Sc

[8/A-24]

No. Of Printed Pages: 3

SARDARPATEL UNIVERSITY

F.Y.BSc. (IInd SEM.) Instrumentation (vocational)

SUBJECT-AC FUNDADAMENTALS

COURSE CODE-USO2CINV01

2nd APRIL-2016

Time: -10:30am to 12:30pm **Marks:-70**

Q-1 Choose the correct answer from given. **[10]**

1. Power factor of a resonance series circuit is_____.
   (a) one (c) infinite
   (b) zero (d) none of above
2. An LC circuit is said to be resonance, when XL _____.
   (a) =XC (c) < XC
   (b) >XC (d) none of above
3. The average value of sinusoidal signal is_____.
   (a) 0.707 Vm (c) 1.1 Vm
   (b) 0.636 Vm (d) none of above
4. The superposition theorem is essentially based on the concept of ____.
   (a) linearity (c) both (a) & (b)
   (b) non-linearity (d) none of above
5. Power factor is given by the ratio of circuit resistance and _____.
   (a) impedance (c) current
   (b) voltage (d) none of above
6. For maximum power transfer the resistance of load circuit should be____.
   (a) equal to source resistance (c) more than source resistance
   (b) less than source resistance (d) none of above
7. A train of sine wave which contains 60 positive peak and 60 negative peaks per second has a frequency of ____ Hz.
   (a) 50 (c) 120
   (b) 60 (d) none of above
8. An ideal constant –current source has_____ resistance.
   (a) zero (c) infinite
   (b) constant (d) none of above
9. The periodic time of the ac signal depends on _____.
   (a) Amplitude of signal (c) Frequency of signal
   (b) Phase angle of signal (d) none of above
10. _____ the Q factor of a circuit narrower its bandwidth, in resonance circuit.
    (a) Lower (c) Medium
    (b) Higher (d) none of above

Q-2 Short answer type Question.(attempt any TEN) **[20]**

1. Define peak value of an AC sinusoidal signal.
2. Define form factor.
3. A sinusoidal signal has ac voltage of peak value 100 volt, determine rms value.
4. State the Milman's theorem.
5. State the Kirchhoff's current and voltage law.

6. What is network?
7. Define admittance.
8. Briefly explain tuning RLC circuit.
9. Define resonance circuit.
10. The high voltage of circuit of color television produces 30000 volt across the 500 pF capacitor. Calculate the energy stored in capacitor.
11. List application of resonance circuit.
12. Define Quality factor for resonance circuit.

Q-3(A) Do as directed **[6]**

(a) (5-j2)+(3+j3)
(b) (8-j1)+(8+j3)
(c) (3-j3)-(2+j2)
(d) (6-j2)+(4+j4)
(e) (12+j4)+(5-j3)
(f) (3+13j)+(5-j5)

Q-3(B) Convert following polar co-ordinates to Cartesian co-ordinates and vice versa. **[4]**

(a) Z=141 & θ=45°
(b) Z=100 & θ= 25°
(c) X= 10 & Y=10
(d) X=25 & Y=25

OR

Q-3(A) Derive an expression for the average and effective values of the ac sinusoidal signals and derive an expression for the form factor. **[6]**

Q-3(B) Define term phase, phase difference, frequency and periodic time of the signal produced by the resonant converter with 30.5 Hz frequency. **[4]**

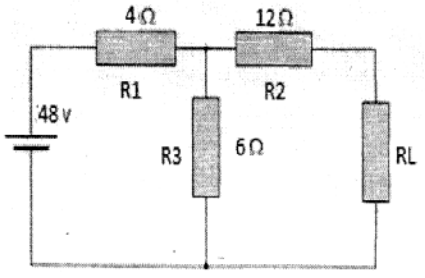
Q-4(A) State and explain Maximum power transfer theorem. **[5]**

Q-4(B) State and explain Thevenin theorem. **[5]**

OR

Q-4(A) State and explain Norton theorem with necessary figure. **[5]**

Q-4(B) Reduce the given circuit in to Norton equivalent circuit. **[5]**



Q-5(A)	Explain the resonance of series RL circuit for sinusoidal signals. Derive expressions for the total impedance and phase angle of the circuit.	[6]
Q-5(B)	Explain energy stored and sinusoidal response of an inductor.	[4]
	OR	
Q-5(A)	Explain the resonance of parallel RL circuit for sinusoidal signals. Derive expressions for the total impedance and phase angle of the circuit.	[6]
Q-5(B)	Explain energy stored and sinusoidal response of capacitor.	[4]
Q-6(A)	Draw the circuit of parallel resonance and explain it with necessary diagrams. And also derive an expression for resonance frequency.	[6]
Q-6(B)	A parallel circuit consisting of a 200 pF capacitor and coil inductance 200 μH and a resistance 5 Ω is connected across a 0.2 V, 800 kHz signal source. Determine for the circuit Q-value and bandwidth .	[4]
	OR	
Q-6(A)	Draw the circuit of series resonance and explain it with necessary diagrams. And also derive an expression for resonance frequency.	[6]
Q-6(B)	Explain series resonance curve.	[4]

X = X = X