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GIET UNIVERSITY, GUNUPUR – 765022

B. Tech (Seventh Semester – Regular) Examinations, November – 2022

BOEME7030 – Industrial Engineering

(Chemical Engg. & PCPR)

Time: 3 hrs

Maximum: 70 Marks

Answer ALL Questions

The figures in the right hand margin indicate marks.

PART – A: (Multiple Choice Questions)

(1 x 10 = 10 Marks)

- | Q.1. Answer ALL questions | [CO#] | [PO#] |
|---|---|---------|
| a. Performance rating is equal to | | |
| (i) Observed performance + normal performance | (ii) Observed performance - normal performance | CO1 PO1 |
| (ii) Observed performance × normal performance | (iii) Observed performance / normal performance | |
| b. process charts, the symbol used for inspection | CO1 | PO1 |
| (i) Circle | (ii) Square | |
| (iii) Arrow | (iv) Triangle | |
| c. Which of the following is a scale plan? | CO1 | PO1 |
| (i) String diagram | (ii) Flow process chart | |
| (iii) Operation process chart | (iv) All of the above | |
| d. In _____ layout, similar machines and services are located together. | CO2 | PO1 |
| (i) Process | (ii) Product | |
| (iii) GT | (iv) Fixed position | |
| e. The basic aim of _____ layout is to identify families of components that require similar processing on a set of machines. | CO2 | PO1 |
| (i) Process | (ii) Product | |
| (iii) GT | (iv) Fixed position | |
| f. _____ layout is used when machines and auxiliary services are located according to the processing sequence of the product. | CO2 | PO1 |
| (i) Process | (ii) Product | |
| (iii) GT | (iv) Fixed position | |
| g. Carrying cost increases when the order size is _____. | CO4 | PO1 |
| (i) Increased | (ii) Decreased | |
| (iii) Kept constant | (iv) None of these | |
| h. In _____ model, the price per unit changes with respect to the quantity of purchase. | CO4 | PO1 |
| (i) Quantity appreciation | (ii) Quantity discount | |
| (iii) Simple | (iv) Manufacturing | |
| i. In _____, an attempt will be made to reduce the project completion time earlier than the project completion time. | CO3 | PO1 |
| (i) CPM | (ii) PERT | |
| (iii) Project crashing | (iv) Resource allocation | |
| j. In _____, probabilistic aspect of time duration of the activities are considered. | CO3 | PO1 |
| (i) PERT | (ii) CPM | |
| (iii) CERT | (iv) XERT | |

PART – B: (Short Answer Questions)**(2 x 10 = 20 Marks)**Q.2. Answer ALL questions

	[CO#]	[PO#]
a. Write two important objectives of a production manager.	CO1	PO1
b. List various symbols used in operation process chart.	CO1	PO1
c. Name various charts used in method study.	CO1	PO1
d. What is plant layout and mention the different types.	CO2	PO1
e. What is MAD and MAPE?	CO2	PO1
f. What is the difference between product layout and process layout?	CO2	PO1
g. What is ABC classification?	CO3	PO1
h. What is pure strategies and mixed strategies?	CO3	PO1
i. State Johnson's rule.	CO4	PO1
j. Write a short note on "delphi technique".	CO4	PO1

PART – C: (Long Answer Questions)**(10 x 4 = 40 Marks)**Answer ALL questions

Marks [CO#] [PO#]

3. a. There are five Existing facilities which are to be served by single new facilities are shown below in the table

Existing facility (i)	1	2	3	4	5
Co-ordinates (ai, bi)	(5,10)	(20,5)	(15,20)	(30,25)	(25,5)
No of trips of loads/years (wi)	100	300	200	300	100

10 CO2 PO2

Find the optimal location of the new facilities based on giving location concept.

(OR)

- b. An 8 hrs work measurement study in a plant reveals the following-
Unit produced= 320
Idle time= 15%
Performance rating= 120%
allowance= 12% of normal time
Determine the standard time per unit produced.
4. a. Suppose that there are 5 existing plants, which have a material movement relationship with a new plant. Let the existing plants have locations of (400, 200), (800, 500), (1100, 800), (200, 900) and (1300, 300). Furthermore, suppose that the numbers of tons transported per year from the new plant to various existing plants are 450, 1200, 300, 800, and 1500, respectively. Then determine optimum location for new plant such that the distance moved (cost) is minimized.

10 CO1 PO2

10 CO2 PO2

(OR)

- b. Explain steps of break-even analysis for plant location selection.
- c. With a suitable example, explain Group Technology.

5 CO2 PO1

5 CO2 PO1

5. a. Potential locations A, B and C have the cost structure shown below for manufacturing a product expected to sell for Rs. 270 per unit. Find the most economical location for an expected volume of 2000 units per year and also determine the optimum volume range for each location.

Site	Fixed cost /year (Rs.)	Variable cost/ unit (Rs.)
A	65000	120
B	75000	56
C	55000	425

10 CO2 PO2

(OR)

- b. State the objectives of plant layout design. Classify the layouts and describe with appropriate examples.
6. a. 5. The super Snow paint shop has recorded the demand for a particular colour during the past 6 weeks as shown below.

Week	1	2	3	4	5	6
Demand in Liter	19	17	22	27	29	33

10 CO2 PO1

10 CO3 PO2

- (a) Calculate a 3-week moving average for the data to forecast demand for the next week.
- (b) Calculate weighted average forecast for the data, using a weight of 0.6 for the most recent data and weights of 0.3 and 0.1 for successive older data.

(OR)

- b. In a factory eight jobs are processed through two machines M1 and M2. The processing time (in hours) required for each job is given below.

JOB	M1	M2
A	3	2
B	4	6
C	5	7
D	8	5
E	3	7
F	5	2
G	3	6
H	7	3

10 CO4 PO2

Determine the optimal sequence for completion of these jobs which will minimize the Makespan.

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