



BRAINWARE UNIVERSITY
Term End Examination 2020 - 21
Programme – Diploma in Electrical Engineering
Course Name – Electrical Circuit and Network
Course Code - DEE301

Semester / Year - Semester III

Time allotted : 75 Minutes

Full Marks : 60

[The figure in the margin indicates full marks. Candidates are required to give their answers in their own words as far as practicable.]

Group-A

(Multiple Choice Type Question)

1 x 60=60

1. (Answer any Sixty)

(i) Kirchhoff's Current law is based on law of conservation of

- | | |
|-----------|-------------|
| a) energy | b) momentum |
| c) mass | d) charge |

(ii) The current law represents a mathematical statement of fact that

- | | |
|--------------------------------------|-------------------------------------|
| a) voltage cannot accumulate at node | b) charge cannot accumulate at node |
| c) charge at the node is infinite | d) none of the mentioned |

(iii) A semiconductor diode is an _____ element.

- | | |
|--------------|---------------|
| a) Bilateral | b) Unilateral |
| c) Active | d) Passive |

(iv) The circuit in which current has a complete path to flow is called _____ circuit.

- | | |
|-----------|--------------|
| a) short | b) open |
| c) closed | d) open loop |

(v) Potential difference in electrical terminology is known as?

- | | |
|---------------|----------------|
| a) Voltage | b) Current |
| c) Resistance | d) Conductance |

(vi) Pick the incorrect statement among the following

- a) Inductor is a passive element
- b) Current source is an active element
- c) Resistor is a passive element
- d) Voltage source is a passive element

(vii) A practical current source can also be represented as

- a) a resistance in parallel with an ideal voltage source
- b) a resistance in parallel with an ideal current source
- c) a resistance in series with an ideal current source
- d) none of the mentioned

(viii) Which of the following is true about an ideal voltage source?

- a) zero resistance
- b) small emf
- c) large emf
- d) infinite resistance

(ix) A dependent source

- a) is always a voltage source
- b) may be a current source or a voltage source
- c) is always a current source
- d) none of the mentioned

(x) Consider a circuit with two unequal resistances in parallel, then

- a) large current flows in large resistor
- b) current is same in both
- c) potential difference across each is same
- d) smaller resistance has smaller conductance

(xi) Ohm's law is not applicable to

- a) dc circuits
- b) high currents
- c) small resistors
- d) semi-conductors

(xii) Conductance is expressed in terms of

- a) mho
- b) mho/m
- c) ohm/m
- d) m/ohm

(xiii) In nodal analysis how many nodes are taken as reference nodes?

- a) 1
- b) 2
- c) 3
- d) 4

(xiv) _____ the resonant frequency, the current in the inductor lags the voltage in a series RLC circuit.

- a) Above
- b) Below
- c) Equal to
- d) Depends on the circuit

(xv) In a series RLC circuit, the phase difference between the current in the circuit and the voltage across the capacitor is?

- a) 0°
- b) 90°
- c) 180°
- d) 360°

(xvi) In a parallel circuit, we consider admittance instead of _____

- a) Resistance
- b) Inductance
- c) Capacitance
- d) Impedance

(xvii) As the impedance increases, the admittance _____

- a) Increases
- b) Decreases
- c) Remain Sme
- d) Zero

(xviii) In a series R-L circuit, V_L ___ V_R by ___ degrees.

- a) lags,45
- b) lags,90
- c) leads,90
- d) leads,45

(xix) The voltage applied across an R-L circuit is equal to ___ of V_R and V_L .

- a) arithmetic sum
- b) algebraic sum
- c) phasor sum
- d) sum of the squares

(xx) In a parallel circuit, we consider _____ instead of impedance

- a) Inductance
- c) Resistance

- b) Admittance
- d) Capacitance

(xxi) Which, among the following is the correct expression for admittance?

