Date: 18-6-10

Have a look

I have been teaching this subject for all competitive examinations like JTO, GATE, IES etc. for the past ten years in various Institutes in AP and I taught this subject nearly 500 times.

Considering all my experiences, this question bank is prepared by collecting questions from various competitive exams, various books and my own thoughts.

This book is useful for any competitive exams. This book contains nearly 600 objective questions with key and no two questions will give same concepts. Almost all the technical and typing mistakes are eliminated and I am giving assurance of 95% accuracy.

This book is dedicated to all my well wishers

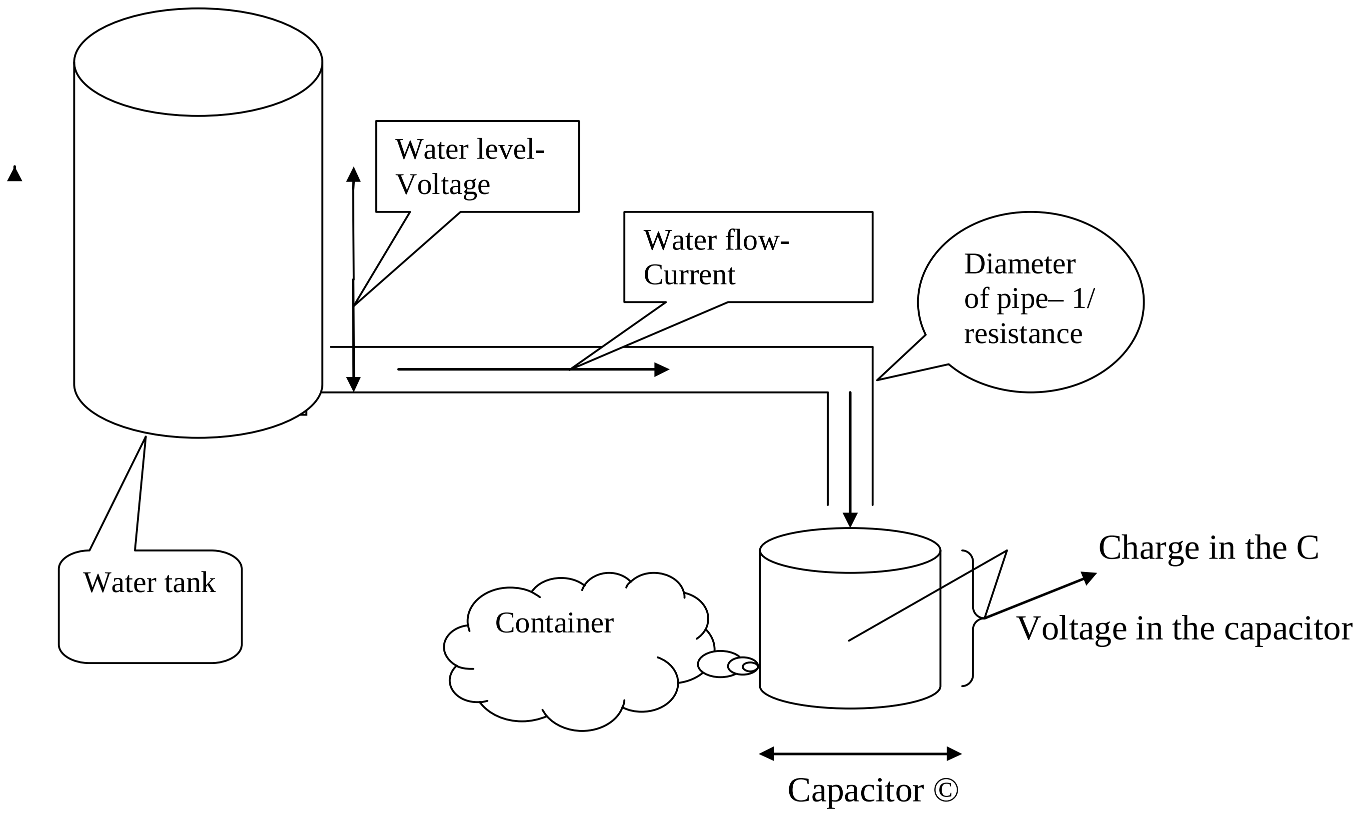
I listen I forgot, I see I remember, I do I learn

Prof Ch Ganapathy Reddy
HOD,ECE,GNITS

CONTENTS

YOU HAVE TO TAKE RISKS, LABOUR HARD AND PROVE YOUR METTLE. IF YOU ARE SUCCESSFUL, DON'T LET IT GO TO YOUR HEAD. IF YOU FAIL, DON'T GIVE UP. RISE TO FIGHT WITH RENEWED VIGOUR. THIS IS THE ONLY PATH TO PROGRESS. NO BYPASSES, NO SHOT CUTS.

PICTORIAL DIAGRAM OF OHMS LAW



Physical parameters	**Electrical parameters**
Water level	Voltage
Water flow	Current
Diameter of pipe line	Reciprocal of resistance
Tap	Switch
Diameter of container	Capacitor
Water level in the container	Voltage in the capacitor
Quantity of water	Charge
Filling bucket	Charging the capacitor

FREQUENTLY USED STATEMENTS IN NETWORKS

- To find voltage at any node, start at same node and go towards ground in a shortest path preferably following KVL sign conventions
- If the branch is containing current source the value of branch current is always source value itself and it is independent of branch resistance and potential difference across it.
- When there is only voltage source between two principal nodes, then go for the principal node
- When there is current source in the branch, don't consider that branch while forming closed loop and write the mesh equations after skipping branch, which contain current source.
- Use nodal analysis to find voltages and mesh analysis to find currents when number of nodal equations needed are equal to mesh equations needed
- When there are super nodes in the network, number of nodal equations will be less than mesh equations. In that case use nodal analysis to find branch currents also
- When there are super meshes in the network, number of mesh equations will be less than nodal equations. In that case use mesh analysis to find voltages also
- To find V_{AB}, start at A and go towards B following KVL sign conventions.
- V_{AB} : Voltage at A with respect to B = $V_A - V_B$
- V_A : Voltage at A with respect ground by default.
- Two ideal voltage sources with different values can't be connected in parallel.
- Two ideal current sources with different values can't be connected in series.
- Two practical current sources in series cannot be combined
- Two practical voltage sources in parallel cannot be combined
- Ideal voltage source internal resistance is zero
- Ideal current source internal resistance is infinite
- Voltage across current meter is zero but voltage across current source cannot be determined directly
- Current through voltmeter is zero but current through voltage source cannot be determined directly

- Power dissipated in the resistor is always positive and independent of current direction

- Power supplied by voltage source is positive if current flows from negative to positive with in the terminal

- Power absorbed by voltage source is positive if current flows from positive to negative with in the terminal

- When frequency of the sources are same either DC or AC use superposition theorem to find current and voltage but not power. However when AC sources are there it takes more time to find current or voltage, hence it is recommended not to use the same

- When frequency of the sources are different use superposition theorem to find current, voltage and power.

- To find phase difference between two signals always see that both signals are in same form either sin or cos and both must be in either positive or negative

- Use phasor form to find RMS of the function if it contains same frequency components

- Use square root method to find RMS of the function if it contains different frequency components

- Capacitor opposes sudden changes of voltage and inductor opposes sudden changes of current

- Voltage across capacitor is continuous function of time, $V_c(0-)=V_c(0+)$ and current through inductor is continuous function of time, $I_L(0-)= I_L(0+)$

- Capacitor smoothen the voltage wave form and inductor smoothen the current wave form

- For DC in steady state capacitor acts like open circuit element and inductor acts like short circuit element and both conducts for AC

- At 0+ capacitor can act as voltage source and value of source is same as $V_C(0-)$ and at 0+ inductor can act as current source and value of source is same as $I_L(0-)$

- If R=0, any RC circuit takes zero time to complete transient and if R=infinite, any RL circuit takes zero time to complete transient

- Impulse response is derivative of step response and ramp response is the integration of step response

- Derivative of discontinuous function is a impulse function whose strength is value of discontinuity

Wish You All The Best

Prof Ch Ganapathy Reddy
HOD,ECE,GNITS

VD,CD,KVL, KCL

Q1) A network has 7 nodes and 5 independent loops. The number of branches in the network is

a) 13 b) 12 c) 11 d) 10 Ans: (c)

Q2) The nodal method of circuit analysis is based on

a) KVL & Ω 's law b) KCL & Ω 's law c) KCL & KVL d) KCL,KVL & Ω 's law Ans: (b)

Q3) For a network of seven branches and four nodes, the number of independent loops will be

a) 11 b) 8 c) 7 d) 4 Ans:(d)

Q4) A network has b branches and nodes. For this mesh analysis will be simpler then node analysis if n is greater then

a) b b) b +1 c) (b / 2) + 1 d) b / 2 Ans:(c)

Q5) The number of independent loops for a network with n nodes and b branches is

a) n-1 b) b-n c) b-n + 1 d) independent no. of nodes Ans: (c)

Q6) A) $a_1\, d^2y / dx^2 + a_2 y\, dy/dx + a_3 y = a_4$ 1) N.L different equation

B) $a_1\, d^3y / dx^3 + a_2 y = a_3$ 2) L. differential equation with constant co-eff

C) $a_1\, d^2y / dx^2 + a_2 x\, dy/dx + a_3\, x^2 y = 0$ 3) L. homo. Differential equation

4) N.L. homo. Different equation.

Ans: A –1, B-2, C-3 5) N.L. first order different equation

Q7) The following constitutes a bilateral element

a) R b) FET c) Vacuum Tube d) metal rectifier. Ans: (a)

Q8) K.Laws fail in the case of

a) linear networks b) non linear networks

c) dual networks d) distributed parameter networks. Ans: (d)

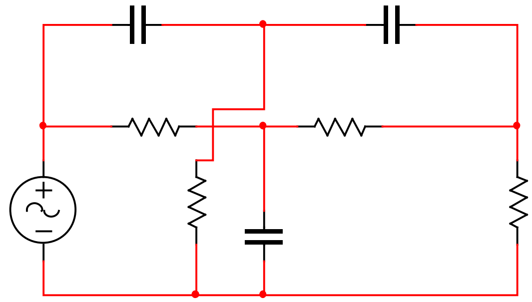
Q9) Ohm's law, KVL &KCL will fail at

a) Low frequency b) high frequency c) high power d) none Ans: (b)

Q10) Total no, of mesh equations required is equal to

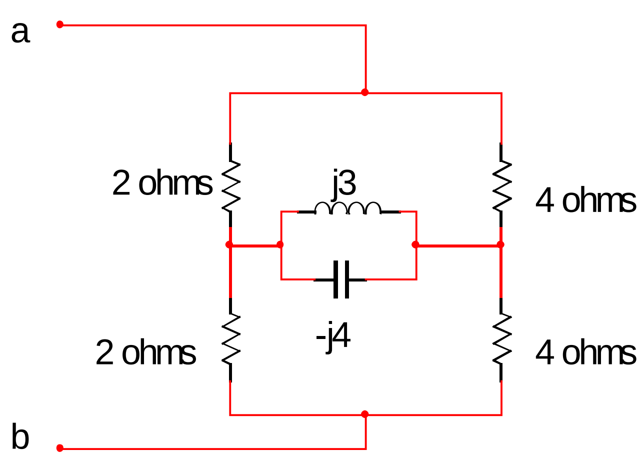
a) no of links b) no. of tree branches c) no. of nodes d)none Ans; (a)

Q11) The minimum number of equations required to analyze the circuit



a) 3 b) 4 c) 6 d)7 Ans:(a)

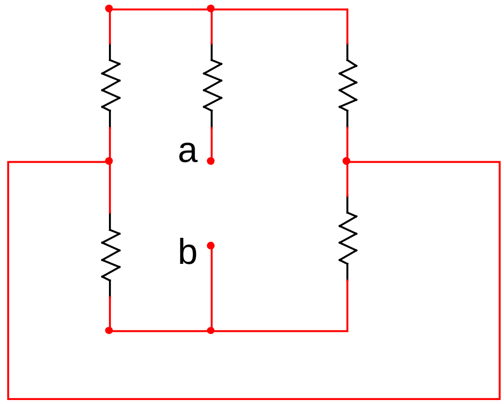
Q12) Equivalent impedance seen across terminals a, b is



a) 16 / 3Ω b) 8 /3 Ω c) 8/ 3 + 12j d) none. Ans: (b)

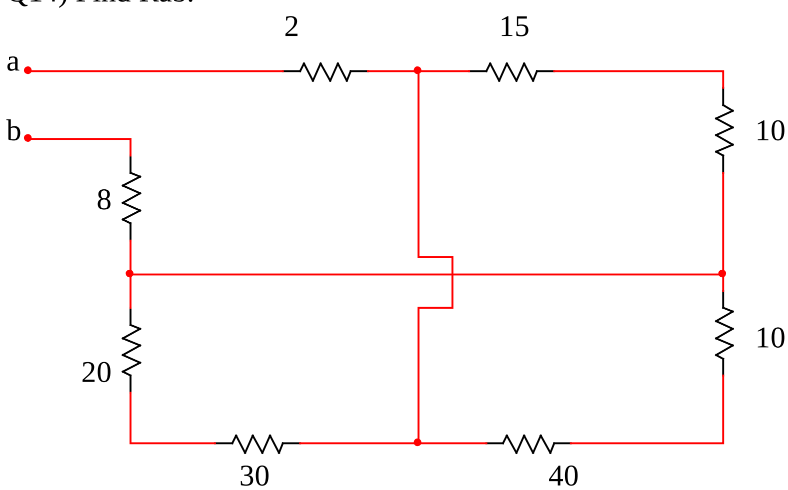
GOD IS NONLINEAR TIME VARYING INVISIBLE COMLEX SYSTEM

Q13) What is the Rab in the circuit when all resistors values are R



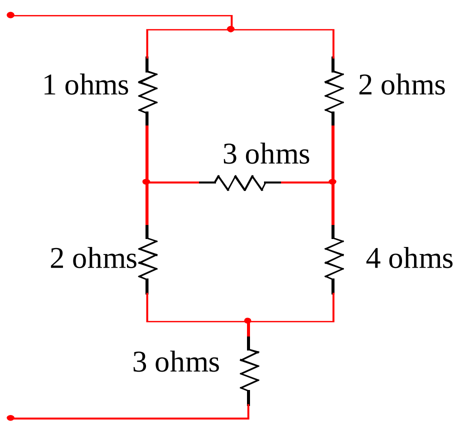
a) 2R b) R c) R/2 d) 3R Ans; (a)

Q14) Find Rab.



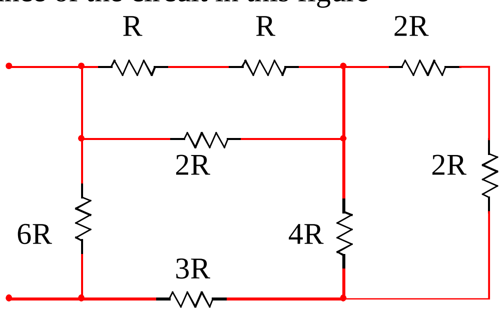
a) 22.5 b)40 c)30 d) none Ans: (a)

Q15)Find the equivalent resistance of the circuit in the figure



a)3 b)4 c)5 d)6 Ans: ©

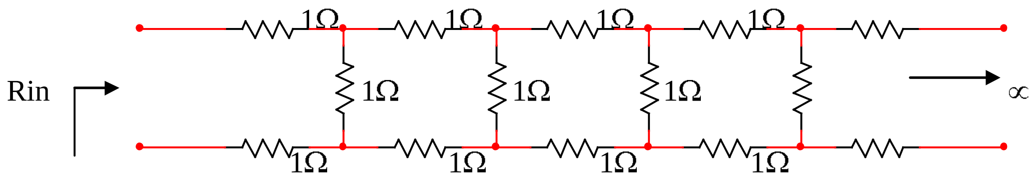
Q16) Find the equivalent resistance of the circuit in this figure



a)1R b)2R c)3R d)4R Ans:©

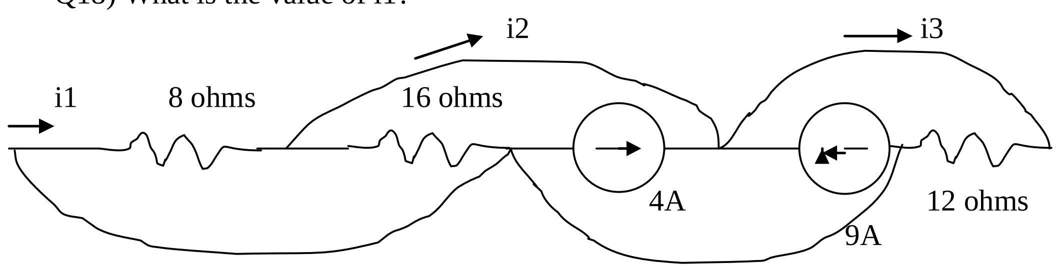
NEGLECTING SMALL THINGS IN LIFE IS TO MISS THE BIGGEST PART OF LIFE IT SELF

Q17) Total resistance Rin is in the circuit shown;



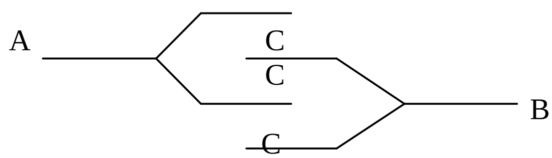
a)(1+√3) b) (1-√5)/2 c) (-1+√5)/2 d)none Ans:(a)

Q18) What is the value of i1?



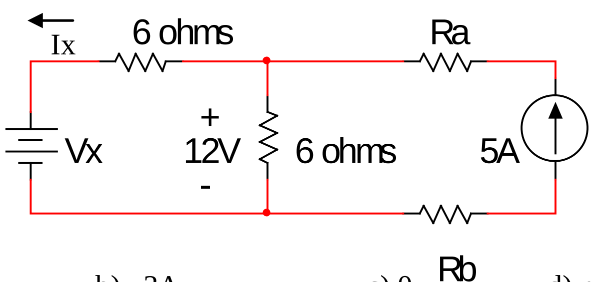
a) 0 b) – 6 c) 6 d) none Ans; (b)

Q19) What is C_{AB}



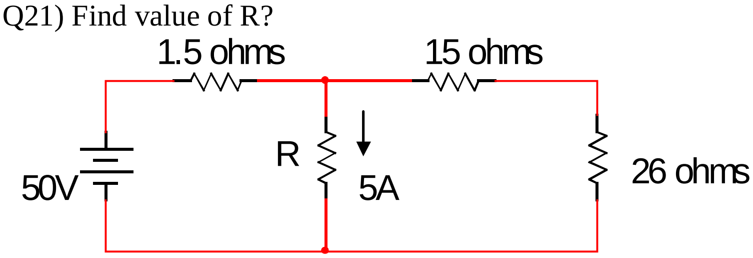
a) C b) C/3 c) 3C d) None Ans: ©

Q20) Find I_x in the circuit shown?



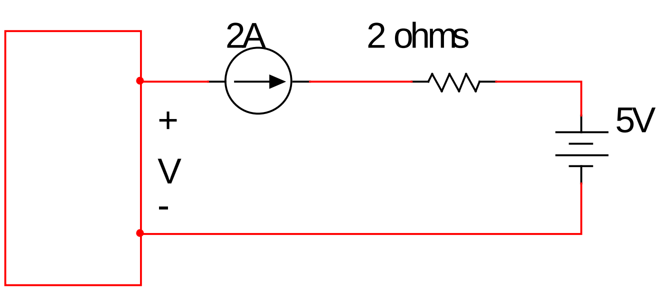
a) 3A b) –3A c) 0 d) none Ans; (a)

Q21) Find value of R?



a) 8.2Ω b) 6Ω c) 10 Ω d) none Ans; (a)

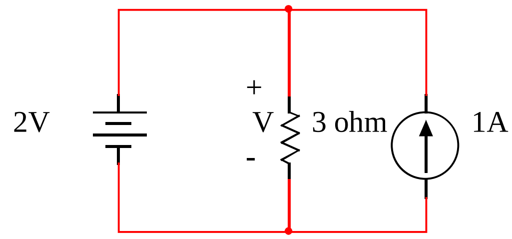
Q22) The voltage V in fig always equal to



a) 9V b) 5V c)1V d) None Ans: (d)

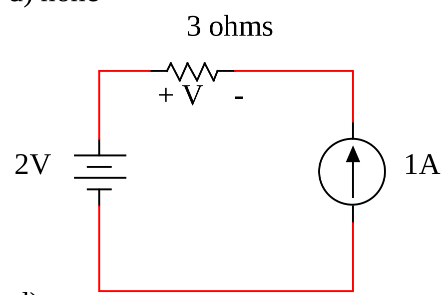
I LISTEN AND I FORGOT, I SEE AND I REMEMBER, I DO AND I LEARN

Q23) Find V in the circuit shown?



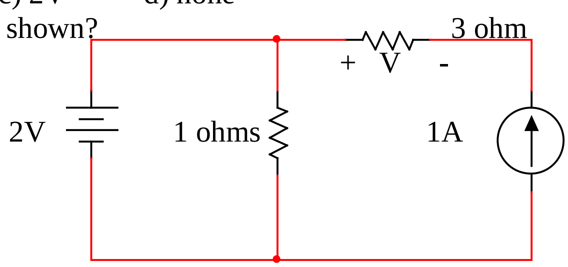
a) 2V b) 3V c) 1V d) none Ans: (a)

Q24) Find V in the circuit shown?



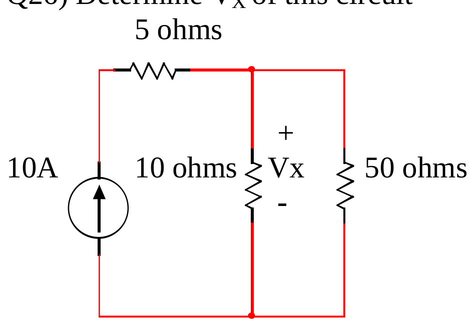
a) – 3 b) +3 c) 2V d) none Ans: (a)

Q25) Find V in the circuit shown?



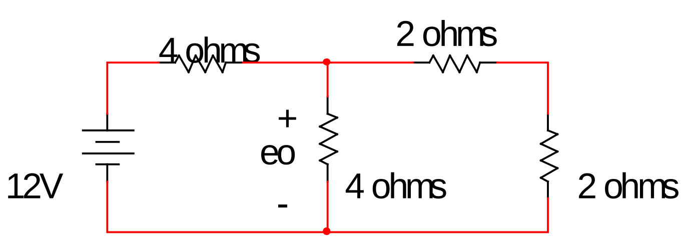
a) + 3V b) – 3V c) 2V d) none Ans: (b)

Q26) Determine V_X of this circuit



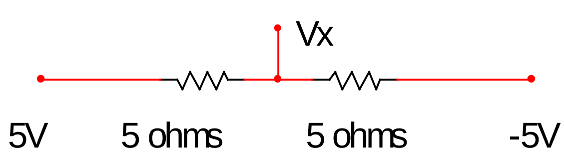
a) 42.2 b)83.3 c)97.3 d)103 Ans:(b)

Q27) Find voltage eo in the fig shown?



a) 2V b) 4/3V c) 4V d) 8V Ans: (c)

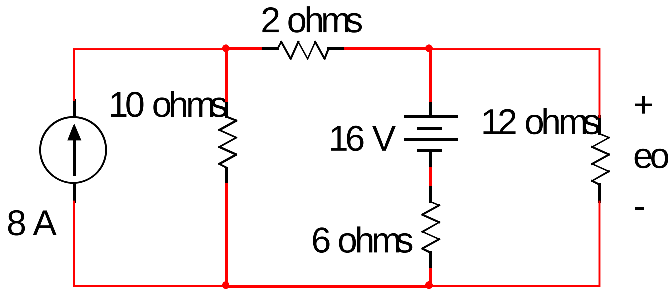
Q28) Find V_X in the circuit shown



a) 2.5 V b) -2.5V c) 0V d) 10V Ans: (c)

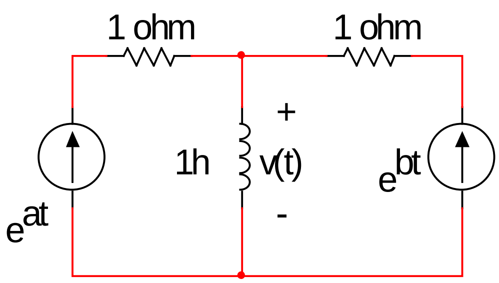
IT MAKES ALL THE DIFFERENCE WHETHER YOU ARE LOOKING DARK FROM BRIGHT OR BRIGHT FROM DARK

Q29) Find voltage eo in the fig shown?



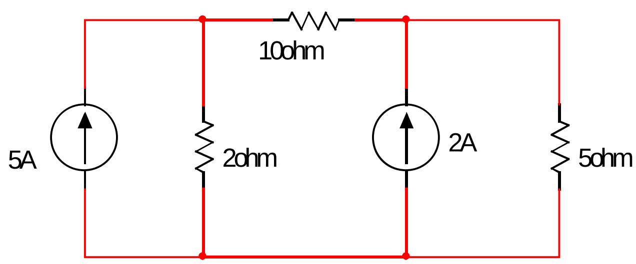
a) 48 b) 24 c) 36 d) 28 Ans: (d)

Q30) The voltage v(t) is



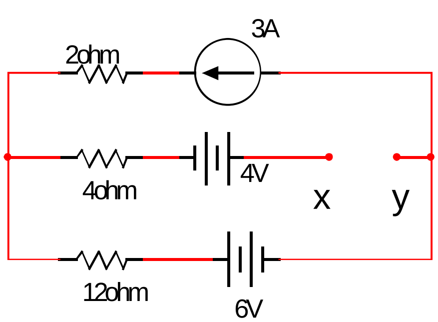
a) $e^{at} - e^{-bt}$ b) $e^{at} + e^{bt}$ c) $a\, e^{at} - b\, e^{bt}$ d) $a\, e^{at} + b\, e^{bt}$ Ans: (d)

Q31) Find current through 5Ω resistor?



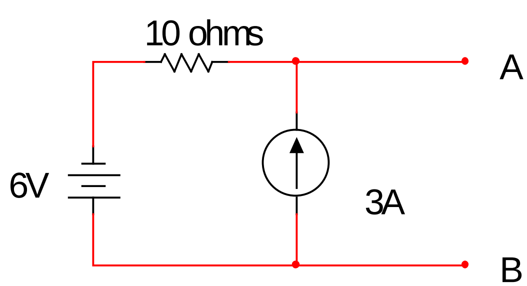
a) 0 b) 2A c) 3A d) 7A Ans; (b)

Q32) Find V_{xy}



a) 10V b) 46V c) 13V d) 58V Ans:(b)

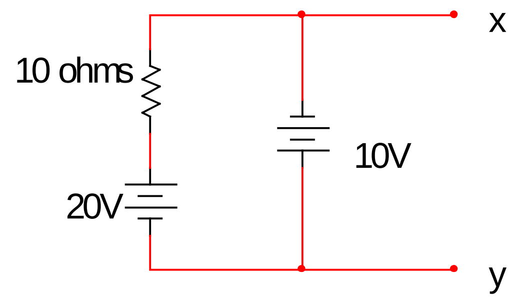
Q33) What is $V_{AB?}$



a) 3V b) 54V c) 24 V d) none Ans: (c)

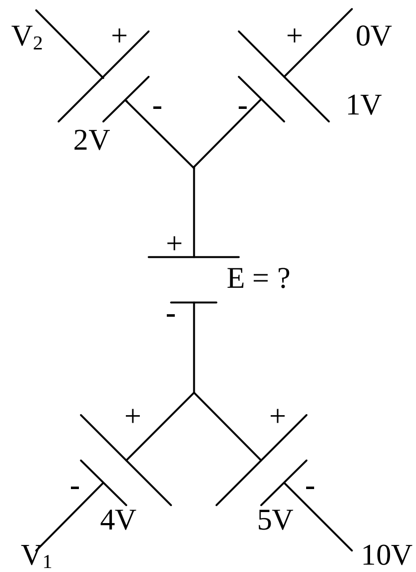
EVEN THOUGH U R IN RIGHT TRACK IF U CAN,T RUN ALONG WITH THE PEOPLE U WILL BE OUT OF THE TRACK AUTOMATICALLY

Q34) What is V_{xy}?



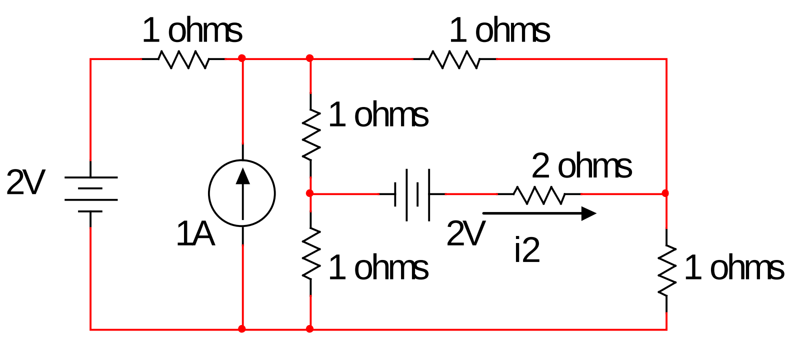
a) 20V b) 30V c) –10V d) 10V Ans: (c)

Q35) In the circuit of fig. The value of the voltage source E is



a) –16V b) 4V c) –6V d) 16V Ans: (a)

Q36) Find i_2 in the fig shown?



a) 4 b)2/3 c)-2/3 d)none Ans: (b)

Q37) Two incandescent light bulbs of 40W & 60W rating are connected in series across the mains. Then

a) The bulbs together consume 100W b) The 60W bulb glows brighter

c) The 40W bulb glows brighter d) The bulbs together consume 50W Ans: (c)

Q38) When a resistor R is connected to a current source, it consumes a power of 18W. When the same R is connected to a voltage source having same magnitude as the current source, the power absorbed by R is 4.5W. The magnitude of the current source & value of R are

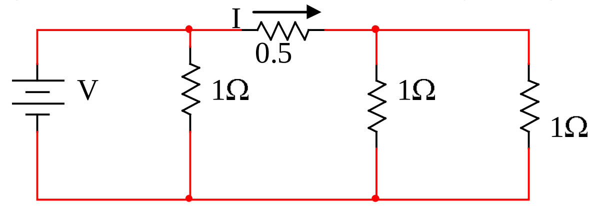
a) $\sqrt{18}$ A & 1Ω b) 3,2 c) 1,18 d) 6, 0.5 Ans: (b)

Q39) If v, w, q stand for voltage, energy & charge, the v can be expressed as

a) v = dq / dw b) v = dw/ dq c) dv = dw/ dq d) dv= dq / dw. Ans: (b)

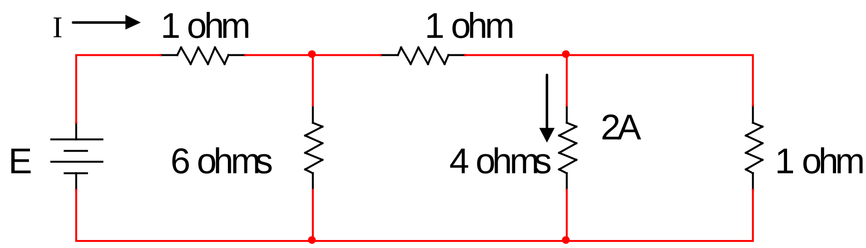
SUCCESS DEPENDS ON ABILITY TO MAKE DECITION

Q40) In the circuit shown in the fig. If I = 2, then the value of the battery voltage V will be



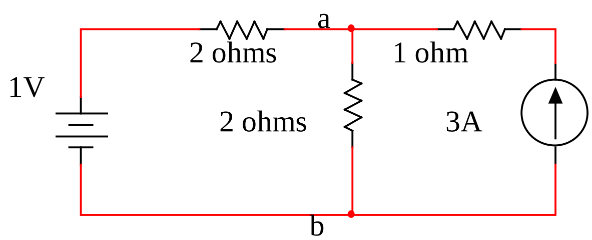
a) 5V b) 3V c) 2V d) 1V Ans:(c)

Q41) Find what is E and I in the fig shown?



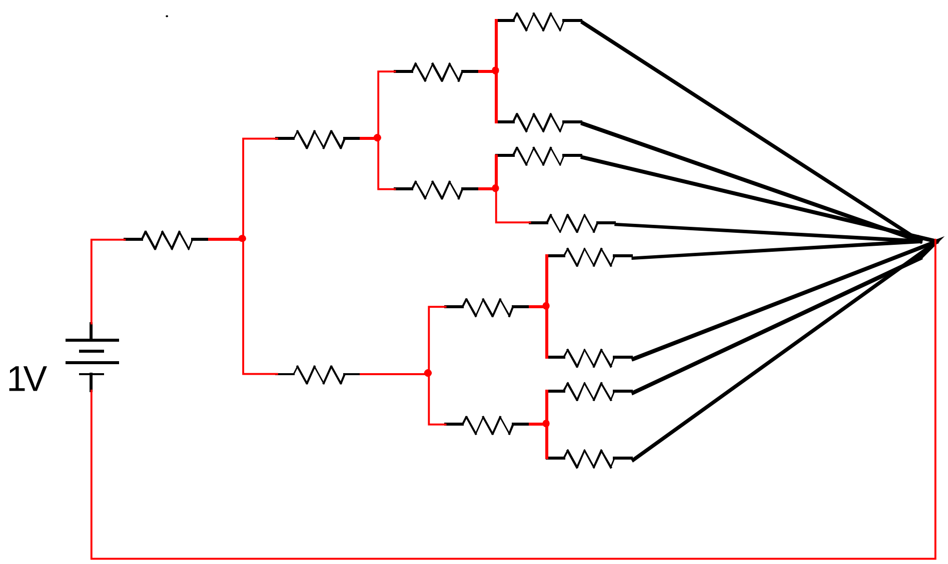
a) I=13A and E=31V b) I=31A and E= 13V c) E=31V and I=31A d)none Ans : (a)

Q42) The voltage across the terminals a & b



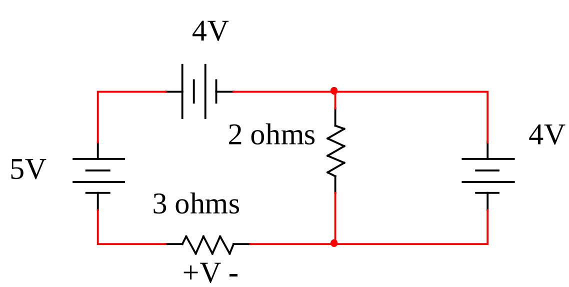
a) 0.5v b) 3.0v c) 3.5v d)4.0 v Ans: (c)

Q43) What is the current supplied by 1V source when each resistance is 1 ohm?



a) 8/15 b)15/4 c)4/15 d) none Ans: (a)

Q44) The voltage v is equal to



a) 3v b) –3v c) 5v d) None Ans:(a)

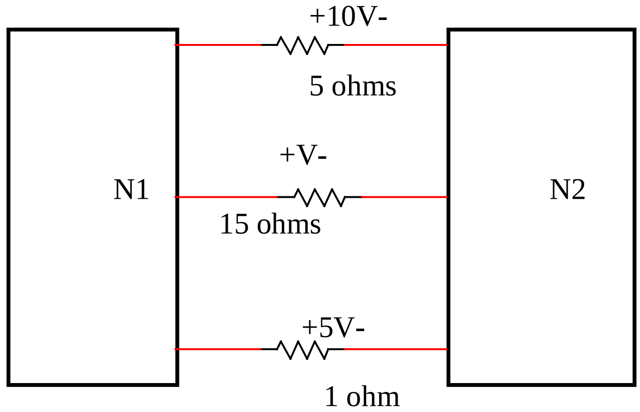
Q45) The phase of even symmetric signal is

a) + 90^0 b) - 90^0 c) 0^0 d) 0^0 or $\pm 180^0$ Ans: (d)

Q46) x (t) = $e^{-10|t|}$ $-\infty<t<\infty$ is a

a) energy signal b) power signal c) both d) none Ans:(a)

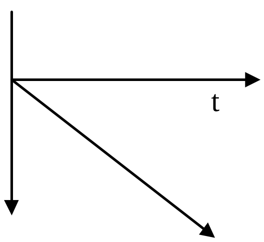
Q47) The voltage across 15 ohms resistor is



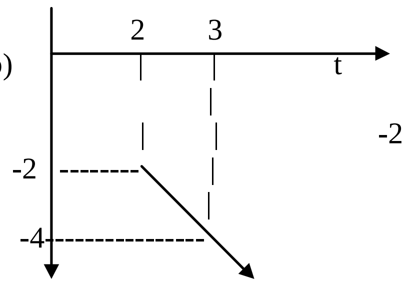
a) -105V b) +105V c) –15V d) + 15v. Ans:(a)

Q48) Plot f(t) = -2 (t-1) u (t-2)

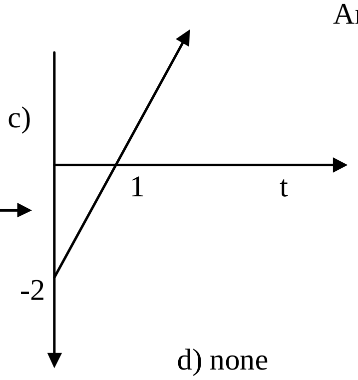
a)



b)



c)

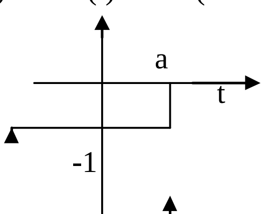


d) none

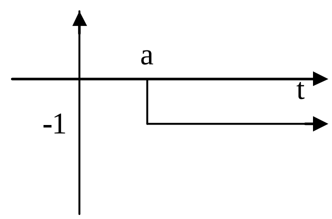
Ans: (b)

Q49) Plot f (t) = - u (-t + a)

a)

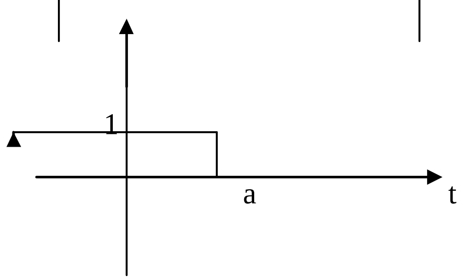


b)

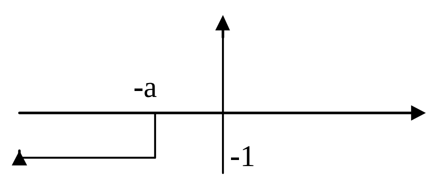


Ans: (a)

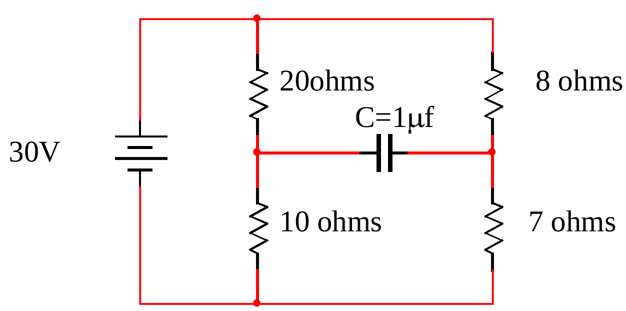
c)



d)



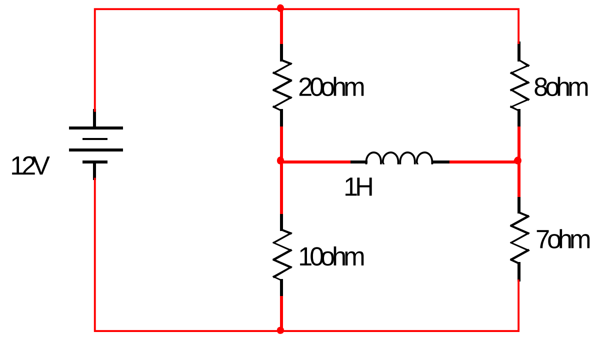
Q50) The energy stored in the capacitor is



a) 8μj b) 30μj c) 45μj d) 900μj Ans:(a)

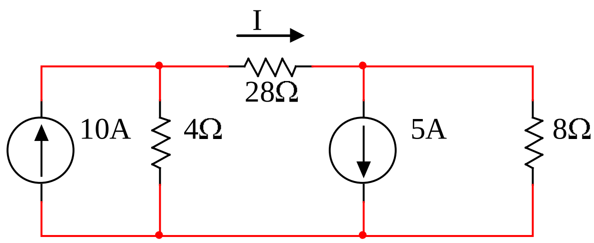
DECITION DEPENDS ON KNOWLEDGE, KNOWLEDGE IS NOTHING BUT INFORMATION

Q51) The stored energy of the inductor is.



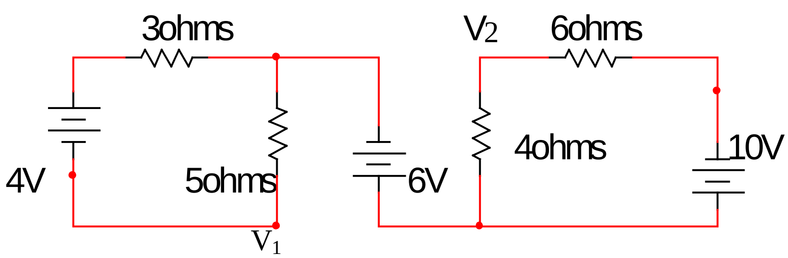
a) 0 mJ b)11.25 mJ c) 744 mJ d) none Ans: (b)

Q52) In the circuit of fig. The current I will be



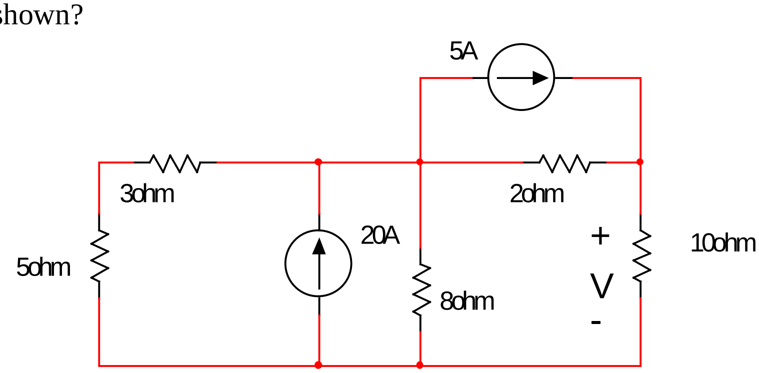
a)1A b) 2A c) 4A d)8A Ans:(b)

Q53) In the circuit shown in fig. The potential difference $V_2 - V_1$ is



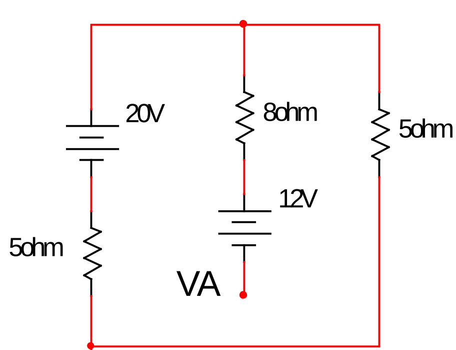
a) –4.5 V b) 0 V c) 4.5V d) 6V. Ans:(c)

Q54) Find V in the fig shown?



