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RB-1734

Second Year B. B. A. (Sem. IV) Examination

April / May – 2010

Production Management

Time : **3** Hours] [Total Marks : **100**

Instructions :

(1)

નીચે દર્શાવેલ ☛ નિશાનીવાળી વિગતો ઉત્તરવહી પર અવશ્ય લખવી.
Fillup strictly the details of ☛ signs on your answer book.

Name of the Examination :

☛ **S. Y. B. B. A. (Sem. 4)**

Name of the Subject :

☛ **Production Management**

☛ Subject Code No. : **1 7 3 4** ☛ Section No. (1, 2,.....) : **Nil**

Seat No. :

Student's Signature

(2) All questions are **compulsory**.

(3) Figures to the right indicate full marks.

1 Answer following questions briefly : (any **five**) **10**

(i) Demand of one chemical is 1600 kgs/week, there are 50 working weeks in one year, inventory carrying cost is Rs. 8.00/kg/yr, ordering cost is Rs. 800.00/order, find out no of orders to be placed in a year if Economic Order Quantity (EOQ) is ordered.

(ii) Give four examples of inspection activity for material type flow process charts.

(iii) If allowance factor is 20% of shift time, what is standard time if normal time is 20 minutes? What shall be standard time if allowance factor is 20% of cycle time?

(iv) Explain classification of independent demand inventories and dependent demand inventories.

(v) Convert following unbalanced maximization problem to balanced minimization format :

Salesman	Area				
	A_1	A_2	A_3	A_4	A_5
S_1	5000	8000	7000	4000	5000
S_2	3000	5000	4500	3000	6000
S_3	Not possible	4000	3500	3000	4500
S_4	8000	9000	7000	5000	4000

(Matrix shows sale in rupees)

(vi) Can you convert following job sequencing problem to a two machine format to apply Johnson's Rule? Justify your answer. (Time in minutes)

	Job1	Job2	Job3	Job4	Job5	Job6
M1	15	04	08	25	10	07
M2	20	06	20	20	10	08
M3	05	06	15	15	08	05

2 Define "Bill of Material". Explain its application and importance in material requirement planning. Explain what do you mean by "Explosion of Bill of Material." **7**

OR

2 Write a short note on "Capacity Requirement Planning". **7**

3 Differentiate between "Intermittent manufacturing system" and "continuous manufacturing system."

OR

3 Discuss various classifications of material handling equipments in detail. **7**

4 Daily requirement of one chemical is 300 kgs. There are 300 working days in a year. Since this material is one of the critical inputs, it is manufactured on in-house basis. In-house manufacturing capacity for this material is 600 kgs/day. Everytime when a new prouction cycle begins for in-house manufacture of this material, Rs. 500.00 are spent on generation on production records. Rs. 600.00 are spent on giving orders and instructions to employees doing in-house manufacture of this material. Rs. 2900.00 are spent on cleaning and re-setting machines before every production run for in-house manufacture. Per unit total cost of manufacturing this material is Rs. 100.00/kg. Inventory carrying cost is 10% of cost of manufacturing on annual basis. **10**

(i) Find out Economic Run Length Quantity.

(ii) Find out Maximum Inventory Level.

(iii) Find out no. of production runs needed in one year.

(iv) Find time gap between end of one production run and beginning of another production run.

(v) Find length of one production run in days.

(vi) Find time gap between beginning of two successive production runs.

OR

4 (a) Annual Requirement of one chemical is 60,000 kgs; cost of placing one order is Rs 5,000.00 per order. Out of every order received, total 5 kgs are used for quality checking. Quality checking is done by destructive testing. Unit price of this material is Rs. 120,00 per kg. Inventory carrying cost is 30% of price on annualized basis. Cost of performing one quality check is **7**

Rs. 1900.00 per test. This cost of quality check does not include cost of 5 kg material used in Q.C. Find EOQ. If supplier offers 5% discount for order quantity of more than or equal to 15,000 kgs, should we accept this discount offer? Justify your answer by proper calculation.

