COLLEGE OF ENGINEERING, PUNE

(An Autonomous Institute of Government of Maharashtra.)
SHIVAJI NAGAR, PUNE - 411 005

END Semester Examination

Total Quality Management TH (PE-OE-14008)

Course: B.Tech | Branch: Production Engineering (Sandwich)

Semester: Sem VII

Year: 2014-2015 | Max.Marks:60

Duration: 3 Hours | Time:- 10 to 1.00 p.m | Date: 12 DEC 2014

Instructions: | MIS No. | | | | | | | | | |

1. Figures to the right indicate the full marks.
2. Mobile phones and programmable calculators are strictly prohibited.
3. Writing anything on question paper is not allowed.
4. Exchange/Sharing of anything like stationery, calculator is not allowed.
5. Assume suitable data if necessary.
6. Write your MIS Number on Question Paper
7. **Question no. 1 is compulsory. Solve any FIVE questions from remaining.**

Q.1 Solve any Four **10**

a) Write the design array for '2 factors 2 levels' full factorial DOE. Consider the suitable response and calculate factor effects and interaction effects.

b) What is meant by 'benchmarking'? Explain with suitable example.

c) Explain different 'tolerance stack models' used in the manufacturing.

d) State and explain 'four dimensions of quality' with their importance.

e) Explain different 'SN ratios' suggested by Taguchi for experimental analysis.

Q.2 a) Explain with suitable example the 'Poka Yoke' concept and briefly discuss the seven guidelines used for 'Poka Yoke' attainment. **5**

b) Explain the 'Just in time' concept and state its philosophy. **5**

Calculate the Takt time for the production of bevel gear if the customer demand is 5000 units per week. Company is operating 5 days/week in a single shift of 8 hr. Two breaks of 25 minutes are allowed for lunch and tea. Maintenance and breakdown activities have average time of 35 minutes per week.

Q.3 a) Explain different types of FMEA with suitable example. Also explain the basic steps used in FMEA analysis. **7**

b) 50 components are tested for two weeks. 20 of them fail in this time, with an average failure time of 1.2 weeks. What is the Mean Time To Failure assuming a constant failure rate? **3**

Q.4 a) A tube manufacturing company was expected to run for 120 hours/week continuously with production capacity of 2000 tubes per 8 hr. shift. At the end the week it produced 25000 tubes together with a waste of 1000 tubes. It had 90 minutes breakdowns and 5 hrs changeover and adjustment. Calculate plant overall effectiveness. **4**

b) What is meant by TPM? Explain the implementation strategy of TPM with suitable example. **6**

Q.5 a) Explain the 'series' and 'parallel' reliability configuration used for reliability analysis with suitable examples. **5**

b) Following casting defects have been observed in the quality inspection of certain Casted components for 1 month production. Construct the Pareto chart and suggest the elimination strategy. **5**

Casting Defects	Count
Shifts	10
Warpage	56
Fins	28
Blow holes	82
Swell	6
Hot Tears	9
Misrun	9
Pin holes	25

Q.6 a) State and explain the 8 'quality management principles' used in the ISO 9000:2000 quality management systems. **4**

b) What is meant by 'Kanban System'? Explain different types of Kanban (cards) used in the industries. **6**

Q.7 The manufacturer wants to set up the new facility to produce the new variety of 'Backpack'. Construct the house of quality matrix for this product to ensure the product meets customer specifications. The customer requirements and product specifications are given below: **10**

Customer requirements	Product specifications
Durable	Size and No. of compartments
Lightweight	Weight
Roomy	Strength
Looks nice	Color
Low cost	Material cost

Assume the suitable data and scales for comparative assessment.