No. of Printed Pages : 5

BME-035

01456

BACHELOR OF TECHNOLOGY IN MECHANICAL ENGINEERING (COMPUTER INTEGRATED MANUFACTURING)

Term-End Examination

June, 2010

BME-035 : INDUSTRIAL ENGINEERING & OPERATIONS RESEARCH

Time : 3 hours *Maximum Marks : 70*

Note : *Answer **seven** questions. **First** question is **Compulsory**. Attempt **any Six** from remaining (8) questions. Use of calculators is allowed.*

1. Choose the correct answer. **10x1=10**

(a) Father of Industrial Engineering is :

(i) Adam Smith (ii) FW Taylor

(iii) Elton Mayo (iv) Henry Fayol

(b) In the basic procedure of Method study, SREDIM, the letter 'R' refers to :

(i) Repeat (ii) Remunerate

(iii) Record (iv) Reduce

(c) Which of the following terms is not associated with contributions of FW Taylor ?

(i) Definite Time (ii) Definite Task

(iii) Definite Method (iv) Definite Value

(d) "If a worker accomplishes his task, pay him full, else see that he will be loser thereby accordingly". This policy is in accordance with :

(i) FW Taylor (ii) Henry Fayol

(iii) F. Gilbreth (iv) A. Maslow

(e) In a process chart, storage is represented by :

(i) Rectangle (ii) Circle

(iii) Semicircle (iv) Triangle

(f) The vowels A, E, I, O, U are used in :

(i) String Diagram (ii) Travel Chart

(iii) REL Chart (iv) SIMO Chart

(g) The time allowance given to worker to recover from fatigue and personal psychological or physiological needs is called _____ Allowance.

(i) Interference (ii) Relaxation

(iii) Process (iv) Contingency

(h) Which of the following case of Simplex will have multiple optimal (Alternate optima) solutions :

(i) $Z_j - C_j = 0$ for non basic decision variables

(ii) Cycling of variables in the basis.

(iii) All slacks are not replaced and $C_j - Z_j$ is still $-ve$

(iv) All artificial variables are not replaced

(i) Transportation Problem is said to be balanced if :

(i) No. of rows = No. of columns

(ii) No. of allocated cells = No. of (rows + columns)

(iii) Total Supply = Total Demand

(iv) No. of supply centres = No. of Demand centres

(j) While revising opportunity cost of AP, we put lines across :

(i) Marked Rows and Unmarked Columns

(ii) Marked Rows and Marked Columns

(iii) Unmarked Rows and Marked Columns

(iv) Unmarked Rows and Unmarked Columns

2. (a) Discuss the contributions of Gilbreth in work study. **5**

(b) Describe SIMO chart with an example of omelette making. **5**

3. (a) Describe various allowances given in Time study with examples. 5

(b) For a particular task, 15 observations are taken by a time study observer. Check if the number of observations is sufficient for 5% accuracy and 95% confidence. Indicate minimum number of observations. 5

4. (a) What do your understand by the terms "Reverse Engg." and "Re-Engineering" ? How can you use these concepts in Design and Development ? 6

(b) Discuss various Man-Machine Relationships. 4

5. Discuss various types of fatigues ? How do they develop ? What are its adverse effects ? How do you overcome them ? 10

6. Food X contains 6 units of Vitamin A per gram and 7 units of Vitamin B per gram and costs 12 paise/gram. Food Y contains 8 units of Vitamin A and 12 units Vitamin B per gram and costs 20 paise/gm. The daily minimum requirement of Vitamin A and B are 100 units and 120 units respectively. Find optimum product mix. 10

7. Optimize the following Transportation Problem cost matrix : 10

Plant	Warehouses			
	W_1	W_2	W_3	Available
A	25	17	25	300
B	15	10	18	500
Requirement	300	300	500	

8. Optimize following AP (Assignment Problem) cost matrix. **10**

Machine	**Jobs**				
	1	**2**	**3**	**4**	**5**
1	80	40	X	70	40
2	X	80	60	40	40
3	70	X	60	80	70
4	70	80	30	50	X
5	40	40	50	X	80

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

(a) Life cycle perspective of product design

(b) Product design and selection process

(c) Environmental considerations in product design

(d) Approaches to innovation

(e) Technology Transfer