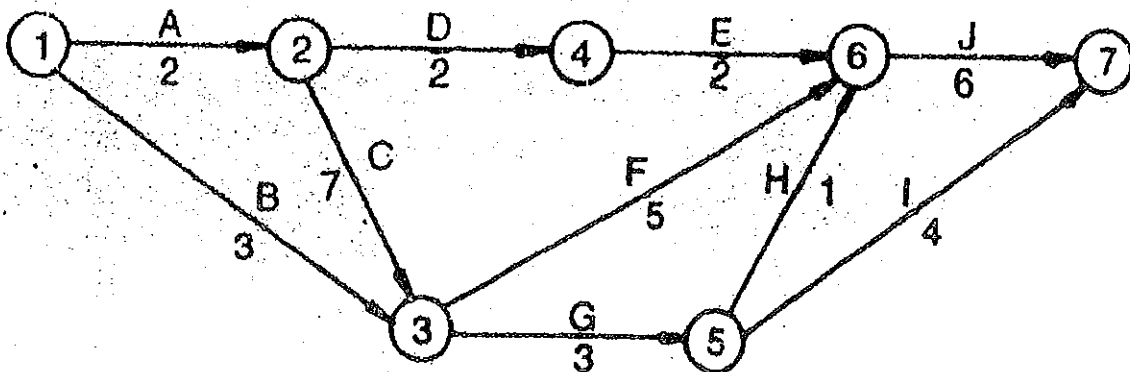


Note: Questions 1 to 6 are compulsory. Attempt any one question among Q7 and Q8 also any one question among Q9 and Q10. Marks are indicated against each question in square brackets.

Q1. The network of a certain projects is shown below. Calculate (a). Total Float (b). Free Float (c). Independent Float (d). Project duration and identify critical path. [6 marks]



Q2. An equipment has been purchased at an initial cost of Rs. 140,000 and has an estimated salvage value of Rs. 20,000. The equipment has an estimated life of 4 years. What will be the book value (in Rs., in integer) obtained at the end of 3rd year using straight-line depreciation method? [4 marks]

Q3. The cost of maintenance for a new bridge with expected 40 years life was estimated to be Rs. 20,000 each year for the first five years followed by a Rs. 100,000 expenditure in the 15th year and Rs. 150,000 expenditure in 30th year. If $i = 10\%$ per year, what is the equivalent uniform annual cost over the entire 40 year period. [3 marks]

Q4. Explain with appropriate sketches how a 'termie' is used to place concrete underwater concreting. [3 marks]

Q5. Explain any one among tilting type of mixers and pan type of mixers used in concrete mixing with the help of neat sketch. [3 marks]

Q6. Explain the importance of dewatering at construction site. With the help of a neat diagram, explain about eductor well technique of dewatering at construction site. [3 marks]

***Attempt any one questions among Q7 and Q8.**

Q7. Calculate number of transit mixers (TM) required for transporting concrete from central batching plant to site. The cycle time data of a 6 m^3 typical transit mixers is given below:

Loading time of TM = 6.0 minutes.

Travel time of loaded TM to site = 30 minutes

Average waiting time at site = 5.0 minutes

Discharge time of concrete at site through concrete pump = 15 minutes.

Travel time for return trip = 24 minutes.

If the central batching plant having average output of $60 \text{ m}^3/\text{hr}$ is to run continuously, work out the requirement of no. of concrete pumps and TM. [6 marks]

Q8. Determine the output of a bulldozer for following situations:

a. Material handled sandy loam top soil having swell = 25%

b. Haul Distance = 30 meter

c. Rated mold board capacity = 3 cu.m loose volume

d. Actual operating time per hour = 45 minutes

e. Forward speed = 2.4 km per hour

f. Reverse speed = 6.0 km per hour

[6 marks]

***Attempt any one questions among Q9 and Q10.**

Q9. Describe a basic shovel by means of a simple diagram and name the main parts. Also indicate its suitability in field operations. [7 marks]

Q10. What is grouting? Define categories of grout. Explain in detail the grouting method used for stabilizing the soil in tunneling. [7 marks]