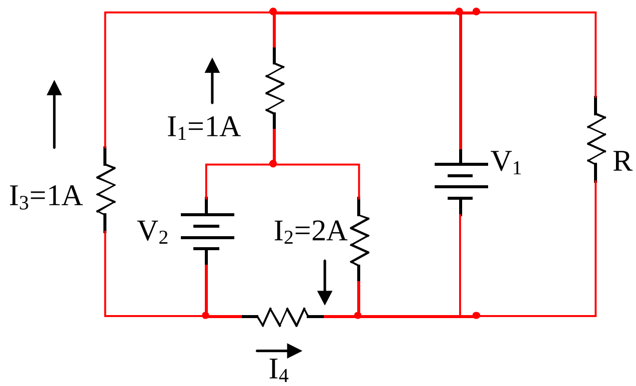
a) 56.25 b)85 c)40 d)none Ans: (a)

Q55) What is VA?



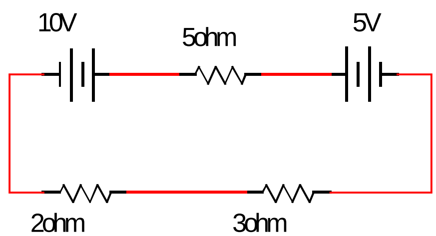
a)-2 b)2 c)-4 d)4 Ans: (a)

Q56) What is the value of I_4 in the fig shown?



a) –4 b) –2 c) Known only if V_1, V_2 And R are known d) known only if V_1, V_2 are known Ans:(a)

Q57) If the voltage of each source in the given network is doubled, then which of the following statement would be true

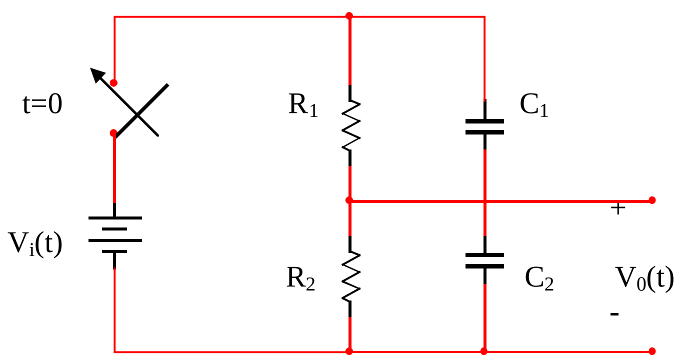


1 Current flowing in the network will be doubled 2 voltages across each resistor will be doubled
3 power absorbed by each resistor will be doubled 4 power delivered by each source will be doubled
a) 1, 2, 3, 4 b) 1,2 c) 2, 3 d) 1, 3, 4 Ans:(b)

Q58) A nonlinear resistance is defined by $i = v^2$. Its dynamic resistance r_d and its static resistance r_s are related as fol
a) $r_d = r_s / 2$ b) $r_d = r_s$ c) $r_d = 2r_s$ d) $r_d = 4r_s$ Ans:(a)

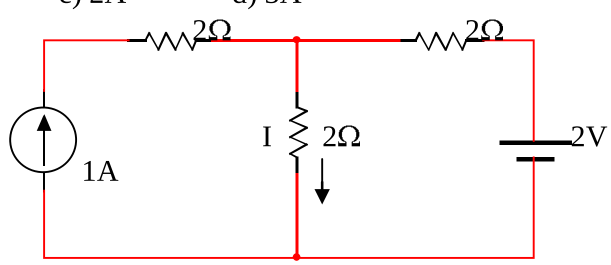
Q59) For a given network, the number of independent mesh equation (N_m) and the number of independent node equation (N_n) obey the following :
a) $N_m = N_n$ b) $N_m > N_n$ c) $N_m < N_n$ d) any one of the above, depending on the network. Ans: (d)

Q60)The capacitors C_1 and C_2 in the circuit of fig. are initially uncharged. The voltage V_0 (t) will be $[R_2 / (R_1 + R_2)]\ V_i$ (t)



a) if $R_1 C_1 = R_2C_2$ b) if $R_1 C_2 = R_2C_1$ c) if $C_1 = C_2$ d) under no conditions (s) Ans:(a)

Q61) In the circuit of fig. What is the current I ?
a) 1A b) 4/3 A c) 2A d) 3A Ans:(a)



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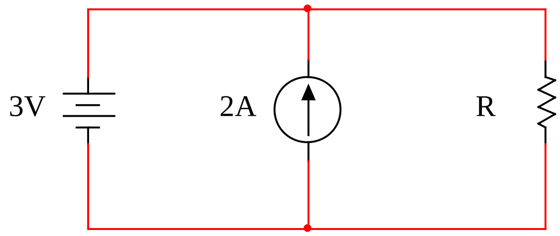
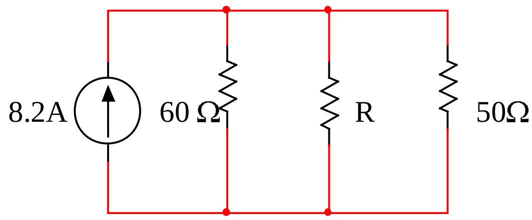
Q62) Find the value of R for which the power supplied by the voltage source is zero?



a) 0 b) 1.5 c) 6 d) 0.667 Ans:(b)

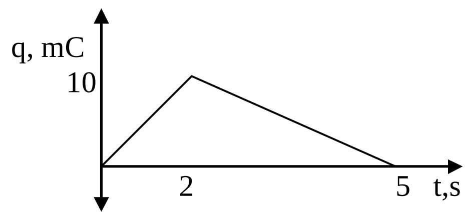
Q63)What value of R ensures that the current through the 60 ohm resistor of this circuit is 1A?



a)5 b)10 c)15 d)20 Ans:(b)

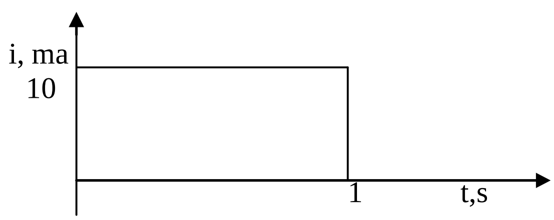
Q64) The charge delivered by a constant voltage source is shown. Determine the current supplied by the source at a) t=1s b) t=3s

a) 5ma,-3.33ma b) 5ma,3.33ma
c) –3.33ma,5ma d) 3.33ma,5ma



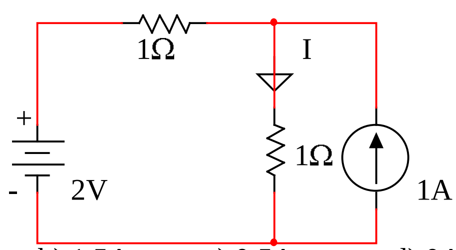
Ans:(a)

Q65) A capacitor is charged by a constant 10ma current source, which is turned on for 1 second. Assuming the capacitor is initially uncharged; determine the charge delivered to and power supplied by the source if the capacitor has a value of 1 mF?



a) 0.01C,10mW b)0.01C,100mW c) 0.1C,10mW d)0.1C,10mW Ans(b)

Q66) The current I in the circuit of fig. is



a) 2A b) 1.5A c) 0.5A d) 0A Ans: (b)

Q67) A 24V battery of internal resistance r = 4Ω is connected to a variable resistance R, the rate of heat dissipation in the resistor is maximum when the current drawn from the battery is I. Current drawn from the battery will be I / 2 when R is equal to

a) 8Ω b) 12Ω c) 16Ω d) 20Ω Ans:(b)

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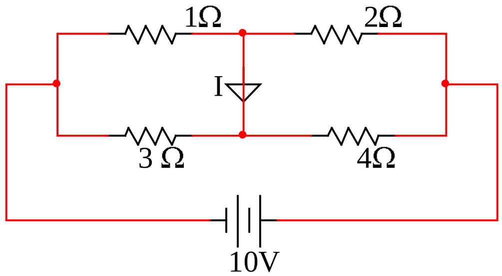
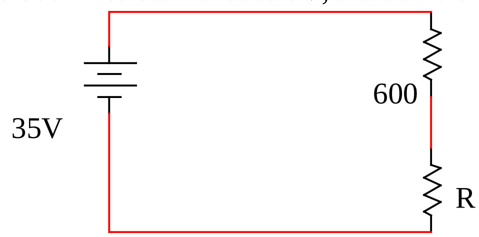
Q68) In the circuit shown in the given figure, current I is;



a) – 2 /5 b) 24 /5 c) 18 / 5 d) 2 / 5 Ans;(a)

Q69) A 35V source is connected to a series circuit of 600Ω and R as shown. If a voltmeter of internal resistance 1.2 KΩ is connected across 600Ω resistor it reads 5V, the value of R = ?

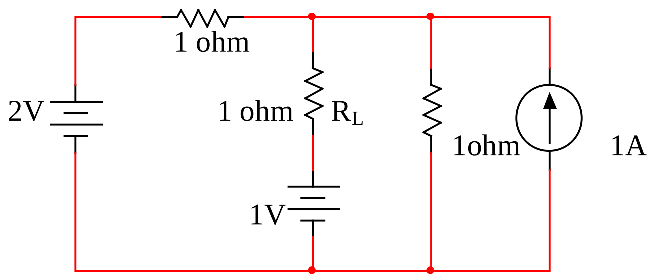


a) 1.2K b) 2.4 KΩ c) 3.6 KΩ d) 7.2KΩ Ans:(b)

Q70) A coil of resistor of 5Ω and inductance 0.4 H is connected to a 50 V d.c supply. The energy stored in the field is

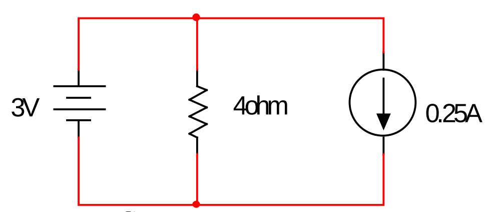
a) 10 joules b) 20 joules c) 40 joules d) 80 joules Ans:(b)

Q71) Find the current in R_L in the circuit below?



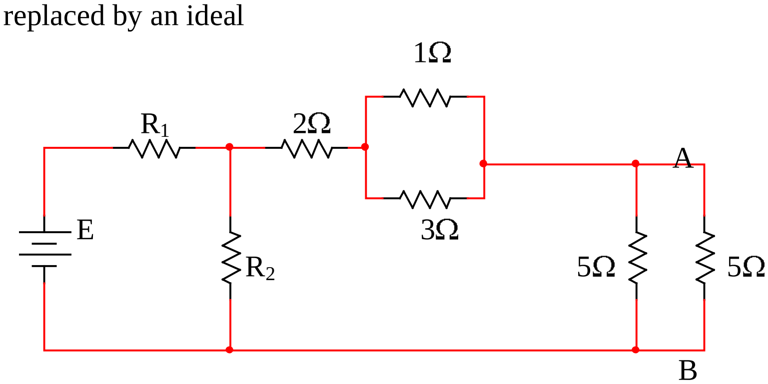
a)0 b)2/3 c)1/3 d)none Ans: ©

Q72) The current flowing through the voltage source in the above circuit is



a) 1.0 A b) 0.75 A c) 0.5 A d) 0.25 A Ans:(a)

Q73) In the circuit shown, the voltage across 2Ω resistor is 20V. The 5Ω resistor connected between the terminals A and B can be replaced by an ideal



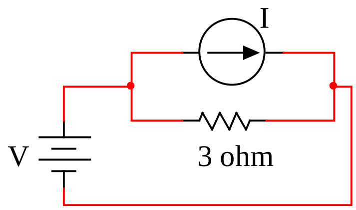
a) Voltage source of 25V with + terminal upward
b) Voltage source of 25V with + terminal downward
c) Current source of 2 A upward d) Current source of 2A downward Ans:(a)

Q74) Consider the following units:

1) sec^{-1} 2) rad^{2} sec^{-2} 3)sec 4) ohm, the units of R/L, 1 / LC, CR and √ (L / C) are respectively.

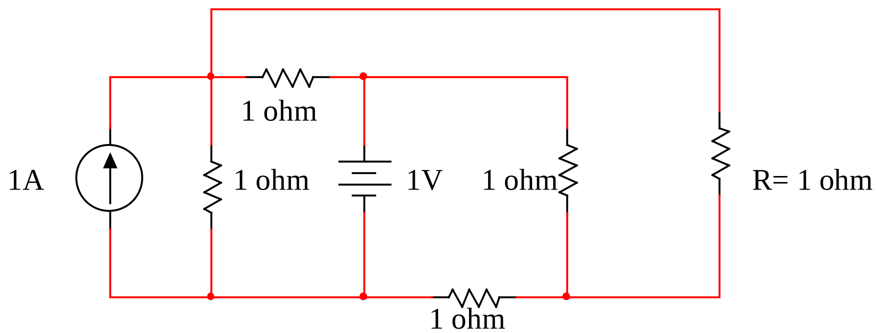
a) 1,2,4 and 3 b) 3,2,1 and 4 c) 2,4,1 and 3 d) 1,2,3 and 4 Ans:(d)

Q75) In the circuit shown in the fig. The effective resistance faced by the voltage source is



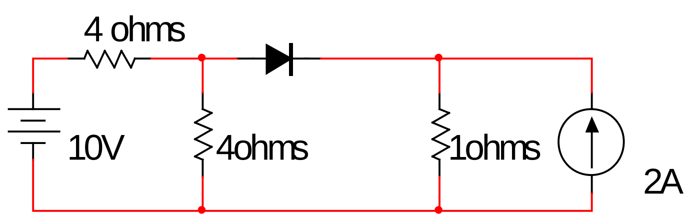
a) 1Ω b) 2Ω c) 3Ω d) 3.3Ω Ans:(c)

Q76) If a resistance ‘R’ of 1Ω is connected across the terminals AB as shown in the given fig. Then the current flowing through R will be.



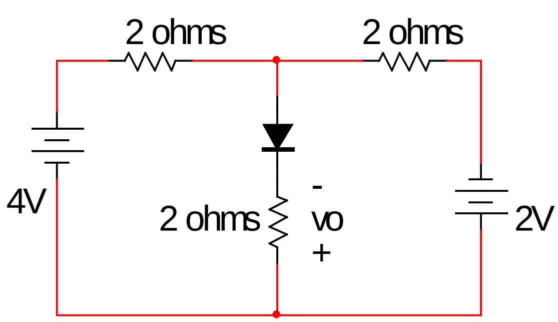
a) 1A b) 0.5A c) 0.25A d) 0.125A Ans:(c)

Q77) Find current from anode to cathode in the diode when diode is ideal



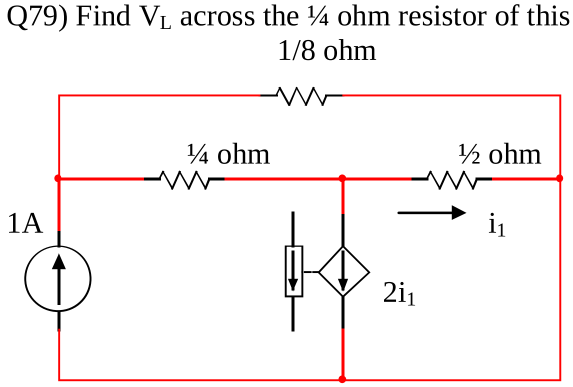
a) 0 b) 4 c)1 d) none Ans: (c)

Q78) The voltage V_0 is



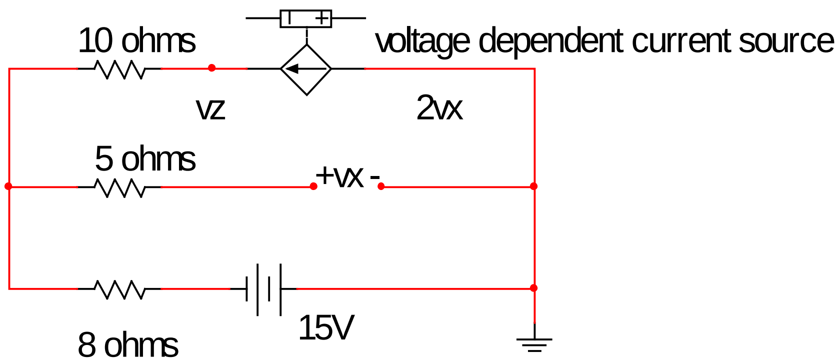
a) 2V b) 1V c) –1 d) -2/3 Ans: (d)

Q79) Find V_L across the ¼ ohm resistor of this circuit



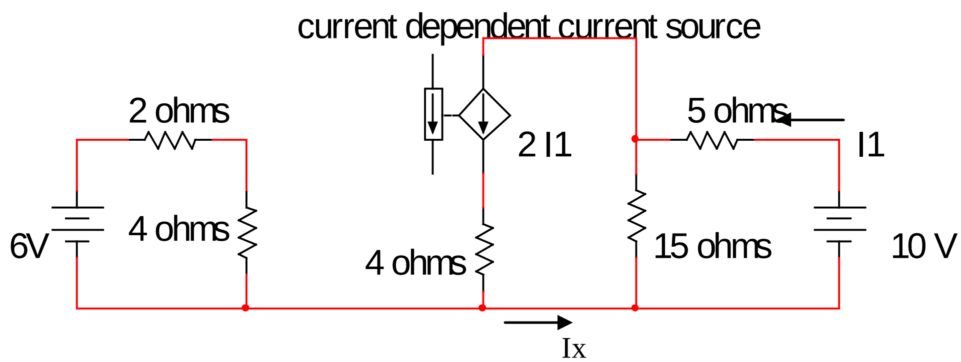
a)1/52 b)2/52 c)3/52 d)5/52 Ans: ©

Q80) What is V_Z in the fig shown?



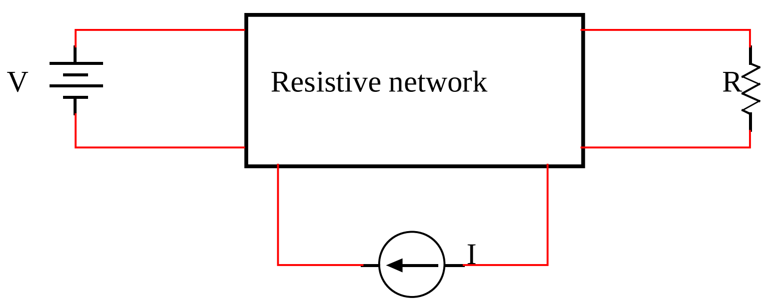
a) 2V b) –21 V c) 21 V d) –2V Ans: ©

Q81) Find Ix in the fig shown?



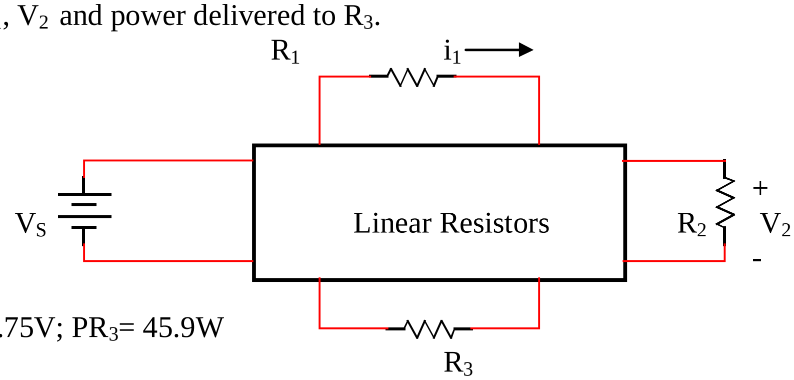
a) 1A b) –2A c) 2A d) None Ans: (b)

Q82) A particular resistor R dissipates a power of 4W when V alone is active. The same resistor R dissipates a power of 9 watts when I alone is active. The power dissipated by R when both sources are active will be.



a) 1W b) 5W c) 13W d) 25W Ans: (d,a)

Q83) When V_S = 120V, it is found that i_1 = 3A, V_2 =50v & power delivered to R_3 is 60w. If V_S reduces to 105 v find new values for i_1, V_2 and power delivered to R_3.



Ans: i_1=2.625A V_2=43.75V; PR_3= 45.9W

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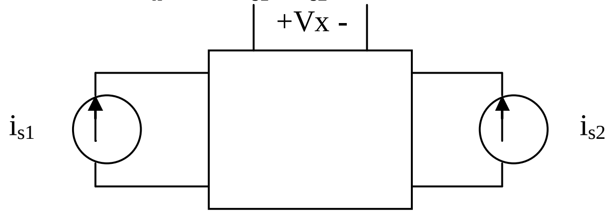
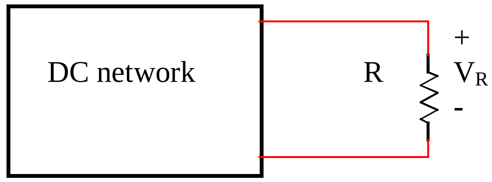
Q84) The linear network contains only resistors if i_{s1} = 8A, i_{s2} = 12A, V_x is found to be 80v. If i_{s1} = -8A, i_{s2} = 4A, V_x = 0 . Find V_x when i_{s1} = i_{s2} = 20A



a) –150 b) 150 c) 100 d)50 Ans:(b)

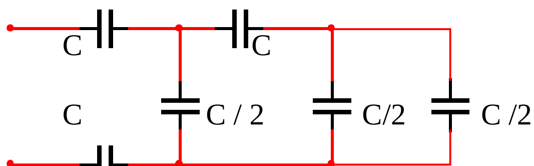
Q85) When R=10ohms,V_R=20V , when R=20 ohms V_R=30V. Find V_R when R=80 ohms



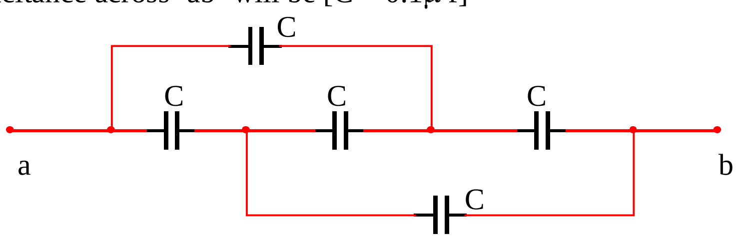
a) 40 b)160 c)48 d) none Ans: ©

Q86) The equivalent capacitance of the network shown in fig. is

a) C / 4 b) C/3 c) 5C / 2 d) 3C Ans:(b)

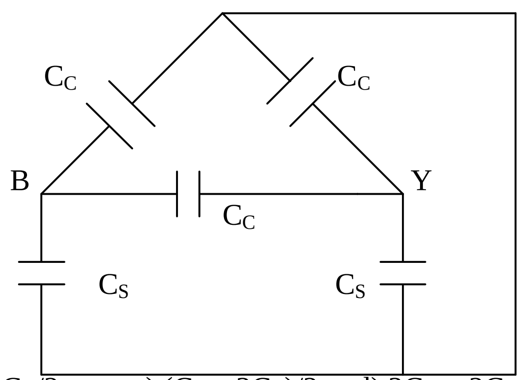


Q87) The equivalent capacitance across ‘ab’ will be [C = 0.1μ f]



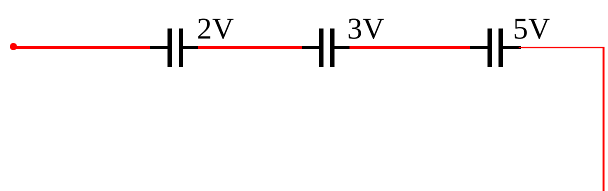
a) 0.2μf b) 0.1μf c) 0.5μf d)0 Ans:(b)

Q88) Find C_{BY} ?



a) $C_c + C_{S/2}$ b) $C_S + Cc/2$ c) $(C_S + 3Cc)/2$ d) $3C_C + 2C_S$ Ans:(c)

Q89) For the circuit shown what is the equivalent capacitance when each capacitor is having 1 coulomb of charge?



a) 10 f b) 0.1 f c) 1 f d) none Ans:(b)

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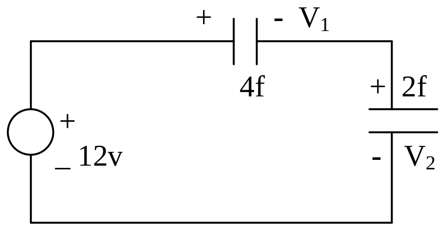
Q90) Find V_1 & V_2

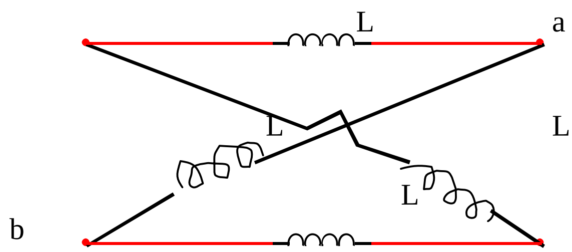


a) 4,8 b) 8,4 c) 6,6 d) 12,12 Ans: (a)

Q91) Identify correct statement?

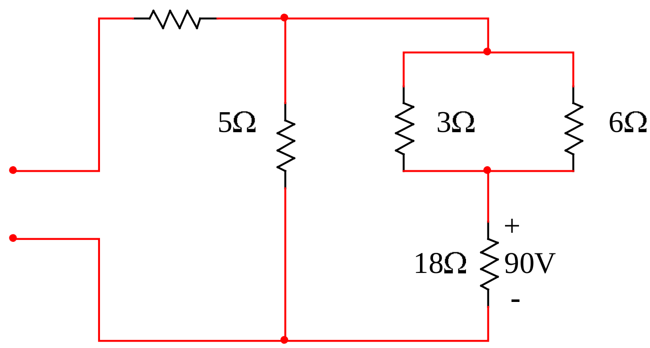
a) $V_L = 1/L\int_{-\infty}^{t} i_L\,dt$ b) $W_L = ½ LI^2$ c) $P_R = I_m^2R$ d) $\psi = LI$ Ans: (d)

Q92) The network shown in the figure draws current I when ab is open. If the ends ab were shorted, the current drawn would be



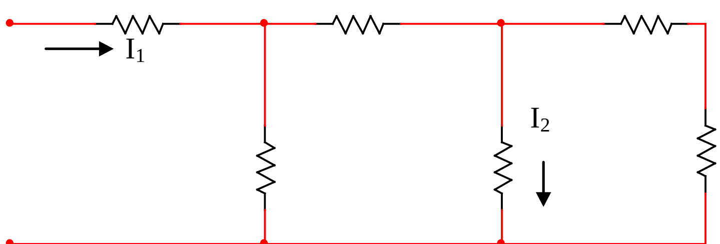
a) ∞ b) 4I c) 2I d) I Ans: (d)

Q93) In the figure below, the voltage across the 18 ohm resistor is 90 volts. What is the total voltage across the combined circuit?



a) 125v b) 16v c) 24v d) 40v Ans: (a)

Q94) The current transfer ratio I_2/I_1 for the network shown in the fig is



All resistors are given as 2 ohms

a) 0.25 b) 0.40 c) 0.50 d) 0.75 Ans(a)

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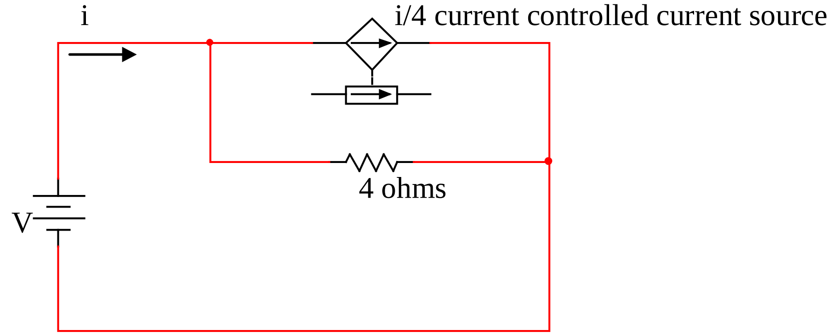
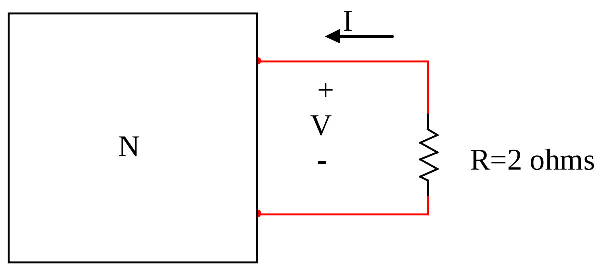
Q95) In the network shown in fig, the effective resistance faced by the voltage source is



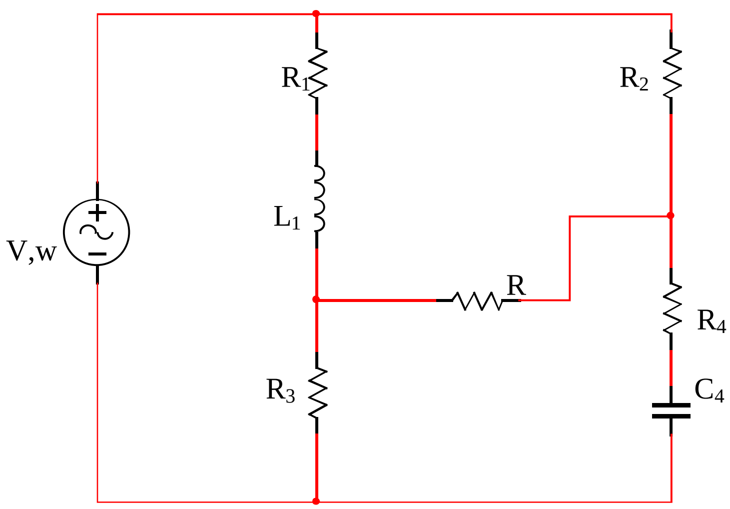
a) 4 ohms   b) 3 ohms   c) 2 ohms   d) 1 mega ohms   Ans(b)

Q96) The V-I relation for the network shown in the given box is V=4I-9. If now a resistor R=2 ohms is connected across it, then the value of I will be



a) –4.5   b) –1.5   c) 1.5   d) 4.5   Ans©

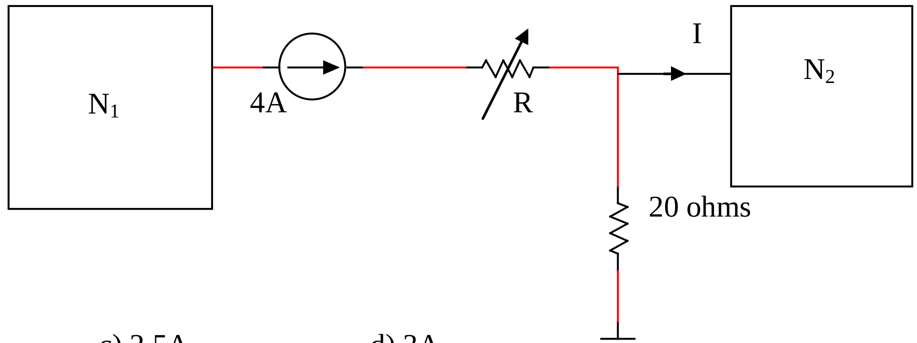
Q97) In the circuit shown in fig, if the current in resistance R is nil, then



a) $wL_1/R_1=1/wC_4R_4$ b) $wL_1/R_1=wC_4R_4$ c) $\tan^{-}(wL_1/R_1)+\tan^{-}(wC_4R_4)=0$

d) $\tan^{-}(wL_1/R_1)+\tan^{-}(1/wC_4R_4)=0$ Ans:(a)

Q98) In the circuit shown in fig, for R=20 ohms the current I is 2A. When R is 10 ohms the current I would be



a)1A   b) 2A   c) 2.5A   d) 3A   Ans: (b)

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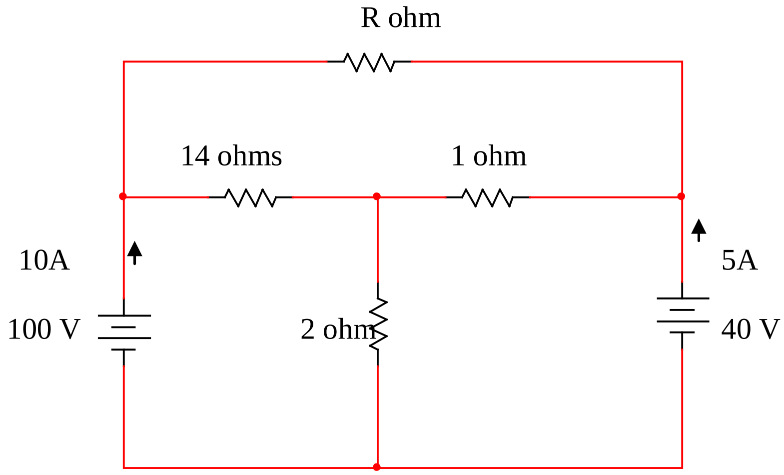
Q99) In the fig, the value of R is



a) 10 ohms b) 18 ohms c) 24 ohms d) 12 ohms Ans: (d)

Q100) An ideal constant voltage source is connected in series with an ideal constant current source. Considered together, the combination will be a

a) Constant voltage source b) constant current source c) constant voltage source and constant current source or a constant power source Ans: (b)

Q101) A network contains only independent current sources and resistors. If the values of all the resistors are doubled, the values of the node voltage

a) will become half b) will remain unchanged c) will become double d) cannot be determined unless the circuit configuration and the values of the resistors are known Ans: ©

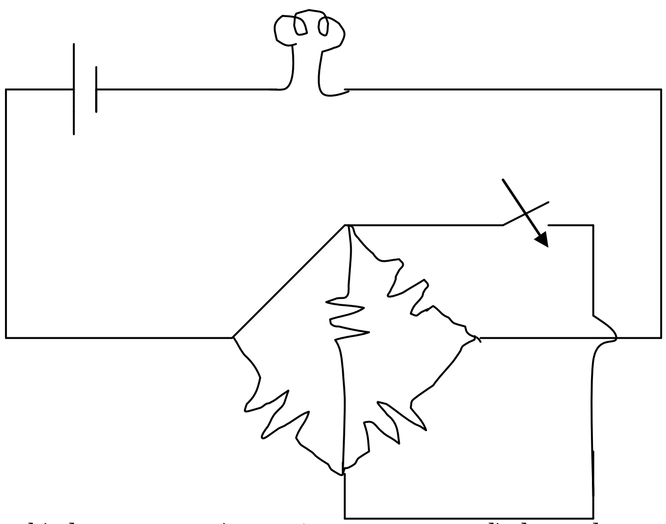
Q102) A network N is a dual of network N if

a) both of them have same mesh equations b) both of them have same node equations c) mesh equations of one are the node equations of the other d) KCL and KVL equations are the same Ans: ©

Q103) A certain network consists of two ideal voltage sources and a large number of ideal resistors. The power consumed in one of the resistor is 4W when either of the two sources is active and the other is replaced by a short circuit. The power consumed by the same resistor when both the sources are simultaneously active would be

a) zero or 16 W b) 4W or 8 W c) zero or 8W d) 8 W or 16 W Ans: (a)

Q104) All the resistances in the circuit are R ohms each. The switch is initially open. What happens to the lam intensity when the switch is closed?



a) Increases b) decreases c) remain constant d) depends on the value of R Ans: (a)

Q105) In the circuit shown the transformers are center tapped and the diodes are connected as shown in a bridge. Between the terminals 1 and 2 an a.c. voltage source of frequency 400 Hz is connected. Another a.c.voltage of 1.0 MHz is connected between 3 and 4. The output between 5 and 6 contains components at

a) 400 Hz, 1.0 MHz, 1000.4 kHz, 999.6 kHz b) 400 Hz, 1000.4 kHz, 999.6 kHz
c) 1 MHz, 1000.4 kHz, 999.6 kHz d) 1000.4 kHz, 999.6 kHz Ans:()

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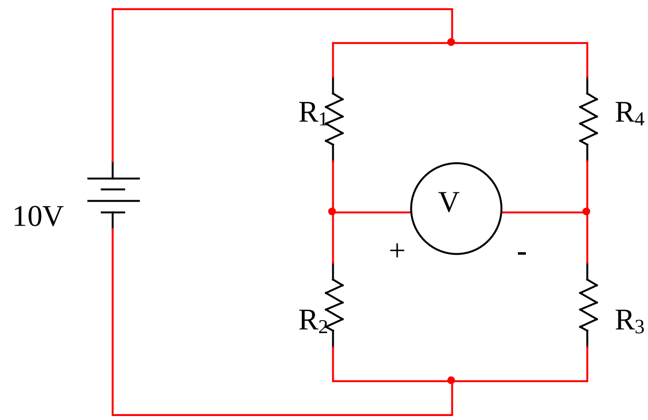
Q106) If $R_1=R_2=R_4=R$ and $R_3=1.1R$ in the bridge circuit shown in fig, then the rearing in the ideal voltmeter connected across a and b is

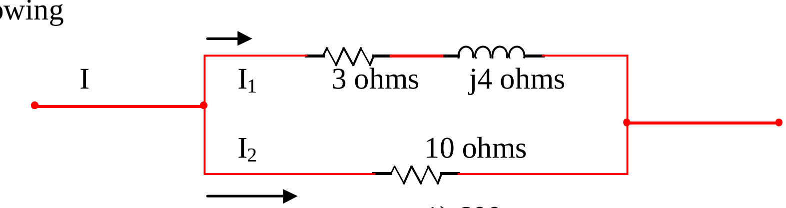


a) 0.238 V b) 0.138 V c) –0.238 V d) 1 V Ans: (c)

Q107) A network has b branches and n nodes. For this mesh analysis will be simpler than node analysis if n is greater than

a) b b) b+1 c) b/2 +1 d) b/2 Ans: (c)

Q108) Match the following



A) I_1/I_2
B) P_1/P_2
C) P_1 in Watts
D) P_2 in Watts

1) 600
2) 0.3
3) 2
4) 500
5) 1.2

A B C D
a) 3 5 4 1
b) 2 3 4 1
c) 3 5 1 4
d) 1 3 1 4

Ans :(c)

Q109) Which of the following does not have the same units as the others? The symbols have their usual meanings;

a) L/R b)RC c) $\sqrt{LC}$ d) $1 / \sqrt{LC}$ Ans:(c,d)

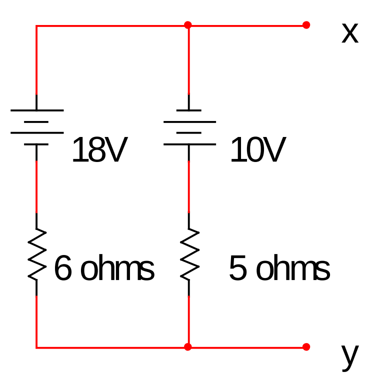
Q110) Consider the following units:

1) sec^{-1} 2) rad^2 sec^{-2} 3)sec 4) ohm, the units of R/L, 1 / LC, CR and $\sqrt{(L / C)}$ are respectively.

a) 1,2,4 and 3 b) 3,2,1 and 4 c) 2,4,1 and 3 d) 1,2,3 and 4 Ans:(d)

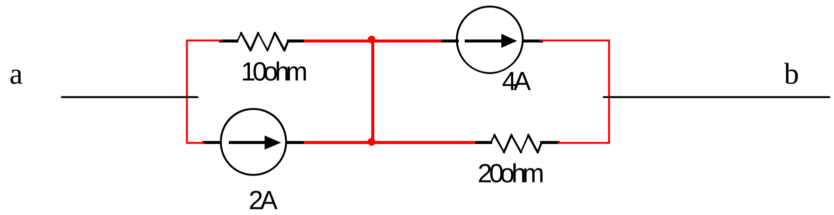
SOURCE TRANSFORMATION

Q1) Find single current source equivalent?



a) 1A, 2.73Ω b) 2.73 A, 1Ω c) 5A, 30 / 11 d) none Ans;(a)

Q2) The value of equivalent voltage and resistance across a& b.



a) – 100, 30 Ω b)- 2, 30Ω c) 10/3, 30Ω d) none. Ans: (a)

Q3) Identify correct statement w r t fig: (a) and (b)

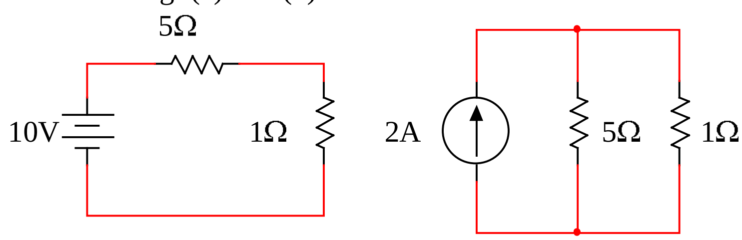


Fig (a) Fig (b)

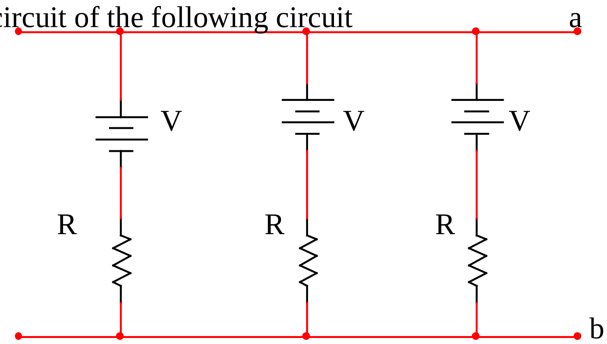
a) power supplied by both the sources are same b)current flowing through 5Ω resistors are same

c) current flowing through 1Ω resistors are same d) all are correct. Ans: (c)

Q4) Practical current source internal resistance should be

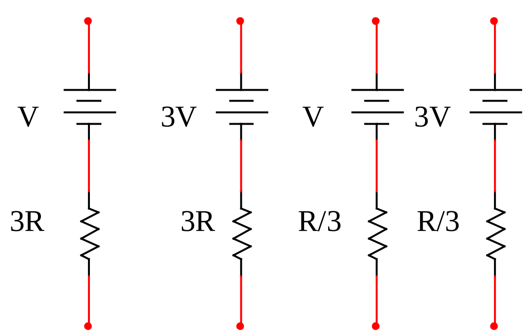
a) Less than R_L b) greater than R_L c) equal to R_L d) none. Ans; (b)

Q5) The equivalent circuit of the following circuit

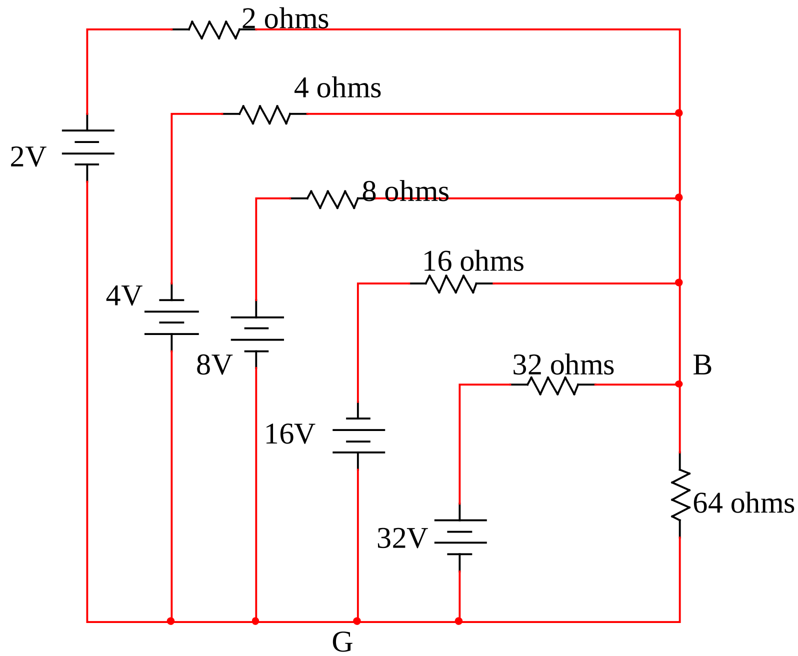


Ans:(c)

a) b) c) d)



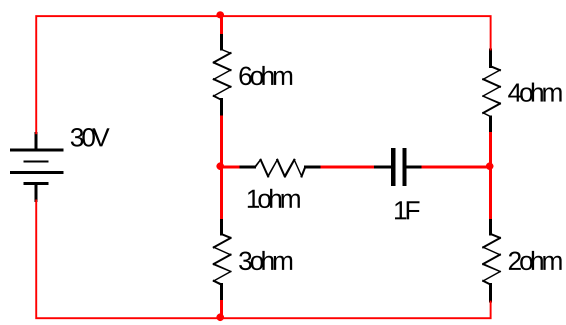
Q6). Obtain potential of node B with respect to G in the network shown in figure



a) 64/63 V b) 1V c) 63/64 V d) 32/63 V Ans: (a)

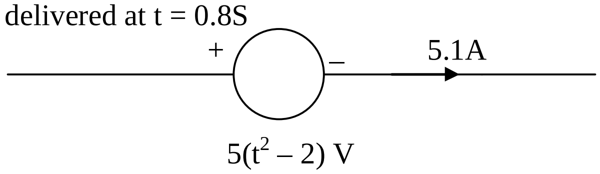
POWER DISSIPATION

Q1) Find power dissipated in resistor 1Ω.



