

**B****DE-2922****First Year B. Sc. (Sem. I) Examination****March / April – 2016****Electronics : Paper - I***(Basic Electrical Circuits)*

Time : 2 Hours]

[Total Marks : 50

**Instructions :**

(1)

નીચે દર્શાવેલ નિશાનીવાળી વિગતો ઉત્તરવહી પર અવશ્ય લખવી. Fillup strictly the details of signs on your answer book.	Seat No. :
Name of the Examination :	<input type="text"/>
<input type="text" value="FIRST YEAR B. Sc. (SEM. 1)"/>	<input type="text"/>
Name of the Subject :	<input type="text"/>
<input type="text" value="ELECTRONICS - 1"/>	<input type="text"/>
Subject Code No. : <input type="text" value="2"/> <input type="text" value="9"/> <input type="text" value="2"/> <input type="text" value="2"/>	<input type="text" value="Student's Signature"/>
Section No. (1, 2,.....) : <input type="text" value="1,2,3"/>	

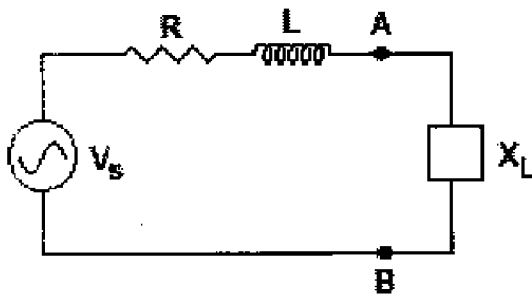
- (2) There are total 28 questions in this question paper.
- (3) Figure on the right indicates full marks
- (4) All symbols and abbreviations have their usual meaning.
- (5) Non-programmable calculators are allowed.
- (6) Assume data if necessary.

**Q. 1 to 12 Multiple choice questions : (1 mark)****Q. 13 to 22 Multiple Choise Questions : (2 marks)****Q. 23 to 28 Multiple Choice Questions : (3 marks)**

***O.M.R. Sheet ભરવા અંગેની અગત્યની સૂચનાઓ આપેલ  
O.M.R. Sheet-ની પાછળ છાપેલ છે.***

***Important instructions to fillup O.M.R. Sheet  
is given back side of provided O.M.R. Sheet.***

- 1 As current travels within a conductor:
- (A) an electrostatic field opposes the current
  - (B) the magnetic field aids the current
  - (C) a magnetic field is developed around it
  - (D) the wire tries to point north
- 2 Load  $Z_L$  for maximum power transfer is



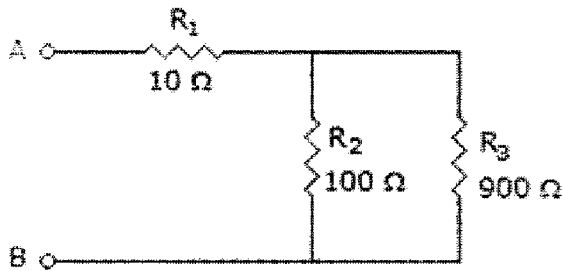
- (A) None
  - (B)  $R$
  - (C)  $R + j\omega L$
  - (D)  $R - j\omega L$
- 3 \_\_\_\_\_ has one winding common with the primary and secondary.
- (A) Line transformer
  - (B) Power transformer
  - (C) Auto transformer
  - (D) Audio transformer
- 4 \_\_\_\_\_ is often used to analyze multiple-source circuits.
- (A) Ohm's law
  - (B) Thevenin's theorem
  - (C) Superposition
  - (D) Kirchhoff's law

- 5 Kirchhoff's voltage law is concerned with
- (A) both IR drops and junction voltage
  - (B) IR drops
  - (C) junction voltage
  - (D) battery EMFs
- 6 According to Thevenin's theorem, any network with two open terminals can be replaced by a voltage source  $V_{th}$  in \_\_\_\_\_ with a single resistance  $R_{th}$ .
- (A) open
  - (B) series
  - (C) parallel
  - (D) short
- 7 The first goal to accomplish in analyzing a complex series-parallel circuit is to
- (A) solve for the total current and resistance
  - (B) equate all parallel components
  - (C) equate all series components
  - (D) solve for all the voltage drops
- 8 \_\_\_\_\_ is a device whose resistance depends upon the quantity of light falling on its surface.
- (A) LCD
  - (B) LDR
  - (C) VDR
  - (D) thermistor

- 9 Which one of the following is not the passive component?
- (A) varactor diode
  - (B) resistor
  - (C) inductor
  - (D) capacitor
- 10 The distance that a signal's energy can travel in the time it takes for one cycle to occur is called the signal's:
- (A) period
  - (B) amplitude
  - (C) frequency
  - (D) wavelength
- 11 In DPDT switch there are total \_\_\_\_\_ terminals.
- (A) 9
  - (B) 2
  - (C) 3
  - (D) 6
- 12 Which type of test equipment is used to measure current?
- (A) wattmeter
  - (B) ohmmeter
  - (C) ammeter
  - (D) voltmeter

