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**Reg. No. :**

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**Question Paper Code: R1325**

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

First Semester

Computer Science and Business Systems

R21UEE125- PRINCIPLES OF ELECTRICAL ENGINEERING

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

(Regulations 2021)

Duration: Three hours

Maximum: 100 Marks

PART A - (10 x 1 = 10 Marks)

1. Kirchoff's Voltage Law (KVL) is based on the principle of: CO1- U  
(a) Conservation of charge (b) Conservation of energy  
(c) Conservation of power (d) Conservation of current
2. Which source provides a constant voltage or current regardless of the rest of the circuit? CO1- U  
(a) Voltage Source (b) Current Source (c) Dependent Source (d) Independent Source
3. Super-Position Theorem is applicable for a CO1- U  
(a) Linear Bilateral Network (b) Non- Linear Bilateral Network  
(c) Linear Uni-lateral Network (d) All the above
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. When an alternating current passes through an ohmic resistance the electrical power converted into heat is CO5- U  
(a) Apparent power (b) True power (c) Reactive power (d) None of the above
6. The current leads the supply voltage in a series RLC circuit has its frequency \_\_\_\_\_ the resonant frequency. CO4- U  
(a) Above (b) Below (c) Equal to (d) Cannot be determined

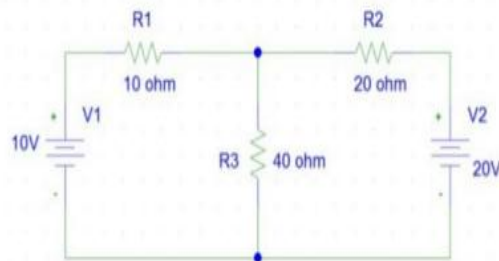
7. The unit of capacitance are CO6- U  
 (a) volts/Coulomb (b)Coulomb/volt (c)Ohms (d) Henry/Weber
8. If three 15uF capacitors are connected in series ,the net capacitance is CO6- U  
 (a) 5uF (b)30uF (a) 5uF (b)30uF
9. Which of the following circuit elements will oppose the change in circuit current? CO1- U  
 (a) Inductance (b)Capacitance (c)Resistance (d) All the above
10. A Sensor is a \_\_\_\_\_. CO6- U  
 (a) Subsystem (b)Module (c) Machine (d) All the above

PART – B (5 x 2= 10Marks)

11. Distinguish between a Loop & Mesh of a circuit. CO1 U
12. State maximum power transfer theorem. CO1 U
13. Define Form factor and Peak factor. CO2 U
14. State the principle of electric generator. CO6 U
15. Define sensors. CO6 U

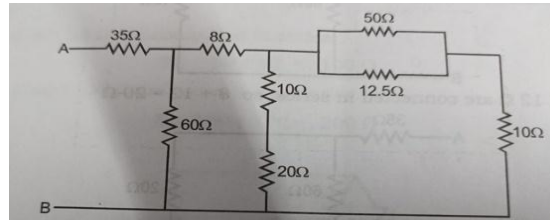
PART – C (5 x 16= 80Marks)

16. (a) (i) Distinguish between Mesh and loop of a circuit. CO1- AP (6)  
 (ii) Find the current flowing through each resistor using nodal analysis for the circuit below. (10)



Or

- (b) Explain briefly about Mesh and nodal Analysis with neat diagram CO1- AP (16)
17. (a) (i) State the difference between Series and Parallel circuits CO2- AP (6)  
 (ii) Determine the equivalent resistance between terminals A and B of figure shown below. (10)



Or

- (b) Derive an expression for Delta to Star Conversion. CO2- AP (16)
18. (a) Explain the characteristics of RLC series Resonant circuit CO4- AP (16)
- Or
- (b) Draw the phasor diagram for a series RL circuit. Also obtain the voltage triangle and impedance triangle CO4- AP (16)
19. (a) What is inductance and explain in detail about the types on inductances. CO6 U (16)
- or
- (b) (i) What is meant by EMF? CO6 U (4)  
(ii) What are the applications of Faraday's Law? (4)  
(iii) Define Ampere's Law (4)  
(iv) Differentiate between Self and mutual inductance (4)
20. (a) State the Principle of operation of a single phase Transformer. CO6 U (16)
- Or
- (b) Explain the various methods of electrical wiring system. CO6 U (16)