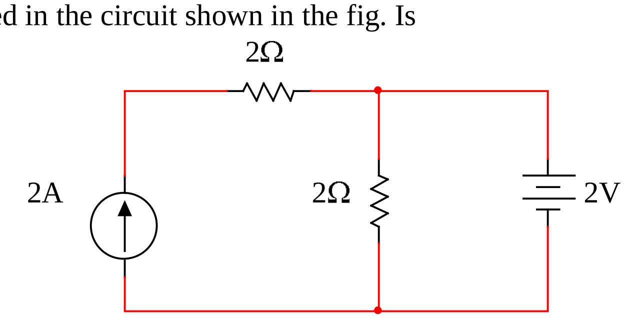
a) 0 b) 6w c) 9w d) none. Ans; (a)

Q2) Find power delivered at t = 0.8S



a) 51W b) 34.68 W c) – 34.68 W d) none Ans; (b)

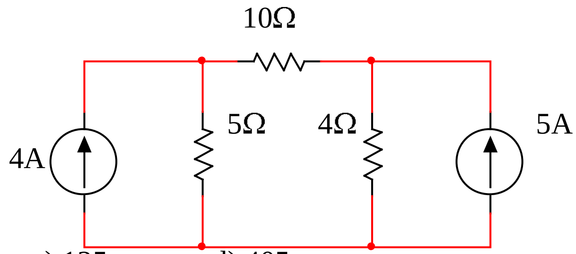
Q3) The total power consumed in the circuit shown in the fig. Is



a) 10W b) 12W c) 16W d) 20W Ans:(a)

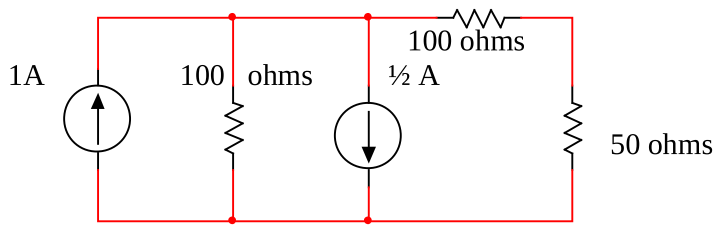
THINK MORE BEFORE YOU TAKE DECISION AND DON'T THINK AFTER YOU TAKE DECISION

Q4) In the circuit shown in the given figure, power dissipation in the 5Ω resistor is



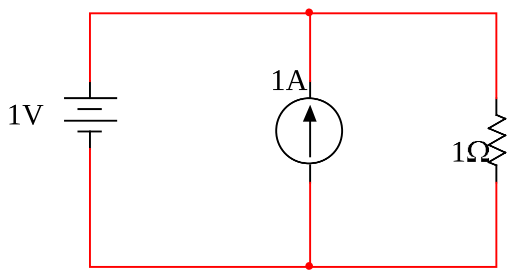
a) zero b) 80w c) 125w d) 405w Ans:(b)

Q5) Find the total power absorbed by all resistors in the circuit shown.



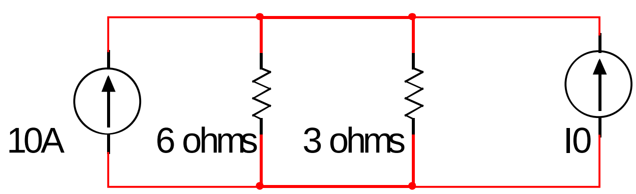
a)15W b)20W c)25W d)30W Ans:(a)

Q6) What will be the power consumed by the voltage source current source and resistance respectively



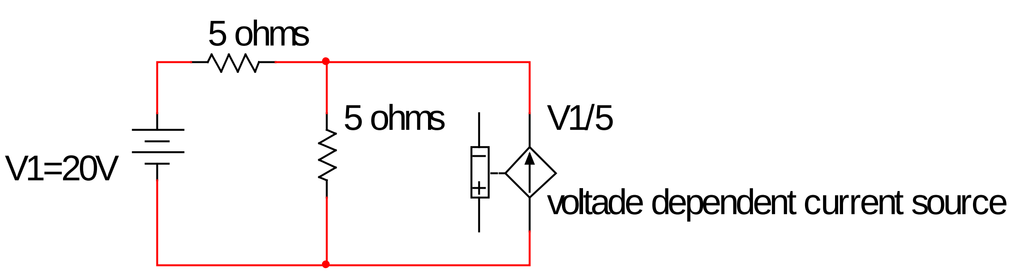
a) 1W, 1W, 2W b) 0W, -1W, 1W c) 1W, 0W, 1W d) 0W, 0W,0W Ans:(b)

Q7) Power absorbed by 6Ω resistor is 24W. Determine Io



a) 4A b) -4A c) 2A d) none Ans: (b)

Q8) The dependent current source shown



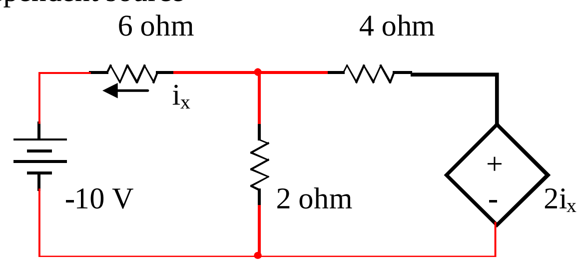
a) Delivers 80 W b) absorbs 80 W c) delivers 40 W d) absorbs 40 W Ans: (a)

Q9) A capacitor is charged by a constant 10mA current source which is turned on for 1 second. Assuming the initially uncharged, determine the power supplied by the source if the capacitor has a value of 1 mf.

a) 10 mw b) 100 mb c) 1 mw d) none Ans : (b)

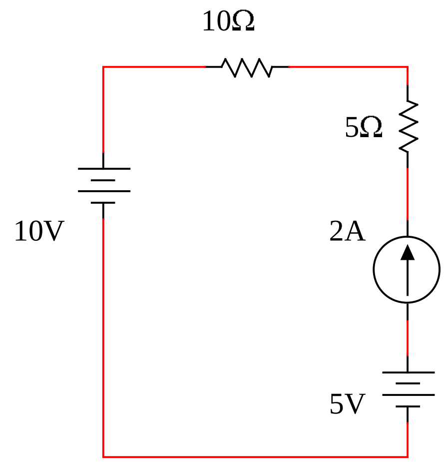
SELF DISCIPLINE IS ALWAYS BEST

Q10) Find power absorbed by dependent source



a) –3 b)3 c) 0 d) none Ans: (a)

Q11) What is the power supplied by 2 A current source.



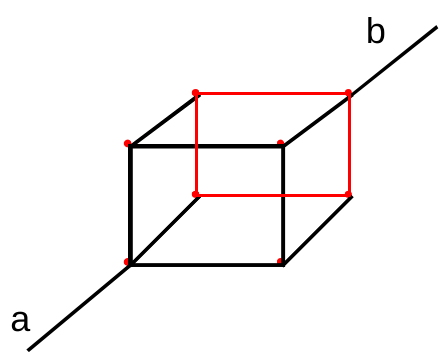
a) –70 w b) 70W c) 50 d) none Ans: (b)

Q12) f(t) = sin t + sin√2 t is passing through R = 1ohm, what is the power dissipated in 1ohm resistor?

a) 1W b) 2W c) since f(t) in non periodic, not possible to find power d) none. Ans :(a)

STAR TO DELTA TRANSFORMATION

Q1) Each branch resistance is 1 ohm. Find equivalent resistance in each path out of 3 paths

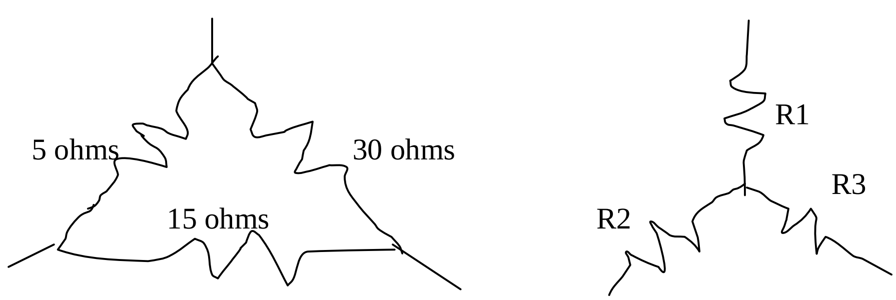


a) 15/6 ohms b) 5/6 ohms c) 6/5 ohms d) none Ans:(a)

Q2) If each branch of a delta circuit has impedance √3 Z, then each branch of the equivalent Wye circuit has impedance

a) Z/√3 b) 3Z c) 3√3 Z d) Z/3 Ans: (a)

Q3) A delta – connected network with its WYE-equivalent is shown. The resistances R_1 R_2 &R_3 are

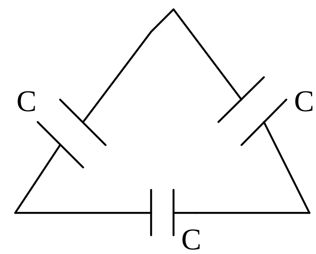


a) 1.5, 3, 9 b) 3, 6, 1.5 c) 9,3, 1.5 d) 3, 1.5, 9 Ans: (d)

Q4) When all resistances in delta connection are having equal value of R. What is the equivalent resistance in star connection?

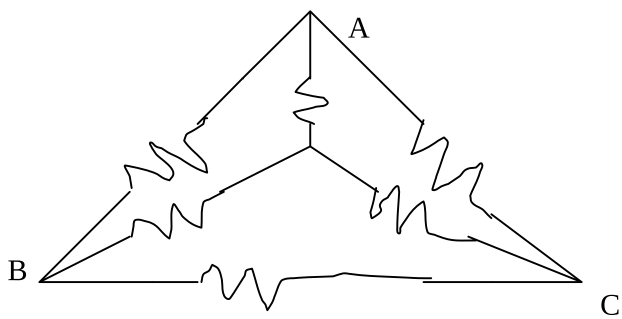
a) $R_Y = R_\Delta$ b) $R_\Delta = R_Y / 3$ c) $R_Y = R_\Delta$ d) none Ans: (a)

Q5) What is the capacitor value in star connection?



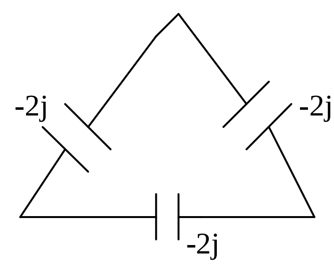
a) C/3 b) 3C c) C d) none Ans: (b)

Q6) The effective resistance between the terminals A and B in the circuit shown in the fig. is (all resistors are equal to R)



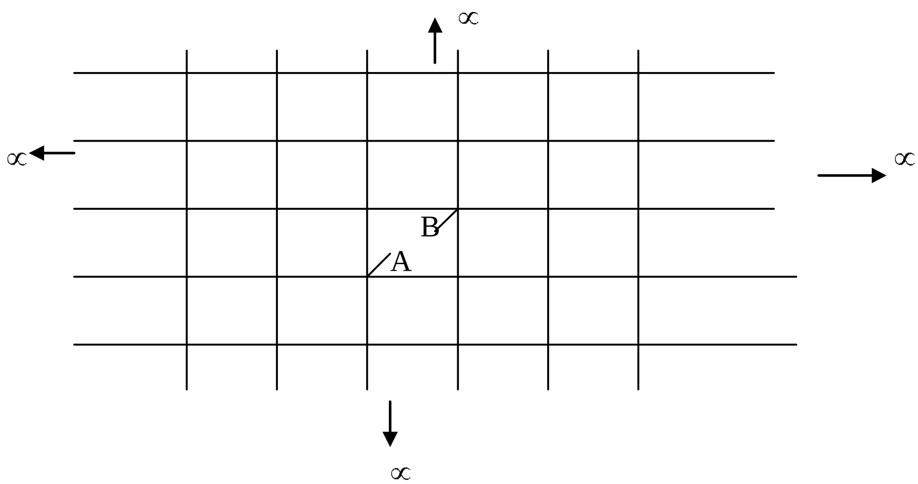
a) R b) R-1 c) R / 2 d) (6 / 11) R Ans:(c)

Q7) What is the equivalent reactance after converting in to star ?



a)-2j/3 b)-6j c)-4j d) none Ans: (a)

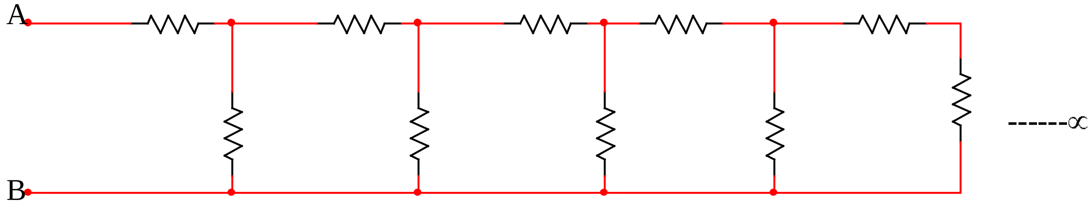
Q8) What is the equivalent resistance between AB when each branch resistance is 2 ohms?



a) 1 b) ¼ c) ½ d) none Ans: (a)

LEARN FROM EXPERIENCE

Q9) What is the equivalent resistance between AB when each branch resistance is 2 ohms?



a) 3.23 ohm   b) 2 ohm   c) difficult to find   d) none   Ans:(a)

DUAL CIRCUITS

Q1)1M The dual of a series R-L circuit is a

a) series R-C circuit b) series L-C circuit c) parallel L-C circuit d) parallel R-C circuit.   Ans: (d)

Q2)1M Which of the following elements are always equal in number in a pair of dual networks?

a) voltage sources b) capacitors c)resistors d) inductors   Ans:(c)

Q3)1M A network has three resistors, four inductors and five capacitors then the number of resistors, inductors and capacitors in its dual network will respectively be

a) 3,4,5   b) 3,5,4   c) 4,5,3   d) 5,3,4   Ans:(b)

Q4) A network N is a dual of network N if

a) both of them have same mesh equation b) both of them have the same node equations c) Mesh equations of one are the node equations of the other d) KCL and KVL equations are the same   Ans: ©

V-I RELATION SHIP IN L AND C

Q1) A unit step voltage is applied across an inductor. The current through the inductor will be

a) zero for all time b) a step function c) a ramp function d) a delta (impulse) function   Ans:(c)

Q2) A ramp current flowing through an initially relaxed capacitor will result in a voltage across it that

a) Varies inversely with time b) remains constant c) varies directly with time d) varies as the square of time.

Ans:(d)

Q3) The voltage v(t) = t u (t) volts is connected across a 1 H inductor having an initial current of -1 A. The net current will be zero at time t equal to

a) 0   b)1/√ 2 second   c) √ 2 sec   d) 1 sec.   Ans:(c)

Q4) A voltage waveform v (t) = 12 t^2 is applied across 1H Inductor for t ≥ 0, with initial current through it being zero. The current through the inductor for t≥0 is given by

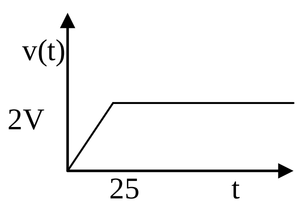
a) 12t   b) 24t   c) 12 t^3 d) 4 t^3 Ans: (d)

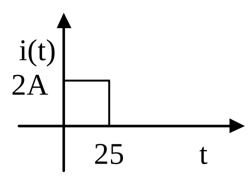
Q5) It is desired to have a constant direct current i (t) through the ideal inductor L. The nature of the voltage source v (t) must

a) Constant voltage   b) Linearly increasing voltage   c) an ideal impulse

d) Exponentially increasing voltage.   Ans: (c)

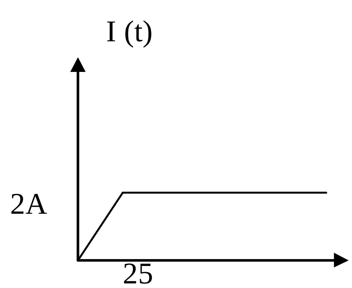
Q6) For the current and voltage waveforms, identify the element & its value.

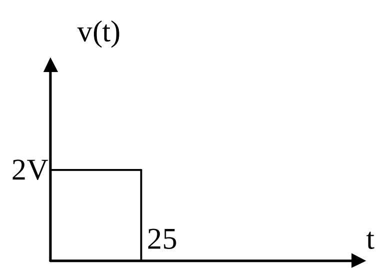




a) L, 25   b) C, 25   c) L, 2   d) C, 2   Ans:(b).

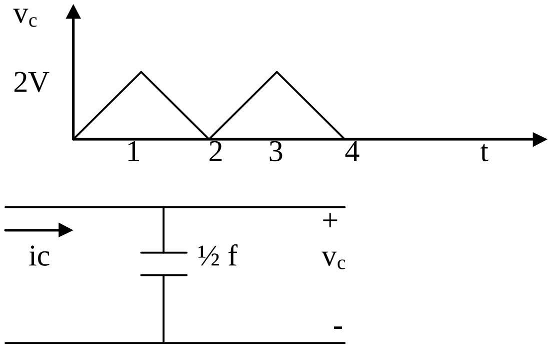
Q7) The voltage and current waveforms for an element are shown in fig, Find the circuit element and its value is



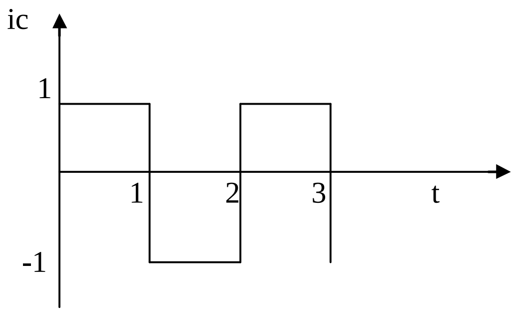


a) L and 25 b) C and 25 c)L and 1H d) C and 1H   Ans: (a)

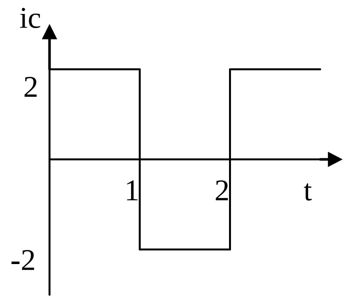
Q8) What is the ic wave form when the wave form v_c is given



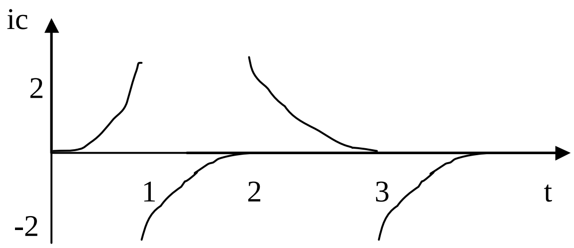
a)



b)



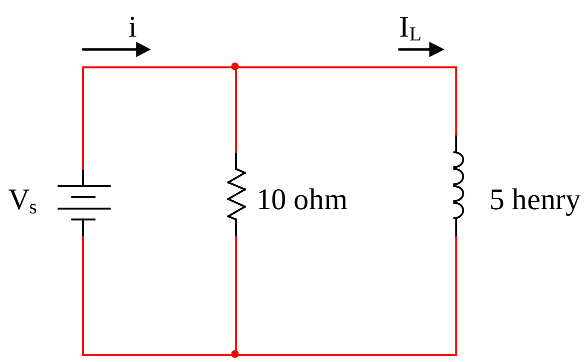
c)



d) None

Ans: (a)

Q9) If $V_s = 40t$ V for $t > 0$ and $i_L(0) = 5A$, what is the value of i(t) at t = 2sec

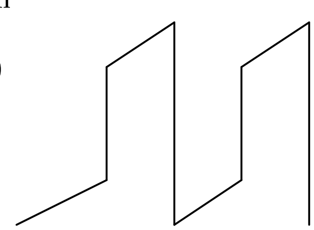


a) 24A b) 34A c) 29A d) 39A

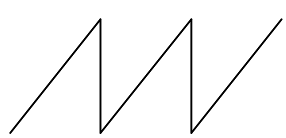
Ans:(c)

Q10) When a periodic triangular voltage of peak to peak amplitude 1V and frequency 0.5 HZ is applied to a parallel combination of 1 ohms resistance and 1F capacitance, the current through the voltage source has the wave form

a)

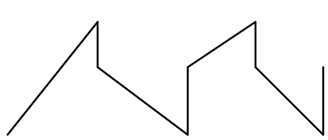


b)

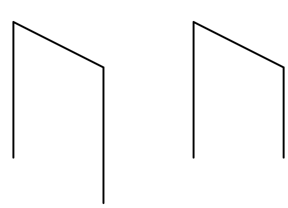


Ans: (c)

c)

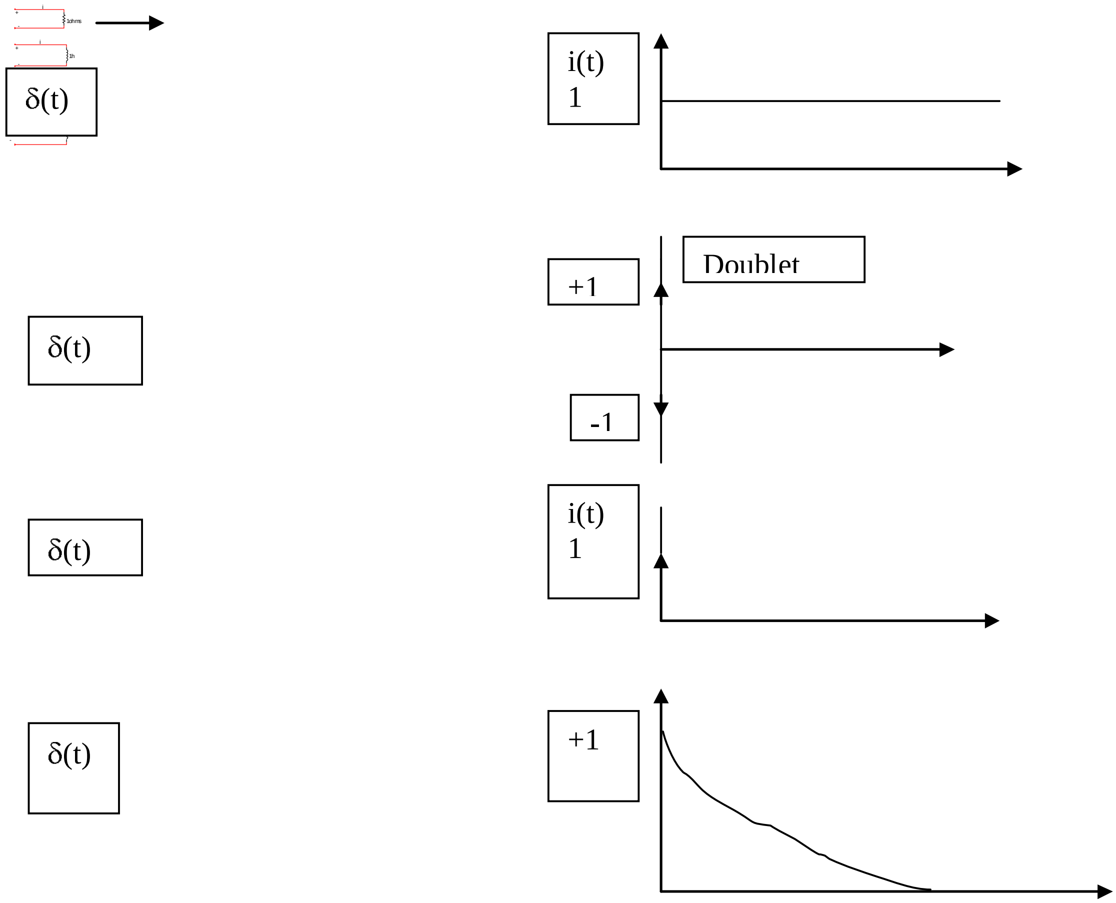


d)



Q11) Match the following from list –1 to list-2

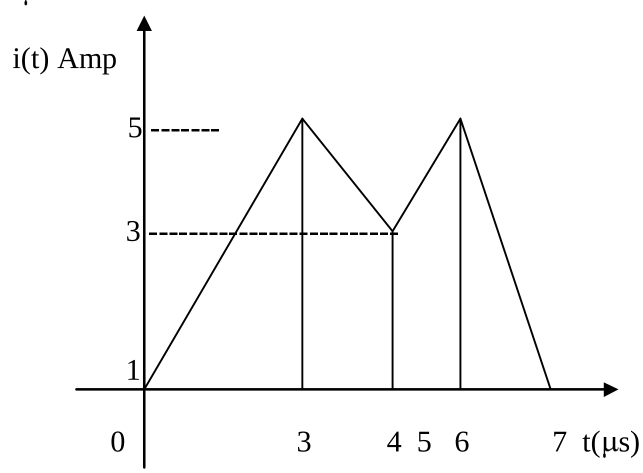
List –1 List-2



	A	B	C	D
a)	1	3	2	4
b)	3	1	2	4
c)	1	3	4	2
d)	3	1	4	2

Ans: (b)

Q12) A current i(t) as shown in the fig. is passed through a capacitor. The charge (in micro- coulomb acquired by the capacitor after 5μs is

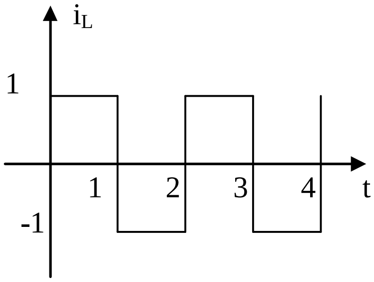


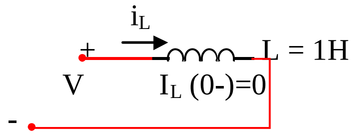
a) 7.5 b) 13.5 c) 14.5 d) 15

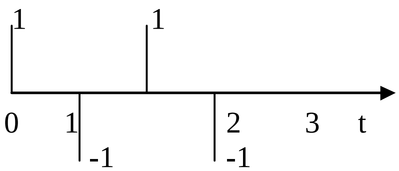
Ans:(a)

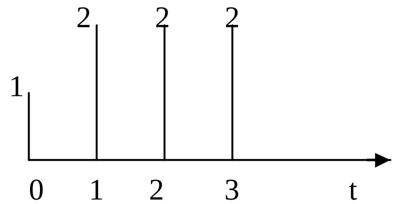
DON'T BE A CONDITIONAL LOVER

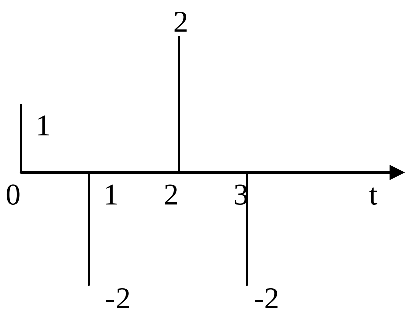
Q13) Current waveform as shown is passing through inductor. Find voltage across L.





a) 

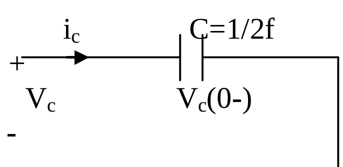
b) 

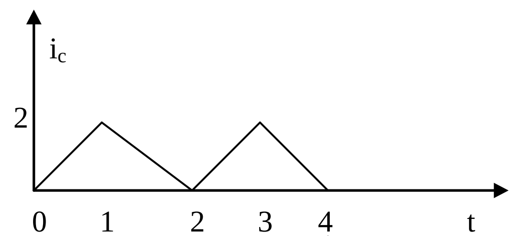
c) 

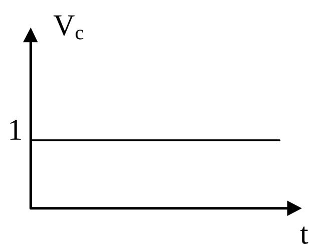
d) none

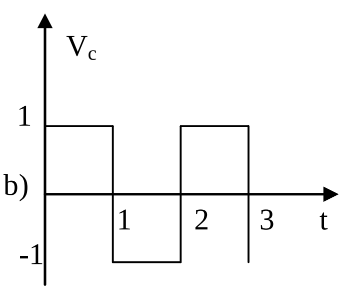
Ans: ©

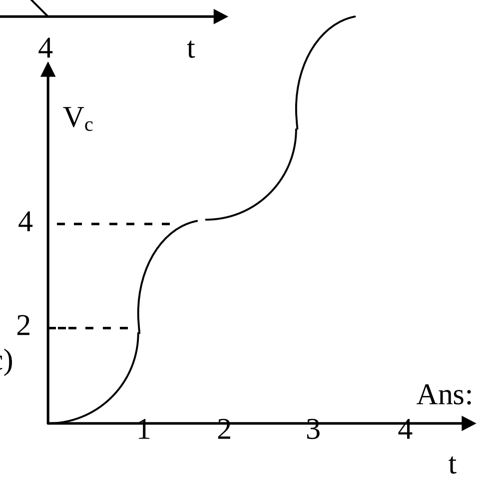
Q14) The current wave form as shown is passing through capacitor, find V_c = ?





a) 

b) 

c) 

d) none

Ans: ©

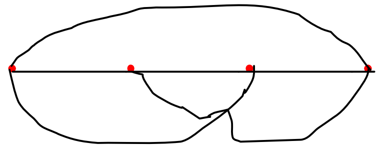
Q15) When a unit impulse voltage is applied to the inductor of 1H, the energy supplied by the source is

a) Infinite b) 1 J c) ½ J d) 0J Ans: (c)

PRACTICE MAKES MAN PERFECT

GRAPH THEORY

Q1) Identify the graph



a) Planner b) Non planner c) Spanning sub graph d) None Ans: (a)

Q2) What is the relation between edges e, chords c, and vertices v

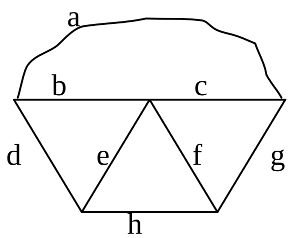
a) c=e-(v-1) b) c=e-v-1 c) v=e-c+1 d) none Ans:(a)

Q3) Tie –set is a dual of

a) KVL b) Cut set c) Spanning sub graph d) None Ans:(b)

Q4) Identity which of the following is not a tree of the graph shown

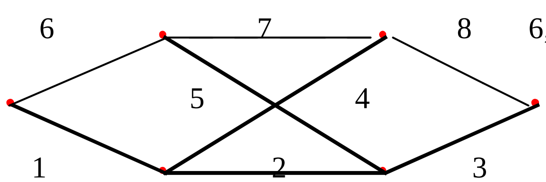
a) begh b) defg c) abfg d) aegh Ans:(c)



Q5) The total no.of f-cuts in a graph is, where v is no. of vertices

a) v –1 b) v c) v+1 d) none Ans: (a)

Q6) The following is invalid f- cut-set for the tree given.



6,7,8 are the links

a) 1,6 b) 2,6,7,8 c)4,6,7 d)2,3,4 Ans: (d)

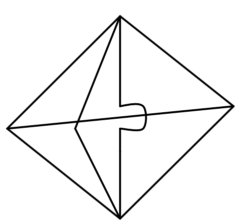
Q7) For a connected graph of e, edges and v vertices a set of --------------- f- circuit with respect to a tree constitutes a complete set of independent circuits of the graph.

a) e-v+1 b)e-v-1 c)e+v-1 d) none Ans:(a)

Q8) The rank of incident matrix(A_a) is at most ,where v is no of vertices of the graph

a) v b) v-1 c) v-2 d) v+1 Ans: (b)

Q9) This graph is called as



a) Planner b) non planner c) complete d) none Ans: (a).

Q10) Edge of co-tree is

a) chord b) Twig c) branch d) none. Ans: (a)

Q11) Another name of tree

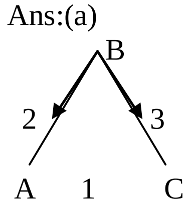
a) Complete graph b) spanning sub graph c) twig d) none. Ans; (b)

Q12) The relationship between total no of vertices (N), total no of edges (E) and total no of chords (C)

a) C = E – (N-1) b) C = E – N –1 c) E = C – (N+1) d) none Ans: (a)

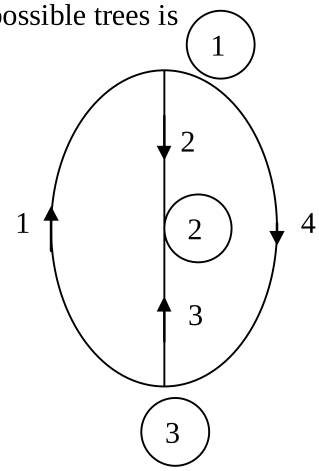
Q13) For the graph as shown in the fig, the incidence matrix A is given by Ans:(a)

a) $\begin{bmatrix} 1 & -1 & 0 \\ 0 & 1 & 1 \\ -1 & 0 & -1 \end{bmatrix}$ b) $\begin{bmatrix} 1 & 0 & -1 \\ 1 & 1 & 0 \\ 0 & -1 & 1 \end{bmatrix}$ c) $\begin{bmatrix} -1 & -1 & 0 \\ 0 & 1 & 1 \\ 1 & 0 & -1 \end{bmatrix}$ d) $\begin{bmatrix} 1 & -1 & 0 \\ 0 & 1 & 1 \\ -1 & 0 & -1 \end{bmatrix}$

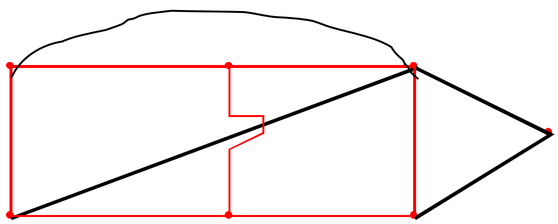


Q14) The number of chords in a graph with b number of branches and n number of nodes is
a) b-n+1 b) b+n-1 c) b+n d) b-n Ans:(a)
Q15) The number of edges in a complete graph of n vertices is
a) n(n – 1) b) n(n-1) / 2 c) n d) n-1 Ans:(b)

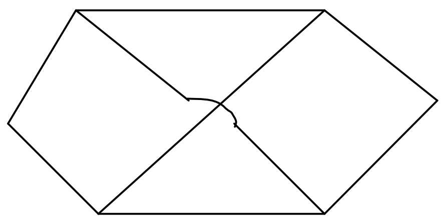
Q16) For the graph shown in fig. The number of possible trees is
a) 6 b) 5 c) 4 d) 3. Ans: (b)



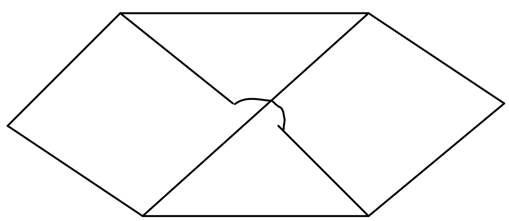
Q17) Identify the graph = ?



a) non planar graph b) planar c) spanning sub graph d) complete graph. Ans: (b)
Q18)Identify the graph.



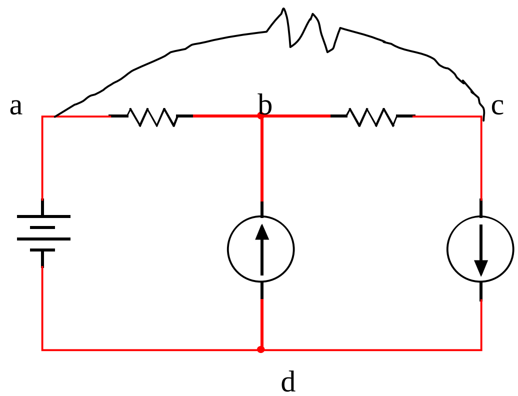
a) Non planner b) planner c) spanning d) complete graph Ans: (b)
Q19) In the fig: number of fundamental cut sets

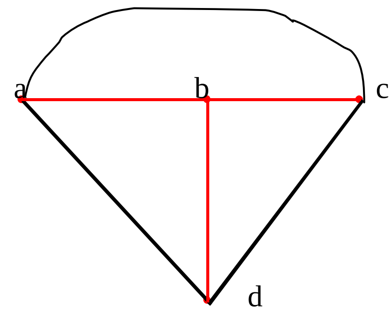


a) 2 b) 3 c) 4 d) 5 Ans: (d)
Q20) Rank of incident matrix is, where v is vertex
a) v b) v-1 c) v+1 d) none Ans: (b)

THE VIRTUES OF HONESTY AND COURAGE BRING SUCCESS

Q21) Fig given below shows a d c resistive network and its graph is drawn aside. A proper tree chosen for analyzing the network will contain the edges



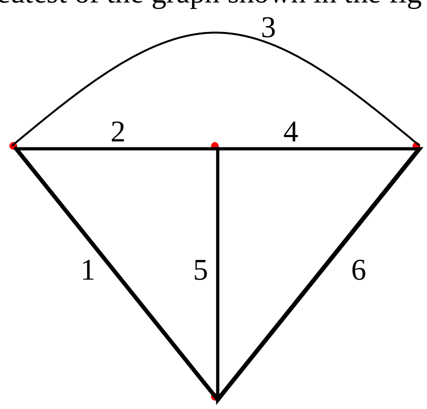


a) ab, bc, ad   b) ab, bc, ca   c) ab, bd, cd   d) ac,bd,ad   Ans: (a)

Q22) Which one of the following is a cutest of the graph shown in the fig

a) 1,2,3,4
b) 2,3,4,6
c) 1,4,5,6
d) 1,3,4,5

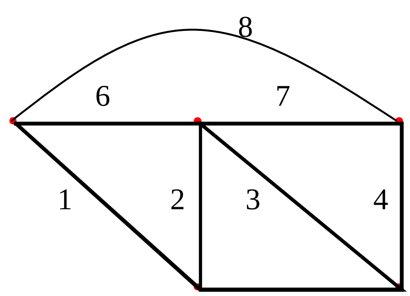
Ans: (d)



Q23) In the graph shown one possible tree is formed by the branches 4,5,6,7 then one possible fundamental loop is

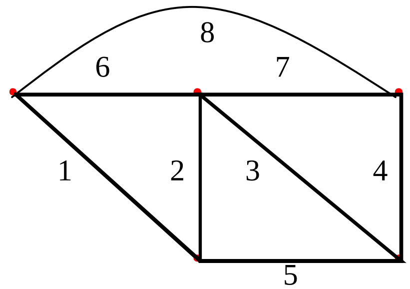
a) 1,4,5
b) 2,3,5
c) 3,4,8
d) 6,7,8

Ans: (b)



UNDERSTANDING BRINGS HAPPINESS
TO BE HAPPY IS TO LET GO THROUGH THE MIND AND NOT JUST THROUGH WORDS

Q24) Match the following, the tree branch 1,2,3 and 8 of the graph shown in



List A	List B
A) Twig	1) 4,5,6,7
B) Link	2) 1,2,3,8
C) Fundamental cutest	3) 1,2,3,4,8
D) Fundamental loop	4) 4,7,8

	A	B	C	D
a)	2	1	4	3
b)	3	2	1	4
c)	1	4	3	2
d)	3	4	1	2

Ans: (a)

RMS AND AVERAGE VALUES

Q1) $I_1 = 120 \text{ Cos } (100\Pi t + 30)$ and $I_2 = -0.1 \text{ Cos } (100\Pi t + 100)$, I_2 leads I_1 by: -----------------
a) -110 deg b) 60 deg c) –60 deg d) 110 deg Ans:(a)

Q2) V_1 leads V_2 by if $V_1 = \sin(wt + 30^0)$, $V_2 = -5 \sin(wt - 15^0)$
a) 225^0 b) 30^0 c) 45^0 d) none. Ans: (a)

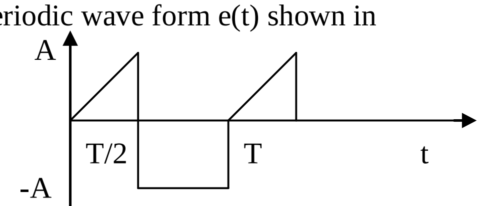
Q3) The RMS value of a rectangular wave of period T, having a value of + V for a duration, T_1 (< T) and –V for the duration $T - T_1 = T_2$ equals.
a) V b) $(T_1 - T_2) / T * V$ c) $V / \sqrt{2}$ d) $(T_1 / T_2)*$ V Ans: (a)

Q4) Sin 5 t + cos 5t = f(t) What is f(t)rms
a) 1 b) 0.707 c) 1.414 d) None Ans:(a)

Q5) f(t) = Sin 10t + Sin 20t ; What is the rms value of f(t)
a)1 b) 1/2 c) $1/\sqrt{2}$ d) $\sqrt{2}$ Ans : (a)

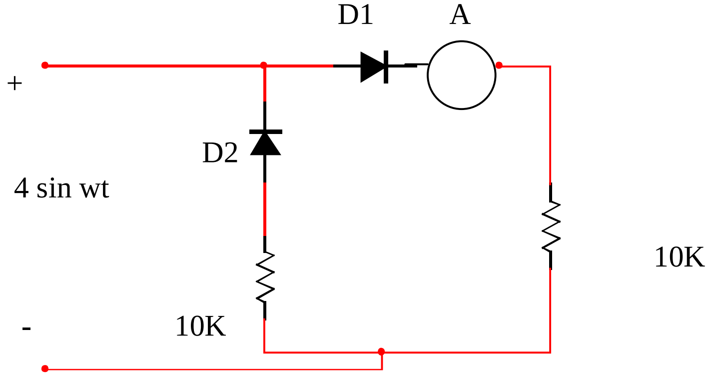
Q6) $f(t) = 2 + \cos(wt+\pi)$, the ratio of V_{rms} / V_{ave}
a) $3/2\sqrt{2}$ b) $\sqrt{3}/2$ c) π d) $\pi/2$ Ans:(a)

Q7) The rms value of the periodic wave form e(t) shown in



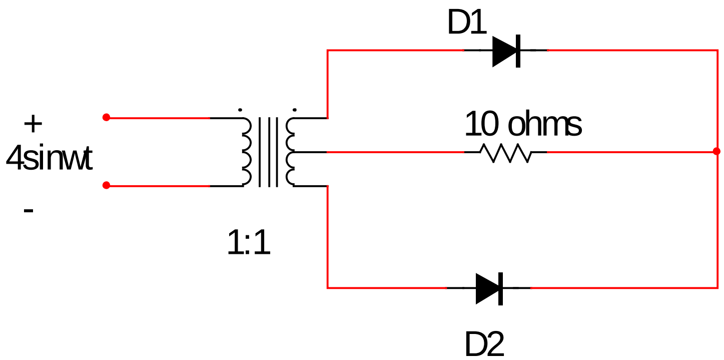
a) $A\sqrt{(3/2)}$ b) $A\sqrt{(2/3)}$ c) $A\sqrt{(1/3)}$ d) $A\sqrt{2}$ Ans: (b)

Q8) Assume that diodes are ideal and the meter is an average indicating ammeter. The ammeter will read



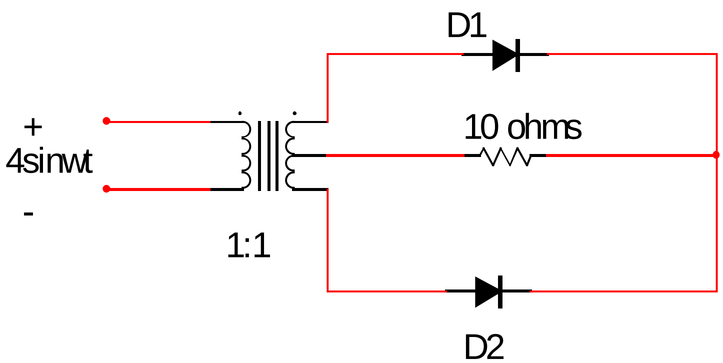
a) $0.4\sqrt{2}$ ma b)0.4 ma c) $0.8/\pi$ ma d) $0.4/\pi$ ma Ans: (d)

Q9) Assume that the diodes are ideal and ammeter is average indicating meter. The ammeter which is in series with 10 ohms resistor will read



a) 0.8 / ∏ b) 0.4 / ∏ c) 0.2 / ∏ d) none. Ans :(b)

Q10) Assume that the diodes are ideal. What is the average power dissipated by the resistor



a) 0.1W b) 0.2W c) 0.162W d) none Ans: (b)

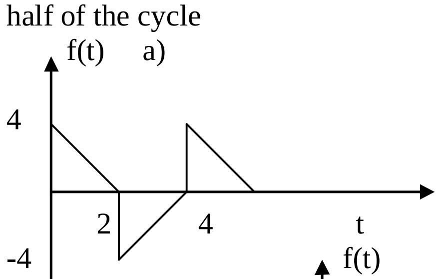
Q11) A periodic signal x(t) of period T_o is given by x (t) = {1, $|t| < T_1$ 0, $T_1 < |t| < (T_0\ 2)$}.The d.c. component of x (t) is

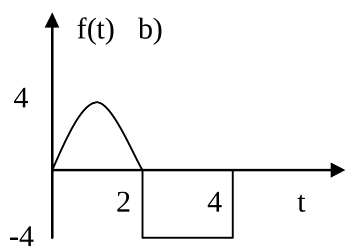
a) T_1 / T_0 b)$T_1/ 2T_0$ c)$2T_1 /T_0$ d) T_0 / T_1 Ans: (c)

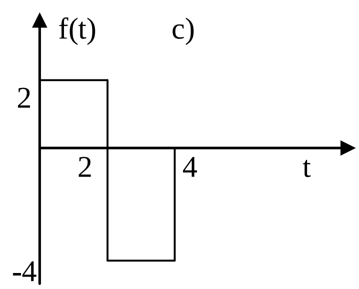
Q12) The r.m.s. value of the current $I_0 + I_1 \cos \omega t + I_2 \sin 2\omega t$ is

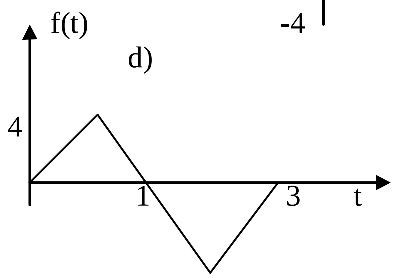
a) $(I_0 + I_1 + I_2) / \sqrt{2}$ b)$\sqrt{(I_0^2 + I_1^2 + I_2^2)}$ c)$\sqrt{(I_0^2 + I_1^2/2 + I_2^2/2)}$ d)$\sqrt{(I_0^2 + (I_1 + I_2)^2) / 2}$ Ans:(c)

Q13) Which of the following waveforms can satisfy property that RMS of the full cycle is same as RMS of the half of the cycle





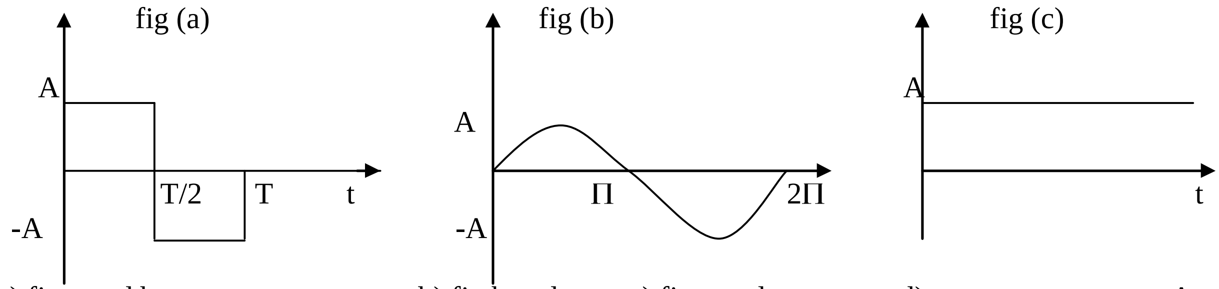




Ans: (a)

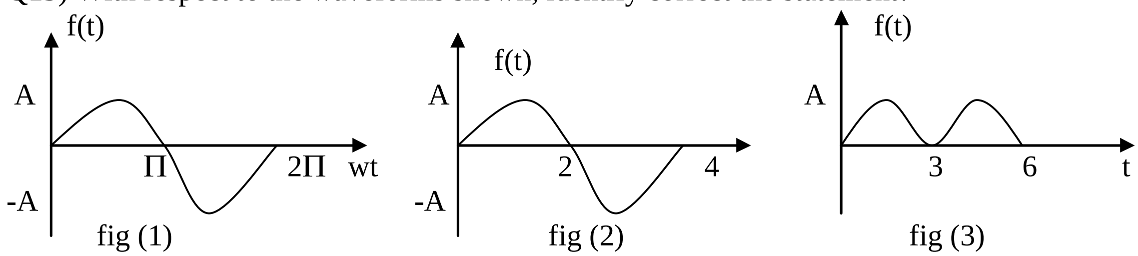
FIRST DISEASES STARTS IN MIND AND SPREAD INTO BODY LATER HENCE ALWAYS THINK GOOD

Q14) Which of the waveforms are having unity peak factor?



