KATHMANDU UNIVERSITY
End Semester Examination
June/July, 2023

Marks scored:

Level : B.E.
Year : III
Course : MEEG 308
Semester : II

Exam Roll No. :
Time: 30 mins.
F. M. : 20

Registration No.:
Date : 25 JUN 2023

SECTION "A"
[20Q. × 1 = 20 marks]

Mark [×] in the most appropriate answer box.

1. The demand for a two-wheeler was 900 units and 1030 units in April 2015 and May2015, respectively. The forecast for the month of April 2015 was 850 units. Considering a smoothing constant of 0.6, the forecast for the month of June 2015 is _____.
[ ] 970 Units [ ] 825 units [ ] 859 units [ ] 900 units

2. A critical activity has _____.
[ ] minimum slack [ ] negative slack [ ] maximum float [ ] zero float

3. The production cost per unit time can be reduced by _____.
[ ] producing more with increased input [ ] producing more with same inputs
[ ] eliminating idle time [ ] minimizing resource wastage

4. Dummy activity are used to _____.
[ ] determine the Critical Path [ ] determine the project slack time
[ ] maintain the required net work [ ] determine overhead cost.

5. In exponential smoothing method which one is **TRUE**?
[ ] $0 \leq \alpha \leq 1$ and high value of α is used for stable demand.
[ ] $0 \leq \alpha \leq 1$ and high value of α is used for unstable demand.
[ ] $\alpha \geq 1$ and high value of α is used for stable demand.
[ ] $\alpha \leq 0$ and high value of α is used for unstable demand.

6. The Start or completion of Task is called _____.
[ ] an event [ ] an activity [ ] a duration [ ] a project

7. Breakeven point is the point where _____.
[ ] fix and variable cost line intersect
[ ] total and fixed cost line intersects
[ ] total and Variable cost line intersects
[ ] sales revenue and total expense lines intersects

8. In inventory control theory, The EOQ is _____.
[ ] average level of inventory
[ ] optimum lot size
[ ] capacity of Warehouse
[ ] lot size corresponding to Break even analysis

9. Which one is the **WRONG** relationship?
[ ] Interfering float = total float – free float
[ ] Total float =free float + independent float
[ ] Total float ≥ free float ≥ independent float
[ ] Free float = total float – head event slack

10. The term reorder point is defined as sum of _____.
[ ] lead time demand and safety stock [ ] safety level of stock and demand per day
[ ] reorder point and Lead time demand [ ] forecasted daily unit sale and Lead Time

11. The objective of Network Analysis is to _____.
[ ] minimize total overhead. [ ] minimize total project labor.
[ ] minimize interruption and conflicts. [ ] minimize total project duration.

12. Forward Pass Calculation are done to find _____ occurrence time of event.
[ ] exact [ ] latest [ ] earliest [ ] approximate

13. Floats for Critical Activities will always be _____.
[ ] same [ ] maximum
[ ] zero [ ] same as duration of activity

14. Replacement of an item will become necessary when _____.
[ ] an old item becomes too expensive to operate and maintain
[ ] when your operator has a high desire on working on new machine
[ ] when your counterpart made a similar change
[ ] when company has surplus funds to spend

15. ABC stock list control focuses on those _____.
[ ] Items not promptly available [ ] Items which are consuming lesson money
[ ] Items having more demand-supply [ ] Item which cost more money

16. Which is **NOT** a simple forecasting method among the following mentioned below?
[ ] Trend revised exponential smoothing [ ] Econometric models
[ ] Linear regression [ ] Multiple regression

17. An item can be purchased for Rs.100 The ordering cost is Rs. 200 and the inventory carrying cost is 10 % of the item cost per annum. If the annual demand is 4000 units, the economic order quantity (in units) is _____.
[ ] 50 [ ] 100 [ ] 200 [ ] 400

18. If the demand for an item is doubled and the ordering cost halved, the economic order quantity _____.
[ ] remains unchanged [ ] is doubled
[ ] is halved [ ] increases with known factors

19. What type of process would a Cement plant be most likely to use?
[ ] Continuous flow [ ] Project [ ] Job shop [ ] Flow shop

20. For a small scale industry, the fixed cost per month is Rs. 5000. The variable cost per product is Rs. 20 and sales price is Rs. 30 per piece. The breakeven production per month will be _____.
[ ] 300 [ ] 460 [ ] 500 [ ] 1000

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Year : III
Time : 2 hrs. 30 mins.

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Semester: II
F. M. : 55

SECTION "B"

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

1.

a. As per the Case Study "Value Management" by R. Terry Hays of Value Management Strategies, Inc. California from Industrial Engineering Handbook by Maynard. Discuss Concept of Value and how value management is changing the Industrial Engineering World, discuss about the Function Analysis Technique, with the very rudimentary examples depicting the [2 + 8]
   - Cost Visibility Worksheet,
   - Sequence Flowchart,
   - Functional Analysis System Technique(FAST) Diagram and
   - Evaluation Technique.

b. As per the Case Study "Facilities Layout and Design" by William Wrennall of the Leawood Group Ltd, Kansas from Industrial Engineering Handbook by Maynard. Considering the simplest example, briefly discuss the Strategic Facilities Planning Process, give an overview by listing the Phases for Layout Lifecycle. Develop Affinities with simplest example to discuss the Layout Process. [5+5]

2.

a. A company purchase 9000 parts of a machine for its annual requirements ordering for month usage at a time, each part cost NRs. 20, the ordering cost per order is NRs 15 and carrying charge is 15% of the average inventory per annum. suggest more economical purchase policy within 1, 15 and 35 orders annually and suggest the most economical order quantity with savings on total relevant cost. [6]

b. Auto manufacturing incorporates makes and sell specialty hub caps for the retail automobile aftermarket, forecast for its wire wheel cap is 1000 units next year, with an average daily demand of 4 units. However, the production process is most efficient at 8 units per day. So the company produces 8 units per day but uses 4 units per day. the company wants to solve for the optimum number of units per order. (the plant schedules production of this hub cap only as needed, during the 250 days per year shop operates) [3]

3.

a. Use the graphical method to find the optimal path with minimum elapsed total time of 2 jobs and 5 machines having two different sequences with the below data. [6]

Job 1	Sequence	A	B	C	D	E
	Time	3	4	2	6	2
Job 2	Sequence	B	C	A	D	E
	Time	5	4	3	2	6

b. Describe in brief how Johnson algorithm is utilized for solving sequencing problems of N jobs and 4 machines. [3]

4.

a. What is ABC analysis, explain its significance with suitable example? [2]

b. What is marketing mix, describe it in detail. [2]

c. What is tracking signal in Forecasting, how UCL and LCL plays significant role in managing and controlling proper forecast, explain with graphical illustration. [2]

5. Listed below are the activities of a small project along their durations. [11]

Activity	1-2	1-3	2-4	3-4	3-5	4-9	5-6	5-7	6-8	7-8	8-10	9-10
Duration(Days)	4	1	1	1	6	5	4	8	1	2	5	7

i. Draw Network Diagram and Calculate the Total Project duration. Highlight critical Path.

ii. Calculate EST, EFT, LST, LFT, Total Float, and Free Float in tabular Form.