

**B.Tech. MECHANICAL ENGINEERING
(COMPUTER INTEGRATED
MANUFACTURING)**

Term-End Examination

December, 2016

**BME-035 : INDUSTRIAL ENGINEERING AND
OPERATIONS RESEARCH**

Time : 3 hours

Maximum Marks : 70

*Note : Attempt **four** questions from Section A and **three** questions from Section B. All questions carry equal marks. Assume any missing data suitably.*

SECTION A

*Answer any **four** of the following :*

1. Discuss the scope and objectives of Industrial Engineering. 10
2. Explain the systematic procedure of methods study with suitable example. 10
3. Calculate the number of observations to be taken for work sampling for an accuracy of 5% and a confidence level of 95%, if the probability of the worker being idle is 0.3. 10

4. Why is technology management significant to competitiveness and industry structure? 10
5. What are the human needs considerations for working in an organisation? 10
6. Write short notes on any *two* of the following: 5+5=10
- (a) Concurrent Engineering
 - (b) Various DFE tools
 - (c) Techniques for invention and innovation

SECTION B

Answer any *three* of the following :

7. A manufacturer of packing material, manufactures two types of packing tins, round and flat. Major production facilities involved are cutting and joining. The Cutting department can process 300 round tins or 500 flat tins per hour. The Joining department can process 500 round tins or 300 flat tins per hour. If the contribution towards profit for a round tin is the same as that of a flat tin, what is the optimum production level of round and flat tins ?

10

8. A Job shop has four men available for work on four separate jobs. Only one man can work on any one job. The cost of assigning each man to each job is given in Table 1. The object is to assign men to jobs such that the total cost is the minimum.

10

		Jobs			
		1	2	3	4
Men	A	20	25	22	28
	B	15	18	23	17
	C	19	17	21	24
	D	25	23	24	24

Table 1

9. A library wants to improve its service facilities in terms of the waiting time of its borrowers. The library has two counters at present and the borrowers arrive according to Poisson distribution with arrival rate 1 every 7 minutes and service time follows exponential distribution with a mean of 10 minutes. The library has relaxed its membership rules and a substantial increase in the number of borrowers is expected. Find the number of additional counters to be provided, if the arrival rate is expected to be twice the present value and the average waiting time of the borrowers must be limited to half the present value. 10
10. Write notes on the following : 10
- (a) Queuing Models
 - (b) Data Envelopment Analysis (DEA)
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