scheduling.
 - b. What are the factors which affect the quality of manufacturing?
 - c. Compare PERT with CPM.
 - d. Explain ABC analysis.
 - e. Describe different types of over heads.
 - f. Give symptoms of a bad plant layout.
 - g. What are the characteristics if ISO-9000?

3 Explain different factors influencing plant location. 10

4 Find the critical path and the duration of project completion for the data given in table. 10

Activity	Predecessor	Duration
A	-	7
B	-	13
C	A	10
D	A	17
E	B	3
F	D, E	26

5 What are the different types of control chart? Discuss about $\bar{X}$ -Chart & P-Chart 10

6 Find the graphical solution of LPP for the following condition 10
Min $Z = 60x + 40y$
Subject to

$$30x + 10y \geq 240$$

$$10x + 10y \geq 160$$

$$20x + 60y \geq 480$$

$$x, y \geq 0$$

7 Write short notes on: 10

- a Scheduling
- b Breakdown Maintenance
- c Six Sigma
- d Job Order production

Th-2 AUTOMOBILE ENGINEERING & HYBRID VEHICLES

Full Marks: 80

Time- 3 Hrs

Answer any five Questions including Q No.1& 2
Figures in the right hand margin indicates marks

1. Answer **All** questions 2 x 10
 - a. What is Air Fuel ratio?
 - b. What is the need of a Differential?
 - c. Define Automobile.
 - d. What is the function of a Spark Plug?
 - e. What is an Electric Vehicle? Give two examples.
 - f. Which types of batteries are used in an Electric Vehicle?
 - g. Name various types of Fuel cells.
 - h. What is the need of braking system in automobile?
 - i. How ignition takes place in petrol engine?
 - j. What do you mean by Carburetion process?
2. Answer **Any Six** Questions 6 x 5
 - a. Write down the advantages of Hydraulic Brake.
 - b. State the layout of Automobile chassis with major components.
 - c. Differentiate between Sliding mesh and Synchromesh gear box.
 - d. Differentiate between Hybrid Vehicle and Electric Vehicle.
 - e. Explain the common ignition troubles and its remedies.
 - f. With a help of neat sketch, show the pump circulation system of water cooling.
 - g. What are components of Transmission system? Explain in brief.
3. Describe the lubrication system of I.C engine. 10
4. Describe the working principle of Fuel Feed Pump with neat sketch. 10
5. Describe the working of Single Plate Clutch with neat sketch. 10
6. Describe constructional features and working of a Telescopic Shock Absorber. 10
7. Describe the working principle of fuel injection system for multi cylinder (in-line) engine. 10

**6TH SEM./MECH./DME/MECH(PROD.)/MECH(MAINT)/
MECH(IND.INT)MECH(SAND)/2022(S)
TH-3 Power Station Engineering**

Full Marks: 80

Time- 3 Hrs

Answer any five Questions including Q No.1& 2
Figures in the right hand margin indicates marks

1. Answer **All** questions 2 x 10
 - a. Classify power plant.
 - b. Define specific steam consumptions.
 - c. What is an Air Pre-heater? State its field of use.
 - d. What is Nuclear Reactor?
 - e. What is the function of surge tank in Hydro electric power plant?
 - f. Draw P-V & T-S diagram of Rankine cycle.
 - g. Define Draught.
 - h. Write name of fuels used in Gas Turbine power station?
 - i. What is the function of cooling tower?
 - j. What is the function of steam condenser?

2. Answer **Any Six** Questions 6 x 5
 - a. Write the difference between Jet condenser and Surface condenser.
 - b. State merits and demerits of Gas turbine station.
 - c. State the criteria for selection of site for a Hydel power plant.
 - d. Explain the working principle of ESP.
 - e. Explain fuel storage and supply system in a diesel power plant.
 - f. Differentiate between Captive and Central power plant.
 - g. Differentiate between boiler mountings and accessories.

3. Describe layout of steam power station. 10

4. Explain the working of PWR with neat sketch. 10

5. Explain the working of diesel power plant. 10

6. A simple Rankine cycle works between pressure 28 bar and 0.06 bar. The initial condition of steam being dry saturated. Calculate the cycle efficiency, work ratio & SSC. 10

7. Define compounding. Explain pressure & velocity compounding with neat sketch. 10

Th4 Advance Manufacturing Processes

Full Marks: 80

Time- 3 Hrs

Answer any five Questions including Q No.1& 2
Figures in the right-hand margin indicates marks

1. Answer **All** questions 2 x 10
 - a. How an Ultrasonic Machining tool removes the material?
 - b. Explain Encapsulation process.
 - c. What is meant by Manufacturing?
 - d. Define Additive Manufacturing process.
 - e. Name two process parameters that affect extrusion of plastics.
 - f. What is Concurrent Engineering?
 - g. What is meant by processability of plastics?
 - h. State the purpose of Maintenance.
 - i. State the layouts of Special Purpose Machining.
 - j. State the full form of LASER.
2. Answer **Any Six** Questions 6 x 5
 - a. Discuss about Calendering process with sketch.
 - b. Compare Additive Manufacturing with CNC.
 - c. Discuss about Abrasive Jet Machining Process with diagram.
 - d. Explain Repair cycle.
 - e. What is Total Productive Maintenance?
 - f. Explain Injection Moulding process with diagram.
 - g. Discuss about Special Purpose Machining.
3. Discuss about any two types of Thermoforming process with sketch. 10
4. Discuss about different types of Machine Tool maintenance. 10
5. Describe briefly about Blow Moulding Process with neat sketch. 10
6. Explain Electric Discharge Machining Process with neat sketch. 10
7. Discuss about the 3-D Printing process principle, materials, advantages and limitations with necessary diagram. 10