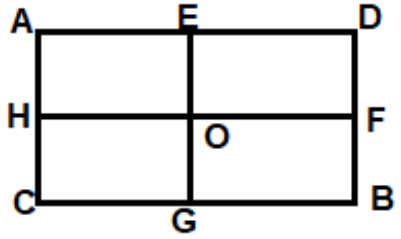
ROUTES & NETWORK – I

1. Study the following figure: A person goes from A to B Always moving to the right or downwards along the lines. How many different route can be adopted?



a) 4 b) 5 c) 6 d) 7

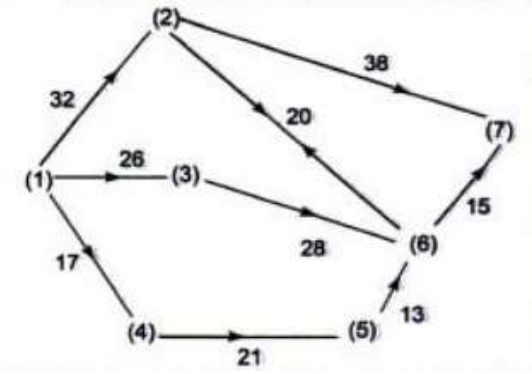
Direction: Five cities P, Q, R, S, T are connected by different modes of transport as follows
1. P and Q are connected by boat as well as rail.
2. S and R are connected by bus and boat.
3. Q and T are connect by air only.
4. P and R are connected by boat only.
5. T and R are connected by rail and bus.

2. Which mode of transport would help one to reach R starting from Q but without changing the mode of transport?
a) Boat b) Bus c) Rail d) Air

3. Which one of the following pairs of cities is connected by any of the routes directly without going to any other city?
a) P and T b) T and S
c) Q and R d) None of these

4. If a person visits each of places starting from P and gets back to P, Which of the following place must be visited twice?
a) Q b) R c) S d) T

Direction: A person has to go from station 1 to station 7. The arrows indicate the direction in which the person can travel. The number given along the arrow represents the distance (in kms) between the two connected stations.

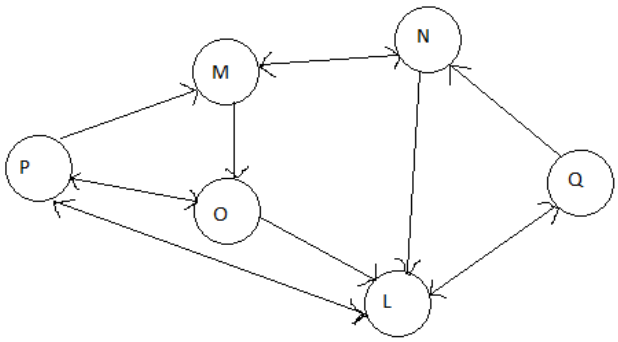


5. The length (in km) of the longest path connecting stations 1 and 7 is -
a) 85 b) 70 c) 109
d) 126 e) None of these

6. The total number of different paths between station 1 and 7 are -
a) 4 b) 5 c) 6
d) 7 e) 8

7. What is the difference b/w the longest and shortest path b/w stations 1 and 7?
a) 32 b) 41 c) 46
d) 48 e) 52

Direction: Six cities- L, M, N,O, P, Q are connected by one way and two way routes as indicated in the diagram given below. The arrow head indicates the direction in which the traffic is allowed to flow. No other route is available those given in the diagram.



