RSC INDUCTIONS 2021

Instructions

1. Explanation is must for all answers, do not assume anything without mentioning.
2. No extra time will be granted for submissions.
3. Scan and send handwritten answers with these details clearly mentioned on first page: Name, MIS, College email ID, Contact number.
4. Even if you are unable to get to the final answer, each step or your logic will fetch marks, so don't forget to mention it.
5. Submit .py or .c or .cpp file along with the answer sheet. If you are unable to write a working code, write Algorithm or Pseudocode in the answer sheet itself.
6. Assume values/variables wherever needed.
7. Make a single zip file containing answer sheets and codes having the following format **"MIS_Name"**, submit the answer sheet on: https://forms.gle/6vLfqhowUpw2N3Dz6.

(Submission Date: 18 October 7:30 PM)

Contact in case of any queries:
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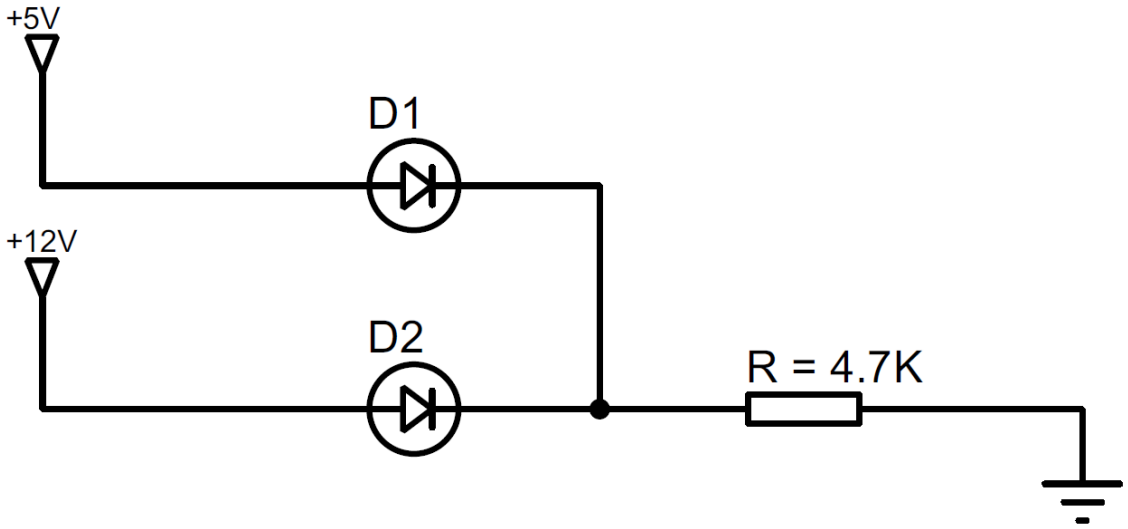
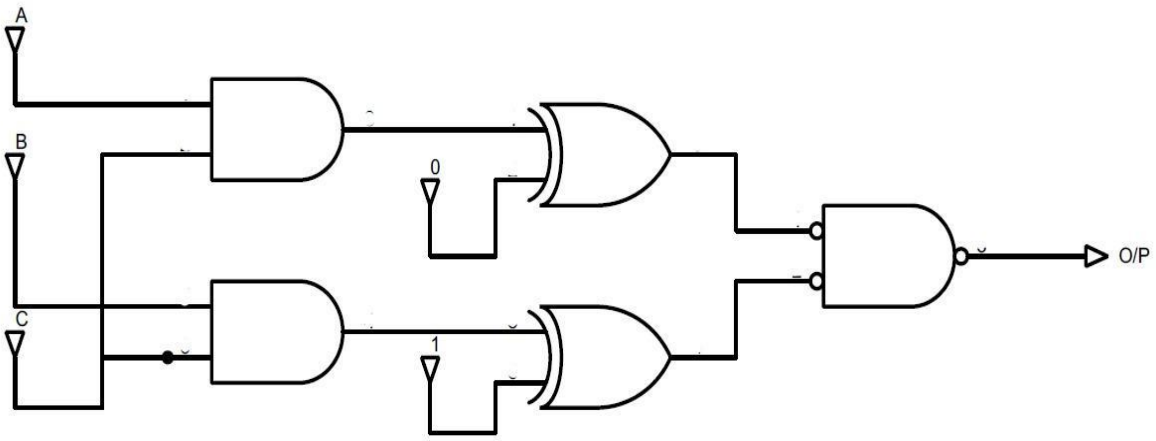
E-Paper:

