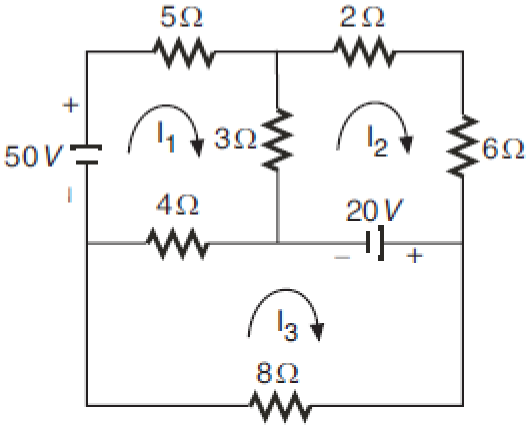
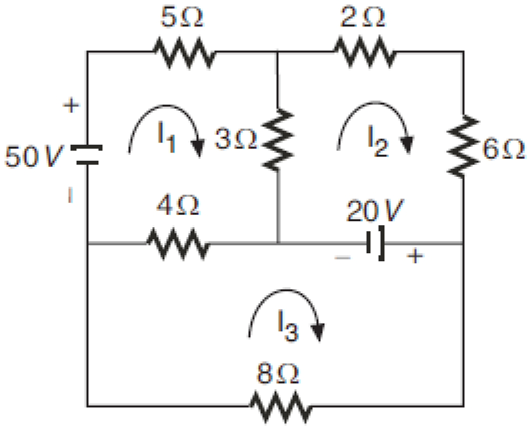
Solve the loop currents I1 of the circuit shown in Fig. 1



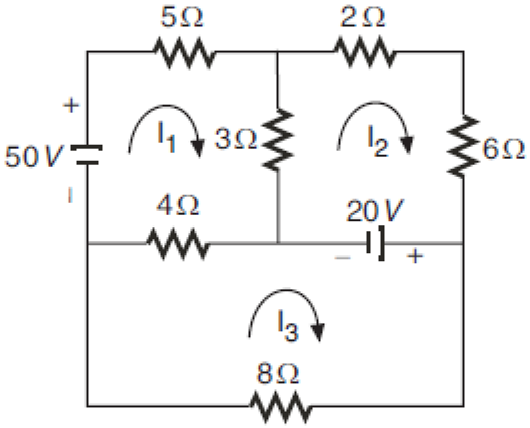
a. i1=5.2 A
b. i1=4.2 A
c. i1=3.2 A
d. i1=2.2 A

Solve the loop currents I2 of the circuit shown in Fig. 1



a. i2=– 0.4 A,
b. i2=– 1.4 A
c. i2=– 2.4 A
d. i2=– 3.4 A

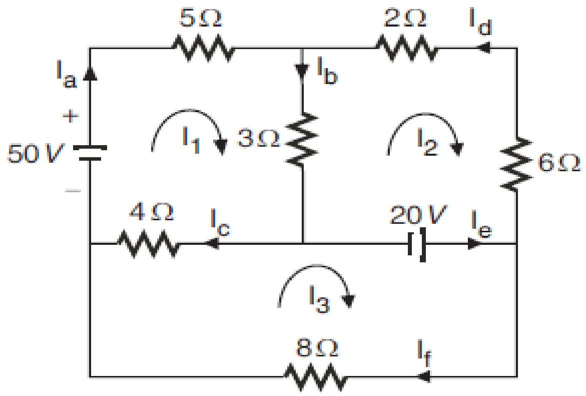
Solve the loop currents I3 of the circuit shown in Fig. 1, by mesh analysis.



a. i3= 3.4 A
b. i3= 4.4 A

c. i3= 5.4 A
d. i3= 6.4 A

Solve the currents in various branches of the circuit shown in Fig. 1, by mesh analysis. i1=5.2 A, i2=– 0.4 A, i3= 3.4 A



a. Ia = 5.2 A, Ib = 5.6 A, Ic=1.8A, Id=0.4A, Ie=3.8A, If=3.4A
b. Ia = 4.2 A, Ib = 4.6 A, Ic=9.8A, Id=1.4A, Ie=4.8A, If=3.4A
c. Ia = 3.2 A, Ib = 7.6 A, Ic=7.8A, Id=2.4A, Ie=5.8A, If=3.4A
d. Ia = 2.2 A, Ib = 8.6 A, Ic=6.8A, Id=3.4A, Ie=6.8A, If=3.4A

Determine the mesh currents I1 in the bridge circuit shown in Fig. 2.

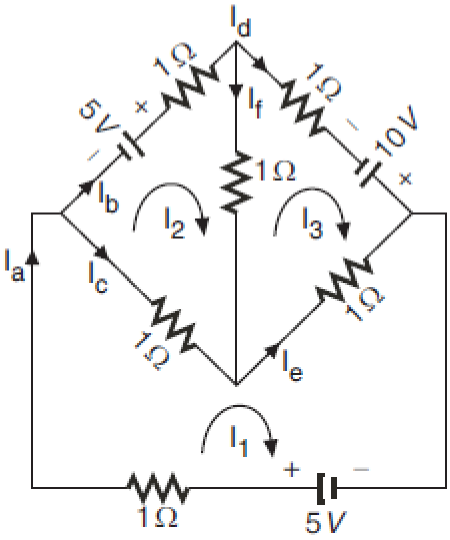


Fig.2

a. I1=6.25A
b. I1=1.25A
c. I1=2.25A
d. I1=3.25A

Determine the mesh currents I2 in the bridge circuit shown in Fig. 2.

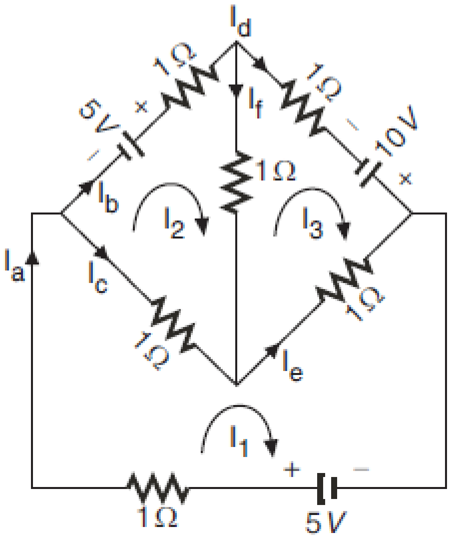


Fig.2

e. I2=6.25A
f. I2=2.25A
g. I2=3.25A
h. I2=5.25A

Determine the mesh currents I3 in the bridge circuit shown in Fig. 2.

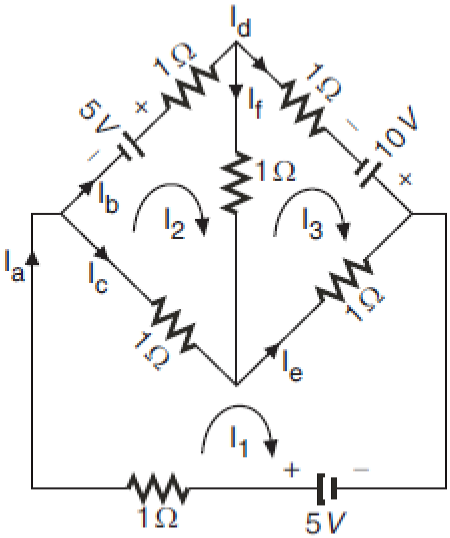
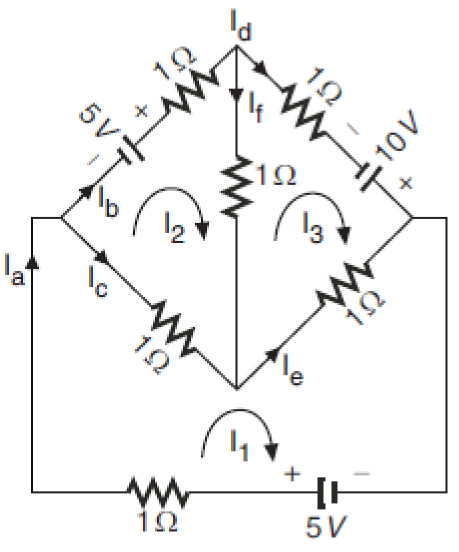


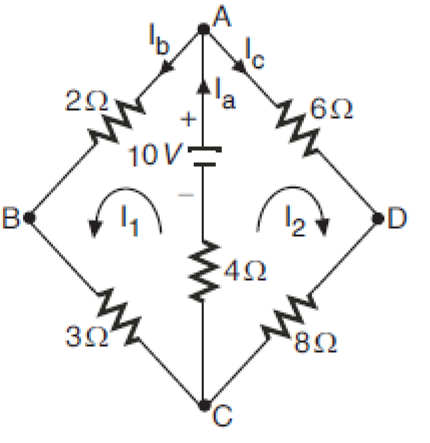
Fig.2

i. I3=7.5A
j. I3=9.5A
k. I3=8.5A
l. I3=7.5A

Determine the currents in various elements of the bridge circuit shown in Fig. 2, using mesh analysis. I1=6.25A, I2=6.25A, I3=7.5A

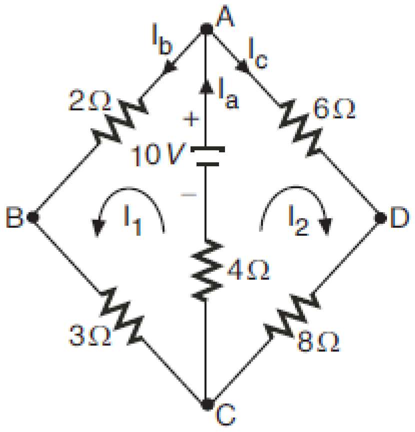


a. Ia = 6.25 A, Ib = 6.25 A, Ic=0A, Id=7.5A, Ie=-1.25A, If=-1.25A
b. Ia = 4.2 A, Ib = 4.6 A, Ic=9.8A, Id=1.4A, Ie=4.8A, If=3.4A
c. Ia = 3.2 A, Ib = 7.6 A, Ic=7.8A, Id=2.4A, Ie=5.8A, If=3.4A
d. Ia = 2.2 A, Ib = 8.6 A, Ic=6.8A, Id=3.4A, Ie=6.8A, If=3.4A



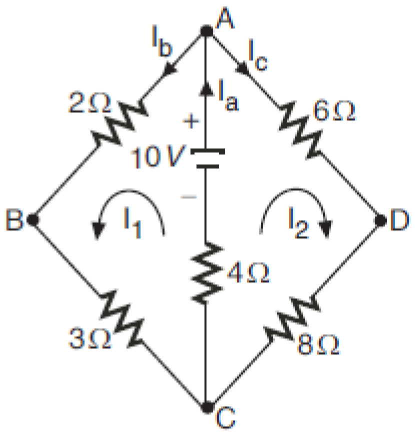
In the circuit shown in Fig, find mesh currents I1 in the circuit,
a. I1=0.9589A
b. I1=0.1589A
c. I1=0.2589A
d. I1=0.3589A

In the circuit shown in Fig, find mesh currents I2 in the circuit,



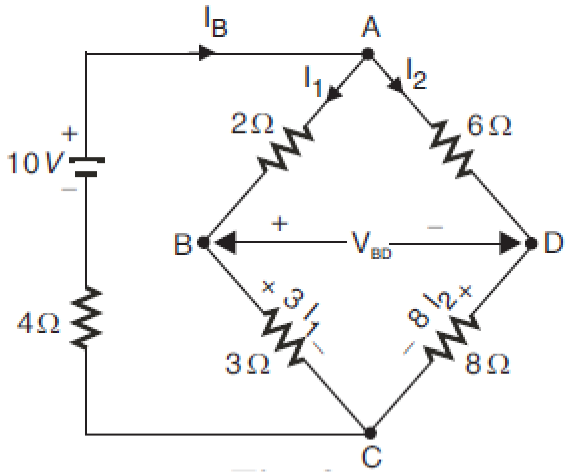
a. I2=0.3425A
b. I2=0.1425A
c. I2=0.2425A
d. I2=0.5425A

In the circuit shown in Fig, find current supplied by the battery.
I1=0.9589A, I2=0.3425A



a. Ia=1.3014A
b. Ia=1.8014A
c. Ia=2.3014A
d. Ia=3.3014A

In the circuit shown in Fig, find potential difference between terminals B and D. I1=0.9589A, I2=0.3425A



a. VBD=0.1367V
b. VBD=1.1367V
c. VBD=2.1367V
d. VBD=3.1367V

Solve the mesh currents I1 shown in Fig. 1.

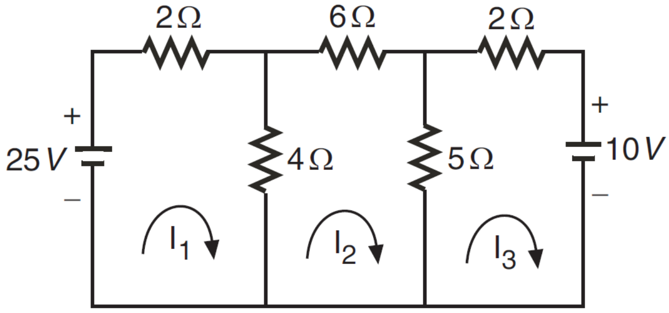


Fig. 1.

a. I1=4.8913A
b. I1=2.8913A
c. I1=3.8913A
d. I1=1.8913A

Solve the mesh currents I2 shown in Fig. 1.

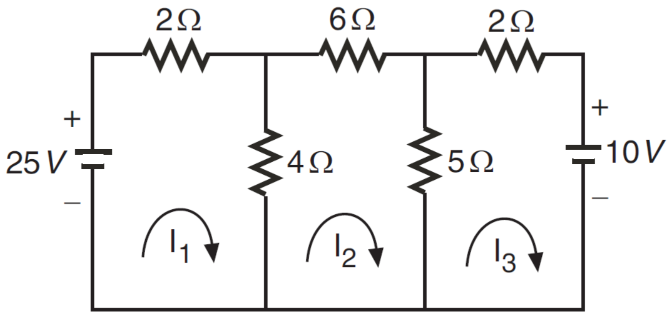


Fig. 1.

a. I2=1.0870A
b. I2=2.0870A
c. I2=3.0870A
d. I2=4.0870A

Solve the mesh currents I3 shown in Fig. 1.

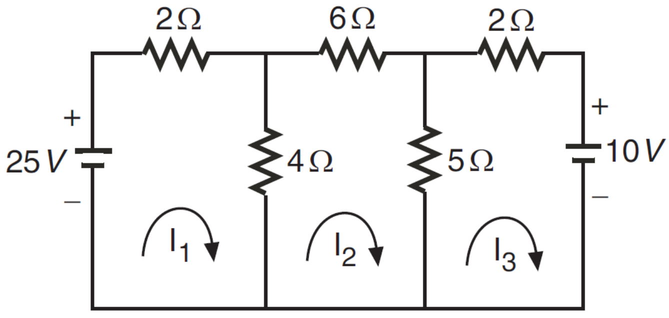
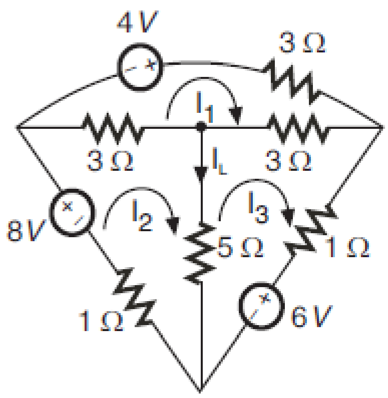


Fig. 1.

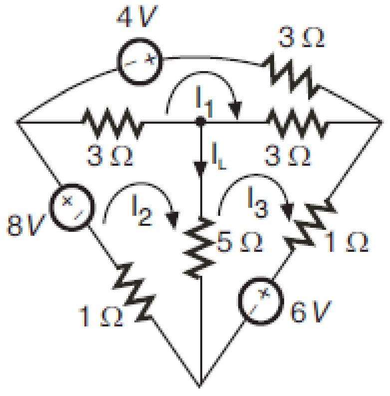
a. I3=-0.6522A
b. I3=-1.6522A
c. I3=-2.6522A
d. I3=-0.6522A

In the circuit shown in Fig. 1, find mesh current I2
Δ=252, Δ2=420, Δ3=168



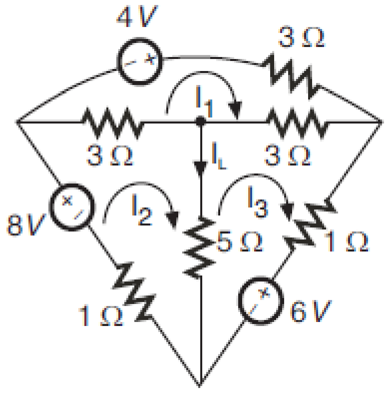
a. 1.6667A
b. 2.667A
c. 3.6667A
d. 4.667A

In the circuit shown in Fig. 1, find mesh current I3
Δ=252, Δ2=420, Δ3=168



e. 0.6667A
f. 2.6667A
g. 3.667A
h. 4.6667A

In the circuit shown in Fig. 1, find IL by mesh analysis.
Δ=252, Δ2=420, Δ3=168



i. 1A
j. 2A
k. 3A
l. 4A

In the circuit shown in Fig. 1, find E such that I2= 0.

$$\Delta_2 = \begin{vmatrix} 8 & E & -2 \\ -4 & -8.4 & -5 \\ -2 & 0 & 8 \end{vmatrix}$$

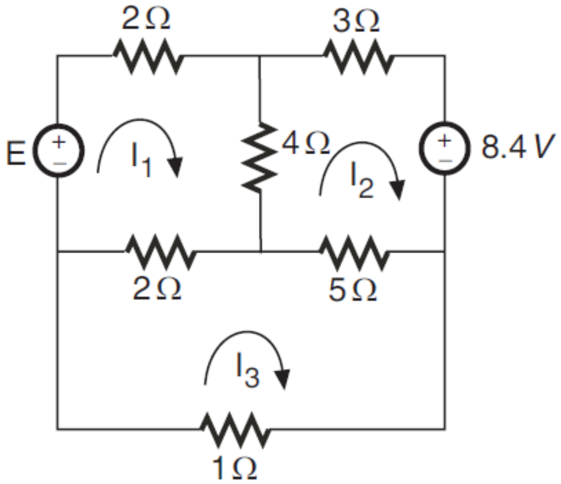


Fig. 1.

a. 12V
b. 10V
c. 9V
d. 8V

Solve the current in 12 Ω resistor by mesh analysis

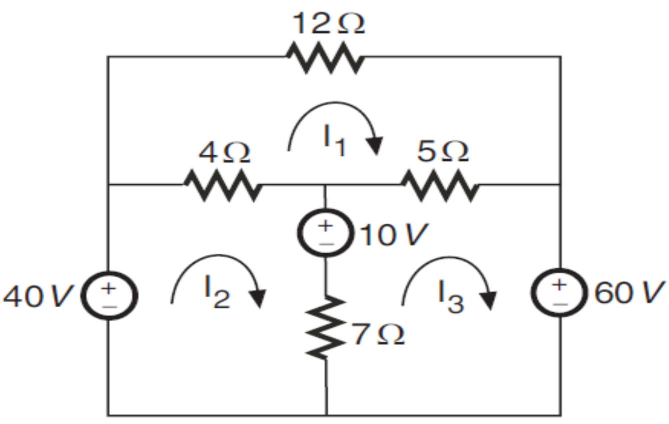


Fig. 1.

a. -1.6667A
b. -2.6667A
c. -3.6667A
d. -4.6667A

Solve the mesh currents I1 in the circuit shown in Fig. 1.

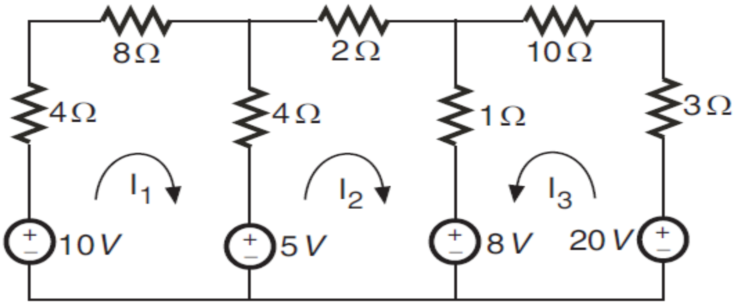


Fig. 1.

a. I1=0.2026A
b. I1=0.5026A
c. I1=0.6026A
d. I1=0.8026A

Solve the mesh currents I2 in the circuit shown in Fig. 1.

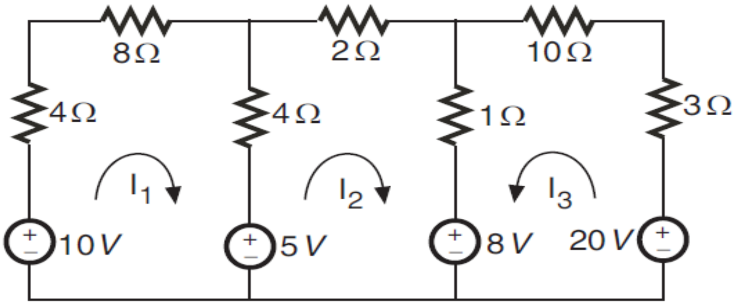


Fig. 1.

a. I2=-0.4398A
b. I2=-0.5398A
c. I2=-0.6398A
d. I2=-0.7398A

Solve the mesh currents I3 in the circuit shown in Fig. 1.

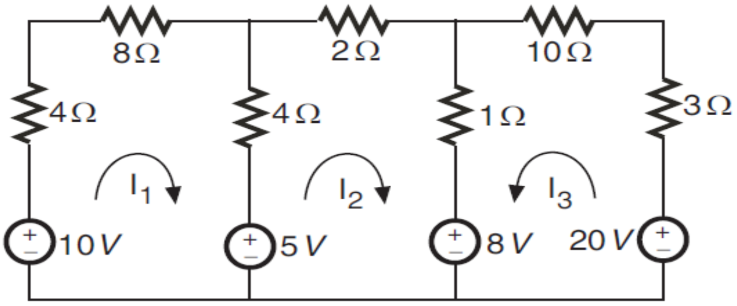


Fig. 1.

a. I3=0.8886A
b. I3=0.8886A
c. I3=0.8886A
d. I3=0.8886A

Determine the power dissipation in the 4 Ω resistor of the

circuit shown in Fig. 1.
I2=2 3506A, I3= -0.0598A

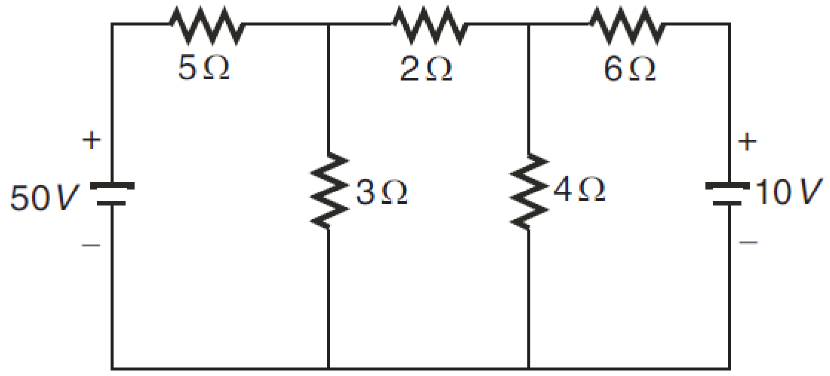


Fig. 1.

a. 23.2401W
b. 28.2401W
c. 29.2401W
d. 25.2401W

Determine the voltage E which causes the current I1 to be zero for the circuit shown in Fig. 1.

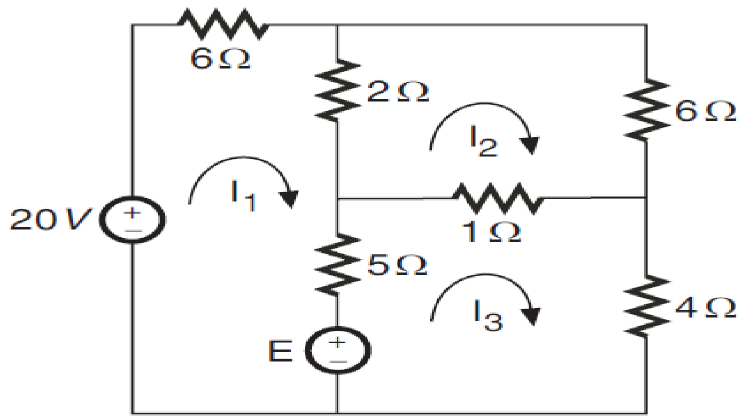


Fig. 1.

a. 42.381V
b. 32.381V
c. 22.381V
d. 12.381V

In the circuit shown in Fig. 1, find I1 using mesh analysis

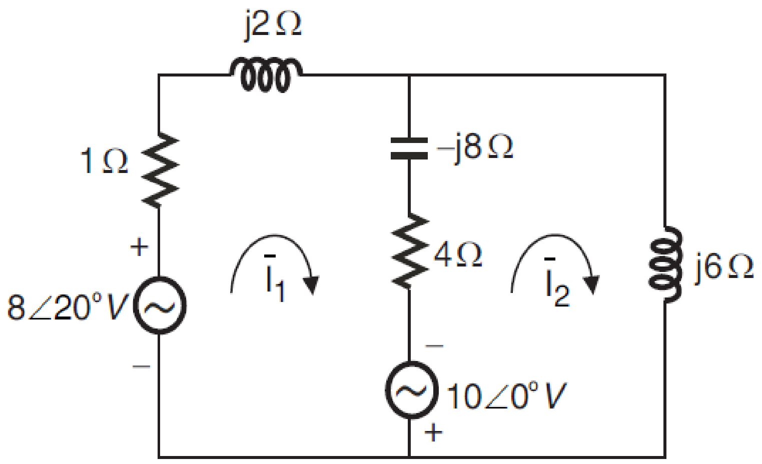


Fig. 1.

a. 1.0428 ∠29.4 A
b. 2.0428 ∠29.4 A
c. 3.0428 ∠29.4 A
d. 4.0428 ∠29.4 A

In the circuit shown in Fig. 1, find I2 using mesh analysis

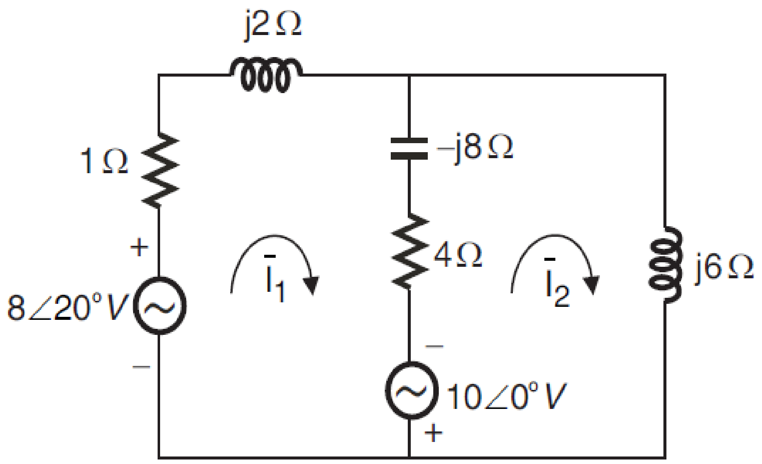


Fig. 1.

a. I2=1.2738∠-86.9A
b. I2=2.2738∠-86.9A
c. I2=3.2738∠-86.9A
d. I2=4.2738∠-86.9A

In the circuit shown in Fig. 1, find voltage drop across 1 Ω resistor. I1=1.0428 ∠29.4 A , I2=1.2738∠-86.9A

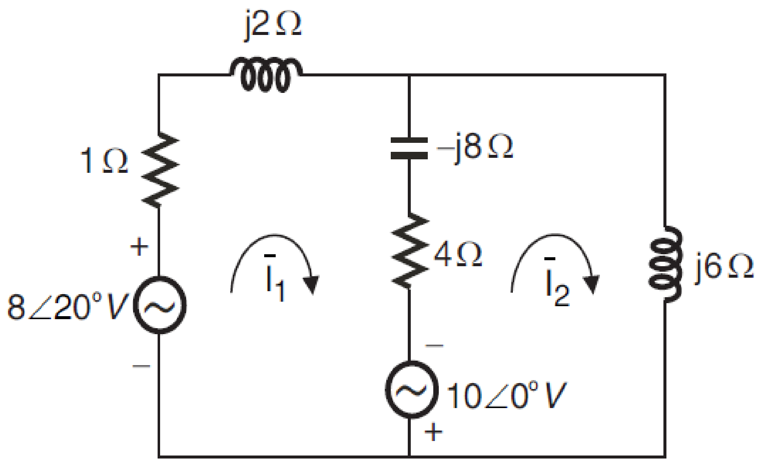


Fig. 1.

