BACHELOR OF TECHNOLOGY IN MECHANICAL ENGINEERING (COMPUTER INTEGRATED MANUFACTURING)

00792

Term-End Examination

December, 2011

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 calculator is allowed.*
*All questions carry **equal** marks.*

1. Choose the correct alternative :

(a) Time study is the contribution of :

(i) Adam Smith (ii) Henry Fayol

(iii) Elton Mayo (iv) F.W. Taylor

(b) In the basic procedure of method study, 'sredim' 'E' indicates.

(i) Ego needs (ii) Evaluation

(iii) Entertainment (iv) Energy

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

(i) F. W. Taylor (ii) Henry Fayol

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

(d) In a process chart 'delay' is represented by :

(i) Rectangle (ii) Circle

(iii) Semi circle (iv) Triangle

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

(i) String diagram (ii) Travel chart

(iii) REL chart (iv) SIMO chart

(f) Normal time + allowances = : _____

(i) Basic time (ii) Observed time

(iii) Relaxation time (iv) Standard time

(g) In the simplex table, the value Zj - Cj for basic variables will be :

(i) Negative (ii) Positive

(iii) Zero (iv) Unity

(h) Which of the following method uses penalties to find IBFS ?

(i) North west corner method

(ii) Vogel's approximation method

(iii) Least cost entry method

(iv) Column minima method

(i) The main criterion used in Hungarian method to solve an assignment problem is to calculate.

(i) Operting cost

(ii) Maintenance cost

(iii) Opportunity cost

(iv) Over heads costs

(j) The value of game whose pay off is a 2x2 unit matrix is :

(i) Zero (ii) Unity

(iii) 0.5 (iv) None of these

2. Describe the contributions of F.W. Taylor towards work study. Explain the procedure of 6 time study.

3. (a) Explains various allowances provided to the operators working in a large scale industry.

(b) How do you understand by PMTS ? What is its significance ? Explain any two in detail.

4. (a) What are the technical factors which affect the product design ?

(b) What is meant by demanufacturing ? Who does it and why ?

5. (a) Explain the objectives and feature of man machine system.

(b) What are different types of work loads ? Give examples.

6. Maximise : $Z = 6x_1 + 9x_2$

Subject to : $2x_1 + 2x_2 \leq 24$

$x_1 + 5x_2 \leq 44$

$6x_1 + 2x_2 \leq 60$ and $x_1, x_2 \geq 0$

using simplex method.

7. Determine the optimum basic feasible solution to the following transportation problem :

		To A	To B	To C	Available
From	1	50	30	220	1
	2	90	45	170	3
	3	250	200	50	4
Required		4	2	2	

8. Solve the travelling sales man problem in the matrix shown below :

To →		1	2	3	4	5
	1	*	6	12	6	4
F	2	6	*	10	5	4
R	3	8	7	*	11	3
O	4	5	4	11	*	5
M	5	5	2	7	8	*

9. Use dominance principle to reduce the following game to 2x2 game. Has the game saddle point ? Use algebraic method to solve the 2x2 game.

		Player B			
		B_1	B_2	B_3	B_4
Player A	A_1	6	−10	9	0
	A_2	6	7	8	1
	A_3	8	7	15	1
	A_4	3	4	−1	4