KATHMANDU UNIVERSITY
End-Semester Examinations
February/March, 2018

Marks scored:

Level : B.E.
Year : III

Course : MEEG 308
Semester: II

Exam Roll No.:

Time: 30 mins.

F.M. : 20

Registration No.:

Date : MAR 1 8 2018

SECTION "A"
[20 Q. × 1 = 20 marks]

Tick the most appropriate answer.

1. A set of requirement for a product-layout in an industry is:
   [ ] General purpose machine and skilled labour
   [ ] Special purpose machine and skilled labour
   [ ] General purpose machine and unskilled labour
   [ ] Special purpose machine and semi-skilled labour

2. The routing function in a production system design is concerned with
   [ ] Manpower utilization
   [ ] Machine utilization
   [ ] Quality assurance of the product
   [ ] Optimizing material flow through the plant

3. The type of layout suitable for use of the concept, principles and approaches of 'group technology' is
   [ ] Product layout
   [ ] Fixed position layout
   [ ] Job-shop layout
   [ ] Cellular layout

4. Consider the following aspects:
   1. Functional 2. Operational 3. Aesthetic
   Which of the above aspects is/are to be analyzed in connection with the product development?
   [ ] 1, 2 and 3 [ ] 1 and 2 only [ ] 2 and 3 only [ ] 3 only

5. The basic break-even model can be modified to handle more than one product. This extension of the basic model requires
   [ ] sales volume for each product
   [ ] three-dimensional graphing software
   [ ] at least a Pentium computer
   [ ] price and cost for each product, as well as the percent of total sales that each product represents

6. Which of the following statements about time-series forecasting is true?
   [ ] It is based on the assumption that future demand will be the same as past demand
   [ ] It makes extensive use of the data collected in the qualitative approach
   [ ] The analysis of past demand helps predict future demand
   [ ] Because it accounts for trends, cycles, and seasonal patterns, it is more powerful than causal forecasting

7. Which of the following forecasting methods takes a fraction of forecast error into account for the next period forecast?
[ ] Simple average method
[ ] Moving average method
[ ] Weighted moving average method
[ ] Exponential smoothening method

8. Given an actual demand of 61, a previous forecast of 58, and an alpha of .3, what would the forecast for the next period be using simple exponential smoothing?
[ ] 45.5 [ ] 57.1 [ ] 58.9 [ ] 61.0

9. In trend-adjusted exponential smoothing, the Forecast Including Trend (FIT) consists of
[ ] an exponentially smoothed forecast and an estimated trend value
[ ] an exponentially smoothed forecast and a smoothed trend factor
[ ] the old forecast adjusted by a trend factor
[ ] the old forecast and a smoothed trend factor

10. Which one of the following forecasting techniques is most suitable for making long range forecasts
[ ] Time series analysis
[ ] Regression analysis
[ ] Exponential smoothing
[ ] Market Surveys

11. Organizations have four approaches for capacity expansion. Which of the following is not one of them
[ ] lead demand with incremental expansion
[ ] lag demand with one-step expansion
[ ] lag demand with incremental expansion
[ ] lead demand with one-step expansion

12. ABC analysis divides on-hand inventory into three classes, generally based upon
[ ] item quality
[ ] unit price
[ ] annual dollar volume
[ ] annual demand

13. Classifying items in A, B and C categories for selective control in inventory management is done by arranging items in the decreasing order of
[ ] Total inventory costs
[ ] Item value
[ ] Annual usage value
[ ] Item demand

14. Setup costs do not include
[ ] Labor cost of setting up machines
[ ] Ordering cost of raw material
[ ] Maintenance cost of the machines
[ ] Cost of processing the work piece

15. Dummy activities are used in a network to
[ ] Facilitate computation of slacks
[ ] Satisfy precedence requirements
[ ] Determine project completion time
[ ] Avoid use of resources

