



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)

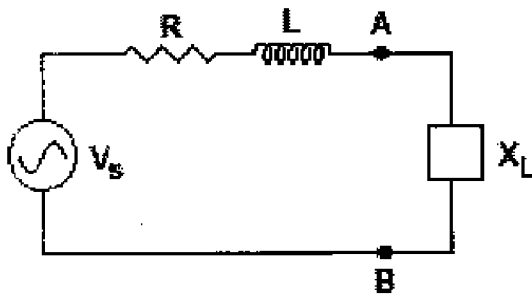
Q. 23 to 28 Multiple Choice Questions : (3 marks)

***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 Which one of the following is not the passive component?
- (A) capacitor
 - (B) varactor diode
 - (C) resistor
 - (D) inductor
- 2 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) wavelength
 - (B) period
 - (C) amplitude
 - (D) frequency
- 3 In DPDT switch there are total _____ terminals.
- (A) 6
 - (B) 9
 - (C) 2
 - (D) 3
- 4 Which type of test equipment is used to measure current?
- (A) voltmeter
 - (B) wattmeter
 - (C) ohmmeter
 - (D) ammeter

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

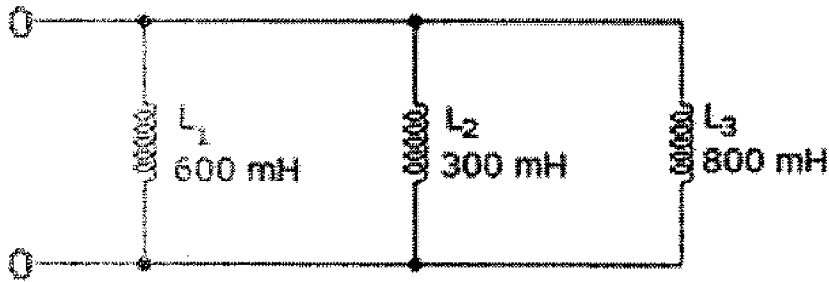


- (A) $R - j\omega L$
 - (B) None
 - (C) R
 - (D) $R + j\omega L$
- 7 _____ has one winding common with the primary and secondary.
- (A) Audio transformer
 - (B) Line transformer
 - (C) Power transformer
 - (D) Auto transformer
- 8 _____ is often used to analyze multiple-source circuits.
- (A) Kirchoff's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

- 9 Kirchhoff's voltage law is concerned with
- (A) battery EMFs
 - (B) both IR drops and junction voltage
 - (C) IR drops
 - (D) junction voltage
- 10 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) short
 - (B) open
 - (C) series
 - (D) parallel
- 11 The first goal to accomplish in analyzing a complex series-parallel circuit is to
- (A) solve for all the voltage drops
 - (B) solve for the total current and resistance
 - (C) equate all parallel components
 - (D) equate all series components
- 12 _____ is a device whose resistance depends upon the quantity of light falling on its surface.
- (A) thermistor
 - (B) LCD
 - (C) LDR
 - (D) VDR

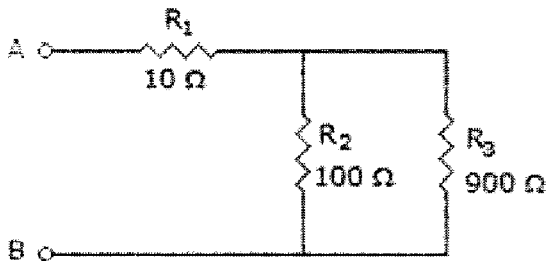
- 13 Kirchhoff's current law state that
- (A) no current can leave the junction
 - (B) total sum of currents meeting at the junction is zero
 - (C) net current flow at the junction is positive
 - (D) algebraic sum of currents meeting at the junction is zero
- 14 For $p = V^2/R$, a decrease in resistance should produce:
- (A) an increase in power
 - (B) a decrease in current
 - (C) a decrease in power
 - (D) an increase in ohms
- 15 A capacitor stores 0.15C at 5 V. Its capacitance is
- (A) 0.03 F
 - (B) 0.03 μ F
 - (C) 0.75 F
 - (D) 0.75 μ F
- 16 In a purely inductive circuit,
- (A) voltage leads current by 90°
 - (B) voltage and current are in phase (0°)
 - (C) current leads voltage by 90°
 - (D) voltage lags current by 90°
- 17 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) 900 turns
 - (B) 1920 turns
 - (C) 75 turns
 - (D) 150 turns
- 18 What is the total inductance of a 5 H and a 100 mH coil connected in parallel?
- (A) 98.0 mH
 - (B) 150.0 mH
 - (C) 4.76 mH
 - (D) 33.3 mH

19



What is the total inductance in the given circuit?

- (A) 900 mH
 - (B) 1700 mH
 - (C) 160 mH
 - (D) 300 mH
- 20 The voltage across a coil when $di/dt = 20$ mA/s and $L = 8$ H is
- (A) 1.6 mV
 - (B) 2.5 mV
 - (C) 16 mV
 - (D) 160 mV
- 21 If R_3 opens in the given circuit, the total resistance (R_T) between points A and B equals _____.

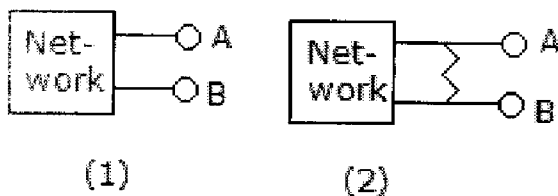


- (A) 110 Ω
 - (B) infinite resistance
 - (C) 900 Ω
 - (D) 100 Ω
- 22 Reactance in an inductive circuit will:
- (A) be independent from frequency
 - (B) depend on the value of X_c
 - (C) increase with frequency
 - (D) decrease with frequency

23 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) 600 mA
- (B) 400 mA
- (C) 200 mA
- (D) 800 mA

24 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) 10 V in series with $5\ \Omega$ resistance
- (B) 6 V in series with $5\ \Omega$ resistance
- (C) 10 V in series with $1.2\ \Omega$ resistance
- (D) 6 V in series with $1.2\ \Omega$ resistance

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

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

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

