

CS/B.Tech/AUE/Even/6th Sem/AUE-606(HU)/2014

2014

Production Management & Operations

Time Alloted : 3 Hours

Full Marks : 70

*The figure in the margin indicate full marks.
Candidates are required to give their answers in their
own words as far as practicable*

GROUP – A
(Multiple Choice Type Questions)

Choose the correct alternative for any ten of the following:

10x1=10

- i) VED analysis is a tool of
- a) inventory management
 - b) forecasting
 - c) quality control
 - d) process improvement
- ii) The process of determining start and finish time of the latest or readily available job is known as
- a) Forward scheduling
 - b) Backward scheduling

- c) Dispatching
 - d) Scheduling
- iii) If the value exponential smoothing constant is unity, it denotes that
- a) The next forecast is same as the most recent actual value
 - b) The next forecast is lesser than the most recent actual value
 - c) The next forecast is higher as the most recent actual value
 - d) Any of these
- iv) Productivity means
- a) $(\text{output} + \text{input}) / \text{input}$
 - b) proper utilization of all resources
 - c) to reduce defective products
 - d) to increase profit
- v) The arrival time in a queuing model can have
- a) Poisson distribution
 - b) Exponential distribution
 - c) Erlang distribution
 - d) All of these
- vi) Linear programming is a
- a) Constrained optimization technique
 - b) Technique for economic allocation of limited

- resources.
- c) Mathematical technique.
 - d) All of the above
- vii) A constraint in an LP model restricts
- a) Value of objective function.
 - b) Value of a decision variable.
 - c) Use of the available resources.
 - d) All of the above
- viii) The solution to a transportation problem with m-rows (supplies) and n-columns (destinations) is feasible if number of positive allocations are
- a) $m + n$
 - b) $m \times n$
 - c) $m + n - 1$
 - d) $m + n + 1$
- ix) Generally PERT technique deals with the project of
- a) Repetitive nature.
 - b) None-repetitive nature.
 - c) Deterministic nature.
 - d) None of the above.
- x) The method used for solving an assignment problem is called
- a) Reduced matrix method.
 - b) MODI method.
 - c) Hungarian method.
 - d) None of the above.
- xi) Which model is used for productivity measurement
- a) EOQ model
 - b) Craig and Harris model
 - c) EPQ model
 - d) All of the above

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xii) Manufacturing of daily used commodities are example of

- a) Batch production b) Mass Production
c) Job production d) None of these

Group-B

(Short answer type questions)

Answer any *three* of the following

5x3=15

2. Write a short note on 6 Sigma quality standard.
3. Briefly explain Johnson's rule of for 2 and 3 machines scheduling.
4. Explain double sampling plain with help of a process flow chart.
5. Today is day 25. 'A factory' has three jobs in the production process.

The three jobs are on order, as indicated below:

Job	Due Date	Work Days Remaining
A	30	4
B	28	5
C	27	2

- i) Find out the Critical Ratio of each job.
- ii) Reallocate the sequence of the job based on the Critical Ratio.

(2 + 3)

6. Examine the following terms in PERT :

- a) Pessimistic time.
- b) Optimistic time.
- c) Most likely time.

Group - C

(Long answer type questions)

Answer any *three* of the following

3x15=45

7. a) What do you mean by production function? State Cobb-Douglas production function? What is its significance? 2+2+2
b) What are the different types of production systems according to volume and product variety? Discuss their relative characteristics with at least two examples of each. 6
c) What do you mean by MRP II? 3
8. a) Solve the following problem using regression analysis. 6

Population	5	7	15	22	27	36
Number of washing machines required	28	40	65	80	96	130

Fit a linear regression equation and estimate the demand for washing machines for a city with a population of 45.

- a) What are acceptable quality level and lot tolerance percent defective? 4
- b) What does negative tracking signal mean? 2
- c) What is work break down structure? Give one example of it. 3

9. The N. Dustrious Company produces two products: I and II. The raw

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material requirements, space needed for storage, production rates, and selling prices for these products are given in the following Table.

Machines	Products	
	I	II
Storage space (ft ² /unit)	4	5
Raw material (lb /unit)	5	3
Production rate (unit/hr)	60	30
Selling price (\$/unit)	13	11

The total amount of raw material available per day for both products is 1575 lb. The total storage space for all products is 1500 ft², and a maximum of 7 hours per day can be used for production. Formulate a linear programming model and solve it graphically to maximize the selling price of the company. (15)

10. The SunRay Transport Company ships truckloads of grain from three silos to four mills. The supply and demand together with the unit transportation cost per truckload on the different routes are summarized in the following table. Solve this transportation model starting with northwest corner solution.

Silo \ Mills	1	2	3	4	Supply
	1	2	3	4	Supply
1	10	2	20	11	15
2	12	7	9	20	25
3	4	14	16	18	10
Demand	5	15	15	15	50
				50	

11. Write Short notes on (any three):

5 x 3 = 15

- Maximum Principle of Game Theory.
- ABC Analysis of Inventory management.
- Routing
- Crashing of Project Network.
- Waiting Line Theory