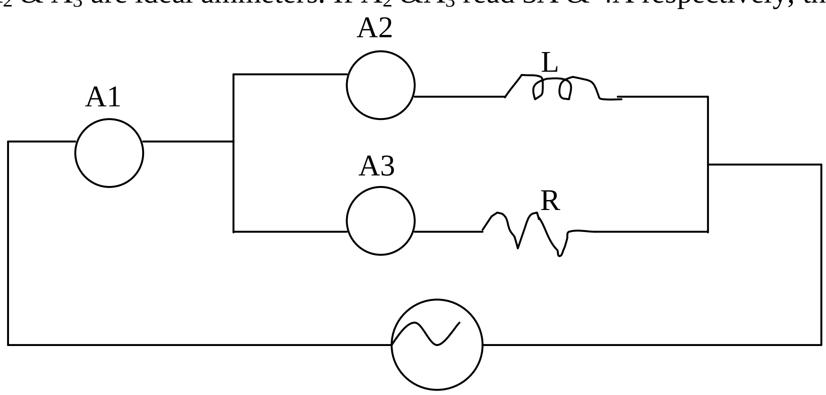
a) fig a and b b) fig b and c c) fig a and c d) none Ans: (b)

Q15) With respect to the waveforms shown, identify correct the statement?



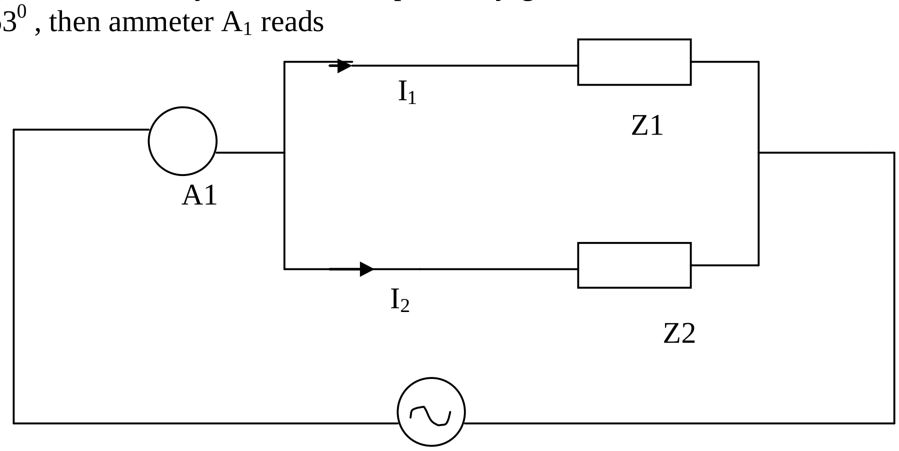
a) all the waveforms will have equal RMS values b) no two waveforms will have same RMS values
c) fig (1) RMS=A/√ 2 ; fig (2) RMS= A/2; fig (3) RMS = A/2 d) none Ans: (a)

Q16) A_1 A_2 & A_3 are ideal ammeters. If A_2 &A_3 read 3A & 4A respectively, then A_1 should read



a) 1A b)5A c) 7A d)none Ans:(b)

Q17) Given $Z_1 = 3 + j4$ and Z_2 is complex conjugate of Z_1. The current I_1 is $4/\sqrt{2} \angle -43^0$ rms and I_2 is $4/\sqrt{2} \angle -63^0$, then ammeter A_1 reads



a) 5.55rms b) 4rms c) $8/\sqrt{2}$ d) none. Ans: (a)

STEADY STATE ANALYSIS

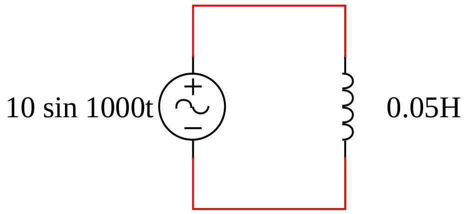
Q1) Inductor acts like for a ac signal in the steady state
a) Open b) closed c) Neither open nor closed d) none Ans: (c)

Q2) The final value theorem is used to find the
a) steady state value of the system output b)initial value of the system output c) transient behavior of the system output d) none of these. Ans:(a)

Q3) A unit step current is impressed across a parallel 3 Ω, 2F circuit. Under steady state, the capacitor voltage will be

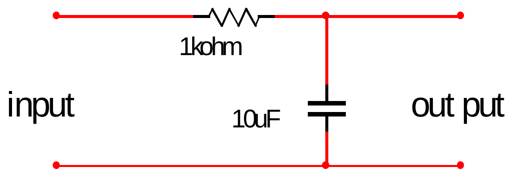
a) 3V b) 2V c) 1V d) 0 Ans:(a)

Q4) In the given circuit, current in amp is



a) -0.2 cos 1000t b) 0.2 cos 1000t c) -0.2 sin 1000t d) 0.2sin 1000t Ans: (a)

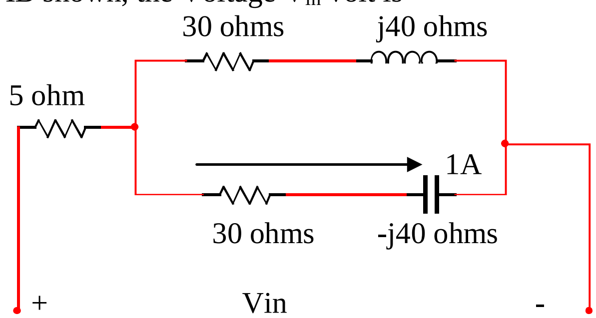
Q5) The steady state o/p voltage corresponding to the input voltage 3 + 4 sin 100t v is



a) $3 + 4/\sqrt{2}\sin(100t - \Pi/4)$ b) $3 + 4\sqrt{2}\sin(100t - \Pi/4)$

c) $3/2 + 4/\sqrt{2}\sin(100t + \Pi/4)$ d) $3 + 4\sin(100t + \Pi/4)$ v Ans: (a)

Q6) For the current in branch AB shown, the Voltage V_{in} volt is



a) 55 b) 110 c) 56 d) 90 Ans: (c)

Q7) $H(S) = (S+2) / (S^2 + S + 4)$ $x(t) = \cos 2t$; $y(t) = \cos(2t + \phi)$, what is ϕ?

a) 45^0 b) 0^0 c) -45^0 d) -90^0 Ans: (c)

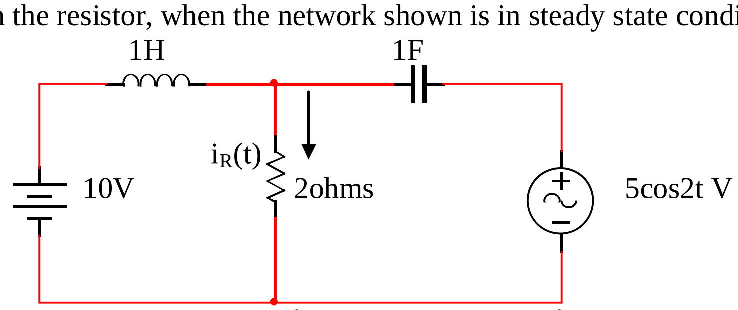
Q8) In a linear system, an input of 5cos wt produces an output of 10 cos wt. The output corresponding to input 10 cos wt will be equal to

a) 20coswt b) –5 sin wt c) 20 sin wt d) – 20 sin wt Ans: (a)

Q9) Currents I_1, I_2 & I_3 meet at a Junction in a circuit. All currents are marked as entering the node. If I_1 = -6 Sin wt mA & I_2 = 8cos wt mA, then I_3 will be Ans:(a)

a)10 cos (wt + 36.87) mA b) 14 cos (wt + 36.87) mA c) –14 sin (wt + 36.87)mA d) –14 sin (wt + 36.87) mA

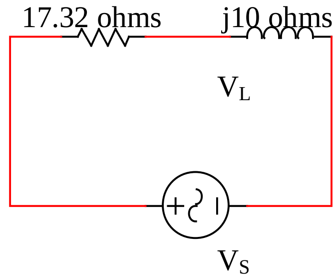
Q10) Find $i_R(t)$ through the resistor, when the network shown is in steady state condition.



a) $5+2.23\cos(2t-26.56^0)$ b) $5+2.23\cos(2t+26.56^0)$ c) $2.23\cos(2t-26.56^0)$ d) none Ans: (a)

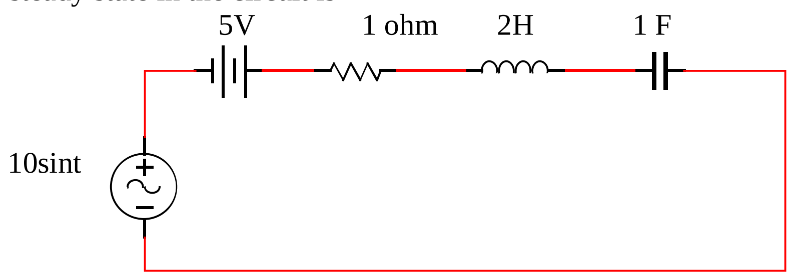
WHEN I AM IN THE ELEVATED COMPANY OF THE ONE GOD, NO BAD COMPANY WILL INFLUENCE ME

Q11) In the circuit shown V_s has a phase angle of________________ with respect to V_L



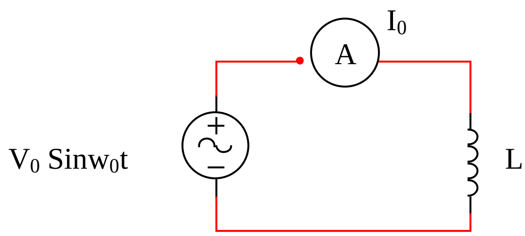
a) 60 b)-60 c)30 d)-30 Ans: (b)

Q12) i(t) under steady state in the circuit is



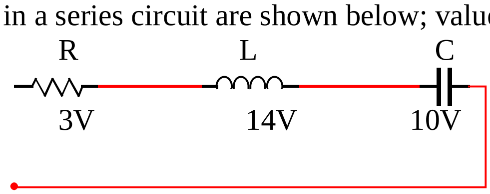
a) 0 b) 5 c) 7.07 sin t d) 7.07 sin (t-45) Ans: (d)

Q13) When a voltage Vo sin w_0t is applied to the pure inductor, the ammeter shown reads Io. If the voltage applied is – Vo sin w_0t + 2Vo sin w_0t - $3V_0$ sin w_0t + $4V_0$ sin $4w_0t$.



a) 0 b) 10 Io c) $\sqrt{(4^2 + 3^2 + 2^2 + 1)}$ d) 2Io Ans:(d)

Q14) Voltage on R, L, C in a series circuit are shown below; value of voltage source is



a) 10V b)-27V c) 27V d) 5V Ans:(d)

Q15) An alternating current source having voltage E= 110 sin ($\omega t + (\pi/3)$) is connected in an a.c. circuit . If the current drawn from the circuit varies as I = 5 sin ($\omega t - (\pi / 3)$). Impedance of the circuit will be

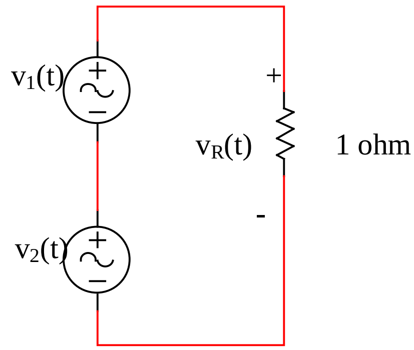
a) 22Ω b)16Ω c) 30.8Ω d) None of the above Ans:(a)

Q16) The impulse response of a first order system is Ke^{-2t}. If the signal is sin2t, then the steady state response will be given by Ans:(c)

a) $\frac{1}{2\sqrt{2}} \sin\left(2t + \frac{\pi}{4}\right)$ b) $\frac{1}{4} \sin 2t$ c) $\frac{K}{2\sqrt{2}} \sin\left(2t - \frac{\pi}{4}\right)$ d) $\frac{1}{2\sqrt{2}} \sin\left(2t - \frac{\pi}{4}\right) + Ke^{-2t}$

TO SEE OTHERS AS FLAWLESS DIAMONDS IS TO BE FREE FROM NEGATIVITY

Q17) Let $v_1(t) = V_{m1} \cos(w_1 t + \theta_1)$, $v_2(t) = V_{m2} \cos(w_2 t + \theta_2)$ under what conditions, the super position theorem is not applicable to compute power in R = 1ohm



a) $w_1 = w_2$ $\theta_1 - \theta_2 \neq \pm K\ \Pi/2$ b) $w_1 = w_2$ $(\theta_1 - \theta_2) = \pm K\Pi/2$ c) $w_1 \neq w_2$ d) none Ans : (a)

Q18) An input voltage $v(t) = 10\sqrt{2}\cos(t+10^0) + 10\sqrt{3}\cos(2t+10^0)$ V is applied to a series combination of resistance $R = 1\Omega$ and an inductance l = 1H. The resulting steady state current i(t) in ampere is

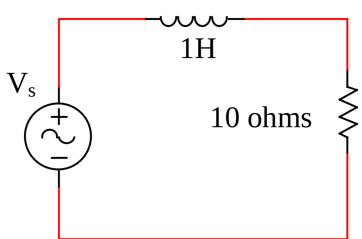
a) $10\cos(t+55^0) + 10\cos(2t+10^0 + \tan^{-1}2)$ b) $10\cos(t+55^0) + 10\sqrt{3}/2\cos(2t+55^0)$

c) $10\cos(t-35^0) + 10\cos(2t+10^0 - \tan^{-1}2)$ e) $10\cos(t-35^0) + 10\sqrt{3}/2\cos(2t-35^0)$ Ans: ( )

Q19) Find the angle V_1 leads V_2 by if $V_1=\sin(wt+30^0)$ and a) $V_2=-5\sin(wt-15^0)$ and b) $V_2=-6\cos(wt+75^0)$

a)225^0 and 30^0 b) 225^0 and 45^0 c) 30^0 and 45^0 d) 30^0 and 90^0 Ans: (b)

Q20)Let $V_s = 5\sin 2t + 10\sin t$. Find i(t).

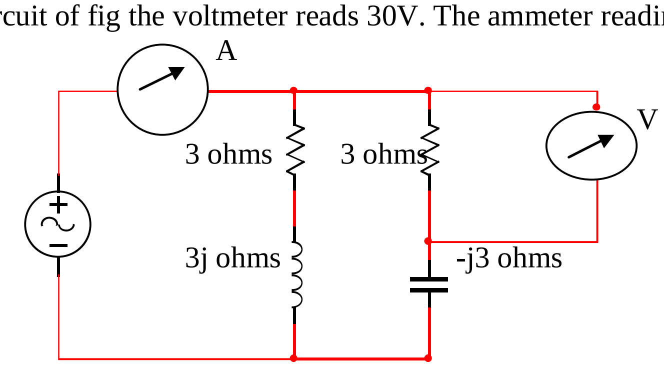


a)$0.49[\cos(2t+78.7^0)+2\cos(t+84.3^0)]$ b)$0.49[\cos9t-101^0)+0.98\cos(2t+95.7^0)]$ c)$0.49\cos(t+78.7^0)$

d)$0.49\cos(t+84.3^0)$ Ans:(a)

Q21) A 159.23 μf capacitor in parallel with a resistance R draws a current of 25 A from 300V 50 HF mains. Using phasor diagram, find the frequency f at which this combination draws the same current from a 360 v mains.

Q22) In the circuit of fig the voltmeter reads 30V. The ammeter reading must be

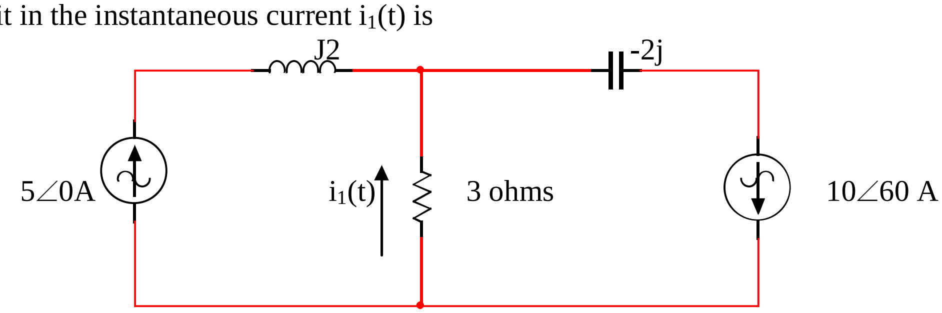


a) zero b)10A c) $10\sqrt{2}$ d) 20A Ans:(c)

Q23)In the circuit $V_s= V_m\sin 2t$ and $Z_2=1+j$. What is the value of C so that the current I is in phase with V_s.

a) ¼ b) $1/2\sqrt{2}$ c) 2 d) 4 Ans: (a)

Q24) For the circuit in the instantaneous current $i_1(t)$ is



a) $10\sqrt{3}/2\ \angle 90$ A b) $10\sqrt{3}/2\ \angle -90$ A c) $5\ \angle 60$ A d) $5\ \angle -60$ A Ans: (a)

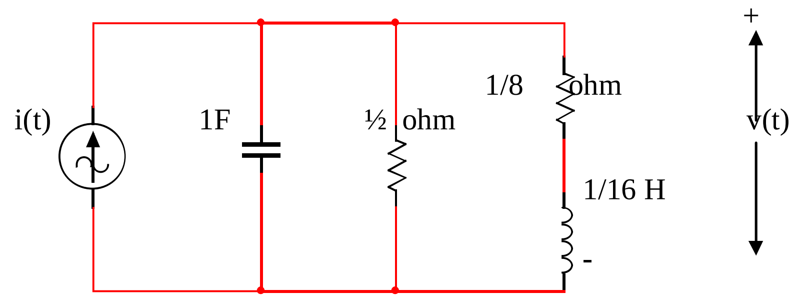
Q25) The system function $H(s) = 1 / (S+1)$. For an input signal cos t, the steady state response is

a) $(1/\sqrt{2}) \cos [t - \pi/4]$ b) cos t c) $\cos [t-\pi/4]$ d) $(1/\sqrt{2}) \cos t$ Ans: (a)

Q26) An input voltage $v(t) = 10\sqrt{2} \cos (t+10^0) + 10\sqrt{3} \cos (2t+10^0)$ V is applied to a series combination of resistance R = 1Ω and an inductance L = 1H. The resulting steady state current i(t) in ampere is

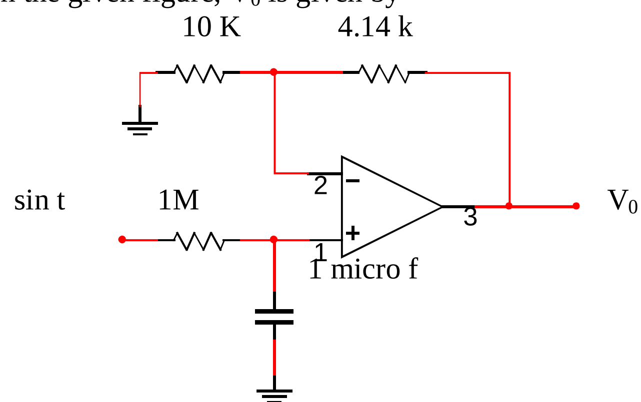
a) $10 \cos (t+55^0) + 10 \cos (2t+10^0 + \tan^{-1} 2)$ b) $10 \cos (t+55^0) + 10\sqrt{(3/2)} \cos (2t+55^0)$
c) $10 \cos (t-35^0) + 10 \cos (2t+10^0 - \tan^{-1} 2)$ d) $10 \cos (t-35^0) + 10\sqrt{(3/2)} \cos (2t-35^0)$ Ans: ©

Q27) In the circuit shown in the figure, i(t) is a unit step current. The steady-state value of v(t) is



a) 2.5 V b) 1V c) 0.1V d) zero Ans: ©

Q28) In the circuit shown in the given figure, V_0 is given by



a) $\sin [t - \pi / 4]$ b) $\sin [t + \pi /4]$ c) sin t d) cos t Ans: (a)

POWER TRIANGLE

Q1) In a highly inductive circuit, a small capacitance is added in series. The angle between the applied voltage and resultant current will

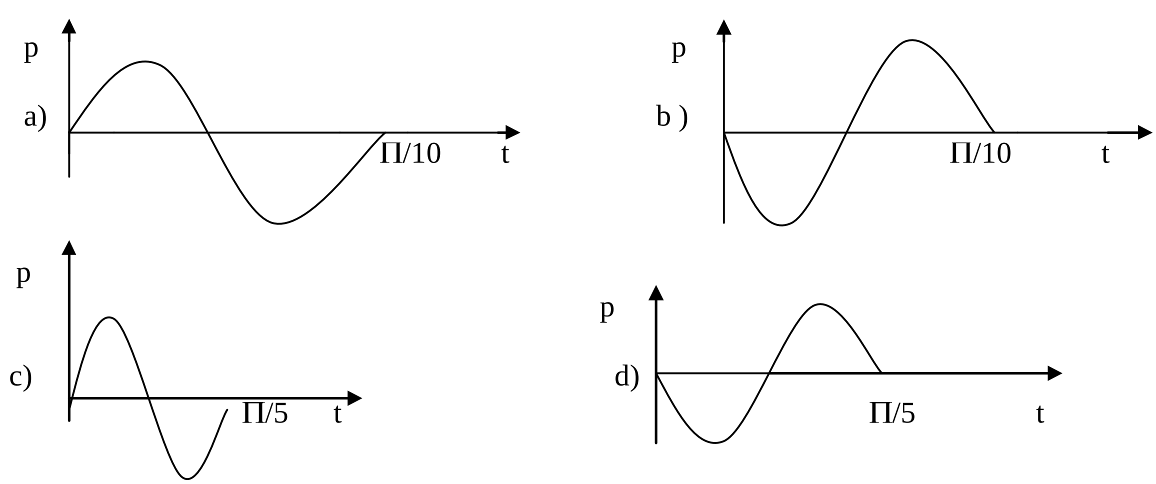
a) Increase b) decrease c) remain constant d) None Ans:(b)

Q2) A water boiler at home is switched on to the ac mains supplying power at 230V/50hz. The frequency of instantaneous power consumed by the boiler is

a) 0 hz b) 50hz c) 100hz d) 150hz Ans:(c)

Q3) The instantaneous power wave from for the pure inductor is when $V_{in} = V_m \sin 10t$.

Ans : (b)



Q4) A Voltage source of $20 \angle 30^0$ is supplying current of $5 \angle -30^0$. What is the complex power absorbed by the source

a) $100 \angle -120^0$ b) $100 \angle 60$ c) $100 \angle 0$ d) $100 \angle 180^0$ Ans; (a)

Q5) The current of 10 $\angle 30^0$ is passing through a capacitor, whose capacitive reactance is - j4.The complex power absorbed will be.

a) 0 b) 25 j va c) - 25 j va d) none. Ans :(d)

Q6) Power dissipated in a pure capacitor in watts is

a) 0 b) VI c) $I^2 | x |$ d)none. Ans: (a)

Q7) Voltage of 10$\angle$30 is applied across a capacitor, whose reactance is –j4. The complex power absorbed will be

a) 0 b) 25jva c) –25jva d) none Ans: (c)

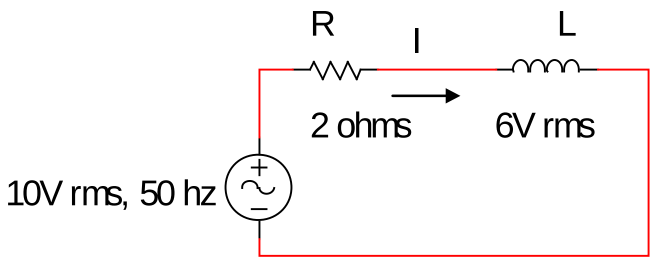
Q8) The voltage phasor of a circuit is 10$\angle 15^0$ V and the current phasor is 2$\angle$-45^0 A. The active and reactive powers in the circuit are

a) 10W and 17.32 var b) 5W and 8.66 var c) 20W and 60 var Ans:(a)

Q9) The average power supplied to an impedance when the current through it is 7 – j4 A and the voltage across it is 2 + j3 V will be

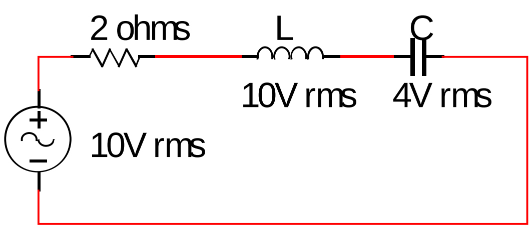
a) 2W b) 7W c) 14W d) 26W Ans:(a)

Q10) The rms value of the current shown in fig is



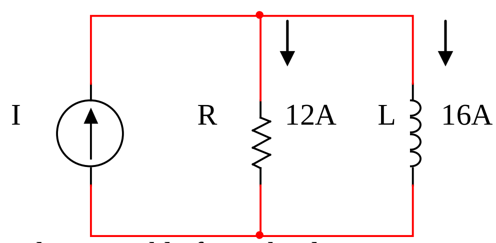
a) 2 b) 4 c) 5 d) 8 Ans:(b)

Q11) The rms value of current in the circuit shown ?



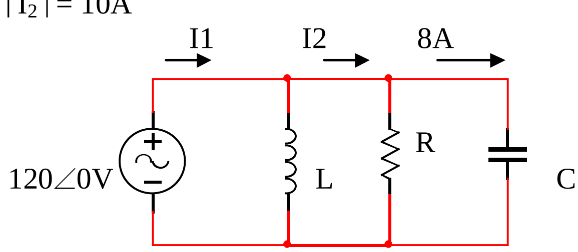
a) 2 b) 5 c) 4 d) none. Ans: (c)

Q12) The circuit shown in the fig; the current supplied by the sinusoidal current source I is



a) 28A b) 4A c) 20A d) not determinable from the data given Ans:(c)

Q13) In the circuit, if $|I_1| = |I_2| = 10A$



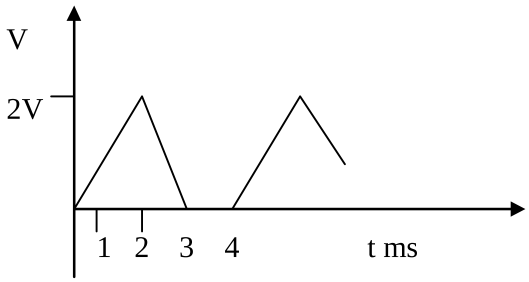
Ans:(c)

a) I_1 will lead by $\tan^{-1}(8/6)$, I_2 will lag by $\tan^{-1}(8/6)$ b) I_1 will lead by $\tan^{-1}(6/8)$, I_2 will lag by $\tan^{-1}(6/8)$

c) I_1 will lag by $\tan^{-1}(8/6)$, I_2 will lead by $\tan^{-1}(8/6)$ d) I_1 will lag by $\tan^{-1}(6/8)$, I_2 will lead by $\tan^{-1}(6/8)$

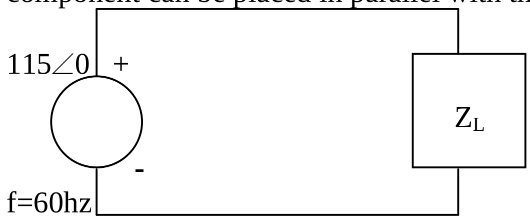
TO BE A MASTER MEANS TO WIN OVER HABITS

Q14) Find the average power delivered to a 10Ω resistor with a voltage across it as shown in the figure.



a) 75mV b)7.5W c)100mW d)75W Ans:(c)

Q15) The circuit shown is used to drive a 2kW motor at a lagging power factor of 0.65. Determine what component can be placed in parallel with the load to increase the factor to 0.95.

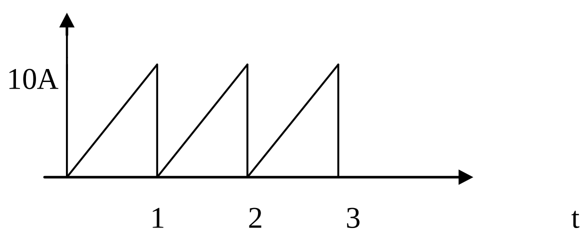


a) 20mF b)337μF c)337mH d)20mH Ans: (b)

Q16) A load with a lagging power of 100kW and an apparent power of 120kVA.if the source supplies 100A rms, determine the inductance or capacitance of the load at 60 Hz.

a)40μH b)147μH c)48mH d)17.6mH Ans:(d)

Q17) Current having wave from shown in the figure is flowing in a resistance of 10Ω the average power is

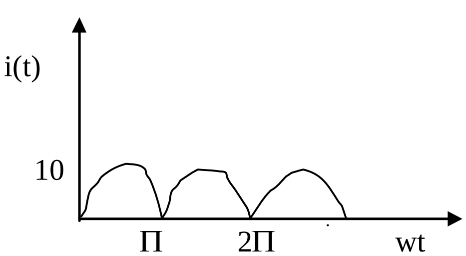


a) 1000 / 1W b) 1000 / 2 W c) 1000 / 3W d) 1000 / 4W Ans:(c)

Q18) The current i(t) , through a 10 Ω resistor in series with an inductor is given by $i(t) = 3+4 \sin (100t + 45^0) + 4 \sin (300t + 60^0)$. The rms value of the current and the power dissipated in the circuit are

a) √ 41 A, 410W b) √ 35A, 350W c) 5A, 250W d) 11A, 1210W Ans:(c)

Q19) The current wave form as shown in fig is passed through resistor of 100Ω. What is the power dissipation in resistor.



a) $(10/\Pi)^2$ 100 b) $(2X\ 10 /\Pi)^2$ 100 c) $(10/\sqrt{2})^2$ 100 d) $(10/2)^2$ 100 Ans:(c)

Q20) $f(t) = \sin t + \sin\sqrt{2}\, t$ is passing through R = 1ohm, what is the power dissipated in 1ohm resistor?

a) 1W b) 2W c) since f(t) in non periodic, not possible to find power d) none. Ans :(a)

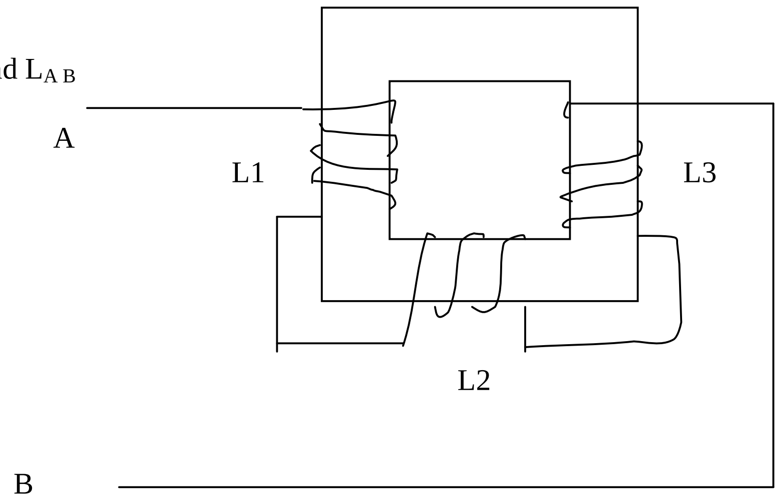
Q21) The current i(t) through a 10 ohm's resistor in series with an inductance is given by $i(t) = 3+ 4 \sin (100t + 45^0) + 4 \sin (300t + 60^0)$. The RMS value of the current and the power dissipated in the circuit are

a) √41 A, 410W b) √ 35, 350 c) 5, 250 d) 11, 1210 Ans: (c)

THERE MUST BE FORGIVENESS ALONG WITH CORRECTION

COUPLING CIRCUITS

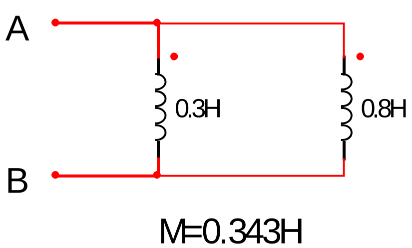
Q1) Find $L_{A\,B}$



Ans: (a)

a) $L_1 + L_2 + L_3 + 2M_{12} - 2M_{23} - 2M_{31}$ b) $L_1 + L_2 + L_3 - 2M_{12} + 2M_{23} + 2M_{31}$
c) $L_1 + L_2 + L_3 + 2M_{12} + 2M_{23} - 2M_{31}$ d) $L_1 + L_2 + L_3 + 2M_{12} + 2M_{23} + 2M_{31}$

Q2) Find $L_{A\,B}$ = ?



a) 0.218 b) 0.296 c) 0.1529 d) none Ans: (b)

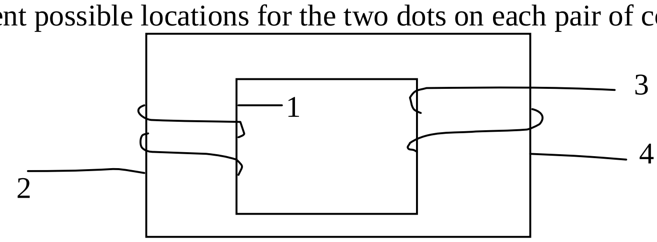
Q3) Two coils connected in series have an equivalent inductance L_A ,if the connection is aiding and an equivalent inductance L_B if the connection is opposing. Find the mutual inductance M in terms of L_A & L_B.

a) $(L_A + L_B) / 2$ b) $L_A + L_B$ c) ¼ $[L_A + L_B]$ d)1/4 $[L_A - L_B]$ Ans:(d)

Q4) Two coupled coils with respective self – inductances $L_1 = 0.5$H and $L_2 = 0.2$ H have a coupling co-efficient K = 0.5 and coil 2 has 1000 turns. If the current in coil 1 is $i_1 = 5 \sin 400t$ amperes, determine maximum flux setup by coil 1

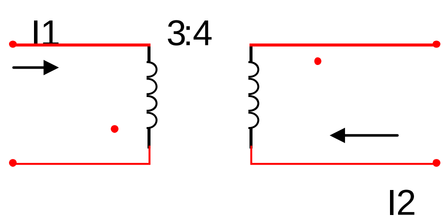
a) 0.4 m wb b) 0.5 m wb c) 1.5 m wb d) none Ans: (c)

Q5) Show two different possible locations for the two dots on each pair of coils.



a) 1 & 3 or 2&4 b) 1&4 or 3&4 c) 1&4 or 3&4 d) none Ans: (a)

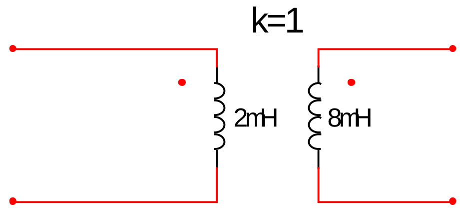
Q6) The ratio of I_2/ I_1 is



a) ¾ b) –3/4 c) 4/3 d) –4/3 Ans: (b)

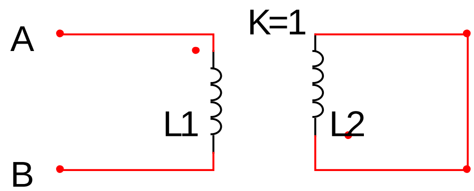
TO REMAIN ALERT MEANS TO PASS THE TEST PAPERS THAT LIFE BRINGS

Q7) What is the transformer turns ratio for the circuit shown



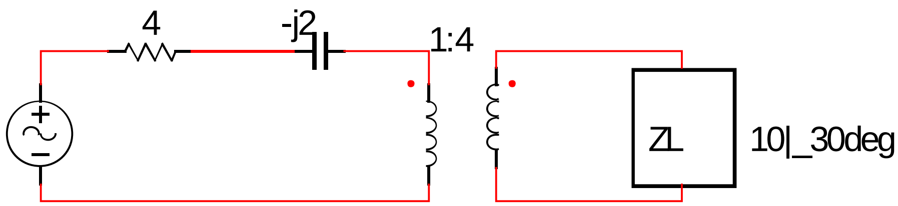
a) 0.5 b) 2 c) 4 d) none Ans: (a)

Q8)Find L_{AB} =?



a) 0 b) $2L_2$ c) $2L_1$ d) none Ans: (a)

Q9) The impedance seen by the source



a) 0.54 + j0.313 b) 4- j2 c) 4.54- j1.69 d) 4+ j2 Ans:(c)

Q10) Two 2H inductance coils are connected in series and are also magnetically coupled to each other, the co-efficient of coupling being 0.1. The total inductance of the combination can be

a) 0.4 H b) 3.2H c) 4.0H d) 4.4H Ans: (d)

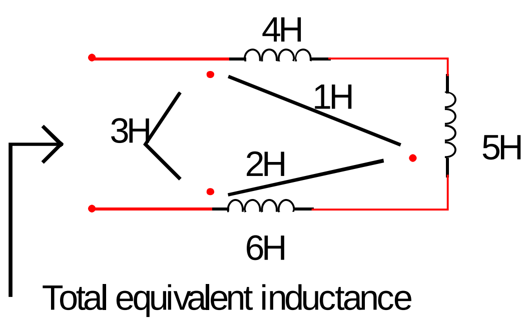
Q11) A coil X of 1000 turns and another coil Y of 2000 turns are placed such that 60% of the flux produces by X links Y. A current of 1A in X produces a flux of 0.1 mwb in it. The mutual inductance between the two coils is

a) 0.12H b) 0.08 H c) 0.06H d) 0.04H Ans: (a)

Q12) Given two coupled inductors L_1 & L_2, their mutual inductance M satisfies

a) $M= \sqrt{(L_1^2 + L_2^2)}$ b) $M > (L_1 + L_2) / 2$ c) $M> \sqrt{L_1 L_2}$ d) $M \subseteq \sqrt{L_1 L_2}$ Ans:(d)

Q13) What is the total equivalent inductance in the fig shown



a) 9H b) 21H c) 11H d) 6H Ans: (c)

Q14) Two coupled coils connected in series have an equivalent inductance of 16 mH or 8 mH depending upon the connection. The value of mutual inductance is

a) 12mH b) $8\sqrt{2}$ mH c) 9mH d) 2mH Ans: (d)

Q15) An ideal transformer of n : 1 trun ratio is to be used for matching a 4 + j3Ω load to a voltage source of 3+ j4 Ω internal impedance. Then n = ?

a) 4/3 b) –4/3 c) 1 d) ¾ Ans ;(c)

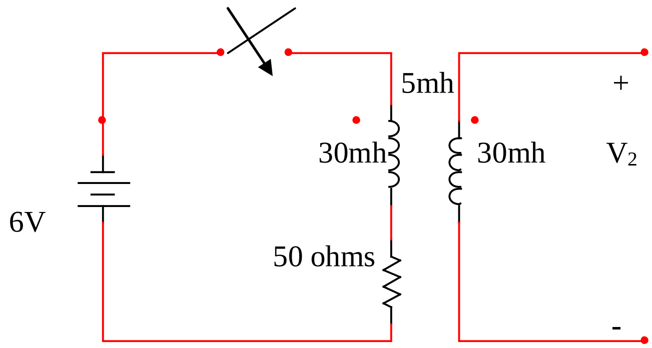
Q16) The coupled inductances L_1 and L_2 , having a mutual inductance M, are connected in series. By a suitable conn is possible to achieve a maximum overall inductance of

a) $L_1 + L_2 – M$ b) $L_1 + L_2$ c) $L_1 +L_2 + M$ d) $L_1 + L_2 +2M$ Ans:(d)

Q17) The relationship between flux ϕ and current I in an inductor L is

a) $\phi = Li$ b) $\phi = L / i$ c) $\phi = L\, di / dt$ d) $I = L\, d\phi / dt$ Ans:(a)

Q18) In the circuit of fig. The switch closed at t=0, the maximum value of V_2 will be



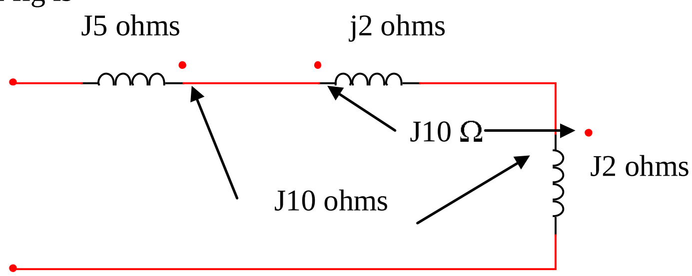
a) 0V b) 1V c) 3.78V d) 6V. Ans:( )

Q19) In a perfect transformer, if L_1 and L_2 are the primary and secondary inductances, and M is the mutual inductance, then

a) $L_1 L_2 - M^2 > 0$ and $L_1 \rightarrow \infty$, $L_2 \rightarrow \infty$ b) $L_1 L_2 - M^2 > 0$ and L_1, L_2 are both finite

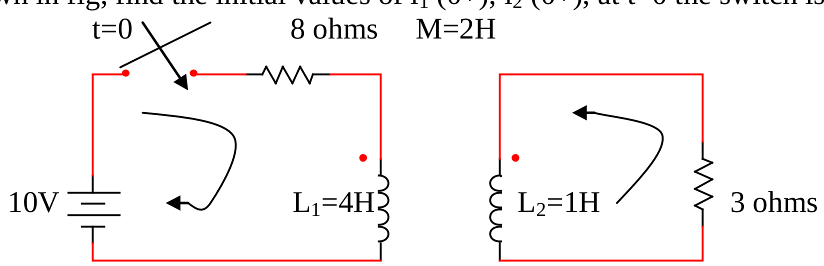
c) $L_1 L_2 - M^2 = 0$ and $L_1 \rightarrow \infty$, $L_2 \rightarrow \infty$ d) $L_1 L_2 - M^2 = 0$ and L_1, L_2 are both finite Ans:(c)

Q20) Impedance Z as shown in fig is



a) j29 ohms b) j9 ohms c) j19 ohms d) j39 ohms Ans: (b)

Q21) The circuit is shown in fig, find the initial values of i_1 (0+); i_2 (0+), at t=0 the switch is closed



a) $i1(0+)=i_2(0+)=0$ b) $i_1(0+)=0.5A; i_2(0+)= -1.0$ c) $i_1(0+)=0; i_2(0+)\neq 0$ d) $i_1(0+)=0.5A; i_2(0+)= -0.5A$ Ans: (b)

SERIES PARALLEL RESONANCE

Q1) The half – power frequency of, series RC circuit is

a) 1/ RC b) RC c) R/C d) C/R Ans;(a)

Q2) For the given parallel resonant circuit, match the following;

A) I at resonance	1) W/R
B) I_L	2) In phase with voltage
C) Dynamic impedance	3) L/CR
	4) Lags the applied voltage.