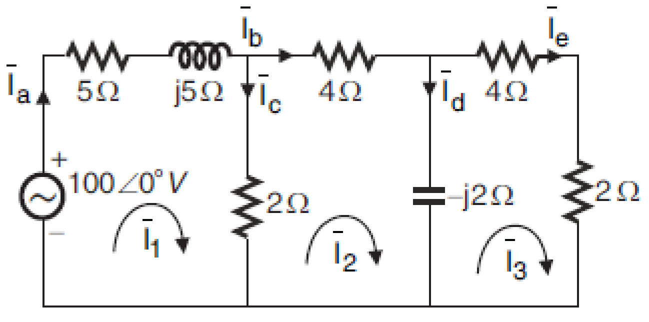
a. V1=1.0428∠29.4V

b. V1=2.0428∠29.4V

c. V1=3.0428∠29.4V

d. V1=4.0428∠29.4V

Solve the mesh currents I1 in the circuit shown in Fig. , using mesh analysis.



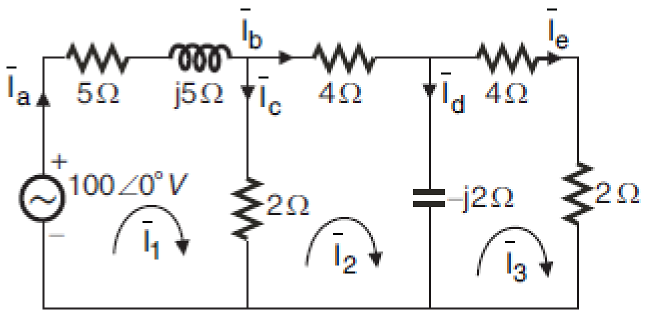
a. I1 = 12.412∠-37A

b. I1 = 10.412∠-37A

c. I1 = 13.412∠-37A

d. I1 = 14.412∠-37A

Solve the mesh currents I2 in the circuit shown in Fig. , using mesh analysis.



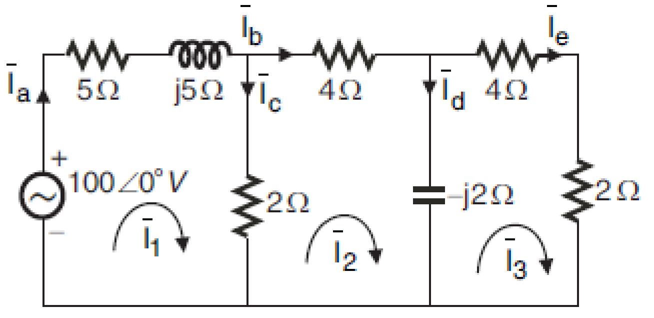
e. I2 = 3.629∠-21.7A

f. I2 = 10.412∠-37A

g. I2 = 13.412∠-37A

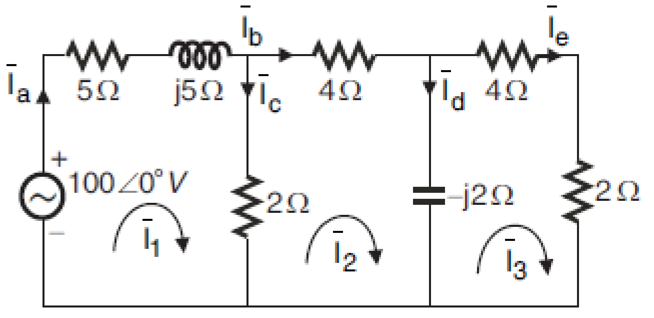
h. I2 = 14.412∠-37A

Solve the mesh currents I3 in the circuit shown in Fig. , using mesh analysis.



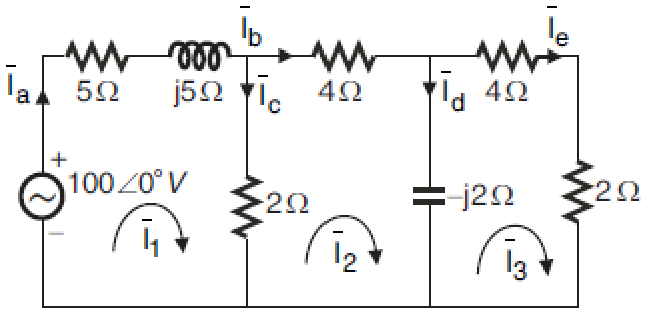
i. I3= 1.147∠-93.3A
j. I3 = 10.412∠-37A
k. I3 = 13.412∠-37A
l. I3 = 14.412∠-37A

Solve the branch current Ia of the circuit shown in Fig., using mesh analysis. I1 = 12.412∠-37A, I2 = 3.629∠-21.7A, I3= 1.147∠-93.3A



a. Ia=12.412∠-37A
b. Ia = 10.412∠-37A
c. Ia = 13.412∠-37A
d. Ia = 14.412∠-37A

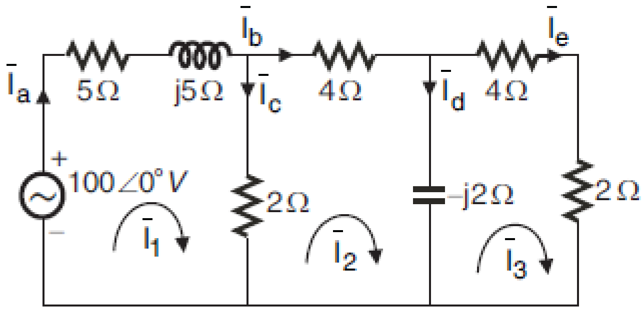
Solve the branch current Ib of the circuit shown in Fig., using mesh analysis. I1 = 12.412∠-37A, I2 = 3.629∠-21.7A, I3= 1.147∠-93.3A



e. Ib= 3.629∠-21.7A
f. Ib = 10.412∠-37A

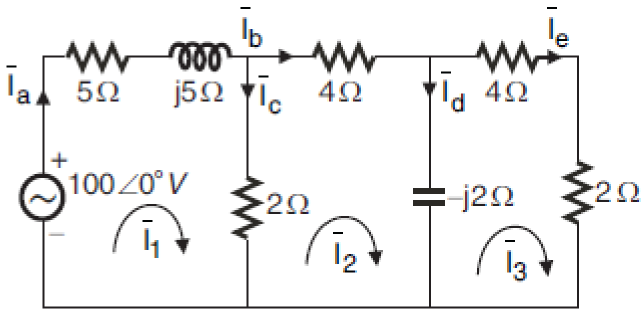
g. Ib = 13.412∠-37A
h. Ib = 14.412∠-37A

Solve the branch current Ic of the circuit shown in Fig., using mesh analysis. I1 = 12.412∠-37A, I2 = 3.629∠-21.7A, I3= 1.147∠-93.3A



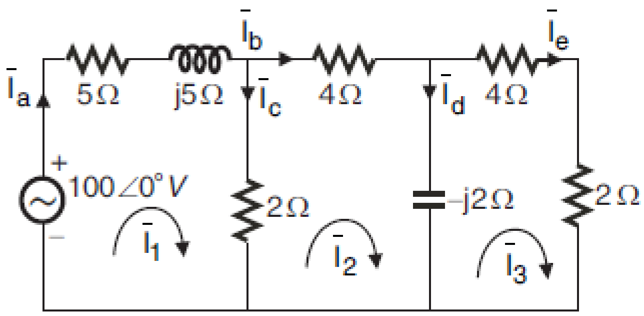
i. Ic=8.962∠-43.1A
j. Ic = 10.412∠-37A
k. Ic= 13.412∠-37A
l. Ic = 14.412∠-37A

Solve the branch current Id of the circuit shown in Fig., using mesh analysis. I1 = 12.412∠-37A, I2 = 3.629∠-21.7A, I3= 1.147∠-93.3A



m. Id=3.443∠-3.3A
n. Id = 10.412∠-37A
o. Id = 13.412∠-37A
p. Id = 14.412∠-37A

Solve the branch current Ie of the circuit shown in Fig., using mesh analysis. I1 = 12.412∠-37A, I2 = 3.629∠-21.7A, I3= 1.147∠-93.3A



q. Ie=1.147∠-93.3A

r. Ie = 10.412∠-37A s. Ie = 13.412∠-37A t. Ie = 14.412∠-37A
What does Ohm's Law state? **A. Voltage is proportional to resistance.** **B. Current is proportional to resistance.** **C. Voltage is proportional to current.** **D. Resistance is proportional to power.**
If a resistor of 10 Ω is connected across a 5 V battery, what is the current flowing through the resistor? Option_a: 0.5 A Option_b: 1 A Option_c: 2 A Option_d: 5 A correct_option: a)0.5 A
In a parallel circuit, the equivalent resistance is: A. The sum of individual resistances. B. The reciprocal of the sum of reciprocals of resistances. C. Equal to the largest resistance. D. Always higher than the smallest resistance. **Answer:** B
Which of the following statements about Kirchhoff's Voltage Law (KVL) is correct?

Option_a: The sum of all voltage drops around a closed loop is always positive.

Option_b: The sum of all voltage drops around a closed loop equals the total resistance.

Option_c: The sum of all voltage drops around a closed loop is equal to the sum of all current sources.

Option_d: The sum of all voltages around a closed loop is zero.

correct_option: d)The sum of all voltages around a closed loop is zero.

Two resistors of 5 Ω and 10 Ω are connected in parallel. If the current entering the parallel combination is 6 A, what is the current through the 10 Ω resistor?

Option_a: 2 A

Option_b: 4 A

Option_c: 5 A

Option_d: 6 A

correct_option: a) 2 A

Kirchhoff's Voltage Law (KVL) is based on the conservation of:

Option_a: Charge

Option_b: Energy

Option_c: Momentum

Option_d: Mass

correct_option: b) Energy

In a series circuit, the current flowing through each component is:

Option_a: The same Option_b: Different Option_c: Dependent on the voltage Option_d: Dependent on the resistance of each component correct_option: a) The same
Ohm's Law states that the current through a conductor between two points is directly proportional to the: Option_a: Resistance between the points Option_b: Voltage between the points Option_c: Temperature difference Option_d: Power dissipated correct_option: b) Voltage between the points
For a simple circuit with a 12 V battery and two series resistors, R1=2 Ω and R2=4Ω, what is the voltage drop across R2? Option_a: 4V Option_b: 6V Option_c: 8V Option_d: 12 V correct_option: c)8 V
If a 5 Ω resistor is connected in series with a 10 Ω resistor across a 15 V battery, what is the current in the circuit?

Option_a: 1 A

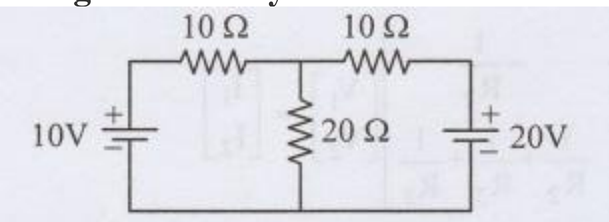
Option_b: 4 A

Option_c: 5 A

Option_d: 6 A

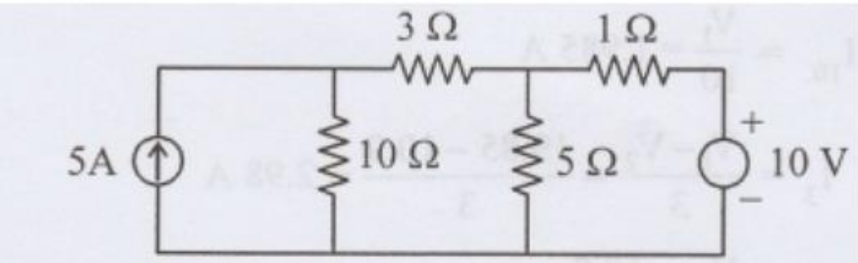
correct_option: a) 1 A

Using nodal analysis determine the current in the 20 Ω resistor.



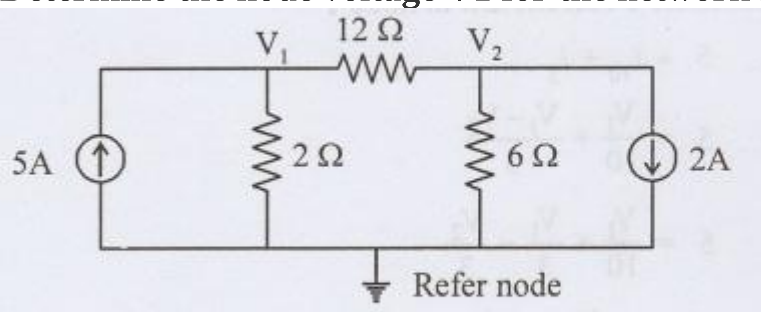
A. 0.6 A (B) 0.7 A (C) 0.8 A(D)0.9 A

Using nodal analysis determine the current in the 10 Ω resistor.



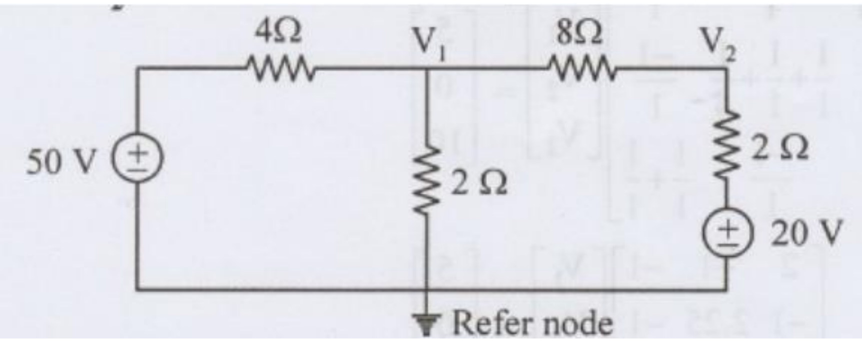
A. 1.6 A (B) 1.985 A (C) 0.85 A(D)0.95 A

Determine the node voltage V1 for the network shown in fig



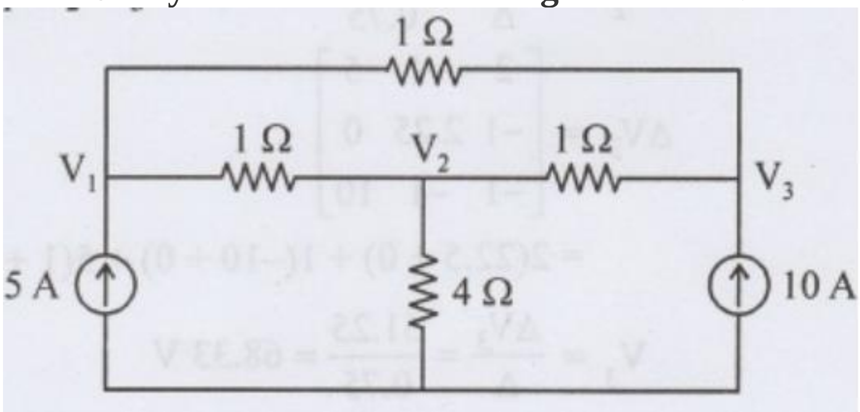
(A) 4 V (B) 5 V (C)6 V(D)7 V

Find V2 in the circuit given below using nodal analysis.



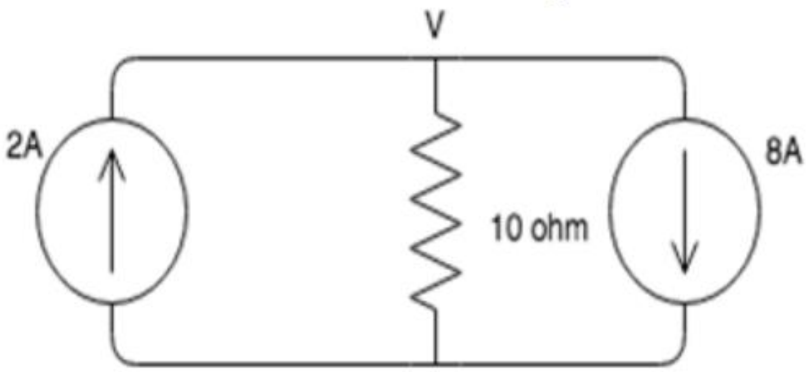
(A) -4 V (B) -5 V (C) -10.2 V(D)-11.2V

Find V3 by nodal method for the given circuit.



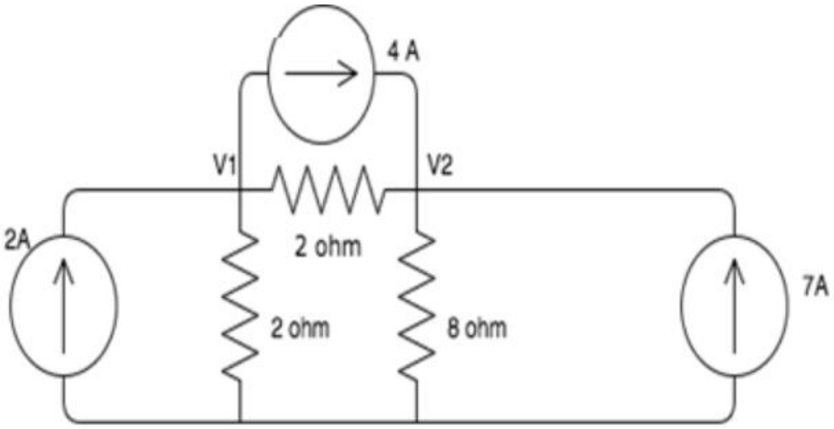
(A) 68.33 V (B) 65.33V (C) 60.34 V (D) 59.34 V

Find the value of the node voltage V.



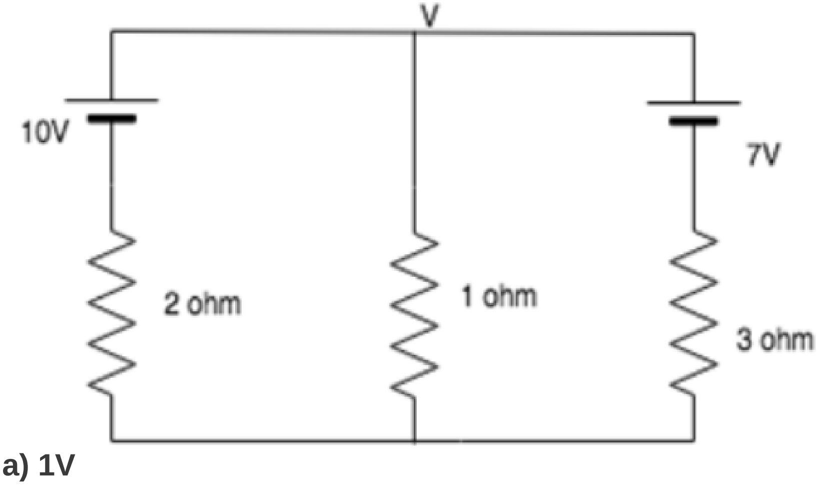
a) -60V
b) 60V
c) 40V
d) -40V

Calculate the node voltages V1 and V2.



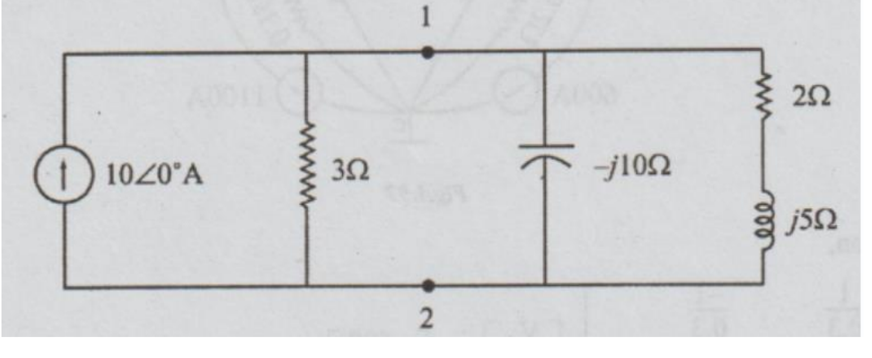
a) 12V, 13V
b) 26.67V, 11.33V
c) 11.33V, 26.67V
d) 13V, 12V

Find the node voltage V.

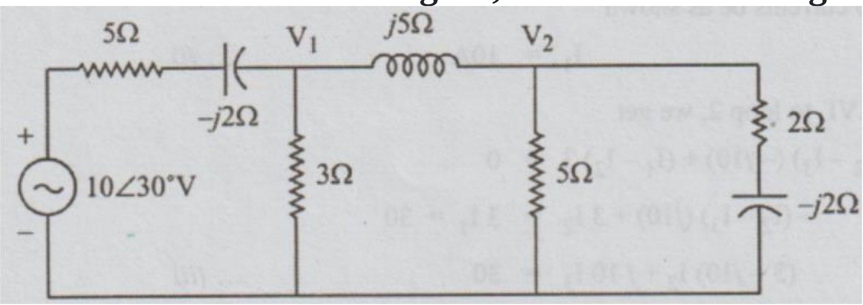
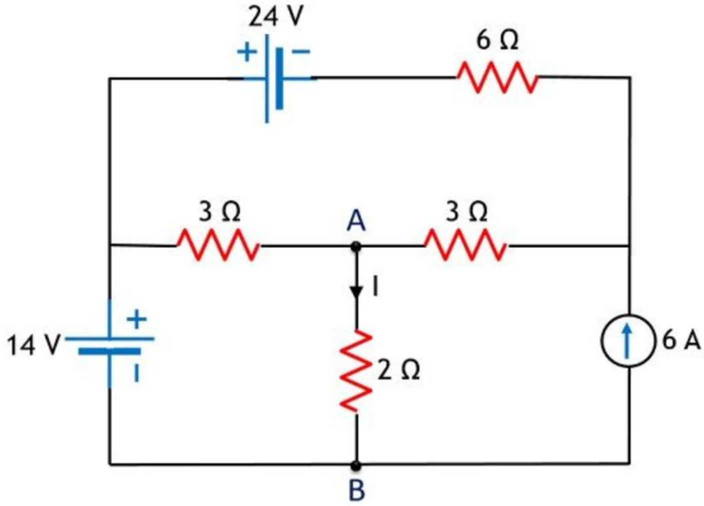


a) 1V
b) 2V
c) 3V
d) 4V

Determine the real power output of the source in the circuit shown in figure, by nodal analysis



a) 110 W
b) 290 W

c) 240 W d) 300 W
In the network shown in figure, find the node voltages V1  a) 7.03 V and angle is 69.90 b) 5.03 V and angle is 74.90 c) 4.03 V and angle is 68.90 d) 3.03 V and angle is 64.90
Find the current in the 2Ω resistor when 6A current source is considered by using the principle of superposition theorem  a).6 A b).-6 A c).12 A d)-12 A
The current in an inductive circuit is given by 0.3 sin (200t – 40°) A. Write the equation for the voltage across it if the inductance is 40 mH. a).v = 2.4 sin (200f +50°)volt

b).v = 7.8 sin (400f +50°)volt

c).v = 8.9 sin (100f +50°)volt

d).v = 6.78 sin (200f +50°)volt

The voltage and current through a circuit element with V=100sin(314t+45°)volts and I=10sin(314t+315°) amperes. Identify the circuit element and find its value

a).Inductance, 0.0810H

b).Inductance, 0.0318H

c).Inductance, 0.0671H

d).Inductance, 0.0453H

An inductor having a Q-factor of 60 is connected in series with a capacitor having a Q-factor of 240. The overall Q-factor of the circuit is

a).36

b).48

c).24

d).12

A network has a resonant frequency of 150 kHz and a bandwidth of 600 Hz. The Q-factor of the network is

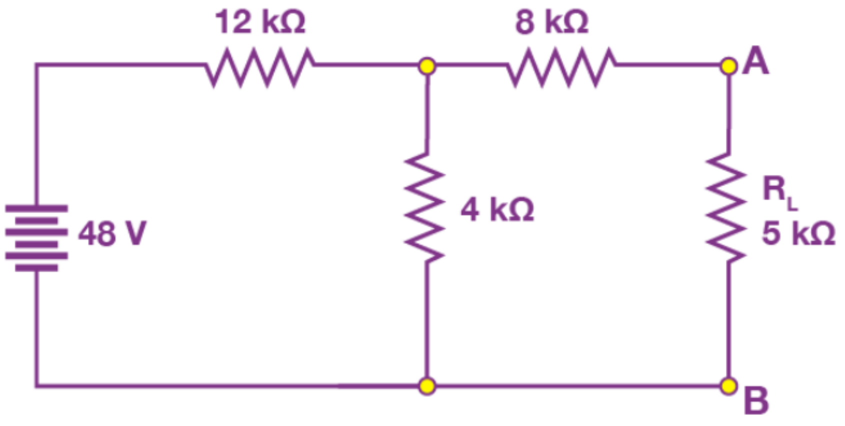
a).125

b).100

c).250

d).225

Find RTH for the circuit below for drawing the Thevenin's Equivalent circuit.



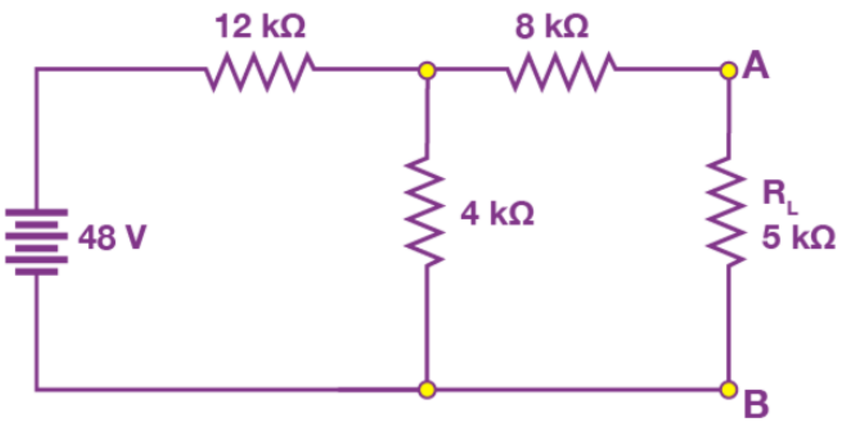
a)125V

b)100V

c)12V

d)25V

Find RTH for the circuit below for drawing the Thevenin’s Equivalent circuit.



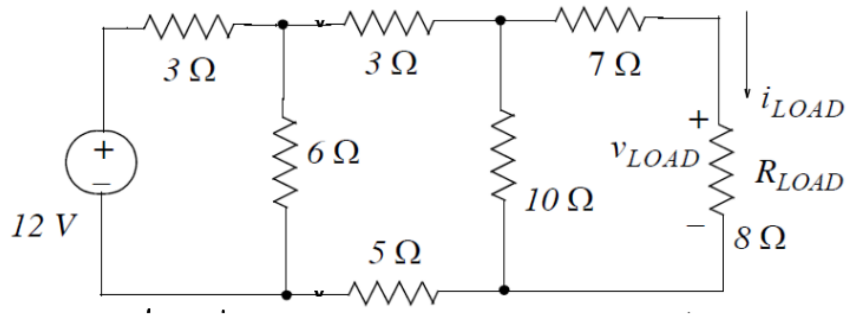
a)5KOhm

b)11KOhm

c)22KOhm

d)11Ohm

Find the current flowing through the load resistor using Thevenin's theorem.



