

Enrollment No.....



Faculty of Engineering
End Sem (Even) Examination May-2022
ME3EI03 Production Planning & Control

Programme: B.Tech.

Branch/Specialisation: ME

Duration: 3 Hrs.**Maximum Marks: 60**

Note: All questions are compulsory. Internal choices, if any, are indicated. Answers of Q.1 (MCQs) should be written in full instead of only a, b, c or d.

- Q.1 i. The last step in production planning and control, before production actually begins is- **1**
 (a) Tools & techniques (b) Dispatching
 (c) Scheduling (d) Time estimating
- ii. The process of comparing output to the plans, as well as to set standards to determine if corrective action is needed is called as- **1**
 (a) Production planning (b) Production scheduling
 (c) Production forecasting (d) Production control
- iii. Process selection is primarily considered during- **1**
 (a) Planning (b) Organizing
 (c) Leading (d) Controlling
- iv. Costs that continue even if no units are produced are called- **1**
 (a) Variable costs (b) Mixed costs
 (c) Marginal costs (d) Fixed costs
- v. Delphi method is used for- **1**
 (a) Judgemental forecast (b) Time series forecast
 (c) Associative model (d) All of these
- vi. Which of the following is not the technique of Forecasting? **1**
 (a) Simple moving average method
 (b) Exponential smoothing
 (c) Weighted moving average method
 (d) Market Potential
- vii. Gantt Chart is mainly useful for the- **1**
 (a) Routing (b) Scheduling
 (c) Follow up (d) Controlling

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- viii. Which scheduling technique should be employed when due dates are important for a job order? **1**
 (a) Forward scheduling (b) Loading
 (c) Dispatching (d) Backward scheduling
- ix. Work study examines- **1**
 (a) Method (b) Duration of work
 (c) Both (a) and (b) (d) None of these
- x. The objective of time study is to determine the time required to complete a job by- **1**
 (a) Fast worker (b) Average worker
 (c) Slow worker (d) Any one of these

- Q.2 i. Define the following terms: **3**
 (a) Production (b) Planning (c) Control.
- ii. What is job order production? State its characteristics. **7**
- OR iii. Explain in detail the product development procedure. **7**

- Q.3 i. Define the term process design. Write the functions of process design. **4**
- ii. Explain the various steps involved in process planning. **6**
- OR iii. The Fixed costs for the year 1987-1990 are Rs.8,00,000, Variable cost per unit is Rs. 30. The estimated sales for the period are valued at Rs.24, 00,000. Each unit sells at Rs.180.
 Determine: (i) Break Even Point (ii) Rs.18,00,000 will be the likely sales turn-over for the next budget period, calculated the estimated contribution and profit. (iii) If a profit target of Rs.9,50,000 has been budget, compute the turn-over required.

- Q.4 i. What are the needs of Forecasting? **2**
- ii. The annual sales of a company are as given below: **8**

Year	1980	1981	1982	1983	1984
Sales in Rs.	50000	65000	75000	52000	72000

By the method of least square, find the trend values for each of the five years.

- OR iii. Forecast the demand in units for the following series by exponential smoothing method: **8**

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Period	1	2	3	4	5	6	7	8
Actual Demand(units)	10	12	8	11	9	10	15	14

Take the old forecast is taken for period 1 is 10 units & $\alpha = 0.3$.

- Q.5 i. Define Routing. **2**
- ii. What are the objectives of production control system? **3**
- iii. What do you understand by Sequencing? Explain how it is useful in production control. **5**
- OR iv. Five jobs are performed first on machine M_1 and then on machine M_2 . Time in hours taken by each job on each machine is given below: **5**

Jobs	A	B	C	D	E
Machine M_1	5	1	9	3	10
Machine M_2	2	6	7	8	4

Determine the optimum sequence of jobs and the minimum time elapsed.