	A	B	C
a)	4	2	3
b)	2	4	3
c)	4	2	1
d)	2	4	1

Ans;(b)

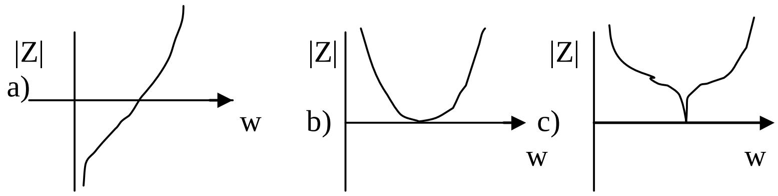
Q3) To increase the Q- factor of an inductor, it can be with

a) Thicker wire b) Thinner wire c) Longer wire

d) Wire with heavy insulation Ans; (a)

MERCY IS TO GIVE COURAGE TO THE ONES WHO ARE WEAK

Q4) given $Z = jWL + 1/jWC$; the magnitude of Z curve will be Ans: (c)



d) none

Q5) The B.W of R.C series circuit is

a) 1/RC b) RC c) ∞ d) none Ans: (c)

Q6) Consider the following statements: In a series RLC resonant circuit, the bandwidth is

1) directly proportional to resonant frequency Ans: (d)

2) Inversely proportional to resonant frequency

3)directly proportional to quality factor

4)Inversely proportional to quality factor

a)2&3 are correct b) 2&4 are correct c) 1&3 are correct d) 1&4 are correct

Q7) An RLC parallel resonant circuit has a resonance frequency of 1.5 MHZ and a bandwidth of 1KHZ. If C= 150 PF, then the effective resistance of the circuit will be

a) 2.96MΩ b) 14.75 Ω c) 9.5Ω d) 4.7Ω Ans: (a)

Q8) The parallel RL circuit is having quality factor of $Q_{1,}$ when it is connected in series with R, the new quality factor Q_2 will be

a) $Q_2 > Q_1$ b)$Q_2 < Q_1$ c) $Q_2 = Q_1$ d) none Ans: (b)

Q9) In a series RLC circuit, as R increases

B.W decreases 2) B.W increases 3)Resonance frequency increases 4) Lower 3dB decreases 5)upper 3dB increases

a) 2,4&5 are correct b) 1,4 &5 are correct c) 2,3,4 are correct d) none. Ans:(a)

Q10) In a series RLC circuit, given R = 10Ω, L = 14H, C = 1F. Find damping ratio.

a) 1.33 b) 0.187 c) 0.5 d) none. Ans :(a)

Q11) The power factor of parallel RLC circuit at $W > W_o$ is

a) < 1 b) =1 c) > 1 d) 0 Ans: (a)

Q12) The phase of even symmetric signal is

a) + 90^0 b) – 90^0 c) 0^0 d) 0^0 or $\pm 180^0$ Ans: (d)

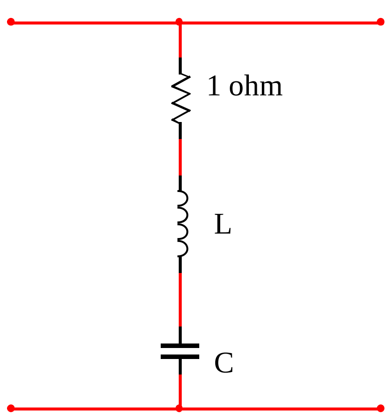
Q13) The power in a series R-L-C circuit will be half of that at resonance when the magnitude of current is equal to

a) V/ 2R b) V/ $\sqrt{3}$R c) V/$\sqrt{2}$R d) $\sqrt{2}$ V/R. Ans: (c)

Q14) Ina series RLC high Q ckt, the current peaks at a frequency

a) f= f_o b) f> f_o c) f< f_o d) none. Ans: (a)

Q15) The given series resonant circuit resonance at frequency of 20 MHZ. It will Ans:(a)



a) By pass all signals of 20 MHZ b) permit flow of signal of 20 MHZ along the time

c) Not produce any effect at 20 MHZ d) cause moderate attenuation of signal at 20 MHZ.

Q16) The half power frequency of series RL circuit is

a) R/L b) L/R c) 2R/L d) 2L/R Ans: (a)

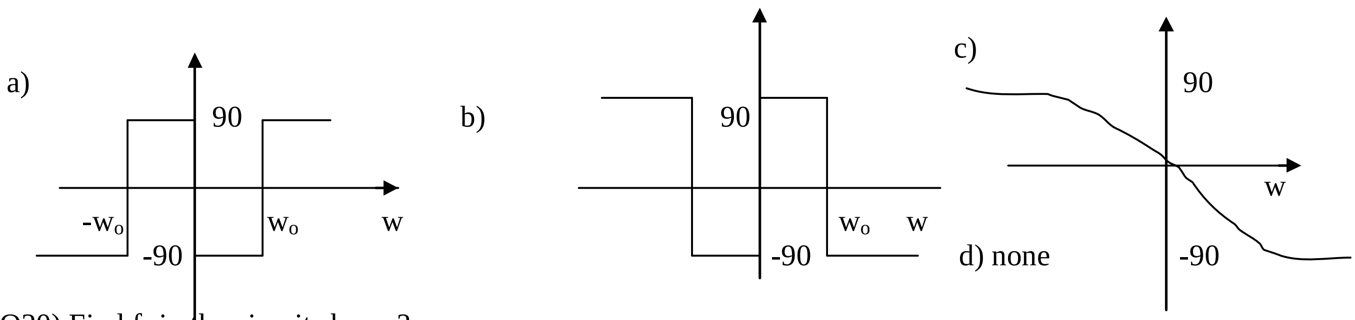
Q17) In a series RLC circuit, the value of current at resonance is affected by the value of

A) only L b) only C c) both L & C d) only R. Ans: (d)

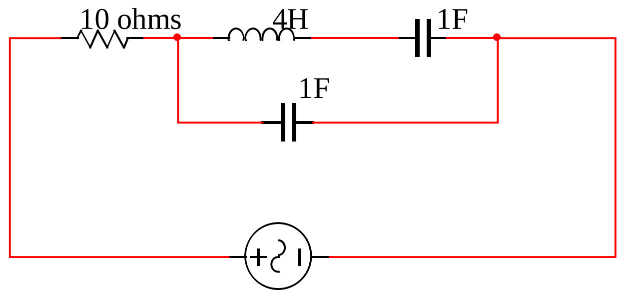
Q18) Ina series RLC circuit at resonance with Q = 10, and with applied voltage of 100 mv at resonance frequency voltage across capacitor is

a) 100mv b) 1 volt c) 10 mv d) 10 volts. Ans: (b)

Q19) The phase response of parallel LC circuit is Ans:(b)

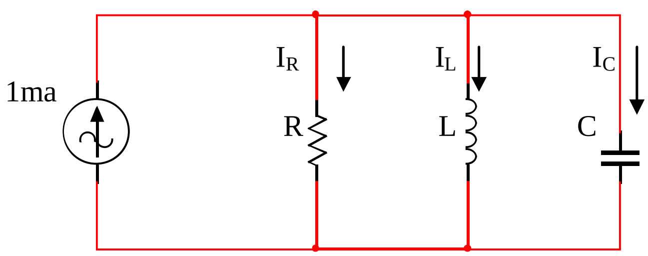


Q20) Find f_o in the circuit shown?



a) all frequencies b) 0.5 rad/ sec c) 5 rad / sec d) 1 rad/ sec Ans: (b)

Q21) The parallel RLC circuit shown is in resonance. Ans: (b)



a) $|I_R| < 1$ mA b) $|I_R + I_L| > 1$mA c) $|I_R + I_C| < 1$mA d) $|I_L + I_C| > 1$mA

Q22) A series R- L- C ckt has a Q of 100 and an impedance of (100 + j0) Ω at its resonance angular frequency of 10^7 rad| sec. The values of R & L are

a) R=100; L=1mH b) R=10; L=10mh c) R=100; L=10mh d) none Ans: (a)

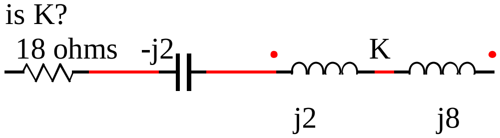
Q23) The parallel RLC circuit having damping ratio δ_p is connected in series with same values, then series circuit damping ratio δ_s is

a) $4\delta_p$ b) $2\delta_p$ c) $\delta_p/4$ d) $\delta_p/2$ Ans(a)

Q24) A series LCR circuit consisting of R = 10Ω, $|X_L| = 20\Omega$ & $|X_C| = 20\Omega$ is connected across an a.c supply of 200v rms. The rms voltage across the capacitor is

a) $200\angle -90^0$ b) $200 \angle +90^0$ c) $400 \angle +90$ d) $400 \angle -90$ Ans: (d)

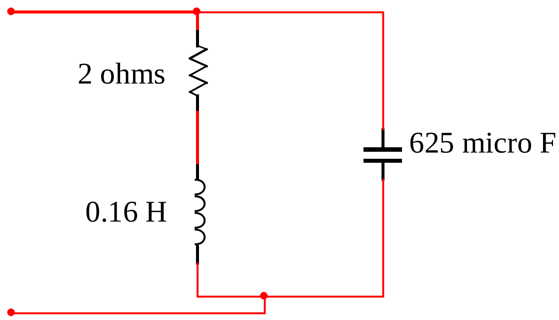
Q25) At f_o what is K?



a) 0.25 b) 0.5 c) 0.999 d) 1.0 Ans: (d)

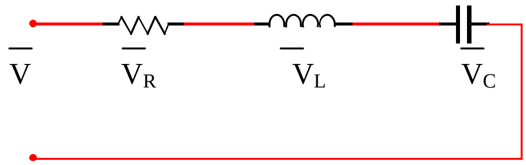
LIFE'S SITUATIONS ARE A GAME FOR THE ONE WHO IS PREPARED TO FACE CHALLENGES

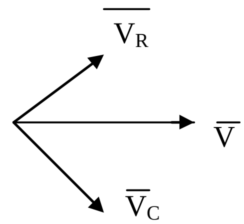
Q26) Find Zin at resonance?



a) 1.28 b) 12.8 c) 2 d) 128Ω Ans:(d)

Q27) For the series RLC circuit, the partial phasor diagram at a certain frequency is shown, the operating frequency of the circuit is





a) Equal to resonant frequency b) less than resonant frequency
c) Greater than resonant frequency d) not zero Ans: (b)

Q28) 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, however, it is 90^0 out of phase with the input voltage.
d) can be greater than the input voltage and is inphase with the input voltage. Ans: (c)

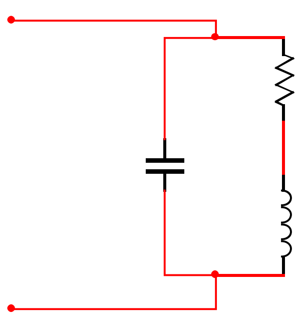
Q29) A series RLC circuit when existed by a 10v sinusoidal voltage source of variable frequency, exhibits resonance at 100 HZ and has a 3dB band width of 5HZ. The voltage across the inductor L at resonance is
a) 10 b) $10\sqrt{2}$ c) $10/\sqrt{2}$ d) 200v Ans: (d)

Q30) A circuit with a resistor, inductor and capacitor in series is resonant at f_o HZ. If all the component values are now doubled, the new resonant frequency is
a) 2 f_o b) still f_o c) f_o / 4 d) f_o /2 Ans:(d)

Q31) A coil (series RL) has been designed for high Q performance at a rated voltage and a specific frequency. If the frequency of operation is doubled, and the coil is operated at the same rated voltage, then the Q factor and the active power P consumed by the coil will be affected as follows
a) P is doubled, Q is halved b) P is halved, Q is doubled
c) P remain constant, Q is doubled d) P decreases 4 times, Q is doubled. Ans: (d)

Q32) A series RLC circuit has the following parameter values R = 10 Ω, L = 0.01H, C = 100μ. The Q factor of the circuit at resonance is
a) 1 b)10 c)0.1 d)none Ans: (a)

Q33) At resonance, the parallel ckt of fig constituted by an iron- cored coil and a capacitor, behaves like.



a) Open circuit b) short c) pure resistance = R d) pure resistance > R Ans: (d)

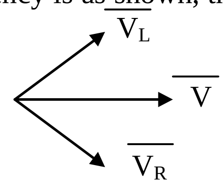
Q34) Find L &C of a parallel R L C circuit to resonate at 1 rad /sec with a Q of 5 and resistance of 1 ohm.
a) 1/5h, 5f b) 5h, 1/5f c) 1h,1f d) 5h,5f Ans: (a)

Q35) In a parallel RLC resonant circuit R = 10 K C = 0. 47 μF, the bandwidth will be.
a) 212.76 rad / sec b) 2.12 x 10^{10} rad / sec c) 100 d) none Ans: (a)

Q36) A parallel resonate circuit (R_P, L, &C) and a series resonant circuit (R_S, L&C) have the same Q. Find the relation between R_P & R_S
a) $R_S=Q^2R_p$ b) $R_P=Q^2R_S$ c) $R_P=R_S$ d) none Ans: (b)

Q37) In a parallel resonant circuit, as R increases, the selectivity will be
a) Decreasing b) Increasing c) Constant d) none Ans: (b)

Q38) In a series RLC circuit, the phasor form at some frequency is as shown, then the frequency is
a) Less then W_0 b) More then W_0 c) equal to W_0
d) None



Ans: (b)

Q39) In a series RLC circuit, let Q_c be the Q of the coil at resonance and let Q_s = (resonance frequency) / (bandwidth . then
a) Q_c and Q_s are not related to each other b) $Q_c > Q_s$ c) $Q_c < Q_s$ d) $Q_c = Q_s$ Ans:(d)

Q40) A coil is represented by an inductance L in parallel with a resistance R. The Q of the coil at frequency w is
a) R / (WL) b) WL / R c) WLR d) 1 / (WLR) Ans:(a)

Q41) The half power bandwidth of a series R-C-L circuit is
a) R/L b) L/RC c) 1/ RC d) ω_0 L/R Ans:(a)

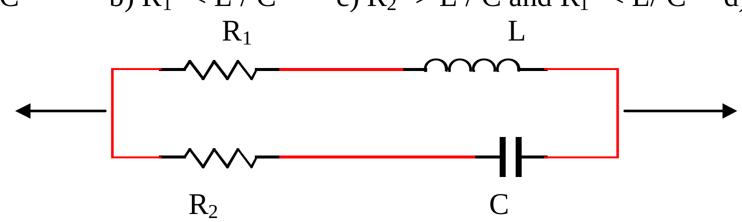
Q42) The Q of a parallel RLC circuit at its resonance frequency ω_0 is
a) ω_0 L / R b) R / ω_0 C c) ω_0 RC d) ω_0 LR Ans:(c)

Q43) In a series R-L-C circuit below resonance, the current
a) lags behind the applied voltage b) leads the applied voltage
c) is in phase with the voltage d) leads of lags behind the applied voltage depending upon the actual values of L and C Ans:(b)

Q44) A high Q coil has:
a) Large bandwidth b) high losses c) low losses d) flat response. Ans:(c)

Q45) At a frequency below the resonant frequency _____________ circuit is capacitive and __________circuit is inductive.
a) Series, parallel b) parallel, series c) parallel, parallel d) series, series Ans:(a)

Q46) In the following parallel circuit, resonance will never occur, if:
a) $R_1^2 = R_2^2 = L / C$ b) $R_1^2 < L / C$ c) $R_2^2 > L / C$ and $R_1^2 < L/ C$ d) $R_1^2 > L/C$ and $R_2^2 > L/C$



Ans:(c)

Q47) The circulating current in a parallel LC circuit at any resonant frequency is
a) Directly proportional to frequency b) Inversely proportional to frequency
c) Independent of frequency d) none of the above Ans:(c)

Q48) Match List-I (Quantities) with List-II (Units) and select the correct answer using the codes given below the Lists:

List-I (Quantities)	List-II (Units)
A. R/ L	1. Second
B. 1 / LC	2. Ohm
C. CR	3. (Radian / second $)^2$
D. √(L / C)	4. $(\text{second})^{-1}$

CODES:	A	B	C	D
a)	4	3	1	2
b)	3	4	2	1
c)	4	3	2	1
d)	3	4	1	2

Ans:(a)

Q49) In series R – L – C circuit excited by a voltage, e = E sin ωt, where LC < ($1/\omega^2$)
a) Current lags the applied voltage b) current leads the applied voltage
c) current is in phase with the applied voltage d) voltages across L and C are equal. Ans:(b)

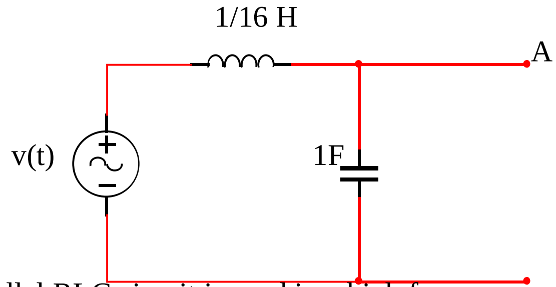
Q50) A series RLC circuit has a resonance frequency of 1 kHz and a quality factor Q = 100.If each of R,L and C is doubled from its original value, the new Q of the circuit is
a) 25 b) 50 c) 100 d) 200 Ans:(b)

Q51) What is the B.W of parallel R,L,C circuit at resonance
a) RC b) 1 / RC c) R / C d) C / R Ans: (b)

Q52) The current Bandwidth of RC series circuit is

a) 1/ RC b) RC c) ∞ d) none Ans: (c)

Q53) The circuit shown acts as an ideal current source with respect to terminals AB, when the frequency is



a) zero
b) 1 rad/sec
c) 4 rad/sec
d) 16 rad/sec

Ans: ©

Q54) A narrow bandwidth parallel RLC circuit is used in a high frequency power amplifier. If the impedance at resonance must be 50ohms, and it must be 60%lower at 50 kHz above resonance, determine R,L,C and Q_0 if resonance is to occur at550kHz.

a) 20 Ω, 1μH, 83.5nF,5.76 b)50Ω,2.2μH,38.1nF,6.58 c)50Ω,2.2μH,38.1nF, 6.58
d) 50Ω,1.0μH, 83.5nF,14.4 Ans: ( )

Q55) A series RLC circuit is excited by an ac voltage v(t) = Sint. If L=10H and C=0.1F,then the peak value of the voltage across R will be

a) 0.707 b) 1 c) 1.414 d) indeterminate as the value of R is not given Ans: (b)

Q56) In a parallel RLC circuit, the current source (I) lags voltage across circuit (V) if

a) wL>1/wC b) wL<1/wC c) R>[wL+1/wC] d) none Ans: (a)

Q57) At lower half power frequency the total reactance of the series RLC circuit is

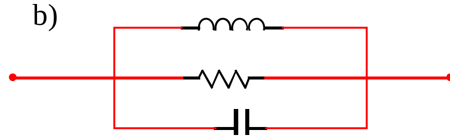
a) –R b) $\sqrt{(2R)}\angle 45^0$ c) $\sqrt{(2R)}\angle -45^0$ d) None Ans: (a)

Q58) In a parallel RLC circuit, the quality factor at a resonance is given by

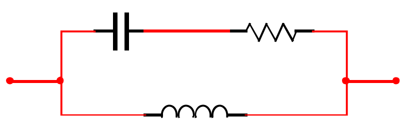
a) R√(L/C) b) R√(C/L) c) 1/R[√(L/C)] d)1/R[√(C/L)] Ans: (d)

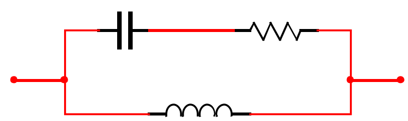
Q59) A practical inductor can be replaced by the following equivalent circuit at low to medium frequency

a)

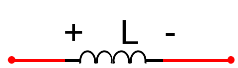

b)


Ans: (a)

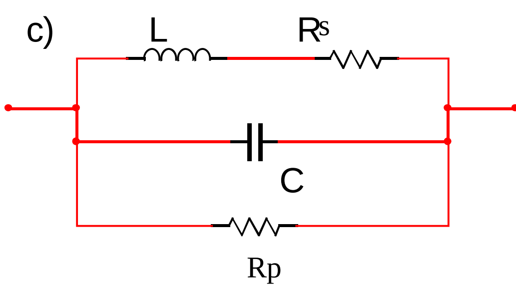
c)


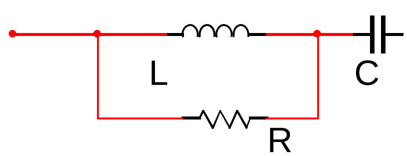
d)


Q60) A coil of wire has inductive impedance. At high frequencies the impedance will be represented by Ans:(c)

a)


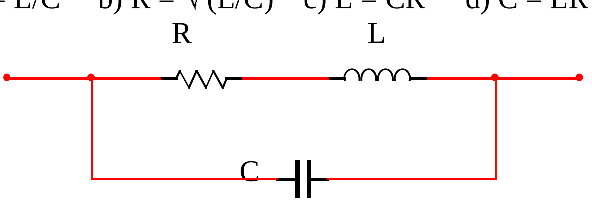
b)


c)


d)


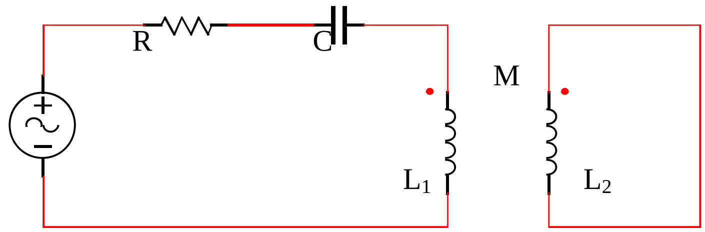
Q61) The equivalent circuit of a resistor is shown in figure. The resistor will be non-inductive if

a) R = L/C b) R = √ (L/C) c) L = CR^2 d) C = LR^2 Ans:( )



FREEDOM MEANS ACCEPTING THE RULES OF FREEDOM

Q62) Determine the resonance frequency and Q- factor of the circuit shown in fig. R =10 Ω , C =3μf, L_1 = 40mH, L_2 =10 mH and M = 10 mH.____

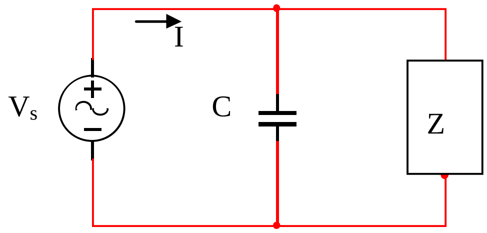


Ans:L = 30mH, fo = 530HZ, Qo = 10

Q63) In a series RLC circuit R=2 Kilo ohms, L= 1H, and C= 1/ 400 micro farads. The resonant frequency is

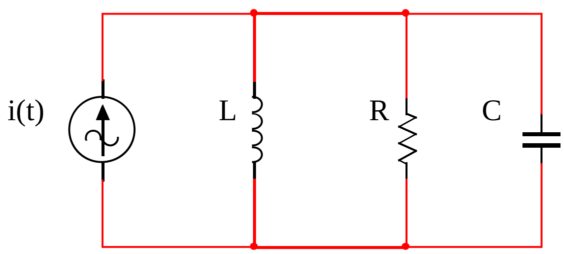
a) $2X10^4$ HZ b) (1/ Π) X104 HZ c) 10^4HZ d) 2ΠX 10^4HZ Ans: (b)

Q64) In the circuit shown in the figure, V_s = V_m sin 2t and Z_2 = 1 –j. The value of C is shown such that the current I is in phase with V_s. The value of C in farad is



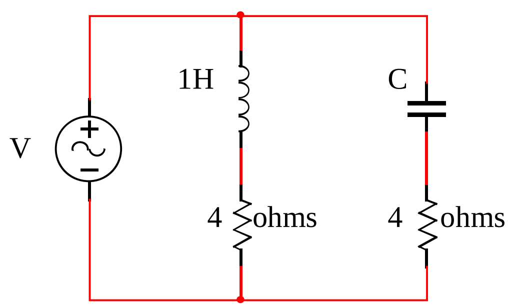
a) ¼ b) 1/ 2√2 c) 2 d) 4 Ans:(a)

Q65)The circuit shown has i(t) = 10 sin (120π t). The power (time average power) dissipated in R is when L = 1 / 120 π H, C = 1/ 60 πH, R = 1 ohm.



a) 25 watts b) 100watts c) 10/ √2 watts d) 50 watts Ans: (a)

Q66) The value of the capacitance C in the given ac circuit to make it a constant resistance circuit OR for the supply current to be independent of its frequency is



a) 1/ 16 F b) 1/12 F c) 1/8F d) ¼ F Ans: (a)

Q67) A parallel RLC circuit has half power frequencies at 105 M rad / s and 95 M rad/s. Then Q is given by

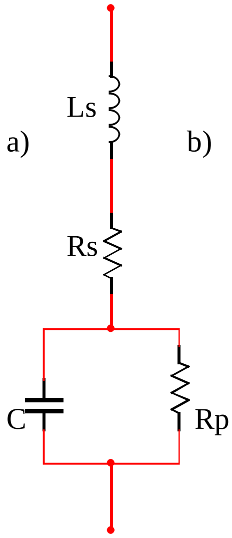
a) 10.5 b) 9.5 c) 100 d) 10 Ans: (d)

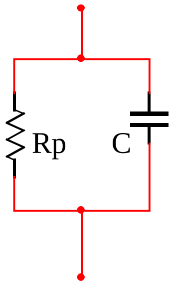
Q68) The system function H(s) = s / (s^2 + 2s + 100). The resonant frequency and the bandwidth in rad/s are given, respectively, by

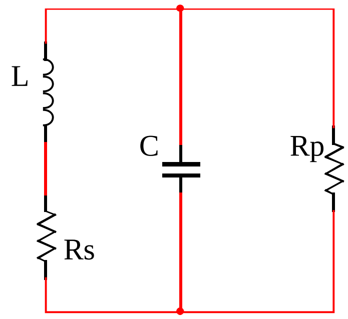
a) 10,1 b) 10,2 c) 100,2 d) 100,1 Ans:(b)

A POWERFUL STAGE IS LIKE A SWITCH, WHICH FINISHES DARKNESS OF NEGATIVITY IN A SECOND

Q69) The high frequency equivalent model of capacitor is

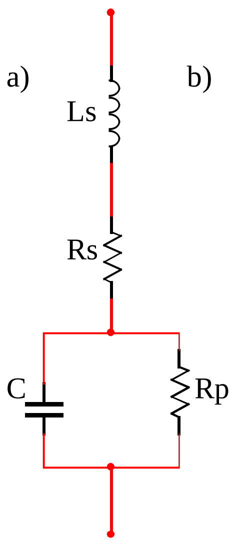
a) 

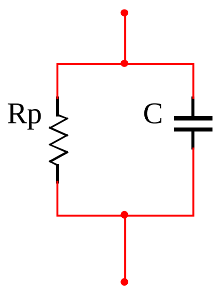
b) 

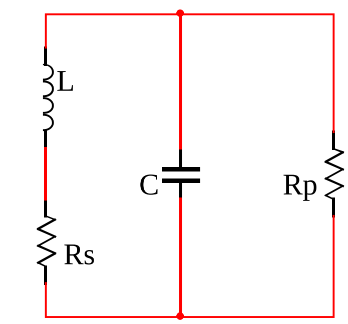
c) 

d) None Ans: (a)

Q70) The low and medium frequency model of the capacitor is

a) 

b) 

c) 

d) None Ans: (b)

THEOREMS

Q1) Super positions theorem is not applicable in the network when it is
a) Linear b) non linear c) Time varying d) Time in varying Ans:(b)

Q2) The superposition theorem is valid for
a) all linear networks b) linear and symmetrical networks only
c) only linear networks having no dependent sources d)linear as well as nonlinear networks. Ans:(a)

Q3) Substitution theorem is not used in the analysis of networks in which they contain elements as
a) Linear b) non linear c) Time varying d) Time in varying e) None Ans:(e)

Q4) Theveni's theorem is not applicable when
1) Load is coupled with the network 2) Linear 3) Time invariant 4) None
5) Non linear 6) Time varying Ans: (a)
a)1,5,6 b) 5,6 c) 1,5 d)1,3,5,6

Q5) Tellegen's theorem is applicable when
a) Nature of elements is irrelevant b) Elements are linear time varying
c) KVL and KCL is not satisfied d) None Ans: (a)

Q6) Reciprocity theorem is applicable when network is
1) Linear 2) Time invariant 3) Passive 4) Independent source 5) Dependent source
6) Mutual inductors
Identify the correct combination
a) 1,2,6 b) 1,2,3,6 c) 1,2,4 d) 1,2,3 Ans: (b)

Q7) Consider the following statements;

1) Tellegen's theorem is applicable to any lumped networks
2) The reciprocity theorem is applicable to linear bilateral networks
3) Thevenin's theorem is applicable to two terminal linear active networks
4) Norton's theorem is applicable to two terminal linear active networks

Which of these statements are correct?

a) 1,2 and 3 b) 1,2,3 and 4 c) 1,2 and 4 d) 3 and 4 Ans;(b)

Q8) Match List –I with List-II and select the correct answer using the codes given below the lists:

List-I (Network Theorms)	List-II (Most distinguished property of network)
A. Raciprocity	1. Impedance Matching
B. Tellegen's	2. Bilateral
C. Superposition	3. $\sum_{k=0}^{b} V_{jk}(t_1)\, I_{jk}(t_2) = 0$
D. Maximum power Transfer	4. Linear
	5. Non linear

CODES:

	A	B	C	D		A	B	C	D
a)	1	2	3	4	b)	1	2	3	5
c)	2	3	4	1	d)	2	3	5	1

Ans:(c)

Q9) In a linear circuit the super position principle can be applied to calculate the

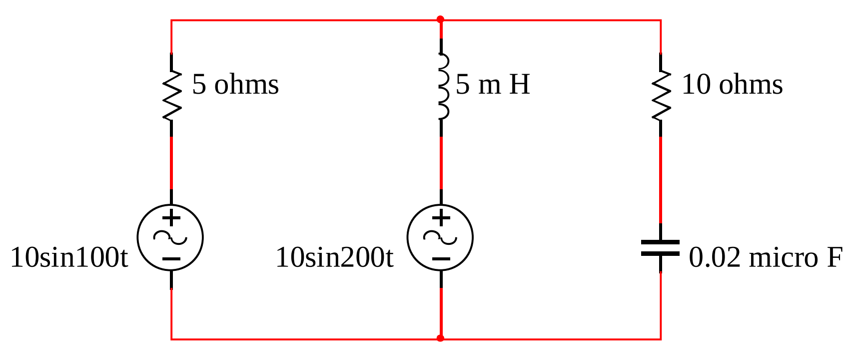
a) Voltage and power b) voltage and current c) current and power d) voltage, current and power

Ans;(b)

Q10) In applying thevenin's theorem, to find the Thevenin impedance, some sources (call them set S_1) have to be replaced by their internal impedances, while others (call them set S_2) should be left undisturbed.

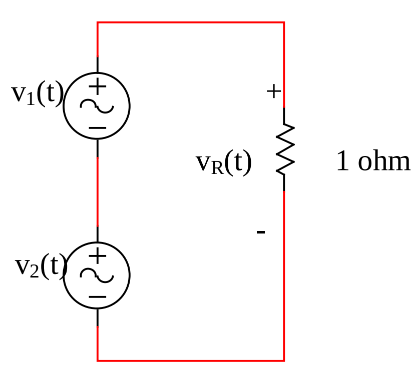
a) S_1 consists of independent sources while S_2 includes all independent sources
b) S_1 consists of dependent sources while S_2 includes all independent sources
c) S_2 is a null set d) S_1 is a null set Ans:(a)

Q11) In the network shown, which one of the following theorems can be conveniently used to calculate the power consumed by the 10 ohm resistor.



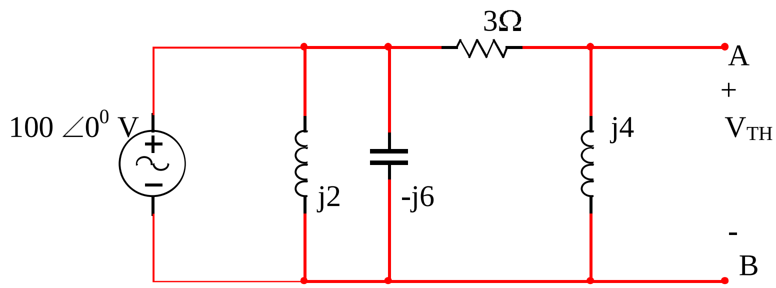
a) Thevenin's theorem b) Maximum power transfer theorem c) Millman's theorem
d) Superposition theorem Ans: (d)

Q12) Let $v_1(t) = V_{m1}\cos(w_1 t + \theta_1)$, $v_2(t) = V_{m2}\cos(w_2 t + \theta_2)$ under what conditions, the super position theorem is not applicable to compute power in R = 1ohm



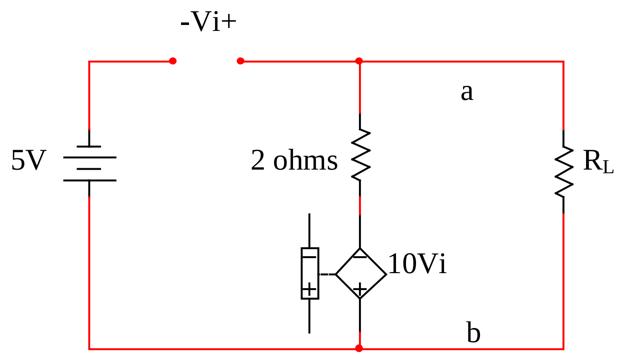
a) $w_1 = w_2$ $\theta_1 - \theta_2 \neq \pm K\ \Pi/2$ b) $w_1 = w_2$ $(\theta_1 - \theta_2) = \pm K\Pi/2$ c) $w_1 \neq w_2$ d) none Ans : (a)

Q13) The Thevenin equivalent voltage V_{TH} appearing between the terminals A and B of the network shown in fig. is given by



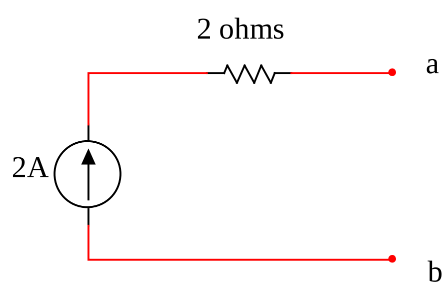
a) j80 (3-j4) b) j 16 (3+ j4) c) 16 (3+ j4) d) 16 (3 – j4) Ans: (a)

Q14) Find the Thevenin equivalent resistance of the circuit to the left of the terminals marked a and b in the figure

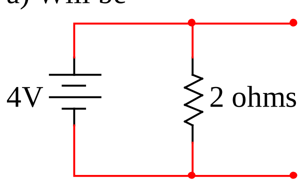


a) 0.2 Ω b) 0.4Ω c) 2Ω d) none. Ans(a)

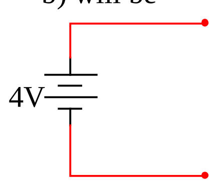
Q15) A dc current source is connected as shown in below figure. The Thevenin's equivalent of the network at terminals a – b will be



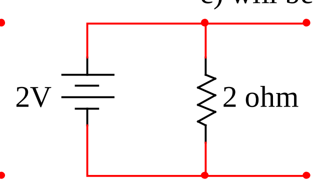
a) Will be



b) will be

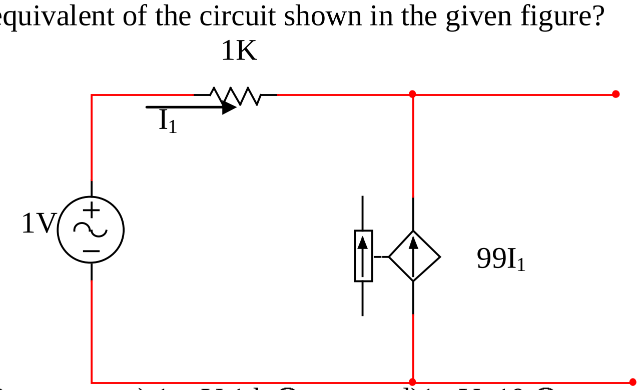


c) will be



d) NOT feasible Ans: (d)

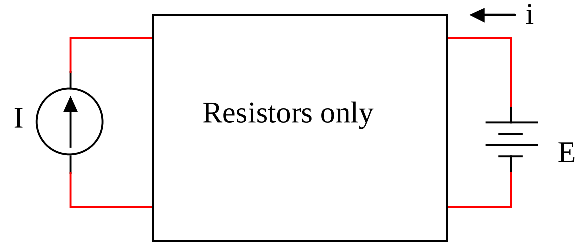
Q16) Which one of the following combinations of open circuit voltage and Thevenin's equivalent resistance represents the Thevenin's equivalent of the circuit shown in the given figure?



a) 1V, 10 Ω b) 1V, 1 k Ω c) 1 mV,1 k Ω d)1mV, 10 Ω Ans: (a)

UNEMPLOYMENT IS A MIRAGE OR SIMPLY A LACK OF IMAGINATION AND ORGANIZATION. THE FACT IS THAT THERE IS ALWAYS SOME WORK TO DO SOMEWHERE

Q17) In the network shown in the given figure current i= 0 when E= = 4 V, I= 2A and i=1A when E=8V, I=2A. The thevenin voltage and the resistance looking into the terminals AB are

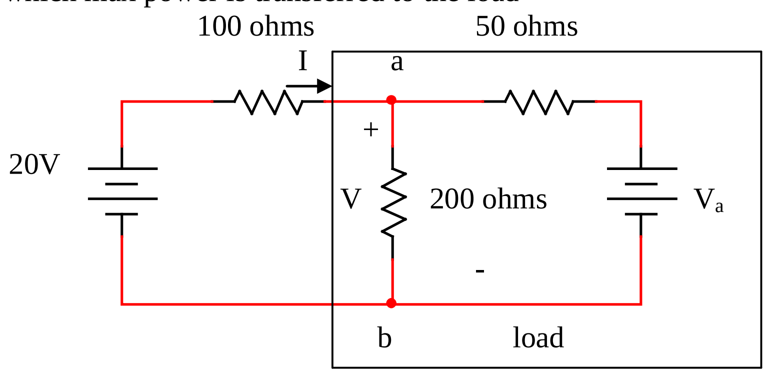


a) 4V,2Ω b) 4V,4Ω c) 8V,2Ω d) 8V,4Ω Ans: (b)

Q18) A battery charger can drive a current of 5A into a 1 ohm resistance connected at its output terminals. If it is able to charge an ideal 2V battery at 7A rate, then its thevenins equivalent will be