Section A

1. Which LED will glow brighter?



2. Find the Output and construct the truth table using the following logic gate diagram.



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3. Where does lightning originate from? (Specify direction and give explanation)

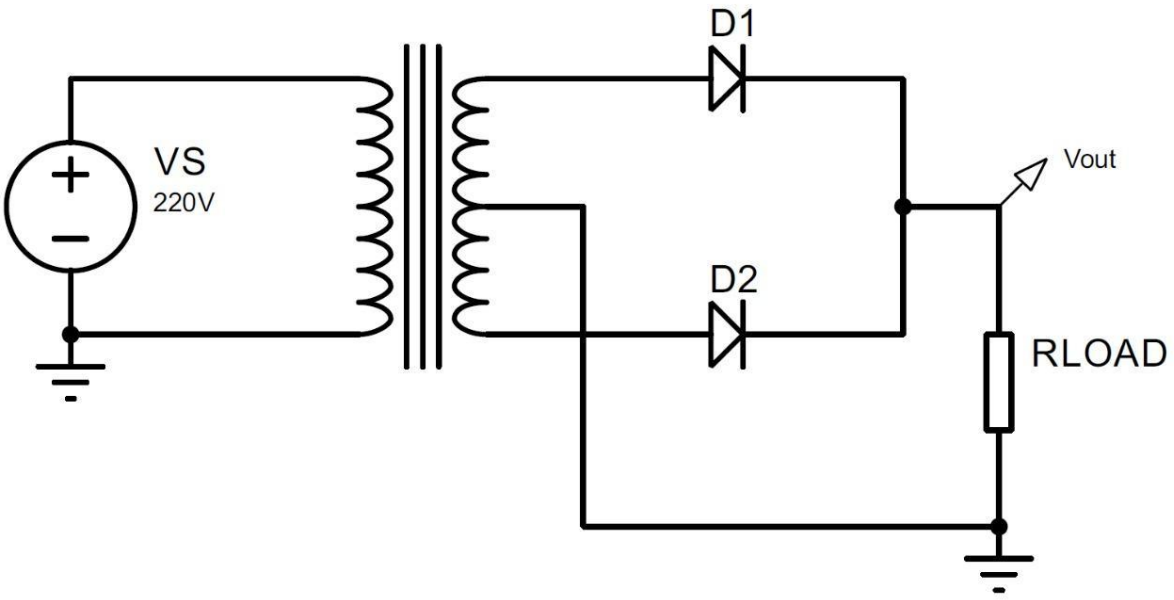
4. There are people in a room, 99% of them are managers and remaining are employees. How many managers will have to leave so that there are 98% managers left in the room?

5. What is the return value of the function 'printf ()'?

6. What is more dangerous: Current or voltage? Explain.

7. In how many ways can 10 people sit on a round table if 3 people refuse to sit together?

8. Find output voltage across load for very high voltage. What will be the output if the resistor is replaced by a capacitor having low capacitance?



9. Find the next in the sequence: C J E P H .....

SECTION B

1. A potentiometer of 10k ohm is used to control the angle of a DC motor. Write an algorithm and a program to rotate the DC motor in the range of 0 to 270 degree covering the whole range of potentiometer. Can the speed of a motor be mapped using a potentiometer?
   (Follow the instructions for coding. Write appropriate comments).

   Test Cases:
   - Input: 0
     Output: 0
   - Input: 10000
     Output: 270

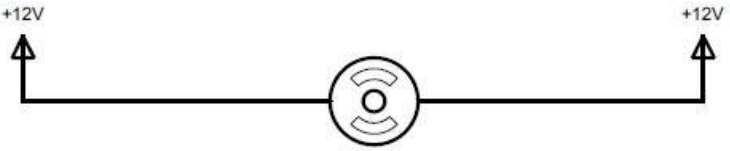
   Explanation:
   - Input 0 corresponds to 0 ohm for which the DC motor rotates by 0 degree.
   - Input 10000 corresponds to 10kohm for which the DC motor rotates by 270 degree.

2.
   a. What happens when the motor is connected to the power supply in this manner and the shaft is rotated manually, see Fig. (I)?

