1. A **project** schedule has the following characteristics. Each activity and their duration are as follows- 1→ 2 =4days, 1→3 =1day, 2→4 =1, 3→4=1, 3→5 =6, 4→9 =5, 5→6 =4, 5→7 =8, 6→8 =1, 7→8 =2, 8→10 =5, 9→10 = 7days. i) Construct a network diagram. ii) Find the **critical path** and show in the diagram. iii) Find total project duration.

2. Derive the basic EOQ formula with suitable assumptions and standard notations.

3. A manufacturing company purchases 9000 parts of a machine for its annual requirements, ordering one month usage at a time. Each part costs Rs. 20. The ordering cost per order is Rs. 15 and carrying charges are 15% of the average inventory per year. Find out a more economical purchasing policy for the company.

1. What is meant by balanced Transportation Problem?
2. What is the concept of **JIT** in relation to inventory management?
3. What is the full form of **PERT** inrelation to project management?
4. What kind of OR problem is solved using Hungarian Method?
5. Which method gives more accurate solution- North-West Corner rule or Vogel’s approximation method?
6. State True/False: Transportation problem is a sub-class of Assignment problem.
7. What do understand by **EOQ** in relation to inventory management?
8. Find a basic feasible solution for the following **Transportation problem** in Table-1.

Table-1 Table-2

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | I | II | III | IV |
| A | 2 | 3 | 4 | 5 |
| B | 4 | 5 | 6 | 7 |
| C | 7 | 8 | 9 | 8 |
| D | 3 | 5 | 8 | 4 |

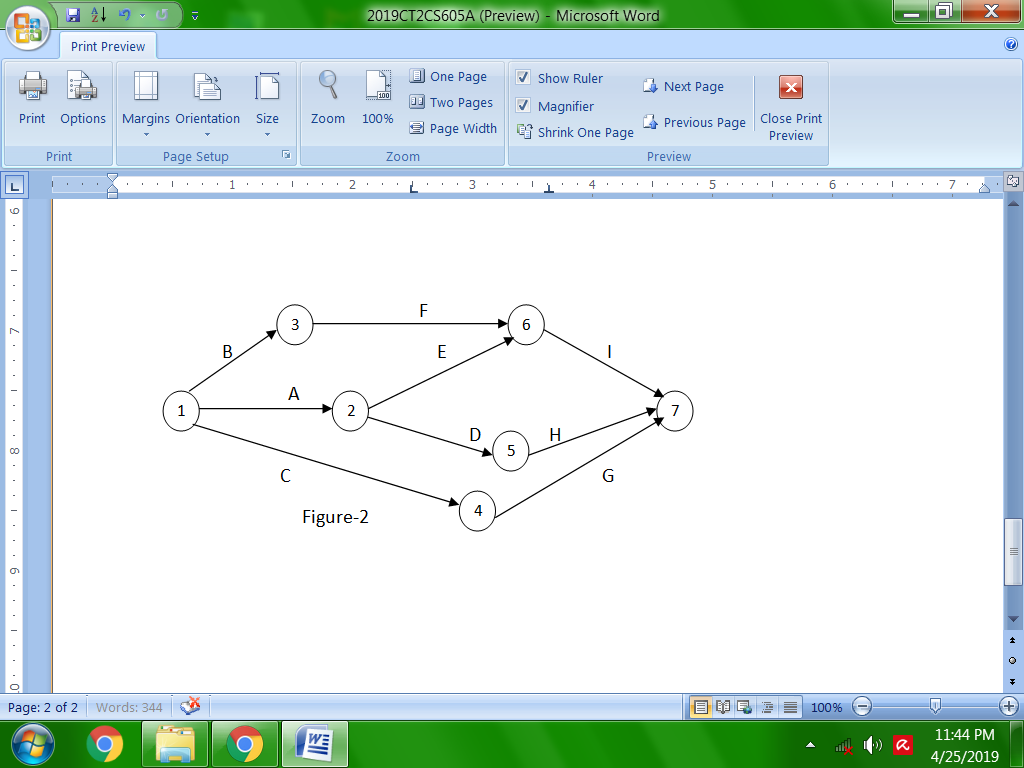
|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  |  | Market | | | | availability |
| Warehouse |  | I | II | III | IV |
| A | 5 | 2 | 4 | 3 | 22 |
| B | 4 | 8 | 1 | 6 | 15 |
| C | 4 | 6 | 7 | 5 | 8 |
| Demand | 7 | 12 | 17 | 9 |  |

Table-2

9. Solve the minimal **assignment problem** whose cost matrix is given in the above Table-2.

10. The network diagram in figure-2 below represents activities associated with a **project**. There 3 sets of times are provided in the table below. Determine- a) expected completion time and variance of the project completion time.

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Activities | A | B | C | D | E | F | G | H | I |
| Optimistic time (t0) | 5 | 18 | 26 | 16 | 15 | 6 | 7 | 7 | 3 |
| Pessimistic time (tp) | 10 | 22 | 40 | 20 | 25 | 12 | 12 | 9 | 5 |
| Most likely time (tm) | 8 | 20 | 33 | 18 | 20 | 9 | 10 | 8 | 4 |

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