

RV K/KW/13/3135/3536

Faculty of Engineering & Technology
Seventh Sem. B.E. (Mech.)/
Sixth Sem. B.E.P. T. (Mech.)
Examination

PRODUCTION TECHNOLOGY — II

Sections—A & B

Time—Three Hours]

[Maximum Marks—80

INSTRUCTIONS TO CANDIDATES

- (1) All questions carry marks as indicated.
- (2) Answer **THREE** questions from Section A and **THREE** questions from Section B.
- (3) Assume suitable data wherever necessary.
- (4) Use of non-programmable calculator is permitted.

SECTION—A

1. (a) What is Productivity? Explain various techniques used to improve productivity. 7
- (b) Explain motion study. How it is different from method study? Explain method study in detail. 6
2. (a) Explain the significance and application of different recording techniques used in method study. 5
- (b) A semi automatic machine produces a component and takes 22 minutes to produce it. The operator takes :

2.00 minutes to load the machine.

1.5 minutes to unload the machine.

1.3 minutes for inspection.

2.00 minutes for packing.

0.5 minutes to move from machine to machine.

- (i) How many machines can one man handle?
- (ii) Make man-machine chart to support your answer. 8

3. (a) What is work measurement? Enumerate the objectives and techniques used for work measurement. 5
- (b) Following data refers to the study conducted for an operation :

Cycle Elements	1	2	3	4	5
1	2.5	2.1	2.2	5.4	2.5
2	6.2	6.0	6.1	5.9	5.9
3	2.3	2.0	2.1	2.1	2.2
4	2.4	2.1	2.8	3.0	2.3
5	3.2	3.1	3.3	3.2	3.0

Timings are given in minutes. Performance rating is 120. Personal allowance is 30 minutes in a shift of 8 hours. Fatigue allowance is 15% and contingency allowance is 2%. Assume element 2 as machine element and delete abnormal observations.

- Estimate standard time of the operation and production rate per 8 hour shift. 8
4. (a) Briefly explain various types of material handling equipment and explain the factors which influence their selection. 7
- (b) Explain the principles of Motion Economy as applied to Human Body. 6
5. (a) Explain process layout and product layout with advantages and limitations. 5
- (b) Explain ergonomic considerations in man machine system. 5
- (c) What is work sampling? What are its merits and limitations? 4

SECTION—B

6. (a) Explain various judgemental techniques used for sales forecasting. 5
- (b) The table shows sales figures for 8 years :

Year	1990	2000	2001	2002	2003	2004	2005	2006
Sales (000')	80	90	92	83	94	99	92	99
Rs.								

- (i) Find linear estimating equation that best describes the data.
- (ii) In which year largest and smallest fluctuations from trend occurs? 8
- (iii) What is the forecast for 2007 and 2008? 8

7. (a) In time series analysis of forecasting, how the seasonal variations are adjusted to arrive at required forecast? Explain the method. 6
- (b) What is value and value analysis? Explain one of the methodologies of doing value analysis in detail. 7
8. (a) Differentiate between Maintenance and Maintainability. Explain the terms Debugging and Modularisation related to them. 6
- (b) What is preventive maintenance? State its objectives. How is it different from predictive maintenance? 7
9. (a) What is redundancy? Prove that component level redundancy gives higher system reliability than unit level redundancy. 5
- (b) An instrument consists of two subsystems connected in series. Subsystem 'A' and 'B' have the reliabilities 0.90 and 0.92 respectively, for certain operating time. It is required to raise the reliability of the instrument to a minimum value of 0.917 by using parallel subsystem of only 'A'. Determine how many units of 'A' be used with one unit of 'B' and give the actual value of system reliability so obtained. Can we achieve the desired result by using two units of 'A' and 'B' each? 8
10. Write short notes on any **THREE** of the following :
- (a) Production planning and control.
- (b) Failure data analysis.
- (c) Bath tub curve and its applications.
- (d) Exponential smoothing method of forecasting. 14