BME-035

BACHELOR OF TECHNOLOGY IN MECHANICAL ENGINEERING (COMPUTER INTEGRATED MANUFACTURING)

01240

Term-End Examination

December, 2010

BME-035 : INDUSTRIAL ENGINEERING & OPERATIONS RESEARCH

Time : 3 hours   *Maximum Marks : 70*

*Note : All questions carry equal marks. Attempt **any four** questions from Section A and **Three** questions from Section B*

SECTION A

Attempt **any four** questions

1. Define productivity. List out different types of productivity. Explain different factors affecting productivity.   **2 + 3 + 5**

2. What is the fundamental difference between **5 + 5** Product and Process Innovation? Discuss the importance of motivation in building innovation.

3. Explain methods time measurement as used for PMTS. Give its importance. Use examples to support. 8 + 2

4. What is string Diagram? Explain it and elaborate situations where string diagrams are being used. Depict one example of string diagram. 3 + 4 + 3

5. What is Reverse Engineering ? Explain with example. How can Reverse Engineering be used in product design and development ? 3 + 3 + 4

6. What is Ergonomics ? Explain how this is used for product design. List out various advantages of applying ergonomics on industrial design. 3 + 4 + 3

SECTION B

Attempt **any Three** question

7. Solve the following Linear Programming model 10
    using graphical method.

    Maximize profit $Z = 50x_1 + 60x_2$

    Subject to $2x_1 + x_2 \le 300$

    $3x_1 + 4x_2 \le 509$

    $x_1 \ge 0$

    $x_2 \ge 0$

    Comment on feasible region. Determine the
    maximum profit.

8. A garment manufacturer has a production line 10
    making 2 styles of shirt. Style 1 shirt requires 200
    gm of cotton thread, 300 gm of dacron thread
    and 300 gm of linen thread. Style 2 shirt requires
    200gm of cotton thread, 200 gm of dacron thread
    and 100 gm of linen thread.

    Manufactures makes profit of Rs 19.50 and
    Rs 15.90 on style 1 and style 2 shirts respectively.

    Manufacturer has inventory of 24 kg of cotton
    thread, 26 kg of dacron thread and 22 kg of linen
    thread.

    Solve this problem for current inventory,
    determine a production schedule to make
    maximum profit.

9. Four persons one available for work on 4 separate **10** jobs (j_i). Cost of assigning each men to each job is given below. Assign men to job to minimize total cost of assignment. Persons are P_1, P_2 P_3 and P_4

From\ To	J1	J2	J3	J4
P1	20	25	22	28
P2	15	18	23	17
P3	19	17	21	24
P4	25	23	24	24

10. What is simulation? where is this done? what are **10** its applications ? Explain steps of simulation process.

11. Write short notes on any two of the following : **10**

    (a) Criteria for decision making under uncertainty

    (b) Goal Programming

    (c) Data Envelopment Analysis.