A **Reg. No. :** | | | | | | | | | | | | |

Question Paper Code: R1325

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

First Semester

Computer Science and Business Systems

R21UEE125- PRINCIPLES OF ELECTRICAL ENGINEERING

(Common to AI&DS and CSE(AI&ML) Branches)

(Regulations R2021)

Duration: Three hours Maximum: 100 Marks

Answer All Questions

PART A - (10 x 1 = 10 Marks)

1. What is the unit of electric current? CO1- U

   (a) Ohm (b) Volt (c) Ampere (d)Watt

2. In which network analysis technique is Kirchhoff's Current Law (KCL) applied to different nodes? CO1- U

   (a) Mesh Analysis (b) Ohm's Law

   (c) Nodal Analysis (d) Kirchhoff's Voltage Law (KVL)

3. Current division principle is applicable for: CO3- U

   (a) Series circuits only (b)Parallel circuits only (c) Both (a) and (b) (d) None of these

4. Electrical appliances are connected in parallel because it CO2- U

   (a) Is a simple circuit (b)Draws less current

   (c) Results in reduced power loss (d) Makes the operation of appliances independent of each other

5. What is the SI unit for quality factor? CO4- U

   (a) Hz (b) kHz (c) MHz (d) No unit

6. What happens to the quality factor when resonant frequency increases? CO4- U

   (a) Increases (b) Decreases (c) Remains the same (d) Becomes zero

7. If three 10uF capacitors are connected in parallel, the net capacitance is CO6- App

(a) 20uF (b) 30uF (c) 40uF (d) 50uF

8. Materials whose permeabilities are slightly greater than that of free space CO3- U

(a) Paramagnetic (b) Non magnetic (c) Ferromagnetic (d)Diamagnetic

9. Motor meters can be used to measure AC or DC CO2- U

(a) Watt-hours (b) Ampere-hours (c) current (d) Voltage

10. Domestic electrical wiring is basically a CO6- U

(a) series connection (b) Parallel connection (c) Both (a) and (b) (d) none

PART – B (5 x 2= 10 Marks)

11. Define: Node (OR) Junction, Tree & branch. CO1- U

12. Two bulbs B1 100 W, 200 V and B2 40 W, 200 V are connected in series across 200 V battery, the total circuit resistance will be CO1 -App

13. Define power factor. CO5- U

14. Explain Capacitor composite. CO6- U

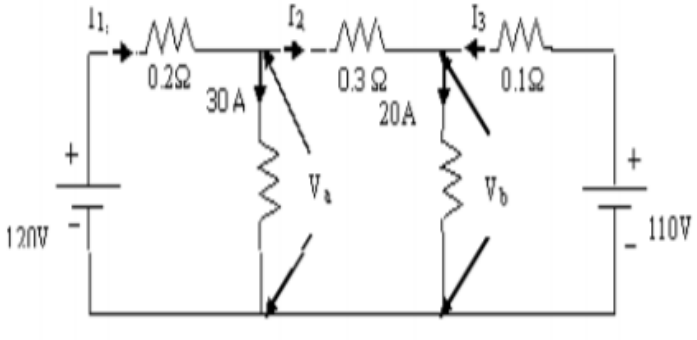
15. Name two safety measures commonly used in electric circuits and appliances.. CO6 -U

PART – C (5 x 16= 80 Marks)

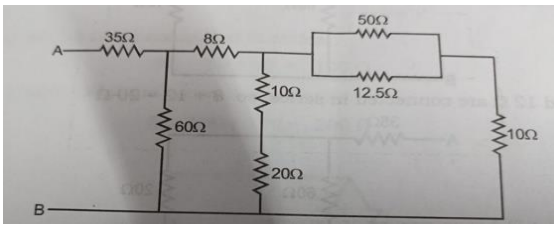
16. (1) Explain briefly about Mesh and nodal Analysis with neat diagram. CO1- App (16)

Or

(b) Find the currents I1 , I2, I3 and the voltages Va and Vb in the network of figure by using nodal analysis. CO1- App (16)



17.	(a)	Derive the expressions for star to delta and delta to star transformations in AC circuits.	CO2- App	(16)
		Or		
	(b)	(i)State the difference between Series and Parallel circuits.	CO2- App	(8)
		(ii)Determine the equivalent resistance between terminals A and B of figure shown below.		(8)



18.	(a)	Derive the expression for a current in a source free RC circuit & draw waveforms.	CO4- App	(16)
		Or		
	(b)	Draw the phasor diagram for a series RL circuit. Also obtain the voltage triangle and impedance triangle.	CO4- App	(16)
19.	(a)	Explain in detail about the principle of operation of a single phase Transformer.	CO6 -U	(16)
		or		
	(a)	What is inductance and explain in detail about the types on inductances..	CO6 -U	(16)
20.	(a)	Draw and explain Piezo electric Transducers.	CO6- U	(16)
		Or		
	(b)	What are the basic concepts of household wiring and explain?	CO6 -U	(16)