8. In how Many different ways can a person travel from city P to city N without passing through any city more than once?
a) Two b) Three c) Four d) one

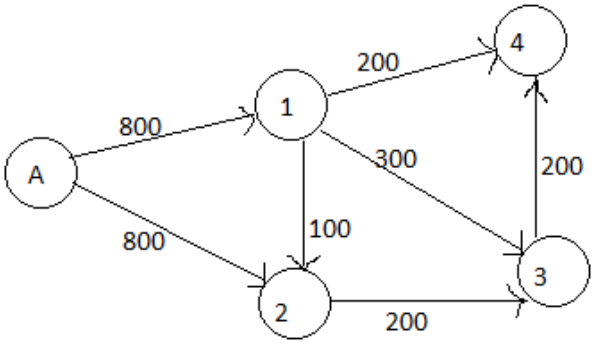
9. In how Many different ways can a person travel from city M to city O without passing through any city more than once?
a) Two b) Three c) Four d) one

10. For which of the following cities it is not possible for a person to start his journey from the city and pass through all the other cities and come back to the same city, without passing through any city more than once?
a) O b) N c) P d) none

11. What is the least possible number of cities, a person has to pass through, while travelling from city O to N?
a) Zero b) Two c) Four d) one

12. Which of the following cities will not be passed through while travelling from city L to M without passing through any city more than once?
a) O b) N c) P d) Q

Direction: The following diagram indicates the network of pipes through which four tanks are connected to a source A in a colony.

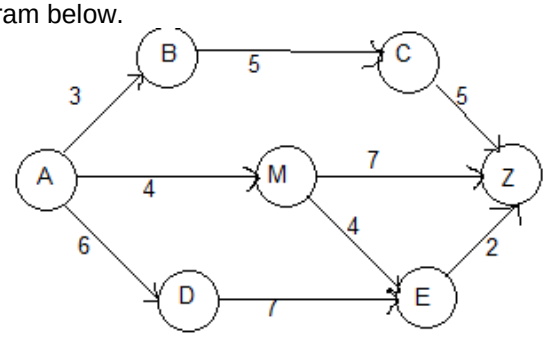


Each tank capacity is 1000 liters and the quantity of water flowing through each of these pipes (in liters) is given above the pipes.

13. How many liters of water is there in tank 1?
    a) 1000 b) 800 c) 200 d) 700

14. How many liters of waters there in tank 2?
    a) 1000 b) 500 c) 600 d) 700

Direction: 1200 vehicles travel every day from Point A to Point Z on a network of one – way roads as shown in the diagram below.



Points B, C, M, D, E are junctions in this network. The number adjacent to the eay depicting each road stands for the cost (in rupees) of travelling on that road. Each vehicle takes a path of least cost from A to Z. If two or more paths have the same cost, then the vehicles are distributed equally on those paths.

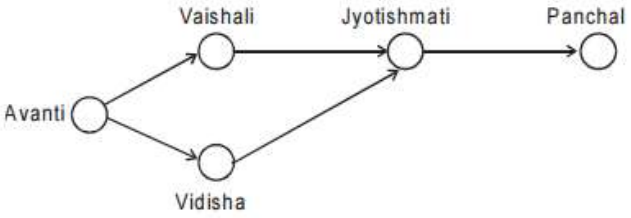
15. What is the cost (in rupees) of the journey for each of the first 600 vehicles which travel from A to Z every day?
    a) 8 b) 9 c) 10 d) 11

16. Which junctions together have the Maximum traffic each day?
    a) B and C b) D and M
    c) M and E d) B and E

17. If the cost of travel on the road from C to Z was reduced by 3 rupees, how many vehicles would travel to junction B every day?
    a) 1000 b) 300
    c) 200 d) 600

18. If the costs of travel on the roads M –Z and D- E have to be changed such that 800 vechicles reach E every day, what should be the new costs in rupees for these two roads?
    a) 4 and 5 b) 2 and 6
    c) 6 and 3 d) 6 and 2

Direction: The following sketch shows the pipelines carrying material from one location to another. Each location has a demand for material. The demand at Vaishali is 400, at Jyotishmati is 400, at Panchal is 700, and at Vidisha is 200. Each arrow indicates the direction of material flow through the pipeline. The flow from Vaishali to Jyotishmati is 300. The quantity of material flow is such that the demands at all these locations are exactly met. The capacity of each pipeline is 1,000.

