



BRAINWARE UNIVERSITY

Term End Examination 2020 - 21

Programme – Diploma in Electronics & Communication Engineering

Course Name – Network Analysis

Course Code - DECE301

Semester / Year - Semester III

Time allotted : 85 Minutes

Full Marks : 70

[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 70=70

1. (Answer any Seventy)

(i) Unit of inductance is _____

- | | |
|----------|----------|
| a) Weber | b) Henry |
| c) Farad | d) Tesla |

(ii) Kirchhoff's voltage law is based on principle of conservation of

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

(iii) In a circuit with more number of loops, which law can be best suited for the analysis?

- | | |
|--------|--------------------------|
| a) KCL | b) Ohm's law |
| c) KVL | d) None of the mentioned |

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

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

(v) Kirchhoff's current law is applied at

- | | |
|-----------------------|--------------------------|
| a) loops | b) nodes |
| c) both loop and node | d) none of the mentioned |

(vi) A semiconductor diode is an _____ element.

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

(vii) Example of distributed element is _____.

- a) Resistor
- b) Thermistor
- c) Semiconductor diode
- d) Transmission lines

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

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

(ix) If the voltage-current characteristics are a straight line through the origin, then the element is said to be?

- a) Linear element
- b) Non-linear element
- c) Unilateral element
- d) Bilateral element

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

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

(xi) Voltage source and terminal voltage can be related as

- a) terminal voltage is higher than the source emf
- b) terminal voltage is equal to the source emf
- c) terminal voltage is always lower than source emf
- d) terminal voltage cannot exceed source emf

(xii) In case of ideal current sources, they have

- a) zero internal resistance
- b) low value of voltage
- c) large value of current
- d) infinite internal resistance

(xiii) 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

(xiv) A practical voltage source can also be represented as

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

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

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

(xvi) 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

(xvii) An electric current of 10 A is the same as

- a) 10 J/C
- b) 10 V/C
- c) 10C/sec
- d) 10 W/sec

(xviii) 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

(xix) In which of the following cases is Ohm's law not applicable?

- a) Electrolytes
- b) Arc lamps
- c) Insulators
- d) Vacuum ratio values

(xx) Conductance is expressed in terms of

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

(xxi) In Superposition theorem, while considering a source, all other voltage sources are?

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

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

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

(xxiii) Three resistance 14.5Ω , 25.5Ω and 60Ω are connected in series across 200 V. What will be the voltage drop across 14.5Ω ?

- a) 29 V
- b) 10
- c) 19
- d) 39

(xxiv) 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 these

(xxv) Reciprocity Theorem is applied for _____ networks.

- a) Linear
- b) Bilateral
- c) Linear bilateral
- d) Lumped

(xxvi) Resistance of a wire is directly proportional to its

- a) Length
- b) Diameter
- c) Area of cross section
- d) All of these

(xxvii) 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

(xxviii) If three resistance (R_1 , R_2 & R_3) are connected in series then Where V =Potential difference, I =Current

- a) $V = I/R_1 + I/R_2 + I/R_3$
- b) $V = IR_1 + IR_2 + IR_3$
- c) $I = VR_1 + VR_2 + VR_3$
- d) $I = V/R_1 + V/R_2 + V/R_3$

(xxix) In a parallel circuit, voltage across each impedance is _____

- a) zero
- b) different
- c) infinite
- d) equal

(xxx) The power factor of an R-L circuit is

- a) often zero
- b) between zero and 1
- c) always unity
- d) between zero and -1

(xxxii) In a series R-L circuit, V_L _____ V_R by _____ degrees.

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

(xxxiii) In a series RLC circuit at resonance, the magnitude of the voltage developed across the capacitor

- a) is always zero
- b) can never be greater than the input voltage
- c) can be greater than the input voltage, and
- d) can be greater than the input voltage,

is in phase with the input voltage

however, it is 90 degree out of phase with the input voltage

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

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

(xxxiv) The form factor is the ratio of

- a) Peak value to r.m.s. value
- b) Average value to r.m.s. value
- c) r.m.s. value to average value
- d) None of these

(xxxv) In a R-L-C circuit

- a) Power is consumed in resistance and is equal to IR
- b) Exchange of power takes place between inductor and supply line
- c) Exchange of power takes place between capacitor and supply line
- d) All of these are correct

(xxxvi) Quality factor-Q of a resonant circuit signifies:

- a) Loss in the resonant circuit
- b) Gain in the resonant circuit
- c) Magnetic energy stored in the circuit
- d) Electric energy stored in the circuit

(xxxvii) At resonance, the capacitive energy is _____ inductive energy.

- a) Greater than
- b) Less than
- c) Equal to
- d) Depends on the circuit

(xxxviii) At resonance, the circuit appears _____

- a) Inductive
- b) Capacitive
- c) Resistive
- d) Either inductive or capacitive

(xxxix) Find the Q factor when the voltage across the inductor is 2000V and the source voltage is 100V.

- a) 10
- b) 20
- c) 30
- d) 40

(xl) At resonance condition, the voltage across the capacitor and inductor is _____ the source voltage.