16. In CPM network critical path denotes the
[ ] Path where maximum resources are used
[ ] Path where minimum resources are used
[ ] Path where delay of one activity prolongs the duration of completion of project
[ ] Path that gets monitored automatically

17. Sequencing (or dispatching)
[ ] assigns dates to specific jobs or operations steps
[ ] assigns jobs to work centers
[ ] specifies the order in which jobs should be done at each center
[ ] assigns workers to jobs

18. Which of the following is a function of inventory
[ ] to decouple or separate parts of the production process
[ ] to provide a stock of goods that will provide a selection for customers
[ ] to take advantage of quantity discounts
[ ] all of the above are functions of inventory

19. In the basic EOQ model, if the cost of placing an order doubles, and all other values remain constant, the EOQ will
[ ] increase by about 41%
[ ] increase by 200%
[ ] increase by 100%
[ ] either increase or decrease

20. A scheduling technique used to achieve optimum, one-to-one matching of tasks and resources is
[ ] the assignment method
[ ] the CDS Algorithm
[ ] Johnson's rule
[ ] the appointment method

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F.M. : 55

SECTION "B"

Attempt all questions. Assume suitable data if necessary.

Q.N.1

a. Define Production planning and Control and list its functions. [2]

b. Explain Batch production system and discuss its characteristics in detail. [3]

c. Define Routing and develop a simple Route sheet? [3]

Q.N.2

a. Explain Cost and Reliability analysis using modular design with a suitable example. [4]

b. Explain Product Design and Development steps in detail with a suitable example. [4]

Q.N.3

a. Define Mean Absolute Deviation (MAD) , Mean Squared Error (MSE) and Mean Absolute Percent Error (MAPE). [3]

b. List types of Forecasting and Explain Exponential smoothing type of Forecasting with suitable example? [2]

c. Hyundai Motors , Kathmandu wants to evaluate performance of its Hyundai i10 forecast, use the forecast and demand data for the last 6 quarters for Hyundai i10 sales as given below. Develop a tracking signal for the forecast and see it stays within acceptable limit, and the defined limit is ±3 MADs. [5]

Quarter	1st	2nd	3rd	4th	5th	6th
Actual Demand	90	95	115	100	125	140
Forecasted Demand	100	100	100	110	110	110

Q.N.4

a. Define Process planning and what are the factors influences process planning. [2]

b. A manufacturer has the following information on its major product;
Regular time production capacity = 2600 units/period
Overtime production costs = Rs. 12 unit
Inventory costs = Rs. 2 unit /period based on the ending inventory)
Backlog costs = Rs. 5 unit/period
Beginning inventory = 400 units demand in units) for periods 1, 2, 3, 4 is 4000, 3200, 2000 and 2800 respectively and the production output is 2900 units. Develop a level output plan that yields zero inventory at the end of period 4. What costs result from this plant? [4]

c. Explain the Capacity Management Technique with suitable flowchart. [2]

Q.N.5

a. Explain the Economic parameter which affects Inventory. [3]

b. Find the optimum order quantity for a product for which the price breaks are as follows:

Quantity in Units	Unit Cost
Less than 100	200
101 to 200	180
More than 200	160

Monthly demand is 400 units. Store cost is 15 % of purchase price. Ordering or set up cost is 50 per order. [7]

Q.N.6

a. A machine operator has to perform two operations, turning and threading on a number of different jobs. The time required to perform these operations in minutes for each job is given. Determine the order in which the jobs should be processed in order to minimize the total time requires to turn out all the jobs. [5]

Machine/Job	J1	J2	J3	J4	J5	J6
A	3	12	5	2	9	11
B	8	10	9	6	3	1

b. Determine the following

i. Draw the CPM network; analyze the paths through the network.

ii. Determine the float for each activity, find the critical path.

iii. Find the project completion time. (6)

Activity	A	B	C	D	E	F	G	H	I	J
Immediate Predecessors	--	--	--	B	C	A	A	F	G	D,E
Durations	10	7	8	13	10	12	14	8	8	10