

Code No: 117DV

R13**JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD****B. Tech IV Year I Semester Examinations, November/December - 2016****INDUSTRIAL MANAGEMENT****(Mechanical Engineering)****Time: 3 Hours****Max. Marks: 75****Note:** This question paper contains two parts A and B.

Part A is compulsory which carries 25 marks. Answer all questions in Part A. Part B consists of 5 Units. Answer any one full question from each unit. Each question carries 10 marks and may have a, b, c as sub questions.

PART - A**(25 Marks)**

1. a) What do you understand by a 'system'? Discuss management as system by bringing out its basic features as such. [2]
- b) What is meant by hierarchical nature of needs? Is hierarchy rigid? Explain. [3]
- c) What are the factors which determine the appropriate span of management? [2]
- d) What is virtual organization? Discuss the reasons for the emergence of the concept of virtual organization. [3]
- e) How will you determine if an organization does or does not have a good product development process in place? [2]
- f) Is group technology layout any differ from a product layout? Give reasons for your answer. [3]
- g) What are the important factors effecting the allowances in work study? [2]
- h) Assuming that the total observed time for an operation of assembling an electric switch is 1.00 min. If the rating is 120%, find normal time. If an allowance of 10% is allowed for the operation, determine the standard time. [3]
- i) What do you mean by performance appraisal? Discuss its need and importance in an organization? [2]
- j) Provide an example of precedence relationships from your personal life. [3]

PART - B**(50 Marks)**

2. a) "Theory X and Theory Y are concerned with the nature of people". How does the job situation affect the application of this theory? What are its implications?
 - b) Critically examine Herzberg's two factor theory. Make a comparison between theories of Herzberg and Maslow. Which of these theories do you prefer in Indian context? Give reasons. [5+5]
- OR**
3. a) How do functional areas of management differ from management functions? Discuss the major functional areas of management.
 - b) In what respect have Fayol's principles of management resulted in contributions to management methods that are different from the techniques of Taylor's scientific management? [5+5]
4. a) Describe various bases for departmentation and suggest a scheme of departmentation for a large marketing company with a field network all over the country.
 - b) What is free form organization? What are its benefits and limitations compared to fixed and rigid structure? [5+5]

OR

5.a) What is the role of operators in an organization? What are the other functions in an organization? Are these functions independent of one another? Give some examples to support your argument.

b) How is informal organization relevant to managers? In what ways, can managers make most effective use of informal organization? [5+5]

6.a) Suppose you are given three alternative designs for the layout of a shop floor in a manufacturing organization. How will you decide which of the three is the most appropriate?

b) A manufacturer of washing machines is in the process of locating regional warehouses in four geographical locations in South India to serve the markets. The markets are geographically split into five segments. Based on forecasting estimates by the marketing department, it has been found that the average monthly demand for the washing machine is 2000, 1500, 1200, 2800 and 2500 in each of the market segments. Based on this forecast and other costs including the fixed and variable costs of setting up warehouses, it has been decided to build four warehouses with a capacity to handle monthly requirements to the extent of 2900, 2300, 3700 and 1100 units, respectively. Due to the geographical spread of the warehouses and the markets, the transportation cost per unit is different between these pairs of warehouses and market segments. The table below has the cost of transporting unit. Identify the cost effective way of serving the market from these warehouses. [4+6]

	Market 1	Market 2	Market 3	Market 4	Market 5
Warehouse A	100	70	50	30	40
Warehouse B	30	95	40	125	50
Warehouse C	75	20	65	40	30
Warehouse D	20	40	95	85	80

OR

7.a) Identify an appropriate layout for each of the following situations. Justify your choice in a sentence or two:

- A manufacturer of garments for Van Heusen
- A multi cuisine restaurant in a posh residential area in Mumbai.
- The overhaul of helicopters.
- A fabricator of custom made PCBs for a large number of electronic applications.
- An eye hospital.
- A motor manufacturer manufacturing 4 product groups for worldwide markets.
- A manufacturer of large turbines for power sector applications.