- a) $Y = Z$
- c) $Y = Z^2$
- b) $Y = 1/Z$
- d) $Y = 1/Z^2$

(xxii) What is the voltage across the capacitor when the source voltage is 100V and the Q factor is 10?

- a) 100V
- c) 1000V
- b) 10V
- d) 0V

(xxiii) In selective circuits, the resonant frequency lies in the _____ of the bandwidth frequency range

- a) Beginning
- c) Midpoint
- b) End
- d) Cannot be determined

(xxiv) In R-L-C series resonant circuit magnitude of resonance frequency can be changed by changing the value of

- a) R only
- c) C only
- b) L only
- d) L or C

(xxv) For a voltage source to be neglected, the terminals across the source should be

- a) replaced by inductor
- c) replaced by some resistance
- b) short circuited
- d) open circuited

(xxvi) In Superposition theorem, while considering a source, all other current sources are?

- a) open circuited
- c) change its position
- b) short circuited
- d) removed from the circuit

(xxvii) For the Reciprocity Theorem to satisfy the ratio of response to excitation before and after the source is replaced should be?

- a) different
- b) before source is replaced is greater than after the source is replaced
- c) same
- d) before source is replaced is less than after the source is replaced

(xxviii) While considering Reciprocity theorem, we consider ratio of response to excitation as ratio of?

- a) voltage to voltage
- b) current to current
- c) voltage to current
- d) None of the above

(xxix) The maximum power is delivered from a source to its load when the load resistance is _____ the source resistance.

- a) greater than
- b) less than
- c) equal to
- d) less than or equal to

(xxx) If there are N nodes in a circuit, then the number of nodal equations that can be formed are?

- a) $N+1$
- b) N
- c) $N-1$
- d) $N-2$

(xxxii) Norton's current is equal to the current passing through the _____ circuited _____ terminals.

- a) open, output
- b) short, input
- c) open, input
- d) short, output

(xxxiii) The condition for maximum power to be transferred to the load is?

- a) Source resistance greater than load resistance
- b) Source resistance equal to load resistance
- c) Source resistance less than load resistance
- d) Source resistance greater than or equal to load resistance

(xxxiii) If $Z_S = R_S + jX_S$, $Z_L = R_L + jX_L$, then if R_L is fixed, the condition for maximum power to be transferred is?

- a) $X_S = X_L$
- b) $X_S + X_L = 0$
- c) $X_S = -X_L$
- d) None of these

(xxxiv) At resonant frequency, the voltage across capacitor is _____ the voltage across inductor.

- a) greater than
- b) less than
- c) equal to
- d) greater than or equal to

(xxxv) While Thevenizing a circuit between two terminals, V_{th} is equal to

- a) Open-circuit terminal voltage
- b) Short-circuit terminal voltage
- c) Net voltage available in the circuit
- d) E.M.F. of the battery nearest to the terminals

(xxxvi) Circuit temporary response that will die out with time is known as _____

- a) Transient response
- b) Steady state response
- c) Step response
- d) Complete response

(xxxvii) A positive sign on susceptance indicates a _____

- a) Capacitive susceptance
- b) Inductive susceptance
- c) Neutral susceptance
- d) resistive susceptance

(xxxviii) The time constant at an R-C circuit is?

- a) R
- b) C
- c) RC
- d) R/C

(xxxix) If the roots of an equation are real and unequal, then the response will be _____

- a) Critically damped
- b) Under damped
- c) Over damped
- d) Damped

(xl) If the roots of an equation are real and equal, then the response will be?

- a) Critically damped
- b) Under damped
- c) Over damped
- d) Damped

(xli) In a loss-free RLC circuit the transient current is _____

- a) Oscillating
- b) Square wave
- c) Sinusoidal wave
- d) Non-oscillating

(xlii) The transient current are associated with the _____

- a) Impedance of the circuit
- b) Applied voltage to the circuit
- c) Resistance of the circuit
- d) Charges in stored energy in the inductor and capacitor

(xliii) The current in the R-L circuit at a time $t = 0+$ is?

