

**BIRLA INSTITUTE OF TECHNOLOGY & SCIENCE, PILANI**  
**Second Semester 2021-22**  
**Manufacturing Planning and Control**  
**MSE G512**

Max. Marks: 50

Duration: 90 minutes

Date: 09-03-2022

**Q.1** Encircle the most appropriate answer:

- (i) The point of indifference is a measure of [1]
- a) Total cost
  - b) Total revenue
  - c) Number of units produced
  - d) Profit
- (ii). Which of the following is not true for forecasting? [1]
- a) Forecasts are rarely perfect
  - b) The underlying casual system will remain same in the future
  - c) Forecast for group of items is accurate than individual item
  - d) Short range forecasts are less accurate than long range forecasts
- (iii). The sequence, generally, followed in developing an HOQ is [1]
- a) Need, competitor evaluation, technical requirements, relationship matrix, target values
  - b) Need, relationship matrix, competitor evaluation, target values, technical requirements
  - c) Need, competitor evaluation, technical requirements, target values, relationship matrix
  - d) Need, technical requirements, competitor evaluation, relationship matrix, target values
  - e) Need, target values, competitor evaluation, technical requirements, relationship matrix
  - f) Need, competitor evaluation, relationship matrix, target values, technical requirements
- (iv). In location planning, environmental regulations, cost and availability of utilities, and taxes are [1]
- a) Global factors
  - b) Country factors
  - c) Regional/community factors
  - d) Site-related factors
  - e) None of the above
- (v). What type of layout(s) would be appropriate for: (Answer correctly at least 2) [1]
- a) Electric scooter plant-.....?
  - b) Home construction -.....?
  - c) A university -.....?

**Q2.** Draw a process map for a hospital dealing with COVID-19 infected/suspected patients? [5]

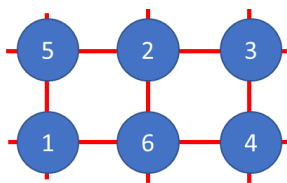
**Q3.** Explain with the help of diagrams and a suitable example, how the house of quality of the product satisfies all the shop floor requirements for its manufacturing in the plant? [5]

**Q4.** Explain the concept of core competencies with the examples of core competency for an automobile company and a retail store? [5]

**Q5.** Logitech is trying to determine how best to produce its newest product, Bluetooth keyboards. The keyboards could be produced in-house using either conventional method or automated assembly line, or purchased from a supplier. Cost data are given below. For what levels of demand should each process be chosen? [5]

	Fixed cost	Variable cost
<b>Conventional method</b>	\$ 8,000	\$ 10
<b>Automated assembly</b>	\$ 20,000	\$ 4
<b>Supplier</b>	\$ 0.00	\$ 20

**Q6.** Existing layout of a small job shop manufacturing facility consisting of six different departments is shown in Figure:

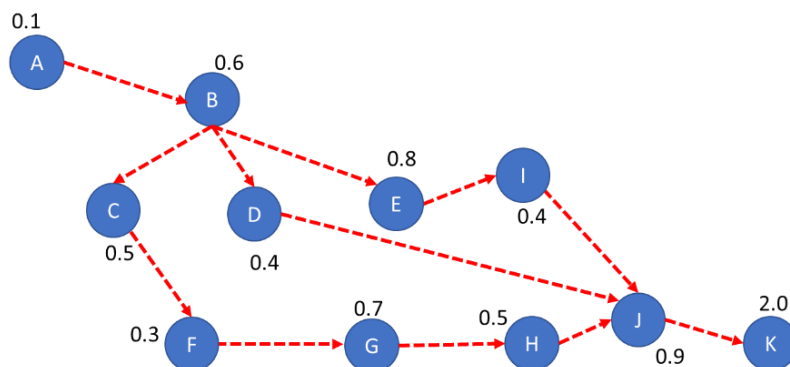


Collected data for movements between various department of a manufacturing shop floor is given in the table:

From/To	Departments					
Departments	1	2	3	4	5	6
1		50	10	25	10	100
2			30	40	20	20
3		40		20	60	40
4		10	10		10	40
5		30	20	10		30
6	40	60	50	20	50	

- (a) Calculate the nonadjacent loads for the initial layout [2]  
 (b) Design the new facility layout of  $2 \times 3$  for minimum travel of inventory among the departments. [3]

**Q7.** The precedence diagram and task times (in minutes) for assembling modular furniture are shown below. Set up an assembly line to assemble 1000 sets of modular furniture in a 40-hour week. Balance the line and calculate its efficiency. Compare at least two options of workstations. [10]



**Q8.** RAP Computers assembles computers from generic parts it purchases at discount and sells the units via phone orders it receives from customers responding to their ads in trade journals. The business has developed an exponential smoothing forecast model to forecast future computer demand. Actual demand for their computers for the past eight months is as follows:

Month	Demand	Forecast
March	120	-
April	110	120.0
May	150	116.0
June	130	129.6
July	160	129.7
August	165	141.8
September	140	151.1
October	155	146.7
November	-	150

- (a). Using the measures of forecast accuracy (MAD, MAPD and cumulative error), ascertain if the forecast appears to be accurate. [5]  
 (b). Determine if a three-month moving average would provide a better forecast. [5]

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