

IV B.Tech. II Semester Regular Examinations April 2015  
**Production & Operations Management**  
 ( Mechanical Engineering )

Max. Marks: 70

Time: 03 Hours

Answer any five questions

All Questions carry equal marks (14 Marks each)

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1. a) Discuss the Functions of production planning & controls operations 7M  
 b) Discuss about new product development 7M
2. a) Explain least square method of forecasting technique 7M  
 b) Using exponential smoothing techniques, compute the forecast from the following data (time series) under the situation when ( compute the forecast for the 11th period

Month	1	2	3	4	5	6	7	8	9	10
Demand	10	12	8	11	9	10	15	14	16	15

use exponential coeff  $\alpha=0.35$ .

3. a) Discuss the Factors affecting facilities location 7M  
 b) Describe product layout, process layout, group technology layout 7M
4. a) State the Strategies for aggregates planning 7M  
 b) Discuss the aggregate planning using O.R. models 7M
5. a) State the Functions of inventories. Derive Wilson's EOQ formula 7M  
 b) Describe ABC and VED analysis of selective inventory management 7M
6. a) Discuss about Scheduling Policies 7M  
 b) Consider the following three machines and 5 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? the processing time in hour is indicated in following table

job	Machine 1	Machine 2	Machine 3
1	07	05	03
2	09	06	08
3	05	02	07
4	06	03	05
5	10	04	04

7. a) What is MRP, discuss on lot sizing techniques in MRP 7M  
 b) How line balancing is done 7M
8. a) What is Lean Management? How Kanban System help? 7M  
 b) What is Six Sigma Quality control, how it can be achieved 7M

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## IV B.Tech. II Semester Regular Examinations April 2015

**Supply Chain Management**  
( Mechanical Engineering )

Max. Marks: 70

Time: 03 Hours

Answer any five questions

All Questions carry equal marks (14 Marks each)

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|-------|---|-----|
| 1. a) | Explain a supply chain with an example  | 6M  |
| b)    | What are the supply chain strategies? Explain them  | 8M  |
| 2. a) | What types of distribution networks are typically best suited for commodity items.  | 7M  |
| b)    | What are some examples of very effective distribution networks?   | 7M  |
| 3. a) | Distinguish capacity location and facility location with suitable examples  | 7M  |
| b)    | With help of a case study, explain the factors influencing facility locations of a modern organization.                               | 7M  |
| 4. a) | What is the role of safety inventory in the supply chain?   | 6M  |
| b)    | Discuss about managing multi-echelon cycle inventory.   | 8M  |
| 5. a) | Explain methods of supplier scoring and assessment.   | 8M  |
| b)    | What are the factors considered in supplier selection?  | 6M  |
| 6. a) | Explain the modes of transportation and their performance characteristics.  | 7M  |
| b)    | Discuss about revenue management in the supply chain.   | 7M  |
| 7. a) | What is the bullwhip effect and how does it relate to lack of coordination in the supply chain?                                       | 7M  |
| b)    | What issues must be considered when designing a supply chain relationship to improve the chances of developing cooperation and trust? | 7M  |
| 8. a) | What are the key advantages that best-of-breed software companies provide?  | 4M  |
| b)    | Write about the role of E- business in a supply chain.  | 10M |

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## IV B.Tech. II Semester Regular Examinations April 2015

**Non Conventional Sources of Energy***( Mechanical Engineering )***Max. Marks: 70****Time: 03 Hours**

Answer any five questions

All Questions carry equal marks (14 Marks each)