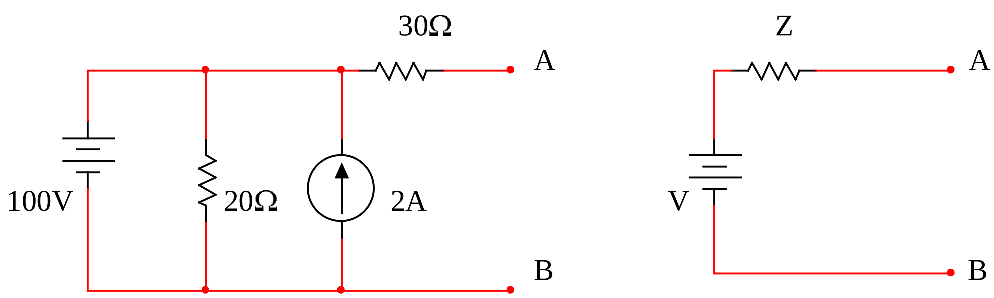
a) 7.5V in series with 0.5 ohm b) 12.5 V in series with 1.5 ohms c) 7.5V in parallel with 0.5 ohm
d) 12.5V in parallel with 0.5 ohm Ans: (b)

Q19) Find V_a for which max power is transferred to the load



a) 7.5V b) 20V c) 10V d) none Ans(a)

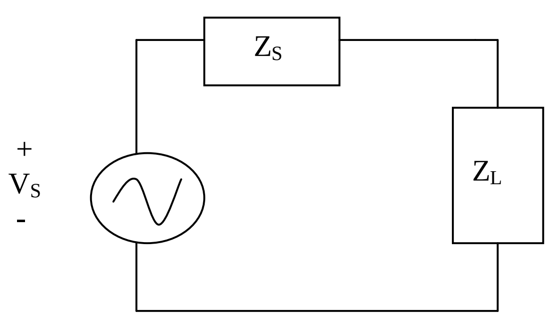
Q20) If the networks shown in fig. I and II are equivalent at terminals A-B, then the values of V (in volts) and Z (in ohms), will be



	V	Z
a)	100	12
b)	60	12
c)	100	30
d)	60	30

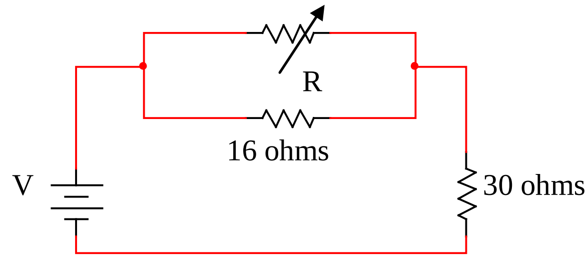
Ans:(c)

Q21) Given Vs=20∠-30 deg rms, Zs=10+j4, under the maximum power transfer condition what is the average power delivered by the source



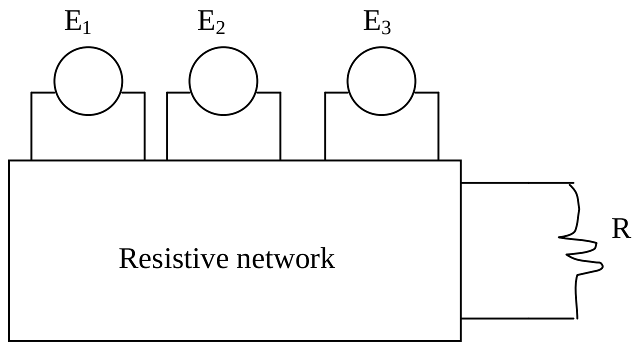
a) 10W b) 20W c) 40W d) none Ans: (a)

Q22) In the circuit shown, the power dissipated in 30 ohm resistor will be maximum if the value of R is



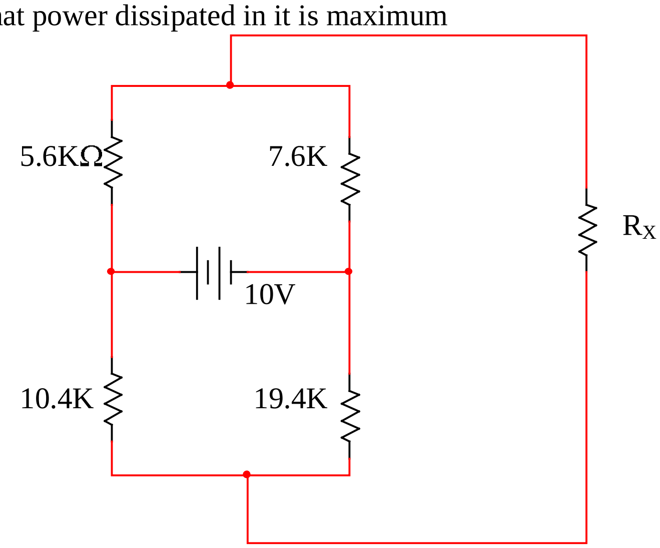
a) 30 ohms b) 16 ohms c) 9 ohms d) zero Ans: (d)

Q23) In the circuit shown, the power consumed in the resistance R is measured when one source is acting at a time, these values are 18W, 50W and 98W. When all the sources are acting simultaneously, the possible maximum and minimum values of power in R will be



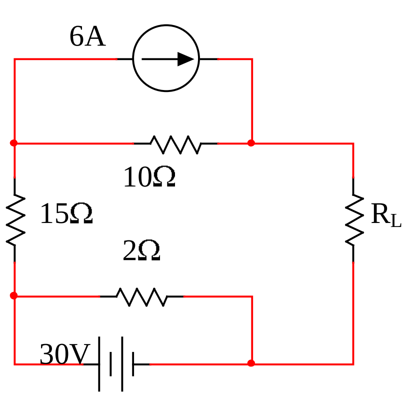
a) 98W and 18 W b) 166 W and 18 W c) 450 W and 2W d) 166 W and 2W Ans: ©

Q24) The value of Rx so that power dissipated in it is maximum



a) 33.4K b) 17.6K c) 10K d) 5K Ans:(c)

Q25) In the circuit shown in the given figure R_L will absorb maximum power when its value is



a) 2.75Ω b) 7.5Ω c) 25Ω d) 27Ω Ans:(c)

PROFIT IS SIMPLY A BASIC NECESSITY TO ANY KIND OF ECONOMIC ENTERPRISE. IT IS A REWARD THAT A BUSINESS GETS FOR THE SERVICE IT RENDERS

Q26) A source of angular frequency 1 rad/sec has a source impedance consisting of 1ohms resistance in series with 1 H inductance. The load that will obtain the maximum power transfer is

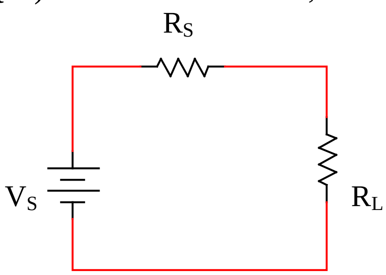
a) 1ohms resistance b) 1ohms resistance in parallel with 1 H inductance Ans: (c)

c) 1ohms resistance in series with 1 F capacitor d) 1ohms resistance in parallel with 1 F capacitor.

Q27) A 2:1 step down impedance matching transformer is often used to connect an antenna to the 75Ω input jack of a television. Assuming the transformer is located at the antenna and the cable between the transformer and the TV can be modeled as a 50 mΩ resistance, determine the maximum power delivered to the TV assuming the antenna intercepts a 10mV signal at 125MHz.

a)166nW b)0.083mW c)1.66µW d)0.083µW Ans:(d)

Q28) For the circuit shown, identify the correct statement?



a) Efficiency of power transmission is maximum when $R_S=R_L$ b) efficiency of power transmission is maximum when $R_S<R_L$ c) efficiency of power transmission is maximum when $R_S>R_L$ d) None Ans: ©

Q29) The V-I characteristics as seen from the terminal-pair (A,B) of the network of figure (a) is shown in figure (b). If a variable resistance R_L is connected across the terminal – pair (A,B) the maximum power that can be supplied to R_L would be

a) 80W

b) 40W

c) 20W

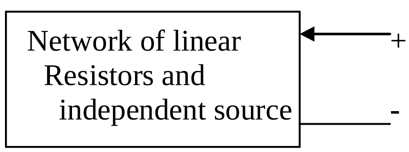


fig a

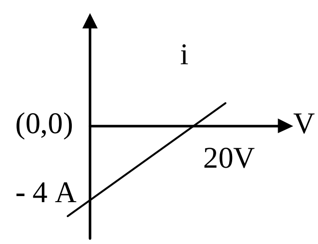
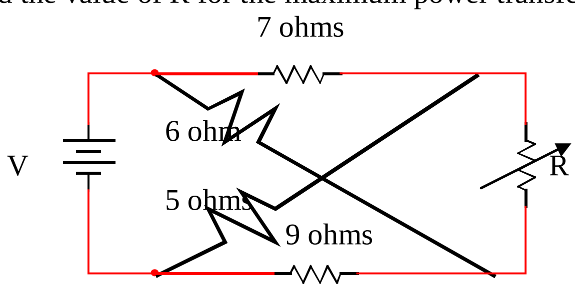


fig b

Ans:(c)

d) Indeterminate unless the actual network is given

Q30) In the lattice network, find the value of R for the maximum power transfer to the load.

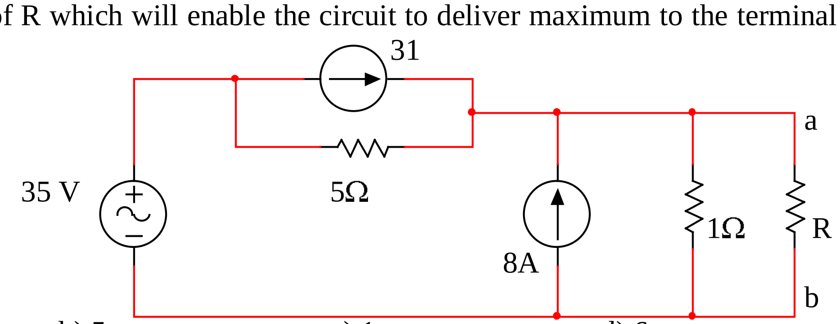


a) 5Ω b) 6.5Ω c) 8Ω d) 9Ω Ans:(b)

Q31) A 5 + j2Ω source has a 4 + j3Ω internal impedance. The load impedance Z_L for receiving maximum power equals.

a) 4- j3Ω b) (4-j3) (5-j2) / √29 Ω c) (4-j3) (5+j2) / √29Ω d) (4-j3) √29 / (5-j2) Ω Ans:(a)

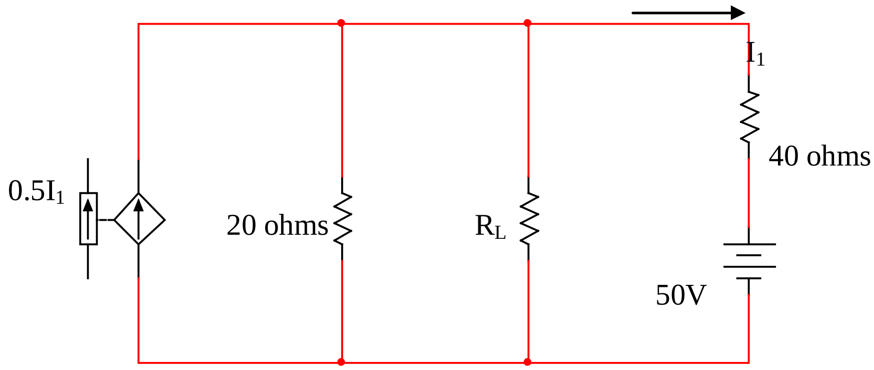
Q32) The value of R which will enable the circuit to deliver maximum to the terminal a and b in the following circuit diagram is



a) 5/6 b) 5 c) 1 d) 6 Ans: (a)

YOU HAVE TO TAKE RISKS, LABOUR HARD AND PROVE YOUR METTLE. IF YOU ARE SUCCESSFUL, DON'T LET IT GO TO YOUR HEAD. IF YOU FAIL, DON'T GIVE UP. RISE TO FIGHT WITH RENEWED VIGOUR. THIS IS THE ONLY PATH TO PROGRESS. NO BYPASSES, NO SHOT CUTS.

Q33) In the network of fig, the maximum power is delivered to R_L if its value is

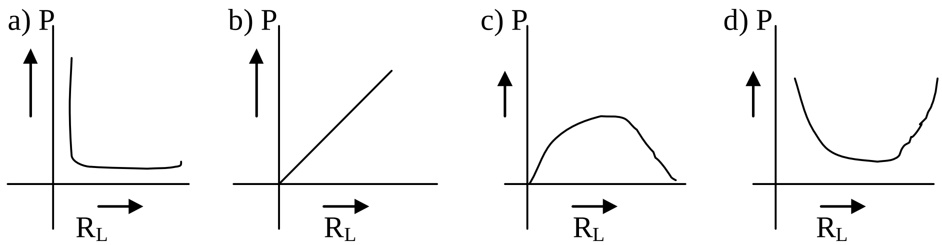


a) 16 b) 40/3 c) 60 d) 20 Ans: (a)

Q34) In the fig, the value of load resistor R, which maximizes the power, delivered to it is

a) 14.14 ohms b) 10 ohms c) 200 ohms d) 28.28 ohms Ans: (a)

Q35) A voltage source with an internal resistance R_s, supplies power to load R_L. The power delivered to the load varies with R_L as



Ans:(c)

Q36) A set of measurement is made on a linear time –invariant passive network as shown in fig a. The network is then reconnected as shown in fig b. Find the current through the 5 ohm resistor.

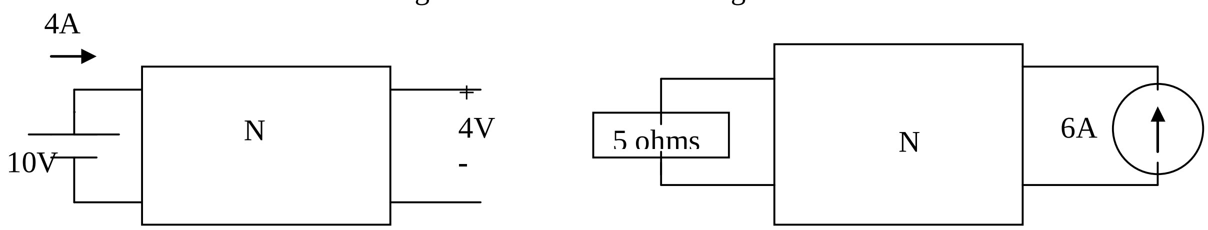


fig a fig b

a) 1.2A b) 0.8A c) 5A d) None Ans:(b)

Q37) Two sets of measurements are made on a linear passive resistive two part network as shown in fig (a) and (b). Find current through 2Ω resistor.

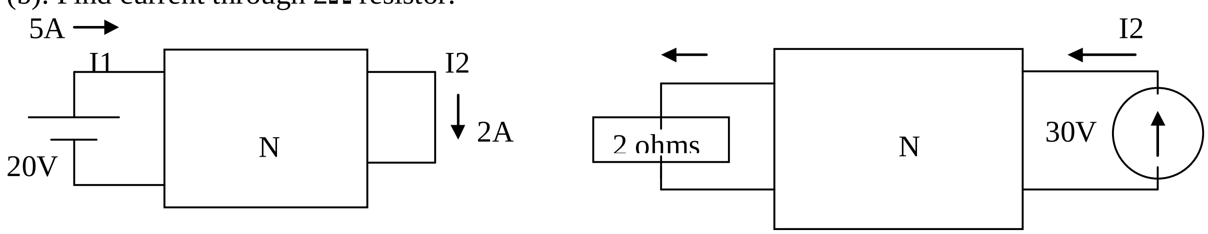
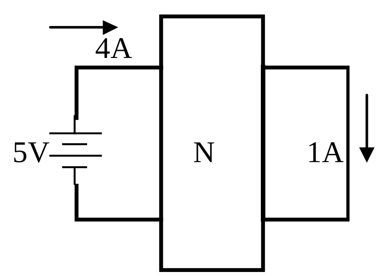
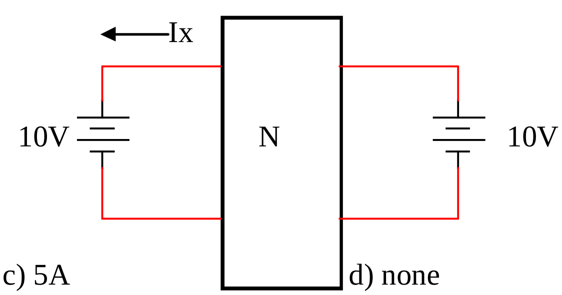


fig a fig b

a) 2A b) 3A c) 4A d) 5A Ans: (a)

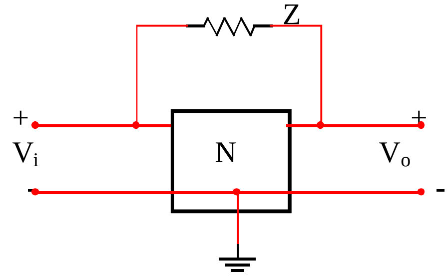
Q38) The network N in figure A and B is passive and contains only linear resistors. The port currents in figure are as marked. Using these values and the principles of superposition and reciprocity, find I_X in figure B





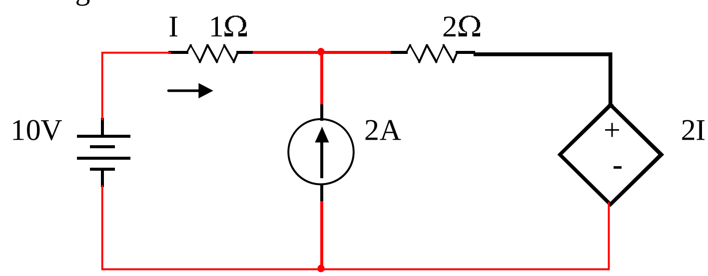
a) 4A b) -6A c) 5A d) none Ans: (b)

Q39) In the circuit shown in fig N is a finite gain amplifier with a gain of k, a very large input impedance, and a very low output impedance. The input impedance of the feedback amplifier with the feedback impedance Z connected as shown will be



a) Z (1- 1 / k)   b) Z (1-k)   c) Z / (k-1)   d) Z / (1-k)   Ans:(d)

Q40) Find the current I in the figure



a) 1.5 A b) 2.0A c) 1.2A d) –4/5A   Ans:(c)

Q41) A simple equivalent circuit of the 2- terminal network shown in the figure is

Ans:(a)

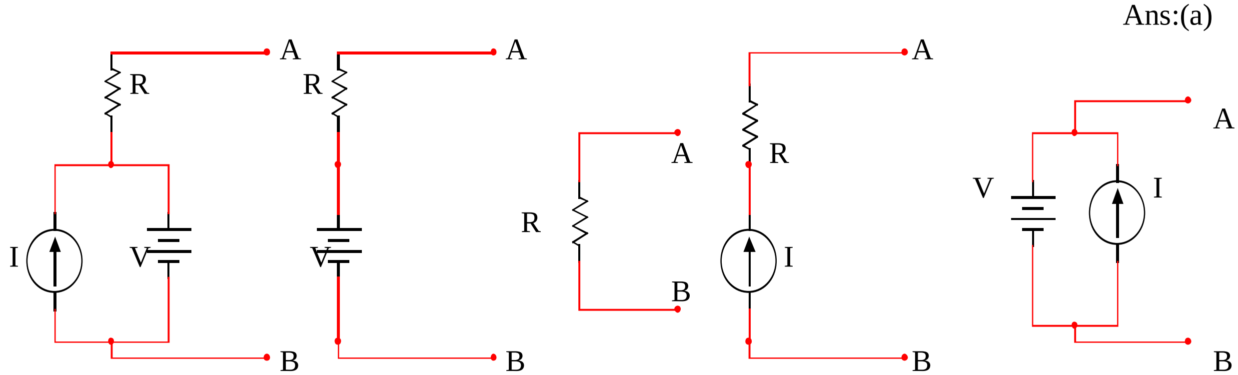
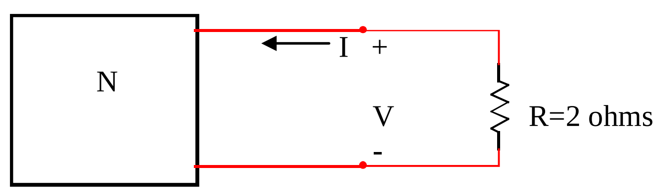


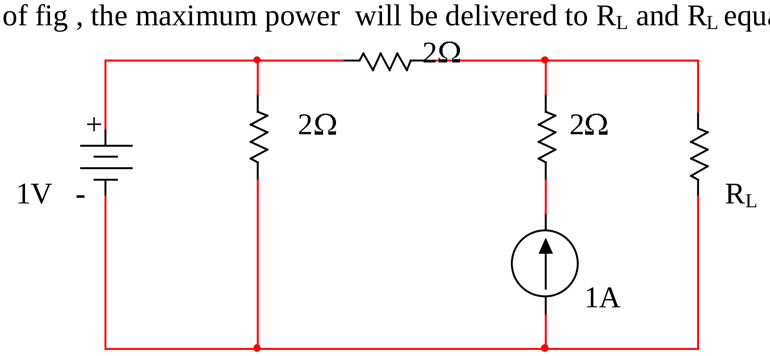
fig   a)   b)   c)   d)

Q42) The V- I relation for the network shown in the given box is V = 4I - 9. If now a resistor R = 2Ω is connected across it, then the value of I will be



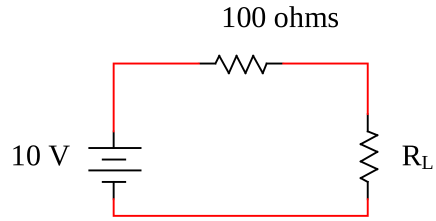
a) – 4.5A   b) –1.5A   c) 1.5A   d) 4.5A   Ans:©

Q43) In the circuit of fig , the maximum power will be delivered to R_L and R_L equals



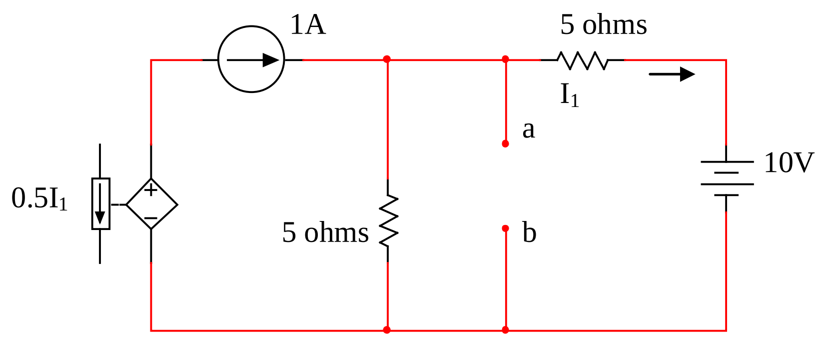
a) 6Ω   b) 2Ω   c)4/3 Ω   d) 1Ω   Ans:(b)

Q44) The maximum power that can be transferred to the load resister R_L from the voltage source in fig is



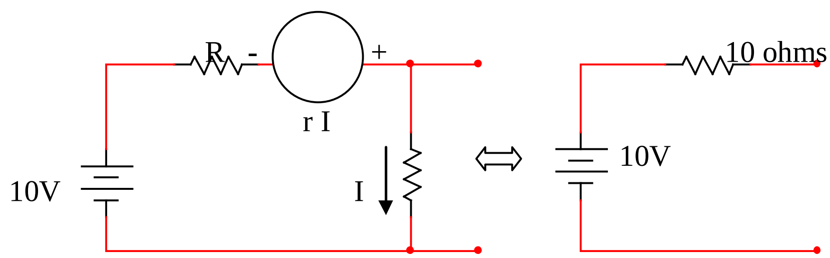
a) 1 W b) 10 W c) 0.25 W d) 0.5 W Ans: (c)

Q45) For the circuit shown, Thevenin's voltage and Thevenin's equivalent resistance at terminals a and b is



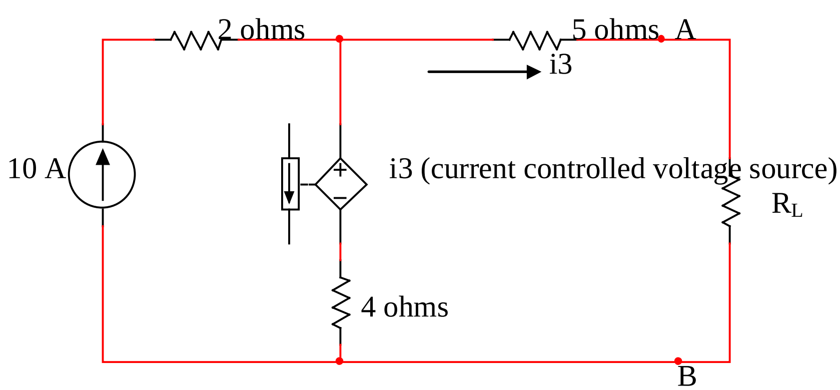
a) 5V and 2 ohms b) 7.5 V and 2.5 ohms c) 4 V and 2 ohms d) 3 V and 2.5 ohms Ans: (b)

Q46) Find the value of R and r. Thevenins equivalent circuit is given by circuit as shown



a) R=r=20 ohms b) R=r=5 ohms c) R=10 ohms ; r=5 ohms d) R=r=10 ohms Ans: (d)

Q47) Thevenin's equivalent of the circuit shown in figure: Vth, Zth values are



a) 20V, 9 ohms b) 40 V, 19/3 ohms c) 40 V, 9 ohms d) 40 V, 8 ohms Ans : (d)

TRANSIENT ANALYSIS

Q1) Capacitor acts like for the a.c. signal in the steady state

a) open b)closed c) not open not close d)none. Ans: (c)

Q2) Double energy transient are produced in circuits consisting of

a) two or more resistors b) resistance and inductance c) resistance and capacitance d) resistance ,inductance and capacitance Ans(d)

Q3)The transient current in a loss free L-C circuit when excited from an ac source is a /an -------sine wave

a) over damped b) under damped c) un damped d) critically damped Ans ©

Q4)The Transient current in an R-L-C circuit is oscillatory when

a) R=0 b) R>2√L/C c) R<2√L/C d) R=2√L/C Ans: (c)

Q5) Which of the following does not have the same units as the others? The symbols have their usual meanings

a) L/R b)RC c) √ LC d) 1 / √ LC Ans:(c,d)

Q6) A DC voltage source is connected across a series RLC circuit, under steady state conditions, the applied DC voltage drops entirely across the

a) R only b) L only c) C only d) R & L combinations Ans: (c)

Q7) Consider a DC voltage source connected to a series RC circuit. When the steady state reaches, the ratio of energy stored in the capacitor to the total energy supplied by the voltage source is equal to

a) 0.362 b) 0.500 c) 0.632 d) 1.00 Ans: (b)

Q8) For a second order system, damping ratio δ is $0<\delta<1$, then the roots of the characteristic polynomial are

a) real but not equal b) real and equal c) complex conjugates d) imaginary Ans: ©

Q9) The response of an LCR circuit to a step input is

	If the T F has
a) over damped	1) poles on –ve real axis
b) critically damped	2) poles on imaginary axis
c) oscillatory	3) multiple poles on +ve real axis
	4) poles on +ve real axis
	5) multiple poles on -ve real axis

a b c

a) 1 2 5
b) 1 5 2
c) 3 4 5 Ans: (b)
d) 1 5 4

Q10) A rectangular voltage pulse of magnitude V and duration T is applied to a series combination of R and C. The max voltage developed across the capacitor is

a) $V(1-e^{-T/RC})$ b) VT/RC c) V d) $Ve^{-T/RC}$ Ans: (a)

Q11) An ideal voltage source will charge an ideal capacitor

a) in infinite time b) exponentially c) instantaneously d) none Ans: (c)

Q12) Energy stored in a capacitor over a cycle, when excited by an a.c source is

a) same as that due to a dc source of equivalent magnitude b) half of that due to a dc source of equivalent magnitude c) zero d) none Ans: ©

Q13) Two coils having equal resistance but different inductances are connected in series. The time constant of the series combination is the Ans: (b)

a) Sum of the time constants of the individual coils b) Average of the time constants of the individual coils c) Geometric mean of the time constants of the individual coils d) Product of the time constants of the individual coils

Q14) An inductor at t=0 with initial current I_0 acts as

a) Short b) open c) current source d) voltage source Ans: ©

Q15) An inductor L carries steady state current I_0, suddenly at time t=0 the inductor is removed from circuit and connected to a resistor R. The current through the inductor at time t is equal

a) $I_0e^{-Rt/L}$ b) $I_0(1-e^{-Rt/L})$ c) $I_0e^{+Rt/L}$ d) $I_0(1-e^{+Rt/L})$ Ans: (a)

Q16) Transient current in a circuit results from

a) voltage applied to the circuit b) impedance of the circuit c) changes in the stored energy in inductors and capacitors d) resistance of the circuit Ans: ©

Q17) A two terminal black box contains one of the RLC elements. The black box is connected to a 220 volts ac supply. The current through the source is I. When a capacitance of 0.1 F is inserted in series between the source and the box, the current through the source is 2I. The element is Ans: (b)

a) a resistance b) an inductance c) a capacitance of 0.5 F d) not identifiable on the basis of the given data

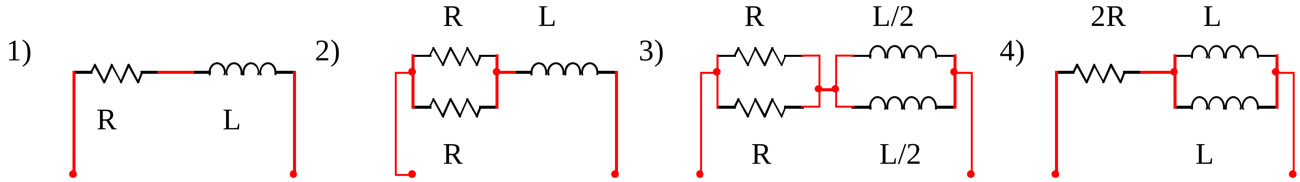
Q18) A two terminal black box contains a single element which can be R,L,C or M. As soon as the box is connected to a dc voltage source, a finite non-zero current is observed to flow through the element. The element is a/an

a) Resistance b) inductance c) capacitance d) Mutual inductance Ans: (b)

Q19) If an RL circuit having angle φ is switched in when the applied sinusoidal voltage wave is passing through an angle θ, there will be no switching transient if

a) $\theta-\varphi=0$ b) $\theta+\varphi=0$ c) $\theta-\varphi=90$ d) $\theta+\varphi=90$ Ans: (a)

Q20) The correct sequence of the time constants of the circuit shown in the increasing order is



a) 1-2-3-4 b) 4-1-2-3 c) 4-3-1-2 d) 4-3-2-1 Ans:(c)

Q21) In a circuit the voltage across an element is $v(t) = 10\,(t-0.01)\,e^{-100t}$ V. The circuit is

a) Un damped b) under damped c) critically damped d) Over damped Ans:(c)

Q22) A unit step voltage is applied at t=0 to a series RL circuit with zero initial conditions

a) It is possible for the current to be oscillatory b) The voltage across the resistor at t=0+ is zero c) The energy stored in the inductor in the steady state is zero d) The resistor current eventually falls to zero Ans: (b)

Q23) A 1 μF capacitor charged through a 2 kΩ resistor by a 10V dc source. The initial growth of capacitor voltage will be at the rate

a) 3.16 V/ms b) 5.0 V/ms c) 6.32 V/ms d) 10.0 V/ ms Ans:(b)

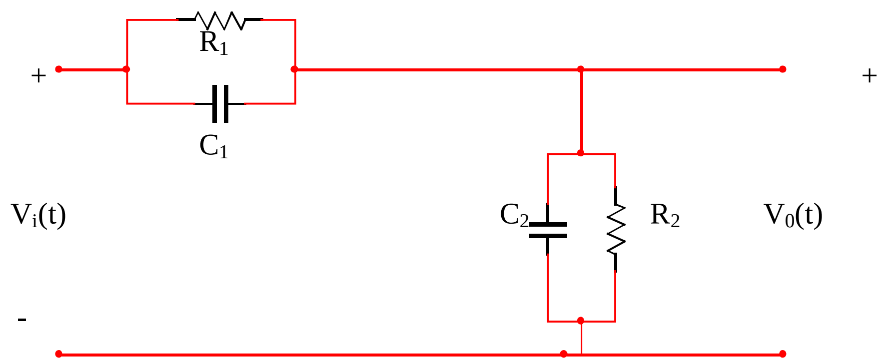
Q24) A series R – C – L circuit is driven by an ac voltage source. Then the voltage across the following elements or the pair of elements cannot exceed the applied voltage

a) C b)L c) R d) R and L Ans:(c)

Q25) A series R-C circuit has a capacitor with an initial voltage of 11 V. A 15 V dc source is now connected across the R-C circuit. The initial rate of change of capacitor voltage can be

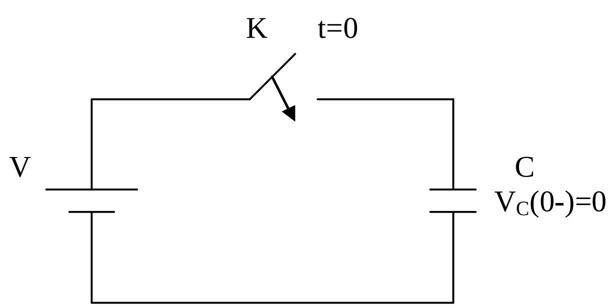
a) 15 X 0.368 / RC b) 15X 0.632 / RC c) 11/ RC d) 4/ RC Ans:(d)

Q26) For the compensated attenuator of fig below, the impulse response under the condition $R_1C_1=R_2C_2$ is



a) $R_2/(R_1+R_2)[1-e^{-t/R_1C_1}]u(t)$ b) $R_2/(R_1+R_2)\delta(t)$ c) $R_2/(R_1+R_2)u(t)$ d) $R_2/(R_1+R_2)[1-e^{-t/R_1C_1}]\,\delta(t)$ Ans: (b)

Q27) What is v_c (o+)?

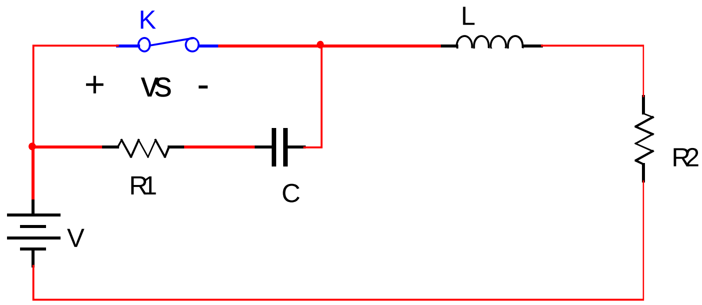


a) 0 b) V c) can't find d) none Ans: (b)

EFFORTS PUT THROUGH THE RIGHT METHOD BRINGS LUCK

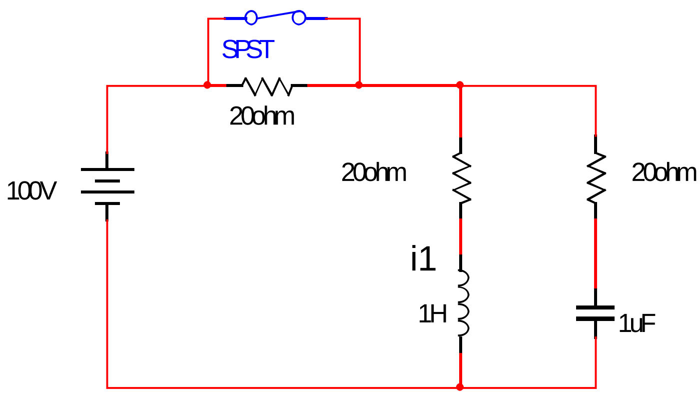
Q28) The switch K opened at t = 0 after the network has attained a steady state with the switch closed.

Find vs (0 +) across the switch ?



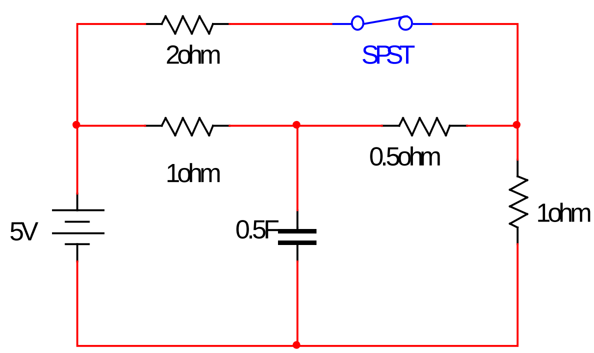
a) VR_1 / R_2 b) V c) V + VR1 / R2 d) 0 Ans: (a)

Q29) The switch SPST is closed at t=0, find d/dt i1 (0 +)



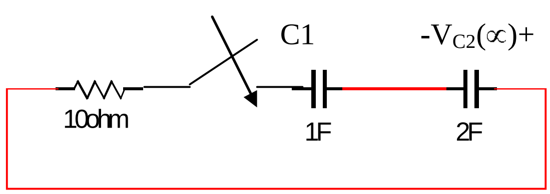
a) 0 b) 40 c) 50 d) none. Ans: (c)

Q30) SPST is closed at t=0.What is the time constant of the circuit?



a) 26/ 7 b) 7/26 c) 7/13 d) none Ans: (b)

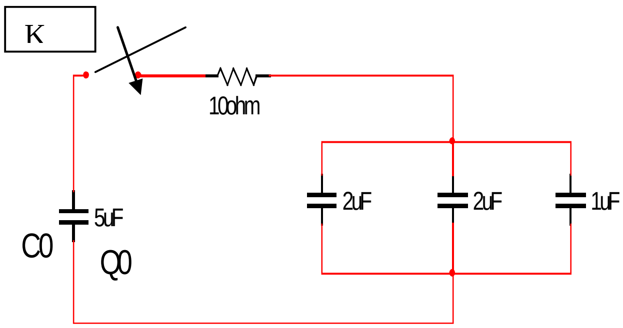
Q31) Given V_{C1} (0-) = 10V, V_{C2} (0-) = 5V find V_{C2} (∞) = ?



a) 7.5 v b) 0 c) 20/3v d) none Ans: (c)

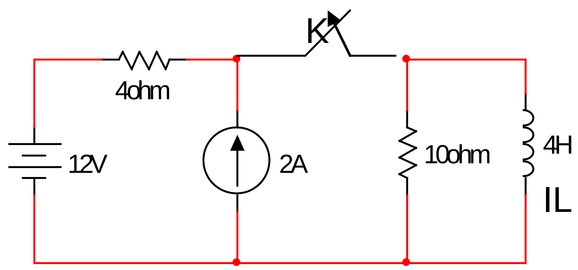
TO BE A TEACHER MEANS TOUCH HEART RATHER THAN HEAD

Q32) Given Initial charge in C_0 = 500µC. In the steady state find charge in 1 µf capacitor?



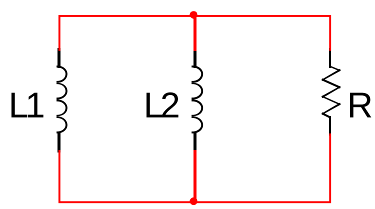
a) 50 μC b) 100μC c) 250μC d)none Ans: (a)

Q33) Switch K is opened at t=0, find I_L (0+) = ?



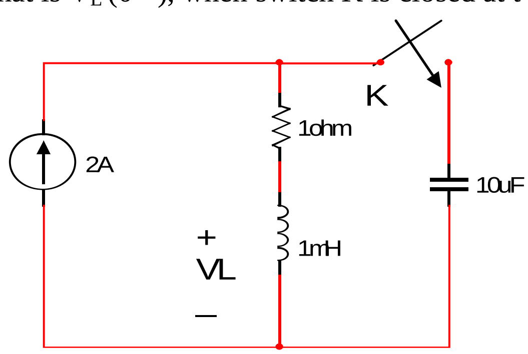
a) 5A b)0 c)2A d) none Ans: (a)

Q34) What is i_{L2} (∞) = ? Given L_1 = 1H , R = 10Ω , L_2 = 2H , i_{L1}(0-) = 2A



a) 2/3 A b) 0 c) 4/3 d) 1A Ans: (a)

Q35) What is V_L (0 +), when switch K is closed at t=0?



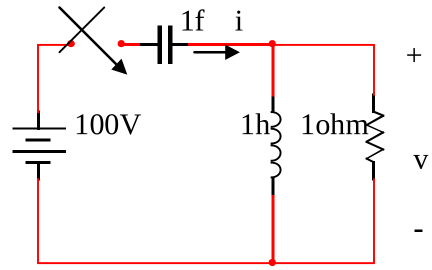
a) 2V b) -2 c) 0 d) none Ans: (b)

Q36) An impulse current 2δ (t) A, with t in second, is made to flow through an initially relaxed 3F capacitor. The capacitor voltage at T = 0+ is

a) 6V b) 2V c) 2/3 V d) zero Ans:(c)

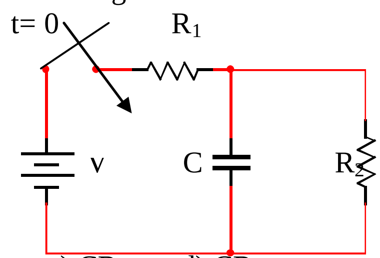
THE BEST WAY TO PROGRESS IS TO GAIN WISHES AND BLESSINGS FROM OTHERS

Q37) The circuit of fig is initially relaxed. At t=0+,



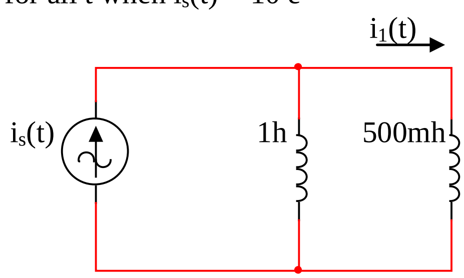
a) v =0 V b) i = .0 A c) v = 100 V d) i = ∞ Ans:(c)

Q38) The time constant of the circuit shown in fig is



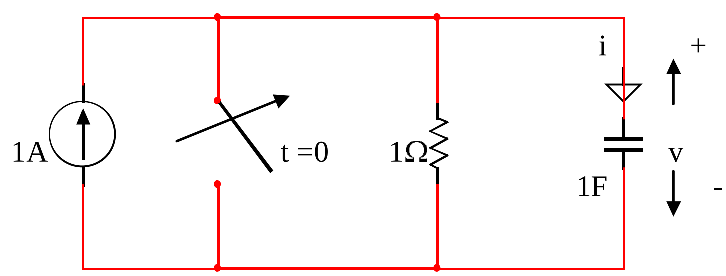
a) C (R_1 +R_2) b) CR_1R_2 / (R_1+R_2) c) CR_1 d) CR_2 Ans:(b)

Q39) If $i_1(t)$ is 5A at t=0, find $i_1(t)$ for all t when $i_s(t) = 10\ e^{-2t}$



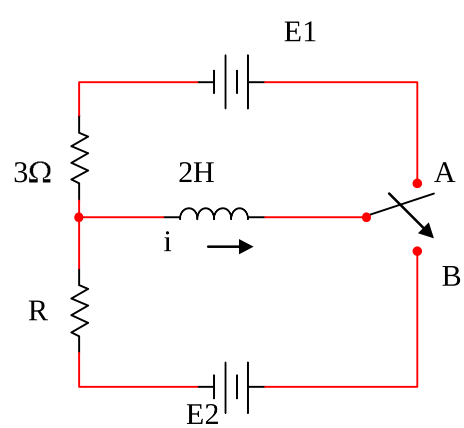
a) e^{-2t} b) $20e^{-2t}$ c)$30e^{-2t}$ d)$6.67e^{-2t}$-1.67 Ans:(d)

Q40) The switch in the circuit of fig. has been closed for a long time. It is opened at t =0 .



