



**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 \_\_\_\_\_ is often used to analyze multiple-source circuits.
- (A) Superposition
  - (B) Kirchhoff's law
  - (C) Ohm's law
  - (D) Thevenin's theorem
- 2 Kirchhoff's voltage law is concerned with
- (A) junction voltage
  - (B) battery EMFs
  - (C) both IR drops and junction voltage
  - (D) IR drops
- 3 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) parallel
  - (B) short
  - (C) open
  - (D) series
- 4 The first goal to accomplish in analyzing a complex series-parallel circuit is to
- (A) equate all series components
  - (B) solve for all the voltage drops
  - (C) solve for the total current and resistance
  - (D) equate all parallel components

- 5 \_\_\_\_\_ is a device whose resistance depends upon the quantity of light falling on its surface.
- (A) VDR
  - (B) thermistor
  - (C) LCD
  - (D) LDR
- 6 Which one of the following is not the passive component?
- (A) inductor
  - (B) capacitor
  - (C) varactor diode
  - (D) resistor
- 7 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) frequency
  - (B) wavelength
  - (C) period
  - (D) amplitude
- 8 In DPDT switch there are total \_\_\_\_\_ terminals.
- (A) 3
  - (B) 6
  - (C) 9
  - (D) 2

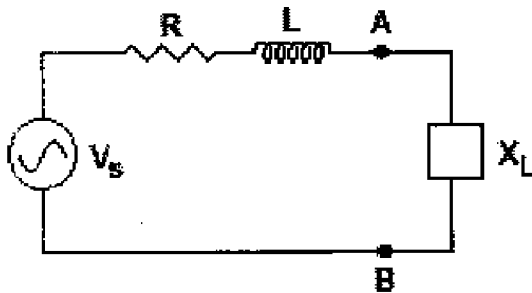
9 Which type of test equipment is used to measure current?

- (A) ammeter
- (B) voltmeter
- (C) wattmeter
- (D) ohmmeter

10 As current travels within a conductor:

- (A) a magnetic field is developed around it
- (B) the wire tries to point north
- (C) an electrostatic field opposes the current
- (D) the magnetic field aids the current

11 Load  $Z_L$  for maximum power transfer is

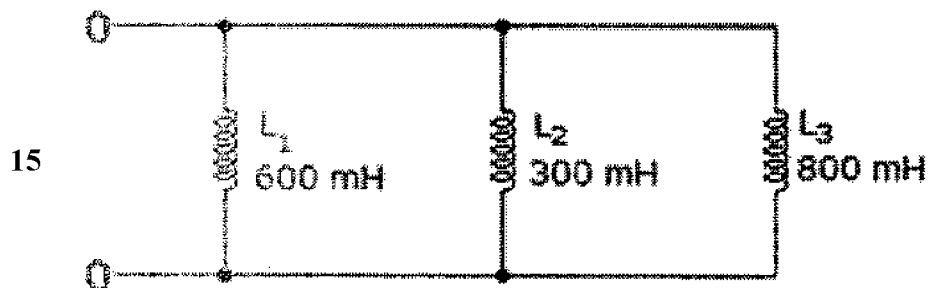


- (A)  $R + j\omega L$
- (B)  $R - j\omega L$
- (C) None
- (D)  $R$

12 \_\_\_\_\_ has one winding common with the primary and secondary.

- (A) Auto transformer
- (B) Audio transformer
- (C) Line transformer
- (D) Power transformer

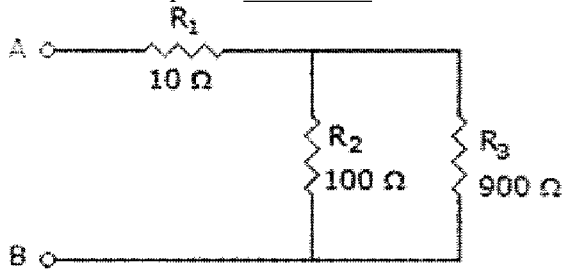
- 13 What is the number of turns required in the secondary winding for a transformer when 120 volts is applied to a 2400-turn primary to produce 7.5 Vac at the secondary?
- (A) 150 turns  
 (B) 900 turns  
 (C) 1920 turns  
 (D) 75 turns
- 14 What is the total inductance of a 5 H and a 100 mH coil connected in parallel?
- (A) 33.3 mH  
 (B) 98.0 mH  
 (C) 150.0 mH  
 (D) 4.76 mH



What is the total inductance in the given circuit?