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1. a) With the aid of a neat sketch, explain the working of Abbot silver disc Pyrheliometer. 7M  
b) With the aid of a neat sketch, explain the working of any one type of Pyranometer. 7M
2. a) With the aid of neat sketches, enumerate the different types of concentrated type collectors. 8M  
b) What are the advantages and disadvantages of concentrating collectors over flat plate collectors? 6M
3. a) Describe in brief the different energy storage methods used in the solar system. 6M  
b) With the aid of neat sketch describe a non-convective solar pond for solar energy collection and storage. 8M
4. Wind at 1 standard atmospheric pressure and 15°C has a velocity of 15 m/s. Calculate:  
(i) The total power density in the wind stream.  
(ii) The maximum obtainable power density.  
(iii) The total power and  
(iv) The torque and axial thrust.  
Given: turbine diameter = 120 m, turbine operating speed = 40 rpm at maximum efficiency. Propeller type wind turbine is considered. 14M
5. a) What are the advantages and disadvantages of floating drum biogas digester? 6M  
b) Explain in detail the various factors that affect generation of biogas. 8M
6. A hot water geothermal plant of the total flow type receives water at 225°C. The pressure at turbine inlet is 10 bar absolute. The plant uses a direct contact condenser that operates at 0.34 bar absolute. The turbine has a polytrophic efficiency of 0.65. For a cycle net output of 10 MW, calculate: (i) the hot water flow in kg/hour; (ii) the condenser cooling water flow in kg/hour if such water is available at 27°C; (iii) the cycle efficiency and (iv) the plant heat rate. 14M
7. a) With the help of a neat sketch explain the working of an OTEC closed cycle system. 7M  
b) The observed difference between the high and low water tide is 8.5 m, for a proposed tidal site. The basin area is about 0.5 sqkm which can generate power for 3 hours in each cycle. The average available head is assumed to be 8 m, and the overall efficiency of the generation to be 70%. Calculate the power at any instant and the yearly power output. Assume the density of sea water to be 1025 kg/m<sup>3</sup>. 7M
8. a) Describe an MHD closed cycle system with the help of a neat sketch. 8M  
b) Describe the principle of working of a fuel cell with reference to H<sub>2</sub> – O<sub>2</sub> cell. 6M

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**Power Plant Engineering**  
( Mechanical Engineering )

Max. Marks: 70

Time: 03 Hours

Answer any five questions

All Questions carry equal marks (14 Marks each)

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1. a) Draw a chart showing operations and devices used in coal handling plant and explain each and every component of the circuit. 7M  
 b) Describe different types of conveyors used for transferring of coal with suitable diagrams. 7M
2. a) What is the need of draught in steam power plant? Explain how to create the natural draught. 7M  
 b) Why pure water is required in the condenser? Explain the methods to purify the water in steam power plants. 7M
3. a) Explain the advantages and disadvantages of diesel power plants over gas turbine power plants 7M  
 b) Draw the schematic layout of diesel cycle power plant along with auxiliary components and explain the salient points. 7M
4. a) How to convert the steam power plant into combined cycle power plant? Differentiate between topping and bottoming units of the combined cycle power plant. 7M  
 b) Explain the constructional features of closed cycle gas turbine power plant along with suitable diagram. 7M
5. a) What do you understand by water hammer and how can it influence the power generation in hydro power plants? 7M  
 b) What are the functions of a surge tank fore bay and draft tube in a hydraulic power plant? 7M
6. a) What is solar energy? What is a solar collector? Explain briefly the solar collector used for power generation. 7M  
 b) Explain the working principle of thermoelectric power generation and derive the equation for the estimation of thermal efficiency. 7M
7. a) How nuclear reactors are classified? Explain them with suitable examples. 5M  
 b) Describe the fast breeder reactor with a neat sketch. 5M  
 c) What are the merits of fast breeder reactor over sodium graphite reactor? 4M
8. a) What do you understand by thermal and nuclear pollution? What are the bad effects of thermal and nuclear pollution? 7M  
 b) The yearly duration curve of a certain plant can be considered as a straight line from 20 MW to 3 MW. To meet this load, three turbine generator units, two rated at 10 MW each and one at 5 MW are installed. Determine:  
 i) Installed capacity ii) Plant factor iii) Maximum demand  
 iv) Load factor and v) Utilisation factor. 7M

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