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P.E.S. College of Engineering, Mandya - 571 401
 (An Autonomous Institution affiliated to VTU, Belgaum)
Seventh Semester, B.E. - Industrial and Production Engineering
Semester End Examination; Dec. - 2015
Operations Management

Time: 3 hrs

Max. Marks: 100

Note: i) Answer any **FIVE** full questions, selecting at least **TWO** full questions from each part.
 ii) Assume missing data if any.

PART - A

- 1 a. Explain the brief history of the development of production management. 10
- b. Discuss the factors influencing productivity. 10
- 2 a. Explain the framework for decision making. 5
- b. List and explain the classification of system. 5
- c. A toy manufacturing firm is evaluating three different sites for its new plant to produce garden tractors (toys) which sell at Rs. 145/- each. The economic portion of the plant location study shows the following cost and market data

Factor	City A	City B	City C
(i) Fixed cost 1 year Rs.	3,00,000	2,00,000	75,000
(ii) Variable cost/ unit Rs.	30	45	70
(iii) Market data demand units	6500	5500	4500
(iv) Probability	60%	30%	10%

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Using the above data, recommend a suitable place for new plant graphically. Also find graphically. Break even volume at this recommended location.

- 3 a. Using a simple exponential smoothing technique compute the forecast for the following series assuming $\alpha = 0.2$ and forecast at 25. Plot the results graphically. 10

Period	1	2	3	4	5	6	7	8	9	10
Actual Demand	50	60	70	80	90	100	110	120	130	140

- b. Allan’s underground systems install septic systems for new houses constructed outside city limits. To help forecast his demand. Mr. Allan has collected data shown in table on the number of country building permits issued per month, along with the corresponding number of bid requests he has received over a 15 month period.

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14
No. of building permits	8	20	48	60	55	58	50	45	34	38	10	5	12	29
No. of bid requests	20	7	8	4	18	40	48	54	47	42	30	22	20	43

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i) Compute a simple correlation coefficient r between the number of building permits issues and the number of bid requests received in that month. Use all 15 period data.

ii) Use first 12 months of data for building permits and compute r between the number of building permits issues in a month and the number of bid requests received 2 months later.

- 4 a. List and explain the objectives of aggregate planning. 5
- b. Briefly explain the planning strategy. 10
- c. Distinguish between aggregate planning and master scheduling. 5

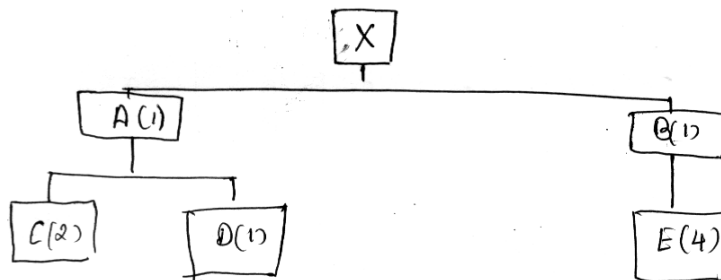
PART - B

- 5 a. Explain the system parameters of MRP system. 5
- b. Complete the MRP shown below and find the amount of inventory on hand at the end of the week.

Order quantity = 500 Lead time = 4 weeks	Week							
	1	2	3	4	5	6	7	8
Projected requirements	150	150	150	150	200	200	180	320
Receipts			500					
On hand at end of period 300	150	0	350	200				
Planner order release								

- c. With the given product structure tree and inventory compute the net requirement for A, B, C, D and E to produce 50 units of X.

Components	A	B	C	D	E
Inventory on hand and on order	20	10	15	30	100



- 6 a. Explain the different scheduling strategies. 6
- b. Enumerate the objectives of scheduling. 4
- c. Find the sequence for the following eight jobs, that minimizes the total elapsed time for the completion of all jobs, each job is processed in order CAB. Find the total elapsed time and idle time of each machine. 10

	Job	1	2	3	4	5	6	7	8
Machines	A	4	6	7	4	5	3	6	2
	B	8	10	7	8	11	8	9	13
	C	5	6	2	3	4	9	15	17

7 a. The following table gives the processing times (in hours) of seven jobs to be processed on three machines M_1, M_2, M_3 in the order of M_1, M_2, M_3 . Sequence these jobs using Johnson's method and find the overall processing time. Find also waiting times of the jobs and the idle time of the three machines.

Job	M_1	M_2	M_3
A	1	7	8
B	3	3	10
C	7	8	9
D	9	2	11
E	4	8	9
E	4	8	9
F	5	6	14
G	2	1	12

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b. Use graphical method to minimize the time needed to process the following jobs on the machine shown. Also calculate the total time needed to complete both jobs.

Job 1	Sequence	A	B	C	D	E
	Time	3	4	2	6	2 = 17
Job 2	Sequence	B	C	A	D	E
	Time	5	4	3	2	6 = 20

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8 a. List and explain the different kinds of waste.

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b. With an example explain the pull method of material flow.

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