

C

Reg. No. :

--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Question Paper Code: U2B05

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

Second Semester

Biomedical Engineering

21UBM205- ELECTRICAL CIRCUITS AND MEASUREMENTS

(Regulations 2021)

Duration: Three hours

Maximum: 100 Marks

Answer All Questions

PART A - (5x 1 = 5 Marks)

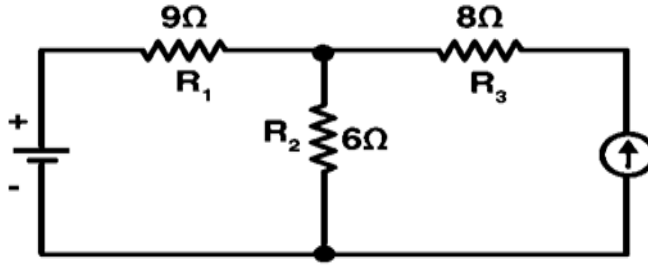
- Ohms law holds true only for _____ circuits CO1- R
(a) Linear (b) Non-linear (c) Unilateral (d) None of the above
- Three equal resistances of $3\ \Omega$ are connected in star. What is the resistance in one of the arms in an equivalent delta circuit CO2- R
(a) $10\ \Omega$ (b) $3\ \Omega$ (c) $9\ \Omega$ (d) $27\ \Omega$
- What is the total reactance of a series RLC circuit at resonance? CO2- R
(a) Equal to X_L (b) Equal to X_C (c) Equal to R (d) Zero
- Which amplifier is used in an electronic multimeter? CO4- R
(a) Wideband amplifier (b) Differential amplifier
(c) Buffer amplifier (d) Power amplifier
- Fuse protection is used for current ratings up to CO5- R
(a) 10 A (b) 20 A (c) 50 A (d) 100 A

PART – B (5 x 3= 15 Marks)

- Why is Ohm's law not applicable to semiconductors? CO1- U
- Define Norton Theorem CO2- U
- What do you understand by resonance? CO3- U
- List the difference between CT and PT CO4- U
- What is the purpose of earthing? CO5- U

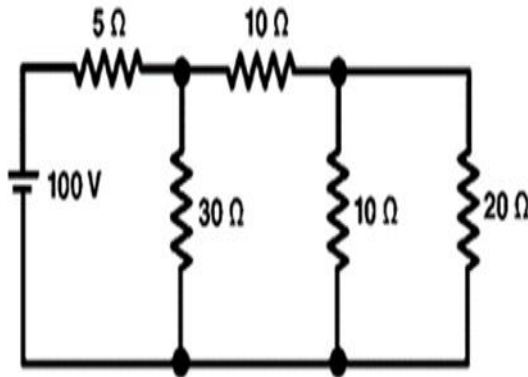
PART – C (5 x 16= 80Marks)

11. (a) Explain in detail about mesh analysis with its step by step procedure and also solve the below figure Find out the amount of voltage that is through the 15 Amps current source by the method of mesh analysis CO1-App (16)

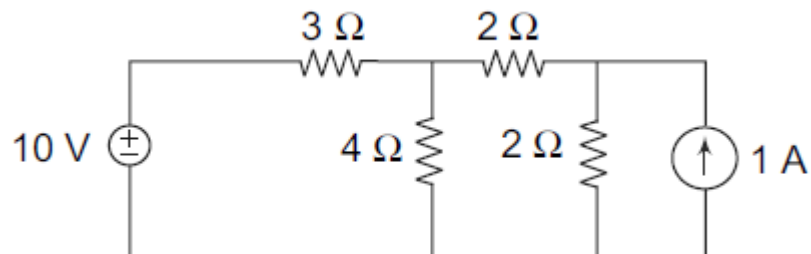


Or

- (b) Explain in detail about nodal analysis with its step by step procedure and also solve the below figure Determine the voltage at each node by the method of nodal analysis for ECG application? CO1-App (16)

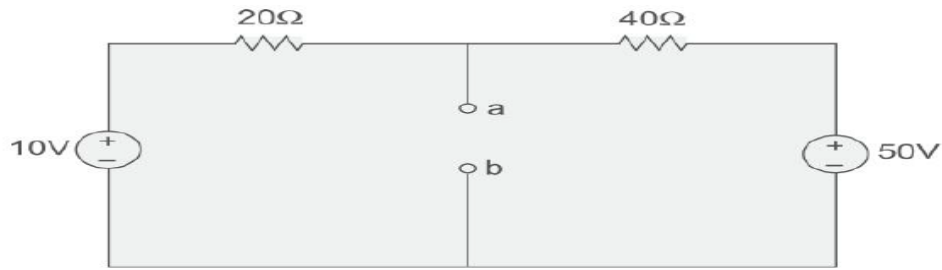


12. (a) Calculate the current in the 4 Ω resistor of using the superposition theorem. CO2-App (16)



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 resonant circuit consists of an inductor with an inductance of 100 mH and a capacitor with a capacitance of 10 μ F. The circuit is driven by an AC voltage source at a frequency of 1 kHz. Analyze the quality factor (Q factor) of the resonant circuit and discuss its significance in terms of selectivity and bandwidth. CO3-App (16)
- Or
- (b) Derive the Transient Response of RL Circuit with D.C. Excitation? How to used to pass DC bias current and block the RF getting back into the power supply. 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 principles and applications of concealed wiring electrical installations used in hospitals? CO5-U (16)
- Or
- (b) Describe the principles and applications of fuses in electrical systems? CO5-U (16)

