Code : 1P1203

M.B.A. II Semester Supplementary Examinations, December2014
Production and Operations Management

Time: 3 hours   Max Marks: 60

Part A
Answer any Four Questions (12 Marks each)   4 x 12 = 48 Marks
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1. a) Explain systems concept of operations function.   6M

   b) Discuss strategic management.   6M

2. a) Briefly explain the steps in new product development   6M

   b) What are the characteristics of service process technology?   6M

3. a) Discuss the merits and demerits of process layout and product layout.   6M

   b) Discuss the steps of RPW method for line balancing   6M

4. a) Distinguish between single machine scheduling and flow shop scheduling   6M

   b) Consider the following 2 machines and 5 jobs flow shop scheduling problem.
      Using Johnson's algorithm, obtain the optimal sequence which will minimize the
      make span.

Job	Machine 1	Machine 2
1	7	8
2	1	4
3	15	12
4	8	5
5	11	6

                                                                               6M

5. a) Discuss the steps in Method Study.   6M

   b) What is out line process chart? Illustrate it with an example.   6M

6. a) Briefly explain the steps in value engineering?   6M

   b) What is Bill of Material? Explain with an example?   6M

7. a) List and explain different types of costs in inventory systems?   6M

   b) Explain quality circles with examples   6M

Part B–Compulsory Question
Analyze the following case and answer the questions.
CASE STUDY   12Marks

You have the opportunity to invest INR 100 billion for your company to develop a jet
engine for commercial aircrafts. Development will span 5 years. The final product costing Rs.
500 million / unit could reach a sales potential, eventually of Rs. 2500 billion. The new engine
can be placed in service 5 years from now, but only if it qualifies four years from now for
certification clearing commercial use and only if it meets America's Federal Aviation
Administration's (FAA) ever tightening standards for noise reduction. Certification also has to
be obtained from India's Director General of Civil Aviation (DGCA). There is competition from
world-class manufacturers like Pratt and Whitney and Rolls Royce who are developing
competing engines. If you decide to proceed with the project, you must also determine where
the new engines will be produced and develop the manufacturing facilities. If you decline to
proceed, your company could invest its resources elsewhere and based on its track record,
get attractive returns.

8. (a) What would be your line of action?   6M

   (b) In case of lengthy product design and development time, what kinds of risks are there? 6M

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M.B.A. II Semester Supplementary Examinations, December2014
Operations Research

Time: 3 hours   Max Marks: 60

Part A
Answer any Four Questions (12 Marks each)   4 x 12 = 48 Marks
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1. a) Discuss the scope and significance of OR in business.   6M
   b) Discuss the Advantages and Limitations of OR   6M

2. Solve the following linear programing problem using Simplex method

$$Maximize\ Z = 3x_1 + 2x_2$$
$$Subject\ to\ \ 2x_1 + x_2 \le 40$$
$$2x_1 + 3x_2 \le 60$$
$$x_1 + x_2 \le 24$$
$$x_1, x_2 \ge 0$$

                                                                                 12M

3. A company has three plants with capacities of 60, 70 and 80 units respectively to meet the demands of three warehouses with requirements of 50, 80 and 80 units. Given the following per unit cost of transportation, find the optimum plan.

Plant	Warehouses		
	A	B	C
X	8	7	3
Y	3	8	9
Z	11	3	5

                                                                                 12M

4. Five jobs 1,2,3,4 and 5 are to be assigned to 5 machines A, B, C, D and E. The costs of assigning these jobs to the machines in Rupees is given in the following table. Determine the optimal assignment so as to minimize total cost.

Jobs	Machines				
	A	B	C	D	E
1	6	7	5	9	4
2	7	5	10	9	6
3	5	4	3	6	5
4	8	3	5	6	4
5	4	2	5	6	6

                                                                                 12M

5. a) Define Pure strategy and Saddle point   4M
   b) Solve the following Game by reducing to 2 X 2 Game using Graphical Method

Player A	Player B		
	I	II	III
I	2	4	10
II	9	6	3

                                                                                  8M

6. a) State the characteristics of decision making   6M
   b) What is decision making under uncertainty? Name commonly used criteria for solving problems under uncertainty?   6M

7. Arrivals at one person barber shop according to a Poisson process with a mean inter-arrival time of 20 minutes. Customers spend on an average of 15 minutes in the barber's chair.

i) What is the probability that a new arrival need not wait for the barber to be free?

ii) What is the expected number of customers in the barber shop?

iii) How much time can a customer expect to wait for his turn?

iv) How much time can a customer expect to spend in the shop?   12M

Part B–Compulsory Question
Analyze the following case and answer the questions.
CASE STUDY   12Marks

8. The following table gives the activities in a construction project and other related information.

Activity	Optimistic time (Days)	Most likely time (Days	Pessimistic time (Days)
1-2	20	30	46
1-3	9	12	21
2-3	3	5	7
2-4	2	3	4
3-4	1	2	3
4-5	12	18	24

i) Draw a PERT diagram

ii) Calculate total project duration

iii) Mark critical path

iv) Find the probability that the project will be completed in 50 days.

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