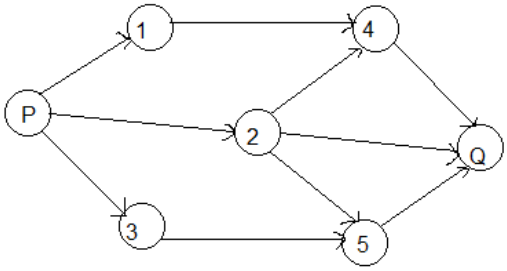


19. The quantity moved from Avanti to Vidisha is
    a. 200 b. 800 c. 700 d. 1,000

20. The free capacity available at the Avanti-Vaishali pipeline is
    a. 0 b. 100 c. 200 d. 300

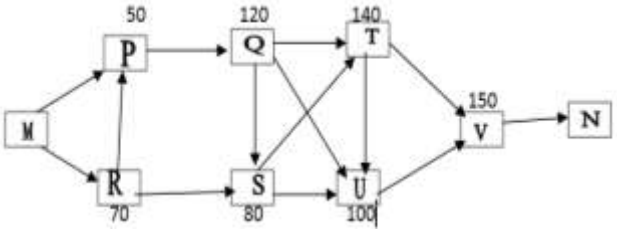
21. What is the free capacity available in the Avanti-Vidisha pipeline?
    a. 300 b. 200 c. 100 d. 0

22. What is the maximum number of routes from P and Q?



    a. 5 b. 9 c. 6 d. 11

Directions: In a workshop, certain machine components are stored in 7 locations named P,Q,R,S,T,U and V (called storage locations). These components are to be carried to location N for further processing by a person. Various paths connecting different locations as well as the number of machine components stored at different storage locations are shown in the diagram below. The person can take only one of the paths given in the diagram and can travel only along the direction of the arrow. For example, the person can travel from T to U, but not from U to T.
The person starts with a drum from location M, follows



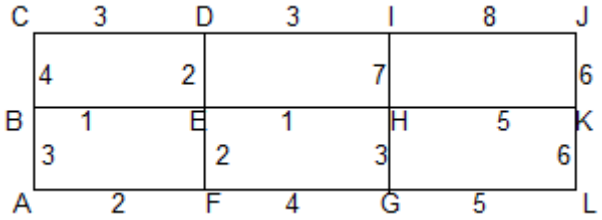
one of the possible routes, visits all the storage locations along the route, puts all the machine components at that location in the drum and finally drops all the machine components at location N.

23. If, due to the oil spill between Q and S, the Person cannot travel along the path Q and S, what is the maximum number of components carried out by the PERSON now?

24. What is the number of possible paths taken by the person between M and N such that the number of machine components carried by it is equal to 540?
    a) 1 b) 0 c) 3 d) 2

25. How many route can a person take from M to N such that it caries 550 or less machine components?
a) 7 b) 9 c) 11 d) 10

Directions: Ten cities A though J are connected as shown below. The number adjacent to a line, connecting any two cities, represents the number of two way routes connecting the two cities. The distance between any two directly connected cities is same through any directly connected route.



26. Find the number of ways in which a person can travel from city A to city H in shortest possible route without passing through any city more than once?
a) 24 b) 31 c) 37 d) None

27. Find the numbers of ways to travel from city B to city I in the shortest possible route without passing through any city more than once?
a) 42 b) 45 c) 47 d) 49

28. In how many ways a person can travel from city K to city F in the shortest possible route without passing through any city more than once?
a) 160 b) 180 c) 190 d) 210

Answer Key

1. C	2. A	3. D	4.	5. E	6. C	7. C	8. A	9. A	10. C
11. B	12. A	13. C	14. D	15. C	16. C	17. D	18. D	19. D	20. D
21. D	22. A	23. 630	24. D	25. B	26. B	27. D	28. C		