C **Reg. No. :** | | | | | | | | | | | | |

Question Paper Code:U2B05

B.E./B.Tech. DEGREE EXAMINATION, NOV 2024

Second Semester

Biomedical Engineering

21UBM205- HUMAN ANATOMY AND PHYSIOLOGY

(Regulations 2021)

Duration: Three hours Maximum: 100 Marks

Answer All Questions

PART A - (5x 1 = 5 Marks)

1. Ohms law holds true only for _____ circuits CO1- U

   (a) Linear (b) Non-linear (c) Unilateral (d) None of the above

2. Three equal resistances of 3 Ω are connected in star. What is the resistance in one of the arms in an equivalent delta circuit CO2- U

   (a) 10 Ω (b)3 Ω (c) 9 Ω (d) 27 Ω

3. What is the total reactance of a series RLC circuit at resonance? CO2- U

   (a) Equal to X_L (b) Equal to X_C (c) Equal to R (d) Zero

4. Which amplifier is used in an electronic multimeter ? CO4- U

   (a) Wideband amplifier (b)Differential amplifier

   (c) Buffer amplifier (d) Power amplifier

5. Fuse protection is used for current ratings up to CO5- U

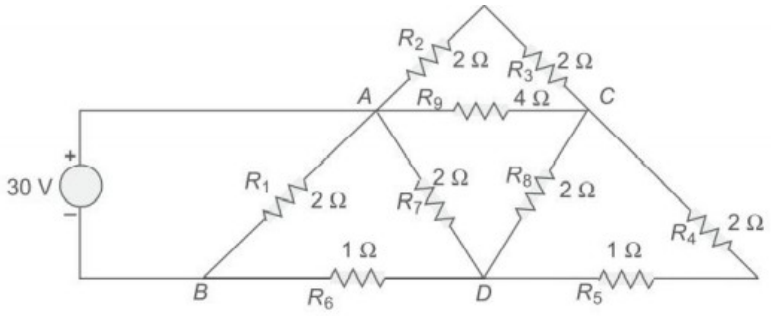
   (a) 10 A (b) 20 A (c) 50 A (d) 100 A

PART – B (5 x 3= 15 Marks)

6. Define ideal voltage source CO1- U
7. Define Norton Theorem CO2- U
8. What do you understand by resonance? CO3- U
9. List the difference between CT and PT CO4- U
10. What is the purpose of earthing ? CO5- U

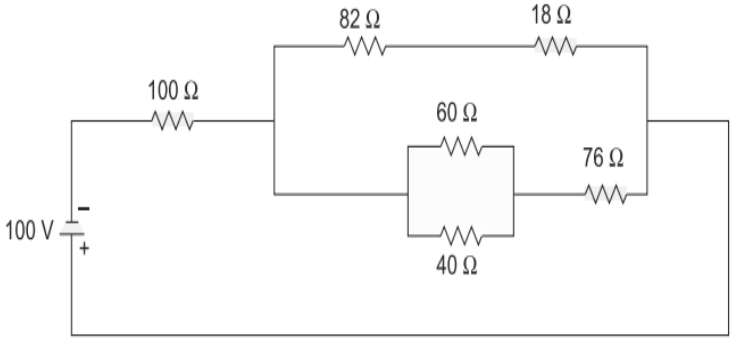
PART – C (5 x 16= 80Marks)

11. (a) Determine the current delivered by the source in the circuit shown in Fig — CO1-App (16)

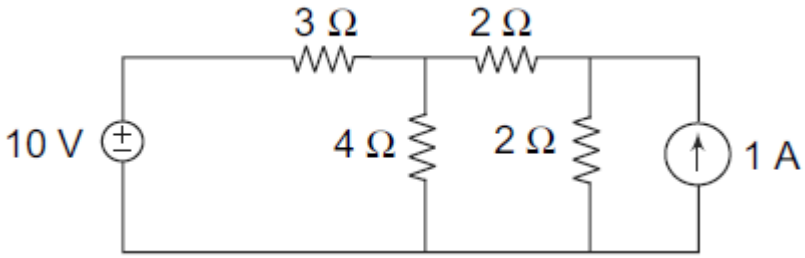


Or

(b) For the circuit shown in Fig., find the total resistance. — CO1-App (16)

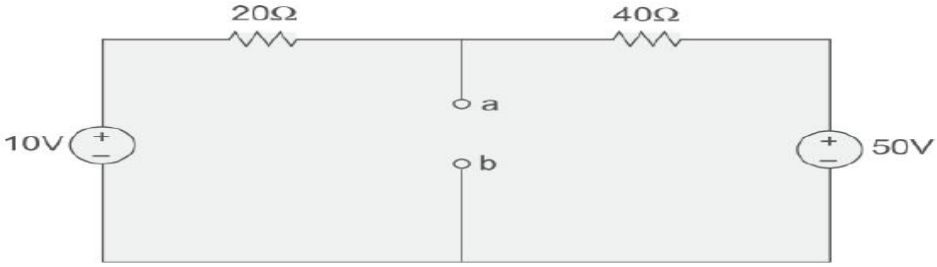


12. (a) Calculate the current in the 4 Ω resistor of using the superposition theorem. — CO2-App (16)



Or

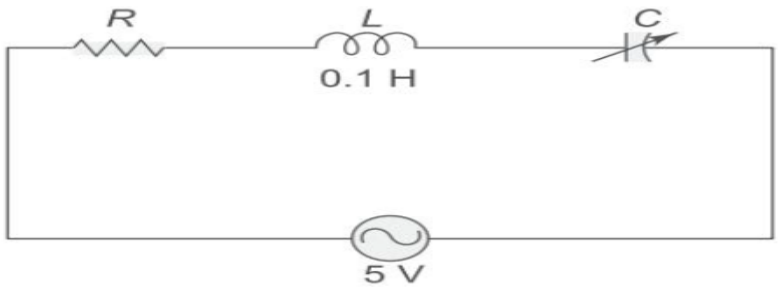
(b) Find the Thevenin's and Norton's equivalents for the circuit shown in Fig. with respect to terminals ab. — CO2-App (16)



13. (a) A series RLC circuit has a quality factor of 5 at 50 rad/s. The current flowing through the circuit at resonance is 10 A and the supply voltage is 100 V. The total impedance of the circuit is 20 V. Find the circuit constants — CO3-App — (16)

Or

(b) In the circuit shown in Fig. a maximum current of 0.1 A flows through the circuit when the capacitor is at 5 μF with a fixed frequency and a voltage of 5 V. Determine the frequency at which the circuit resonates, the bandwidth, the quality factor Q and the value of resistance at resonant frequency — CO3-App — (16)



14. (a) Explain the construction and working principle of PMMC type instrument with necessary diagram — CO4-U — (16)

Or

(b) Elucidate the construction and working principle of an energy meter with necessary circuit arrangement — CO4-U — (16)

15. (a) Explain the various methods of electrical wiring system — CO5-U — (16)

Or

(b) What are the basic concepts of household wiring and explain? — CO5-U — (16)