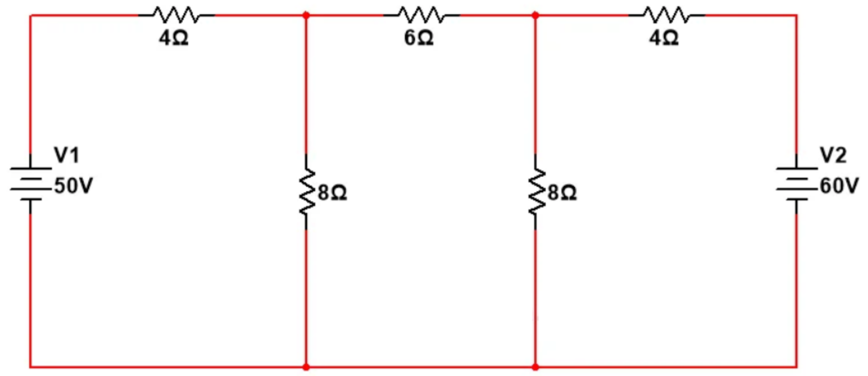
a)2.2A

b)22A

c)2A

d)0.2A

Find the current across 6 ohm resistor using thevenin's theorem.



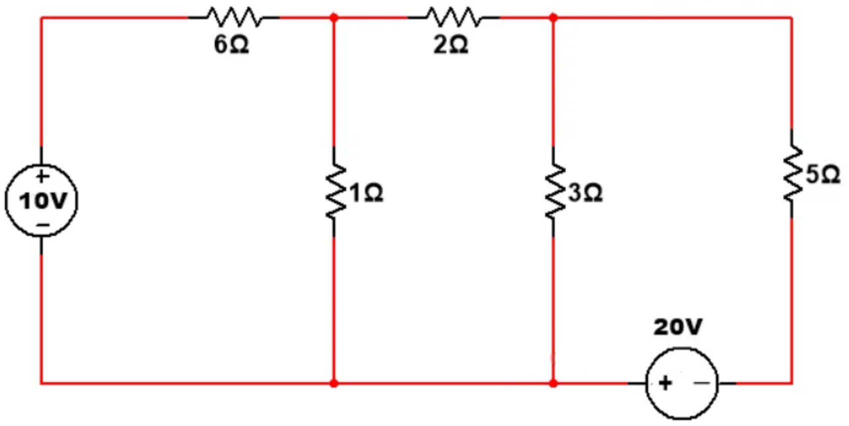
a)0.59A

b)59A

c)0.059A

d)5.9A

Find the current flowing through 5 ohm resistor using thevenin's theorem.



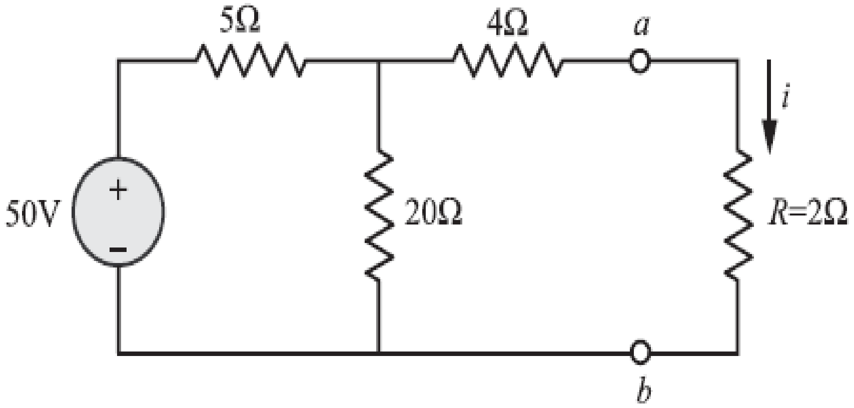
a)3.2A

b)5.9A

c)1A

d)10A

Using Norton’s theorem find the load current for the given circuit.



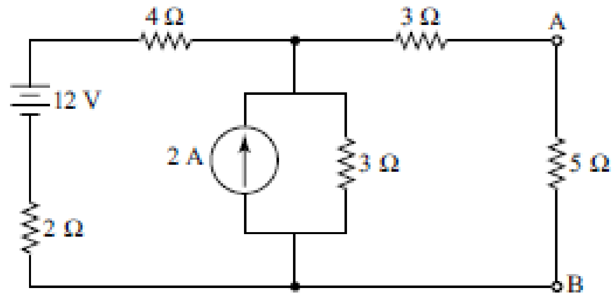
a)1.2A

b)8A

c)4A

d)2A

Use Thevenin's theorem to calculate the current flowing through the 5 Ω resistor in the given circuit.



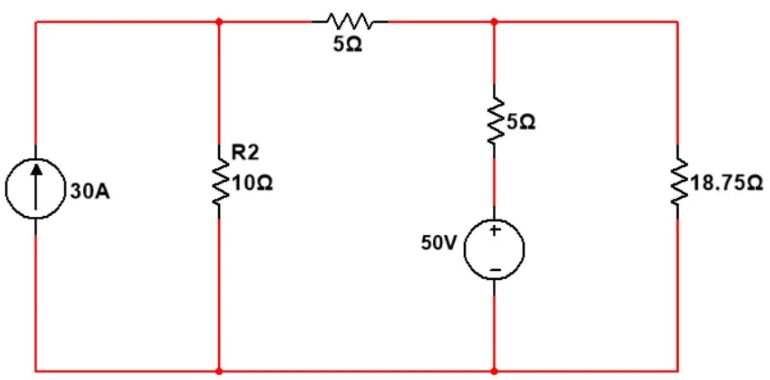
a)0.6A

b)2A

c)6A

d)0.2A

In the given network draw Norton's equivalent circuit and find the current through 18.75Ω resistor.



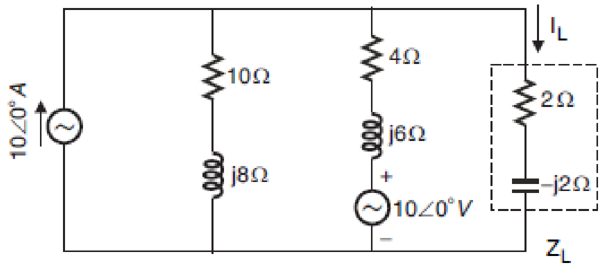
a)12A

b)8A

c)2A

d)5A

Determine the thevenin voltage for the given circuit.



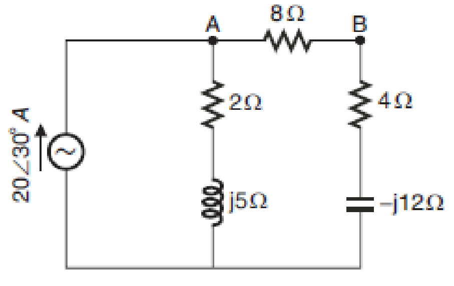
a)42+j8.99V

b)36+j3.99V

c)36.42+j4.99V

d)36.42+j34.99V

Determine the short circuit current across terminals A and B in the given circuit.



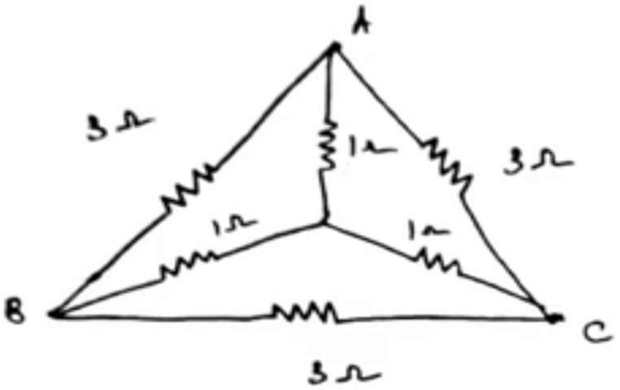
a)86+j26A

b)9.86+j6.26A

c)98+j2.6A

d)5.86+j6.6A

Obtain the Equivalent circuit Resistance of BC using Delta to Star conversion.



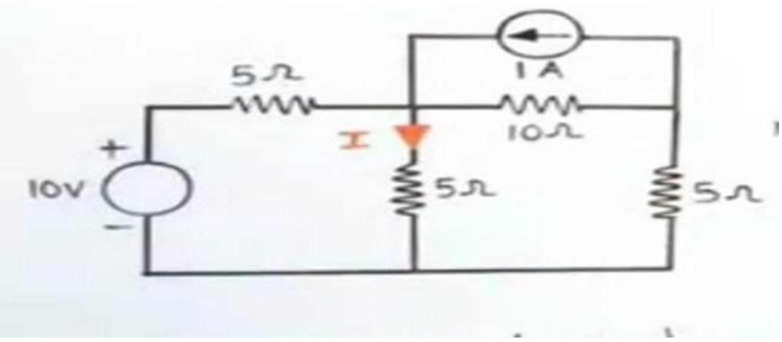
a. 1 Ω

b.2 Ω

c.3Ω

d.4Ω

Find the current I shown in the circuit below using source Transformation.



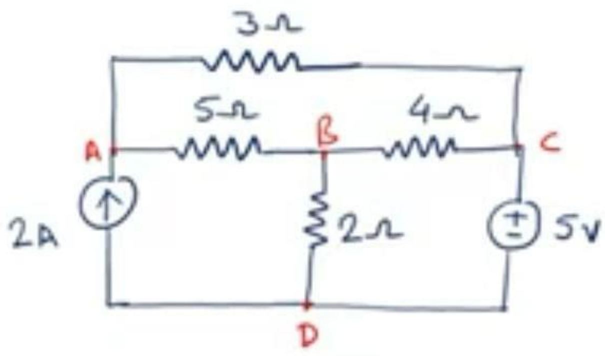
a. 1.8 A

b .2.2 A

c. 3.5 A

d. 1.14 A

Using source Transformation ,find the current and voltage across2 ohm resistor for the given circuit..



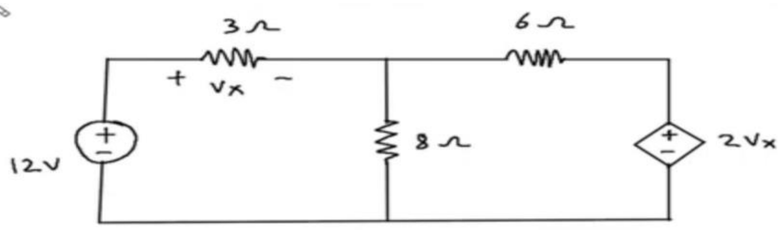
a.1.9A,5 volts

b.1.5A,3 volts

c.2.0A,3 volts

d.2.5A,4 volts

Apply source Transformation to find Vx in the circuit below.



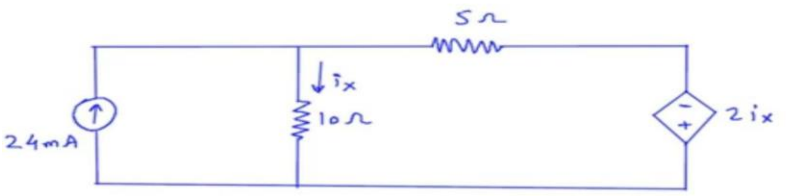
a. 2.5 volts

b. 4.2 volts

c. 3.65 volts

d. 5 volts

Use Source Transformation to find ix in the circuit shown in fig..



a. 2.8mA

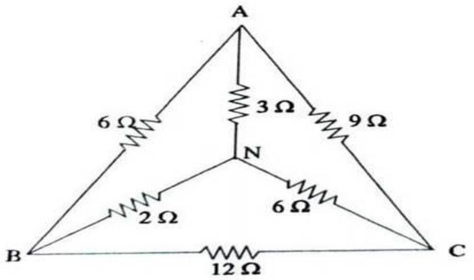
b. 2.3mA

c . 5.6mA

d. 7.05 mA

In the circuit of figure six resistors are connected to form a delta and star.

Find the effective resistance between a) A and B b) A and N.



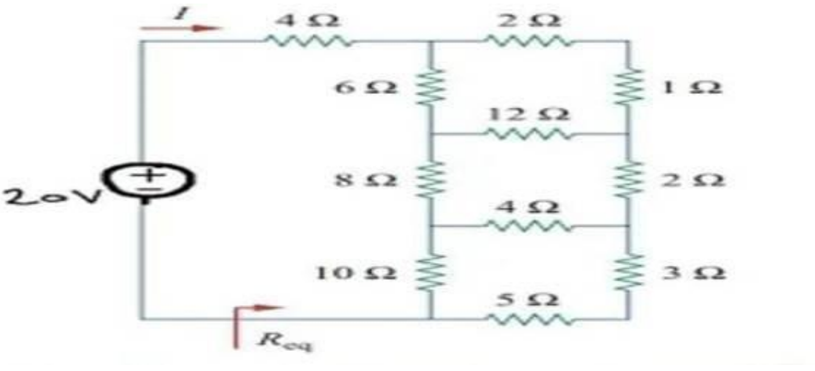
a. 2.4Ω and 1.9Ω

b. 1.4Ω and 7.9Ω

c. 4.4Ω and 3.7Ω

d. 1.9Ω and 5.9Ω

Obtain Req and I in the circuit using star delta Transformation.



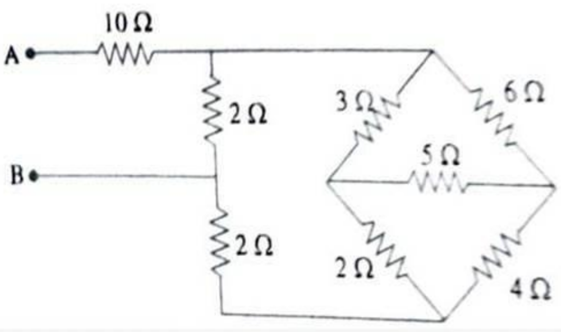
a. 12.21Ω and 1.64 A

b. 9.2Ω and 4.44 A

c. 5.11Ω and 2.64 A

d. 12.21Ω and 3.10 A

Find the Equivalent resistance across AB using Delta star conversion.



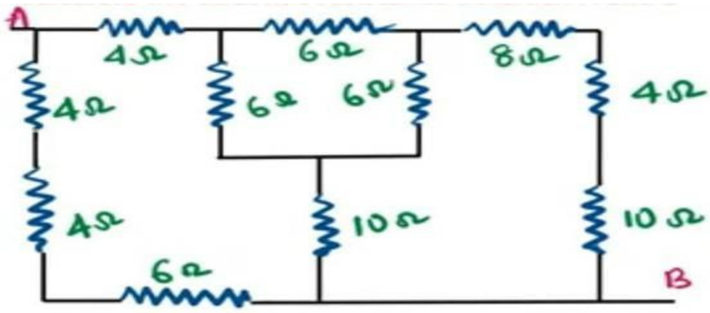
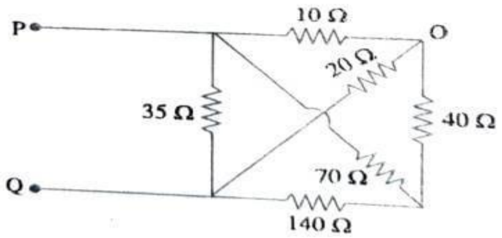
a. 5.5 Ω

b. 12.34Ω

c. 11.454Ω

d. 8.8Ω

Calculate the effective resistance between A and B Using Star Delta conversion.

 a. 7Ω b. 6Ω c. 5Ω d. 8Ω
Obtain the equivalent resistance at the terminals P-Q by Using star - delta Conversion.  a. 15Ω b. 10Ω c. 12Ω d. 25Ω

Question 1: START
In a parallel circuit with two resistors, R1 and R2, the total resistance is given by:
Question 1: END

Option_a: R=R1+R2
Option_b: R=$(1/R_1) + (1/R_2)$
Option_c: $(R_1 R_2)/ (R_1+R_2)$
Option_d: $(R_1+R_2)/2$
correct_option: c).$(R_1 R_2)/ (R_1+R_2)$

Question 2: START
According to Kirchhoff's Current Law (KCL), the algebraic sum of currents at a node is:

Question 2: END

Option_a: Zero
Option_b: Equal to the total voltage at the node
Option_c: Equal to the sum of resistances at the node
Option_d: Dependent on the values of current
correct_option: a) Zero

Question 3: START
Ohm's Law states that the current through a conductor between two points is directly proportional to the:
Question 3: END

Option_a: Resistance between the points
Option_b: Voltage between the points
Option_c: Temperature difference
Option_d: Power dissipated
correct_option: b) Voltage between the points

Question 4: START
If a resistor of 10 Ω is connected across a 5 V battery, what is the current flowing through the resistor?
Question 4: END

Option_a: 0.5 A
Option_b: 1 A
Option_c: 2 A
Option_d: 5 A
correct_option: a)0.5 A

Question 5: START
For a simple circuit with a 12 V battery and two series resistors, R1=2 Ω and R2=4Ω, what is the voltage drop across R2?
Question 5: END

Option_a: 4V
Option_b: 6V
Option_c: 8V
Option_d: 12 V
correct_option: c)8 V

Question 6: START
Which of the following statements about Kirchhoff's Voltage Law (KVL) is correct?
Question 6: END

Option_a: The sum of all voltage drops around a closed loop is always positive.
Option_b: The sum of all voltage drops around a closed loop equals the total resistance.
Option_c: The sum of all voltage drops around a closed loop is equal to the sum of all current sources.
Option_d: The sum of all voltages around a closed loop is zero.
correct_option: d)The sum of all voltages around a closed loop is zero.

Question 7: START
In a series circuit, the current flowing through each component is:
Question 7: END

Option_a: The same
Option_b: Different
Option_c: Dependent on the voltage
Option_d: Dependent on the resistance of each component
correct_option: a) The same

Question 8: START
Two resistors of 5 Ω and 10 Ω are connected in parallel. If the current entering the parallel combination is 6 A, what is the current through the 10 Ω resistor?
Question 8: END

Option_a: 2 A
Option_b: 4 A
Option_c: 5 A
Option_d: 6 A
correct_option: a) 2 A

Question 9: START
If a 5 Ω resistor is connected in series with a 10 Ω resistor across a 15 V battery, what is the current in the circuit?
Question 9: END

Option_a: 1 A
Option_b: 4 A
Option_c: 5 A
Option_d: 6 A
correct_option: a) 1 A

Question 10: START
Kirchhoff's Voltage Law (KVL) is based on the conservation of:
Question 10: END

Option_a: Charge
Option_b: Energy
Option_c: Momentum
Option_d: Mass
correct_option: b) Energy

Question 11: START
Two resistors R1=3Ω and R2=6Ω, are connected in series across a 36 V source. What is the voltage across R2 using the voltage division rule?
Question 11: END

Option_a: 12 V
Option_b: 18 V
Option_c: 24 V
Option_d: 30 V
correct_option: c) 24 V

Question 12: START

Three resistors R1=4Ω, R2=5Ω, and R3=6Ω are connected in series across a 45 V source. What is the voltage across R3 using the voltage division rule?
Question 12: END

Option_a: 10 V
Option_b: 15 V
Option_c: 20 V
Option_d: 25 V
correct_option: b) 15 V

Question 13: START
A circuit has two resistors R1=2Ω and R2=8Ω connected in parallel. If the total current entering the parallel combination is 20 A, what is the current through R1 using the current division rule?
Question 13: END

Option_a: 18 A
Option_b: 10 A
Option_c: 4 A
Option_d: 2 A
correct_option: a) 18 A

Question 14: START
Two resistors R1=3Ω and R2=12Ω, are connected in parallel across a 24 V source. What is the current through R1 using the current division rule?
Question 14: END

Option_a: 1 A
Option_b: 2 A
Option_c: 6 A
Option_d: 8 A
correct_option: d) 8 A

Question 15: START
In a series circuit with resistors R1=10Ω, R2=20Ω, and R3=30Ω connected to a 60 V battery, calculate the voltage drop across R1 using the voltage division rule.
Question 15: END

Option_a: 10 V
Option_b: 15 V
Option_c: 20 V
Option_d: 30 V
correct_option: a) 10 V

Question 16: START
Three resistors R1=2Ω, R2=4Ω, and R3=8Ω are connected in parallel. If the total current entering the parallel combination is 24 A, what is the current through R3 using the current division rule?
Question 16: END

Option_a: 3.4 A
Option_b: 8 A
Option_c: 12 A
Option_d: 18 A

correct_option: a) 3.4 A

Question 17: START
For a series circuit with resistors R1=1Ω, R2=4Ω, and R3=5Ω, the total resistance is 10 Ω. If the circuit is powered by a 20 V source, what is the voltage drop across R2 using the voltage division rule?
Question 17: END

Option_a: 2 V
Option_b: 8 V
Option_c: 10 V
Option_d: 5 V
correct_option: b) 8 V

Question 18: START
In a parallel circuit, R1=6Ω and R2=3Ω with a total current of 18 A flowing into the combination. Calculate the current through R1 using the current division rule.
Question 18: END

Option_a: 6 A
Option_b: 9 A
Option_c: 12 A
Option_d: 15 A
correct_option: a) 6 A

Question 19: START
A 10 V source is connected across two resistors, R1=3Ω and R2=7Ω, in series. What is the voltage across R1 using the voltage division rule?
Question 19: END

Option_a: 3 V
Option_b: 4 V
Option_c: 5 V
Option_d: 7 V
correct_option: a) 3 V

Question 20: START
In a circuit with resistors R1=5Ω and R2=15Ω connected in parallel, the total current entering the combination is 40 A. Calculate the current through R2 using the current division rule.
Question 20: END

Option_a: 10 A
Option_b: 20 A
Option_c: 30 A
Option_d: 40 A
correct_option: a) 10 A

Question 21: START
Three resistors are connected in a star (Y) configuration with resistances RA=5Ω, RB=10Ω, and RC=15Ω. What is the equivalent resistance between two terminals AB after converting the network to a delta (Δ) configuration?
Question 21: END

Option_a: 15 Ω
Option_b: 30 Ω
Option_c: 50 Ω

Option_d: 75 Ω
correct_option: a) 15 Ω

Question 22: START
In a delta network, the resistances are given as RAB=12Ω, RBC=24Ω, and RCA=36Ω. What is the equivalent resistance RA in the star network?
Question 22: END

Option_a: 6 Ω
Option_b: 8 Ω
Option_c: 10 Ω
Option_d: 12 Ω
correct_option: a) 6 Ω

Question 23: START
For a delta network with resistances RAB=30Ω, RBC=60Ω, and RCA=90Ω, the equivalent star resistance RB is given by which formula?
Question 23: END

Option_a: RB=(RAB·RBC)/(RAB+RBC+RCA)
Option_b: RB=(RBC·RCA)/(RAB+RBC+RCA)
Option_c: RB=(RCA·RAB)/(RAB+RBC+RCA)
Option_d: RB=(RAB·RBC·RCA)/(RAB+RBC+RCA)
correct_option: a).RB=(RAB·RBC)/(RAB+RBC+RCA)

Question 24: START
In a star network, each resistor has a value of 10 Ω. After converting it to a delta network, what will be the value of each resistor in the delta configuration?
Question 24: END

Option_a: 10 Ω
Option_b: 20 Ω
Option_c: 30 Ω
Option_d: 40 Ω
correct_option: c) 30 Ω

Question 25: START
If a delta network has resistors RAB=6Ω, RBC=12Ω, and RCA=18Ω, find the equivalent star resistance RC.
Question 25: END

Option_a: 3 Ω
Option_b: 4 Ω
Option_c: 5 Ω
Option_d: 6 Ω
correct_option: d) 6 Ω

Question 26: START
In a star network with resistances RA=2Ω, RB=3Ω, and RC=4Ω, what is the equivalent resistance between terminals after converting to a delta configuration?
Question 26: END

Option_a: 9 Ω
Option_b: 12 Ω
Option_c: 15 Ω
Option_d: 6.5 Ω

correct_option: d) 6.5 Ω

Question 27: START
A delta network has resistances RAB=10Ω, RBC=15Ω, and RCA=20Ω. What is the value of RA in the equivalent star network?
Question 27: END

Option_a: 5 Ω
Option_b: 4.44 Ω
Option_c: 10 Ω
Option_d: 12 Ω
correct_option: b) 4.44 Ω

Question 28: START
In a balanced delta network, each resistor has a resistance of 12 Ω. If this network is converted to a star configuration, what will be the resistance of each resistor in the star network?
Question 28: END

Option_a: 4 Ω
Option_b: 8 Ω
Option_c: 10 Ω
Option_d: 10 Ω
correct_option: a) 4 Ω

Question 29: START
Given a delta network with resistances RAB=8Ω, RBC=16Ω, and RCA=24Ω, what is the total resistance across terminals A and B after converting it to a star network?
Question 29: END

Option_a: 4 Ω
Option_b: 6 Ω
Option_c: 6.67 Ω
Option_d: 12 Ω
correct_option: c) 8 Ω

Question 30: START
In Thevenin's Theorem, the Thevenin equivalent circuit for a linear two-terminal network consists of:
Question 30: END

Option_a: An ideal current source and a resistor in series
Option_b: An ideal voltage source and a resistor in series
Option_c: A capacitor and a resistor in parallel
Option_d: An inductor and a resistor in parallel
correct_option: b) An ideal voltage source and a resistor in series

Question 31: START
For a given circuit, the open-circuit voltage across terminals A and B is 12 V, and the equivalent resistance seen from these terminals is 4 Ω. What is the Thevenin equivalent voltage and resistance?
Question 31: END

Option_a: 6 V, 4 Ω
Option_b: 12 V, 4 Ω
Option_c: 12 V, 8 Ω
Option_d: 24 V, 4 Ω
correct_option: b) 12 V, 4 Ω

Question 32: START
In a circuit with a Thevenin equivalent voltage of 15 V and a Thevenin resistance of 5 Ω, what load resistance will maximize the power transferred to the load?
Question 32: END

Option_a: 2.5 Ω
Option_b: 5 Ω
Option_c: 10 Ω
Option_d: 15 Ω
correct_option: b) 5 Ω

Question 33: START
Thevenin's Theorem is applicable only to circuits that are:
Question 33: END

Option_a: Linear and bilateral
Option_b: Non-linear and unilateral
Option_c: Linear and time-invariant
Option_d: Non-linear and time-variant
correct_option: a) Linear and bilateral

Question 34: START
If the load resistance RL is connected to a Thevenin equivalent circuit with a Thevenin voltage Vth=10V and Thevenin resistance Rth=5Ω, what is the current through RL when RL=5Ω?
Question 34: END

Option_a: 1 A
Option_b: 2 A
Option_c: 0.5 A
Option_d: 10 A
correct_option: a) 1 A

Question 35: START
In a circuit, the open-circuit voltage across two terminals is 20 V, and the short-circuit current across the same terminals is 5 A. What is the Thevenin resistance?
Question 35: END

Option_a: 2 Ω
Option_b: 4 Ω
Option_c: 5 Ω
Option_d: 10 Ω
correct_option: b) 4 Ω

Question 36: START
A complex circuit has a Thevenin equivalent voltage of 25 V and a Thevenin resistance of 50 Ω. If a 50 Ω load is connected to the Thevenin equivalent, what is the voltage across the load?
Question 36: END

Option_a: 12.5 V
Option_b: 25 V
Option_c: 50 V
Option_d: 0 V
correct_option: a) 12.5 V

Question 37: START
For maximum power transfer in a circuit, the load resistance RL should be:
Question 37: END

Option_a: Twice the Thevenin resistance
Option_b: Half the Thevenin resistance
Option_c: Equal to the Thevenin resistance
Option_d: Very large compared to the Thevenin resistance
correct_option: C) Equal to the Thevenin resistance

