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(Following Paper ID and Roll No. to be filled in your Answer Book)

PAPER ID : 2942   **Roll No.** [ ][ ][ ][ ][ ][ ][ ][ ][ ][ ]

B. Tech.

(SEM. VIII) THEORY EXAMINATION 2011-12

PRODUCTION AND OPERATIONS MANAGEMENT

Time : 3 Hours   *Total Marks : 100*

Note : Attempt *all* questions.

1. Answer any *four* parts of the following :   **(5×4=20)**

   (a) Explain the meaning and scope of operations strategy.

   (b) Identify the important operations priorities and explain them in brief.

   (c) Starting 1990 onwards describe the changes that have occurred in competitive priorities of the industries.

   (d) Discuss the basic differences between operations management and operations research.

   (e) Operations management is different from production management. Justify this statement.

   (f) With the help of an input-output model describe the nature of primary inputs and the transformation functions for :

   – A hospital

   – College or university and

   – Automobile factory.

2. Answer any *four* parts of the following :   **(5×4=20)**

   (a) Explain the meaning and scope of SLP.

   (b) Discuss the basic differences between product layout, process layout and fixed position layout. Indicate their applications.

   (c) Enumerate the important issues in locating a new facility.

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(d) What important issues must be addressed while locating a service facility ? Name at least two models for the above.

(e) What considerations must be made while planning the capacity for a service facility/manufacturing ?

(f) Briefly describe the important capacity planning concepts. What is meant by best operating level ?

3. Answer any *two* parts of the following : (10×2=20)

(a) Discuss the meaning of who, what, when, where, why and how of job design. Explain what are the advantages and disadvantages of labour specialization and job enrichment in job design.

(b) An activity sampling study was made in the purse fabrication department to study the cutting, sealing, finishing and packaging operations. Three workers X, Y and Z are involved in the operation. Using the following work-sampling data, compute the normal time and standard time of the finishing operation :

Employee	X	Y	Z
Total hours	40	30	40
Total No. of observations	400	360	340
No. of observations of finishing operation	80	90	85
Avg. rating	110	120	80

Assume 4000 purse equivalent as the output and allowances as 16%.

(c) What are the limitations of CPM ?

The following data pertains to design and development of a project :

Activity	Time estimates (days)		
	a	m	b
Design (A)	10	22	28
Build prototype (B)	3	4	5

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Activity	Time estimates (days)		
	a	m	b
Evaluate equipment (C)	4	6	14
Test prototype (D)	1	2	3
Report writing (E)	1	4	7
Write methods report (F)	7	8	9
Write final report (G)	2	2	2

Compute the critical path length and the probability of completing the project in 41.45 days. (Area of normal distribution curve corresponding to $\pm 1\sigma$ is about 68%).

Precedence relationships are as below :

Activity	Immediate Predecessors
A	—
B	A
C	A
D	B
E	C, D
F	C, D
G	E, F

a = optimistic time; b = pessimistic time; m = most likely time.

4. Answer any *two* parts of the following : (10×2=20)

   (a) What is implied by the word aggregate in aggregate planning ? State the inputs required for aggregate planning. Discuss the pros and cons of various aggregate planning strategies.

   (b) Explain the meaning of lateness and tardiness of a job.

   A machining center in a job-shop has 5 unprocessed jobs at a particular point of time. The jobs are labelled as 1, 2, 3, 4 and 5 in order they entered the shop. The respective processing times and due dates for the five jobs are as

under. Compute the mean flow time, average tardiness and no. of tardi jobs as per FCFS and SPT strategies :

Job No.	Processing time (days)	Due date
1	11	61
2	29	45
3	31	31
4	1	33
5	2	32

(c) Describe the functions that must be performed in scheduling and controlling an operation. Give a list of commonly used measures for schedule performance evaluation. In a single machine scheduling, what priority rules be employed to minimize the mean flow time, mean tardiness and maximum tardiness ?

5. Answer any *two* parts of the following : (10×2=20)

(a) Installing MRP system tends to bring an integration of materials management, production management and other functions of the organization. Discuss the preceding statement. Describe the role of MIS in successful implementation of MRP.

(b) With the help of suitable examples explain the following : (i) Long range capacity planning, (ii) Rough cut capacity planning and (iii) Short-term capacity planning. Also explain the difference between capacity requirements and resource requirements planning.

(c) What is meant by world-class manufacturing ? Discuss, why the operations strategy keeps changing for companies that are world-class competitors and what considerations must be made when developing world-class strategy for a company ? Discuss, what actions are needed to protect a company's future and enable it to develop as a world-class manufacturer.