

Code: 1G581

IV B.Tech. II Semester Advanced Supplementary Examinations June 2016

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 is the need for a product design & development detailing the characteristics of good design? 7M
- b) How can the effectiveness of the product development process be measured? 7M
2. a) Describe briefly about forecasting variables? 4M
- b) The sales report of a company for 13 years of operation is furnished below.

Year	Number sales
1	96
2	116
3	119
4	127
5	146
6	145
7	153
8	158
9	160
10	165
11	177
12	190
13	205

 - (i) Find a simple regression for the above data
 - (ii) Forecast the sales for the 14th year of operation. 10M
3. a) Is a group technology layout any different from product layout? Give reasons for your answer. 7M
- b) Distinguish between CRAFT and CORELAP layouts? 7M
4. a) "Mixed strategies are always superior to pure strategies in an APP exercise." Comment on this statement. 7M
- b) Discuss controlling aspects of aggregate planning? 7M
5. a) The annual demand for an automobile component is 36,000 units. The carrying cost is Rs. 0.5/unit/year, the ordering cost is Rs. 25 per order and the shortage cost is Rs. 15/unit/year. Find the optimal values of the following.
 - (i) EOQ
 - (ii) Maximum Inventory
 - (iii) Maximum shortage quantity
 - (iv) Cycle time
 - (v) Inventory period
 - (vi) Shortage period. 12M
- b) What is VED analysis? 2M
6. a) Describe flow shop and job shop scheduling techniques? 7M
- b) How would you determine the complexity of the scheduling problem? 7M
7. a) Data integrity is a major issue for many organizations while using an MRP system. Comment on this statement. 8M
- b) Explain Enterprise Resource Planning? 6M
8. a) Why does JIT manufacturing require changes in manufacturing architecture? What are the key changes made to a manufacturing system for JIT manufacturing? 8M
- b) What is the relationship between lean management and JIT manufacturing? 6M

Hall Ticket Number :

--	--	--	--	--	--	--	--	--	--

R11

Code: 1G585

IV B.Tech. II Semester Advanced Supplementary Examinations June 2016

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) Explain the terrestrial and extraterrestrial regions with neat diagram. 10M
b) Write note on environmental impacts of solar power. 4M
2. a) Write the advantages and disadvantages of flat plate collectors. 8M
b) What is meant by solar concentrator? Explain. 6M
3. a) Write the applications of non-connective solar pond. 6M
b) Discuss any **two** methods of the solar crop drying. 8M
4. a) Explain the performance characteristics of wind energy sources. 8M
b) Write the advantages, disadvantages and economic status of wind energy. 6M
5. a) Explain the anaerobic digestion system of biogas. 8M
b) Explain the advantages of Biogas for cooking. 6M
6. a) Write note on the Geothermal energy sources in India. 6M
b) Discuss the different methods of harnessing the Geothermal energy. 8M
7. a) Explain the wave energy conversion devices. 8M
b) Write note on the applications of ocean thermal energy conversion. 6M
8. a) Discuss the Peltier and Joule Thomson effects. 8M
b) Write note on the principle of Faraday's law. 6M

Code: 1G689

IV B.Tech. II Semester Advanced Supplementary Examinations June 2016

Pre-Stressed Concrete

(Civil Engineering)

Max. Marks: 70

Time: 3 Hours

Answer any five questions

All Questions carry equal marks (14 Marks each)

Assume suitable data, if necessary

1. a) List the advantages and limitations of prestressed concrete. 7M
b) Explain the principles of pre tensioning and post tensioning. 7M
2. Discuss about the following post tensioning methods with neat sketches
i) Gifford-Udall system
ii) Hoyer system 14M
3. a) A post-tensioned concrete beam of rectangular section, 120 mm wide and 350 mm deep, is stressed by a parabolic cable with zero eccentricity at the supports and an eccentricity of 50 mm at the centre of span. The area of the cable is 4200 mm^2 and initial stress in the cable is 20 N/mm^2 . If the ultimate creep strain is $30 \times 10^{-6} \text{ mm/mm per N/mm}^2$ of stress and modulus of elasticity of steel is 210 mm^2 , compute the loss of stress in steel only due to creep of concrete. 9M
b) Enumerate the differences between prestressed concrete and reinforced concrete. 5M
4. A prestressed concrete beam of section 120 mm wide by 300 mm deep is used over an effective span of 6 m to support a uniformly distributed load of 4 kN/m, which includes the self-weight of the beam. The beam is prestressed by a straight cable carrying a force of 180 kN and located at an eccentricity of 50 mm. Determine the location of the thrust-line in the beam and plot its position at quarter and central span sections. 14M
5. A beam of symmetrical I-section spanning 8 m has a flange width of 150 mm & flange thickness of 80 mm respectively. The overall depth of the beam is 450 mm. Thickness of the web is 80 mm. The beam is prestressed by a parabolic cable with an eccentricity of 150 mm at the centre of the span & zero at the supports. The LL on the beam is 2.5 kN/m.
a) Determine the effective force in the cable for balancing the DL & LL on the beams.
b) Sketch the distribution of resultant stress at the centre of span section for the above case.
c) Calculate the shift of the pressure line from the tendon–centre–line. 14M
- 6 a) Explain analysis of end blocks by Guyon's method. 7M
b) Explain about Anchorage Zone Reinforcement? 7M
- 7 A composite T-beam is made up of a pre-tensioned rib 150 mm wide and 250 mm deep, and a cast in-situ slab 410 mm wide and 50 mm thick having a modulus of elasticity of 28 kN/mm^2 . If the differential shrinkage is 110×10^{-6} units, determine the shrinkage stress developed in the precast and cast in situ units. 14M
8. A prestressed beam of rectangular section, 100 mm wide and 200 mm deep, has a straight duct 25 mm by 40 mm with its centre located at 50 mm from the soffit of the beam which is prestressed by 12 wires of 7 mm diameter stressed to 600 N/mm^2 . The beam supports an imposed load of 4 kN/m over a span of 6m. The modulus of elasticity of concrete is 38 kN/mm^2 . Estimate the central deflection of the beam under the action of prestress, self – weight and live load.
a) Based on net section (beam ungrouted) and
b) Based on transformed section (beam grouted). 14M