Question 38: START
A network has an internal Thevenin resistance of 10 Ω and a Thevenin voltage of 40 V. To maximize power transfer, what power is delivered to the load?
Question 38: END

Option_a: 40 W
Option_b: 80 W
Option_c: 160 W
Option_d: 200 W
correct_option: a) 40 W

Question 39: START
For a circuit with Thevenin equivalent voltage Vth=12V and Thevenin resistance Rth=6Ω, what is the current through a load resistance RL=12Ω when connected across the terminals?
Question 39: END

Option_a: 0.66 A
Option_b: 1 A
Option_c: 1.5 A
Option_d: 2 A
correct_option: a) 0.66 A

Question 40: START
In Norton's Theorem, the Norton equivalent circuit of a linear two-terminal network consists of:
Question 40: END

Option_a: An ideal current source and a resistor in series
Option_b: An ideal voltage source and a resistor in series
Option_c: An ideal current source and a resistor in parallel
Option_d: A capacitor and an inductor in series
correct_option: c) An ideal current source and a resistor in parallel

Question41: START
In superposition theorem, when we consider the effect of one voltage source, all the other voltage sources are
Question41: END

Option_a: Shorted
Option_b: Opened
Option_c: Removed
Option_d: Undisturbed
correct_option: Shorted

Question 42: START
In superposition theorem, when we consider the effect of one current source, all the other voltage sources are
Question42: END

Option_a: Shorted
Option_b: Opened
Option_c: Removed
Option_d: Undisturbed
correct_option: Shorted

Question43: START
In superposition theorem, when we consider the effect of one voltage source, all the other current sources are
Question43: END

Option_a: Shorted
Option_b: Opened
Option_c: Removed
Option_d: Undisturbed
correct_option: Opened

Question44: START
In superposition theorem, when we consider the effect of one current source, all the other current sources are
Question44: END

Option_a: Shorted
Option_b: Opened
Option_c: Removed
Option_d: Undisturbed
correct_option: Opened

Question45: START
Superposition theorem is valid for
Question45: END

Option_a: Linear systems
Option_b: Non-linear systems
Option_c: Both linear and non-linear systems
Option_d: Neither linear nor non-linear systems
correct_option: Linear systems

Question46: START
Superposition theorem does not work for
Question46: END

Option_a: Current
Option_b: Voltage
Option_c: Power
Option_d: Works for all: current, voltage and power
correct_option: Power

Question47: START
Which of the following statements is/are correct regarding superposition theorem
(1). It can be used to calculate voltage , current and power
(2). It can be used to calculate voltage and current in a circuit containing resistor , inductor and diode.
(3). It can be used to calculate voltage and current in a circuit having linear elements resistor , capacitor and inductor
Question47: END

Option_a: (1),(2) and (3)
Option_b: (1) and (2) only
Option_c: (3) only
Option_d: (3) and (2) only
correct_option: (3) only

Question48: START
For applying the superposition theorem, we need
Question48: END

Option_a: No source
Option_b: Only one source
Option_c: Two or more sources
Option_d: None of the options
correct_option: Two or more sources

Question49: START
The maximum power drawn from source depends on __________
Question49: END

Option_a: Value of source resistance
Option_b: Value of load resistance
Option_c: Both source and load resistance
Option_d: Neither source or load resistance
correct_option: Value of load resistance

Question50: START
The maximum power is delivered from a source to its load when the load resistance is ______ the source resistance.
Question50: END

Option_a: greater than
Option_b: less than
Option_c: equal to
Option_d: less than or equal to
correct_option: equal to

An eight-pole synchronous generator is running at 750 rpm. What is the frequency of induced EMF? At what speed should the generator be run so that the EMF induced will have a frequency of 60 Hz?

a. 50 Hz, 900 rpm
b. 60 Hz, 800 rpm
c. 50 Hz, 700 rpm
d. 60 Hz, 600 rpm

Calculate the distribution factor for a four-pole, three-phase alternator having 36 slots on the stator. a. 0.96 b. 0.86 c. 0.66 d. 0.56
A three-phase 36-pole synchronous generator is rotated by a water turbine at 167 rpm. The stator has 324 slots and each slot has 10 conductors. The flux per pole is 20 mWb. Calculate the EMF induced per phase if full-pitch coils are used for the winding. a. 2301 V b. 2401 V c. 2351 V d. 2601 V
The induced EMF in a synchronous machine is 11,000 V with a distributed fractional pitch winding. If a concentrated full-pitch winding were made, what would have been the induced EMFs. Assume the distribution factor and the pitch factor as 0.96 and 0.98, respectively. a. 11,692V b. 12,692V c. 13,692V d. 14,692V
The stator winding of a three-phase synchronous machine has been wound for four poles in 36 slots. Each coil span has an eight-slot pitch, i.e., the distance between the coil sides of a coil has been eight slots. Calculate the distribution factor and the pitch factor. a. kd=0.96, kp=0.98 b. kd=0.76, kp=0.58 c. kd=0.86, kp=0.68 d. kd=0.46, kp=0.78
Calculate the distribution factor for a single-layer 36-slot two-pole three-phase stator winding of a synchronous machine. a. 0.958 b. 0.858 c. 0.758 d. 0.658
A transformer has 1000 turns on its primary and 500 turns on the secondary. When a voltage, V of frequency f is connected across the primary winding a maximum flux of 2 × 10−3 Wb is produced in the core which links both the windings. Calculate the value of the

EMF induced in the two windings. a. E1=444V, E2=222V b. E1=244V, E2=122V c. E1=344V, E2=422V d. E1=544V, E2=722V
A transformer has 900 turns on its primary winding and 300 turns on its secondary. A voltage of 230 V at 50 Hz is connected across its primary winding. The cross-sectional area of the core is 64 cm2. Calculate the magnitude of the induced EMF in the secondary winding. a. E2=76.7V b. E2=66.7V c. E2=56.7V d. E2=46.7V
A transformer has 900 turns on its primary winding and 300 turns on its secondary. A voltage of 230 V at 50 Hz is connected across its primary winding. The cross-sectional area of the core is 64 cm2. calculate the value of maximum flux density in the core. a. Bm = 0.18 Wb/m2 b. Bm = 0.78 Wb/m2 c. Bm = 0.88 Wb/m2 d. Bm = 0.98 Wb/m2
A 110 V/220 V transformer is supplied with 110 V, 50 Hz supply to its low-voltage side. It is desired to have maximum value of core flux as 4.2 mWbs. Calculate the required number of turns in its primary winding.
a. N1= 118 turns b. N1= 218 turns c. N1= 318 turns d. N1= 418 turns
100 kVA, 1100/220 V, 50 Hz transformer has 100 turns on its secondary winding. Calculate the number of turns of the primary winding. a. N1=500 Turns b. N1=400 Turns c. N1=300 Turns d. N1=200 Turns
100 kVA, 1100/220 V, 50 Hz transformer has 100 turns on its secondary winding. Calculate the currents that would flow in both the windings when fully loaded.

a. I1=91A, I2=454.5A b. I1=80.1A, I2=350.5A c. I1=40.1A, I2=650.5A d. I1=30.1A, I2=750.5A
100 kVA, 1100/220 V, 50 Hz transformer has 100 turns on its secondary winding. Calculate the maximum value of flux in the core. a. 9.9mWb b. 8.2mWb c. 7.9mWb d. 6.9mWb
The maximum flux density in the core of a 1100/220 V, 50 Hz, 100 kVA transformer is 3.5 Wb/m2. Calculate number of turns of the primary and secondary windings if the EMF per turn is 5.5 V. a. N1=200 Turns, N2=40 Turns b. N1=100 Turns, N2=30 Turns c. N1=300 Turns, N2=20 Turns d. N1=400 Turns, N2=10 Turns
The maximum flux density in the core of a 1100/220 V, 50 Hz, 100 kVA transformer is 3.5 Wb/m2. Calculate the area of cross section of the core. a. 70.78 cm2 b. 60.78 cm2 c. 50.78 cm2 d. 40.78 cm2
The no-load input power to a transformer is 100 W. The no-load current is 3 A when the primary applied voltage is 230 V at 50 Hz. The resistance of the primary winding in 0.5Ω. Calculate the value of iron loss. a. 95.5 W b. 85.5 W c. 75.5 W d. 65.5 W
The no-load input power to a transformer is 100 W. The no-load current is 3 A when the primary applied voltage is 230 V at 50 Hz. The resistance of the primary winding in 0.5Ω. Calculate the value of no-load power factor. a. 0.15 lag b. 0.25 lag c. 0.35 lag d. 0.45 lag

A 100 kVA, 2400/240 V, 50 Hz transformer has a no-load current of 0.64 A and a core loss of 700 W, when its high-voltage side is energized at rated voltage and frequency. Calculate the components of the no-load current. a. Ic=0.29A Im=0.57A b. Ic=0.39A Im=0.67A c. Ic=0.49A Im=0.77A d. Ic=0.59A Im=0.87A
A 100 kVA, 2400/240 V, 50 Hz transformer has a no-load current of 0.64 A and a core loss of 700 W, when its high-voltage side is energized at rated voltage and frequency. Calculate the components of the no-load branch parameters of the equivalent circuit. a. Rc= 8.27 kΩ Xm=4.2kΩ b. Rc= 7.27 kΩ Xm=3.2kΩ c. Rc= 6.27 kΩ Xm=42.2kΩ d. Rc= 5.27 kΩ Xm=1.2kΩ
A 40 kVA 3200/400 V, single phase, 50 Hz transformer has 112 turns on the secondary winding. Calculate the number of turns on the primary winding. What is the secondary current at full load? What should be the cross-sectional area of the core for a core flux density of 1.2 Wb/m2? a. 896, 100 A, 0.1362 m2 b. 996, 600 A, 0.2362 m2 c. 696, 700 A, 0.3362 m2 d. 596, 10 A, 0.462 m2
A 400 kVA transformer has a full-load core loss of 800 W and copper loss of 2500 W. What will be the values of these losses at 1/2 load? a. 800 W, 625 W b. 700 W, 525 W c. 600 W, 425 W d. 500 W, 325 W
A single-phase transformer is required to step down the voltage from 1100 V to 400 V at 50 Hz. The core has a cross-sectional area of 25cm2 and the maximum flux density is 5Wb/m2. Determine the number of turns of the primary and secondary windings. a. 396, 144 b. 696, 244 c. 296, 344 d. 196, 444
A single phase 40 kVA transformer has primary and secondary voltages of 6600 V and 230 V, respectively. The number of turns of the secondary winding is 30. Calculate the number of turns of the primary winding.

a. 860 b. 760 c. 660 d. 560
A single phase 40 kVA transformer has primary and secondary voltages of 6600 V and 230 V, respectively. The number of turns of the secondary winding is 30. Calculate the primary and secondary winding currents. a. 6.06 A, 173.9 A b. 5.06 A, 273.9 A c. 4.06 A, 373.9 A d. 3.06 A, 473.9 A
A transformer on no load takes 4.5 A at a power factor of 0.25 lagging when connected to a 230 V, 50 Hz supply. The number of turns of the primary winding is 250. Calculate the magnetizing current a. 4.35A b. 4.35A c. 4.35A d. 4.35A
A transformer on no load takes 4.5 A at a power factor of 0.25 lagging when connected to a 230 V, 50 Hz supply. The number of turns of the primary winding is 250. Calculate the core loss. a. 259 W b. 259 W c. 259 W d. 259 W
A transformer on no load takes 4.5 A at a power factor of 0.25 lagging when connected to a 230 V, 50 Hz supply. The number of turns of the primary winding is 250. Calculate the maximum value of flux in the core. a. 4.14 mWb b. 5.14 mWb c. 6.14 mWb d. 3.14 mWb
A 660 V/ 220 V single-phase transformer takes a no-load current of 2A at a power factor of 0.225 lagging. The transformer supplies a load of 30 A at a power factor of 0.9 lagging. Calculate the current drawn by the primary from the mains. Resistance and reactance of the windings may be neglected. a. 11.38 A b. 21.38 A c. 31.38 A

d. 41.38 A
A 660 V/ 220 V single-phase transformer takes a no-load current of 2A at a power factor of 0.225 lagging. The transformer supplies a load of 30 A at a power factor of 0.9 lagging. Calculate the primary power factor. Resistance and reactance of the windings may be neglected. a. 0.829 lag b. 0.729 lag c. 0.629 lag d. 0.529 lag
A 220 V, 50 kW dc shunt generator was run as a motor on no load at rated speed. The current drawn from the line was 8A and the shunt field current was 2A. The armature resistance of the machine is 0.1 Ω. Calculate the no load input power. a. 1760 W b. 1860 W c. 1960 W d. 1460 W
A 220 V, 50 kW dc shunt generator was run as a motor on no load at rated speed. The current drawn from the line was 8A and the shunt field current was 2A. The armature resistance of the machine is 0.1 Ω. Calculate the Iron, friction and windage, and field copper losses. a. 1756.4 W b. 1856.4 W c. 1956.4 W d. 1656.4 W
A 220 V, 50 kW dc shunt generator was run as a motor on no load at rated speed. The current drawn from the line was 8A and the shunt field current was 2A. The armature resistance of the machine is 0.1 Ω. Calculate the Full-load armature Copper loss. a. 5253 W b. 5553 W c. 6253 W d. 7253 W
A 220 V, 50 kW dc shunt generator was run as a motor on no load at rated speed. The current drawn from the line was 8A and the shunt field current was 2A. The armature resistance of the machine is 0.1 Ω. Calculate the efficiency of the generator at full load. a. 87.7% b. 88.7% c. 89.7% d. 90.7%

A four-pole dc generator having wave-wound armature winding has 51 slots, each slot containing 20 conductors. Calculate the voltage generated in the armature when driven at 1500 rpm. Assume flux per pole to be 0.5 mWb. a. 25.5V b. 35.5V c. 45.5V d. 55.5V
A six-pole, lap-connected dc generator has a total of 650 conductors. The flux per pole is 0·05 Wb. Calculate the speed at which the armature is to be driven to generate an EMF of 220 V. a. 406 rpm b. 506 rpm c. 306 rpm d. 206 rpm

Question51: START
What is the principle of the transformer?
Question51: END

Option_a: Gauss law
Option_b: Coulomb's law
Option_c: Electromagnetic induction
Option_d: Ampere's law
correct_option: Electromagnetic induction

Question52: START
Voltage induced in secondary coil of transformer is given by___________________.
Question52: END

Option_a: N_P*V_P/N_S
Option_b: N_S*V_P/N_P
Option_c: $(N_P/V_P)*N_S$
Option_d: $N_P/(V_P*N_S)$
correct_option: N_S*V_P/N_P

Question53: START
According to _____________________ induced e.m.f. opposes the cause due to which they are produced
Question53: END

Option_a: Lenz law
Option_b: Newton's law
Option_c: Faraday's law
Option_d: Coulomb's law
correct_option: Lenz law

Question54: START
The emf induced in a coil having N turns is?
Question54: END

Option_a: $E = \phi/t$
Option_b: $E = N*\phi/t$
Option_c: $E = N*\phi*t$
Option_d: $E = N^2*\phi*t$
correct_option: $E = N*\phi/t$

Question55: START
According to _________________ induced emf is equal to rate of change of magnetic flux
Question55: END

Option_a: Newton's law
Option_b: Lenz law
Option_c: Faraday's law
Option_d: Coulomb's law
correct_option: Faraday's law

Question56: START
Transformer cores are laminated to reduce
Question56: END

Option_a: Copper loss
Option_b: Eddy current loss
Option_c: Hysteresis loss
Option_d: All of the above
correct_option: Eddy current loss

Question57: START
To reduce hysteresis loss, transformer core is made of
Question57: END

Option_a: Silicon steel
Option_b: Aluminium
Option_c: Copper
Option_d: Lead
correct_option: Silicon steel

Question58: START
If the transformer is loaded then the secondary terminal voltage ______ for lagging power factor.
Question58: END

Option_a: falls
Option_b: rise
Option_c: double
Option_d: none of the above
correct_option: falls

Question59: START
The efficiency of the transformer will be maximum when
Question59: END

Option_a: Iron losses is equal to the twice of the copper losses
Option_b: Copper losses is equal to the twice of the iron losses
Option_c: Iron losses is equal to the copper losses
Option_d: All of these
correct_option: Iron losses is equal to the copper losses

Question60: START
Copper losses occurs due to ohmic resistance in
Question60: END

Option_a: Primary winding
Option_b: Secondary winding
Option_c: Both primary and secondary winding
Option_d: None of these
correct_option: Both primary and secondary winding

Question61: START
In transformer if the secondary is open circuited then its terminal voltage is
Question61: END

Option_a: kW
Option_b: KVAR
Option_c: kWh
Option_d: KVA
correct_option: KVA

Question62: START
Which of the following does not change in an ordinary transformer
Question62: END

Option_a: Frequency
Option_b: Voltage
Option_c: Current
Option_d: Power
correct_option: Frequency

Question63: START
If primary number of turns are higher then, transformer is called __________
Question63: END

Option_a: Step-down
Option_b: Step-up
Option_c: One-one
Option_d: Autotransformer
correct_option: Step-down

Question64: START
If secondary number of turns are higher then, transformer is called _________
Question64: END

Option_a: Step-down
Option_b: Step-up
Option_c: One-one
Option_d: Autotransformer
correct_option: Step-up

Question65: START
The open circuit test in a transformer is used to measure__
Question65: END

Option_a: Copper loss
Option_b: Winding loss
Option_c: Total loss
Option_d: Core loss
correct_option: Core loss

Question66: START
Why OC test is performed on LV side?
Question66: END

Option_a: Simple construction
Option_b: Less voltage is required and parameters can be transformed to HV side
Option_c: It'll not give losses if conducted on HV side
Option_d: HV side does not have connections for voltage
correct_option: Less voltage is required and parameters can be transformed to HV side

Question67: START
While conducting short-circuit test on a transformer which side is short circuited?
Question67: END

Option_a: High voltage side
Option_b: Low voltage side
Option_c: Primary side
Option_d: Secondary side
correct_option: Low voltage side

Question68: START
Which types of windings are used in transformer?
Question68: END

Option_a: Helical winding
Option_b: Cylindrical winding
Option_c: Continuous disc winding
Option_d: All of above
correct_option: All of above

Question69: START

Breather is provided in a transformer to
Question69: END

Option_a: Absorb moisture of air during breathing
Option_b: provide cold air in the transformer
Option_c: The filter of transformer oil
Option_d: None of above
correct_option: Absorb moisture of air during breathing

Question70: START
Oil is provided in an oil filled transformer for
Question70: END

Option_a: Lubrication
Option_b: Insulation
Option_c: cooling
Option_d: both cooling and insulation
correct_option: both cooling and insulation

Question71: START
Which of the following is not a part of transformer?
Question71: END

Option_a: Conservator
Option_b: breather
Option_c: Exciter
Option_d: Buchholz relay
correct_option: Exciter

Question72: START
Noise of transformer mainly due to
Question72: END

Option_a: Cooling fan
Option_b: magnetostriction in an iron core
Option_c: Mechanical vibration
Option_d: All of the above
correct_option: magnetostriction in an iron core

Question73: START
The part of a transformer which is visible from outside
Question73: END

Option_a: Bushings
Option_b: Core
Option_c: Primary winding
Option_d: Secondary winding
correct_option: Bushings

Question74: START

Part of the transformer which undergoes most damage from overheating is __
Question74: END

Option_a: Iron core
Option_b: Copper winding
Option_c: Winding insulation
Option_d: Frame or case
correct_option: Winding insulation

Question75: START
Which is the most common, famous and adopted method of cooling of a power transformer?
Question75: END

Option_a: Air blast cooling
Option_b: Natural air cooling
Option_c: Oil cooling
Option_d: Any of the above method can be used
correct_option: Oil cooling

Question76: START
Function of conservator in an electrical transformer is
Question76: END

Option_a: Supply cooling oil to transformer in time of need
Option_b: Provide fresh air for cooling the transformer
Option_c: Protect the transformer from damage when oil expends due to heating
Option_d: Cannot be determined
correct_option: Protect the transformer from damage when oil expends due to heating

Question77: START
Which chemical is used in breather?
Question77: END

Option_a: Asbestos fibre
Option_b: Silica sand
Option_c: Sodium chloride
Option_d: Silica gel
correct_option: Silica gel

Question78: START
Buchholz's relay will give warning and protection against _______
Question78: END

Option_a: Electrical fault inside the transformer itself
Option_b: Electrical fault outside the transformer in outgoing feeder
Option_c: For both outside and inside faults
Option_d: Cannot be determined
correct_option: Electrical fault inside the transformer itself

Question79: START

An auto transformer can be used as
Question79: END

Option_a: Step up device
Option_b: Step down device
Option_c: Both step up and step down
Option_d: None of the above
correct_option: Both step up and step down

Question80: START
In an Auto Transformer, The Primary and Secondary are___________coupled.
Question80: END

Option_a: Electrically only
Option_b: Magnetically only
Option_c: Both electrically & magnetically
Option_d: None of the above
correct_option: Both electrically & magnetically

Question81: START
A load test on a single-phase induction motor is conducted to evaluate its performance under different load conditions.
Question81: END

Option_a: To determine the voltage drop
Option_b: To evaluate motor performance under varying loads
Option_c: To measure the speed of the motor only
Option_d: To test the insulation resistance
correct_option: To evaluate motor performance under varying loads

Question82: START
The efficiency of a single-phase transformer is maximum at:
Question82: END

Option_a: Full load
Option_b: Half load
Option_c: No load
Option_d: Quarter load
correct_option: Half load

Question83: START
In an LVDT, the output voltage is zero when:
Question83: END

Option_a: The core is at the null position
Option_b: The core is fully inserted
Option_c: The supply voltage is maximum
Option_d: The frequency is maximum
correct_option: The core is at the null position

Question84: START
Which type of meter is commonly used to measure energy consumption in households?
Question84: END

Option_a: Ammeters
Option_b: Voltmeters
Option_c: Energy meters
Option_d: Ohmmeters
correct_option: Energy meters

Question85: START
The purpose of using a wattmeter is to measure:
Question85: END

Option_a: Voltage
Option_b: Current
Option_c: Power
Option_d: Resistance
correct_option: Power

Question86: START
A Moving Coil (MC) instrument is primarily used for:
Question86: END

Option_a: AC measurements
Option_b: DC measurements
Option_c: Both AC and DC measurements
Option_d: Frequency measurements
correct_option: DC measurements

Question87: START
The sensitivity of a wattmeter can be increased by:
Question87: END

Option_a: Increasing the resistance of the current coil
Option_b: Decreasing the resistance of the current coil
Option_c: Increasing the inductance of the voltage coil
Option_d: Decreasing the inductance of the voltage coil
correct_option: Increasing the resistance of the current coil

Question88: START
An induction motor is commonly used in:
Question88: END

Option_a: Power plants
Option_b: Domestic appliances
Option_c: Aircraft engines
Option_d: Nuclear reactors
correct_option: Domestic appliances

Question89: START
The function of a capacitor in a single-phase motor is to:
Question89: END

Option_a: Start the motor
Option_b: Increase the speed
Option_c: Reduce the voltage
Option_d: Decrease the current

correct_option: Start the motor

Question90: START
The standard frequency of AC supply in India is:
Question90: END

Option_a: 50 Hz
Option_b: 60 Hz
Option_c: 75 Hz
Option_d: 100 Hz
correct_option: 50 Hz

Question91: START
In the two wattmeter method, when the power factor is zero, the readings of wattmeters are:
Question91: END

Option_a: Both positive
Option_b: Both negative
Option_c: One positive, one negative
Option_d: Zero
correct_option: One positive, one negative

Question92: START
The primary advantage of using an LVDT is its:
Question92: END

Option_a: High accuracy
Option_b: Low cost
Option_c: Large size
Option_d: High power consumption
correct_option: High accuracy

Question93: START
The scale of a Moving Coil (MC) meter is typically:
Question93: END

Option_a: Non-uniform
Option_b: Uniform
Option_c: Exponential
Option_d: Logarithmic
correct_option: Uniform

Question94: START
What is the phase difference between current and voltage in a purely capacitive circuit?
Question94: END

Option_a: 0 degrees
Option_b: 90 degrees
Option_c: 180 degrees
Option_d: 270 degrees
correct_option: 90 degrees

Question95: START
Which instrument is used to measure high-frequency AC signals?

Question95: END

Option_a: Moving Iron (MI) meter
Option_b: Moving Coil (MC) meter
Option_c: Electrodynamometer
Option_d: Digital Oscilloscope
correct_option: Digital Oscilloscope

Question96: START
The power factor of a purely inductive circuit is:
Question96: END

Option_a: Unity
Option_b: Zero
Option_c: 0.5
Option_d: Negative
correct_option: Zero

Question97: START
In an energy meter, the term 'creep' refers to:
Question97: END

Option_a: Unwanted slow rotation of the disc
Option_b: Sudden increase in current
Option_c: Sudden decrease in voltage
Option_d: Constant power factor
correct_option: Unwanted slow rotation of the disc

Question98: START
LVDTs are best suited for measuring:
Question98: END

Option_a: High temperatures
Option_b: Large displacements
Option_c: Small displacements
Option_d: High pressures
correct_option: Small displacements

Question99: START
The slip of an induction motor increases with:
Question99: END

Option_a: Increase in load
Option_b: Decrease in load
Option_c: Increase in speed
Option_d: Increase in voltage
correct_option: Increase in load

Question100: START
The moving coil meter works on the principle of:
Question100: END

Option_a: Electromagnetic induction
Option_b: Electrostatic effect
Option_c: Thermionic emission

Option_d: Motor effect
correct_option: Motor effect

Question101: START
If a device consumes 2 kW power for 5 hours, the energy consumed is:
Question101: END

Option_a: 10 kWh
Option_b: 1 kWh
Option_c: 5 kWh
Option_d: 0.5 kWh
correct_option: 10 kWh

Question102: START
What is the typical range of slip for a single-phase induction motor at full load?
Question102: END

Option_a: 0% to 1%
Option_b: 5% to 7%
Option_c: 10% to 15%
Option_d: 20% to 30%
correct_option: 5% to 7%

Question103: START
The scale of a Moving Iron (MI) instrument is typically:
Question103: END

Option_a: Uniform across all ranges
Option_b: Narrower at low readings and wider at higher readings
Option_c: Wider at low readings and narrower at higher readings
Option_d: Identical to a Moving Coil (MC) instrument scale
correct_option: Narrower at low readings and wider at higher readings

Question104: START
The primary winding of a transformer is connected to:
Question104: END

Option_a: The load
Option_b: The power supply
Option_c: A capacitor
Option_d: A resistor
correct_option: The power supply

Question105: START
The power factor of a purely resistive circuit is:
Question105: END

Option_a: 0
Option_b: 0.5
Option_c: 1
Option_d: Negative
correct_option: 1

Question106: START
What type of losses occur in the core of a transformer?

