

Ganpat University
U. V. Patel College of Engineering, Kherva
M. Tech. (A.M.T.) SEM - I Regular Examination, Dec/Jan - 2013-14
3ME102 - PRODUCTION AND OPERATION MANAGEMENT

Max. Time: 3 hours

Max. Marks: 70

Instructions:

- (1) Attempt all question.
- (2) Right figure indicates full marks.
- (3) Assume required data if necessary.

Section - I

Q.1 Answer the following question.

[12]

[A] What are the function and scope of the POM?

[B] The past data on the load on the machines is shown below

Month	Load (HRS)	Month	Load (HRS)
May-12	-	Sep-12	750
June-12	580	Oct-12	855
July-12	605	Nov-12	975
Aug-12	670		

1. Compute the load on the machine center using 5th moving average for the month of December 2012.
2. Compute a weighted three months moving average for December, 2012 where the weights are 0.5 for the latest month, 0.3 and 0.2 for the other months respectively.

OR

Q.1 Answer the following question.

[12]

[A] The quarterly sales for last 3 years are given below. Using time series analysis method calculates the quarterly sales of 4th year.

Year	Quarter	Units Sales (x 10 ⁴)
1 st Year	1	22
	2	33
	3	40
	4	31
2 year	1	28
	2	34
	3	52
	4	32
3 rd year	1	35
	2	46
	3	57
	4	46

[B] Enlist various methods of sales forecasting and explain moving average methods.

Q.2 Answer the following question.

[11]

- [A] A travelling salesman has to visit five cities. He wishes to start from a particular city, visit each city once and then return to his starting point. The travelling cost (in 1000 Rs.) of each city from a particular city is given below:

From City	To City				
	A	B	C	D	E
A	--	2	5	7	1
B	6	--	3	8	2
C	8	7	--	4	7
D	12	4	6	--	5
E	1	3	2	8	--

What should be the sequence of visit of the salesman so that the cost is minimum?

- [B] What are the benefits of Just in time (JIT) approach? Enlist various elements of JIT.

OR

Q.2 Answer the following question.

[11]

- [A] A department of company has five employees with five jobs to be performed. The time (in hours) that each man takes to perform each job is given in the effectiveness matrix.

Jobs	Employees				
	I.	II.	III.	IV.	V.
A	10	5	13	15	16
B	3	9	18	13	6
C	10	7	2	2	2
D	7	11	9	7	12
E	7	9	10	4	12

How should the jobs be allocated, one per employee, so as to minimize the total man-hours?

- [B] Explain the objective, functions and benefits of MRP.

Q.3 Attempt any three.

[12]

- [A] Write a short note on aggregate planning.
 [B] Explain general step in information system design in MIS.
 [C] What is the role of Capability Maturity Model (CMM) in Management Information System (MIS).
 [D] Write a short note on Group Technology.

Section – II

Q.4 Answer the following question.

[12]

[A] An established decided to add a new product to its line. It will buy the product from manufacturing concern, package it, and sell it to a number of distributors that have been selected on geographical basis. The step shown in the following table is to be planned.

Activity	Description	Predecessors	Duration (Days)
A	Organize sales office	---	6
B	Hire salesmen	A	4
C	Train	B	7
D	Select advertising company	A	2
E	Plan campaign	D	4
F	Conduct campaign	E	10
G	Design packages	---	2
H	Setup packaging facilities	G	10
I	Packaging initial stocks	J, H	6
J	Order stock	---	13
K	Select distributors	A	9
L	Sell to distributors	C, K	3
M	Ship stocks to distributors	I, L	5

1. Find the critical path.
2. For each non-critical activity, find the total and free float.

[B] Find the sequence that minimizes the total time required in performing the following jobs on three machines in the order ABC. Processing times (in hours) are given in below table.

Job	1	2	3	4	5
Machine A	8	10	6	7	11
Machine B	5	6	2	3	4
Machine C	4	9	8	6	5

OR

Q.4 Answer the following question.

[12]

[A] Job each of which must be processed on the machine M1, M2, ...M6. The processing time in hrs. are given in table:

Jobs	Processing times					
	M1	M2	M3	M4	M5	M6
A	20	7	6	3	9	24
B	18	5	8	7	9	18
C	13	6	7	4	6	14
D	22	5	3	4	6	10

Find: (i) Optimal Sequence. (ii) Minimum total elapsed time. (iii) Idle times associated with machines.

[B] Give a difference between PERT & CPM.

Q.5 Answer the following question.

[11]

[A] A company manufactures 30 items per day. The sale of these items depends upon demand which has the following distribution:

Sales(units)	27	28	29	30	31	32
Probability	0.10	0.15	0.20	0.35	0.15	0.05

The production cost and sale price of each unit are Rs. 40 and Rs.50 respectively, any unsold product is to be disposed of at a loss of Rs. 15 per unit. There is a penalty of Rs. 5 per unit if the demand is not met.

Using the following random numbers estimate total profit/loss for the company for the next 10 days: 10, 99, 65, 99, 95, 01, 79, 11, 16, 20.

If the company decides to produce 29 items per day, what is the advantage or disadvantage to the company?

[B] With the help of sketch explain the components of queuing system.

OR

Q.5 Answer the following question.

[11]

[A] In a railway marshaling yard, goods trains arrive at a rate of 30 trains per day. Assuming that the inter arrival time follows an exponential distribution and the service time (the time taken to hump a train) distribution is also exponential with an average of 36 minutes. Calculate:

1. Expected queue size (line length)
2. Probability that the queue size exceeds 10.

[B] Define simulation and explain types of simulation.

Q.6 Attempt any three.

[12]

[A] Rules for AOA network construction.

[B] What is Management Information System (MIS)? Also state the scope of MIS in the area of manufacturing industries.

[C] Explain the MRP System. Discuss different inputs and outputs of MRP.

[D] Explain the various terms associated with line balancing.

END OF PAPER