

22573

24225

3 Hours / 70 Marks

Seat No.

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- Instructions* – (1) All Questions are *Compulsory*.
(2) Answer each next main Question on a new page.
(3) Figures to the right indicate full marks.
(4) Use of Non-programmable Electronic Pocket Calculator is permissible.
(5) Mobile Phone, Pager and any other Electronic Communication devices are not permissible in Examination Hall.

Marks

1. Attempt any FIVE of the following : 10
- a) Define ‘Ergonomics’.
 - b) Give symbols for any four therbligs.
 - c) Define np and p charts.
 - d) Enlist controlling functions of PPC.
 - e) Enlist types of events in network analysis.
 - f) Define ‘maintenance’.
 - g) Give formula to calculate –
 - i) manpower efficiency
 - ii) maintenance cost index

P.T.O.

2. Attempt any THREE of the following :**12**

- a) Prepare a material type flow process chart for sleeve placket making.
- b) Explain scheduling and routing as planning functions.
- c) Give Fulkerson's rule for numbering the events.
- d) Analyse break even point graphically.

3. Attempt any THREE of the following :**12**

- a) Calculate standard time for following data –

Cycle → Elements	Time in min.				
	1	2	3	4	5
A	2.5	2.1	2.2	2.3	2.5
B	6.2	6	6.1	5.9	5.9
C	2.4	2.5	2.8	3	2.9

- Element B is m/c element
 - Total allowances → 18%
 - Performance rating → 120%
- b) Analyse the formulae for \bar{X} - chart if –
 - i) mean and standard deviation is known.
 - ii) mean and standard deviation is unknown.
 - c) From following data, calculate –
 - i) P/\sqrt{V} ratio and
 - ii) Profit when sales in Rs. 20,000

Data → Fixed expenses = Rs. 4000/-, BEP = Rs. 10,000/-
 - d) Analyse benefits of condition - based maintenance.

4. Attempt any THREE of the following :**12**

- a) Apply 'Westing House' method for performance rating calculation in time study where observed time is 0.05 min.

Criteria	Rating
Skill	B ₂
Efforts	C ₂
Conditions	C
Consistency	C

- b) Compare AON with AOA in network analysis.
- c) Calculate Break Even Point in units for –
- Factory rent = Rs. 2000
 - Machinery cost = Rs. 1,80,000/-
 - Garment selling price = Rs. 620/-
 - Variable cost = Rs. 120/-
- d) Give natural classification of cost and explain its elements.
- e) Compare between preventive with breakdown maintenance.

5. Attempt any TWO of the following :**12**

- a) Explain various types of elements in work study with one example each.
- b) If 10 garments were selected at 6 different times, following no. of defective garments were observed –

Sample No. →	1	2	3	4	5	6
Defective garments →	2	1	4	2	0	2

Draw np and p chart and comment.

- c) Construct network and find critical path for following data →

Activity	Predecessor	Time (weeks)
A	–	6
B	–	10
C	–	14
D	C	6
E	A, B	14
F	E, D	6
G	D	4
H	B	8
I	G, F, H	4

6. Attempt any TWO of the following :

12

- a) Following data is obtain for project →

Activity	(Days)		
	to	tm	tp
1 – 2	6	9	12
1 – 3	3	4	11
2 – 4	2	5	14
3 – 4	4	6	8
3 – 5	1	1.5	5
2 – 6	5	6	7
4 – 6	7	8	15
5 – 6	1	2	3

- Find critical path
 - Calculate variance and standard deviation of project.
 - Calculate std. normal variate 'Z' of completing the project in 26 days.
- Give assumptions and advantages of Break Even Point.
 - Explain objectives of maintenance.