- (A) 300 mH  
 (B) 900 mH  
 (C) 1700 mH  
 (D) 160 mH
- 16 The voltage across a coil when  $di/dt = 20$  mA/s and  $L = 8$  H is
- (A) 160 mV  
 (B) 1.6 mV  
 (C) 2.5 mV  
 (D) 16 mV

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



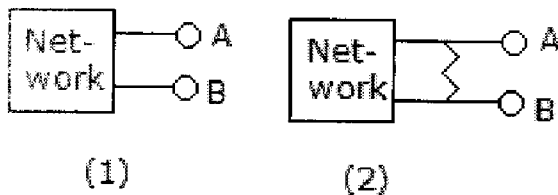
- (A)  $100\ \Omega$   
(B)  $110\ \Omega$   
(C) infinite resistance  
(D)  $900\ \Omega$
- 18 Reactance in an inductive circuit will:  
(A) decrease with frequency  
(B) be independent from frequency  
(C) depend on the value of  $X_c$   
(D) increase with frequency
- 19 Kirchoff's current law state that  
(A) algebraic sum of currents meeting at the junction is zero  
(B) no current can leave the junction  
(C) total sum of currents meeting at the junction is zero  
(D) net current flow at the junction is positive
- 20 For  $p = V^2/R$ , a decrease in resistance should produce:  
(A) an increase in ohms  
(B) an increase in power  
(C) a decrease in current  
(D) a decrease in power
- 21 A capacitor stores  $0.15\text{C}$  at  $5\ \text{V}$ . Its capacitance is  
(A)  $0.75\ \mu\text{F}$   
(B)  $0.03\ \text{F}$   
(C)  $0.03\ \mu\text{F}$   
(D)  $0.75\ \text{F}$
- 22 In a purely inductive circuit,  
(A) voltage lags current by  $90^\circ$   
(B) voltage leads current by  $90^\circ$   
(C) voltage and current are in phase ( $0^\circ$ )  
(D) current leads voltage by  $90^\circ$

- 23 How many amps are used by a 100 watt, 120 volt light bulb?
- (A) 12000 amps
  - (B) 830 mA
  - (C) 12 amps
  - (D) 1.2 amps
- 24 How many ohms of resistance allow a current of 720  $\mu\text{A}$  to flow when 3.6 kV is applied?
- (A) 5 k $\Omega$
  - (B) 200 k $\Omega$
  - (C) 5 M $\Omega$
  - (D) 200 n $\Omega$
- 25 Two similar coils have self inductance of 1 mH each. Coefficient of coupling is 0.5. The mutual inductance M is
- (A) 0.5 mH
  - (B) 0.707 mH
  - (C) 1 mH
  - (D) 0.25 mH

26 With 21 V applied, if  $R_1 = 5$  ohms,  $R_2 = 35$  ohms, and  $R_3 = 14$  ohms, what is the current of  $R_2$  if  $R_1$  is series connected with parallel circuit  $R_2$  and  $R_3$ ?

- (A) 800 mA
- (B) 600 mA
- (C) 400 mA
- (D) 200 mA

27 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  $1.2\ \Omega$  resistance
- (B) 10 V in series with  $5\ \Omega$  resistance
- (C) 6 V in series with  $5\ \Omega$  resistance
- (D) 10 V in series with  $1.2\ \Omega$  resistance

28 A  $33\ \text{k}\Omega$  resistor with a 20% tolerance checks out as ok with which of the following ohmmeter readings?

- (A) 24183 ohms
- (B) 6600 ohms
- (C) 39970 ohms
- (D) 26400 ohms