- a) Greater than
- b) Less than
- c) Equal to
- d) Much less than

(xli) Form factor for a sine wave is

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

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

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

(xliii) What is the Q factor of a selective circuit?

- a) Very low
- b) Very high
- c) Zero
- d) Infinity

(xliv) In an A.C. circuit power is dissipated in

- a) Resistance only
- b) Inductance only
- c) Capacitance only
- d) None of these

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

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

(xlvi) Phase sequence depends on the?

- a) field
- b) rotation of the field
- c) armature
- d) rotation of the armature

(xlvi) In three phase system, the three voltages (currents) differ in phase by _____ electrical degrees from each other in a particular sequence.

- a) 30
- b) 60
- c) 90
- d) 120

(xlvii) In a three phase alternator, there are _____ independent phase windings or coils.

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

(xlviii) In the Delta connection, there will be _____ number of common terminals.

- a) 0
- b) 1
- c) 2
- d) 3

(l) If a star connected system has equal impedances Z_1 , then after converting into delta connected system having equal impedances Z_2 , then?

- a) $Z_2 = Z_1$
- b) $Z_2 = 2Z_1$
- c) $Z_2 = 3Z_1$
- d) $Z_2 = 4Z_1$

(li) In star connected system, V_{RY} is equal to?

- a) V_{YR}
- b) $-V_{YR}$
- c) $2V_{YR}$
- d) $3V_{YR}$

(lii) 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) $V_{RY} = 3V_{ph}$

(liii) In a star connected system, the relation between V_{YB} , V_{ph} is?

- a) $V_{YB} = V_{ph}$
- b) $V_{YB} = \sqrt{3} V_{ph}$
- c) $V_{YB} = 3 V_{ph}$
- d) $V_{YB} = \frac{1}{\sqrt{3}} V_{ph}$

(liv) The voltages, V_{BR} , V_{ph} are related in star connected system is?

- a) $V_{BR} = 3 V_{ph}$
- b) $V_{BR} = \sqrt{3} V_{ph}$
- c) $V_{BR} = \frac{1}{\sqrt{3}} V_{ph}$
- d) $V_{BR} = V_{ph}$

(lv) In a delta-connected system, the currents $I_R = I_B = I_Y = ?$

- a) I_{Ph}
- b) $2 I_{Ph}$
- c) $\sqrt{3} I_{Ph}$
- d) $4 I_{Ph}$

(lvi) The relation between I_L and I_{Ph} is in a delta connected system is?

- a) $I_L = I_{Ph}$
- b) $I_L = \sqrt{3} I_{Ph}$
- c) $I_L = 3 I_{Ph}$
- d) $I_L = \frac{1}{\sqrt{3}} I_{Ph}$

(lvii) In three phase system at any given instant, the algebraic sum of three voltages must be?

- a) 0
- b) 1
- c) 2
- d) 3

(lviii) A filter which passes without attenuation all frequencies up to the cut-off frequency f_c and attenuates all other frequencies greater than f_c is called?

- a) high pass filter
- b) low pass filter
- c) band elimination filter
- d) band pass filter

(lix) A filter that passes all frequencies lying outside a certain range, while it attenuates all frequencies between the two designated frequencies is called?

- a) high pass filter
- b) band elimination filter
- c) band pass filter
- d) low pass filter

(lx) The ratio of transform current to the transform voltage is defined as _____ of the resistor.

- a) transform admittance
- b) transform impedance
- c) transform current
- d) transform voltage

(lxi) The ratio of voltage transform at first port to the voltage transform at the second port is called?

- a) Voltage transfer ratio
- b) Current transfer ratio
- c) Transfer impedance
- d) Transfer admittance

(lxii) The ratio of the current transform at one port to current transform at other port is called?

- a) Transfer admittance
- b) Transfer impedance
- c) Current transfer ratio
- d) Voltage transfer ratio

(lxiii) The ratio of voltage transform at first port to the current transform at the second port is called?

- a) Voltage transfer ratio
- b) Transfer admittance
- c) Current transfer ratio
- d) Transfer impedance

(lxiv) Two ports containing no sources in their branches are called?

- a) active ports
- b) passive ports
- c) one port
- d) three port

(lxv) If the impedance of a system is 4 ohm, calculate its admittance

- a) 0.25 ohm⁻¹
- b) 4 ohm
- c) 25 ohm⁻¹
- d) 0.4 ohm⁻¹

(lxvi) In a circuit, find the value of IR.

- a) 0
- b) V/I
- c) V
- d) Cannot be determined

(lxvii) Power in a Three Phase Circuit =

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

(lxviii) In a two phase generator, the armature has two distinct windings that are displaced _____ apart.

- a) 45°
- b) 90°
- c) 135°
- d) 180°

(lxix) In a star connected system, the phasors V_{RN} , V_{YN} are _____ apart.

- a) 15°
- b) 30°
- c) 45°
- d) 60°

(lxx) In delta-connected system, the currents I_R , I_Y , I_B are equal in magnitude and they are displaced by _____ from one another.

- a) 0°
- b) 60°
- c) 90°
- d) 120°