University of Mumbai

Examination 2020 under cluster 5 (APSIT)

Program: Electronics and Telecommunication Engineering

Curriculum Scheme: Revised 2012

Examination: Second Year Semester III

Course Code: ETC304 and Course Name: Circuit and Transmission Lines

Time: 1 hour Max. Marks: 50

===

Note to the students:- All the Questions are compulsory and carry equal marks .

Q1.	Bipolar Junction transistor (BJT) is example of ------------ dependent source.
Option A:	Current controlled voltage source
Option B:	Voltage controlled voltage source
Option C:	Current controlled current source
Option D:	Voltage controlled current source
Q2.	Superposition theorem is not applicable to network containing -----
Option A:	Dependent current source
Option B:	Non-linear elements
Option C:	Depended voltage source
Option D:	Linear element
Q3.	Which of the following represent Voltage across inductor?
Option A:	$L x dV_L(t)/dt$
Option B:	$C x di(t)/dt$
Option C:	$L x di(t)/dt$
Option D:	Integration of Current in inductor
Q4.	If load of the circuit is not fixed then, -------- theorem is preferred to calculate voltage or current through load.
Option A:	Norton's Theorem
Option B:	Superposition Theorem
Option C:	Maximum power transfer theorem
Option D:	Thevenin's theorem
Q5.	Which of the following is correct the KVL equilibrium equation in graph theory?
Option A:	$B\ Z_b\ B^T\ I_l = B\ Z_b\ I_S$
Option B:	$B\ Z_b\ B^T\ I_l = B\ V_S – B\ Z_b\ I_S$
Option C:	$B\ Z_b\ I_l = B\ V_S – B\ Z_b\ I_S$
Option D:	$Z_b\ B^T\ I_l = B\ V_S – B\ Z_b\ I_S$
Q6.	Dot convention in inductively coupled coils is used to
Option A:	Power delivered to the other coil
Option B:	Determine turning ratio of two coils

Option C:	Polarities of induced e.m.f.
Option D:	Types of dependent source to be introduced
Q7.	Two inductively coupled coils connected in series have equivalent inductance of 12mH or 16mH depending on their connection. Calculate Mutual inductance (M)
Option A:	1
Option B:	2
Option C:	4
Option D:	8
Q8.	If 100 u(t) signal is applied to the R-C network where R = 100 ohm and C = 0.1 uF connected in series. With zero initial condition, determine voltage across capacitor after t = τ where τ=RxC.
Option A:	86.46V
Option B:	100 V
Option C:	63.21 V
Option D:	0
Q9.	For R-L network with zero initial conditions ($i_L(0^-) = 0$), at t = 0^+, inductor behaves as ---
Option A:	Voltage source
Option B:	Produces non-zero current
Option C:	Short circuit
Option D:	Open circuit
Q10.	A step function is applied to RLC series circuit having R = 2 ohm, L = 1H and C = 1F, transient current response of the circuit would be
Option A:	Over damped
Option B:	Critically damped
Option C:	Under damped
Option D:	Unstable
Q11.	If Laplace of a current in a loop of the network is given as I(S) = $\frac{(S+1)+1}{(S+1)^2+1}$ then i(t) is given by ------
Option A:	$(e^{-t}cost + e^{-t}sint)$ u(t)
Option B:	Cos(t)
Option C:	Sin(t)
Option D:	(Cos(t) + sin(t)) u(t)
Q12.	Time constant of series connected R-L network is -------.
Option A:	L / R
Option B:	R / L
Option C:	RxL
Option D:	LS

Q13.	For following function number of zeros are -----. $$F(S) = \frac{S^3 + 3S^2 + 4S + 1}{S^4 + 3S^3 + 2S^2 + 4S + 1}$$
Option A:	1
Option B:	2
Option C:	3
Option D:	4
Q14.	If R and C are connected in series then equivalent impedance is given by ---.
Option A:	$\frac{RCS + 1}{CS}$
Option B:	$\frac{CS}{RCS + 1}$
Option C:	$\frac{S}{RS + 1}$
Option D:	R + CS
Q15.	If L{f(t)} = F(S) then L{f'(t) } = ---------
Option A:	S F(S) – f(0)
Option B:	F'(S)
Option C:	dF(S) / dt
Option D:	dF(S) / dS
Q16.	Determine location of poles of following transfer function $F(S) = \frac{S^2+1}{S^3+4S}$
Option A:	0, 2j
Option B:	1j, -1j
Option C:	0, 2j, -2j
Option D:	-3, -4
Q17.	One of the conditions for two port network to be reciprocal is ------
Option A:	$Z_{11} = Z_{22}$
Option B:	$h_{21} = - h_{12}$
Option C:	A = D
Option D:	$Y_{11} = Y_{22}$
Q18.	Two port network are connected in parallel. The combination is to be represented as a single two-port network. The parameters obtained by adding individual are -.
Option A:	Z-parameter matrix
Option B:	h-parameter matrix
Option C:	Y-parameter matrix
Option D:	ABCD-parameter matrix
Q19.	Z parameter of two port network are Z_{11} = 20 ohm, Z_{22} = 30 ohm and $Z_{12}=Z_{21}=10$ ohm. Then network is -------.

Option A:	Not reciprocal
Option B:	Reciprocal
Option C:	Symmetrical
Option D:	Neither reciprocal nor symmetrical
Q20.	A two port network is said to be symmetrical if ----
Option A:	Voltage to current ratio at one port is same as the voltage to current ratio at other port with one port open circuited.
Option B:	Voltage gain and current gain are same.
Option C:	Ratio of excitation at one port to response at other port is same if excitation and response is interchanged.
Option D:	Output voltage to input voltage
Q21.	Driving point admittance function Y(S) = $\frac{(\frac{1}{R})S}{S+1/RC}$ is -----
Option A:	Series combination of two inductors
Option B:	Parallel combination of Inductor and capacitor
Option C:	Series combination of resistor and capacitor
Option D:	Series combination of two capacitors
Q22.	Function F(S) =$\frac{(S-9)}{S^2-9S+20}$ is not positive real function because ---
Option A:	A zero and poles are at right half of S-Plane
Option B:	Highest power of numerator and denominator is differ by more than unity
Option C:	Poles and zeros are not interlaced
Option D:	All poles lie on left half of S-Plane
Q23.	Realization of network using Foster-II can be obtained by -----
Option A:	Partial fraction expansion on Z(S)
Option B:	Partial fraction expansion on Y(S)
Option C:	Continued fraction expansion Z(S)
Option D:	Continued fraction expansion Y(S)
Q24.	Q.1. A lossless transmission line with operating frequency of 10 MHz is characterized by R = 0.006 Ω/m, L = 2.5μH/m and C = 4.45 pF/m. Determine Characteristic impedance.
Option A:	750
Option B:	800
Option C:	850
Option D:	900
Q25.	For a matched line, load impedance is equal to –
Option A:	Input impedance
Option B:	Output impedance
Option C:	Characteristic impedance
Option D:	Source impedance