

2026

BUSINESS ADMINISTRATION — HONOURS

Paper : BBAA-403-CC7

(Production and Operations Management)

Full Marks : 75

The figures in the margin indicate full marks.

*Candidates are required to give their answers in their own words
as far as practicable.*

Group - A

1. Answer *any ten* questions :

2×10

- (a) What are the fundamental differences between goods and services?
- (b) What is Bath tub Curve?
- (c) What are the differences between MTBF and MTTR?
- (d) Define lean production.
- (e) Define Delphi method of forecasting.
- (f) What is weighted moving average method in forecasting?
- (g) What is Maintenance Prevention?
- (h) State the differences between FCFS and EDD.
- (i) Define Quality.
- (j) What is process layout?
- (k) State any two measures of forecast error.
- (l) What is FMS?
- (m) What are common and assignable causes?
- (n) State the differences between mean and range chart.
- (o) What is Statistical Quality Control?
- (p) What distribution is followed for arrival in queuing theory?

Please Turn Over

(4731)

Group - B

2. Answer **any five** questions.

5×5

(a) Find the trend for the following series using three years weighted moving average with weights 1,2,1 :

Year	1	2	3	4	5	6	7
Values	2	4	5	7	8	10	13

(b) Four jobs are to be processed on the machine as per data listed in table :

Jobs	Processing time (days)	Due date
1	4	6
2	7	9
3	2	19
4	6	17

Arrange the sequence of jobs with respect to EDD and SPT.

(c) There are 5 jobs, each of which has to go through the machines A and B in the order AB. The processing times (in hours) are given as :

Jobs	J1	J2	J3	J4	J5
Machine A	2	4	5	7	1
Machine B	3	6	1	4	8

Determine a sequence of these jobs that will minimise the total elapsed time T. Also obtain :
(i) the minimum elapsed time; and (ii) the idle time for each of the machines

(d) Make a comparative study of Process and Product Layout.

(e) The following actual demand and forecast values are given for the past four periods. We want to calculate MAD and MSE for this forecast to see how well it is doing.

Period	Actual Demand	Forecast Demand
1	63	68
2	59	65
3	54	61
4	65	59

(f) What is Flexible Manufacturing system? Explain its characteristics with suitable examples.

(g) Fit a linear trend equation in the following series on production (tons) and predict the production of 2025 :

Year	2018	2019	2020	2021	2022	2023
Production (Tons)	21	37	48	56	62	69

(h) Explain the differences between Mean Time Between Failure (MTBF) and Mean Time to Repair (MTTR).

(3)

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Group - C

10×3

Answer *any three* questions.

3. A machine is set to deliver packets of given weight. Ten samples of size 5 each were recorded. Below are given relevant data :

Sample No.	1	2	3	4	5	6	7	8	9	10
Mean	15	17	15	18	17	14	18	15	17	16
Range	7	7	4	9	8	7	12	4	11	5

Calculate the values of the central line and control limits for mean and range chart and then comment on the state of control. (Conversion factors $n = 5$ are $A_2 = 0.58$, $D_3 = 0$, $D_4 = 2.11$)

4. Use the method of exponential smoothing, find forecasts for the following sales data, taking an initial forecast 25 and smoothing coefficient 0.4 :

Day	1	2	3	4	5	6	7	8
Sales	26	28	23	27	24	30	26	27

5. What is product or line layout and Process or functional layout? Explain the characteristics, advantages and disadvantages of each of them.
6. The intangible and tangible figures for the three sites S1, S2 and S3 are given below in a tabular form. Make out your calculations to select the best site out of the three.

Factors	S1	S2	S3
Banking Cost and Equipment	25 lakhs	15 lakhs	20 lakhs
Taxes per year	2.5 lakhs	1 lakh	1.8 lakhs
Power cost per year	1 lakh	1.5 lakhs	1.2 lakhs
Community Attitude	Moderate	Excellent	Good
Labour Supply	Inadequate	Good	Adequate
Research Climate	Good	Excellent	Very Good

7. What is lean production? What are the characteristics of lean production? Explain two card Kanban system.

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