Question106: END

Option_a: Copper losses
Option_b: Hysteresis losses
Option_c: Windage losses
Option_d: Mechanical losses
correct_option: Hysteresis losses

Question107: START
In an LVDT, what is the function of the core?
Question107: END

Option_a: To provide insulation
Option_b: To induce voltage
Option_c: To measure temperature
Option_d: To change the frequency
correct_option: To induce voltage

Question108: START
The slip of an induction motor is defined as:
Question108: END

Option_a: The difference between synchronous speed and rotor speed
Option_b: The ratio of voltage to current
Option_c: The difference between input and output power
Option_d: The ratio of frequency to speed
correct_option: The difference between synchronous speed and rotor speed

Question109: START
The standard unit for measuring electrical energy is:
Question109: END

Option_a: Watt
Option_b: Joule
Option_c: Kilowatt-hour
Option_d: Volt
correct_option: Kilowatt-hour

Question110: START
The direction of rotation of a three-phase motor can be changed by:
Question110: END

Option_a: Changing the voltage
Option_b: Reversing two of the phase connections
Option_c: Increasing the frequency
Option_d: Adding a capacitor
correct_option: Reversing two of the phase connections

Question111: START
The voltage regulation of a transformer is:
Question111: END

Option_a: The ratio of load voltage to no-load voltage
Option_b: The change in secondary voltage from no-load to full-load
Option_c: The efficiency of the transformer

Option_d: The resistance of the winding
correct_option: The change in secondary voltage from no-load to full-load

Question112: START
What is the function of the commutator in a DC motor?
Question112: END

Option_a: To change AC to DC
Option_b: To reverse the direction of current
Option_c: To increase voltage
Option_d: To decrease resistance
correct_option: To reverse the direction of current

Question113: START
An energy meter is calibrated in:
Question113: END

Option_a: Volts
Option_b: Watts
Option_c: Amperes
Option_d: kWh
correct_option: kWh

Question114: START
The purpose of a starter in an induction motor is to:
Question114: END

Option_a: Increase the speed
Option_b: Limit the starting current
Option_c: Decrease the voltage
Option_d: Improve power factor
correct_option: Limit the starting current

Question115: START
The efficiency of a transformer under full load is:
Question115: END

Option_a: Always 100%
Option_b: Less than 100%
Option_c: More than 100%
Option_d: Equal to the power factor
correct_option: Less than 100%

Question116: START
A Moving Iron (MI) instrument is primarily used for:
Question116: END

Option_a: DC measurements
Option_b: High-frequency measurements
Option_c: AC measurements
Option_d: Resistance measurements
correct_option: AC measurements

Question117: START
The purpose of a fuse in an electrical circuit is to:

Question117: END

Option_a: Increase current
Option_b: Protect against overcurrent
Option_c: Measure voltage
Option_d: Store energy
correct_option: Protect against overcurrent

Question118: START
The typical range of efficiency for an induction motor is:
Question118: END

Option_a: 50-60%
Option_b: 70-80%
Option_c: 85-95%
Option_d: 100%
correct_option: 85-95%

Question119: START
In a star-connected three-phase system, the line voltage is:
Question119: END

Option_a: Equal to the phase voltage
Option_b: Less than the phase voltage
Option_c: More than the phase voltage
Option_d: Zero
correct_option: More than the phase voltage

Question120: START
The primary function of a circuit breaker is to:
Question120: END

Option_a: Provide insulation
Option_b: Switch the circuit on and off
Option_c: Protect against overload
Option_d: Store electrical energy
correct_option: Protect against overload

Question 121: START
In a DC shunt motor, speed is related to armature current as
Question 121: END

Option_a: Directly proportional to the armature current
Option_b: Proportional to the square of the current
Option_c: Independent of armature current
Option_d: Inversely proportional to the armature current
correct_option: Inversely proportional to the armature current

Question 122: START
In a DC shunt motor for zero armature current we get speed
Question 122: END

Option_a: Non-zero and minimum
Option_b: Zero

Option_c: Non-zero and maximum
Option_d: Doesn't depend on armature current
correct_option: - Zero

Question 123: START
As the load is increased the speed of DC shunt motor will
Question 123: END

Option_a: Reduce slightly
Option_b: Increase slightly
Option_c: Increase proportionately
Option_d: Reduce rapidly
correct_option: Increase slightly

Question 124: START
The armature torque of the DC shunt motor is proportional to
Question 124: END

Option_a: Field flux only
Option_b: Armature current only
Option_c: Field flux and armature current
Option_d: Field current
correct_option: Armature current only

Question 125: START
Correct equation of speed-torque characteristic of DC shunt motor is
Question 125: END

Option_a: $[V_t / k\Phi] = [R_a / k^1 \Phi^2] T$
Option_b: $[V_t / k\Phi^2] = [R_a / k^1 \Phi^2] T$
Option_c: $[V_t / k\Phi] = [R_a / k^1 \Phi] T$
Option_d: $[V_t / k\Phi^2] = [R_a / k^1 \Phi^2] T$
correct_option: $[V_t / k\Phi] - [R_a / k^1 \Phi^2] T$

Question 126: START
For some percentage increase in the torque, which DC motor will have the least percentage increase of input current?
Question 126 : END

Option_a: Series motor
Option_b: Shunt motor
Option_c: Cumulative compound motor
Option_d: Separately exited motor
correct_option: Shunt motor

Question 127: START
If a DC shunt motor is working at full load and if shunt field circuit suddenly opens
Question 127: END

Option_a: Will make armature to take heavy current, possibly burning it
Option_b: Will result in excessive speed, possibly destroying armature due to excessive centrifugal stresses
Option_c: Nothing will happen to motor
Option_d: Motor will come to stop
correct_option: Will make armature to take heavy current, possibly burning it

Question 128: START
The speed of a DC shunt motor can be made more than full load speed by
Question 128: END

Option_a: Reducing the field current
Option_b: Decreasing the armature current
Option_c: Increasing the armature current
Option_d: Increasing the excitation current
correct_option: Reducing the field current

Question 129: START
No load speed of the DC shunt motor is 1322 rpm while full load speed is 1182 rpm. What will be the speed regulation?
Question 129: END

Option_a: 12.82 %
Option_b: 11.8 %
Option_c: 16.6 %
Option_d: 14.2 %
correct_option: 11.8 %

Question 130: START
Magnitude of flux in an energy meter varies _
Question 130: END

Option_a: due to abnormal currents and voltages
Option_b: due to high resistance and inductance values
Option_c: due to changes in the transformer turns
Option_d: due to the induced e.m.f in the windings
correct_option: due to abnormal currents and voltages

Question 131: START
Energy meter creeps due to
Question 131: END

Option_a: due to change in supply
Option_b: due to reversal in polarity of voltage
Option_c: due to asymmetry in magnetic circuit
Option_d: due to turns ratio of transformer
correct_option: due to asymmetry in magnetic circuit

Question 132: START
How is the flux of shunt coil related to voltage?
Question 132: END

Option_a: flux is proportional to square of voltage
Option_b: directly proportional
Option_c: inversely proportional
Option_d: independent of each other
correct_option: flux is proportional to square of voltage

Question 133: START
Supply voltage in an energy meter is
Question 133: END

Option_a: constant always
Option_b: zero always
Option_c: depends on the load
Option_d: can fluctuate
correct_option: can fluctuate

Question134: START
How is the flux of shunt coil related to voltage?
Question134: END

Option_a: flux is proportional to square of voltage
Option_b: directly proportional
Option_c: inversely proportional
Option_d: independent of each other
correct_option: flux is proportional to square of voltage

Question 135: START
How can temperature effect be compensated in an energy meter?
Question 135: END

Option_a: through heat sinks
Option_b: by a temperature shunt
Option_c: by using resistance
Option_d: by using a coolant
correct_option: by a temperature shunt

Question 136: START
In some energy meters, creeping can be avoided by
Question 136: END

Option_a: attaching small gold pieces
Option_b: attaching small aluminium pieces
Option_c: attaching small iron pieces
Option_d: attaching small zinc pieces
correct_option: attaching small iron pieces

Consider the characteristic equation: $s^4 + 3s^3 + 3s^2 + 2s + 1 = 0$ Using the Routh-Hurwitz criterion, the stability of the system is determined. a) Stable b) Marginally Stable **c) Unstable** d) Cannot be determined
A characteristic equation is given as: $s^3 + 2s^2 + 3s + 6 = 0$

Using the Routh-Hurwitz criterion, the number of poles in the right half-plane is:

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

A characteristic equation is:
$s^4 + 2s^3 + s^2 + 3s + 5 = 0$
What is the nature of stability according to Routh's criterion?

a) Stable
b) Unstable
c) Marginally Stable
d) Critically Damped

Question: 137 START
Routh Hurwitz criterion gives:
Question 137: END

Option_a: Number of roots in the right half of the s-plane
Option_b: Value of the roots
Option_c: Number of roots in the left half of the s-plane
Option_d: Number of roots in the top half of the s-plane
correct_option: Number of roots in the right half of the s-plane

Question138: START
Routh Hurwitz criterion cannot be applied when the characteristic equation of the system containing coefficient's which is/are
Question138: END

Option_a: Exponential function of s
Option_b: Sinusoidal function of s
Option_c: Complex
Option_d: Exponential and sinusoidal function of s and complex
correct_option: Exponential and sinusoidal function of s and complex

Question139: START
Consider the following statement regarding Routh Hurwitz criterion
Question139: END

Option_a: It gives absolute stability
Option_b: It gives gain and phase margin
Option_c: It gives the number of roots lying in RHS of the s-plane
Option_d: It gives gain, phase margin and number of roots lying in RHS of the s-plane
correct_option: it gives gain, phase margin and number of roots lying in RHS of the s-plane

Question140: START
The order of the auxiliary polynomial is always:

Question140: END

Option_a: Even
Option_b: Odd
Option_c: May be even or odd
Option_d: None of the mentioned
correct_option: Even

Question141: START
Which of the test signals are best utilized by the stability analysis.
Question141: END

Option_a: Impulse
Option_b: Step
Option_c: Ramp
Option_d: Parabolic
correct_option: Impulse

Question142: START
The characteristic equation of a system is given as3s4+10s3+5s2+2=0. This system is:
Question142: END

Option_a: Stable
Option_b: Marginally stable
Option_c: Unstable
Option_d: Linear
correct_option: Unstable

Question143: START
The characteristic equation of a system is given ass3+25s2+10s+50=0. What is the number of the roots in the right half s-plane and the imaginary axis respectively?
Question143: END

Option_a: 1,1
Option_b: 0,0
Option_c: 2,1
Option_d: 1,2
correct_option: 0,0

Question144: START
The necessary condition for the stability of the linear system is that all the coefficients of characteristic equation 1+G(s)H(s) =0, be real and have the
Question144: END

Option_a: Positive sign
Option_b: Negative sign
Option_c: Same sign
Option_d: Both positive and negative
correct_option: Same sign

Question145: START
For making an unstable system stable:
Question145: END

Option_a: Gain of the system should be increased
Option_b: Gain of the system should be decreased
Option_c: The number of zeroes to the loop transfer function should be increased
Option_d: The number of poles to the loop transfer function should be increased
correct_option: Gain of the system should be decreased

Question 146: START
The order of the auxiliary polynomial is always:
Question 146: END

Option_a: Even
Option_b: Odd
Option_c: May be even or odd
Option_d: None of the mentioned
correct_option: Even

Question147: START
The major components of a controller are
Question147: END

Option_a: Control element
Option_b: Error detector and control element
Option_c: Feedback element
Option_d: Error detector and feedback element
correct_option: Error detector and control element

Question148: START
What is an electric drive?
Question148: END

Option_a: A machine that converts electrical energy into kinetic energy
Option_b: A machine that converts mechanical energy into electrical energy
Option_c: A machine that converts electrical energy into mechanical energy
Option_d: A machine that converts kinetic energy into electrical energy
correct_option: A machine that converts electrical energy into mechanical energy

Question149: START
Which of the following is used to build a electric drive?
Question149: END

Option_a: Source
Option_b: Motor
Option_c: Control unit
Option_d: All of the mentioned
correct_option: All of the mentioned

Question150: START
Which of the following is/are components of an electric drive?
Question150: END

Option_a: Control unit and Power Modulator
Option_b: Electric Motor and Control System
Option_c: Input Command
Option_d: Sensing Device and Electric Motor

correct_option: Electric Motor and Control System

Question151: START
Which of the following is a function of electric drive?
Question151: END

Option_a: Transport energy from the storage system to the wheels
Option_b: Transport energy from the control system to the wheels
Option_c: Transport fuel from the electric motor to the wheels
Option_d: Transport fuel from the storage system to the wheels
correct_option: Transport energy from the storage system to the wheels
Question152: START
Which of the following exhibits linearly rising load torque characteristics
Question152: END

Option_a: Rolling Mills
Option_b: Fan load
Option_c: Separately excited dc generator connected to the resistive load
Option_d: Elevators
correct_option: Separately excited dc generator connected to the resistive load

Question153: START
What is the maximum number of lighting points that can be connected in a circuit?
Question153: END

Option_a: 5
Option_b: 10
Option_c: 8
Option_d: 12
correct_option:10

Question154: START
Which material is used for wiring continuous bus bar?
Question154: END

Option_a: Aluminium
Option_b: Copper
Option_c: Both (A) and (B)
Option_d: None of these
correct_option: Aluminium

Question155: START
For what voltage levels are the screwed conduit circuits used?
Question155: END

Option_a: Less than 250 V
Option_b: For voltages between 250 V – 600 V
Option_c: For voltages above 600 V
Option_d: None of these
correct_option: For voltages between 250 V – 600 V

Question156: START
Which among these is a method of wiring?
Question156: END

Option_a: Joint box
Option_b: Tee system
Option_c: Loop in system
Option_d: All of these
correct_option All of these

Question157: START
Blinking of fluorescent tube may be on account of
Question157: END

Option_a: Low circuit voltage
Option_b: Loose contact
Option_c: Defective starter
Option_d: Any of the above
correct_option: Any of the above

A 100 W bulb is used for 5 hours daily. What is the energy consumption per month (30 days)?

a) 5 kWh
b) 10 kWh
c) 15 kWh
d) 30 kWh

A 1.5 kW heater is operated for 4 hours daily. Calculate the total energy consumed in 20 days.

a) 60 kWh
b) 120 kWh
c) 80 kWh
d) 90 kWh

An electric motor runs at 2 kW power consumption for 5 hours. If electricity cost is ₹6 per unit, what is the total cost for 10 days?

a) ₹600
b) ₹500
c) ₹700
d) ₹800

A 2 HP motor runs for 3 hours per day. Given that 1 HP = 746 W, calculate the monthly consumption (30 days).

a) 134 kWh
b) 100 kWh
c) 150 kWh
d) 200 kWh

A refrigerator operates at 300 W and runs for 12 hours a day. Find the monthly (30 days) energy consumption. **a) 108 kWh** **b) 90 kWh** **c) 50 kWh** **d) 36 kWh**
A household uses the following devices daily: • **TV (200 W for 3 hours)** • **Fan (75 W for 6 hours)** • **Light (60 W for 8 hours)** **Calculate the total energy consumed per day.** **a) 2.22 kWh** **b) 1.5 kWh** **c) 3 kWh** **d) 1.8 kWh**
A factory uses a machine that runs on 5 kW for 6 hours daily. If the electricity tariff is ₹7 per kWh, what is the daily cost? **a) ₹200** **b) ₹210** **c) ₹250** **d) ₹300**
A slow speed alternator works in parallel with a turbo-alternator, the combined output being 2500 kW at 0.8 p.f. lag. If the turbo alternator provides 1000 kW at unity p.f., at what p.f will the slow speed machine work ? **a. 0.624** **b. 0.824** **c. 0.924** **d. 0.524**
Two alternators working in parallel supply a lighting load of 3000 kW and a motor load aggregating 5000 kW at a p.f. of 0.71. One machine is loaded to 5000 kW at p.f. 0.8 lag. Determine the load and p.f. of the other machine. **a. 0.927** **b. 0.727** **c. 0.627**

d. **0.827**
A single phase motor takes a current of 40A at p.f. 0.7 lag from a 440 V 3-phase 50 Hz supply. Determine the value of a shunt capacitor so as to raise the p.f. to 0.9 lag, the load remaining the same. **a.** **188 µF** **b.** **198 µF** **c.** **18 µF** **d.** **28 µF**
A 500 W discharge lamp takes a current of 4A at unity p.f. Calculate the inductance of a choke required to enable the lamp to work on 250 V 50 Hz mains. Determine also the capacitance to be connected across the mains to bring the resultant p.f. to unity. **a.** **44 µF.** **b.** **54 µF.** **c.** **64 µF.** **d.** **74 µF.**
A lithium-ion battery has a capacity of 10 Ah. If 2 Ah of charge has been removed, what is the SOC? **a.** **80%** **b.** **90%** **c.** **60%** **d.** **50%**
A battery has an open-circuit voltage (OCV) of 4.2 V and an internal resistance (Ri) of 0.1 Ω. If a load current of 5 A is applied, what is the battery voltage? **a.** **4.05 V** **b.** **3.7 V** **c.** **5.05 V** **d.** **6.05 V**
A battery has a maximum operating temperature of 45°C. If the current temperature is 40°C, what is the temperature margin? **a.** **5°C** **b.** **4°C** **c.** **3°C** **d.** **2°C**

A battery has a maximum charge current of 2 C (20 A) and a maximum discharge current of 1 C (10 A). If the battery is currently at 50% SOC, what is the maximum allowed charge/discharge current?

a. Maximum charge current = 20 A (2C), Maximum discharge current = 10 A (1C)
b. Maximum charge current = 10 A (2C), Maximum discharge current = 20 A (1C)
c. Maximum charge current = 30 A (2C), Maximum discharge current = 5 A (1C)
d. Maximum charge current = 40 A (2C), Maximum discharge current = 10 A (1C)

A residential flat has average electrical consumption per day as follows,

i) 4 tube lights of 40 watts for 5 hours per day

ii) 2 filament lamps of 60 watts for 8 hours per day

iii) 1 water heater rated 2 kW for 1 hour per day.

iv) 1 water pump of 0.5 kW rating for 3 hours per day.

Calculate cost of energy per month if 1 unit costs Rs. 3.50.

a. Rs. 552.30.
b. Rs. 652.30.
c. Rs. 852.30.
d. Rs. 952.30.

In a residence, 4 tube lights: each of them of 40 W are operated daily for 5 hours and 3 fans: each of 120 W are operated daily for 4 hours. Calculate the electricity bill at Rs. 5 per unit for September month.

a. Rs. 336
b. Rs. 436
c. Rs. 536
d. Rs. 636

An air conditioner is rated 240 V, 1.5 kW. The air conditioner is switched on 8 hours each day. What is electrical energy consumed in 30 days?

a. 360 kWh
b. 370 kWh
c. 380 kWh
d. 390 kWh

Calculate the monthly bill if a heater of 100 watt is used at the rate of rs. 1 per unit for 1 hour daily.

a. Rs. 3. **b. Rs. 4.** **c. Rs. 5.** **d. Rs. 6.**
A lamp rated 20W and an electric iron rated 50W are used for 2 hour everyday. Calculate the total energy consumed in 20 days. **a. 2.8 kWh** **b. 3.8 kWh** **c. 4.8 kWh** **d. 5.8 kWh**

Question158: START
For operation of fluorescent tube on DC supply the additional device incorporated in the Tube circuit is a
Question158: END

Option_a: Transformer
Option_b: Resistor
Option_c: Inductor
Option_d: All of the above
correct_option: Resistor

Question159: START
A capacitor is connected across the fluorescent tube circuit in order to
Question 159: END

Option_a: Eliminate the noise
Option_b:. Limit the current
Option_c: Improve the power factor of the tube circuit
Option_d: None of the mentioned
correct_option: Improve the power factor of the tube circuit

Question160: START
The Flickr effect of fluorescent lamps is more pronounced at
Question160: END

Option_a: Lower voltages
Option_b: Higher voltages
Option_c: Higher frequencies
Option_d: Lower frequencies
correct_option: Lower frequencies

Question161: START
For a given system response y(t) to a unit step input u(t), what characteristic of the system can be determined if the response includes an exponential decay term?
Question161: END

Option_a: The system is unstable
Option_b: The system has underdamped poles
Option_c: The system is critically damped
Option_d: The system has no damping
correct_option: The system has underdamped poles

Question162: START
If a unit impulse signal δ(t)\delta(t)δ(t) is applied to a linear time-invariant (LTI) system, which of the following can best describe the resulting output?
Question162: END

Option_a: The output will be a scaled version of δ(t)\delta(t)δ(t)
Option_b: The output will be the impulse response of the system
Option_c: The output will be the step response of the system
Option_d: The output will be zero for all time
correct_option: The output will be the impulse response of the system

Question163: START
A unit ramp function r(t)=tu(t) is applied to a first-order system with a time constantWhich of the following best describes the output response?
Question163: END

Option_a: It will have a constant steady-state value
Option_b: It will linearly increase with time indefinitely
Option_c: It will approach a steady-state ramp with a slope determined by τ\tauτ
Option_d: It will exhibit an oscillatory response
correct_option: It will approach a steady-state ramp with a slope determined by τ\tauτ

Question164: START
In control systems, which of the following input signals is often used to test the transient response characteristics of a system, particularly in feedback control design?
Question164: END

Option_a: Unit ramp signal
Option_b: Unit impulse signal
Option_c: Exponential decay signal
Option_d: Sinusoidal signal
correct_option: Unit impulse signal

Question165: START
Which of the following best describes the response of a second-order system when excited by a unit step signal, if the system is underdamped?
Question165: END

Option_a: A smooth exponential decay to zero
Option_b: An oscillatory response with a decaying amplitude
Option_c: A ramp response with steady-state error
Option_d: A steady-state constant response with zero overshoot
correct_option: An oscillatory response with a decaying amplitude

Question166: START

When comparing the Fourier series representation of a square wave and a sinusoidal wave of the same frequency, what key characteristic distinguishes them?
Question166: END

Option_a: Square wave contains only even harmonics
Option_b: Sinusoidal wave contains more harmonics
Option_c: Square wave contains odd harmonics, sinusoidal contains only the fundamental
Option_d: Sinusoidal wave has a flat amplitude spectrum
correct_option: Square wave contains odd harmonics, sinusoidal contains only the fundamental

Question167: START
In a DIT-FFT algorithm, what key operation differentiates it from the direct computation of the Discrete Fourier Transform (DFT)?
Question167: END

Option_a: Computation is based on breaking the input sequence into even and odd parts
Option_b: The output sequence is reversed
Option_c: It only calculates half of the DFT coefficients
Option_d: It requires complex conjugate multiplications at each step
correct_option: Computation is based on breaking the input sequence into even and odd parts

Question168: START
In a DIF-FFT algorithm, what is the main reason for performing decimation on the output instead of the input sequence?
Question168: END

Option_a: To minimize the total number of computations required
Option_b: To apply twiddle factors more efficiently
Option_c: To ensure that the input sequence remains in natural order
Option_d: To reduce the memory usage during computation
correct_option: To ensure that the input sequence remains in natural order

Question169: START
In a scenario where you need to minimize the number of arithmetic operations for a large input sequence, which FFT structure (DIT or DIF) would you prefer, and how would the choice impact the computation?
Question169: END

Option_a: DIT, because it reduces complex multiplications in each stage
Option_b: DIT, as it performs bit-reversal at the output, optimizing the sequence
Option_c: DIF, as it places the twiddle factor multiplications in initial stages, reducing overall complexity
Option_d: DIF, because it limits additions in the later stages
correct_option: DIF, as it places the twiddle factor multiplications in initial stages, reducing overall complexity

Question170: START
How does the butterfly computation in DIT-FFT differ from that in DIF-FFT with respect to the application of twiddle factors?
Question170: END

Option_a: DIT-FFT applies twiddle factors after the butterfly operation
Option_b: DIT-FFT applies twiddle factors only at the last stage
Option_c: DIF-FFT applies twiddle factors before the butterfly operation
Option_d: Both algorithms apply twiddle factors at every stage
correct_option: DIF-FFT applies twiddle factors before the butterfly operation

Question171: START
In an 8-point FFT, the DIT-FFT and DIF-FFT produce the same result but in different orders. What output difference specifically distinguishes the final outputs of DIT-FFT from DIF-FFT?
Question171: END

Option_a: DIT-FFT provides output in bit-reversed order, while DIF-FFT provides it in natural order
Option_b: DIT-FFT provides output in natural order, while DIF-FFT provides it in bit-reversed order
Option_c: Both algorithms output in bit-reversed order
Option_d: Both algorithms output in natural order
correct_option: DIT-FFT provides output in bit-reversed order, while DIF-FFT provides it in natural order

Question172: START
Given that both DIT and DIF FFTs involve recursive butterfly operations, in what case would the butterfly structure in DIT be more advantageous than DIF, especially in terms of implementation on a software-based digital signal processor (DSP)?
Question172: END

Option_a: When the input data is naturally in bit-reversed order
Option_b: When the algorithm needs to minimize memory for each butterfly stage
Option_c: When the DSP is optimized for forward-order computations, aligning with DIT’s bit-reversed input order
Option_d: When minimizing latency across stages is essential
correct_option: When the DSP is optimized for forward-order computations, aligning with DIT’s bit-reversed input order

Question173: START
You are comparing the speed and efficiency of DIT and DIF FFT algorithms for a research project on high-frequency data processing. Which key factors would you prioritize in selecting one algorithm over the other, and what would be your choice?
Question173: END

Option_a: Choose DIT for lower frequency resolution and simplicity
Option_b: Choose DIF for faster computation in hardware due to in-place input structure Option_c: Choose DIT to reduce the total memory requirement
Option_d: Choose DIF to minimize frequency resolution in final stages
correct_option: Choose DIF for faster computation in hardware due to in-place input structure

Question174: START
In designing an FFT algorithm for adaptive filtering applications, where rapid and efficient frequency updates are essential, would DIT or DIF be preferable, and why?
Question174: END

Option_a: DIT, since it can more easily accommodate dynamic input changes
Option_b: DIF, as it optimizes the use of twiddle factors in each stage
Option_c: DIT, due to its reduced need for twiddle factor adjustments
Option_d: DIF, as it allows for quick adjustments with natural order inputs
correct_option: DIF, as it allows for quick adjustments with natural order inputs

Question175: START
If your goal is to implement a parallel FFT computation on a multicore processor, which algorithm (DIT or DIF) would facilitate more efficient parallel processing, and what is the reason behind this choice?
Question175: END

Option_a: DIT, as it allows parallel processing through its decimation structure

Option_b: DIF, because it organizes computations such that later stages can be parallelized
Option_c: DIF, as it provides natural ordering at each stage, simplifying data distribution across cores
Option_d: DIT, since it inherently minimizes the interdependencies between stages
correct_option: DIF, as it provides natural ordering at each stage, simplifying data distribution across cores

Question176: START
If you were given an 8-point FFT to compute by hand and needed the simplest approach to verify the results, which algorithm (DIT or DIF) would you select, and what would be the rationale behind your choice?
Question176: END

Option_a: DIT, because it provides intermediate results that are easy to validate at each stage
Option_b: DIF, as it maintains a straightforward order of input operations
Option_c: DIF, since it produces outputs in natural order, making verification easier
Option_d: DIT, as it minimizes the twiddle factor computations required for each step correct_option: DIF, since it produces outputs in natural order, making verification easier

Question177: START
system produces zero output for one input and same gives the same output for several other inputs. What is the system called?
a) Non – invertible System
b) Invertible system
c) Non – causal system
d) Causal system
Question177: END

Option_a: Non – invertible System
Option_b: Invertible system
Option_c: Non – causal system
Option_d: Causal system
correct_option Non – invertible System

Question178: START
How is a linear function described as?
a) Zero in Finite out
b) Zero in infinite out
c) Zero in zero out
d) Zero in Negative out
Question178: END

Option_a: Zero in Finite out
Option_b: Zero in infinite out
Option_c: Zero in zero out
Option_d: Zero in Negative out
correct_option: Zero in zero out

Question179: START
If n tends to infinity, is the accumulator function an unstable one?
Question179: END

Option_a: The function is marginally stable
Option_b: The function is unstable
Option_c: The function is stable
Option_d: None of the mentioned

correct_option: The function is unstable

Question180: START
Determine the discrete-time signal: $x(n)=1$ for $n\geq0$ and $x(n)=0$ for $n<0$
Question180: END

Option_a: Unit ramp sequence
Option_b: Unit impulse sequence
Option_c: Exponential sequence
Option_d: Unit step sequence
correct_option: Unit step sequence

Question181: START
In the context of digital filter design, what is the primary purpose of using the Bilinear Transformation technique?
Question181: END

Option_a: To preserve the frequency response of an analog filter exactly
Option_b: To perform a one-to-one mapping of the impulse response
Option_c: To optimize the phase response of the filter
Option_d: To map the entire analog frequency range to the digital frequency range without aliasing
correct_option To map the entire analog frequency range to the digital frequency range without aliasing

