BRAINWARE UNIVERSITY

Term End Examination 2020 - 21

Programme – Bachelor of Technology in Electronics & Communication Engineering

Course Name – Network Theory

Course Code - PCC-EC304

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 these

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

a) Energy b) momentum

c) mass d) Charge

(v) 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 these

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

a) Short
b) Open
c) closed
d) open loop

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

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

(viii) 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

(ix) 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

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

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

(xi) 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

(xii) 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

(xiii) 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

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

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

(xv) 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

(xvi) 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

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

a) Ratio
b) Addition
c) product
d) Subtraction

(xviii) 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

(xix) The circuit which satisfies Reciprocity Theorem is called?

a) Short circuit
b) Open circuit
c) Linear circuit
d) Non-linear circuit

(xx) 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*

(xxi) For ZL = ZS*, the relation between XL and XS is?

a) XL = XS
b) XL = 0
c) XL = 1
d) XL = -XS

(xxii) The efficiency in case of maximum power transfer theorem is

a) 100 %.
b) less than 50 %.
c) 50 %.
d) 50 % - 100 %.

(xxiii) 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

(xxiv) 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

(xxv) 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

(xxvi) The circuit is said to be in resonance if the current is ____ with the applied voltage.

a) in phase
b) out of phase
c) 45? out of phase
d) 90? out of phase

(xxvii) In a series resonance circuit, series resonance occurs when?

a) XL = 1
b) XL = XC
c) XC = 1
d) XL = -XC

(xxviii) As XL = XC in a series resonance circuit, the impedance is_____

a) purely capacitive
b) purely resistive
c) purely inductive
d) capacitive and inductive

(xxix) Fourier series uses which domain representation of signals?

a) Time domain representation
b) Frequency domain representation
c) Both combined
d) Neither depends on the situation

(xxx) How does Fourier series make it easier to represent periodic signals?

a) Harmonically related
b) Sinusoidally related
c) Periodically related
d) Exponentially related

(xxxi) How do we represent a pairing of a periodic signal with its fourier series coefficients in case of continuous time fourier series?

a) x(t) ? Xn
b) x(t) ? Xn+1
c) x(t) ? X
d) x(n) ? Xn

(xxxii) What are the properties of continuous time fourier series?

a) Linearity, time shifting
b) Linearity, time shifting, frequency shifting
c) Linearity, time shifting, frequency shifting, time reversal, time scaling,
d) Linearity, time shifting, frequency shifting, time reversal, time scaling,

periodic convolution

periodic convolution, multiplication, differentiation

(xxxiii) How is time shifting represented in case of periodic signal?

a) Xn = x(t-t0), Yn = Xn e-njwt0

b) x(t-t0), Yn = Xn e-njwt0

c) Xn = x(-t0), Yn = Xn e-njwt0

d) If x(t) is shifted to t0, Xn is shifted to t0

(xxxiv) What is the frequency shifting property of continuous time fourier series?

a) Multiplication in the time domain by a real sinusoid

b) Multiplication in the time domain by a complex sinusoid

c) Multiplication in the time domain by a sinusoid

d) Addition in the time domain by a complex sinusoid

(xxxv) Why does the signal change while time scaling?

a) Time changes

b) Because the frequency changes

c) Length changes

d) Both frequency and time changes

(xxxvi) In delta-connected system, the currents IR , IY , IB are equal in magnitude and they are displaced by _____ from one another.

a) 90?

b) 120?

c) 60?

d) 0?

(xxxvii) In a delta-connected system, the currents IR = IB = IY =?

a) 2IPh

b) IPh

c) 3IPh

d) 4IPh

(xxxviii) 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

(xxxix) 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

(xl) Form factor for a sine wave is

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

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

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

(xlii) Laplace transform changes the ____ domain function to the _____ domain function.

a) time, time
b) time, frequency
c) frequency, time
d) frequency, frequency

(xliii) In the bilateral Laplace transform, the lower limit is?

a) 0
b) 1
c) ?
d) – ?

(xliv) The voltage and current in a capacitor are related as?

a) i=Cdt/dv
b) v=Cdv/dt
c) i=Cdv/dt
d) v=Cdt/dv

(xlv) The s-domain equivalent of the capacitor reduces to a capacitor with impedance?

a) sC
b) C
c) 1/C
d) 1/sC

(xlvi) After taking the inverse transform of current in the circuit shown below,

the value of current is?

a) i=(V/C)e-t/R
b) i=(V/C)e-t/RC
c) i=(V/R)e-t/RC
d) i=(V/R)e-t/R

(xlvii) The voltage across the resistor in the circuit shown below is?

a) Vet/R
b) Ve-t/RC
c) Ve-t/R
d) Vet/RC

(xlviii) The transfer function of a system having the input as X(s) and output as Y(s) is?

a) Y(s)/X(s)
b) Y(s) * X(s)
c) Y(s) + X(s)
d) Y(s) – X(s)

(xlix) The real part of the complex frequency is called?

a) radian frequency
b) neper frequency
c) sampling frequency
d) angular frequency

(l) The imaginary part of the complex frequency is called?

a) angular frequency
b) sampling frequency
c) neper frequency
d) radian frequency

(li) The transform admittance of the inductor is?

a) 1/sL
b) sL
c) 1/L
d) L

(lii) In the circuit shown below, find the value of Z1.

a) j?L
b) 2 j?L
c) j?L/2
d) 4 j?L

(liii) In the circuit shown below, find the value of Z2.

a) j?C
b) 2 j?C

c) 1/j?C
d) 1/2 j?C

(liv) The value of Z1Z2 in the circuit shown below is?

a) L/C
b) C/L
c) 1/LC
d) LC

(lv) The cut-off frequency of the constant k-low pass filter is?

a) 1/?LC
b) 1/(??LC)
c) ?LC
d) ??LC

(lvi) The cut-off frequency of the low pass filter is?

a) 1/?LC
b) 1/(??LC)
c) ?LC
d) ??LC

(lvii) The zeros in the transfer function are denoted by?

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

(lviii) The poles in the transfer function are denoted by?

a) X
b) Y
c) Z
d) W

(lix) The network function N (S) becomes _____ when s is equal to anyone of the zeros.

a) 1
b) 2
c) 0
d) ?

(lx) The N (S) becomes _____ when s is equal to any of the poles.

a) ?
b) 0
c) 1
d) 2

(lxi) The coefficients in the numerator polynomial of the transfer function may be?

a) must be negative
b) must be positive
c) may be positive
d) may be negative

(lxii) The degree of numerator polynomial in a transfer function may be as small as _____ independent of the degree of the denominator polynomial.

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

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

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

(lxiv) Two ports containing sources in their branches are called?

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

(lxv) The value of one decibel is equal to?

a) 0.115 N
b) 0.125 N
c) 0.135 N
d) 0.145 N

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

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

(lxvii) A filter which attenuates all frequencies below a designated cut-off frequency fc and passes all other frequencies greater than fc is called?

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

(lxviii) A filter that passes frequencies between two designated cut-off frequencies and attenuates all other frequencies is called?

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

(lxix) 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

(lxx) The Laplace transform of a function f(t) is?

a) $\int_0^{\infty} f(t)\, e^{-st}\, dt$

b) $\int_{\infty}^{0} f(t)\, e^{-st}\, dt$

c) $\int_0^{\infty} f(t)\, e^{st}\, dt$

d) None of these