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 : 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) 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

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

a) energy b) momentum

c) mass d) charge

(iii) 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

(iv) A semiconductor diode is an _____ element.

a) Bilateral b) Unilateral

c) Active d) Passive

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

a) short b) open

c) closed
d) open loop

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

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

(vii) 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

(viii) 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

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

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

(x) 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

(xi) 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

(xii) Ohm’s law is not applicable to

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

(xiii) Conductance is expressed in terms of

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

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

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

(xv) Bulb in street lighting are connected in

a) parallel.
b) series.
c) series parallel
d) end of end.

(xvi) _____ 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

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

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

(xviii) As the impedance increases, the admittance _____

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

(xix) In a series R-L circuit, VL___VR by ___ degrees.

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

(xx) The voltage applied across an R-L circuit is equal to ___ of VR and VL .

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

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

a) Inductance
b) Admittance
c) Resistance
d) Capacitance

(xxii) 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

(xxiii) At resonance, the circuit appears _____

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

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

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

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

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

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

a) Resistance only
b) Inductance only
c) Capacitance only
d) None of the above

(xxvii) 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

(xxviii) 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

(xxix) 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

(xxx) To check for the Reciprocity Theorem we consider _____ of response to excitation.

a) ratio
b) addition
c) product
d) subtraction

(xxxi) 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

(xxxii) 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

(xxxiii) Reciprocity Theorem is used to find the change in _____ when the

resistance is changed in the circuit

a) Voltage
b) Voltage or current
c) Current
d) Power

(xxxiv) 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

(xxxv) If the source impedance is complex, then the condition for maximum power transfer is?

a) ZL = ZS
b) ZL = ZS*
c) ZL = -ZS
d) ZL = -ZS*

(xxxvi) If ZL = ZS*, then?

a) RL = 1
b) RL = 0
c) RL = -RS
d) RL = RS

(xxxvii) 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

(xxxviii) Thevenin's voltage is equal to the _____ voltage across the _____ terminals.

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

(xxxix) 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

(xl) 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

(xli) If ZS= RS+jXS, ZL=RL+jXL, then if RL is fixed, the condition for maximum power to be transferred is?

a) XS=XL

b) XS+XL=0

c) XS=-XL

d) None of these

(xlii) 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

(xliii) Thevenin's resistance Rth is found

a) Between same open terminals as for Eth

b) Between any two open terminals

c) Between same open terminals as for Eth

d) By removing voltage sources along with their internal resistances

(xliv) 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

(xlv) A positive sign on susceptance indicates a ____

a) Capacitive susceptance

b) Inductive susceptance

c) Neutral susceptance

d) resistive susceptance

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

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

(xlvii) 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 increase and then decrease

(xlviii) 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

(xlix) It the roots of an equation are real and equal, than the response will be?

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

(l) In a loss-free RLC circuit the transient current is ____

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

(li) 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

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

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

(liii) 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

(liv) 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)

(lv) 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

(lvi) 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

(lvii) 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

(lviii) 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.

(lix) 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

(lx) 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

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

a) line current is+B127:B133 equal to phase current
b) Line voltage is equal to phase voltage
c) Line voltage and line current is zero
d) None of these

(lxii) Ina 3-phase AC circuit, the sum of all three generated voltage is _____

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

(lxiii) For a polyphase system the no. of watt meter required to measure power is equal to

a) Number of wires
b) One less than number of wires
c) Number of phases
d) None of these

(lxiv) Phase sequence depends on the?

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

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

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

(lxvi) The relation between VRY ,Vph in a star connected system is?

a) VRY =Vph
b) VRY =?3Vph
c) VRY =3?3Vph
d) VRY =3Vph

(lxvii) The relation between IL and IPh is in a delta connected system is?

a) IL = IPh
b) IL = 3?3IPh
c) IL =3 IPh
d) IL =?3 IPh

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

a) VLILcos? W
b) 3?3VLILcos? W
c) ?3 VLILcos? W
d) 3VLILcos? W

(lxix) Form factor for a sine wave is

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

(lxx) If the resistors of star connected system are ZR, ZY, ZB then the impedance ZBY in delta connected system will be?

a) (ZRZY+ ZYZB+ ZBZR)/ZR
b) (ZRZY+ ZYZB+ ZBZR)/ZY
c) (ZRZY+ ZYZB+ ZBZR)/ZB
d) (ZRZY+ ZYZB+ ZBZR)/(ZB+ZY)