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<b>R-17</b>
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**Code: 7G587**

IV B.Tech. II Semester Regular & Supplementary Examinations June 2022

**Power Plant Engineering**  
( Mechanical Engineering )

Max. Marks: 70

Time: 3 Hours

Answer any five full questions by choosing one question from each unit ( 5x14 = 70 Marks )

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Marks	CO	Blooms Level
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<b>UNIT-I</b>
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|--|-----|---|----|
| 1. Explain with a neat sketch the working of a thermal power plant and discuss the function of major components in it. | 14M | 1 | L2 |
|--|-----|---|----|

**OR**

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|---|-----|---|----|
| 2. Enumerate the steps involved in coal handling and describe the in plant coal handling with a neat diagram. | 14M | 1 | L3 |
|---|-----|---|----|

<b>UNIT-II</b>
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|--|-----|---|----|
| 3. With the help of a neat diagram, explain chain grate stoker. List a few advantages and disadvantages. | 14M | 2 | L1 |
|--|-----|---|----|

**OR**

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|---|-----|---|----|
| 4. Explain with sketch the operation of balanced draught system. What are its advantages? | 14M | 2 | L2 |
|---|-----|---|----|

<b>UNIT-III</b>
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|---|-----|---|----|
| 5. Discuss the essential components of a diesel power plant with neat layout. | 14M | 3 | L1 |
|---|-----|---|----|

**OR**

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|---|-----|---|----|
| 6. Explain the working details of gas turbine power plant indicating all auxiliaries. | 14M | 3 | L2 |
|---|-----|---|----|

<b>UNIT-IV</b>
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|--|-----|---|----|
| 7. What is Hydrological cycle? Explain its significance in locating the site and design of hydroelectric power plants. | 14M | 4 | L1 |
|--|-----|---|----|

**OR**

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|---|-----|---|----|
| 8. Enumerate and explain the essential components of a nuclear reactor. | 14M | 4 | L3 |
|---|-----|---|----|

<b>UNIT-V</b>
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|---|-----|---|----|
| 9. How to make use of the tides for power generation based on their capacities? Explain the principle of operation. | 14M | 5 | L2 |
|---|-----|---|----|

**OR**

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|---|-----|---|----|
| 10. Estimate the generating cost per unit supplied from a power plant having the following data: (i) Plant capacity = 120 MW; Capital cost = Rs.600 × 10 <sup>6</sup> ; Annual load factor = 40 %; Annual cost of fuel, taxation, oil and salaries = Rs.500000; Interest and Depreciation = 12 %. | 14M | 5 | L4 |
|---|-----|---|----|

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<b>R-17</b>
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**Code: 7G583**

IV B.Tech. II Semester Regular & Supplementary Examinations June 2022

**Rapid Prototyping**  
( Mechanical Engineering )

Max. Marks: 70

Time: 3 Hours

Answer any five full questions by choosing one question from each unit ( 5x14 = 70 Marks )

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	Marks	CO	Blooms Level
<b>UNIT-I</b>			
1. a) What are the key aspects of RPT?	4M	CO1	BL1
b) Discuss the evolution of RP systems indicating the history and their growth rate in the industrial sector.	10M	CO1	BL1
<b>OR</b>			
2. a) What are the advantages of Rapid Prototyping?	6M	CO1	BL2
b) Explain in detail the process chain of Rapid Prototyping.	8M	CO1	BL2
<b>UNIT-II</b>			
3. a) Explain about data formats and data interfacing.	7M	CO2	BL2
b) What is part orientation? Explain with illustrations.	7M	CO2	BL2
<b>OR</b>			
4. a) List various Rapid Prototyping Data Formats? Explain about the significance of STL format?	8M	CO2	BL3
b) Discuss various aspects of tool path generation.	6M	CO2	BL3
<b>UNIT-III</b>			
5. a) What are the part building and post building process involved in SLA?	8M	CO3	BL2
b) Explain the working principle of SGC.	6M	CO3	BL2
<b>OR</b>			
6. a) Explain the working principle of LOM.	7M	CO3	BL1
b) What are the steps in pre build and post-build process for LOM?	7M	CO3	BL1
<b>UNIT-IV</b>			
7. a) What are the processing techniques used in LENS?	7M	CO4	BL3
b) What are the advantages and limitations of LENS? Explain with examples.	7M	CO4	BL3
<b>OR</b>			
8. a) Explain how SLS process can be used to produce direct and in-direct prototypes.	7M	CO4	BL2
b) What are different types of materials available for the SLS system? What are their respective applications?	7M	CO4	BL2
<b>UNIT-V</b>			
9. a) Discuss how RPT can be used for the production of rapid tooling for aerospace and electronics industries.	7M	CO5	BL3
b) Explain the process of RTV epoxy tooling. Write advantages, disadvantages and applications of it.	7M	CO5	BL3
<b>OR</b>			
10. a) With a neat sketch explain Arc spray metal tooling.	7M	CO5	BL4
b) Which rapid tooling techniques are best suited for production of ceramic parts? Explain anyone.	7M	CO5	BL4

