

Hall Ticket Number :

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R11/R13

Code: 1G582

IV B.Tech. II Semester Regular & Supplementary Examinations April 2017

Power Plant Engineering
(Mechanical Engineering)

Max. Marks: 70

Time: 3 Hours

Answer any **five** questions

All Questions carry equal marks (**14 Marks** each)

1. a) Draw the layout of steam power plant and explain its working principle. 10M
b) State the characteristics of good ash handling plant. 4M
2. a) Sketch and explain the working of any two types of stokers. 8M
b) Write the advantages and disadvantages of pulverized fuel firing system. 6M
3. a) Write a note on fuel supply system for diesel power plant. 8M
b) Discuss the applications of diesel power plant. 6M
4. a) Differentiate between open and closed cycle gas turbine power plant. 4M
b) Elaborate on various methods used to increase the efficiency of gas turbine power plant. 10M
5. a) List the factors to be considered for selecting a site for hydro electric power plant. 8M
b) What are the advantages and disadvantages of micro hydro power plants ? 6M
6. a) Name the various types of solar energy collectors. 4M
b) Explain with neat sketch, the working of MHD power generation system. 10M
7. a) Draw the layout of a nuclear power plant and explain its working. 8M
b) Explain the various methods of waste disposal in nuclear power plants. 6M
8. a) List the various types of tariffs. 4M
b) Calculate the cost of power generation per kWh for a power station having the following data : Installed capacity of the plant = 200 MW, Capital cost = Rs. 400 crores, Rate of interest and depreciation = 12 %, Annual cost of fuel, salaries and taxation = Rs. 5 crores and load factor = 50 %. 10M

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R11/R13

Code: 1G585

IV B.Tech. II Semester Regular & Supplementary Examinations April 2017

Non Conventional Sources of Energy

(Mechanical Engineering)

Max. Marks: 70

Time: 3 Hours

Answer any **five** questions

All Questions carry equal marks (**14 Marks** each)

1. a) Write down the empirical equation for estimating the monthly average of daily global radiation on a tilted surface. 7M
b) Define solar constant. What are the reasons for variation in solar radiation reaching earth than received at the outside of the atmosphere? 7M
2. a) List different methods of harnessing solar energy. 6M
b) Compare the performance of various types of solar collectors. How is focusing accomplished in parabolic dish collector? 8M
3. a) Discuss briefly solar absorption cooling system using a simple block diagram. 7M
b) Explain the principle of conversion of solar energy in to heat. 7M
4. a) Explain principles of power generation in windmills. Derive an expression for maximum efficiency. 10M
b) Discuss merits and demerits of wind energy. 4M
5. a) What are the biomass conversion technologies? Draw a schematic diagram to explain various conversion technologies and products. 10M
b) List out the problems involved with biogas production. 4M
6. a) What is plate tectonic theory and how is it related to geothermal energy? 7M
b) Briefly explain methods of harnessing geothermal energy in geothermal power plants. 7M
7. a) Briefly explain critical criteria in the design of ocean thermal energy conversion plants. 7M
b) What are the civil works design considerations for mini-hydel power plants? 7M
8. a) What is the need for direct energy conversions? Explain its limitations. 7M
b) Briefly describe the operation fuel cell. How do you select fuels in the cell based on different operating conditions? 7M

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R11/R13

Code: 1G587

IV B.Tech. II Semester Regular & Supplementary Examinations April 2017

Supply Chain Management

(Mechanical Engineering)

Max. Marks: 70

Time: 3 Hours

Answer any **five** questions

All Questions carry equal marks (**14 Marks** each)

1. a) Describe how a company achieves strategic fit between its supply chain strategy and its competitive strategy 8M
b) Why is Supply Chain Management important? 6M
2. a) Discuss the strengths and weaknesses of various distribution options. 6M
b) What are the key factors that drive network design decisions? 8M
3. a) Explain the role of facility decisions in designing a supply chain network 6M
b) What is a dynamic warehouse location? When it is more appropriate to use this approach? 8M
4. Daily demand for PCs at Dell is normally distributed, with a mean of 2500 and a standard deviation of 500. A key component in PC assembly is the hard drive. The hard drive supplier takes an average of $L=7$ days to replenish inventory at Dell. Dell is targeting a CSL of 90 percent (providing a fill rate close to 100 percent) for its hard drive inventory. Evaluate the safety inventory of hard drives that Dell must carry if the standard deviation of the lead time is seven days. Dell is working with the supplier to reduce the standard deviation to zero. Evaluate the reduction in safety inventory that Dell can expect as a result of this initiative. 14M
5. a) Explain the role of sourcing in a supply chain 7M
b) Discuss factors that affect the decision to outsource a supply chain function. 7M
6. a) What are the main drivers of transportation decisions within a firm? 6M
b) Why transportation is considered so important to the India economy? Why is it so important to an individual firm? 8M
7. a) What are the main causes of bullwhip effect? 7M
b) Discuss managerial levers that help achieve coordination in a supply chain. 7M
8. a) What are the key challenges in adapting IT to improve the efficiency of the supply chain? 7M
b) What are the ways in which a firm can simultaneously reduce supply chain costs and improve customer service? 7M

Code: 1G581

IV B.Tech. II Semester Regular & Supplementary Examinations April 2017

Production & Operations Management

(Mechanical Engineering)

Max. Marks: 70

Time: 3 Hours

Answer any **five** questions

All Questions carry equal marks (**14 Marks** each)

- 1. a) What do you mean by hierarchical production planning? Are there any benefits in this exercise? 7M
- b) Use an example to demonstrate hierarchical production planning? 7M
- 2. a) What are the different types of forecasting? 2M
- b) A health services provider needs to estimate the demand for a certain type of service on a weekly basis. This information is important for planning manpower allocation decisions. Table1 has data on the demand for the services in the last 6 weeks. The organization is currently using an exponential smoothening model with an alpha value of 0.25.

Table 1: Data on demand for services in six weeks.

Week	Demand
Week1	60
Week2	85
Week3	120
Week4	90
Week5	100
Week6	80

Demonstrate the usefulness of the focus forecasting technology (exponential smoothening) by forecasting the demand during weeks 2 to 5 12M

- 3. a) What are the different types of layouts? How should an organization decide on which layout to choose? 7M
- b) Describe computerized layout ALDEP? 7M
- 4. a) What is the meaning of the term aggregate plan? What are the objectives of aggregate plans? 7M
- b) Discuss the relevant cost components involved in aggregate planning decisions? 7M
- 5. a) What are the benefits of ABC analysis? 7M
- b) Discuss EOQ model by taking suitable example? 7M
- 6. a) Discuss scheduling techniques? 4M
- b) Consider the following two machines and 3 jobs flow shop problem. Check whether Johnson's rule can be extended to this problem. If so, what is the optimal schedule and the corresponding make span?

Job	Processing Time	
	Machine 1	Machine 2
1	7	3
2	5	7
3	10	4

- 7. a) How is MRP II different from MRP? What are the additional advantages that an organization 10M
- b) What are the inputs to material requirement planning? 4M
- 8. a) What is lean management? Why do organizations need it? 7M
- b) Under what conditions will the kanban-based scheduling systems fail to produce satisfactory results? 7M