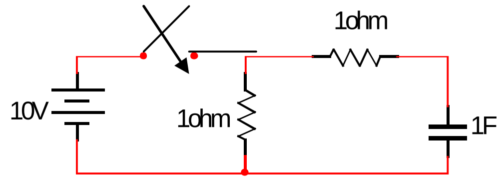
a) v(0+) = 1V, i (0+) = 0A b) v(0+) = 0V, i(0+) = 0A c) v(0+) = 0V, i (0+) =1A
d)v (0+) = 1 V, i(0+) = 1A Ans:(c)

Q41) In the circuit shown, the switch is moved from position A to B at time t = 0. The current i through the inductor satisfies the following conditions 1. i(0) = -8A 2. di / dt (t=0) = 3A / s 3. i(∞) = -4A the value of R is



a) 0.5 ohm b) 2.0 ohm c) 4.0 ohm d) Ans:(a)

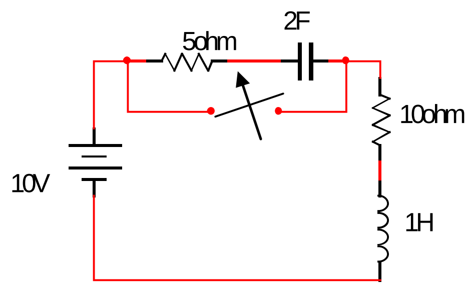
Q42) In the circuit shown above, the switch is closed at t = 0. The current through the capacitor will decrease exponentially with a time constant



a) 0.5 s b) 1 s c) 2s d) 10s Ans:(b)

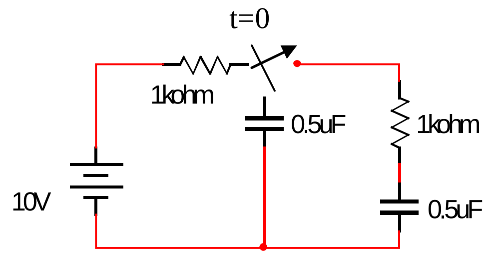
Q43) In the network shown, the switch is opened at t = 0. Prior to that, network was in the steady- state, Vs (t) at t =0 is

+V_S(t)-



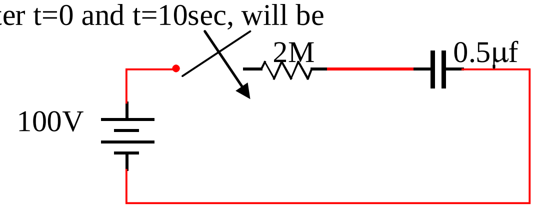
a) 0 b) 5V c) 10V d) 15V Ans:(b)

Q44) For the circuit shown different time constants are given. What are the charging and discharging times respectively? 1) 0.5 x 10^{-3} S 2) 2x10^{-3} S 3) 0.25x10^{-3} S 4) 10^{-3} S



a) 1,2 b) 2,3 c) 1,3 d) 2,4 Ans:(c)

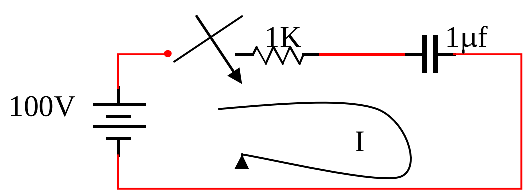
Q45) The voltage across R after t=0 and t=10sec, will be



a) 100V, 632V b) 0V, 63.2V c) 100V, 36.8V d) 0V, 26.8V Ans:(c)

Q46) In the network shown in the fig. The switch K is closed at t = 0 with the capacitor uncharged.

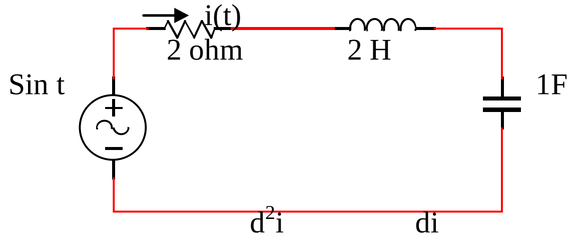
The value for $\frac{di(t)}{dt}$ at t = 0^+ will be ,



a) 100 amp / sec b) –100 amp/sec c) 1000 amp/sec d) –1000 amp/sec Ans:(b)

TO LISTEN TO OTHERS FULLY IS TO BE ABLE TO BE FREE FROM REPEATING MISTAKES

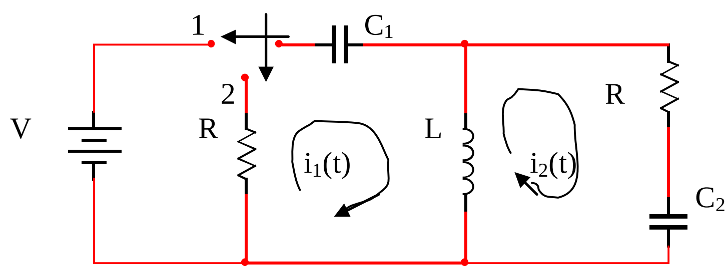
Q47) The differential equation for the current i(t) in the circuit of fig. is



a) $2\dfrac{d^2 i}{dt^2} + 2\dfrac{d\,i}{dt} + i\,(t) = \sin t$ b) $\dfrac{d^2 i}{dt^2} + 2\dfrac{di}{dt} + 2i(t) = \cos t$

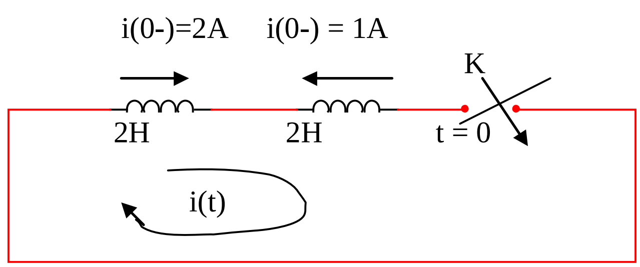
c) $2\dfrac{d^2 i}{dt^2} + 2\dfrac{di}{dt} + i(t) = \cos t$ d) $\dfrac{d^2 i}{dt^2} + 2\dfrac{di}{dt} + 2i(t) = \sin t$ Ans: (c)

Q48) For the circuit shown the switch is in position 1 for a long time and thrown to position 2 at t=0. At $t=0^+$, the current i_1 is



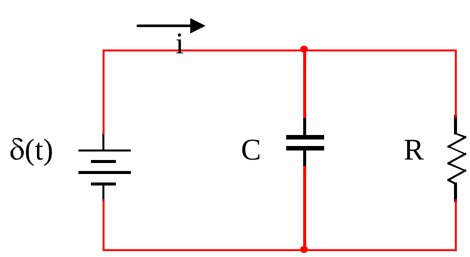
a) –V/2R   b)-V/R   c)-V/4R   d)zero   Ans: (a)

Q49) The switch K is closed at t=0. Find i(0+) = ?



a) 0.5A   b) 1A   c) 2A   d) none   Ans: (a)

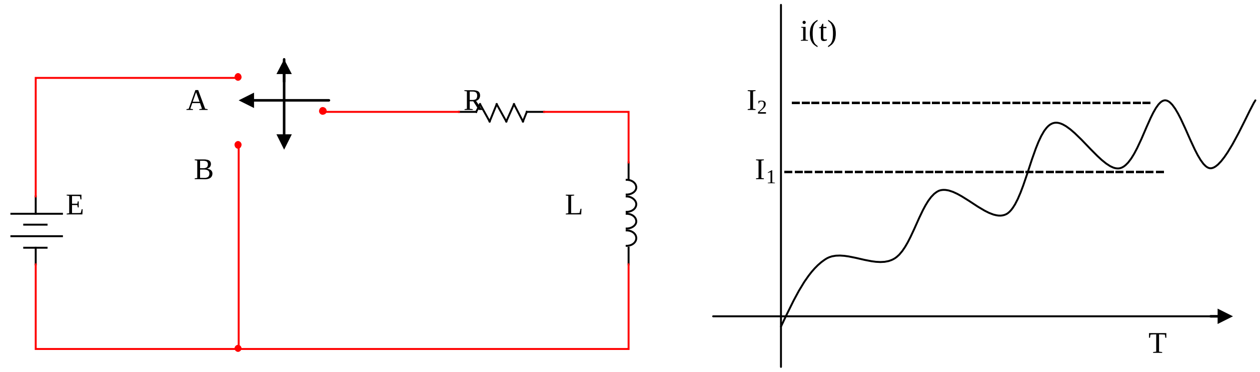
Q50) What is i(t) when the source is δ (t) = ?



a) (1/R)δ (t) + ¼ u (t)   b) (1/R)δ (t) + C δ^1 (t)   c) (1/R) δ (t) – 1 / (R^2 C) $e^{-t/\tau}$ d) none   Ans: (b)

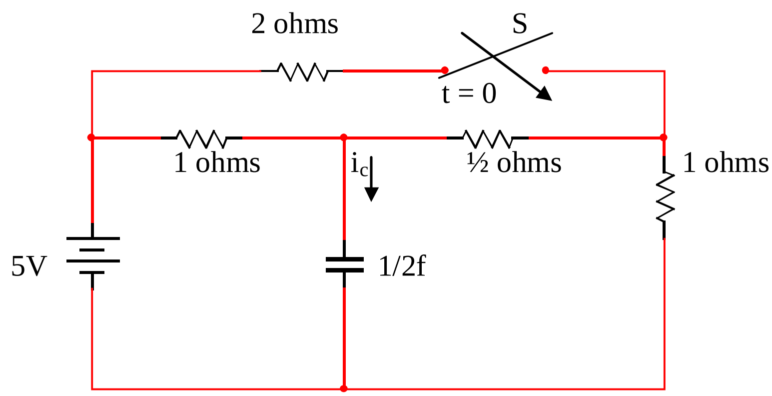
THE SWEETNESS OF THE MIND BRINGS SWEETNESS IN WORDS AND INTERACTIONS

Q51) The switch is caused to snap back and forth between the two positions A & B at regular intervals equal to L / R sec. After a large no. of cycles the current becomes periodic as shown in the plot. Determine level of I_1 = ?



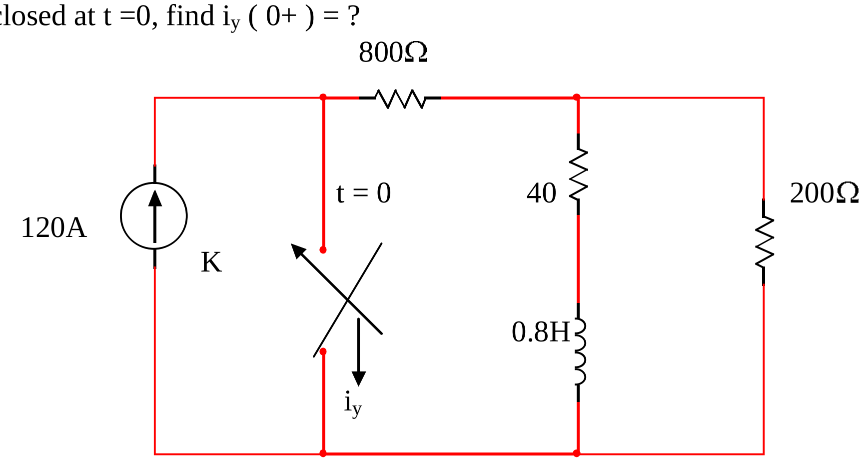
a) E/R(e+1) b) E/R(e/e+1) c) E/R(e-1) d) none Ans: (a)

Q52) Find i_c(0+1) = ? when switch S is closed at t = 0.



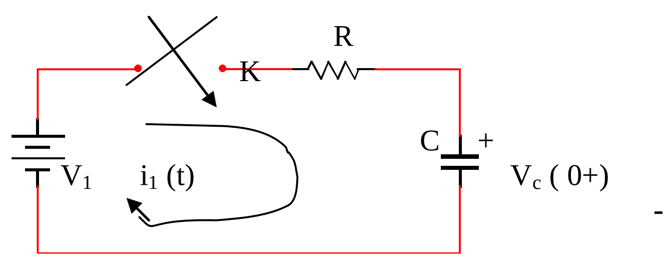
a) 0.75 A b) 3.142A c) 0 d) none Ans: (a)

Q53) Switch K is closed at t =0, find i_y (0+) = ?



a) 120A b) 100A c) 20A d) none Ans: (b)

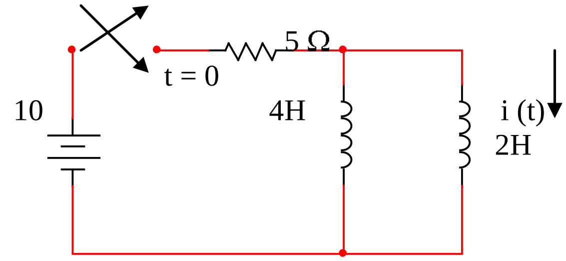
Q54) If V_1 and V_c(0 +) are multiplied by K the i_1(t) is



a) Multiplied by K times. b) Added by K c) subtracted by K d) not effected. Ans: (a)

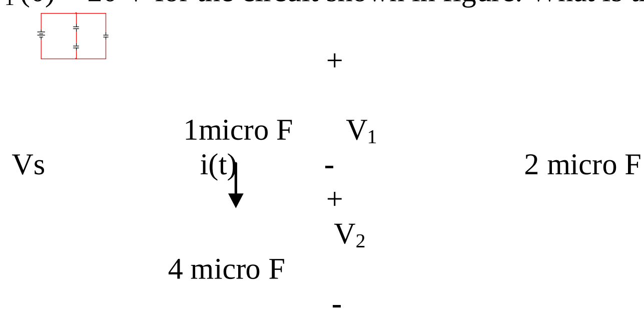
SELF-RESPECT BRINGS CONSTANT LEARNING AND AN EXPERIENCE OF SUCCESS

Q55) What is i (∞).



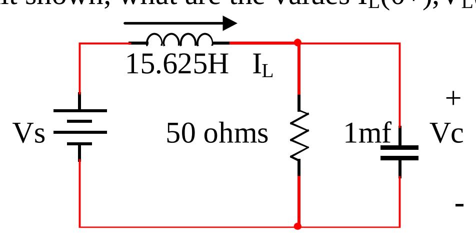
a) 2A b) 2/3A c) 4/3 A d) none Ans: (c)

Q56) Let $V_s = 100\ e^{-80\ t}$ V and V_1 (0) = 20 V for the circuit shown in figure. What is the value at i (t).



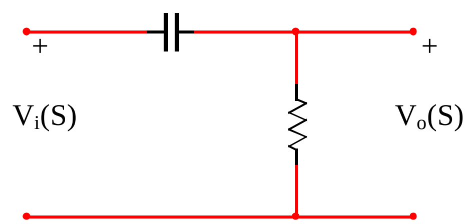
a) – 6.4 $e^{80\ t}$ mA b) 6.4 $e^{-80\ t}$ mA c) 12.8 $e^{-80\ t}$ mA d) -6.4 $e^{-80\ t}$ mA Ans(d)

Q57) If Vs=10+20u(t) V in the circuit shown, what are the values I_L(0+),V_L(0+)



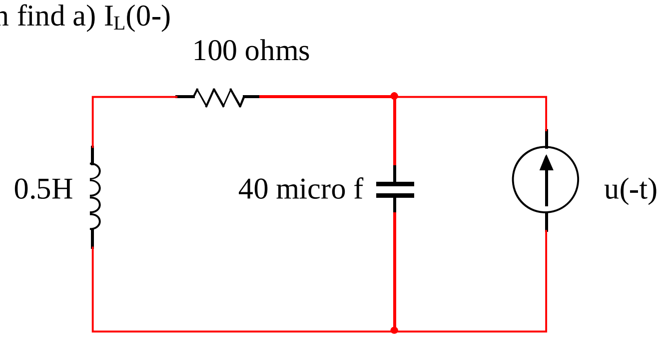
a) 0.2 A, 20 V b) 0.2 A, 100 V c) 2 A, 10 V d) 0.2 A, 10 V Ans (a)

Q58)The sinusoidal steady state voltage gain of the network shown in the figure will have magnitude equal to 0.707 at an angular frequency of



a) zero b) RC rad/sec c) 1/RC rad/sec d) 1 rad/sec Ans (c)

Q59)a) For the circuit shown find a) I_L(0-)



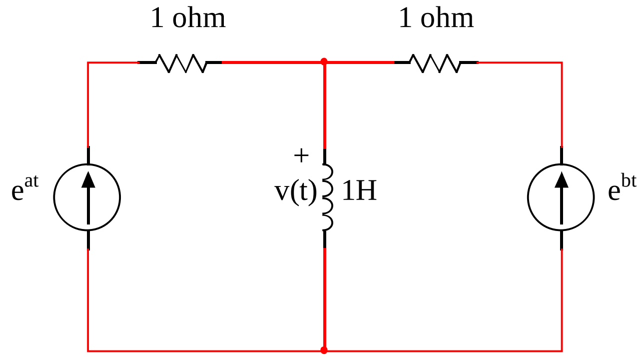
a) 0.01 b) 1 c) 0 d) None Ans:(b)

b) Find di/dt(0+) for above circuit?

a) 0.1 b) 0.01 c) 10 d) 0 Ans: (d)

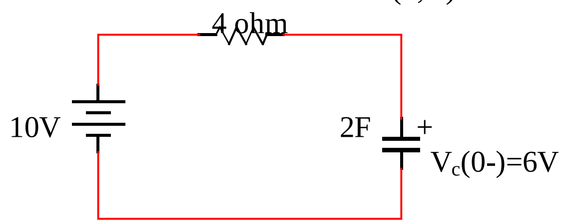
GOOD ACTIONS FORM GOOD CHARACTER

Q60) The voltage v(t) is



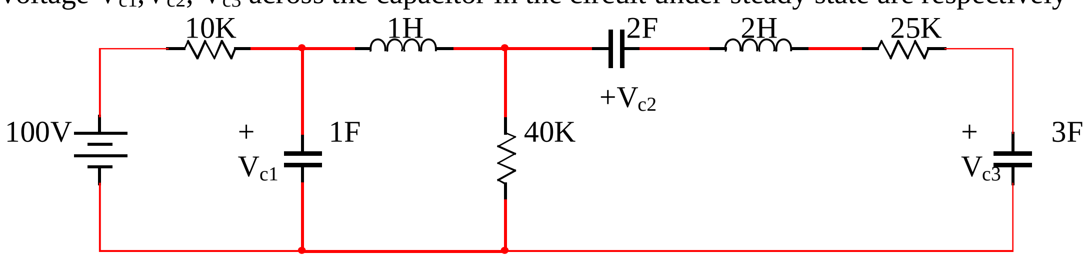
a) $e^{at}-e^{bt}$ b) $e^{at}+e^{bt}$ c) $ae^{at}-be^{bt}$ d) $ae^{at}+be^{bt}$ Ans: (d)

Q61) The energy absorbed by the 4 ohm resistor in the time interval $(0,\infty)$ is



a) 36J b) 16J c) 256J d) none Ans: (b)

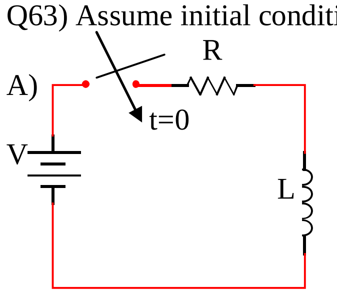
Q62) The voltage V_{c1},V_{c2}, V_{c3} across the capacitor in the circuit under steady state are respectively



a) 80,32,48 b) 80,48,32 c) 20,8,12 d) 20,12,8 Ans: (b)

Q63) Assume initial conditions are zero

A)



1) Current increases monotonically with time

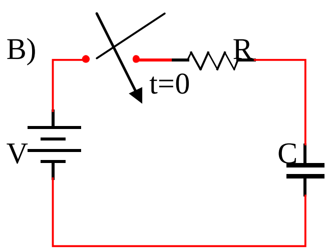
2) Current decreases monotonically with time

3) Current remain constant at V/R

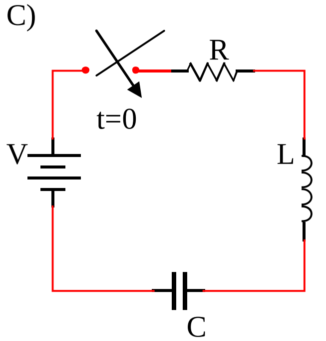
4) Current first increases, then decreases

5) no current can ever flow

B)



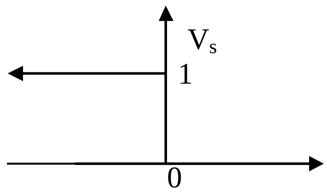
C)

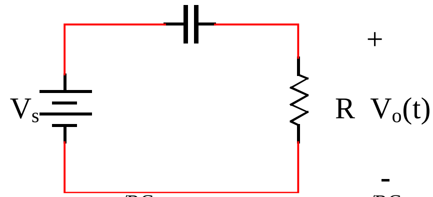


	A B C
a)	1 2 4
b)	2 1 4
c)	1 2 5
d)	none

Ans: (a)

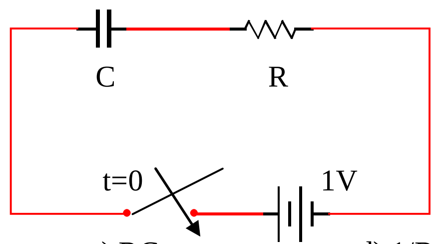
Q64) The output voltage of circuit in fig for t>0 is





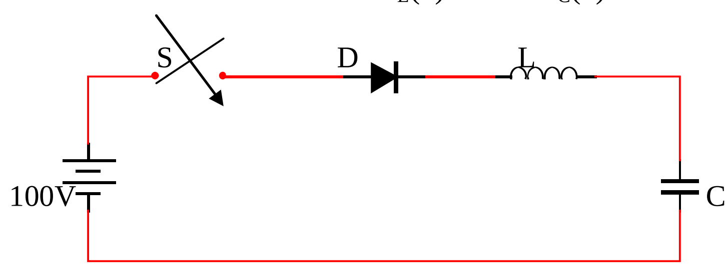
a) $e^{-t/RC}$ b) $-e^{-t/RC}$ c) $1-e^{-t/RC}$ d) $e^{-t/RC}-1$ Ans: (b)

Q65) In the series RC circuit shown, the voltage across C starts increasing when the dc source is switched on. The rate of increase of voltage across C at the instant just after switch is closed (t=0+) will be



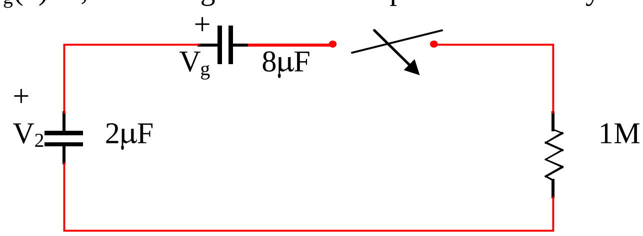
a) 0 b)∞ c) RC d) 1/RC Ans: (d)

Q66) Q) In the circuit, the switch S is closed at t=0 with $I_L(0)=0$ and $V_C(0)=0$. In the steady state V_C equal to



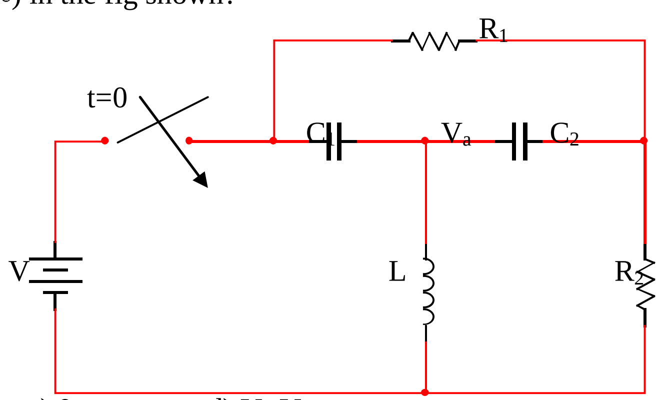
a) 200 V b) 100 V c) zero d) –100 V Ans: (b)

Q67) Given $V_2(0)$ =10V and $V_g(0)=0$, the voltage across the capacitors in steady state will be



a) $V_2(\infty)=V_g(\infty)=0$ b) $V_2(\infty)=2V, V_g(\infty)=8$ c) $V_2(\infty)=V_g(\infty)=8V$ d) $V_2(\infty)=V_g(\infty)=2V$ Ans: ©

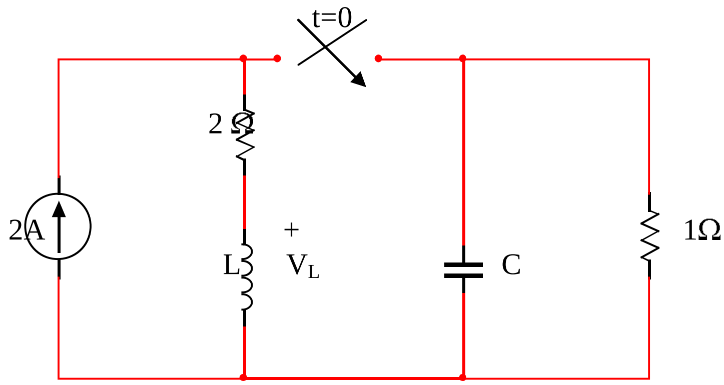
Q68) Find $V_a(0+)$ and $V_{c1}(\infty)$ in the fig shown?



a) V,V b) 0,V c) 0 d) V,-V Ans: (a)

TRUE VICTORY LIES IN INSPIRING COURAGE IN OTHERS

Q69) The voltage across L at t=0+ will be

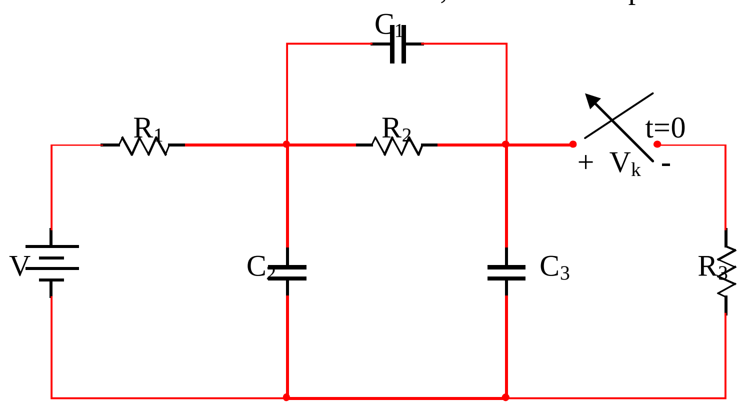


a) 0 b) 2V c) 4V d) –4 V Ans: (d)

Q70) When a constant voltage source V is connected to a series R-L circuit with zero initial stored energy in the inductor, the instantaneous value of power supplied to the inductor L is given by

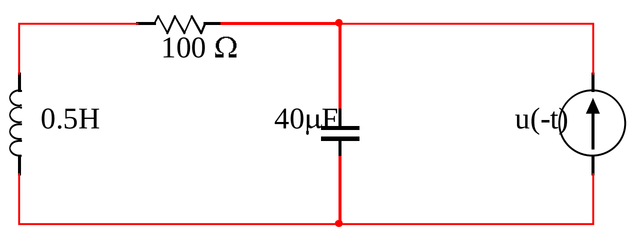
a) $V^2/R\ (e^{-Rt/L}- e^{-2Rt/L})$ b) $V^2/R\ (1- e^{-Rt/L})$ c) $V^2/R\ e^{-Rt/L}$ d) $V^2/R\ (1+ e^{-Rt/L})$ Ans: (a)

Q71) A steady state is reached with the switch closed. At t=0, the switch is opened. Find $V_k(0+)$



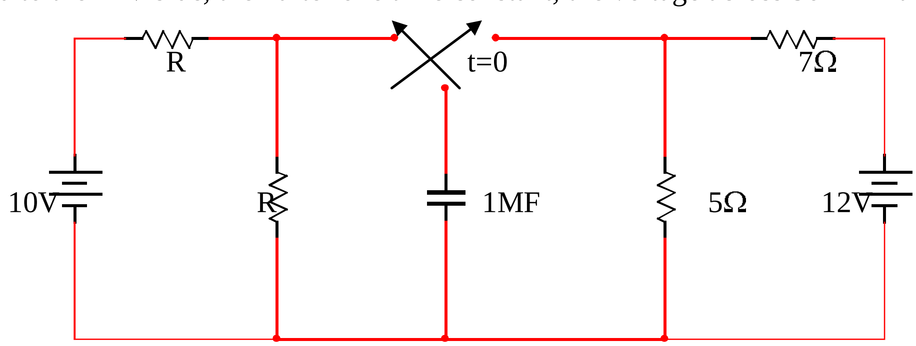
a) $–VR_3/R_1+R_2+R_3)$ b) $VR_3/R_1+R_2+R_3)$ c) 0 d) none Ans: (b)

Q72) What is di/dt(0+) in the fig shown?



a) 0.1 b) 0.01 c) 10 d) 0 Ans: (d)

Q73) In the network shown, the switch has remain closed for a long time on the 10V source side. If at time t=0, it is changed to the 12V side, then after one time constant, the voltage across 5ohm in the circuit will be



a)5 b) $5e^{-1}$ c) 10 d) 12 Ans: (a)

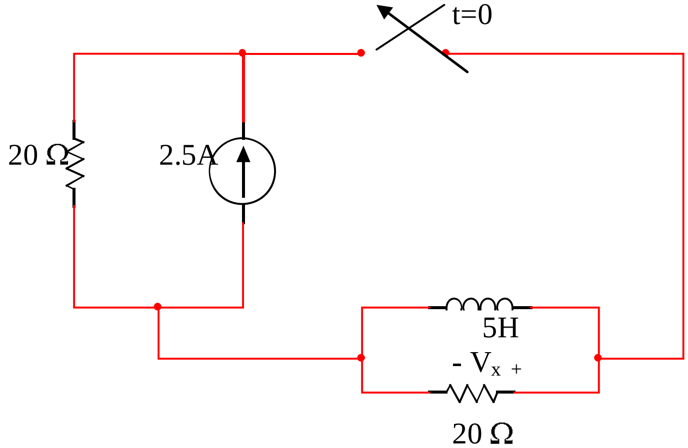
Q74) The response of an initially relaxed linear constant parameter network to a unit impulse applied at t=0 is $4e^{-2t}u(t)$. The response of this network to a unit step function will be

a) $2(1-e^{-2t})u(t)$ b) $4(e^{-t}-e^{-2t})$ c) sin2t d) $(1-4e^{-4t})u(t)$ Ans: (a)

Q75) If $i(t) =1/4[1-e^{-2t}]u(t)$, then the complex frequencies associated with I(t) would include

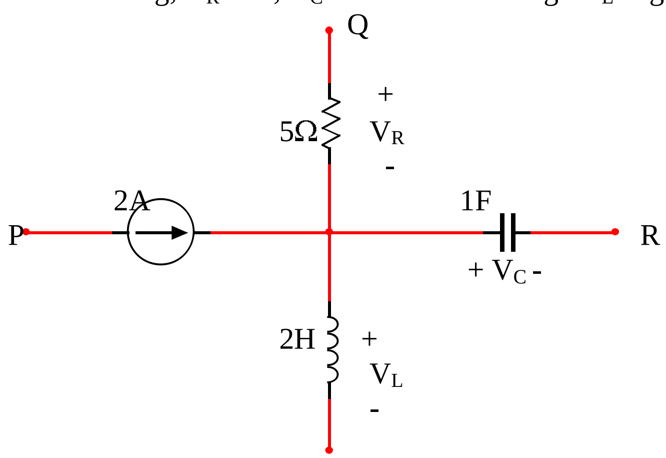
a) s=0 and s=j2 b) s=j2 and s=-j2 c) s=-j2 and s=-2 d) s=0 and s=-2 Ans: (d)

Q76) The switch was closed for a long time before opening at t=0. The voltage V_x at t=0+ is



a) 25 V b) 50 V c) –50 V d) 0V Ans: ©

Q77) A segment of a circuit is shown in fig, V_R=5V, V_C=4sin2t. The voltage V_L is given by

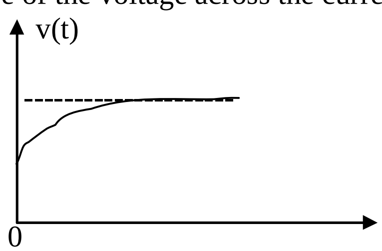


a) 3-8 cos 2t b) 32 sin 2t c) 16 sin 2t d) 16 cos 2t Ans: (b)

Q78) An excitation is applied to a system at t=T and its response is zero for -∞<t<T. Such a system is

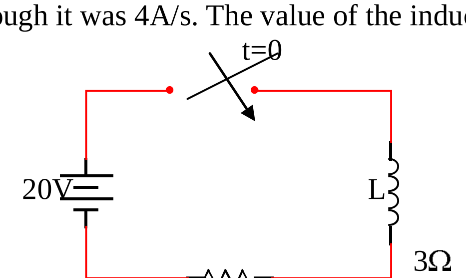
a) Non-causal system b) stable system c) causal system d) unstable system Ans: (c)

Q79) When a current source of value 1 is suddenly connected across a two terminal relaxed RC network at time t=0, the observed nature of the voltage across the current source is shown in the fig. The RC network is



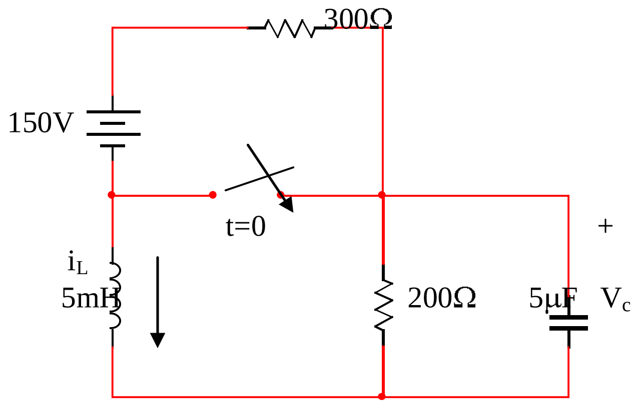
a) a series combination of R and C b) a parallel combination of R and C c) A series combination of R and parallel combination of R and C d) a pure capacitor Ans: (c)

Q80) In the circuit shown, switch S is closed at time t=0. After some time when the current in the inductor was 6A, the rate of change of current through it was 4A/s. The value of the inductor is



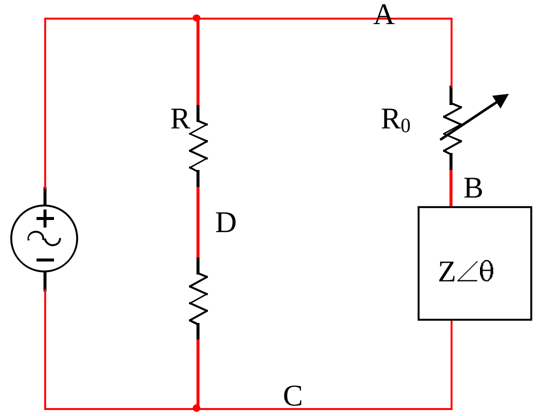
a) Indeterminate b) 1.5H c) 1.0H d) 0.5H Ans: (d)

Q81) After keeping it open for a long time, the switch S in the circuit is closed at t=0. The capacitor voltage $V_c(0+)$ and inductor current $i_L(0+)$ will be



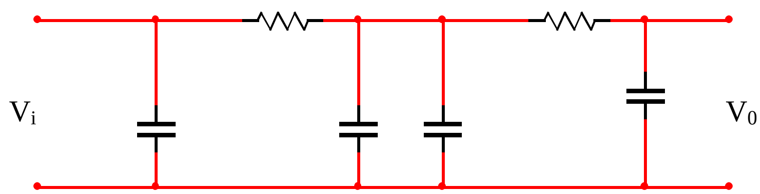
a) 60V and –0.3A b) 150V and zero c) zero and 0.3A d) 90V and –0.3A Ans: (a)

Q82) In the circuit shown, if R_0 is adjusted such that $|V_{AB}| = |V_{BC}|$, then



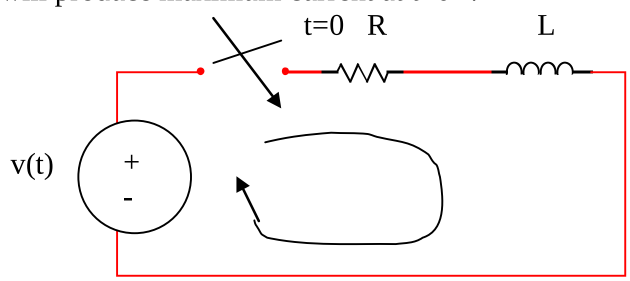
a) $\theta=2\tan^{-}[2|V_{BD}| / |V|]$ b) $|V_{DC}| = |V_{BC}|$ c) $|V_{AB}| = |V_{AD}|$ d) $\theta=\tan^{-}[|V_{BD}| / |V|]$ Ans: (a)

Q83) For the circuit shown, the order of the differential equation relating V_0 to V_i will be



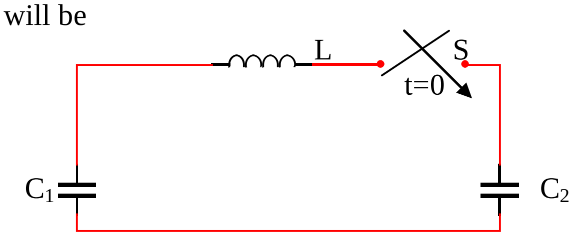
a) 4 b) 3 c) 2 d) 1 Ans: (b)

Q84) In the circuit shown, switch K is closed at t=0. The circuit was initially relaxed. Which one of the following sources of v(t) will produce maximum current at t=0+?



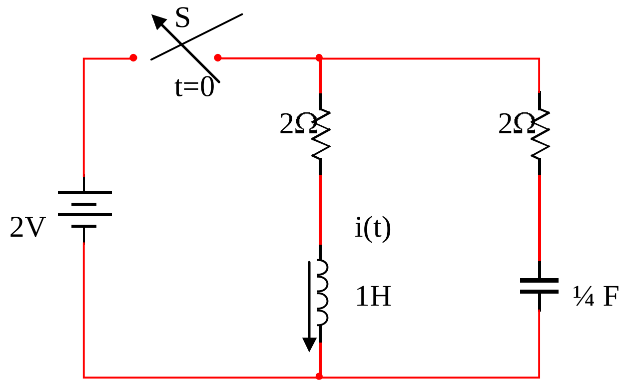
a) Unit step b) Unit impulse c) Unit ramp d) unit step plus unit ramp Ans: (b)

Q85) In the circuit shown $C_1=C_2=2F$ and the capacitor C_1 has a voltage of 20V when S is open. If the switch S is closed at t=0, the voltage V_{C2} will be



a) fixed voltage of 20V b) fixed voltage of 10V c) fixed voltage of –10V d) sinusoidal voltage Ans:(d)

Q86) The circuit shown in the fig is in steady state with the switch S closed. The current i(t) after S is opened at t=0 is

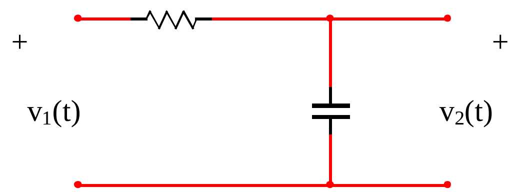


a) a decreasing exponential b) an increasing exponential c) a damped sinusoid d) oscillatory Ans: ©

Q87) A series RL circuit is initially relaxed. A step voltage is applied to the circuit. If τ is the time constant of the circuit, the voltage across R and L will be the same at time t equal to

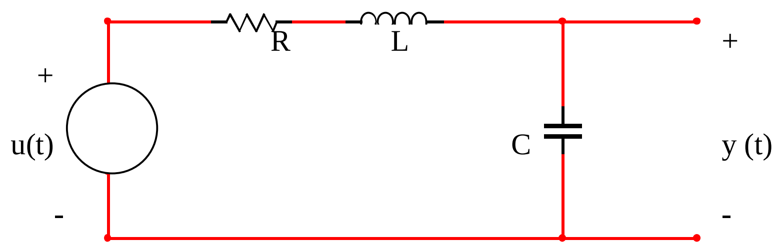
a) τln2 b) τln(1/2) c) 1/τln2 d) 1/τln(1/2) Ans: (a)

Q88) For the following circuit a source of $v_1(t)=e^{-2t}$ is applied. Then the resulting response $v_2(t)$ is given by



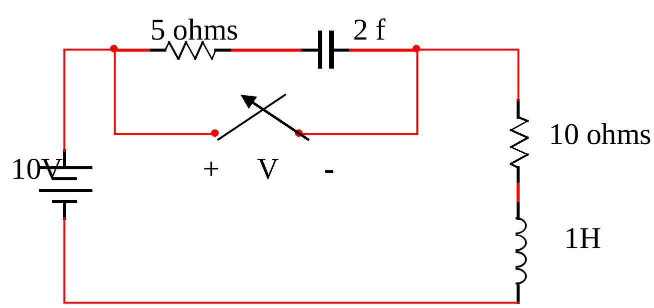
a) $e^{-2t}+e^{-t}$ b) e^{-t} c) $e^{-t}-e^{-2t}$ d) $e^{-2t}/2$ Ans: ©

Q89) The condition on R, L and C such that the step response y (t) in fig has no oscillations, is



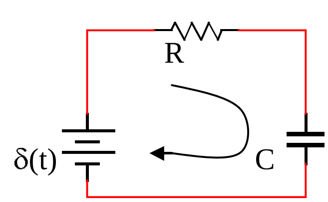
a) R⊒1/2 X√(L/C) b) R⊒√(L/C) c) R⊒2 X√(L/C) d) R=1/√(LC) Ans: ©

Q90) In the network shown, the switch is opened at t=0, prior to that, the network was in the steady state. Find V at t=0+



a) 0V b) 5 V c) 10V d) 15 V Ans: (b)

Q91) The circuit is shown, find i(t) if the impulse voltage is applied to the circuit.



a) $i(t) = 1/R[1-(1/RC)\ e^{-t/RC}]u(t)$ b) $i(t) = 1/R[\ e^{-t/RC}]u(t)$ c) $i(t) = 1/R[\delta(t)-(1/RC)\ e^{-t/RC}]u(t)$ d) None Ans: ©

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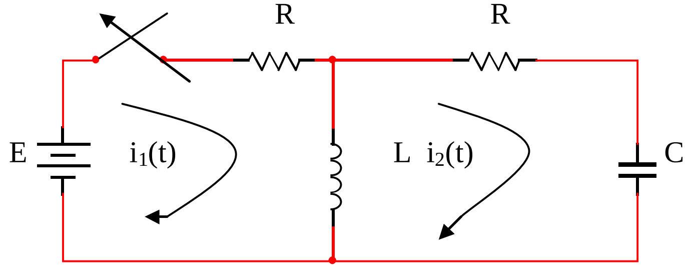
Q92) The network shown has reached steady state before the switch s is opened at t=0. Determine the initial condition and its derivatives of current i_2 (t)



a) $i2(0+)=0$; $i_2'(0+)=V/2R$ b) $i2(0+)=V/R$; $i_2'(0+)=V/2R$ c) $i2(0+)=0$; $i_2'(0+)=V/R$ d) None Ans: ( )

Q93) $f(t) = \delta(t) + 3\,e^{-t}$ initial value of the function f(t)

a) 3 b) 1 c) 4 d) none Ans: (a)

TWO PORT NETWORKS

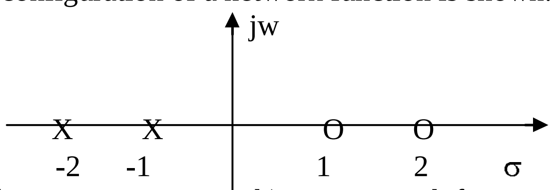
1. As the poles of a network shift away from the axis, the response

a) Remain constant b) becomes less oscillating c) becomes more oscillating d) none of these Ans: (b)

2. The response of a network is decided by the location of

a) Its zeros b) Its poles c) both zeros & poles d) neither zeros nor poles. Ans :(c)

3. The pole-zero configuration of a network function is shown. The magnitude of the transfer function will



a) Decrease with frequency b) increase with frequency

c) Initially increase and then decreases with frequency d) Be independent of frequency Ans: (d)

4. The condition that a 2- port network is reciprocal can be expressed in terms of its ABCD Parameters as __________________ Ans: AD – BC =1

5. Two identical 2- port networks with Y parameters $Y_{11} = -Y_{12} = -Y_{21} = Y_{22} = 1S$ are connected in cascade. The over all Y parameters will satisfy the condition

a) $Y_{11} = 1S$ b) $Y_{12} = -1/2\ S$ c) $Y_{21} = -2S$ d) $Y_{22} = 1S$ Ans: ( )

6. For two two – port networks connected in parallel, the overall y-matrix is
   a) Always the sum of the individual y- matrixes
   b) The sum of the individual y- matrixes if certain conditions are satisfied.
   c) Always the inverse of the sum of the individual z- matrixes.
   d) The inverse of the sum of the individual z- matrixes if certain conditions are satisfied. Ans:( )

7. Given $I_1 = 2V_1 + V_2$ and $I_2 = V_1 + V_2$ the Z-parameters are given by

a) 2,1,1,1 b) 1,-1,-1,2 c)1,1,1,2 d) 2, -1,1,1 Ans: (b)

8. The short – circuit admittance matrix of a two-port network is as shown

$$\begin{bmatrix} 0 & -1/2 \\ ½ & 0 \end{bmatrix}$$

The two-port network is Ans:(a)

a) Non reciprocal & passive b) Non-reciprocal & active c) Reciprocal & passive d) reciprocal & active.