Question182: START
Which of the following best describes how the Bilinear Transformation maps the analog s-plane to the digital z-plane?
Question182: END

Option_a: It maps the entire left half of the s-plane to the entire z-plane
Option_b: It maps the origin of the s-plane to infinity in the z-plane
Option_c: It maps the jω-axis to the unit circle in the z-plane
Option_d: It maps the right half of the s-plane to the left half of the z-plane
correct_option: It maps the jω-axis to the unit circle in the z-plane

Question183: START
In Impulse Invariant Transformation, what is a primary drawback that may arise when designing digital filters from analog prototypes?
Question183: END

Option_a: Aliasing, as it does not prevent overlap of the frequency spectrum
Option_b: Frequency warping, causing an inaccurate mapping of frequencies
Option_c: Non-causal filter design, making it impossible for real-time applications
Option_d: A need for high sampling rates to achieve accurate results
correct_option: Aliasing, as it does not prevent overlap of the frequency spectrum

Question184: START
What is the nature of the following function: $y[n] = y[n-1] + x[n]$?
Question184: END

Option_a: Integrator
Option_b: Differentiator
Option_c: Subtractor
Option_d: Accumulator
correct_option: Accumulator

Question185: START
Which of the following transformations is better suited for low-pass filter designs when a precise match between analog and digital frequency response is critical?
Question185: END

Option_a: Impulse Invariant Transformation, as it avoids aliasing
Option_b: Bilinear Transformation, as it warps frequencies to maintain shape
Option_c: Impulse Invariant Transformation, due to its simple one-to-one mapping
Option_d: Bilinear Transformation, as it provides a more accurate mapping at low frequencies correct_option: Bilinear Transformation, as it provides a more accurate mapping at low frequencies

Question186: START
In Bilinear Transformation, what effect does the frequency warping have on high-frequency components when transforming from analog to digital?
Question186: END

Option_a: High-frequency components are compressed toward the Nyquist frequency Option_b: High-frequency components are stretched uniformly across the frequency axis
Option_c: High-frequency components are mapped to low frequencies, creating aliasing Option_d: High-frequency components remain unaffected by warping
correct_option: High-frequency components are compressed toward the Nyquist frequency

Question187: START
In designing a high-pass filter using Impulse Invariant Transformation, what must be considered to reduce the effects of aliasing?
Question187: END

Option_a: Use a very low cutoff frequency
Option_b: Increase the sampling frequency to minimize aliasing
Option_c: Apply a pre-warping technique
Option_d: Design a low-pass filter instead and convert it to high-pass
correct_option: Increase the sampling frequency to minimize aliasing

Question188: START
How does the Impulse Invariant Transformation maintain the time-domain characteristics of an analog filter when transforming it to a digital filter?
Question188: END

Option_a: It maps each impulse response sample in the analog domain to the digital domain
Option_b: It applies a pre-warping effect to match impulse timings
Option_c: It mirrors the analog filter's poles exactly onto the z-plane
Option_d: It uses zero-order hold to approximate the analog response
correct_option: It maps each impulse response sample in the analog domain to the digital domain

Question189: START
Consider designing a band-pass digital filter. Given that both Bilinear Transformation and Impulse Invariant Transformation are options, which would you choose and why?
Question189: END

Option_a: Impulse Invariant, to maintain the time-domain characteristics of the analog filter
Option_b: Impulse Invariant, to simplify the mapping of high frequencies
Option_c: Bilinear, to avoid frequency warping in the lower frequency range
Option_d: Bilinear, to avoid aliasing and ensure accurate frequency mapping
correct_option: Bilinear, to avoid aliasing and ensure accurate frequency mapping

Question190: START
For an analog filter with a cutoff frequency close to the Nyquist limit, why would Bilinear Transformation be less ideal for digital conversion, and what would you do to mitigate this issue?
Question190: END

Option_a: Frequency warping distorts high frequencies, so apply pre-warping to compensate
Option_b: It fails to map lower frequencies accurately; increase sampling rate
Option_c: Impulse response aliasing; switch to Impulse Invariant Transformation
Option_d: It inverts the phase response; adjust the pole-zero configuration
correct_option: Frequency warping distorts high frequencies, so apply pre-warping to compensate

Question191: START
Which of the following best explains why a Low Pass Filter is often used in anti-aliasing applications?
Question191: END

Option_a: It allows only high frequencies to pass, reducing high-frequency noise
Option_b: It blocks low frequencies, ensuring only high-frequency components are sampled
Option_c: It attenuates high frequencies, limiting the bandwidth and preventing aliasing
Option_d: It mirrors frequencies to reduce spectral overlap
correct_option It attenuates high frequencies, limiting the bandwidth and preventing aliasing

Question192: START
For audio applications where low-frequency noise is common, which filter type is typically used to remove low-frequency interference while preserving high-frequency components of the signal?
Question192: END

Option_a: Low Pass Filter
Option_b: High Pass Filter
Option_c: Band Pass Filter
Option_d: Band Reject Filter
correct_option: High Pass Filter

Question193: START
In designing a Band Pass Filter, what characteristic must be carefully controlled to ensure the filter accurately targets the desired frequency band?
Question193: END

Option_a: The passband ripple
Option_b: Only the cutoff frequency of the high-pass component
Option_c: The roll-off rate of both the low- and high-frequency cutoffs
Option_d: The gain of the entire frequency range
correct_option: The roll-off rate of both the low- and high-frequency cutoffs

Question194: START
Which of the following filter types would be most effective in removing a specific interfering frequency within a signal while leaving the surrounding frequencies largely unaffected?
Question194: END

Option_a: Low Pass Filter
Option_b: High Pass Filter
Option_c: Band Pass Filter
Option_d: Band Reject Filter
correct_option: Band Reject Filter

Question195: START

Suppose you are designing a filter for an audio application to enhance vocals between 300 Hz and 3 kHz while attenuating other frequencies. Which type of filter is most appropriate, and why?
Question195: END

Option_a: Low Pass Filter, to allow all frequencies below 3 kHz
Option_b: High Pass Filter, to remove frequencies below 300 Hz
Option_c: Band Pass Filter, to pass frequencies only between 300 Hz and 3 kHz
Option_d: Band Reject Filter, to eliminate all frequencies except 300 Hz to 3 kHz

Question196: START
When designing a High Pass Filter for a real-time signal processing system, what potential limitation should you consider regarding the filter's cutoff frequency, and why?
Question196: END

Option_a: The cutoff should be very low to preserve low-frequency components
Option_b: The cutoff should be chosen carefully to avoid unwanted phase distortion near the cutoff frequency
Option_c: The cutoff should be very high to allow only high-frequency signals to pass through Option_d: The cutoff must be flexible to adapt to different signal requirements
correct_option: The cutoff should be chosen carefully to avoid unwanted phase distortion near the cutoff frequency

Question197: START
In wireless communication systems, which type of filter would be chosen to eliminate unwanted signals from neighboring frequency bands, and what is a key requirement of this filter's design?
Question197: END

Option_a: Low Pass Filter, with sharp roll-off
Option_b: High Pass Filter, with gradual roll-off
Option_c: Band Pass Filter, with a narrow bandwidth
Option_d: Band Reject Filter, with selective attenuation
correct_option: Band Reject Filter, with selective attenuation

Question198: START
For a seismic signal processing application that requires monitoring frequencies between 0.1 Hz and 10 Hz, which filter design would you choose and why?
Question198: END

Option_a: Low Pass Filter, to attenuate all frequencies above 10 Hz
Option_b: High Pass Filter, to pass all frequencies above 0.1 Hz
Option_c: Band Pass Filter, to pass frequencies only between 0.1 Hz and 10 Hz
Option_d: Band Reject Filter, to eliminate frequencies outside of the range 0.1 Hz to 10 Hz
correct_option: Band Pass Filter, to pass frequencies only between 0.1 Hz and 10 Hz

Question199: START
You are developing a filter to isolate and analyze harmonic frequencies within a power signal. Which type of filter would allow you to observe harmonic components while filtering out both high- and low-frequency noise?
Question199: END

Option_a: Low Pass Filter, with a low cutoff frequency
Option_b: High Pass Filter, with a high cutoff frequency
Option_c: Band Pass Filter, with a narrow passband centered on the harmonic frequencies
Option_d: Band Reject Filter, tuned to remove the fundamental frequency only
correct_option: Band Pass Filter, with a narrow passband centered on the harmonic frequencies

Question200: START

If you need to design a filter for biomedical signals to suppress 60 Hz power line interference while preserving other signal frequencies, which filter type would you select and how would it be configured?
Question200: END

Option_a: Low Pass Filter with cutoff below 60 Hz
Option_b: High Pass Filter with cutoff above 60 Hz
Option_c: Band Pass Filter targeting the desired biomedical signal frequencies only
Option_d: Band Reject Filter centered at 60 Hz to suppress interference specifically
correct_option: Band Reject Filter centered at 60 Hz to suppress interference specifically

Question201: START
A circuit has a Norton equivalent current of 3 A and a Norton resistance of 4 Ω. What is the equivalent Thevenin voltage?
Question201: END

Option_a: 3 V
Option_b: 6 V
Option_c: 12 V
Option_d: 15 V
correct_option: c) 12 V

Question202: START
A circuit has a Norton equivalent current of 3 A and a Norton resistance of 4 Ω. What is the equivalent Thevenin voltage?
Question202: END

Option_a: 10 V
Option_b: 12 V
Option_c: 13 V
Option_d: 14 V
correct_option: b) 12 V

Question203: START
If the open-circuit voltage across terminals is 24 V and the short-circuit current across the same terminals is 6 A, what is the Norton resistance?
Question203: END

Option_a: 2 Ω
Option_b: 3 Ω
Option_c: 4 Ω
Option_d: 6 Ω
correct_option: b) 4 Ω

Question204: START
In a Norton equivalent circuit with Norton current I_N=10 A and Norton resistance R_N=5Ω, what is the current through a 5 Ω load connected across the terminals?
Question204: END

Option_a: 2 A
Option_b: 5 A
Option_c: 7.5 A
Option_d: 10 A
correct_option: b) 5 A

Question205: START
The Norton resistance of a network is found to be 10 Ω, and the Norton current is 2 A. If a load resistance of 10 Ω is connected across the terminals, what is the voltage across the load?
Question205: END

Option_a: 5 V
Option_b: 10 V
Option_c: 15 V
Option_d: 20 V
correct_option: b) 10 V

Question206: START
In Norton's Theorem, what happens to all independent sources in the network while calculating the Norton resistance?
Question206: END

Option_a: All voltage sources are short-circuited, and current sources are left open
Option_b: All voltage sources are open-circuited, and current sources are shorted
Option_c: All sources are turned off, meaning voltage sources are shorted, and current sources are opened
Option_d: No change is made to the sources
correct_option: c) All sources are turned off, meaning voltage sources are shorted, and current sources are opened

Question207: START
For a network with a Norton equivalent current of 15 A and a Norton resistance of 3 Ω, calculate the power delivered to a 3 Ω load resistor.
Question207: END

Option_a: 37.5 W
Option_b: 168.75 W
Option_c: 75 W
Option_d: 112.5 W
correct_option: b) 168.75 W

Question208: START
A Norton equivalent circuit has a current source of 8 A and a parallel resistance of 6 Ω. If a 12 Ω resistor is connected across the terminals, what is the equivalent current through the 12 Ω resistor.
Question208: END

Option_a: 2 A
Option_b: 3 A
Option_c: 4 A
Option_d: 6 A
correct_option: b) 3 A

Question209: START
In a circuit, the open-circuit voltage is measured as 50 V, and the short-circuit current is 5 A. What is the Norton equivalent current and resistance?

Question209: END

Option_a: 5 A, 10 Ω
Option_b: 10 A, 5 Ω
Option_c: 2.5 A, 20 Ω
Option_d: 4 A, 12.5 Ω
correct_option: a) 5 A, 10 Ω

Question210: START
Norton's theorem is used to simplify which of the following types of electrical circuits?
Question210: END

Option_a: Only AC circuits
Option_b: Only DC circuits
Option_c: Both AC and DC circuits
Option_d: Only resistive circuits
correct_option: c) Both AC and DC circuits

Question211: START
What is the maximum power that can be transferred to R in the circuit shown below?
Question211: END

Option_a: 2 W
Option_b: 4 W
Option_c: 8 W
Option_d: 16 W
correct_option: 8 W

Question212: START
When the load resistance equal to source resistance, which of the following is maximum
Question212: END

Option_a: Voltage
Option_b: Current
Option_c: Power
Option_d: Power factor
correct_option: Power

Question213: START
Which of the following transformer, Buchholz's relay can be fixed on?
Question213: END

Option_a: Welding transformers
Option_b: Oil cooled transformers
Option_c: Auto-transformers
Option_d: Air-cooled transformers
correct_option: Oil cooled transformers

Question214: START
An ideal transformer will have maximum efficiency at a load such that _______
Question214: END

Option_a: copper loss > iron loss
Option_b: cannot be determined
Option_c: copper loss = iron loss
Option_d: copper loss < iron loss
correct_option: copper loss = iron loss

Question215: START

For a transformer with primary turns 400, secondary turns 100, if 20A current is flowing through primary, we will get ___________
Question215: END

Option_a: 800A at secondary
Option_b: 40A at secondary
Option_c: 80A at secondary
Option_d: 5A at secondary
correct_option: 80A at secondary

Question216: START
The full-load copper loss of a transformer is 1600 W. At half-load, the copper loss will be _______
Question216: END

Option_a: 1600 W
Option_b: 6400 W
Option_c: 400 W
Option_d: 800 W
correct_option: 400 W

Question217: START
Power transformers other than distribution transformers are generally designed to have maximum efficiency around ______
Question217: END

Option_a: 10% overload
Option_b: Near full-load
Option_c: Half-load
Option_d: No-load
correct_option: Near full-load

Question218: START
No-load current in the transformer is _______
Question218: END

Option_a: Sinusoidal distorted
Option_b: Sinusoidal
Option_c: Steps
Option_d: Straight DC
correct_option: Sinusoidal distorted

Question219: START
For a 20kVA transformer with a turn ratio of 0.4 what amount of total power is transferred inductively?
Question219: END

Option_a: 10kVA
Option_b: 8kVA
Option_c: 50kVA
Option_d: 12kVA
correct_option: 12kVA

Question220: START
Which of the following is the major requirement for the transformers used for electronic purposes?

Question220: END

Option_a: Constant amplitude voltage gain
Option_b: Perfect DC isolation, maximum efficiency and constant voltage gain
Option_c: Perfect DC isolation
Option_d: Maximum efficiency
correct_option: Constant amplitude voltage gain

Question221: START
Which type of motor is typically used in electric vehicles for its high torque capabilities?
Question221: END

Option_a: Induction Motor
Option_b: Synchronous Motor
Option_c: Stepper Motor
Option_d: DC Shunt Motor
correct_option: Induction Motor

Question222: START
The primary purpose of using a voltage stabilizer in an electrical system is to:
Question222: END

Option_a: Increase power factor
Option_b: Reduce energy consumption
Option_c: Maintain constant voltage output
Option_d: Protect against short circuits
correct_option: Maintain constant voltage output

Question223: START
What is the typical power factor range for industrial loads?
Question223: END

Option_a: 0.2 to 0.5
Option_b: 0.5 to 0.7
Option_c: 0.7 to 0.9
Option_d: 0.9 to 1.0
correct_option: 0.7 to 0.9

Question224: START
In a three-phase power system, the type of connection that allows for reduced conductor material is:
Question224: END

Option_a: Delta connection
Option_b: Star connection
Option_c: Series connection
Option_d: Parallel connection
correct_option: Star connection

Question225: START
The insulation resistance of a good electrical cable should be:
Question225: END

Option_a: High
Option_b: Low
Option_c: Zero

Option_d: Variable
correct_option: High

Question226: START
The synchronous speed of a 4-pole motor operating on a 50 Hz supply is:
Question226: END

Option_a: 750 RPM
Option_b: 1500 RPM
Option_c: 3000 RPM
Option_d: 3600 RPM
correct_option: 1500 RPM

Question227: START
A rheostat is used in an electrical circuit to:
Question227: END

Option_a: Increase current
Option_b: Decrease voltage
Option_c: Control resistance
Option_d: Store charge
correct_option: Control resistance

Question228: START
The primary function of a transformer is to:
Question228: END

Option_a: Convert AC to DC
Option_b: Step up or step down voltage
Option_c: Store electrical energy
Option_d: Regulate current flow
correct_option: Step up or step down voltage

Question229: START
Which material is commonly used for the core of a transformer?
Question229: END

Option_a: Aluminum
Option_b: Copper
Option_c: Silicon steel
Option_d: Plastic
correct_option: Silicon steel

Question230: START
A power factor of 1 indicates that the load is:
Question230: END

Option_a: Purely resistive
Option_b: Purely inductive
Option_c: Purely capacitive
Option_d: Non-linear
correct_option: Purely resistive

Question 231: START

The Routh-Hurwitz criterion cannot be applied when the characteristic equation of the system contains any coefficients which is :
Question 231: END

Option_a: Negative real and exponential function
Option_b: Negative real, both exponential and sinusoidal function of s
Option_c: Both exponential and sinusoidal function of s
Option_d: Complex, both exponential and sinusoidal function of s
correct_option: Negative real, both exponential and sinusoidal function of s

Question 232: START
The given characteristic equation $s^4+s^3+2s^2+2s+3=0$ has:
Question 232: END

Option_a: Zero root in the s-plane
Option_b: One root in the RHS of s-plane
Option_c: Two root in the RHS of s-plane
Option_d: Three root in the RHS of s-plane
correct_option: Two root in the RHS of s-plane

Question 233: START
The wattmeter reading while measuring the reactive power with wattmeter is?
Question 233: END

Option_a: $V_L I_L \sec Ø$
Option_b: $V_L I_L \sin Ø$
Option_c: $V_L I_L \tan Ø$
Option_d: $V_L I_L \cos Ø$
correct_option: - $V_L I_L \sin Ø$

Question 234: START
The total reactive power in the load while measuring the reactive power with wattmeter is? Question 234: END

Option_a: $\sqrt{3} V_L I_L \cos Ø$
Option_b: $\sqrt{3} V_L I_L \tan Ø$
Option_c: $\sqrt{3} V_L I_L \sin Ø$
Option_d: $\sqrt{3}\ V_L I_L \sec Ø$

correct_option: $\sqrt{3} V_L I_L \sin Ø$

Question 235: START
In which of the following motor, ratio of starting torque to full-load torque will be least?
Question 235: END

Option_a: DC series motors
Option_b: DC shunt motors
Option_c: DC compound motors
Option_d: Synchronous motors
correct_option: DC shunt motors

Question 236: START
Which of the following is a function of electric drive?
Question 236: END

Option_a: Transport energy from the storage system to the wheels
Option_b: Transport energy from the control system to the wheels
Option_c: Transport fuel from the electric motor to the wheels
Option_d: Transport fuel from the storage system to the wheels
correct_option: Transport energy from the storage system to the wheels

Question 237: START
In the rotor voltage injection method, when an external voltage source is in phase with the main voltage then speed will
Question 237: END

Option_a: Decrease
Option_b: First increases then decrease
Option_c: Increase
Option_d: Remain unchanged
correct_option: Increase

Question 238: START
Which of the following motor is a 1-Φ AC motor?
Question 238: END

Option_a: Shunt motor
Option_b: Capacitor run
Option_c: Series motor
Option_d: Synchronous motor
correct_option: Capacitor run

Question 239: START
The wattmeter method is used to measure power in a three-phase load. The wattmeter readings are 400W and -35W. Calculate the total active power.
Question 239: END

Option_a: 360
Option_b: 365
Option_c: 370
Option_d: 375
correct_option: 365

Question 240: START
What is the unit of the apparent or complex power?
Question 240: END

Option_a: VA
Option_b: ohm
Option_c: Volt
Option_d: VAR
correct_option: VA

Question241: START
Analyze the purpose of a low pass filter in an audio system. In what scenarios would it be most effectively applied?
Question241: END

Option_a: To allow high frequencies for bass enhancement
Option_b: To pass only low frequencies, filtering out noise
Option_c: To block interference in low-frequency bands

Option_d: To pass all frequencies uniformly
correct_option: To pass only low frequencies, filtering out noise

Question242: START
Identify the application that would benefit from a high pass filter. Why is this choice significant?
Question242: END

Option_a: To improve the bass response in a subwoofer
Option_b: To allow only high frequencies in tweeters
Option_c: Band Pass Filter targeting the desired biomedical signal frequencies only
Option_d: To enhance the entire frequency range in speakers
correct_option: To allow only high frequencies in tweeters

Question243: START
If you need to allow a specific range of frequencies to pass through a system while attenuating others, which filter would you use and why?
Question243: END

Option_a: Low pass filter for reducing high frequencies
Option_b: High pass filter for reducing low frequencies
Option_c: Band pass filter to isolate a frequency range
Option_d: Band reject filter for suppressing a range
correct_option: Band pass filter to isolate a frequency range

Question244: START
Evaluate a band reject filter's role in eliminating specific interference signals. In what type of signal processing is this useful?
Question244: END
Option_a: Low pass filter for audio signal noise
Option_b: High pass filter for eliminating low-frequency hums
Option_c: Notch filter to remove 60 Hz electrical noise
Option_d: Band pass filter for passing only desired signals
correct_option: Notch filter to remove 60 Hz electrical noise

Question245: START
Compare the frequency response characteristics of band pass and band reject filters. What insights can be drawn from their operational differences?
Question245: END

Option_a: Band pass filter passes all frequencies
Option_b: Band reject filter passes frequencies within a certain range
Option_c: Band pass filter blocks all frequencies
Option_d: Band pass passes within a range; band reject blocks a range
correct_option: Band pass passes within a range; band reject blocks a range

Question246: START
Explain the significance of the cutoff frequency in a filter design. How does this affect the filter's performance?
Question246: END

Option_a: It defines where 90% power is transmitted
Option_b: It is where the output falls to 70.7% of input power
Option_c: It has no significant effect on performance
Option_d: It causes full power output at all frequencies
correct_option: It is where the output falls to 70.7% of input power

Question247: START
If a system requires the elimination of high-frequency noise, which type of filter would you analyze and choose?
Question247: END

Option_a: High pass filter to block low-frequency signals
Option_b: Band pass filter to block a wide range
Option_c: Low pass filter to eliminate high-frequency noise
Option_d: Band reject filter to eliminate specific noise frequencies
correct_option: Low pass filter to eliminate high-frequency noise

Question248: START
Examine why an operational amplifier is essential in an active filter circuit. What role does it play in signal processing?
Question248: END

Option_a: Provides resistance
Option_b: Supplies capacitance for frequency adjustment
Option_c: Adds gain and stability to filter performance
Option_d: Reduces the signal power
correct_option: Adds gain and stability to filter performance

Question249: START
Analyze the relationship between the highest and lowest cutoff frequencies in a band pass filter. How would this define the filter's bandwidth?
Question249: END

Option_a: The sum of the frequencies
Option_b: The difference between the frequencies
Option_c: The product of the frequencies
Option_d: Double the highest frequency
correct_option: The difference between the frequencies

Question250: START
Consider a scenario where frequencies within a narrow range need to be blocked while all others are allowed. Which filter would you choose and why?
Question250: END

Option_a: Low pass filter for only low-frequency signals
Option_b: High pass filter for only high-frequency signals
Option_c: Band pass filter to allow a specific range
Option_d: Band reject filter to block a specific frequency range
correct_option: Band reject filter to block a specific frequency range

Question251: START
Norton's theorem states that any two-terminal linear network can be replaced by:
Question251: END

Option_a: A voltage source in series with a resistor
Option_b: A current source in parallel with a resistor
Option_c: A current source in series with a resistor

Option_d: A voltage source in parallel with a resistor
correct_option: A current source in parallel with a resistor

Question252: START
In Norton's theorem, the equivalent current source is called:
Question252: END

Option_a: Thevenin resistance
Option_b: Norton resistance
Option_c: Norton current
Option_d: Short-circuit current
correct_option: Short-circuit current

Question253: START
To find the Norton resistance of a network, we:
Question253: END

Option_a: Open-circuit the load
Option_b: Short-circuit the load
Option_c: Remove all independent sources
Option_d: Replace independent sources with their internal resistances
correct_option: Replace independent sources with their internal resistances

Question254: START
The relationship between Norton's and Thevenin's equivalent circuits is:
Question254: END

Option_a: They are completely unrelated
Option_b: They are inversely proportional
Option_c: They are duals of each other
Option_d: They are exactly the same
correct_option: They are duals of each other

Question255: START
What is the unit of the Norton current?
Question255: END

Option_a: Ohm
Option_b: Ampere
Option_c: Volt
Option_d: Siemens
correct_option: Ampere

Question256: START
What is the unit of the Norton current?
Question256: END

Option_a: Ohm
Option_b: Ampere
Option_c: Volt
Option_d: Siemens
correct_option: Ampere

Question257: START
Norton’s Theorem is used for

Question257: END

Option_a: Finding equivalent voltage
Option_b: Simplifying a circuit for analysis
Option_c: Calculating complex impedance
Option_d: Reducing power consumption
correct_option: Simplifying a circuit for analysis

Question258: START
Norton’s Theorem is valid for which type of circuits?
Question258: END

Option_a: Nonlinear circuits
Option_b: Linear and bilateral circuits
Option_c: AC circuits only
Option_d: Unilateral circuits
correct_option: Linear and bilateral circuits
Question259: START
What happens to the Norton current if the resistance in the load increases?
Question259: END

Option_a: It increases
Option_b: It decreases
Option_c: It remains constant
Option_d: It depends on the voltage
correct_option: It remains constant

Question260: START
If the load resistance is equal to the Norton resistance, the power transferred to the load is:
Question260: END

Option_a: Maximum
Option_b: Minimum
Option_c: Zero
Option_d: Infinite
correct_option: Maximum

Question261: START
To convert Thevenin's equivalent circuit to Norton's equivalent circuit
Question261: END

Option_a: Replace the voltage source with a current source
Option_b: Replace the resistance with a capacitance
Option_c: Replace the current source with a voltage source
Option_d: Short-circuit the Thevenin resistance
correct_option: Replace the voltage source with a current source

Question262: START
If the load resistance equals the Thevenin resistance, the power delivered to the load is:
Question262: END

Option_a: Maximum
Option_b: Minimum
Option_c: Zero
Option_d: Infinite

correct_option: Maximum

Question263: START
In a Delta (Δ) connection, the loads are connected:
Question263: END

Option_a: In parallel
Option_b: In series
Option_c: End-to-end in a closed loop
Option_d: To a common neutral point
correct_option: End-to-end in a closed loop

Question264: START
What is the advantage of using a Star connection over a Delta connection?
Question264: END

Option_a: Higher current capacity
Option_b: Lower line voltage for the same phase voltage
Option_c: Requires fewer wires for transmission
Option_d: Allows for a neutral point
correct_option: Allows for a neutral point

Question265: START
In which type of connection is a neutral wire typically available?
Question265: END

Option_a: Star connection
Option_b: Delta connection
Option_c: Both Star and Delta connections
Option_d: Neither
correct_option: Star connection

Question266: START
Which connection (Star or Delta) is more commonly used in long-distance power transmission?
Question266: END

Option_a: Star connection
Option_b: Delta connection
Option_c: Both equally
Option_d: Neither
correct_option: Star connection

Question267: START
The Current Division Rule is primarily based on:
Question267: END

Option_a: Kirchhoff's Voltage Law
Option_b: Kirchhoff's Current Law
Option_c: Ohm's Law
Option_d: Conservation of Power
correct_option: Kirchhoff's Current Law

Question268: START
The total resistance of two parallel resistors, R_1 and R_2, is given by:

Question268: END

Option_a: R_1+R_2
Option_b: $R_1 R_2/(R_1+R_2)$
Option_c: $R_1 R_2$
Option_d: $R1^2+R2^2$
correct_option: $R_1 R_2/(R_1+R_2)$

Question269: START
In a series circuit with resistors $R_1=10\Omega$, $R_2=20\Omega$, and a 30V supply, the voltage across R_2 is:
Question269: END

Option_a: 10V
Option_b: 20V
Option_c: 15V
Option_d: 5V
correct_option: 20V

Question270: START
If two parallel resistors $R_1=5\ \Omega$ and $R_2=10\ \Omega$ are connected to a 10A source, the current through R_1 is:
Question270: END

Option_a: 2A
Option_b: 5A
Option_c: 6.67A
Option_d: 10A
correct_option: 6.67A

Question271: START
For resistors R_1 and R_2 in parallel, the resistor with the smaller resistance:
Question271: END

Option_a: Carries more current
Option_b: Carries less current
Option_c: Carries equal current
Option_d: Has no effect on the current
correct_option: Carries more current

Question272: START
The Voltage Division Rule is valid only if:
Question272: END

Option_a: The circuit is a parallel network
Option_b: The resistors have equal values
Option_c: The resistors are connected in series
Option_d: The resistors are connected to a DC source
correct_option: The resistors are connected in series

Question273: START
The Current Division Rule is applicable for:
Question273: END

Option_a: Resistors in series

Option_b: Resistors in parallel
Option_c: Any type of circuit
Option_d: Capacitors in series
correct_option: Resistors in parallel

Question274: START
The Voltage Division Rule is used to calculate:
Question274: END

Option_a: Voltage across series resistors
Option_b: Voltage across parallel resistors
Option_c: Current through series resistors
Option_d: Current through parallel resistors
correct_option: Voltage across series resistors

Question275: START
In a parallel circuit, the total current is:
Question275: END

Option_a: Equal to the smallest branch current.
Option_b: Equal to the largest branch current.
Option_c: The sum of all branch currents
Option_d: Zero.
correct_option: The sum of all branch currents

Question276: START
Ohm’s Law applies to:
Question276: END

Option_a: Nonlinear circuits
Option_b: Only AC circuits
Option_c: Only DC circuits
Option_d: Both AC and DC circuits
correct_option: Both AC and DC circuits

Question277: START
What is the current through a 10Ω resistor when a 5V source is connected across it?
Question277: END

Option_a: 0.5A
Option_b: 2A
Option_c: 5A
Option_d: 10A
correct_option: 0.5A

Question278: START
In a circuit, if 10A flows into a junction and 4A flows out, what is the remaining current outflow?
Question278: END

Option_a: 4A
Option_b: 6A
Option_c: 10A
Option_d: 14A
correct_option: 6 A

Question279: START
Kirchhoff's Voltage Law (KVL) is based on the principle of:
Question279: END

Option_a: Conservation of charge
Option_b: Conservation of energy
Option_c: Conservation of momentum
Option_d: None of the above
correct_option: Conservation of energy

Question280: START
Kirchhoff's Current Law (KCL) states:
Question280: END

Option_a: The total voltage around a closed loop is zero
Option_b: The sum of currents entering a junction equals the sum leaving it.
Option_c: Voltage across a resistor is proportional to the current
Option_d: Power dissipated is proportional to resistance.
correct_option: The sum of currents entering a junction equals the sum leaving it.