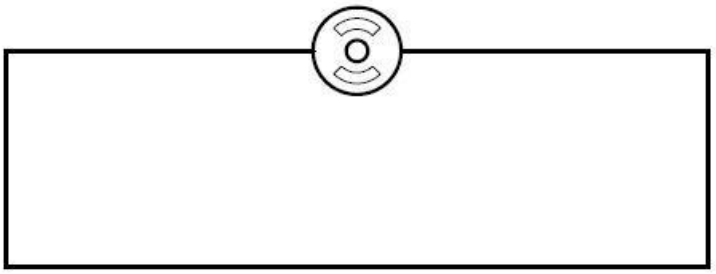
   b. What happens when both ends of the motor are shorted and the shaft is manually rotated, see Fig. (II)?

   c. What happens when an AC source is connected to a DC motor and DC source is connected to an AC motor?

(I)



(II)



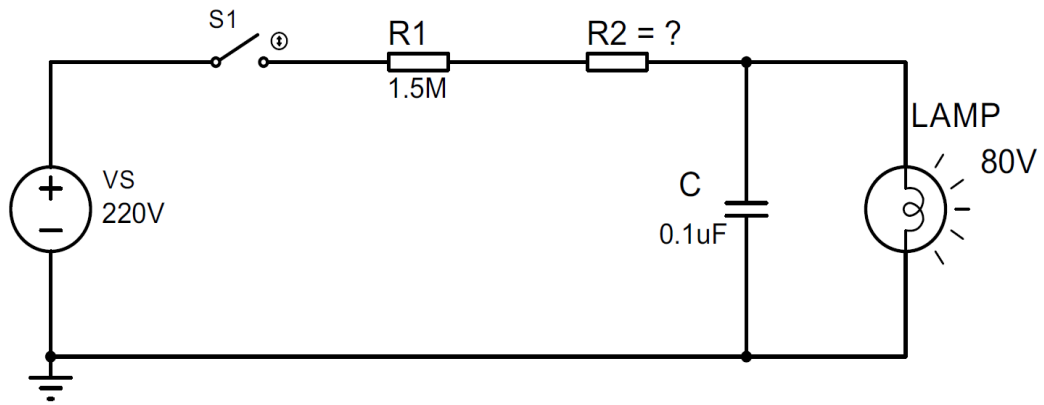
3. Write a program to print the following pattern.
   (Follow the instructions for coding. Write appropriate comments.)

```
    1
   1 1
  1 2 1
 1 3 3 1
1 4 6 4 1
```

4. Consider the arithmetic operation performed in a particular number system whose radix/base is 'r'.23 + 44 + 14 + 32 = 223. What is the value of 'r' here?

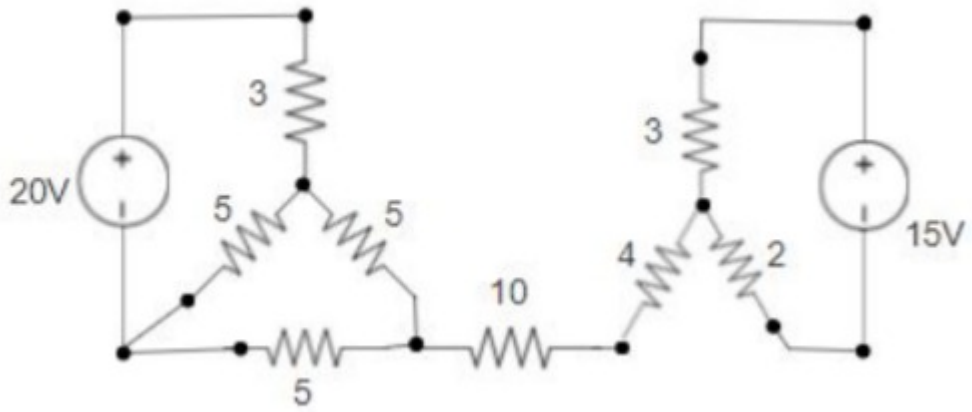
5. What is H-bridge? Draw diagrams and explain the function of H-bridge. Explain an application of H-bridge (Give detailed explanation)

6. Given that the threshold voltage for the lamp to glow is 80V, R1=1.5Mohm, if for the first-time lamp glows in 0.4sec just after switch S1 is closed. Find the value of resistor R2 if Capacitor is initially uncharged and C=0.1uF



7. How will you convert high DC voltage to 5V DC? Explain the circuit design. How will you implement the protection circuit to isolate the higher voltage side from the lower voltage side?

8. In the network shown in the figure below, find the current in the 10-ohm resistance. Explain the reason for the value of current obtained.



----------ALL THE BEST----------