(3 Hours) (80 marks)

N.B.: (1) Q. No. 1 is compulsory
    (2) Answer any THREE questions from the remaining questions.
    (3) Figures to the right indicate full marks.
   (4) Illustrate answers with neat sketches where ever required.

1.   Write short note on. **(Any Four)**   20

  (a)   Contribution of F. W. Taylor

  (b)   FAST Diagram

  (c)   Job evaluation process

  (d)   Business Process Reengineering (BPR)

  (e)   Maynard Operation Sequence Technique (MOST)

  (f)   Application of IT in Agile manufacturing

2. (a)   Define Productivity. Explain productivity measures and productivity improvement techniques in brief.   10

  (b)   Define Value Engineering. Write steps of the Value Engineering. Distinguish Value Engineering and Value Analysis.   10

3. (a)   What is work measurement? Enlist various techniques of work measurement and explain PMTS in detail.   10

  (b)   Discuss information recording techniques of method study in brief. Illustrate string diagram with example.   10

4. (a)   Describe factors affecting facility location. Explain any one method for evaluation of facility location.   10

  (b)   What are incentive schemes? What are the characteristics of good incentive schemes?   10

5. (a)   The observed times and the performance ratings for the five elements are given in the table. Compute the standard time assuming rest and personal allowance as 15% and contingency allowance as 2% of the basic time.   10

Element	1	2	3	4	5
Observed Time (min)	0.2	0.08	0.50	0.12	0.10
Performance Rating	85	80	90	85	80

  (b)   Explain: (i) Flexible Manufacturing system, (ii) Lean manufacturing system   10

6. (a) The precedence diagram for activity A to G is shown below. The element   10
time required for the activities are shown in the diagram. The line operates
for 7 hours per day and the output of 550 units are desired.

1. Calculate the cycle time and theoretical minimum number of work
stations required.

2. Group the tasks in appropriate number of workstations

3. Calculate the balance efficiency.
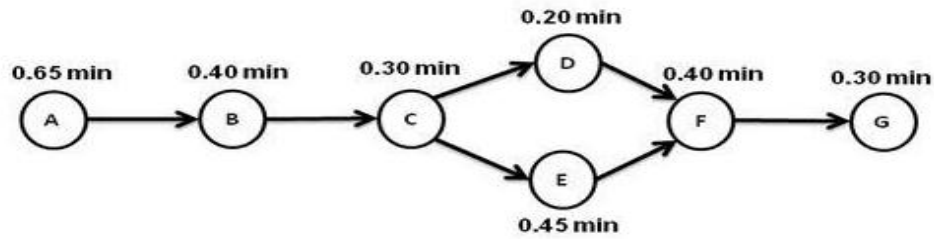
(b) What is Material Handling System? What are the important principles of   10
Material Handling?