Question281: START
A superposition theorem deals with _____ type of supplies connected in an electrical circuit?
Question281: END

Option_a: Independent
Option_b: Dependent
Option_c: Linear
Option_d: Both b and c
correct_option: Independent

Question282: START
Superposition theorem explains about ___ type of network?
Question282: END

Option_a: Linear
Option_b: Non-Linear
Option_c: Zero network
Option_d: Both b and c
correct_option: Linear

Question283: START
Which of the following are included in a superposition based theorem?
Question283: END

Option_a: Linear networks
Option_b: AC, DC circuits
Option_c: Norton
Option_d: All the above
correct_option: All the above

Question284: START

Superposition theorem is applicable for ___ type of analysis?
Question284: END

Option_a: Network
Option_b: Electric
Option_c: Mechanical
Option_d: Both a and b
correct_option: Both a and b

Question285: START
Network based analysis is used to identify ______ parameter?
Question285: END

Option_a: Voltage
Option_b: Current
Option_c: Resistance
Option_d: Both a and b
correct_option: Both a and b

Question286: START
___ is the term that defines a device with 2 or multiple terminals with flow of current?
Question286: END

Option_a: Component
Option_b: Node
Option_c: Mesh
Option_d: Port
correct_option: Component

Question287: START
Which of the following are network theorems?
Question287: END

Option_a: Superposition theorem
Option_b: Thevenins theorem
Option_c: Nortons theorem
Option_d: All the above
correct_option: All the above

Question288: START
In a superposition theorem the sources act ______?
Question288: END

Option_a: Independently
Option_b: Dependently
Option_c: Constantly
Option_d: Both a and b
correct_option: Independently

Question289: START
Which of the following parameter is calculated via superposition theorem?
Question289: END

Option_a: Voltage drop
Option_b: Current drop

Option_c: Potential difference
Option_d: Resistance
correct_option: Voltage drop

Question290: START
Which of the following is the first step of superposition theorem?
Question290: END

Option_a: Connect DC supply
Option_b: Calculate over current flow
Option_c: Connect voltage source
Option_d: Calculate each branch current
correct_option: Connect DC supply

Question291: START
The MPTT states that maximum power is transferred from a source to a load when the __________________?
Question291: END

Option_a: Load resistance is maximum
Option_b: Load resistance is minimum
Option_c: Source resistance is maximum
Option_d: Source resistance is equal to the load resistance
correct_option: Source resistance is equal to the load resistance

Question292: START
According to the Maximum Power Transfer Theorem, the efficiency of power transfer is ___________________?
Question292: END

Option_a: 50%
Option_b: 75%
Option_c: 100%
Option_d: Depends on the circuit configuration
correct_option:

Question293: START
The Maximum Power Transfer Theorem is applicable for _____________________?
Question293: END

Option_a: DC circuits
Option_b: AC circuits
Option_c: Both DC and AC
Option_d: Neither DC nor AC
correct_option: Both DC and AC

Question294: START
According to the Maximum Power Transfer Theorem, the maximum power transferred to the load is given by ____________________?
Question294: END

Option_a: P = V^2/R
Option_b: P = I^2*R
Option_c: P = V*I
Option_d: P = R/(V*I)
correct_option: = I^2*R

Question295: START
The Maximum Power Transfer Theorem is based on the concept of _________________?
Question295: END

Option_a: Ohm’s Law
Option_b: Kirchhoff’s Laws
Option_c: Thevenin’s Theorem
Option_d: Superposition Principle
correct_option: Thevenin’s Theorem

Question296: START
Transformer works on ______ principle.
Question296: END

Option_a: Gauss’s law
Option_b: Fleming’s right-hand rule
Option_c: Faraday’s law of electromagnetic induction
Option_d: Fleming’s left-hand rule
correct_option: Faraday’s law of electromagnetic induction

Question297: START
A step-up transformer has _____ number of turns on primary winding and _____ number of turns on secondary winding.
Question297: END

Option_a: Less, More
Option_b: More, More
Option_c: More, Less
Option_d: Less, Less
correct_option: Less, More

Question298: START
A step-down transformer has _____ number of turns on primary winding and _____ number of turns on secondary winding
Question298: END

Option_a: Less, More
Option_b: More, More
Option_c: More, Less
Option_d: Less, Less
correct_option: More, Less

Question299: START
A transformer is a _____ device.
Question299: END

Option_a: Static
Option_b: Dynamic
Option_c: Static and Dynamic
Option_d: None of the above
correct_option: Static

Question300: START
In a transformer the relation between the input frequency and the output voltage on secondary winding is _____.
Question300: END

Option_a: Same
Option_b: increases
Option_c: decreases
Option_d: Increases and decreases with time
correct_option: Same

Question301: START
Copper losses in a transformer are measured using _____.
Question301: END

Option_a: Closed circuit
Option_b: Open circuit
Option_c: Both a & b
Option_d: None of the above
correct_option: Open circuit

Question302: START
What is the functionality of a breather in a transformer?
Question302: END

Option_a: It absorbs the moisture of air during breathing
Option_b: Passes cold air to the transformer
Option_c: It is the transformer oil filter
Option_d: Both a & b
correct_option: It absorbs the moisture of air during breathing

Question303: START
What is basic functionality of a transformer?
Question303: END

Option_a: Voltage to current converter
Option_b: Current to voltage converter
Option_c: Frequency converter
Option_d: None of the above
correct_option:

Question304: START
The core of a transformer is laminated for _____ reason
Question304: END

Option_a: Minimize hysteresis loss
Option_b: Minimize eddy & hysteresis current loss
Option_c: Lowers eddy current loss
Option_d: Copper loss
correct_option: Lowers eddy current loss

Question305: START
What is the need of performing a short circuit test in a transformer?
Question305: END

Option_a: To find copper loss
Option_b: To find core loss
Option_c: To find insulation resistance
Option_d: To find complete loss

correct_option: To find copper loss

Question306: START
Which losses in a transformer is zero at full load?
Question306: END

Option_a: Core loss
Option_b: Eddy current loss
Option_c: Copper loss
Option_d: Friction loss
correct_option: Eddy current loss

Question307: START
The current rating of a transformer is expressed as_____.
Question307: END

Option_a: Kilowatts
Option_b: KVAR
Option_c: Kilo-volt-ampere
Option_d: Ampere
correct_option: Kilo-volt-ampere

Question308: START
What is the purpose of oil in an oil-filled transformer?
Question308: END

Option_a: Insulate
Option_b: Resistance
Option_c: Cooling
Option_d: Both a & c
correct_option: Both a & c

Question309: START
Which of the following component is not related to the transformer?
Question309: END

Option_a: Breather
Option_b: Conservator
Option_c: Buchholz relay
Option_d: Exciter
correct_option: Exciter

Question310: START
Which component of the transformer causes noise?
Question310: END

Option_a: Vibration due to mechanical motion
Option_b: Fan that is used for cooling purpose
Option_c: Iron core which contains magnetostriction
Option_d: All the above
correct_option: Iron core which contains magnetostriction

Question311: START
What is the main objective of conducting a load test on a single-phase induction motor?
Question311: END

Option_a: To determine the starting current
Option_b: To evaluate performance under load conditions
Option_c: To test insulation resistance
Option_d: To measure winding resistance
correct_option: To evaluate performance under load conditions

Question312: START
During a load test on a single-phase induction motor, what does voltage regulation measure?
Question312: END

Option_a: Speed variation under load
Option_b: Voltage drop from no load to full load
Option_c: Power consumption
Option_d: Efficiency under load
correct_option: Voltage drop from no load to full load

Question313: START
Which parameter indicates the efficiency of a single-phase induction motor during a load test?
Question313: END

Option_a: Torque
Option_b: Current
Option_c: Power factor
Option_d: Power output-to-input ratio
correct_option: Power output-to-input ratio

Question314: START
What does LVDT stand for?
Question314: END

Option_a: Linear Variable Differential Transformer
Option_b: Load Voltage Differential Transformer
Option_c: Low Voltage Direct Transformer
Option_d: Line Voltage Dual Transformer
correct_option: Linear Variable Differential Transformer

Question315: START
What is the principle of operation of an LVDT?
Question315: END

Option_a: Resistance change
Option_b: Capacitance change
Option_c: Inductance change
Option_d: Magnetic flux change
correct_option: Inductance change

Question316: START
In an LVDT, which component moves to produce a variable output?
Question316: END

Option_a: Primary coil
Option_b: Secondary coil
Option_c: Magnetic core
Option_d: Calibration knob
correct_option: Magnetic core

Question317: START
The two-wattmeter method is used to measure power in which type of system?
Question317: END

Option_a: Single-phase AC
Option_b: Three-phase AC
Option_c: DC
Option_d: Mixed-phase system
correct_option: Three-phase AC

Question318: START
When does one wattmeter show zero reading in a two-wattmeter method?
Question318: END

Option_a: Power factor is 1
Option_b: Power factor is 0
Option_c: Power factor is 0.5
Option_d: Power factor is 0.866
correct_option: Power factor is 0

Question319: START
In the two-wattmeter method, the total power is calculated as:
Question319: END

Option_a: W1 × W2
Option_b: W1 + W2
Option_c: (W1 - W2)/2
Option_d: (W1 + W2)/2
correct_option: W1 + W2

Question320: START
What does an energy meter measure in an electrical circuit?
Question320: END

Option_a: Instantaneous power
Option_b: Total energy consumed
Option_c: Voltage levels
Option_d: Current flow
correct_option: Total energy consumed

Question321: START
What is the unit of measurement for energy in an energy meter?
Question321: END

Option_a: Watts
Option_b: Ampere-hours
Option_c: Watt-hours
Option_d: Joules
correct_option: Watt-hours

Question322: START
Which type of energy meter is commonly used for residential purposes?
Question322: END

Option_a: Induction type
Option_b: Digital type
Option_c: Electronic type
Option_d: All of the above
correct_option: All of the above

Question323: START
Which component of the induction motor is responsible for inducing EMF in the rotor during operation?
Question323: END

Option_a: Stator
Option_b: Rotor windings
Option_c: Slip rings
Option_d: Commutator
correct_option: Stator

Question324: START
What happens to the efficiency of a single-phase induction motor as the load increases?
Question324: END

Option_a: Efficiency decreases
Option_b: Efficiency increases
Option_c: Efficiency remains constant
Option_d: Efficiency fluctuates randomly
correct_option: Efficiency increases

Question325: START
What is the typical power factor range of a single-phase induction motor under full load?
Question325: END

Option_a: 0.1 to 0.3
Option_b: 0.4 to 0.6
Option_c: 0.7 to 0.9
Option_d: 1.0
correct_option: 0.7 to 0.9

Question326: START
What is the primary advantage of using an LVDT in measurement systems?
Question326: END

Option_a: High accuracy and reliability
Option_b: Easy to manufacture
Option_c: High cost-effectiveness
Option_d: Limited range of operation
correct_option: High accuracy and reliability

Question327: START
What kind of output does an LVDT produce?
Question327: END

Option_a: Digital output
Option_b: AC voltage proportional to displacement
Option_c: DC voltage proportional to displacement
Option_d: Pulsed signal
correct_option: AC voltage proportional to displacement

Question328: START
What is the role of the null position in an LVDT?
Question328: END

Option_a: Maximum output voltage
Option_b: Minimum displacement
Option_c: Zero output voltage
Option_d: Calibration reference point
correct_option: Zero output voltage

Question329: START
In the two wattmeter method, when the power factor is 0.5, what is the ratio of the two wattmeter readings?
Question329: END

Option_a: Equal readings
Option_b: Opposite and equal magnitudes
Option_c: One is double the other
Option_d: One is zero, and the other is maximum
correct_option: Opposite and equal magnitudes

Question330: START
If both wattmeters show positive readings in a two-wattmeter method, what can be concluded about the power factor?
Question330: END

Option_a: Power factor is less than 0.5
Option_b: Power factor is greater than 0.5
Option_c: Power factor is zero

Option_d: Power factor is negative
correct_option: Power factor is greater than 0.5

Question331: START
Which phase sequence is assumed when using the two wattmeter method?
Question331: END

Option_a: ABC
Option_b: BAC
Option_c: Random
Option_d: No assumption
correct_option: ABC

Question332: START
Which of the following can cause errors in energy meter readings?
Question332: END

Option_a: Temperature variations
Option_b: Harmonics in the supply
Option_c: Magnetic interference
Option_d: All of the above
correct_option: All of the above

Question333: START
What is the typical accuracy class of an energy meter used for commercial purposes?
Question333: END

Option_a: 0.1%
Option_b: 1%
Option_c: 5%
Option_d: 10%
correct_option: 1%

Question334: START
Which type of energy meter is preferred for measuring reactive power?
Question334: END

Option_a: Electromechanical meter
Option_b: Induction-type watt-hour meter
Option_c: Digital energy meter
Option_d: None of the above
correct_option: Digital energy meter

Question335: START
Why is an induction motor called a self-starting motor?
Question335: END

Option_a: It does not require external starting mechanisms
Option_b: It has high starting torque
Option_c: It uses capacitor starting

Option_d: It requires a rotor winding
correct_option: It does not require external starting mechanisms

Question336: START
What is the function of slip in an induction motor?
Question336: END

Option_a: Synchronize rotor and stator speeds
Option_b: Allow the rotor to lag behind the synchronous speed
Option_c: Increase power factor
Option_d: Reduce heat generation
correct_option: Allow the rotor to lag behind the synchronous speed

Question337: START
What is the function of damping torque in an energy meter?
Question337: END

Option_a: To measure power factor
Option_b: To reduce vibrations and stabilize the pointer
Option_c: To increase sensitivity
Option_d: To reduce measurement time
correct_option: To reduce vibrations and stabilize the pointer

Question338: START
How is overloading prevented in a wattmeter?
Question338: END

Option_a: By using a fuse
Option_b: By limiting the current range
Option_c: By installing a circuit breaker
Option_d: By calibrating the wattmeter
correct_option: By limiting the current range
Question339: START
What is the major limitation of an analog energy meter?
Question339: END

Option_a: Low accuracy
Option_b: Cannot measure AC power
Option_c: Cannot measure reactive power
Option_d: Susceptible to temperature changes
correct_option: Low accuracy

Question340: START
Which of the following factors affects the calibration of an LVDT?
Question340: END

Option_a: Temperature
Option_b: Core material
Option_c: Frequency of excitation

Option_d: All of the above
correct_option: All of the above

Question 341: START
Consider the following statements:
Routh-Hurwitz criterion gives:
1. Absolute stability
2. The number of roots lying on the right half of the s-plane
3. The gain margin and the phase margin
Question 341: END

Option_a: 1,2 and3
Option_b: 1 and 2
Option_c: 2 and 3
Option_d: 1 and 3
correct_option: 1 and 2

Question 242: START
Which of the following techniques is utilized to determine at the actual point at which the root locus crosses the imaginary axis?
Question 242: END

Option_a: Nyquist technique
Option_b: Routh-Hurwitz technique
Option_c: Nichol's technique
Option_d: Bode technique
correct_option: Routh-Hurwitz technique

Question 343: START
Due to which of the following reasons excessive band width in control systems should be avoided?
Question 343: END

Option_a: It leads to slow speed of response
Option_b: It leads to low relative stability
Option_c: Noise is proportional to bandwidth
Option_d: Presence of feedback
correct_option: - Noise is proportional to bandwidth

Question 344: START
The use of feedback element in the feedback loop is:
Question 344: END

Option_a: It converts the output variable 'c' to another suitable feedback variable 'b' to compare with the input command signal.
Option_b: It is the actuating element
Option_c: To increase the stability
Option_d: None of the mentioned
correct_option: It converts the output variable 'c' to another suitable feedback variable 'b' to compare with the input command signal

Question 345: START
Stability of a system implies that:
Question 345: END

Option_a: Small changes in the system input does not result in large change in system output
Option_b: Small changes in the system parameters does not result in large change in system output
Option_c: Small changes in the initial conditions does not result in large change in system output
Option_d: All of the above mentioned
correct_option: All of the above mentioned

Question 346: START
The necessary condition of stability are:
Question 346: END

Option_a: Coefficient of characteristic equation must be real and have the same sign
Option_b: Coefficient of characteristic equation must be non-zero
Option_c: Both of the mentioned
Option_d: Coefficient of characteristic equation must be zero
correct_option: Both of the mentioned

Question 347: START
The Positiveness of the coefficients of characteristic equation is necessary as well as sufficient condition for
Question 347: END

Option_a: First order system
Option_b: Second order system
Option_c: Third order system
Option_d: None of the mentioned
correct_option: Third order system

Question 348: START
The slope of the V-I curve is 78°. Calculate the value of resistance. Assume the relationship between voltage and current is a straight line.
Question 348: END

Option_a: 4.732 Ω
Option_b: 4.608 Ω
Option_c: 4.543 Ω
Option_d: 4.648 Ω
correct_option: 4.732 Ω

Question 349: START
In a DC shunt motor, speed is related to armature current as
Question 349: END

Option_a: Directly proportional to the armature current
Option_b: Proportional to the square of the current
Option_c: Independent of armature current
Option_d: Inversely proportional to the armature current
correct_option: Inversely proportional to the armature current

Question 350: START
What will be the effect of opening of field of a DC shunt motor while motor is running?
Question 350: END

Option_a: The speed of motor will be reduced
Option_b: The armature current will reduce

Option_c: The motor will attain dangerously high speed
Option_d: The motor will continue to constant speed
correct_option: The motor will attain dangerously high speed

Question 351: START
What will be the effect of reducing load on DC shunt motor?
Question 351: END

Option_a: Speed will increase abruptly
Option_b: Speed will increase in proportion to reduction in load
Option_c: Speed will remain almost constant
Option_d: Speed will reduce
correct_option: - Speed will remain almost constant

Question 352: START
. Practical reason behind speed of DC shunt motor is proportional to back emf only is Question 352: END

Option_a: Back emf is equal to armature drop
Option_b: Flux is proportional to field current
Option_c: Flux is proportional to armature current
Option_d: Flux is practically constant in DC shunt motors

correct_option: Flux is practically constant in DC shunt motors

Question 353: START
The armature torque of the DC shunt motor is proportional to
Question 353: END

Option_a: Field flux only
Option_b: Armature current only
Option_c: Field flux and armature current
Option_d: Field current
correct_option: Armature current only

Question 354: START
If a DC shunt motor is working at full load and if shunt field circuit suddenly opens
Question 354: END

Option_a: Will make armature to take heavy current, possibly burning it
Option_b: Will result in excessive speed, possibly destroying armature due to excessive centrifugal stresses
Option_c: Nothing will happen to motor
Option_d: Motor will come to stop
correct_option: Will make armature to take heavy current, possibly burning it

Question 355: START
Speed torque characteristic of DC shunt motor is
Question 355: END

Option_a: Starting from origin
Option_b: Starting from speed axis and increasing
Option_c: Starting from speed axis and decreasing
Option_d: Starting from speed axis and constant
correct_option: Starting from speed axis and decreasing

Question 356: START
In A.C. circuits, power consumed is
Question 356: END

Option_a: product of voltage and current
Option_b: it depends on the p.f. of the circuit in addition to voltage and current
Option_c: it depends on the supply voltage
Option_d: it depends on the magnitude of the circuit current
correct_option: it depends on the p.f. of the circuit in addition to voltage and current

Question 357: START
In a Dynamometer type wattmeter, the fixed coil is split into
Question 357: END

Option_a: 4
Option_b: 3
Option_c: 2
Option_d: 1
correct_option: 2

Question 358: START
When a current carrying coil is placed in the magnetic field?
Question 358: END

Option_a: no force is exerted
Option_b: voltage is produced
Option_c: power is generated
Option_d: a force is exerted
correct_option: a force is exerted

Question 359: START
When the moving coil in a Dynamometer type wattmeter deflects
Question 359: END
Option_a: pointer moves
Option_b: pointer doesn’t move
Option_c: current flows
Option_d: voltage is generated
correct_option: pointer moves

Question 360: START
Which type of battery is commonly used in modern electric vehicles due to its high energy density and efficiency?
Question 360: END

Option_a: Nickel-Cadmium (NiCd)
Option_b: Lead-Acid
Option_c: Lithium-Ion (Li-ion)
Option_d: Alkaline
correct_option: Lithium-Ion (Li-ion)

Question 361: START
Which type of electric vehicle has both an electric motor and an internal combustion engine?
Question 361: END

Option_a: Battery Electric Vehicle (BEV)
Option_b: Hybrid Electric Vehicle (HEV)
Option_c: Plug-in Hybrid Electric Vehicle (PHEV)
Option_d: Fuel Cell Electric Vehicle (FCEV)
correct_option: - Plug-in Hybrid Electric Vehicle (PHEV)

Question 362: START
What is the term used for the energy efficiency of an electric vehicle, measured in miles (or kilometers) driven per unit of energy consumed (e.g., miles per kilowatt-hour)?
Question 362: END

Option_a: Energy density
Option_b: Energy efficiency
Option_c: Range anxiety
Option_d: Electric vehicle efficiency

correct_option: √ Electric vehicle efficiency

Question 363: START
The aluminous if you CNC office sodium vapour lamp is ....lumens per watt
Question 363: END

Option_a: 40 to 50
Option_b: 50 to 100
Option_c: 10 to 12
Option_d: 100 to 150
correct_option: 40 to 50

Question 364: START
In filament lamps coiled coil filaments are used in
Question 364: END

Option_a:. Coloured lamps
Option_b: Low wattage lamps
Option_c: Gas field lamps
Option_d: Higher wattage lamps
correct_option: Gas field lamps

Question 365: START
Filament lamps normally operate at a power factor of
Question 365: END

Option_a: Unity
Option_b: 0.8 lagging
Option_c: 0.5 lagging
Option_d: 0.9 lagging
correct_option: Unity

Question 366: START
In a series RLC circuit, the phase difference between the current in the capacitor and the current in the resistor is?
Question 366: END

Option_a: 0^0
Option_b: 90^0

Option_c: 180^0
Option_d: 360^0
correct_option: 0^0

Question 367: START
In a series RLC circuit, the phase difference between the current in the circuit and the voltage across the capacitor is?
Question 367: END

Option_a: 0^0
Option_b: 90^0
Option_c: 180^0
Option_d: 360^0
correct_option: 90^0

Question 368: START
_________ the resonant frequency, the current in the capacitor leads the voltage in a series RLC circuit.
Question 368: END

Option_a: Above
Option_b: Below
Option_c: Equal to
Option_d: Depends on the circuit
correct_option: Below

Question 369: START
A current of 2A flows in a wire offering a resistance of 10ohm. Calculate the energy dissipated by the wire in 0.5 hours.
Question 369: END

Option_a: 72Wh
Option_b: 72kJ
Option_c: 7200J
Option_d: 72kJh
correct_option: 72kJ

Question 370: START
The current in the inductor ___________ the voltage in a series RLC circuit above the resonant frequency.
Question 370: END

Option_a: Leads
Option_b: Lags
Option_c: Equal to
Option_d: Depends on the circuit
correct_option: Lags
Question371: START
Ramp signal is primarily used to test:
Question371: END

Option_a: Steady-state response
Option_b: Stability
Option_c: Transient response
Option_d: All of the above

correct_option: Steady-state response

Question372: START
High pass filters are commonly used in:
Question372: END

Option_a: Tweeters to allow high frequencies
Option_b: Subwoofers to boost bass
Option_c: Band-reject filters
Option_d: Time-domain analysis
correct_option: Tweeters to allow high frequencies

Question373: START
A high pass filter is used in audio systems to:
Question373: END

Option_a: Suppress low-frequency interference
Option_b: Enhance bass frequencies
Option_c: Eliminate high frequencies
Option_d: Pass all signals
correct_option: Suppress low-frequency interference

Question374: START
Low pass filters are typically applied in:
Question374: END

Option_a: Audio bass enhancement
Option_b: High-frequency signal analysis
Option_c: Frequency band isolation
Option_d: Noise suppression
correct_option: Noise suppression

Question375: START
A low pass filter is used in anti-aliasing to:
Question375: END

Option_a: Allow low frequencies while blocking high frequencies
Option_b: Block low frequencies while passing high frequencies
Option_c: Pass all frequencies
Option_d: Mirror frequencies
correct_option: Allow low frequencies while blocking high frequencies

Question376: START
Impulse Invariant Transformation is less suitable for:
Question376: END

Option_a: High-pass filters
Option_b: Low-pass filters
Option_c: Band-pass filters

Option_d: Systems with high-frequency content
correct_option: Systems with high-frequency content

Question377: START
In Impulse Invariant Transformation, high sampling frequency is necessary to:
Question377: END

Option_a: Avoid aliasing
Option_b: Preserve impulse response
Option_c: Simplify computation
Option_d: Reduce filter order
correct_option: Avoid aliasing

Question378: START
Which of the following characteristics is preserved in Impulse Invariant Transformation?
Question378: END