- Q.6 Attempt any two:
- i. Explain the procedure for method study. **5**
- ii. Explain the principle techniques of work measurement and their applications. **5**
- iii. Briefly explain the concept of work sampling with suitable example. **5**

Marking Scheme

ME3EI03 Production Planning & Control

- Q.1 i. The last step in production planning and control, before production actually begins is- **1**
 (b) Dispatching
- ii. The process of comparing output to the plans, as well as to set standards to determine if corrective action is needed is called as- **1**
 (d) Production control
- iii. Process selection is primarily considered during- **1**
 (a) Planning
- iv. Costs that continue even if no units are produced are called- **1**
 (d) Fixed costs
- v. Delphi method is used for- **1**
 (a) Judgemental forecast
- vi. Which of the following is not the technique of Forecasting? **1**
 (d) Market Potential
- vii. Gantt Chart is mainly useful for the- **1**
 (b) Scheduling
- viii Which scheduling technique should be employed when due dates are important for a job order? **1**
 (d) Backward scheduling
- ix. Work study examines- **1**
 (c) Both (a) and (b)
- x. The objective of time study is to determine the time required to complete a job by- **1**
 (b) Average worker
- Q.2 i. Define the following terms: **3**
 (a) Production 1 mark
 (b) Planning 1 mark
 (c) Control 1 mark
- ii. Job order production 2 marks **7**
 Any five its characteristics
 1 mark for each (1 mark * 5) 5 marks
- OR iii. Product development procedure. **7**
 1 mark for each procedure (1 mark * 7)

- Q.3 i. Definition of process design 2 marks **4**
 Two functions of process design 2 marks
- ii. Steps involved in process planning **6**
 1 mark for each step (1 mark * 6)
- OR iii. Determine: **6**
 Break Even Point – Rs 960000 2 marks
 Contribution- Rs. 1500000 1 mark
 Profit – Rs. 700000 1 mark
 Turn-over required- Rs. 2112000 2 marks

- Q.4 i. Any four needs of Forecasting **2**
 0.5 mark for each (0.5 mark * 4)
- ii. Find the trend values for each of the five years. **8**

Calculations

Fitting the Straight line trend:

For Table

3 marks

Year X	Sales (in1000 Rs.) y	Deviation of X from 1982 x= X-\bar{X}	x²	x*y	Trend Values Y= a+bx

The equation of line of trend is **Y= a+bx** where,

a = $\Sigma y/n = 62.80$ 1 mark

b = $\Sigma xy / \Sigma x^2 = 3.1$ 1 mark

Therefore, equation of line of trend is **Y= 62.80+3.1x** -

0.5 mark

By putting the values of **x** from the above table in equation

For five year

0.5 mark for each Year (0.5 mark * 5)

2.5 marks

Trend values for **1980=56.60**

Trend values for **1981=59.70**

Trend values for **1982=62.80**

Trend values for **1983=65.90**

Trend values for **1984=69.00**

OR iii. The forecast for various periods can be calculated in the following tabular form. Taking old forecast is for period 1 is 10 units & $\alpha = 0.3$ **8**

Period	Actual demand (in units) (D_1)	Initial forecast (F_1) (in units)	Error = ($D_1 - F_1$)	α * Error [$\alpha * (D_1 - F_1)$]	New forecast (F_0) $F_0 = F_1 + \alpha * (D_1 - F_1)$

- Q.5 i. Definition of Routing. **2**
 ii. Any three objectives of production control system **3**
 1 mark for each objective (1 mark * 3)
 iii. Sequencing 2.5 marks **5**
 Their uses in production control 2.5 marks
 OR iv Sequencing and elapsed time **5**
 Brief explanations about the steps (0.5 mark * 5) 2.5 marks

Sequence of jobs

B	D	C	E	A
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Calculation of minimum elapsed time can be done in tabular form

For Table 2.5 marks

Sequence of jobs	Machine M_1		Machine M_2				
	Time in	Processing time	Time out	Time in	Processing time	Time out	Idle time

- Q.6 Attempt any two: **5**
 i. Block diagram of procedure of method study 2.5 marks **5**
 Brief description about procedure of method study 2.5 marks
 ii. Principle techniques of work measurement 2.5 marks **5**
 Five applications 2.5 marks
 iii. Concept of work sampling with example. **5**
 As per the explanation
