Register Number: …….

B.E DEGREE EXAMINATIONS: NOV/DEC 2010

Second Semester

ELECTRONICS AND INSTRUMENTATION ENGINEERING

U07EE201::Electric Circuit Analysis

Time: Three Hours **Maximum Marks: 100**

Answer ALL Questions:-

PART A (10 x 1 = 10 Marks)

1. Kirchoff s laws are valid for

   A) linear circuits only B) passive time invariant circuits

   C) nonlinear circuits D) both linear and nonlinear circuits.

2. When all the resisters in the circuits are of 1ohm each, equivalent resistance across the point A & B in the fig (i) will be

   A)1Ω B) 0.5 Ω C) 2 Ω D)1.5 Ω

3. The sources in the circuit shown are a sinusoidal source. The supply voltage across various elements is marked in the fig (ii). The input voltage is

   A) 10V B) 5V C) 27V D)24V

4. In the fig(iii) i(t) under steady state is

   A) 0 B) 5 C) 7.07 sin t D) 7.07 sin (t-45º)

5. At half power points of an RLC series circuit

   A) $R=X_L-X_C$ B) $X_L=X_C$ C) R=O D) $X_L=2Xc$

6. Resonance frequency frof as series RLC circuit is related to half power frequency fl & f2 as

   A) fr= (fl+f2)/2 B) fr=√flf2 C) fr = f2-fl D) fr= √fl + √f2

7. For maximum power transfer of power initial resistance of the sources should be

   A) equal to load resistance B) less than load resistance

   C) greater than load resistance D) zero

8. Maximum efficiency of power transfer to load in maximum power transfer theorem is

   A) 25% B) 50% C) 75% D) 100%

9. In the delta equation of given fig(iv) star connected circuit 2QR is equal to

   A) 40 Ω B) 20+j10 Ω C) 10+j10/3 Ω D) 10+j30 Ω

10. Power measurement in balanced 3 phase circuit can be done by

    A) 1 watt meter method B) 2 watt meter method

    C) 3 watt meter method D) 4 watt meter method

PART B (10 x 2 = 20 Marks)

11. Define RMS value.
12. Define form factor.
13. State initial value and final value theorem.
14. Write the equation for RL forced response.
15. Draw the impedance triangle diagram.
16. Write the equation for Q factor.
17. State compensation theorem.
18. State millman's theorem.
19. Draw the phasor diagram of voltage for three phase three wire system.
20. Write the relationship between for mutual inductance and coefficient of coupling.

PART C (5 x 14 = 70 Marks)

21. (a) Use mesh analysis to determine the three mesh currents in the given fig(v).

(OR)

(b) Determine the values of II and h for the given fig (vi)

22. (a) Find Vc(t) and i(t) in the 2000 for all time for the given fig(vii)

(OR)

(b) Specift the forced response by finding values for 1m and <1>in the time domine expression i(t)= 1m e-2tcos(4t+ <D)for the given fig (viii)

23. (a) (i) A voltage source 40+60 u(t)V, 51!Fcapacitor and 2000 resistance are in series. Find power being absorbed by the inductor and by the resister at t=l.2ms. (7)

(ii) Calculate the values for average power, apparent power, power factor delivered to each of two loads. for the given fig(ix) (7)

(OR)

(b) (i) Vs = 100cos wt mV is applied to a series resonant circuit composed of 100 resister, 200n F and 2mH. Calculate the current amplitude ifw=48K rad/sec.

24. (a).Determine the current through 10 resister across x-y using thevenin's theorem for the given fig(x)

(OR)

(b) Find the current! using super position theorem for the given fig(xi)

25. (a) (i) Find II for VI = 142.3 sin lOOt,LI= 0.2H, L2=0.lH,.M=O.lH, R=100 given fig(xii). (4)

(ii) Compute the voltage for the given fig(xiii) coupled circuit. Repeat with polarity of one circuit is reversed. (10)

(OR)

(b) find the line current and total power in the given figure (xiv) if line voltage is 240V.

****