Seat No.	

B.Sc. (Semester - I) (Old) (CBCS) Examination Oct/Nov-2019
Electronics (Paper – I)
BASIC CIRCUIT THEORY AND NETWORK ANALYSIS

Day & Date: Tuesday, 19-11-2019 Max. Marks: 70
Time: 11:30 AM To 02:00 PM

Instructions: 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Use of scientific calculator is permissible.
4) Draw neat labeled diagrams whenever necessary.

Q.1 Fill in the blanks by choosing correct alternatives given below. **14**

1) A resistor has color bands of Brown, Black, Green & Gold then its value is _____.
   a) $100\,K\Omega \pm 5\%$ b) $1\,M\Omega \pm 5\%$
   c) $10\,M\Omega \pm 5\%$ d) $1K\Omega \pm 5\%$

2) The unit of capacitive reactance is _____.
   a) Ohm b) Henry
   c) Farad d) Ampere

3) A LCR series circuit is said to resistive if _____.
   a) $V_L < V_C$ b) $V_L > V_C$
   c) $V_L = V_C$ d) $V_L \geq V_C$

4) The T network is also called as _____.
   a) delta b) star
   c) open d) all of these

5) The admittance parameters are also called as _____ parameters.
   a) Z b) h
   c) Y d) ABCD

6) The working principle of transformer is based on _____.
   a) self-induction b) conduction
   c) insulation d) mutual induction

7) The practical voltage source has _____ internal resistance.
   a) infinite b) finite
   c) zero d) all of these

8) In series resonance circuit at resonance the current is _____.
   a) minimum b) zero
   c) equal to voltage d) maximum

9) The node point is a _____ of the two or more branches.
   a) common point b) earth point
   c) open point d) all of these

10) The hybrid parameters h_{11} is called as _____.
    a) output conductance b) reverse voltage gain
    c) input impedance d) forward current gain

11) The main purpose of fuse is _____.
   a) to protect the circuit from the excessive temperature
   b) to protect the circuit against the excessive current
   c) to protect the circuit against the excessive voltage
   d) none of these

12) The unit of impedance is _____.
   a) Semen's   b) Farad
   c) Henry   d) Ohm

13) A sinusoidal signal has frequency of 20 Hz then its time period is _____.
   a) 50 m sec   b) 500 m sec
   c) 5 m sec   d) 0.5 m sec

14) In pure capacitive circuit the current is _____ with voltage.
   a) lagging   b) out of phase
   c) leading   d) in phase

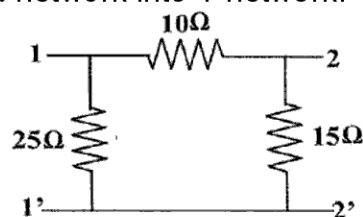**Q.2 A) Answer the following questions. (Any Four)**   08
   1) State applications of capacitor.
   2) Define the terms
      i) In Phase
      ii) Out of Phase
   3) State Superposition theorem.
   4) Define inductance. State its practical unit.
   5) A series resonance circuit has bandwidth of 32 KHz and quality factor of 5. Calculate resonating frequency.

B) Write notes. (Any Two)   06
   1) Non-sinusoidal ac sources
   2) Relay
   3) Kirchhoff's laws

**Q.3 A) Answer the following questions. (Any Two)**   08
   1) Define passive and active components. Give the classifications of capacitors.
   2) Compare series and parallel resonance circuit.
   3) Convert the following π network into T network.

B) Answer the following questions. (Any One)   06
   1) With the help of two port model determine the impedance (Z) parameters.
   2) State and prove maximum power transfer theorem.

Q.4 A) Answer the following questions. (Any Two)   10
   1) Find out current flowing through load resistance R_L of a following dc network using Thevenin's theorem.
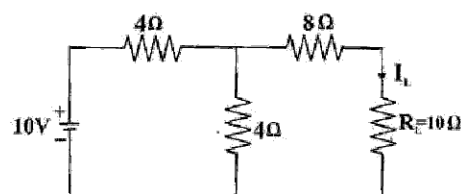
2) What are different de sources? Explain current source.
3) A series LCR circuit is connected to ac source having frequency of 50Hz. If $L = 10\,mH, C = 1000\mu F$ and $R = 100\,\Omega$. Calculate
   i) Inductive reactance
   ii) Capacitive reactance
   iii) Resonating frequency

B) Answer the following questions. (Any One) 04
1) What are different types of transformers? Give its applications.
2) A 50Hz sinusoidal ac signal has maximum value of 160 volts. Calculate
   i) Average value
   ii) RMS value
   iii) Peak to Peak value
   iv) Time period

Q.5 Answer the following questions. (Any Two) 14
a) What is capacitance? State its unit. What are its types? Define any two specifications of capacitor.
b) Define the term phase difference? Explain phase relationship of voltage and current in pure resistor and pure capacitor.
c) Find out current flowing through each branch of the following de network using Node analysis.