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Your Roll No.....

BBS / IV Sem. – 2012

BUSINESS STUDIES – Paper 403

Production & Operations Management

Time : 3 hours

Maximum Marks : 75

*(Write your Roll No. on the top immediately
on receipt of this question paper.)*

*Attempt any **Fifteen** questions.*

1. Define Operations Management. Explain the key decisions of Operations manager. (5)
2. Explain the following terms :-
 - (i) MTBF
 - (ii) MTTR
 - (iii) Availability
 - (iv) Reliability
 - (v) Maintainability (5)
3. Demand for a dairy product was 200 in April, 50 in May and 150 in June. The forecast for April was 100

P.T.O.

units. With a smoothing constant of 0.20 ($\alpha = .20$) and using first order exponential smoothing, calculate the Demand forecast for the month of July. Also calculate MAD. (5)

4. Explain any two qualitative methods of forecasting in detail. (5)
5. Anil Sharma is the Supervisor of Legal Copy Express, which provides copy services for downtown Los Angeles Law firms. Five customers submitted their orders at the beginning of the week. Specific scheduling data are as follows :-

Job (In order of Arrival)	Processing Time (Days)	Due Date
A	3	5
B	4	6
C	2	7
D	6	9
E	1	2

Sharma has to decide on processing sequence for five orders. The rules he can opt are (FCFS, SPT, LPT, EDD). Which sequence should Sharma follow on the basis of Total flow time, mean flow time, utilisation, Average tardiness ? (5)

6. A machine is set to deliver the packets of a given weight. Ten samples of size five each were examined and following results were obtained.

Sample No. :	1	2	3	4	5	6	7	8	9	10
Mean :	43	49	37	44	45	37	51	46	43	47
Range :	5	6	5	7	7	4	8	6	4	6

Calculate the values for Central Line and Control Limits for the mean chart and range chart.

Use $A_2 = 0.58$ $D_3 = 0$ $D_4 = 2.11$.

Comment on the state of control and also draw the Control Charts. (5)

7. On an average 96 patients per 24-hour day require the service of an emergency clinic. Also, on an average, a patient requires 10 minutes of entire attention. Assume that the facility can handle only one emergency at a time. Suppose that it costs the clinic Rs. 100 per patient treated to obtain an average servicing time of 10 minutes, and that each minute of decrease in the average time would cost Rs. 10 per patient treated. How much would have to be budgeted by the clinic to decrease the average size of the queue from $1\frac{1}{3}$ patients to $\frac{1}{2}$ a patient ? (5)

8. From a lot consisting of 2200 items, a sample size of 225 is taken. If it contains 2 or less defective, the lot is accepted or rejected. Plot the operating characteristic curve. (5)

9. Amar company is currently working with a process which after paying for material, Labour etc brings a profit of Rs. 12000. The following alternatives are made available to the company.

(i) The company can conduct research (R_1) which is expected to cost Rs. 10,000 having 90% chances of success. If it proves a success, the company gets a gross income of Rs. 25000.

(ii) The company can conduct research (R_2) which is expected to cost Rs. 8000 having a probability of 60% of success, the gross income will be Rs. 25000.

(iii) The company can pay Rs. 6000 as royalty for a new process which will bring a gross income of Rs. 20000.

(iv) The company continues the current process because of limited resources, it is assumed that only one of two - types of research can be carried out at time. Use decisions free analysis to locate the optimal strategy for the company. (5)

10. Write a short note of Product – Process matrix. (5)

11. Explain Product and Process Layout with the help of suitable example. Also give advantages and disadvantages of both. (5)

12. The assembly Line whose activities are shown below has an 8-minute cycle time. Draw the precedence graph and find minimum possible no. of workstations. Then arrange the activities in order to balance the Line. What is the efficiency of your time balance?

Task	Performance Time (minutes)	Task must follow this part
A	5	—
B	3	A
C	4	B
D	3	B
E	6	C
F	1	C
G	4	D,E,F
H	2	G

(5)

13. Explain the following :-

(i) Type I Error and Type II Error

(ii) Order Qualifier and Order Winner (5)

14. A manufacturer of electrical switchgear is in the process of preparing the aggregate production plan for next year. The table below given details pertaining to the forecast demand for "equivalent" model of switch gear and no. of working days available during planning horizon.

Month	Demand (in units)	No. of working Days
April	250	23
May	220	22
June	300	21
July	290	24
August	260	22
September	180	22
October	200	19
November	220	23
December	250	21
January	200	23
February	240	20
March	270	24

The following relevant details are also available :-

- (i) The manufacturer currently works on a single shift basis and employs 125 workers.

- (ii) One unit of switch gear requires 100 hours of production time.
- (iii) It is expected that at the beginning of the planning horizon, there will be a finished goods inventory of 200 switchgear.
- (iv) Inventory carrying cost are Rs. 1000 per switchgear per month and unit shortage cost are 200 percent of unit carrying cost.

Devise a level production plan with constant work forme and constant working hour and compute cost of plan. (5)

15. Write short notes on any **two** of the following :-

(i) Bath tub curve

(ii) Batch production

(iii) Kan Ban Production System (5)

16. Explain the key factors that influence Facility Location. (5)