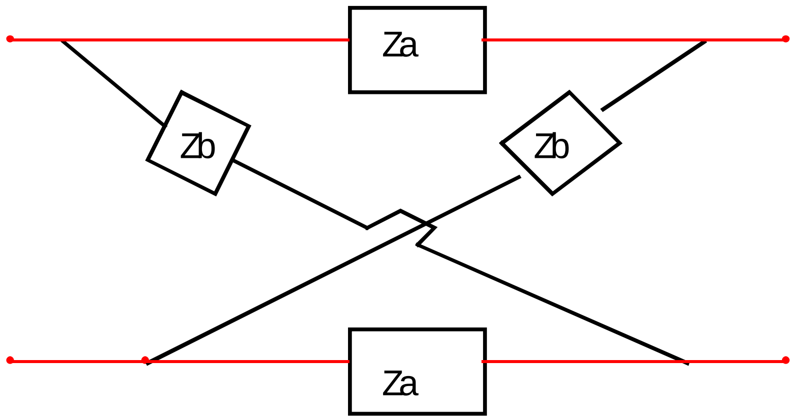
9. If the two port network is reciprocal, then

a) $Z_{12} / Y_{12} = Z_{12}^2 – Z_{11} Z_{12}$ b) $Z_{12} = 1/Y_{22}$ c) $h_{12} = -h_{21}$ d) AD-BC = 0 Ans: (c)

10. Two networks are cascaded through an ideal buffer. If tr_1 & tr_2 are the rise times of two networks, then the over all rise time of the two networks together will be

a) $\sqrt{tr_1\, tr_2}$ b) $\sqrt{(tr_1^2 + tr_2^2)}$ c) $tr_1 + tr_2$ d) $(tr_1 + tr_2)/2$ Ans: (b)

11. The open- circuit transfer impedance Z_{21} of the two-port network is

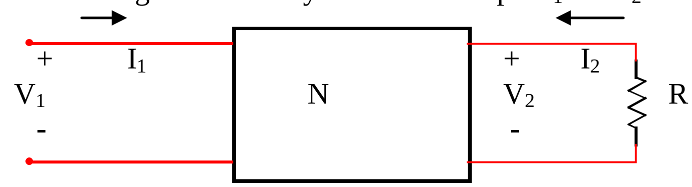


a) $(Z_a - Z_b)/2$ b) $(Z_b - Z_a)/2$ c) $(Z_a + Z_b)/2$ d) $Z_a + Z_b$ Ans:(b)

12. Two networks are cascaded through an ideal buffer. If td_1 & td_2 are the delay times of two networks, then the over all delay time of the two networks together will be

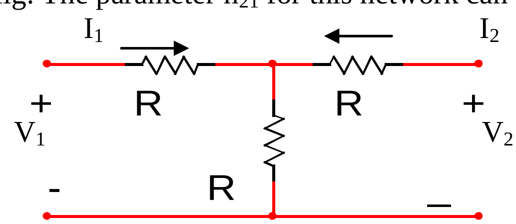
a) $\sqrt{td_1\, td_2}$ b) $\sqrt{(td_1^2 + td_2^2)}$ c) $td_1 + td_2$ d) $(td_1 + td_2)/2$ Ans: (c)

13. The two- port network shown in fig. described by the relationships $V_1 = kV_2$ and $I_1 = kI_2$ its input impedance is



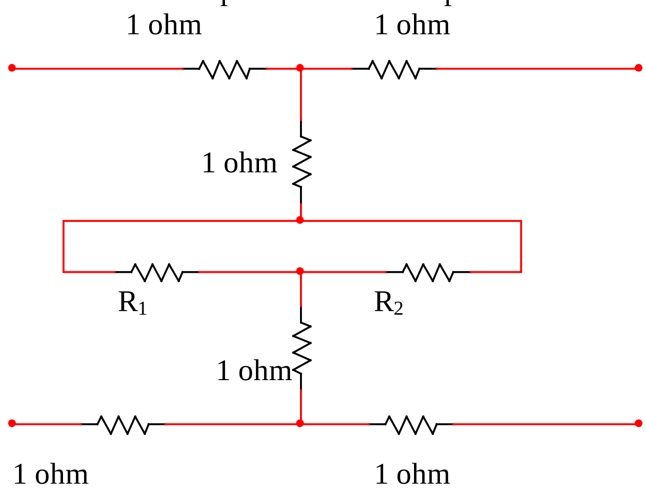
a) R b) –R c) kR d) k^2 R Ans:(b)

14. A 2- port network is shown in fig. The parameter h_{21} for this network can be given by



a) – ½ b) +1/2 c) – 3/2 d) + 3/2 Ans:(a)

15. For the circuit shown identify the correct statement ,where Za is Z-parameters of top circuit , Zb is Z parameters of bottom circuit and Z is the Z parameters of complete circuit

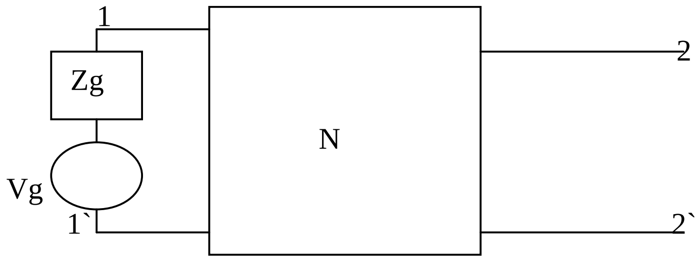


a) for any value of R_1 and R_2 $Z = Z_a + Z_b$ b) If $R_1 = R_2 = 0$ then only $Z = Z_a + Z_b$
c) If R_1 and R_2 is equal to 1 ohm then only $Z = Z_a + Z_b$ d) None Ans: (b)

16. A two port network is reciprocal, if and only if

a) $Z_{11} = Z_{22}$ b) BC – AD = -1 c) $Y_{12} = -Y_{21}$ d) $h_{12} = h_{21}$ Ans;(b)

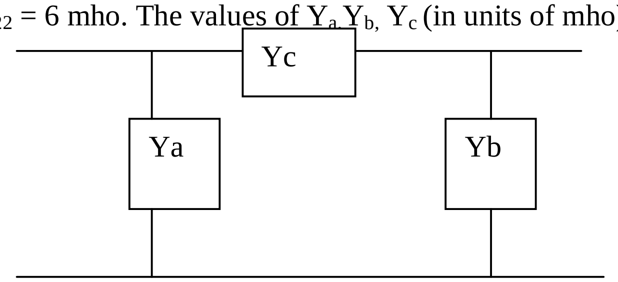
17. The two – port network shown in the fig. is characterized by the impedance parameters Z_{11}, Z_{12}, Z_{21} and Z_{22}. For the equivalent Thevenin's source looking to the left of port 2, the V_T and Z_T will be respectively



a) $V_T = \dfrac{Z_{11}}{Z_{11} + Z_g} V_g$; $Z_T = Z_{22} - Z_{12}$ b) $V_T = \dfrac{Z_{12}}{Z_{11} + Z_g} V_g$; $Z_T = Z_{22} - Z_{12}$

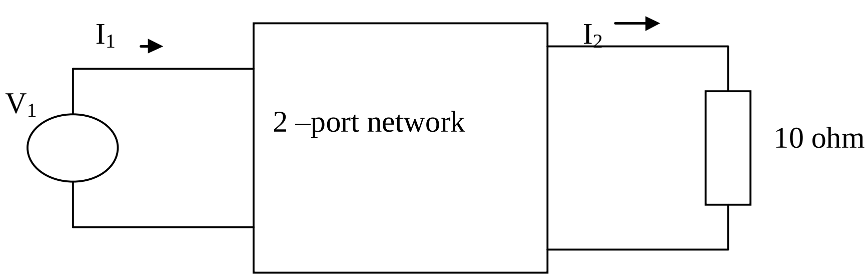
c) $V_T = \dfrac{Z_{21} V_g}{Z_{11} + Z_g}$; $Z_T = Z_{22} + \dfrac{Z_{12} Z_{21}}{Z_{11} + Z_g}$ d) $V_T = \dfrac{Z_{21} V_g}{Z_{11} + Z_g}$; $Z_T = Z_{22} - \dfrac{Z_{12} Z_{21}}{Z_{11} + Z_g}$ Ans:(d)

18. In respect of the 2-port network shown in the fig. The admittance parameters are: Y_{11} = 8mho, $Y_{12} = Y_{21}$ =–6 mho and Y_{22} = 6 mho. The values of Y_a, Y_b, Y_c (in units of mho) will be respectively



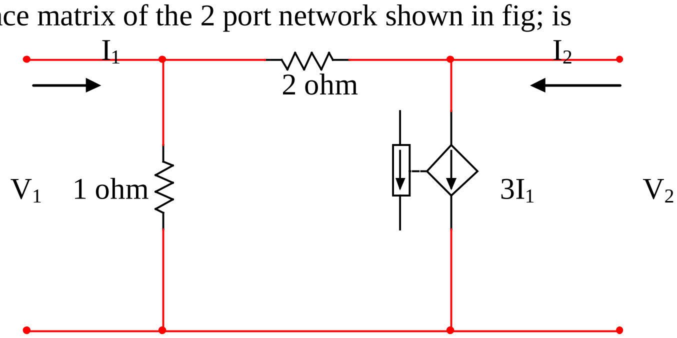
a) 2,6 and –6 b) 2,6 and 0 c) 2,0 and 6 d) 2,6 and 8 Ans:(c)

19. If the transmission parameters of the network are A = C = 1, B = 2 and D = 3, then the value of Z_m is



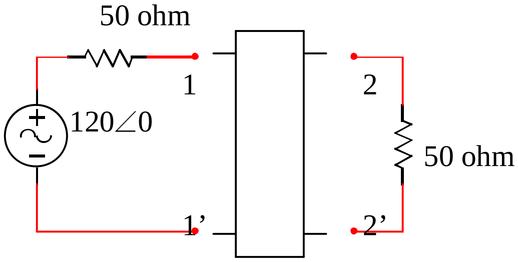
a) 12 /13 Ω b) 13/12 Ω c) 3Ω d)4Ω Ans:(a)

20. The open circuit impedance matrix of the 2 port network shown in fig; is



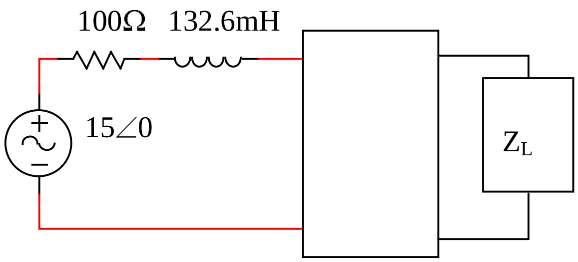
a) $\begin{bmatrix} -2 & 1 \\ 8 & 3 \end{bmatrix}$ b) $\begin{bmatrix} -2 & -8 \\ 1 & 3 \end{bmatrix}$ c) $\begin{bmatrix} 0 & 1 \\ 1 & 0 \end{bmatrix}$ d) $\begin{bmatrix} 2 & -1 \\ -1 & 3 \end{bmatrix}$ Ans:(a)

21. A bilateral "black box" draws 7.5mA from a 1 V source connected to port 1 with port 2 shorted. Under these conditions, the current in the short is 5 mA. With a 10 V source connected to port 2; the box draws 100mA from the source with port 1 short circuited. Determine the voltage across a 50 ohms load when the "black box" is connected as shown.



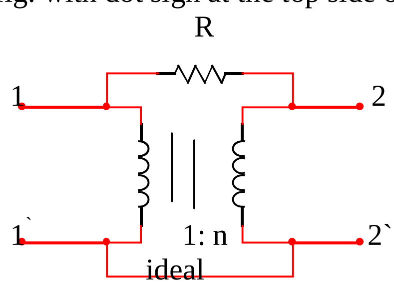
a)$10.0\angle 0^0$ V b)$10.0\angle -90^0$ V c) $15.0 \angle -90^0$ V d)$15.0 \angle 0^0$ V Ans: (d)

22. The network in the box shown displays the following z parameters: z_{11}= 50 ohms, z_{12} = -100 ohms, z_{21} = 500 ohms, and z_{22} = 2.5 k ohms. Determine the circuit required for z_L to insure maximum power transfer. Assume f = 60 Hz.



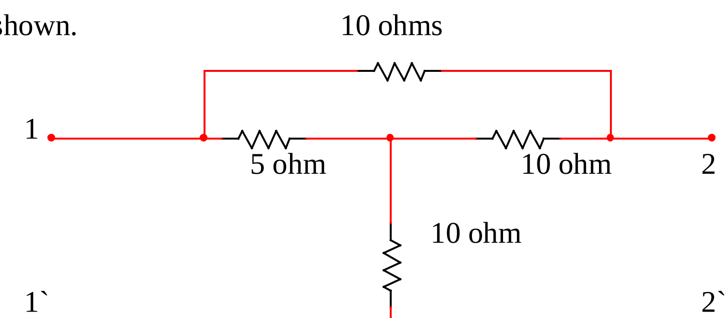
a)2.8k ohms. 26.5 μF in series. b)2.6 k ohms, 26.5 μF in series c)2.8 k ohms, 265 mH in series d)2.6 k ohms, 265 mH in series Ans: ©

23. Find Z_{22} of the circuit shown in the fig: with dot sign at the top side of two windings



a) $R / n^2 – 1$ b) $nR / n^2 – 1$ c) $n^2R / n^2 – 1$ d) none Ans: (c)

24. Find Y_{11} of the fig; shown.



a) 0.2 mohs b) 5 mhos c) infinite d) none Ans: (a)

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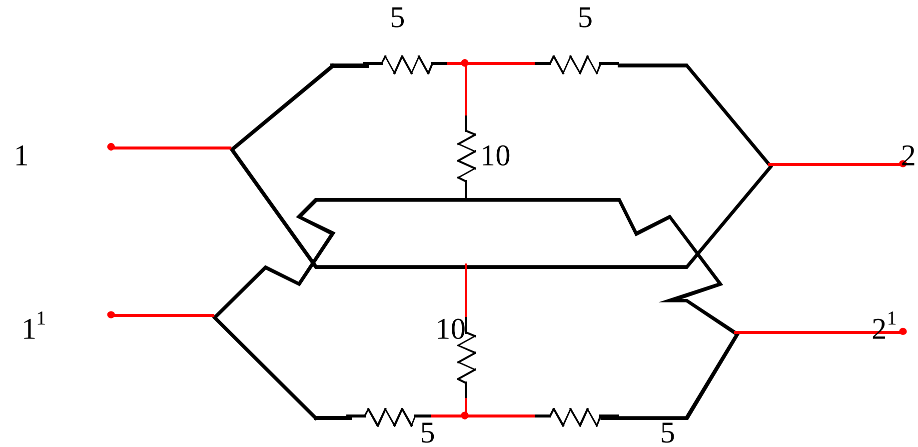
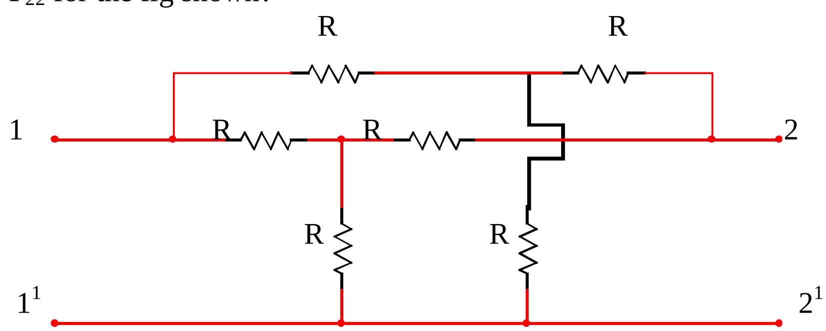
25. Find Y_{11} of the fig; shown



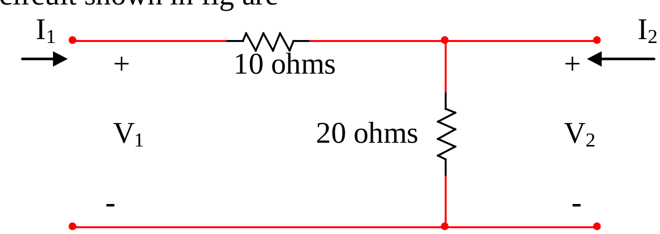
a) 25 / 3 mhos b) 50 / 3 mhos c) ∞ d) 6 / 25 mhos Ans: (c)

26. Find Y_{22} for the fig shown?



a) 4 R/ 3 b) 3 / 4R c) 4 / 3R d) 3R / 4 Ans: (c)

27. The h parameters of the circuit shown in fig are



a) $\begin{pmatrix} 0.1 & 0.1 \\ -0.1 & 0.3 \end{pmatrix}$ b) $\begin{pmatrix} 01 & -1 \\ 1 & 0.05 \end{pmatrix}$ c) $\begin{pmatrix} 30 & 20 \\ 20 & 20 \end{pmatrix}$ d) $\begin{pmatrix} 10 & 1 \\ -1 & 0.05 \end{pmatrix}$ Ans: (d)

28. Two transmission lines are connected in cascade whose ABCD parameters are

$$\begin{bmatrix} A_1 & B_1 \\ C_1 & D_1 \end{bmatrix} = \begin{bmatrix} 1 & 10\angle 30 \\ 0 & 1 \end{bmatrix} \quad \& \quad \begin{bmatrix} A_2 & B_2 \\ C_2 & D_2 \end{bmatrix} = \begin{bmatrix} 1 & 0 \\ 0.025\angle -30 & 1 \end{bmatrix}$$

Find resultant ABCD parameters____

29. For the circuit shown, if the input impedance Z_1 at port 1 is given by $Z_1 = K_1 (S+2)/ (S+5)$ then the I/P impedance Z_2 at port 2 will be

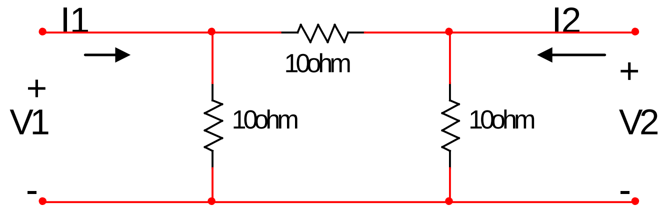
a) $K_2 (S+3) / (S+5)$ b) $K_2 (S+2) / (S+3)$ c) $K_2 S / (S + 5)$ d) $K_2 S / (S+2)$ Ans: ( )

30. A passive 2-port network is in a steady state. Compared to its input, the steady state output can never offer

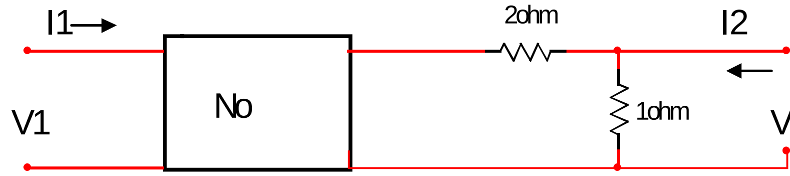
a) Higher voltage b) lower impedance
c) Greater power d) better regulation Ans: (c)

THE ONE WHO IS FLEXIBLE IS CONSTANTLY HAPPY

31. Admittance matrix of the circuit as shown is ________________________



32. Find A,B,C,D parameters of No______________________________

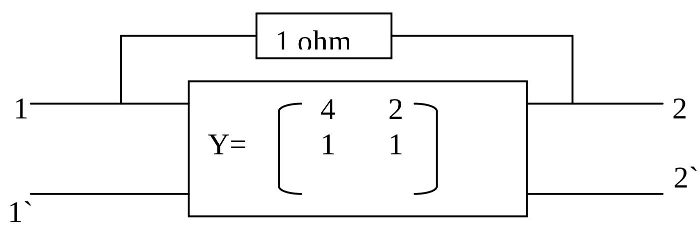


$$\begin{bmatrix} V_1 \\ I_1 \end{bmatrix} = \begin{bmatrix} 30 & 23 \\ 13 & 10 \end{bmatrix} \begin{bmatrix} V_2 \\ -I_2 \end{bmatrix}$$

33. A symmetrical lattice network has a resistance R_1 in the series arm and a resistance R_2 in the cross arm. Its Z_{12} parameter is

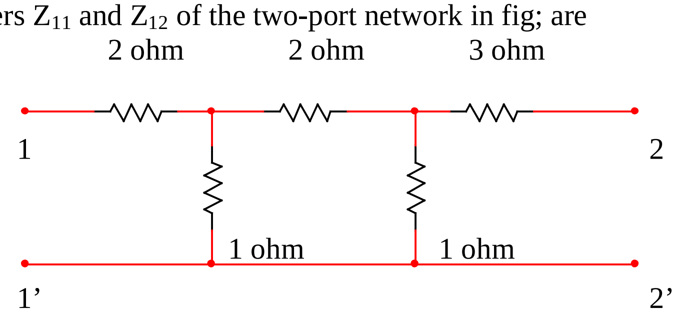
a) $(R_1 + R_2) /2$ b) $(R_2 – R_1) / 2$ c) $(R_1 – R_2) / 2$ d) $2 (R_1 – R_2)$ Ans:( )

34. The Y parameters of a four – terminal block are $\begin{bmatrix} 4 & 2 \\ 1 & 1 \end{bmatrix}$ A single element of 1 ohm is connected across as shown in the given fig. The new Y parameters will be



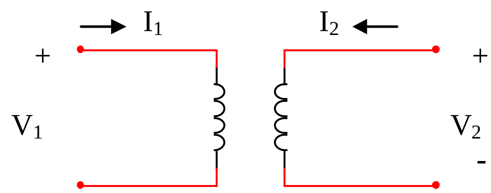
a) $\begin{bmatrix} 5 & 1 \\ 0 & 2 \end{bmatrix}$ b) $\begin{bmatrix} 4 & 3 \\ 2 & 2 \end{bmatrix}$ c) $\begin{bmatrix} 3 & 2 \\ 1 & 1 \end{bmatrix}$ d) $\begin{bmatrix} 4 & 2 \\ 1 & 1 \end{bmatrix}$ Ans:( )

35. The impedance parameters Z_{11} and Z_{12} of the two-port network in fig; are



a) $Z_{11} = 2.75\Omega$, $Z_{12} = 0.25\Omega$ b) $Z_{11} = 3\ \Omega$, $Z_{12} = 0.5\Omega$ c) $Z_{11} = 3\ \Omega$, $Z_{12} = 0.25\Omega$ d) $Z_{11} = 2.25\ \Omega$, $Z_{12} = 0.5\Omega$ Ans: ( )

36. The ABCD parameters of an ideal n:1 transformer shown in fig are $\begin{pmatrix} n & 0 \\ 0 & X \end{pmatrix}$. The value of X will be



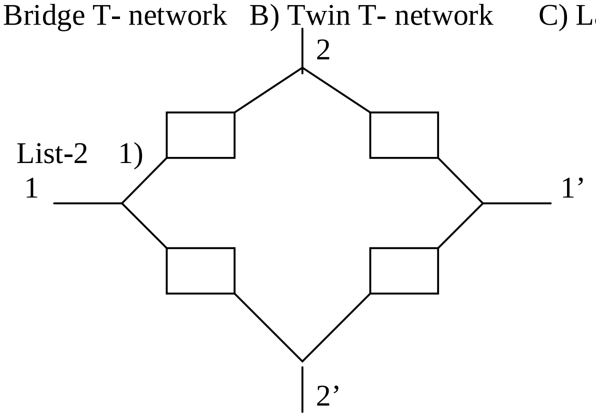
a) n b)1/n c) n^2 d) $1/n^2$ Ans: (b)

37. Match list-1 with list-2 and select the correct answer using the codes given below the lists:

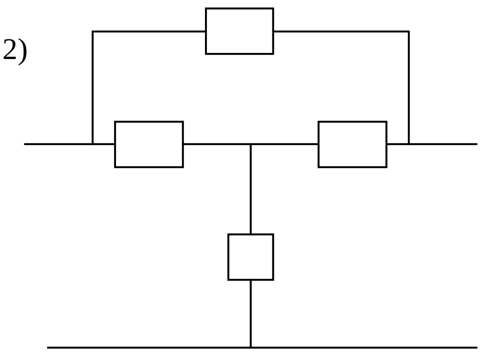
List-1

A) Bridge T- network B) Twin T- network C) Lattice network D) Ladder network

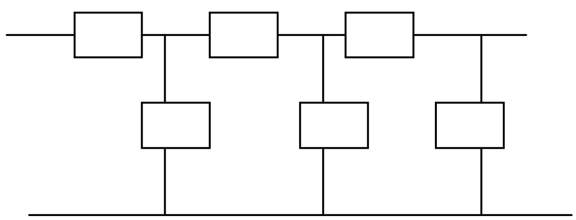
List-2 1)



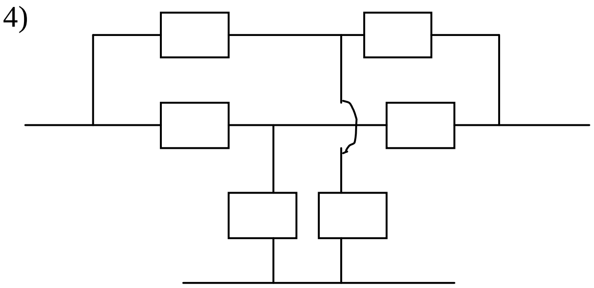
2)



3)



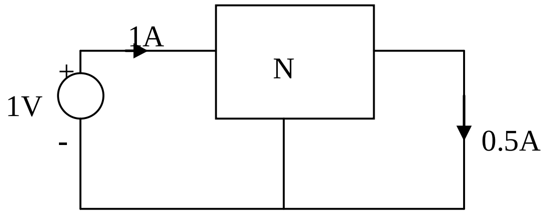
4)

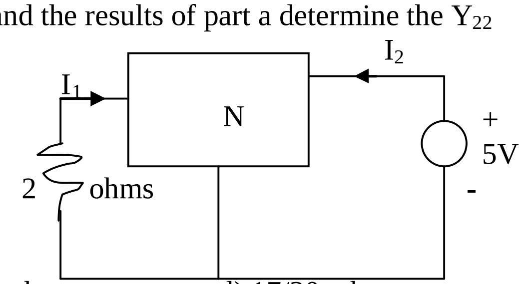


A, B, C, D
a) 2, 4, 3, 1
b) 4, 2, 1, 3
c) 4, 2, 1, 3
d) 2, 4, 1, 3

Ans:(d)

38. It is given that in the fig b I_2=2A. Using this and the results of part a determine the Y_{22}





a) 1 mho b) –1/2 mho c) ½ ohm d) 17/30 mho Ans: (a)

NETWORK FUNCTIONS

1. The necessary and sufficient condition for a rational function of T (s) to be driving point impedance of an RC network is that all poles and zeros should be
   a. Simple and lie on the negative axis in the s- plane b) Complex and lie in the left half of the s- plane
   b. Complex and lie in the right half of the s- plane d) Simple and lie on the +ve real axis of the s-plane

Ans: (a)

2. For an RC driving – point impedance function the poles and zeros

a) Should alternate on real axis b) should alternate only on the real axis
c) Should alternate on the imaginary axis d) can lie any where on the left half plane Ans: (b)

3. The transfer function of a passive circuit has its poles and zeros on

a) Left and right halves respectively of the s-plane b) right and left halves respectively of the s-plane
c) Right half of the s – plane d) left half of the s- plane. Ans:(a)

4. A realizable driving point function N(s) can be expressed as follows:

$N(S) = KS / (S^2+w_0^2) + F_1(S)$ where $F_1(S)$ has no poles at $S= \pm jw_0$. The constant K
a) may be complex b) must be real and positive c) must be real and negative d) must be real but may be positive or negative. Ans:( )

5. An LC one-port has two inductances and a capacitance connected in such a manner that the two inductances cannot be combined into one. The driving point impedance will have

a) a zero at s=0 as well as at s=∞ b) a pole at s=0 as well as at s = ∞ c) a zero at s= 0 and a pole at s=∞
d) a pole at s = 0 and a zero at s = ∞ Ans:( )

6. An RLC network has two poles which are complex conjugates and very close to the jw-axis. Its transient response

a)is critically damped b) is over damped c) is under damped d) cannot be determined from this data Ans: ( )

7. An impedance function Z (s) is such that $Re(Z(jw)) < 0$ for $w_1 < w < w_2$ and $Re(Z(jw)) > 0$ for $0 \le w < w_1$, and $w_2 < w \le \infty$. It

a) can be realized by an RC network. b) can be realized by an RL network c) can be realized by an RLC network d) cannot be realized by an RLC network.

8. A gyrator has an admittance matrix = $\begin{bmatrix} 0 & G \\ -G & 0 \end{bmatrix}$. It synthesizes an inductor at its input terminals when terminated by a capacitor C. The magnitude of inductor is

a) G^2C b) C/G^2 c) G^2/C d) 2CG Ans:(b)

9. Match List –I with List –II and select the correct answer using the codes given below the Lists:

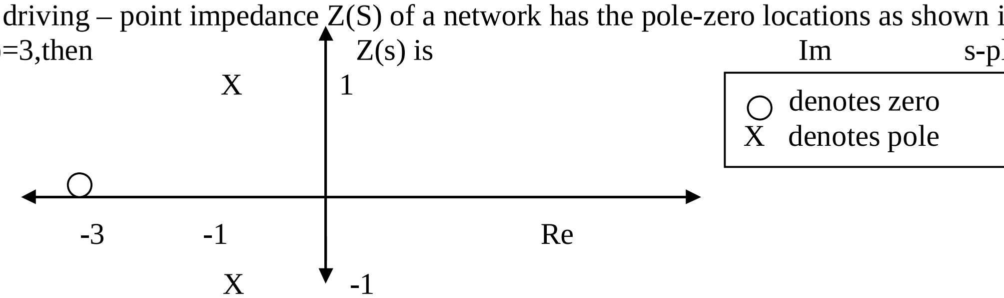
List-I	List-II
A. Internal impedance of an ideal current source is	1. Forced response of the circuit
B. For attenuated natural oscillations, the poles of the Transfer function must lie on the	2. Natural response of the circuit
C. A battery with an e. m. f. E and internal resistance R delivers current to a load R_L. Maximum power transferred is	3. $\dfrac{E^2}{4R}$
D. The roots of the characteristic equation given	4. $\dfrac{E^2}{2R}$
	5. Left hand part of the complex frequency plan
	6. Right hand part of the complex frequency plan
	7. Infinite
	8. Zero

Codes:

	A	B	C	D		A	B	C	D
a)	7	6	3	1	b)	8	5	4	2
c)	8	6	4	1	d)	7	5	3	2

Ans:(d)

10. The driving – point impedance Z(S) of a network has the pole-zero locations as shown in fig;if Z(0)=3,then Z(s) is



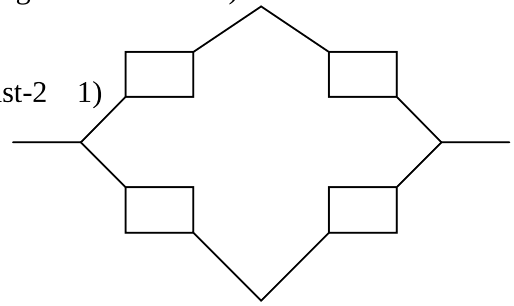
a)$3(S +3) / (S^2 +2s +3)$ b) $2(S+3) / (S^2\ 2S +2)$ c)$3(S-3) / (S^2 – 2S –2)$ d) $2(S-3) / (S^2- 2s-3)$Ans: ()

11. Match list-1 with list-2 and select the correct answer using the codes given below the lists:

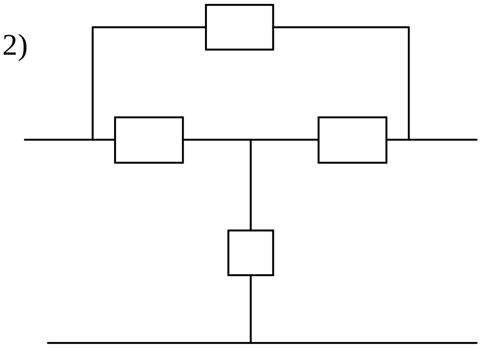
List-1

A) Bridge T- network B) Twin T- network C) Lattice network D) Ladder network

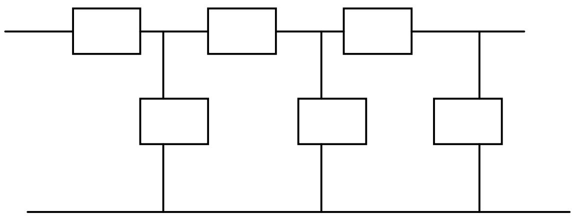
List-2 1)



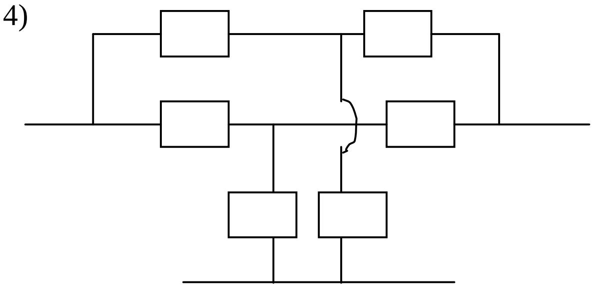
2)



3)



4)



A, B, C, D

e) 2, 4, 3, 1
f) 4, 2, 1, 3
g) 4, 2, 1, 3
h) 2, 4, 1, 3

Ans:(d)

SYNTHESIS

Q1) In an impedance function, a pole at infinity to be realized by using

a) a capacitance in series b) an inductance in series

c) an inductance in parallel with the driving point terminals d) none Ans:(b)

Q2) An impedance function whose real part varnishes at some real frequency is called

a) minimum impedance function b) minimum reactance function

c) minimum susceptance function d)minimum resistance function Ans:(d)

Q3) zero of a network is the critical frequency at which network function becomes

a) zero b) unity c)infinite d) sinusoidal. Ans:(a)

Q4) Match the list- I & list II

A) $(S^2 - S + 4) / (S^2 + S + 4)$ 1) Non – positive real.

B) $(S + 4) / (S^2 + 3S - 4)$ 2) Non – minimum phase.

C) $(S + 4) / (S^2 + 6S + 5)$ 3) RC– impedance

D) $(S^3 + 3S) / (S^4 + 2S^2 + 1)$ 4) Unstable

5) RL impedance

A,B,C,D

a) 1,2,3,4
b) 2,4,3,1
c) 1,2,4,5
d) 2,4,1,5

Ans: (b)

Q5) Match the following

A) $(S^2 - S + 1) / (S^2 + S + 1)$ 1) RL admittance.

B) $(S^2 + S + 1) / (S^2 - S + 1)$ 2) RL impedance

C) $(S^2 - 4S + 3) / (S^2 + 6S + 8)$ 3) Unstable.

4) Non – minimum phase

A,B,C

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

Ans: (c)

Q6) Match the following;

A) Poles and zeros of driving point reactance function of LC network — 1) Lie on the real axis

2) a zero

B) Canonic LC network contains — 3) Maximum number of elements

C) The number of canonic networks for a given driving point reactance function is — 4) Four

5) Minimum number of elements

D) The first critical frequency nearest the origin of the complex frequency plane for on RL driving point impedance function will be. — 6) Alternate

7) Either a pole or zero

8) Three.

A,B,C,D

a) 1,5,8,7
b) 6,5,4,2
c) 6,5,3,2
d) 1,3,4,7 Ans: (b)

Q7) An RC driving point function has zeros at S = -2 & s = - 5. The admissible poles for the functions are

a) S = 0, -6 b) S= -1, -3 c) 0,-1 d) –3, -4 Ans: (b)

Q8) Which one of the following is a + ve real function

a) $S (S^2 + 4) / (S^2 + 1) (S^2 + 6)$ b) $S (S^2 - 4) / (S^2 + 1) (S^2 + 6)$

c) $(S^3+ 3S^2 +2S + 1) / 4S$ d) $S (S^4 + 3S^2 + 1) / (S+1) (S + 2) (S+ 3) (S+ 4)$ Ans: (a)

Q9) An LC driving point function has the following finite, non-zero critical frequencies: poles at s = ± j2, ± j4; zeros at s = ± j1 and ± j3. At s = 0, the function must have a

a) Pole b) zero c) a pole or a zero d) a finite non- zero value.

Q10) A second order band pass filter has a value of 10 for the ratio of center frequency to bandwidth. The filter can be realized with

a) RLC elements b) RL elements only c) LC elements only d) RC elements only. Ans:( )

Q11) For the driving point impedance function of an R-C network,

a) the critical frequency nearest the origin is a pole
b) poles and zeros can occur in any sequence
c) all internal poles are on the positive real axis
d) all internal zeros are on the positive axis Ans:()

Q12) The transfer function 1 / s

a) can be realized by an R-C network b) can be realized by an R-L network

c) Can be realized by an R-L-C network d) cannot be realized by an R-L-C network Ans:(d)

Q13) Of the following driving point impedance, the one realized by an R-C network is Ans:(a)

a) (s + 1) (s+3) / s (s+2) b) s(s+2) / (s+1) (s+2) c) (s+2) (s+3) / s(s+1) d) s(s+1) / (s+2) (s+3)

Q14) Consider the following statements regarding the driving-point admittance function

$$Y(s) = \frac{S^2+2.5S+1}{S^2+4S+3}$$

1) It is an admittance of RL network 2)Poles and zeros alternate on the negative real axis of the s-plane

3) The lowest critical frequency is a pole 4)Y (0)= (1/3)

Which of these statements are correct?

a) 1,2and 3 b) 2 and 4 c) 1and 3 d) 1,2,3 and 4 Ans:(a)

GENERAL

Q1) A linear time invariant system has an impulse response e^{2t}, t > 0. If the initial conditions are zero and input is e^{3t}, the output for t >0 is

a) $e^{3t} - e^{2t}$ b) e^{5t} c) $e^{3t} + e^{2t}$ d) none of the above Ans;(a)

DEMOCRACY MEANS FAITH IN SELF, IT MEANS FAIT IN ONE'S ABILITY TO STAND ON ONE'S OWN FEET AND PROSPER BY ONE'S OWN EFFORTS.

Q2) Match List – I with List-II and select the correct answer using codes given below the list;

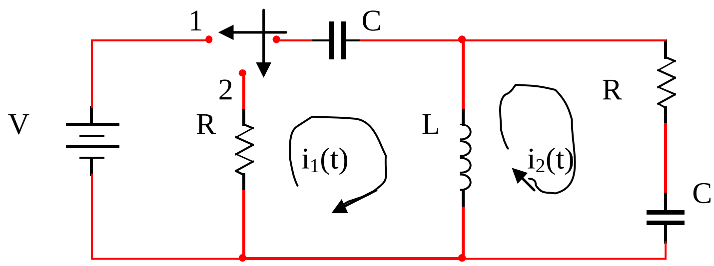
List-I	List-II
A. A series RLC circuit is over damped when	1. $\lim_{t \to 0} f(t) = \lim_{S \to \infty} SF(s)$
B. The unit of the real part of the complex frequency is	2. $\dfrac{R^2}{4L^2} < \dfrac{1}{LC}$
C. If F(S) is the Laplace transform of f (t) then F (s) and f (t) are known as	3. rad/s
D. If f (t) its first derivative are Laplace transferable then the initial value of f (t) is given by	4. Inverse functions.
	5. $\dfrac{R^2}{4L^2} \geq \dfrac{1}{LC}$
	6. neper sec^{-1}
	7. $\lim_{t \to 0} f(t) = \lim_{S \to 0} SF(s)$
	8. Transfrom pairs

CODES:

	A	B	C	D		A	B	C	D
a)	5	6	8	1	b)	5	6	1	8
c)	6	5	3	4	d)	6	5	2	7

Ans:(a)

Q3) For the circuit shown the switch is in position 1 for a long time and thrown to position 2 at t=0. $I_1(s)$ and $I_2(s)$ are the Laplace transforms of $i_1(t)$ and $i_2(t)$ respectively. The equations for the loop currents $I_1(S)$ and $I_2(S)$ are



a) $\begin{bmatrix} R+LS+1/CS & -LS \\ -LS & R+1/CS \end{bmatrix} \begin{bmatrix} I_1(S) \\ I_2(S) \end{bmatrix} = \begin{bmatrix} V/S \\ 0 \end{bmatrix}$

b) $\begin{bmatrix} R+LS+1/CS & -LS \\ -LS & R+1/CS \end{bmatrix} \begin{bmatrix} I_1(S) \\ I_2(S) \end{bmatrix} = \begin{bmatrix} -V/S \\ 0 \end{bmatrix}$

Ans: (d)

c) $\begin{bmatrix} R+LS+1/CS & -LS \\ -LS & R+LS+1/CS \end{bmatrix} \begin{pmatrix} I_1(S) \\ I_2(S) \end{pmatrix} = \begin{pmatrix} V/S \\ 0 \end{pmatrix}$

d) $\begin{pmatrix} R+LS+1/CS & -LS \\ -LS & R+LS+1/CS \end{pmatrix} \begin{pmatrix} I_1(S) \\ I_2(S) \end{pmatrix} = \begin{pmatrix} -V/S \\ 0 \end{pmatrix}$

WHAT WE NEED TO PROPAGATE IS THAT WEALTH COMES ONLY WITH THE APPLICATION OF EVERYONE'S BEST EFFORTS. AND MAKING BEST EFFORTS NOT ONLY PRODUCES DESIRABLE RESULTS, BUT ALSO IS A REWARD IN ITSELF.