Mark Scored:

KATHMANDU UNIVERSITY
End Semester Examination
August/September, 2017

AUG 30 2017

Level : B. E.
Year : III

Course : MEEG 308
Semester : II

Exam Roll No. :

Time: 30 min

F. M. : 20

Registration No.:

Date :

SECTION "A"
[20 Q × 1 = 20 marks]

Tick the most appropriate answer.

1. Job production does not possess _____ characteristics.
   [ ] small production runs
   [ ] manufacturing cycle time is long
   [ ] flow of materials is simple
   [ ] small inventory of materials

2. What is Debt service coverage ratio?
   [ ] loan paying capability of an investment
   [ ] loan covered by service
   [ ] service covered upon investment
   [ ] debt covered in a projects

3. The routing function in a production system design is concerned with
   [ ] man power utilization
   [ ] machine utilization
   [ ] quality assurance of the product
   [ ] optimizing material flow through the plant

4. The marketing mix consists of which four areas?
   [ ] product, price, profit and promotion
   [ ] product, promotion, potential and profit
   [ ] product, profit, promotion and provision
   [ ] product, price, place and promotion

5. The following aspect of product is concerned with the ease and efficiency of the product performance
   [ ] functional aspect
   [ ] durability aspect
   [ ] operational aspect
   [ ] aesthetic aspect

6. The relation for calculating the trend component in forecasting is
   [ ] $T_t = (F_t - F_{t-1}) + (1 - \beta)T_{t-1}$
   [ ] $T_t = \beta(F_t - F_{t-1}) + (1 - \beta)T_{t-1}$
   [ ] $T_t = \beta(F_{t-1} - F_t) + (1 - \beta)T_{t-1}$
   [ ] $T_t = (1 - \beta)(F_t - F_{t-1}) + \beta T_{t-1}$

7. If the actual demand for a period is 100 units but forecast demand was 90 units. The forecast error is
   [ ] -10 [ ] +10 [ ] -5 [ ] +5

8. Which of the following organization is best suited for steel plants
   [ ] functional organization
   [ ] staff organization
   [ ] line organization
   [ ] line, staff and functional organization

9. A modular design helps in
   [ ] low cost of production
   [ ] control of product reliability and cost
   [ ] greater product variety at low cost
   [ ] all of the above

10. The correct sequence of operations in production planning and control is
    [ ] routing-scheduling-dispatching-follow up
    [ ] scheduling-routing- dispatching-follow up
    [ ] dispatching-routing-scheduling- follow up
    [ ] routing-scheduling-follow up-dispatching

11. Gantt charts are generally used for
[ ] Inventory control [ ] material handling
[ ] production scheduling [ ] machine repair schedules

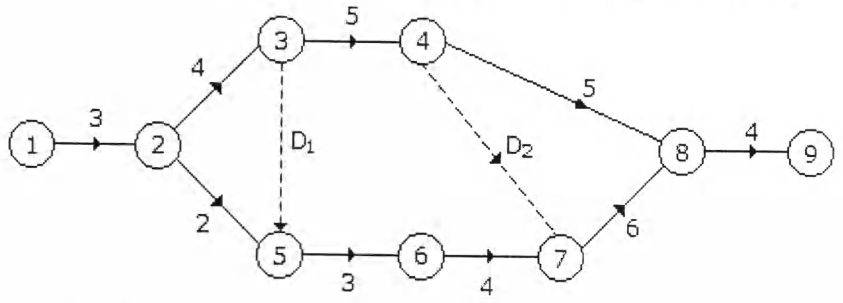
12. A critical activity has
[ ] maximum slack [ ] minimum slack [ ] zero slack [ ] average slack

13. A drilling Work-centre has three drills, three operators per shift, one shift per day, five days worked per week, and eight hours worked per shift. Records indicate that machine utilization is 95 % and operator efficiency is 85 %. What is the effective work center capacity per week?
[ ] 96.9 hours/week [ ] 90.9 hours/week [ ] 92.9 hours/week [ ] 80.9 hours/week

14. Which of the following is true for Inventory control?
[ ] economic order quantity has minimum total cost per order
[ ] inventory carrying costs increases with quantity per order
[ ] ordering cost decreases with lot size
[ ] all of the above

15. In inventory control theory, the economic order quantity is
[ ] average level of inventory
[ ] optimum lot size
[ ] capacity of an inventory
[ ] lot size corresponding to break-even analysis

16. In a network shown in the below Figure, the critical path is along



[ ] 1-2-3-4-8-9 [ ] 1-2-3-5-6-7-8-9 [ ] 1-2-3-4-7-8-9 [ ] 1-2-5-6-7-8-9

17. Which of the following are the guidelines for the construction of a network diagram?
[ ] each activity is represented by one and only one arrow in the network
[ ] dangling must be avoided in a network diagram
[ ] dummy activity consumes no time or resource
[ ] all of the above

18. A dummy activity
[ ] is artificially introduced [ ] is represented by a dotted line
[ ] does not require any times [ ] all of the above

19. PERT and CPM are
[ ] techniques to determine project status [ ] decision making techniques
[ ] aids to determine cost implications of project [ ] aids to the decision makers

20. In ABC Control policy, maximum attention is given to
[ ] those items which consume money [ ] those items which are readily not available
[ ] proper quality assurance programs [ ] those items which consume more money

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SECTION "B"

Attempt *ALL* questions. Assume suitable data if necessary.

Q.N.1

a. Define and explain the importance of industrial engineering and management. [2]
b. List types of production system and discuss its characteristics? [3]
c. Draw an interrelationship chart of PPC and explain? [3]

Q.N.2

a. Explain types of Economic analysis to be carried out for a new product. [4]
b. Discuss briefly about product life cycle. [2]
c. What is modular design? Explain cost and reliability analysis using modular design. [4]

Q.N.3

a. List types of forecasting based on Time horizon. [2]
b. What is tracking signal. How it monitors and controls forecasting? [2]
c. A car manufacturerwants to forecast the demand for a particular model.Past data shows that there is an increasing trend.The company assumes that the initial forecast for month 1 was 11 units and the trend over that period was 2 units.Smoothing constants are $\alpha = 0.2$ $\beta = 0.4$. [6]

Month(t)	1	2	3	4	5	6	7	8	9	10
Actual Demand (A_t)	12	17	20	19	24	21	31	28	38	

Q.N.4

a. 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]
b. Draw a process route sheet with suitable simple example. [2]
c. What are the factors that Make or Buy decisions depend upon during Process planning. [2]

Q.N.5

a. Explain and Develop an Economic Order Quantity model assuming suitable data and prove that holding cost is equivalent to ordering cost for EOQ model. [8]

Q.N.6

a. There are four jobs A, B, C and D which are to be processed on machines M1, M2, M3 and M4 in the order M1 M2 M3 M4. The processing time in hours is given below. Find the Optimal sequence and the total elapsed time. [5]

JOBS	MACHINES			
	M1	M2	M3	M4
A	15	5	4	14
B	12	2	10	12
C	13	3	6	15
D	16	0	3	19

b. Determine :
   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	K	L	M
Immediate Predecessors	--	--	B	A	C	C	F	G	C	I, H	D, E, J	I, H	K, L
Durations	36	4	2	2	10	15	4	9	9	9	20	8	20