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**Code: 7G581**

IV B.Tech. II Semester Regular & Supplementary Examinations June 2022

## **Supply Chain Management**

( Mechanical Engineering )

Max. Marks: 70

Time: 3 Hours

Answer any five full questions by choosing one question from each unit ( 5x14 = 70 Marks )

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	Marks	CO	Blooms Level
<b>UNIT-I</b>			
1. a) Classify the supply chain macro processes in a firm	4M	CO1	L1
b) Why should a firm such as Dell take into account total supply chain profitability when making decisions?	10M	CO1	L2
<b>OR</b>			
2. a) Describe the major challenges that must be overcome to manage a supply chain successfully	4M	CO1	L3
b) How would you characterize the competitive strategy of a high-end department store chain such as Nordstrom? What are the key customer needs that Nordstrom aims to fill?	10M	CO1	L4M
<b>UNIT-II</b>			
3. What type of network is best suited to highly differentiated products?	14M	CO2	L2
<b>OR</b>			
4. a) Explain the frame work for Network Design Decision?	7M	CO2	L2
b) Classify the different types of supply chain networks?	7M	CO2	L2
<b>UNIT-III</b>			
5. a) What do you understand the impact of trade promotions on lot size and cycle inventory	6M	CO3	L1
b) Explain the modes of transportation and their performance characteristics.	8M	CO3	L4
<b>OR</b>			
6. Discuss key drivers that may be used to tailor transportation. How does tailoring help?	14M	CO3	L4
<b>UNIT-IV</b>			
7. Explain the role of sourcing in a supply chain.	14M	CO4	L4
<b>OR</b>			
8. Why do you think assembly in the consumer electronics industry is performed by third parties, whereas assembly in the auto industry is almost never outsourced?	14M	CO4	L3
<b>UNIT-V</b>			
9. Write short notes on (i) CRM (ii) SRM	14M	CO5	L3
<b>OR</b>			
10. Which processes within each macro process are best suited to being enabled by IT? Which processes are least suited?	14M	CO5	L3

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**Code: 7G588**

IV B.Tech. II Semester Regular & Supplementary Examinations June 2022

**Unconventional Machining Processes**

( Mechanical Engineering )

Max. Marks: 70

Time: 3 Hours

Answer any five full questions by choosing one question from each unit ( 5x14 = 70 Marks )

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	Marks	CO	Blooms Level
<b>UNIT-I</b>			
1. a) "Tool may be present or may not be present in non-traditional machining process". <b>Justify</b> the statement.	4M	1	L5
b) <b>Classify</b> the common non-traditional methods. Give a list of such operations.	10M	1	L4
<b>OR</b>			
2. a) What are the types of transducers used in Ultrasonic machining? <b>Explain</b> their working principles. What is the function of horn in USM? What are different types of horns? What are the feeding mechanisms used for the tool?	10M	1	L2
b) <b>Discuss</b> the effects of the amplitude and frequency of vibrations, abrasive grain size and mass flow rate on the rate of material removal and surface finish obtainable in ultrasonic machining.	4M	1	L2
<b>UNIT-II</b>			
3. a) <b>Write</b> short notes on abrasives used in Abrasive Jet Machining (AJM).	7M	2	L1
b) <b>Name</b> different gases used in AJM.	4M	2	L1
c) <b>Paraphrase</b> the term mixing ratio in AJM process? <b>Explain</b> How mixing ratio affect the MRR?	3M	2	L2
<b>OR</b>			
4. a) <b>List</b> the advantages and disadvantages of WJM system.	7M	2	L1
b) <b>Explain</b> about the principle of water jet machining.	7M	2	L2
<b>UNIT-III</b>			
5. a) <b>What</b> the reaction are possible in cathode (tool) and anode (workpiece) in ECM process? (Assume electrolyte NaCl)?	7M	3	L1
b) <b>What</b> are the operations performed in ECM?	7M	3	L1
<b>OR</b>			
6. a) <b>List</b> the newer machining processes which use electro chemical energy.	7M	3	L1
b) <b>Explain</b> How electrochemical grinding is superior to conventional grinding?	7M	3	L2
<b>UNIT-IV</b>			
7. a) <b>Explain</b> the selection of different types of electrode materials in EDM process.	7M	4	L2
b) <b>List</b> the factors which govern the MRR in Electro Discharge Machining (EDM).	7M	4	L1
<b>OR</b>			
8. a) What is recast layer in electro-discharge machining? <b>Explain</b>	7M	4	L2
b) <b>Name</b> some of the dielectric fluids commonly used in EDM. Name some of the tool material used in EDM.	7M	4	L1
<b>UNIT-V</b>			
9. a) <b>What</b> is meant by "Doping" of LASER? <b>List</b> the doping materials with their advantages.	7M	5	L1
b) <b>Explain</b> the principle of PAM. Discuss the application of plasma for machining.	7M	5	L2
<b>OR</b>			
10. a) <b>What</b> is the purpose of deflection coil in EBM process?	7M	5	L1
b) <b>Compare</b> EBM and LBM on the following aspects: (i) Machining rate    (ii) Tool wear rate    (iii) Accuracy.	7M	5	L2