b) An organization has warehouses for life saving drugs at six different locations whose coordinates given in the following table. The organization is in the process of locating one more critical central warehouse which will distribute drugs to all the existing warehouses on emergency request. Find the location of new warehouse. [4+6]

Existing warehouse number	Coordinates of Centroids
1	200, 100
2	400, 300
3	250, 120
4	550, 200
5	220, 250
6	400, 300

- 8.a) A job consists of three work elements and all performed by the same operator. An analyst conducted work sampling to determine the standard time for the job. The duration of the study is two shifts each with 400 minutes of effective time. The details of observations are summarized in the following table. The total number of acceptable units produced during the study period is 150 units. Determine the standard time by assuming allowance of 10%.

Work Element Number	Frequency of Performance	Performance Rating (%)
1	70	80
2	80	120
3	50	110

- b) A time study was made of a punch press operator. The average observed time after discounting non normal occurrences was 0.52 minute per unit. The operator performance was judged to be 90 and the allowances for this type of work total 12 percent. What is the normal time and standard time for this job? [5+5]

OR

- 9.a) In a welding shop, a direct time study was done on a welding operation. One inexperienced industrial engineer and one experienced industrial engineer conducted the study simultaneously. They agreed precisely on cycle time (shown below) but their opinion on rating the worker differed. The experienced engineer rated the worker 100 percent and the other engineer rated the worker 120 percent. They used a 0.10 percent allowance fraction.

Cycle Time (Minutes)	Number of times observed
20	2
24	1
29	1
32	1

From the above statement,

- Determine the standard time using the experienced industrial engineer's worker rating.
 - Find the standard time using the worker rating of inexperienced industrial engineer.
 - Comment on the reliability of time study engineers.
- b) A manufacturer of garments wants to set up a quality control system using control charts for process control. The manufacturer has the three options to choose from:
- Measure the critical dimensions of the garment for establishing its quality.
 - Segregate every batch of production into good quality and seconds quality.
 - Estimate the number of defects for bale of cloth issued for production
- The manufacturer is not sure about what it means to choose which of the above. Prepare a report explaining the pros and cons of each of the choices, the nature of efforts required to setup control charts and implications of their use. [5+5]

- 10.a) A project management firm is preparing a network for one of the projects that it has recently bid for. The client demands that the project needs to be completed and delivered at its site by week 25. The firm has identified the list of activities to be performed and estimated the duration of each of the activities. The details are given in the table below. Use this information to draw a network and help the firm answer the following questions

Activity	Predecessor	Duration (weeks)
A	-	8
B	A	3
C	A	6
D	A	4
E	B	5
F	B	4
G	C,E	6
H	D	6
I	F	6
J	D	4
K	G,H,I	3
L	J,K	3

- i) Will the firm be able to meet with the customer's dead line of 25 weeks?
 ii) If the firm cannot, identify the set of activities that need to be considered for a possible reduction in duration.
 iii) If the cost of reduction is RS 10000 per week and the firm will have to pay a penalty of Rs 7000 per week of delay in completion in addition to paying affixed amount of Rs 20000, what will your recommendation be to the firm with respect to reducing the duration?
- b) Explain the trade- off in network crashing. [6+4]

OR

11.a) Consider the following problem involving activities from A to J.

Activity	Immediate predecessor(s)	Duration (months)
A	-	1
B	A	4
C	A	2
D	A	2
E	D	3
F	D	3
G	E	2
H	F,G	1
I	C,H	3
J	B	2

- i) Construct the CPM network. ii) Determine the critical path.
 iii) Compute total floats and free floats for non-critical activities.
- b) Consider the following data of a project.

Activity	Predecessor(s)	Duration (weeks)		
		a	m	b
A	-	1	2	3
B	-	2	2	8
C	A	6	7	8
D	B	1	2	3
E	A	1	4	7
F	C,D	1	5	9
G	C,D,E	1	2	3
H	F	1	2	9

- i) Construct the project network. ii) Find the expected duration and variance of each activity.
 iii) Find the critical path and the expected project completion time. [5+5]

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