Printed Page:- 05 **Subject Code:- AME0603**

Roll. No:

NOIDA INSTITUTE OF ENGINEERING AND TECHNOLOGY, GREATER NOIDA

(An Autonomous Institute Affiliated to AKTU, Lucknow)

B.Tech

SEM: III - THEORY EXAMINATION (2023 - 2024)

Subject: Industrial Engineering

Time: 3 Hours **Max. Marks: 100**

General Instructions:

IMP: *Verify that you have received the question paper with the correct course, code, branch etc.*

1. *This Question paper comprises of* **three Sections -A, B, & C.** *It consists of Multiple Choice Questions (MCQ's) & Subjective type questions.*

2. *Maximum marks for each question are indicated on right -hand side of each question.*

3. *Illustrate your answers with neat sketches wherever necessary.*

4. *Assume suitable data if necessary.*

5. *Preferably, write the answers in sequential order.*

6. *No sheet should be left blank. Any written material after a blank sheet will not be evaluated/checked.*

SECTION A **20**

1. Attempt all parts:-

1-a. Which of the following charts are used for plant layout design? 1

1. Operation process chart 2. Man machine chart

3. Correlation chart 4. Travel chart. Select the correct answer using the codes given below: **[CO1]**

(a) 1, 2, 3 and 4

(b) 1, 2 and 4

(c) 1, 3 and 4

(d) 2 and 3

1-b. Productivity is the ____ of production system. **[CO1]** 1

(a) Measurement

(b) Efficiency

(c) Both (A) and (B)

(d) None of the above

1-c. The demand and forecast for February are 12000 and 10275, Respectively. Using single exponential smoothening method (smoothening coefficient = 1

0.25), forecast for the month of March is: **[CO2]**

(a) 431

(b) 9587

(c) 10706

(d) 11000

1-d. The proper sequence of activities for material requirement planning is: (CO2) 1

(a) Master production schedule, capacity planning, MRP and order release.

(b) Order release, master production schedule, MRP and capacity planning.

(c) Master production schedule, order release, capacity planning and MRP.

(d) Capacity planning, master production schedule, MRP and order release

1-e. Little's law is a relationship between: **[CO3]** 1

(a) Stock level and lead time in an inventory system

(b) Waiting time and length of the queue in a queuing system

(c) Number of machines and job due dates in a scheduling problem

(d) Uncertainty in the activity time and project completion time

1-f. Setup costs do not include **[CO3]** 1

(a) Labour cost of setting up machines

(b) Ordering cost of raw material

(c) Maintenance cost of the machines

(d) Cost of processing the work piece

1-g. Work study is also recognised as **[CO4]** 1

(a) Time study

(b) Motion study

(c) both 'a' and 'b'

(d) None of the above

1-h. Work study is mainly aimed at. **[CO4]** 1

(a) Determining the most efficient method of performing a job

(b) Establishing the minimum time of completion of job

(c) Developing the standard method and standard time of a job

(d) Economizing the motions involved on the part of the worker while performing a job

1-i. An optimal assignment requires that the maximum number of lines which can be drawn through squares with zero opportunity cost should be equal to the 1

number of _____.**[CO5]**

(a) Rows or columns

(b) rows and columns.

(c) rows+columns- 1

(d) rows-columns.

1-j. The solution to a transportation problem with m-sources and n-destinations is feasible if the numbers of allocations are _____.. **[CO5]** 1

(a) m+n

(b) mn

(c) m-n

(d) m+n-1

2. Attempt all parts:-

2.a. Define the term production system.**[CO1]** 2

2.b. Define Critical Activity? **[CO2]** 2

2.c. Explain the queue discipline and its various forms: **[CO3]** 2

2.d. What do you understand by Value engineering. **[CO4]** 2

2.e. List out the methods used to obtain initial basic feasible solution in Transportation Problem. **[CO5]** 2

SECTION B **30**

3. Answer any <u>five</u> of the following:-

3-a. Setting up an Industry in rural area is more advantageous. Justify (CO1) 6

3-b. Define process planning. Also differentiate between manual process planning and computer aided process planning [CO1] 6

3-c. Explain in detail about various phases of project management. **[CO2]** 6

3-d. what do you understand by material requirement planning (MRP). also explain input and output of MRP. **[CO2]** 6

3.e. In a Super market, the average arrival rate of customer is 10 in every 30 minutes following poisson process. The average time taken by the cashier to list and calculate the customers purchases is 2.5 minutes, following exponential distribution. What is the probability that the queue length exceeds 6? **[CO3]** 6

3.f. What is the purpose of string diagram and explain it with an example. **[CO4]** 6

3.g. What is an assignment problem? How does it differ from a transportation problem? **[CO5]** 6

SECTION C 50

4. Answer any <u>one</u> of the following:-

4-a. Explain Steps of generative type of process planning. Also write down the advantages and limitations of Generative process planning. **[CO1]** 10

4-b. What are the factors which influence the selection of plant location. Also write down the principles of plant location. **[CO1]** 10

5. Answer any <u>one</u> of the following:-

5-a. What do you understand by forecasting. What are the different types of forecasting. explain exponential smoothing method of forecasting.[CO2] 10

5-b. The following table shows the jobs of a network along with their time estimates. Draw the project network and find the probability of project completion in 40 days **[CO2]** 10

JOB	1-2	1-6	2-3	2-4	3-5	4-5	6-7	5-8	7-8
to	1	2	2	2	7	5	5	3	8
tm	7	5	14	5	10	5	8	3	17
tp	13	14	26	8	19	17	29	9	32

Question Instruction

6. Answer any <u>one</u> of the following:-

6-a. A company producing a single product and sells it at Rs. 10 per unit. Variable cost is Rs. 6 per unit and fixed cost is Rs. 40,000 per annum. Calculate (a) Break even point, (b) Sales volume required to earn a profit of Rs. 60,000 per annum . **[CO3]** 10

6-b. ABC manufacturing company purchases 9000 parts of a machine for its annual requirement. Each part costs Rs.20. The ordering cost per order is Rs.15 and the carrying charges are 15% of the average inventory per year. Apply EOQ formulae and find out EOQ, No of orders ,Total Inventory Cost and total cost. **[CO3]** 10

7. Answer any <u>one</u> of the following:-

7-a. Define Work Study. State its objectives. Differentiate between Method Study and Work Measurement. **[CO4]** 10

7-b. Explain Predetermined Motion Time study(PMTS) and Method Time Measurement (MTM). **[CO4]** 10

8. Answer any <u>one</u> of the following:-

8-a. Solve using Vogel's Approximation Method and perform optimality Test using 10

MODI method.**[CO5]**

Origin/Destination	D1	D2	D3	D4	SUPPLY
O1	11	13	17	14	250
O2	16	18	14	10	300
O3	21	24	13	10	400
DEMAND	200	225	250	275	950

8-b. The processing time in hours for the jobs when allocated to the different machines is indicated below. Select the best assignment of the machines for the jobs so that the total processing time is Minimum. **[CO5]** 10

	M1	M2	M3	M4	M5
J1	9	22	58	11	19
J2	43	78	72	50	63
J3	41	28	91	39	45
J4	74	42	27	49	39
J5	36	11	57	22	25