- a) V/R
- b) R/V
- c) V
- d) R

(xliv) In an R-C circuit, when the switch is closed, the response _____

- a) do not vary with time
- b) decays with time
- c) rises with time
- d) first increases and then decreases

(xlv) The expression of current in R- C circuit is?

- a) $i=(V/R)\exp(t/RC)$
- b) $i=(V/R)\exp(-t/RC)$
- c) $i=(V/R)-\exp(t/RC)$
- d) $i=(V/R)-\exp(-t/RC)$

(xlvi) The steady state part in the expression of current in the R-L circuit is?

- a) $(V/R)(\exp((R/L)t))$
- b) $(V/R)(-\exp((R/L)t))$
- c) V/R
- d) R/V

(xlvii) If the roots of an equation are real and unequal, then the response will be?

- a) critically damped
- b) under damped
- c) over damped
- d) damped

(xlvi) If the roots of an equation are complex conjugate, then the response will be?

- a) over damped
- b) critically damped
- c) damped
- d) under damped

(xlvii) A series RLC circuit draws current at leading power factor at

- a) Less than resonant frequency
- b) More than resonant frequency
- c) Resonant frequency
- d) Never.

(i) A CR network is one which consists of _____

- a) A network consisting of a capacitor only
- b) A capacitor and resistor connected in series
- c) A network consisting of a resistor only
- d) A capacitor and resistor connected in parallel

(ii) The dynamic impedance of a R-L-C parallel circuit at resonance is

- a) R/LC
- b) C/LR
- c) LC/R
- d) L/CR

(iii) Power in a 3-phase circuit _____

- a) $P = 3 V_{pn} I_{pn} \cos \phi$
- b) $\sqrt{3} V_L I_L \cos \phi$
- c) $P = 3 V_{pn} I_{pn} \cos \phi$ & $\sqrt{3} V_L I_L \cos \phi$
- d) None of these

(iv) For a 3-phase, delta connection _____

- a) line current is equal to phase current
- b) Line voltage is equal to phase voltage
- c) Line voltage and line current is zero
- d) None of these

(liv) In a 3-phase AC circuit, the sum of all three generated voltage is _____

- a) Infinity
- b) One
- c) Zero
- d) None

(lv) Each coil in three phase alternator has _____ number of terminals.

- a) 8
- b) 6
- c) 4
- d) 2

(lvi) In wye or star connection, _____ of the three phases are joined together within the alternator.

- a) similar ends
- b) opposite ends
- c) one opposite end, two opposite ends
- d) one similar end, two opposite ends

(lvii) The relation between V_{RY} , V_{ph} in a star connected system is?

- a) $V_{RY} = V_{ph}$
- b) $V_{RY} = \sqrt{3} V_{ph}$
- c) $V_{RY} = 3\sqrt{3} V_{ph}$
- d) $V_{RY} = 3 V_{ph}$

(lviii) In a delta connected system, the expression of power (P) is?

- a) $V_L I_L \cos \phi \text{ W}$
- b) $3\sqrt{3} V_L I_L \cos \phi \text{ W}$
- c) $\sqrt{3} V_L I_L \cos \phi \text{ W}$
- d) $3 V_L I_L \cos \phi \text{ W}$

(lix) Form factor for a sine wave is

- a) 1.414
- b) 0.707
- c) 0.637
- d) 1.11

(lx) If the resistors of star connected system are Z_R , Z_Y , Z_B then the impedance Z_{BY} in delta connected system will be?

- a) $(Z_R Z_Y + Z_Y Z_B + Z_B Z_R) / Z_R$
- b) $(Z_R Z_Y + Z_Y Z_B + Z_B Z_R) / Z_Y$
- c) $(Z_R Z_Y + Z_Y Z_B + Z_B Z_R) / Z_B$
- d) $(Z_R Z_Y + Z_Y Z_B + Z_B Z_R) / (Z_B + Z_Y)$

