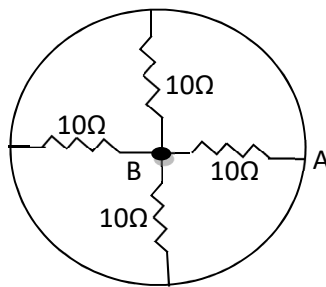


- 10) The managing director entered the conference room 10 minutes before 12:30 hours for interviewing. He came 20 minutes before the chairman who was 30 minutes late. At what time, the interviews were scheduled?
- a) 12:20 hours b) 12:10 hours c) 12:15 hours d) none
- (4)

Group – B

(Physics)

- 2) Implement the Boolean function $f(A,B) = A'B'+AB$ using NOR gates only. [3]
- 3) A Boolean expression is a tautology if and only if for all possible assignments of truth values (true or false) to its variables its truth value is true. Construct truth table to show the Boolean expression $P + Q + P' Q'$ is tautology. [3]
- 4) Construct OR gate using NAND gates only. [3]
- 5) Find the equivalence resistance between A & B in the following circuit. [3]

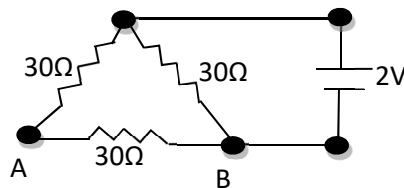


- 6) Find the current flow in the AB segment of the following circuit. [3]

Group – C

(Mathematics)

- 7) Out of 7 consonants and 4 vowels, how many words of 3 consonants and 2 vowels can be formed? [3]



- 8) How many 7 digit numbers can be formed with the digits 1, 2, 3, 4, 3, 2 and 1 so those odd digits always occupy odd places? [3]
- 9) Solve: $2^X + 2^Y = 20$ & $X + Y = 6$. [3]
- 10) The sum of perimeters of a circle and a square is given. Show that when the sum of areas is least, the side of the square is double the radius of the circle. [3]

- 11) Two trains start at the same time, one from Bangalore to Mysore and the other from Mysore to Bangalore. If they arrive at their destinations one hour and four hours respectively after passing one another, how much faster is one train running than the other ? [3]

Group – D

(Mathematical Puzzle)

- 12) I renovated my bathroom and got myself a new bath tub along with new accessories. I have two taps now - hot one and cold one. The hot tap fills the bath tub faster i.e. in fifteen minutes while it takes eighteen minutes for the cold tap to fill the bath tub. The drain hole can drain the entirely filled bathtub in ten minutes when the taps are not running. If I leave both the taps on with the drain plug left out, how long will it take the bath to fill? [5]
- 13) Four people need to cross a rickety bridge at night. Unfortunately, they have only one torch and the bridge is too dangerous to cross without one. The bridge is only strong enough to support two people at a time. Not all people take the same time to cross the bridge. Times for each person: 1 min, 2 mins, 7 mins and 10 mins. What is the shortest time needed for all four of them to cross the bridge? [5]

Rough Work