Birla Institute of Technology and Science, Pilani
Mid-Sem Examination 2023-24
Analytics for Supply Chain MPBA G 523
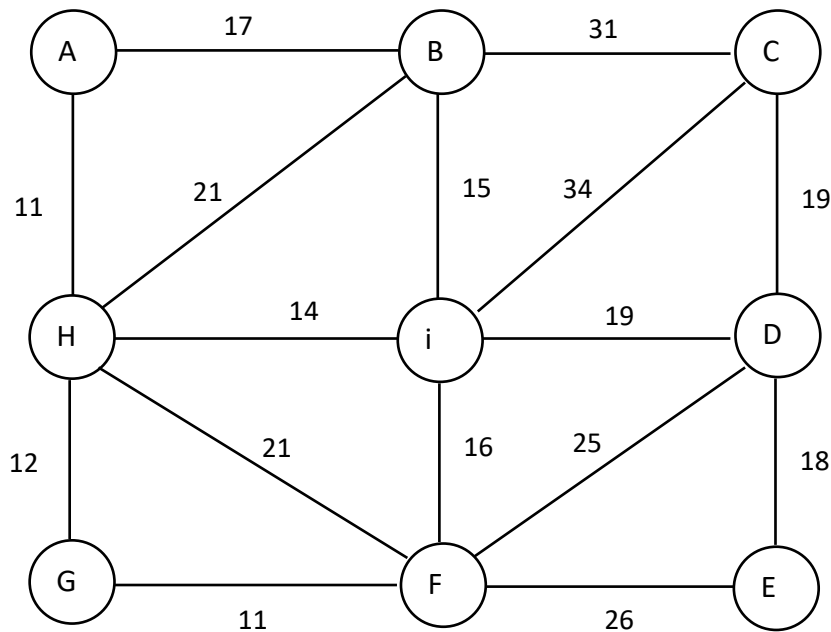
Max. Marks 30   **Max Time: 90 minutes**

Q1 – Consider the following network –

Solve the set Covering problem with a policy of Covering Distance D_c = 18 and compare the solution with a policy of D_c = 20.

Q2 – Blue computers a major server manufacturer currently has plants in Chennai and Ahmedabad with capacity of one million units a year C_d =1.5m units a year. The firm divides the India into five markets, North-east, South-east, Mid-west, South and West. Each server sells for 1000$. The firm anticipated a 50% growth in demand in each region. To meet growth company decides about the two new potential sites viz. Guwahati and Visakhapatnam. Company pay taxes at the tune of 27% of income. Assam state offered tax detection of 27% to 20% for the next 10 years. Consider the 10 years for the analysis. Annual fixed costs, production supply units per unit as shown in table below –

	Variable production as supply unit				
	North - East	South-east	Mid-west	South	west
Chennai	185	180	175	175	200
Ahmedabad	170	190	180	200	220
Guwahati	180	180	185	185	215
Visakhapatnam	220	220	195	195	175
Demand (1100 Units /Year)	700	400	400	300	600

FC of plant location: 150, 200, 150, 150.

Q3.-

WW Grainger buys from hundreds of suppliers and is considering the ==aggregation== of in-bound shipments to lower units. Truck load shipping costs $500 per truck only with 100$ per pick up. Average annual demand from each supplier is 10,000 units. Each unit costs 50$ and Grainger includes annual holding cost of 20 percent. What is the optimal order frequency and order size if Grainger decides to aggregate four suppliers per truck? What is the optimal order size if each truck has a capacity of 2500 units?

Q4.-

The road system around the hotel complex (node 1) near the large amusement park (node 11) is shown in following figure. The numbers by nodes represent traffic allow in hundreds of cars per hour. What is the maximum flow of cars from the hotel complex to the park?