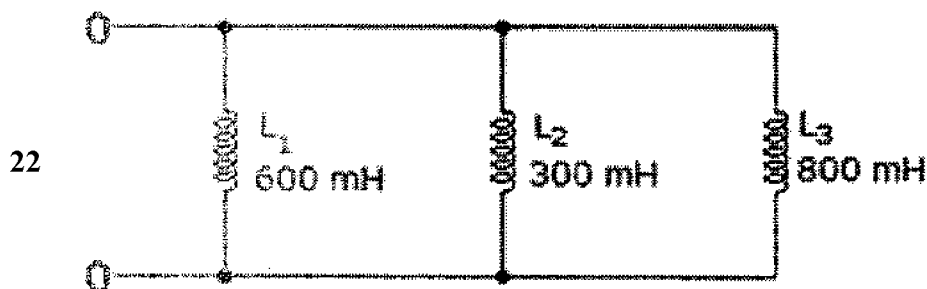
- 13 The voltage across a coil when  $di/dt = 20 \text{ mA/s}$  and  $L = 8 \text{ H}$  is
- (A) 2.5 mV
  - (B) 16 mV
  - (C) 160 mV
  - (D) 1.6 mV

- 14 If  $R_3$  opens in the given circuit, the total resistance ( $R_T$ ) between points A and B equals \_\_\_\_\_.



- (A) infinite resistance
  - (B)  $900 \Omega$
  - (C)  $100 \Omega$
  - (D)  $110 \Omega$
- 15 Reactance in an inductive circuit will:
- (A) depend on the value of  $X_c$
  - (B) increase with frequency
  - (C) decrease with frequency
  - (D) be independent from frequency
- 16 Kirchhoff's current law state that
- (A) total sum of currents meeting at the junction is zero
  - (B) net current flow at the junction is positive
  - (C) algebraic sum of currents meeting at the junction is zero
  - (D) no current can leave the junction
- 17 For  $p = V^2/R$ , a decrease in resistance should produce:
- (A) a decrease in current
  - (B) a decrease in power
  - (C) an increase in ohms
  - (D) an increase in power

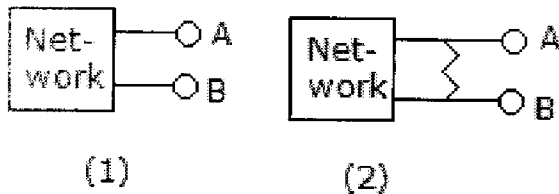
- 18 A capacitor stores 0.15C at 5 V. Its capacitance is  
 (A) 0.03  $\mu\text{F}$   
 (B) 0.75 F  
 (C) 0.75  $\mu\text{F}$   
 (D) 0.03 F
- 19 In a purely inductive circuit,  
 (A) voltage and current are in phase ( $0^\circ$ )  
 (B) current leads voltage by  $90^\circ$   
 (C) voltage lags current by  $90^\circ$   
 (D) voltage leads current by  $90^\circ$
- 20 What is the number of turns required in the secondary winding for a transformer when 120 volts is applied to a 2400-turn primary to produce 7.5 Vac at the secondary?  
 (A) 1920 turns  
 (B) 75 turns  
 (C) 150 turns  
 (D) 900 turns
- 21 What is the total inductance of a 5 H and a 100 mH coil connected in parallel?  
 (A) 150.0 mH  
 (B) 4.76 mH  
 (C) 33.3 mH  
 (D) 98.0 mH



- What is the total inductance in the given circuit?  
 (A) 1700 mH  
 (B) 160 mH  
 (C) 300 mH  
 (D) 900 mH

- 23 How many ohms of resistance allow a current of  $720 \mu\text{A}$  to flow when  $3.6 \text{ kV}$  is applied?
- (A)  $5 \text{ M}\Omega$
  - (B)  $200 \text{ n}\Omega$
  - (C)  $5 \text{ k}\Omega$
  - (D)  $200 \text{ k}\Omega$
- 24 Two similar coils have self inductance of  $1 \text{ mH}$  each. Coefficient of coupling is  $0.5$ . The mutual inductance  $M$  is
- (A)  $1 \text{ mH}$
  - (B)  $0.25 \text{ mH}$
  - (C)  $0.5 \text{ mH}$
  - (D)  $0.707 \text{ mH}$
- 25 With  $21 \text{ V}$  applied, if  $R_1 = 5 \text{ ohms}$ ,  $R_2 = 35 \text{ ohms}$ , and  $R_3 = 14 \text{ ohms}$ , what is the current of  $R_2$  if  $R_1$  is series connected with parallel circuit  $R_2$  and  $R_3$ ?
- (A)  $400 \text{ mA}$
  - (B)  $200 \text{ mA}$
  - (C)  $800 \text{ mA}$
  - (D)  $600 \text{ mA}$

- 26 The Thevenin's equivalent of network in figure(1) is a 10 V source in series with  $2\ \Omega$  resistance. If a  $3\ \Omega$  resistance is connected across AB as shown in figure(2) the Thevenin's equivalent is



- (A) 6 V in series with  $5\ \Omega$  resistance  
(B) 10 V in series with  $1.2\ \Omega$  resistance  
(C) 6 V in series with  $1.2\ \Omega$  resistance  
(D) 10 V in series with  $5\ \Omega$  resistance
- 27 A  $33\ \text{k}\Omega$  resistor with a 20% tolerance checks out as ok with which of the following ohmmeter readings?
- (A) 39970 ohms  
(B) 26400 ohms  
(C) 24183 ohms  
(D) 6600 ohms
- 28 How many amps are used by a 100 watt, 120 volt light bulb?
- (A) 12 amps  
(B) 1.2 amps  
(C) 12000 amps  
(D) 830 mA