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**Code: 7G586**

IV B.Tech. II Semester Regular & Supplementary Examinations June 2022

**Non-Conventional Sources of Energy**

( Mechanical Engineering )

Max. Marks: 70

Time: 3 Hours

Answer any five full questions by choosing one question from each unit ( 5x14 = 70 Marks )

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Marks	CO	Blooms Level
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**UNIT-I**

- |    |  |     |     |     |
|----|--|-----|-----|-----|
| 1. | With the aid of neat sketches, explain the working of<br>i) Pyrheliometer and ii) Pyranometer. | 14M | CO1 | PO2 |
|----|--|-----|-----|-----|

**OR**

- |    |   |    |     |     |
|----|---|----|-----|-----|
| 2. | a) Discuss about the role and potential of New and Renewable sources of energy.   | 7M | CO1 | PO2 |
|    | b) Find the hour angle at the sunrise and the sunset on March 22 for a surface inclined at an angle 20° facing south at New Delhi (28° 35' N, 77° 12' E). | 7M | CO1 | PO3 |

**UNIT-II**

- |    |   |     |     |     |
|----|---|-----|-----|-----|
| 3. | a) Explain the main components of a Flat plate Solar collector with a neat diagram. | 10M | CO2 | PO2 |
|    | b) Compare between the Concentrating Collectors and Flat plate Collectors.          | 4M  | CO2 | PO2 |

**OR**

- |    |  |    |     |     |
|----|--|----|-----|-----|
| 4. | a) Enumerate the different types of Concentrating type collectors.       | 7M | CO2 | PO1 |
|    | b) Describe briefly the working of a Solar pond. Write its applications. | 7M | CO2 | PO2 |

**UNIT-III**

- |    |   |    |     |     |
|----|---|----|-----|-----|
| 5. | a) Discuss the advantages and disadvantages of Horizontal and Vertical axis Wind turbines.          | 7M | CO3 | PO2 |
|    | b) With the aid of a neat sketch, explain the working of KVIC digester (Floating gas holder plant). | 7M | CO3 | PO2 |

**OR**

- |    |  |     |     |     |
|----|--|-----|-----|-----|
| 6. | Describe with a neat sketch the working of a horizontal axis wind turbines with its main components. | 14M | CO3 | PO2 |
|----|--|-----|-----|-----|

**UNIT-IV**

- |    |   |     |     |     |
|----|---|-----|-----|-----|
| 7. | Explain with a schematic diagram, working of Liquid dominated total flow geothermal system. | 14M | CO4 | PO2 |
|----|---|-----|-----|-----|

**OR**

- |    |   |    |     |     |
|----|---|----|-----|-----|
| 8. | a) Explain the three basic kinds of Geo thermal resources.            | 7M | CO4 | PO2 |
|    | b) Estimate the energy and power in simple single basin Tidal system. | 7M | CO4 | PO3 |

**UNIT-V**

- |    |  |     |     |     |
|----|--|-----|-----|-----|
| 9. | a) What are the advantages of using MHD systems?   | 4M  | CO5 | PO1 |
|    | b) With the aid of a neat sketch, describe the principle of working of a Fuel cell with reference to H2-O2 cell. | 10M | CO5 | PO2 |

**OR**

- |     |  |     |     |     |
|-----|--|-----|-----|-----|
| 10. | a) With the aid of a neat sketch, explain the working of a Closed cycle MHD generator. | 10M | CO5 | PO2 |
|     | b) What are the advantages and disadvantages of a Fuel cell?                           | 4M  | CO5 | PO1 |

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**Code: 7G584**

IV B.Tech. II Semester Regular & Supplementary Examinations June 2022

**Production and Operations Management**

( Mechanical Engineering)

Max. Marks: 70

Time: 3 Hours

Answer any five full questions by choosing one question from each unit ( 5x14 = 70 Marks )

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	Marks	CO	Blooms Level
<b>UNIT-I</b>			
1. What is Production and Operations Management? Make an overview about POM.	14M	CO1	1
<b>OR</b>			
2. Explain Different Types of Forecasting Techniques in detail.	14M	CO1	2
<b>UNIT-II</b>			
3. What is Plant Location? Discuss the factors affecting Plant Location with suitable illustrations.	14M	CO2	2
<b>OR</b>			
4. What are the different types of Plant Layouts? How should an organisation decide on, which Plant Layout to choose?	14M	CO2	1
<b>UNIT-III</b>			
5. Define Capacity Planning. Analyze various strategies of Capacity Planning.	14M	CO3	4
<b>OR</b>			
6. What is Line of Balance? Describe the LOB Technique with an illustration.	14M	CO4	2
<b>UNIT-IV</b>			
7. What is Priority Sequencing? List various criteria used in it and state how an appropriate sequencing rule in practice?	14M	CO4	1
<b>OR</b>			
8. What is scheduling in job? Demonstrate the concept underlying its importance.	14M	CO4	3
<b>UNIT-V</b>			
9. What is Total Quality Management? Evaluate its Key Components.	14M	CO5	5
<b>OR</b>			
10. Why do manufacturing industries need "Six Sigma"? Elaborate.	14M	CO5	1

\*\*\*END\*\*\*