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Question Paper Code: 51535

B.E. / B.Tech. DEGREE EXAMINATION, NOV 2016

Third Semester

Electronics and Instrumentation Engineering

15UEI305 - ELECTRICAL CIRCUITS AND NETWORKS

(Regulation 2015)

Duration: Three hours

Maximum: 100 Marks

Answer ALL Questions

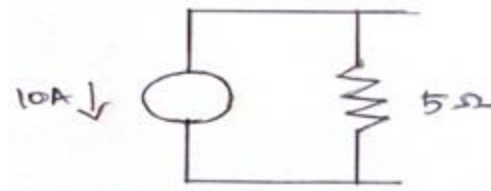
PART A - (10 x 1 = 10 Marks)

- Ohmic law mention, $V = IR$, when
 - voltage is constant
 - at any resistance
 - only for DC
 - when temperature remains constant
- Two no. of 8Ω resistance is connected in parallel. What is the effective value?
 - 16
 - 4
 - 4
 - none of these
- Norton's theorem is the dual of _____ theorem.
 - superposition
 - reciprocity
 - Thevenin
 - all the above
- The maximum power transferred to any load of RL will be
 - Vg/RL
 - $Vg^2/2RL$
 - $Vg^2/4RL$
 - none of these
- The maximum value of coefficient of coupling K is
 - >1
 - <1
 - ∞
 - 1
- When a RLC circuits is said be at resonance, then than PF of the circuits will be
 - zero
 - unity
 - lag
 - load

7. The time constant of RL series circuit is
 (a) L (b) R/L (c) L/R (d) none of these
8. The laplace transform of capacitor value 'c' will be
 (a) C (b) $1/S$ (c) $1/CS$ (d) CS
9. The power of a 3 phase supply systems of having V line voltage is
 (a) VI (b) $3VI$ (c) $\sqrt{3}VI\cos\phi$ (d) $3VI\cos\phi$
10. Minimum number of Wattmeter required to measure power in 3ϕ , 3 wire unbalanced systems is
 (a) one (b) two (c) three (d) anyone

PART - B (5 x 2 = 10 Marks)

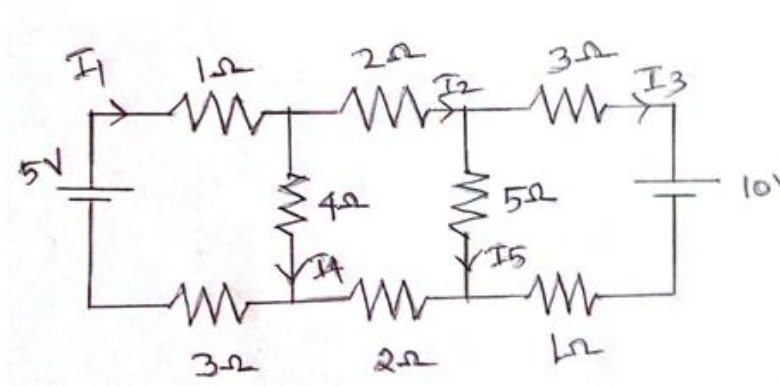
11. Draw the equivalent voltage source for the current source given



12. State superposition theorem.
13. Define band width.
14. What is the time constant of a series RC circuits?
15. Define phase sequence.

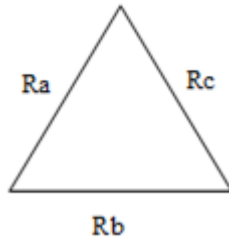
PART - C (5 x 16 = 80 Marks)

16. (a) Find the current in all the branches of the circuits given below by nodal method. (16)

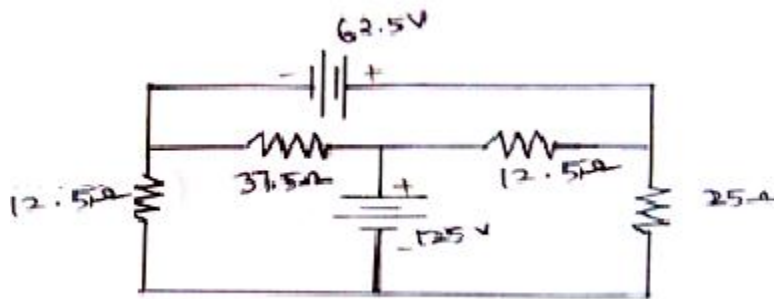


Or

(b) Derive for a given delta connected system the equivalent value in star position. (16)

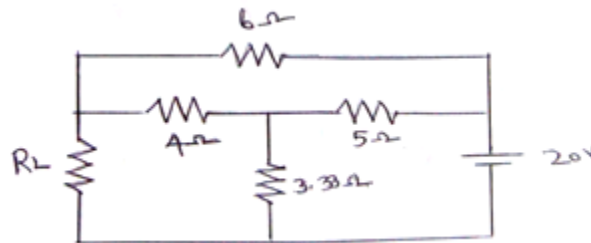


17. (a) Find the current through 25 resistor in the circuits given by super position theorem. (16)



Or

(b) Find the value of R_L in the circuits given for maximum power transfer to it. Find maximum power. (16)



18. (a) (i) Derive band width and quality factor. (6)

(ii) Derive the equation for band width $= R/2\pi L$. (10)

Or

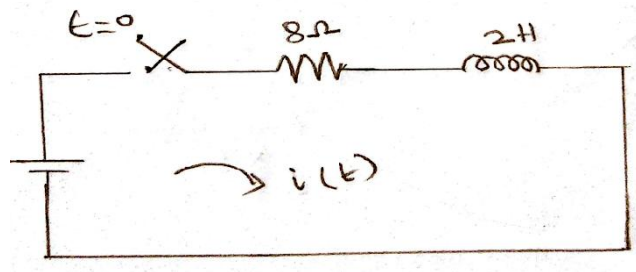
(b) (i) Explain tuned circuits and its application. (6)

(ii) Derive for the single tuned coupled circuits maximum output at resonance. (10)

19. (a) (i) Explain transient response. (4)
- (ii) Derive the equation for RC series circuit time constant both for charging and discharging condition. (12)

Or

- (b) In the circuit given below, find the transient current and the initial rate of growth of current when the switch is closed at $t = 0$. (16)



20. (a) Draw the circuit and prove that two Wattmeter method will measure 3ϕ power. (16)

Or

- (b) A balanced star connected load of 100 kW is connected to a balanced 3ϕ supply system at 400 V and 50 Hz . The line current taken from the supply is 150 A (lagging). Find the circuit constants of the load phase. (16)