(b) Explain why interest cost and storage cost needs separate treatment and why they should not be combined as inventory carrying cost. **3**

5 (a) Explain various techniques of Value Analysis in detail. **7**

(b) A time study was conducted on a job which contains from elements : **5**

Element	Performance Rating (%)	Observed Time (Minutes)					
		Cycle 1	Cycle 2	Cycle 3	Cycle 4	Cycle 5	Cycle 6
1	90	0.44	0.47	0.96	0.45	0.43	0.42
2	85	1.50	1.54	1.47	1.51	1.49	1.45
3	110	0.84	0.89	0.78	0.83	0.86	0.80
4	100	1.10	1.14	1.08	2.41	1.16	1.18

Following are work-sampling results :

- Useful work frequency = 160
- Avoidable Delay frequency = 20
- Unavoidable delay frequency = 60

(i) Find out allowance factor

(ii) Find Normal Time and Standard Time for the job if the allowance factor is % of shift timings.

OR

5 (a) Following activities were observed in a semi-automatic manufacturing operation : **9**

(i) Worker loads raw material piece into machine - 1 minute

(ii) Worker starts machine by engaging a lever - 1 minute

(iii) Machine runs automatically with automatic stoppage at the end - 4 minutes

(iv) Worker unloads finished piece from machine - 2 minutes

(v) Machine throws waste material automatically - 1 minute

(vi) Worker inspects finished piece - 1 minute

(vii) Worker puts finished piece in a box - 3 minutes

(viii) Worker puts data in the job card - 1 minute

Construct 1 worker × 1 machine chenk for the most efficient activity sequence. Find out cycle time for this activity sequence.

(b) Mention symbols and abbreviations for following therbligs : **3**

(i) Unavoidable delay

(ii) Search

(iii) Inspect.

6 (a) Explain various objectives of quality control. **6**

(b) Billing time in a super market is monitored using X-chart and R-chart. Following are observation values for six samples with sample size n = 20 : (Time in minutes) **5**

Sample	Mean	Range
1	3.06	0.42
2	3.15	0.50
3	3.11	0.41
4	3.13	0.46
5	3.06	0.46
6	3.09	0.45

Find out 3-sigma control limits of X-chart and R-chart (for n=20 sample size, A_2=0.18, D_3 = 0.41, D_4 = 1.59)

(c) Differentiate between fixed and flexible production budgets. **3**

OR

6 (a) Explain major limitation of X-chart and R-chart when there is a targetted value of variable X_T and permissible range X_{max} and X_{min}. How control charts can be misleading in this situation? **5**

(b) A beverage company wants to fill 351.00 ml in every bottle because nett quantity mentioned on bottle is 350.00 ml. To be on safer side, company wants to fill exact 351.00 ml. Total 20 samples with sample size = 5 are taken. Following are results : **5**

$\bar{\bar{X}}$ = 350.945 ml

σ = Std. deviation of process is 0.345 ml.

$\bar{R}$ = 0.571 ml.

Find control limits for X-chart and R-chart (Find 3σ limits)

Note : For n = 5, d_3 = 0.00 and d_4 = 2.11

(c) A data entry team enters data of customer orders in computer. Every day no. of errors in 10 forms entered are counted.

The process is under control when average no. of errors are 5 per form.

Find out two-sigma control limits for the chart.

7 (a) Explain following priority rules : **5**

(i) EDD

(ii) SPT

(iii) LPT

(iv) LS

(v) PCO

(b) Write a short note on "Dispatching". **5**

OR

7 There are four students in a college. Let us call them S1, S2, S3 and S4. They are representing college to a competition in which there are five events E_1, E_2, E_3, E_4 and E_5. In every event, only one student can participate. No student can participate in two events or more. In the following table, probability of student to win an event is mentioned for every combination of students and events : **10**

	E_1	E_2	E_3	E_4	E_5
S_1	0.6	0.5	0.7	0.3	0.8
S_2	0.1	0.3	0.7	0.3	0.5
S_3	0.7	0.6	0.6	0.5	0.2
S_4	0.2	0.5	0.8	0.6	0.6

Please decide which student should participate in which event to maximize average winning probability. Which event should not be competed?