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Question Paper Code: U1325

B.E. / B.Tech. DEGREE EXAMINATION, NOV 2023

First Semester

Computer Science and Business Systems

21UEE125- 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. An instrument which detects electric current is known as CO6-U
(a) Voltmeter (b) Rheostat (c) Ammeter (d) Wattmeter
2. Ohm's law is not applicable to CO6-U
(a) DC circuits (b) high currents (c) small resistors (d) semi-conductors.
3. The S.I. unit of power is CO6-U
(a) Henry (b) Coulomb (c) Watt (d) Watt-hour
4. A circuit contains two un-equal resistances in parallel CO6-U
(a) current is same in both
(b) large current flows in larger resistor
(c) potential difference across each is same
(d) smaller resistance has smaller conductance
5. SI unit for quality factor is CO6-U
(a) Hz (b) KHz (c) MHz (d) No unit
6. Resonance frequency occurs when _____ CO6-U
(a) $X_L = X_C$ (b) $X_L > X_C$ (c) $X_L < X_C$ (d) Cannot be determined
7. The Power factor of electrical bulb is CO6-U
(a) unity Pf (b) zero (c) 0.8 Pf (d) 1.2 Pf

8. If three 10 μ F capacitors are connected in parallel, the net capacitance is CO6-U
 (a) 20 μ F (b) 30 μ F (c) 40 μ F (d) 50 μ F
9. Unit of inductance is CO6-U
 (a) Ohm (b) Henry (c) Ampere turns (d) Weber/metre
10. Domestic electrical wiring is basically a CO6-U
 (a) series connection (b) Parallel connection
 (c) Both (a) & (b) (d) none of the above

PART – B (5 x 2= 10Marks)

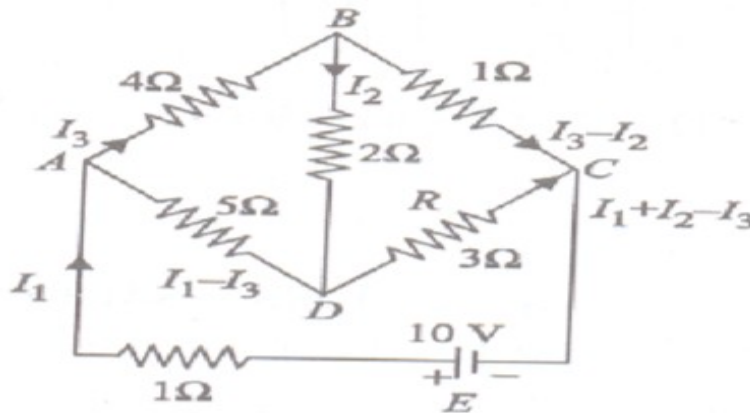
11. State Ohm's law. CO6-U
12. State Nortons theorem CO6-U
13. Define power factor CO6-U
14. State the principle of electric generator CO6-U
15. List the materials used for house wiring. CO6-U

PART – C (5 x 16= 80Marks)

16. (a) (i) Distinguish between Dependent and Independent electrical sources. CO1-App (4)
 (ii) Write short notes on conversion of energy (4)
 (iii) Two 60 ohm resistors are connected in series. If a resistor R is connected across one of them, the total circuit resistance becomes 80 ohm. Find the value of R. (8)

Or

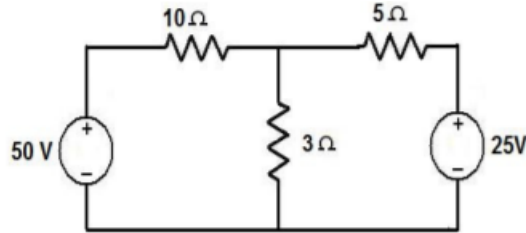
- (b) Find the currents I_1 , I_2 , I_3 and the voltages V_a and V_b in the network of figure by using nodal analysis. CO1 App (16)



17. (a) (i) Derive an expression for star to Delta Conversion. CO2-App (8)
(ii) Derive an expression for Series RL Circuit CO2-App (8)

Or

- (b) Find the current in each resistor using superposition theorem CO2- App (16)



18. (a) A Series circuit has $R= 10\Omega$, $L= 50\text{mH}$ and $C=100\mu\text{F}$ and is supplied with $200\text{ V } 50\text{ C/S}$, Find (a) Impedance, Current, Power, Power factor and the Voltage drop CO3-Ana (16)

Or

- (b) Draw the phasor diagram for a series RL circuit. Also obtain the voltage triangle and impedance triangle CO3-Ana (16)

19. (a) Define inductance and compare different types on inductances with relevant Example. CO4-Ana (16)

or

- (b) (b) Explain in detail about the principle of operation of a single phase Transformer with neat diagram. CO4-Ana (16)

20. (a) Discuss the different types of wiring used in house hold with neat diagram. CO5-U (16)

Or

- (b) (i) Write Short notes on CO5-U
(a) Earthing (4)
(b) The necessity of Earthing (4)
(ii) Write down some electrical safety measures to be followed CO5-U (8)