Option_a: Frequency response
Option_b: Impulse response timing
Option_c: Phase response
Option_d: Stability of the system
correct_option: Impulse response timing

Question379: START
Pre-warping is applied in Bilinear Transformation to:
Question379: END

Option_a: Avoid aliasing
Option_b: Improve time-domain response
Option_c: Match analog and digital frequencies
Option_d: Reduce computational complexity
correct_option: Match analog and digital frequencies

Question380: START
A major drawback of Bilinear Transformation is:
Question380: END

Option_a: Aliasing
Option_b: Time-domain mismatch
Option_c: Frequency warping
Option_d: Non-causal response
correct_option: Frequency warping

Question381: START
Frequency warping in the Bilinear Transformation affects:
Question381: END

Option_a: Low frequencies
Option_b: High frequencies
Option_c: Entire frequency range equally
Option_d: Does not affect frequency response
correct_option: High frequencies

Question382: START
The primary purpose of the Bilinear Transformation in filter design is:
Question382: END

Option_a: Frequency response preservation
Option_b: Mapping analog frequencies to digital frequencies without aliasing
Option_c: Simplification of filter order
Option_d: Exact time-domain matching
correct_option: Mapping analog frequencies to digital frequencies without aliasing

Question383: START
The butterfly operation in DIF-FFT differs from DIT-FFT in:
Question383: END

Option_a: Order of applying the twiddle factors
Option_b: Number of twiddle factors used
Option_c: Memory complexity
Option_d: Type of arithmetic operations
correct_option: Order of applying the twiddle factors

Question384: START
DIF-FFT is preferred over DIT-FFT when:
Question384: END

Option_a: Input sequence is in natural order
Option_b: Higher memory usage is acceptable
Option_c: Hardware implementation is required
Option_d: Output needs to be in bit-reversed order
correct_option: Input sequence is in natural order

Question385: START
What distinguishes the DIF-FFT from the DIT-FFT?
Question385: END

Option_a: Decimation of the input in DIF-FFT
Option_b: Bit-reversal at output in DIF-FFT
Option_c: Twiddle factor application after butterfly computation in DIF-FFT
Option_d: Use of complex arithmetic in DIF-FFT
correct_option: Bit-reversal at output in DIF-FFT

Question386: START

In the DIF-FFT algorithm, the primary operation at each stage is:
Question386: END
Option_a: Bit-reversal of the input
Option_b: Decimation in the output sequence
Option_c: Multiplication with the Fourier coefficients
Option_d: Addition of twiddle factors
correct_option: Decimation in the output sequence

Question387: START
DIT-FFT is typically used when:
Question387: END

Option_a: Input sequence is in bit-reversed order
Option_b: Output sequence is in natural order
Option_c: Complex arithmetic is minimal
Option_d: Twiddle factors are precomputed
correct_option: Input sequence is in bit-reversed order

Question388: START
What operation is central to each stage of the DIT-FFT?
Question388: END

Option_a: Addition of twiddle factors
Option_b: Multiplication of twiddle factors
Option_c: Butterfly computations
Option_d: Sorting of coefficients
correct_option: Butterfly computations

Question389: START
Op In the DIT-FFT algorithm, how is the input sequence processed?
Question389: END

Option_a: Decimation in the output sequence
Option_b: Decimation in the input sequence
Option_c: Both input and output decimated
Option_d: None of the above
correct_option: Decimation in the input sequence

Question390: START
The integral of the unit impulse signal δ(t) over all time is:
Question390: END

Option_a: 0
Option_b: 1
Option_c: Infinity
Option_d: Undefined

correct_option: 1

Question391: START
A band reject filter is also known as a:
Question391: END

Option_a: Low pass filter
Option_b: High pass filter
Option_c: Band stop filter
Option_d: Band pass filter
correct_option: Band stop filter

Question392: START
Band reject filters are primarily used to:
Question392: END

Option_a: Pass all frequencies within a specific range
Option_b: Block frequencies outside a specific range
Option_c: Eliminate a specific narrow frequency range
Option_d: Enhance a specific narrow frequency range
correct_option: Eliminate a specific narrow frequency range

Question393: START
A typical application of a band reject filter is:
Question393: END

Option_a: Suppressing 60 Hz power line interference
Option_b: Enhancing bass in audio systems
Option_c: Filtering all low frequencies in a signal
Option_d: Amplifying high-frequency signals
correct_option: Suppressing 60 Hz power line interference

Question394: START
The key characteristic of a notch filter is:
Question394: END

Option_a: Passing all frequencies uniformly
Option_b: Allowing frequencies outside the stop band
Option_c: Attenuating a very narrow frequency range
Option_d: Amplifying signals within the stop band
correct_option: Attenuating a very narrow frequency range

Question395: START
In wireless communication, a band reject filter is useful for:
Question395: END

Option_a: Isolating specific communication channels
Option_b: Eliminating interference from neighboring frequency bands

Option_c: Enhancing data transmission rates
Option_d: Amplifying high-frequency noise
correct_option: Eliminating interference from neighboring frequency bands

Question396: START
A band pass filter is designed to:
Question396: END

Option_a: Pass frequencies within a specified range and attenuate others
Option_b: Block all frequencies below a certain value
Option_c: Pass low frequencies while blocking high frequencies
Option_d: Block low frequencies while passing high frequencies
correct_option: Pass frequencies within a specified range and attenuate others

Question397: START
Band pass filters are commonly used in:
Question397: END

Option_a: Eliminating specific frequency bands
Option_b: Amplifying high-frequency signals
Option_c: Audio systems to isolate vocal ranges
Option_d: Noise reduction in power supplies
correct_option: Audio systems to isolate vocal ranges

Question398: START
The bandwidth of a band pass filter is determined by:
Question398: END

Option_a: The sum of the cutoff frequencies
Option_b: The difference between the cutoff frequencies
Option_c: The ratio of the cutoff frequencies
Option_d: The product of the cutoff frequencies
correct_option: The difference between the cutoff frequencies

Question399: START
Band pass filters are most effective for:
Question399: END

Option_a: Allowing all frequency components
Option_b: Enhancing signals within a specific range
Option_c: Blocking high-frequency noise
Option_d: General signal amplification
correct_option: Enhancing signals within a specific range

Question400: START
In a band pass filter, the roll-off rate at the cutoff frequencies is determined by:
Question400: END

Option_a: The gain of the filter
Option_b: The order of the filter
Option_c: The bandwidth of the filter
Option_d: The input signal strength
correct_option: The order of the filter

Find the bilinear transformation of the analog filter transfer function H(s) = 1 / (s + 1) to obtain the digital filter transfer function H(z). **a)H(z) = (1 - z^{-1}) / (1 - (1/2)z^{-1})** **b)H(z) = (1 + z^{-1}) / (1 - (1/2)z^{-1})** **c)H(z) = (1 - z^{-1}) / (1 + (1/2)z^{-1})** **d)H(z) = (1 + z^{-1}) / (1 + (1/2)z^{-1})**
A digital filter has a transfer function H(z) = (z + 1) / (z - 1). Find the analog filter transfer function H(s) using the inverse bilinear transformation. **a)H(s) = (s - 1) / (s + 1)** **b)H(s) = (s + 1) / (s + 1)** **c)H(s) = (s + 1) / (s - 1)** **d)H(s) = (s - 1) / (s - 1)**
Find the bilinear transformation of the analog filter transfer function H(s) = 1 / (s^2 + 2s + 1) to obtain the digital filter transfer function H(z). **a)H(z) = (1 + z^{-1}) / (1 - (2/3)z^{-1} + (1/3)z^{-2})** **b)H(z) = (1 - z^{-1}) / (1 - (2/3)z^{-1} + (1/3)z^{-2})** **c)H(z) = (1 + z^{-1}) / (1 - (2/3)z^{-1} + (1/3)z^{-2})** **d)H(z) = (1 - z^{-1}) / (1 + (2/3)z^{-1} + (1/3)z^{-2})**
A digital filter has a transfer function H(z) = (z^2 + 1) / (z^2 - 1). Find the analog filter transfer function H(s) using the inverse bilinear transformation. **a)H(s) = (s^2 - 1) / (s^2 - 1)** **b)H(s) = (s^2 + 1) / (s^2 - 1)**

c)$H(s) = (s^2 - 1) / (s^2 - 1)$

d)$H(s) = (s^2 + 1) / (s^2 + 1)$

Find the bilinear transformation of the analog filter transfer function $H(s) = 1 / (s + 2)$ to obtain the digital filter transfer function $H(z)$.

a)$H(z) = (1 - z^{-1}) / (1 - (2/3)z^{-1})$

b)$H(z) = (1 + z^{-1}) / (1 - (2/3)z^{-1})$

c)$H(z) = (1 - z^{-1}) / (1 + (2/3)z^{-1})$

d)$H(z) = (1 + z^{-1}) / (1 - (2/3)z^{-1})$

Find the impulse invariant transformation of the analog filter transfer function $H(s) = 1 / (s + 2)$ to obtain the digital filter transfer function $H(z)$.

a)$H(z) = (T/2)z / (z + e^{-2T})$

b)$H(z) = (T/2)z / (z - e^{2T})$

c)$H(z) = (T/2)z / (z + e^{2T})$

d)$H(z) = (T/2)z / (z - e^{-2T})$

A digital filter has a transfer function H(z) = (T/4)z / (z - e^(-4T)). Find the sampling period T.

a)T = 0.35

b)T = 0.55

c)T = 0.25

d)T = 0.50

Find the impulse invariant transformation of the analog filter transfer function

$H(s) = 1 / (s^2 + 4s + 4)$ to obtain the digital filter transfer function $H(z)$.

a)$H(z) = (T^2/2)z / (z - e^{-2T})^2$

b)$H(z) = (T^2/2)z / (z - e^{-2T})^2$

c)$H(z) = (T^2/2)z / (z - e^{-2T})^2$

d)$H(z) = (T^2/2)z / (z - e^{-2T})^2$

A digital filter has a transfer function H(z) = (T/2)z / (z - e^(-2T)). Find the analog filter transfer function H(s) using the inverse impulse invariant transformation. **a)H(s) = 1 / (s - 2)** **b)H(s) = 1 / (s + 2)** **c)H(s) = 1 / (s + 3)** **d)H(s) = 1 / (s - 3)**
Find the impulse invariant transformation of the analog filter transfer function H(s) = 1 / (s + 1) to obtain the digital filter transfer function H(z) with a sampling period T = 0.1. **a)H(z) = (0.1/2)z / (z - $e^{-0.1}$)** **b)H(z) = (0.1/2)z / (z - $e^{-0.1}$)** **c)H(z) = (0.1/2)z / (z - $e^{-0.1}$)** **d)H(z) = (0.1/2)z / (z - $e^{-0.1}$)**

Unit 5	**INTRODUCTION TO SIGNAL PROCESSING**
1.	Design Butterworth filter using impulse invariant method for the following specification $0.8 \leq \lvert H(e^{j\omega})\rvert \leq 1$ for $0 \leq \omega \leq 0.2\pi$ $\lvert H(e^{j\omega})\rvert \leq 0.2$ for $0.6\pi \leq \omega \leq \pi$ What is the passband edge frequency in the analog domain when using impulse invariant transformation if ωp=0.2π? a) 0.2 b) 0.3249 c) 0.5 d) 0.989
2.	Design Butterworth filter using impulse invariant method for the following specification $0.8 \leq \lvert H(e^{j\omega})\rvert \leq 1$ for $0 \leq \omega \leq 0.2\pi$ $\lvert H(e^{j\omega})\rvert \leq 0.2$ for $0.6\pi \leq \omega \leq \pi$ What is the passband edge frequency in the analog domain when using impulse invariant transformation if ωs=0.6π? a) 0.2 b) 0.3249 c) 0.5 d) 0.989
3.	In an Nth-order Butterworth filter, how many poles exist in the S-plane? a) N

	b) 2N c) N+1 d) N/2
4.	If the sampling frequency is 100 Hz and the desired digital cutoff is 20 Hz, what is the equivalent analog cutoff using impulse invariant transformation? a) 12.7 Hz b) 25.3 Hz c) 31.4 Hz d) 40 Hz
5.	A digital bandpass filter has a lower cutoff of 70 Hz and an upper cutoff of 200 Hz, with a sampling rate of 800 Hz. What are the equivalent analog cutoff frequencies? a) 73.1 Hz, 210.5 Hz b) 69.2 Hz, 198.4 Hz c) 75.7 Hz, 215.3 Hz d) 71.8 Hz, 202.6 Hz
6.	**What is the value of the bilinear transformation constant if the sampling period is 0.2 sec?** a) 5 b) 10 c) 2.5 d) 20
7.	If a Butterworth filter has a 3 dB cutoff frequency at 2 kHz, at what frequency will the gain be 0.1? a) 4 kHz b) 6.32 kHz c) 8.49 kHz d) 10.23 kHz
8.	For a fourth-order Butterworth filter, what is the magnitude response at $\omega=\sqrt{2}\Omega c$? a) 0.5 b) 0.707 c) 0.2 d) 0.333
9.	If the cutoff frequency of an analog Butterworth filter is 5 rad/sec, what is the equivalent digital cutoff frequency using bilinear transformation with T=0.1? a) 0.482π b) 0.397π c) 0.267π d) 0.158π
10.	A digital Butterworth filter is designed with a passband edge of 0.2π and a stopband edge of 0.6π. If the bilinear transformation is applied, what is the corresponding stopband frequency in the analog domain? **a)** 2.75 rad/sec

	b) 3.14 rad/sec **c)** 4.68 rad/sec **d)** 5.52 rad/sec
11.	What is the minimum order (N) required to design an FIR filter using a rectangular window with a transition width of 0.15π? a) 10 b) 20 c) 14 d) 28
12.	If an FIR filter is designed using a rectangular window of length N=51N = 51N=51, what is the approximate 3 dB bandwidth of the main lobe? a) 4π/51 b) 8π/51 c) 6π/51 d) 2π/51
13.	What is the minimum order (N) required to design an FIR filter using a rectangular window with a transition width of 0.15π? a) 10 b) 14 c) 28 d) 20
14.	If a low-pass FIR filter with a cutoff frequency of 0.3π is designed using a rectangular window of length N=31, what is the transition width approximately? a) 0.2π b) 0.1π c) 0.3π d) 0.05π
15.	If an FIR low-pass filter is designed using a rectangular window of length N=41, what is the main lobe width in Hz when the sampling frequency is 10 kHz? a) 243 Hz b) 685 Hz c) 487 Hz d) 972 Hz
16.	If the cutoff frequency of an FIR filter is 2 kHz and the sampling frequency is 8 kHz, what is the normalized cutoff frequency (in π units)? a) 0.25π b) 0.5π c) 0.75π d) 1.0π
17.	If an FIR low-pass filter is designed using a Hamming window of length N=101, what is the approximate transition width in cycles/sample?

	a) 0.02 b) 0.04 c) 0.06 d) 0.08
18.	What is the approximate -3 dB main lobe width of a Hamming window of length 101? a) $4\pi/101$ b) $8\pi/101$ c) $2\pi/101$ d) $6\pi/101$
19.	If a Hamming window is used to design an FIR filter with a cutoff frequency of 1.5 kHz and a sampling frequency of 10 kHz, what is the required filter length for a transition width of 0.2 kHz? a) 20 b) 50 c) 60 d) 80
20.	If the transition width of an FIR filter using a Hamming window is 0.08π, what is the approximate required filter order? a) 25 b) 45 c) 35 d) 55
21.	What is the minimum filter order N required to design an FIR filter using a Hanning window with a transition width of 0.1π? a) 20 b) 35 c) 40 d) 55
22.	If a Hanning window is applied to an FIR filter of length 51, what is the approximate stopband attenuation? a) -13 dB b) -10 dB c) -53 dB d) -31 dB
23.	If a Hanning window is used to design an FIR filter with a cutoff frequency of 2 kHz and a sampling frequency of 10 kHz, what is the required filter length for a transition width of 500 Hz? a) 20 b) 30 c) 60 d) 50
24.	If a Hanning window is used for FIR filter design with a stopband attenuation of -31 dB, how does the stopband attenuation change when the window length is doubled? a) Remains -31 dB b) Improves to -43 dB

	c) Improves to -58 dB d) Decreases to -13dB
25.	If an FIR filter is designed using a Hanning window of length N=61, what is the main lobe width in Hz when the sampling frequency is 10 kHz? a) 162 Hz b) 387 Hz c) 292 Hz d) 487 Hz

	INTRODUCTION TO SIGNAL PROCESSING
26.	Design Butterworth filter using impulse invariant method for the following specification $0.8 \leq \lvert H(e^{j\omega})\rvert \leq 1$ for $0 \leq \omega \leq 0.2\pi$ $\lvert H(e^{j\omega})\rvert \leq 0.2$ for $0.6\pi \leq \omega \leq \pi$ Which of the following is the minimum order of the Butterworth filter required to satisfy the given specifications? e) 2 f) 3 g) 5 h) 6
27.	Design Butterworth filter using bilinear transformation $0.8 \leq \lvert H(e^{j\omega})\rvert \leq 1$ for $0 \leq \omega \leq 0.2\pi$ $\lvert H(e^{j\omega})\rvert \leq 0.2$ for $0.6\pi \leq \omega \leq \pi$ Using the bilinear transformation, the pre-warped analog passband and stopband frequencies (Ωp and Ωs) are calculated as: a) Ωp =0.6545, Ωs = 2.296. b) Ωp =0.6283, Ωs = 2.199. c) Ωp =0.6674, Ωs = 2.456. d) Ωp =0.6124, Ωs = 2.123.
28.	A digital low-pass Chebyshev filter is designed using the bilinear transformation method with the following specifications: $0.707 \leq \lvert H(e^{j\omega})\rvert \leq 1$ for $0 \leq \omega \leq \pi/2$ $\lvert H(e^{j\omega})\rvert \leq 0.2$ for $3\pi/4 \leq \omega \leq \pi$ Which of the following is the correct expression for the filter order N based on Chebyshev approximation? a) $N=\frac{\cosh^{-1}\sqrt{\frac{0.2^{-2}-1}{0.707^{-2}-1}}}{\cosh^{-1}(\frac{\omega_s}{\omega_p})}$. b) $N=\frac{\ln\sqrt{\frac{0.2^{-2}-1}{0.707^{-2}-1}}}{\ln(\frac{\omega_s}{\omega_p})}$. c) $N=\frac{\sinh^{-1}\sqrt{\frac{0.2^{-2}-1}{0.707^{-2}-1}}}{\sinh^{-1}(\frac{\omega_s}{\omega_p})}$.

	d) N= $\frac{\cos^{-1}\sqrt{\frac{0.707}{0.2}}}{\cos^{-1}(\frac{\omega s}{\omega p})}$.
29.	Design a low-pass Chebyshev filter with the following specifications: Passband edge frequency of,ωp = 2 rads Passband ripple of 3dB Cut-off frequency is at mid-point of the transition band Stopband attenuation of 20dB or greater beyond ωs =2.5 rads Find the filter transfer function. a) H(S) = $\frac{4.077}{(S^2+2.108S+4.077)}$. b) H(S) = $\frac{3.98}{(S^2+1.92S+3.98)}$. c) H(S) = $\frac{4.466}{(S^2+2.186S+4.466)}$. d) H(S) = $\frac{3.5}{(S^2+2.108S+3.5)}$.
30.	For the analog transfer Function H(s) = $\frac{2}{(S+1)(S+2)}$. In the impulse invariance method, the poles of H(s) are transformed using which equation? a) $Z = e^{ST}$. b) Z = ST+1. c) Z= $\frac{2+ST}{2-ST}$. d) Z= $\frac{S}{1+ST}$.
31.	Convert the analog filter with the system function H(s) = $\frac{(S+0.1)}{(S+0.1)^2+16}$.Into a IIR digital filter by mean of bilinear transformation. The digital filter is to have resonance frequency $=\pi/2$. a) Z = 0.5 ± j 0.5z. b) Z = 0.707 ± j 0.707z. c) Z = 0.923 ± j 0.382z. d) Z = 0.382 ± j 0.923z.
32.	Using the bilinear transform design a high-Pass filter, monotonic in pass-band with cut-off frequency of 1000 Hz and down 10 dB at 350 Hz. The sampling frequency is 5000 Hz. a) Ωc =6283.19 rad/sec. b) Ωc =3216.99 rad/sec. c) Ωc =6789.56 rad/sec. d) Ωc =2500.00 rad/sec.
33.	Determine X(k) for N = 8 using DIT-FFT algorithm the magnitude of X(0) the DC component, for the given function below: x(n) = 2^n a) 256. b) 255. c) 127. d) 128.
34.	Find the eight-point IDFT using the DIT algorithm for the following input.X(k)={20, -5.828-j2.279, 0, -0.172-j0.279 , 0 , -0.172+j0.279, 0 ,

	-5.828+j2.279} a) x(n)={2,3,4,5,6,5,4,3}. b) x(n)={1,2,3,4,5,4,3,2}. c) x(n)={3,4,5,6,7,6,5,4}. d) x(n)={2,2,2,2,2,2,2,2}.
35.	Compute IDFT of X(k) = {8, 0, 0, 0, 0, 0, 0, 0} using DIT. a) {1, 1, 1, 1, 1, 1, 1, 1} b) {8, 8, 8, 8, 8, 8, 8, 8} c) {0, 0, 0, 0, 0, 0, 0, 0} d) {2, 2, 2, 2, 2, 2, 2, 2}
36.	What is the twiddle factor for an 8-point IDFT at stage 1? a) W_8^0 b) W_8^1 c) W_8^2 d) W_8^4
37.	How many stages are required to compute an 8-point IDFT using the radix-2 DIT algorithm? a) 2 b) 3 c) 4 d) 8
38.	Compute IDFT of X(k) = {16, 0, 0, 0, 0, 0, 0, 0}. a) {16, 16, 16, 16, 16, 16, 16, 16} b) {2, 2, 2, 2, 2, 2, 2, 2} c) {4, 4, 4, 4, 4, 4, 4, 4} d) {1, 1, 1, 1, 1, 1, 1, 1}
39.	Compute the IDFT of X(k) = {8, -4+4j, 0, -4-4j, 0, -4+4j, 0, -4-4j}. a) {1, 1, 1, 1, -1, -1, -1, -1} b) {2, 2, 2, 2, -2, -2, -2, -2} c) {1, -1, 1, -1, 1, -1, 1, -1} d) {0, 0, 0, 0, 0, 0, 0, 0}
40.	The bit-reversed order of X(k) = {X0, X1, X2, X3, X4, X5, X6, X7} for an 8-point IDFT is: a) {X0, X4, X2, X6, X1, X5, X3, X7} b) {X0, X2, X4, X6, X1, X3, X5, X7} c) {X0, X1, X2, X3, X4, X5, X6, X7} d) {X0, X7, X6, X5, X4, X3, X2, X1}
41.	Compute IDFT of X(k) = {32, 0, 0, 0, 0, 0, 0, 0} using DIT. a) {4, 4, 4, 4, 4, 4, 4, 4} b) {2, 2, 2, 2, 2, 2, 2, 2} c) {1, 1, 1, 1, 1, 1, 1, 1} d) {8, 8, 8, 8, 8, 8, 8, 8}
42.	Compute IDFT of X(k) = {10, 2+2j, 0, 2-2j, 0, 2+2j, 0, 2-2j}. a) {1, 1, 1, 1, -1, -1, -1, -1} b) {2, 2, 2, 2, -2, -2, -2, -2} c) {1, -1, 1, -1, 1, -1, 1, -1} d) {0, 0, 0, 0, 0, 0, 0, 0}

43.	How many complex multiplications are required for an 8-point IDFT using radix-2 DIT? a) 8 b) 12 c) 16 d) 24
44.	Compute IDFT of X(k) = {4, 0, 0, 0, 0, 0, 0, 0}. a) {4, 4, 4, 4, 4, 4, 4, 4} b) {1, 1, 1, 1, 1, 1, 1, 1} c) {2, 2, 2, 2, 2, 2, 2, 2} d) {0, 0, 0, 0, 0, 0, 0, 0}
45.	The IDFT of an 8-point sequence results in how many complex additions in DIT? a) 8 b) 12 c) 24 d) 32
46.	Compute the IDFT of X(k) = {12, 0, 0, 0, 0, 0, 0, 0} using the DIT algorithm. a) {12, 12, 12, 12, 12, 12, 12, 12} b) {1.5, 1.5, 1.5, 1.5, 1.5, 1.5, 1.5, 1.5} c) {3, 3, 3, 3, 3, 3, 3, 3} d) {6, 6, 6, 6, 6, 6, 6, 6}
47.	Compute IDFT of X(k) = {0, 8, 0, 0, 0, 0, 0, 0}. a) {1, -1, 1, -1, 1, -1, 1, -1} b) {0, 1, 0, -1, 0, 1, 0, -1} c) {1, 0, -1, 0, 1, 0, -1, 0} d) {2, -2, 2, -2, 2, -2, 2, -2}

	INTRODUCTION TO SIGNAL PROCESSING
1	Design Butterworth filter using impulse invariant method for the following specification $0.8 \leq \lvert H(e^{j\omega})\rvert \leq 1$ for $0 \leq \omega \leq 0.2\pi$ $\lvert H(e^{j\omega})\rvert \leq 0.2$ for $0.6\pi \leq \omega \leq \pi$ i) $s=\frac{(1+Z^{-1})}{(1-Z^{-1})}$ j) $s=\frac{(1-Z^{-1})}{(1+Z^{-1})}$ k) $s=(1-Z^{-1})$ l) $s=\frac{(1+Z^{-2})}{(1-Z^{-1})}$
2	Design Butterworth filter using bilinear transformation $0.8 \leq \lvert H(e^{j\omega})\rvert \leq 1$ for $0 \leq \omega \leq 0.2\pi$

	$\lvert H(e^{j\omega})\rvert \le 0.2$ for $0.6\pi \le \omega \le \pi$ e) s= $2\frac{(1+Z^{-1})}{(1-Z^{-1})}$ f) s= $2\frac{(1-Z^{-1})}{(1+Z^{-1})}$ g) s= $4(1-Z^{-2})$ h) s= $4\frac{(1+Z^{-2})}{(1-Z^{-1})}$
3	A digital low-pass Chebyshev filter is designed using the bilinear transformation method with the following specifications: $0.707 \le \lvert H(e^{j\omega})\rvert \le 1$ for $0 \le \omega \le \pi/2$ $\lvert H(e^{j\omega})\rvert \le 0.2$ for $3\pi/4 \le \omega \le \pi$ Which of the following is the correct expression for the filter order N based on Chebyshev approximation? e) N= $\frac{\cosh^{-1}\sqrt{\frac{0.2^{-2}-1}{0.707^{-2}-1}}}{\cosh^{-1}(\frac{\omega s}{\omega p})}$. f) N= $\frac{\ln\sqrt{\frac{0.2^{-2}-1}{0.707^{-2}-1}}}{\ln(\frac{\omega s}{\omega p})}$. g) N= $\frac{\sinh^{-1}\sqrt{\frac{0.2^{-2}-1}{0.707^{-2}-1}}}{\sinh^{-1}(\frac{\omega s}{\omega p})}$. h) N= $\frac{\cos^{-1}\sqrt{\frac{0.707}{0.2}}}{\cos^{-1}(\frac{\omega s}{\omega p})}$.
4	Design a low-pass Chebyshev filter with the following specifications: Passband edge frequency of,ωp = 2 rads Passband ripple of 3dB Cut-off frequency is at mid-point of the transition band Stopband attenuation of 20dB or greater beyond ωs =2.5 rads Find the filter transfer function. e) $H(S) = \frac{4.077}{(S^2+2.108S+4.077)}$. f) $H(S) = \frac{3.98}{(S^2+1.92S+3.98)}$. g) $H(S) = \frac{4.466}{(S^2+2.186S+4.466)}$. h) $H(S) = \frac{3.5}{(S^2+2.108S+3.5)}$.
5	For the analog transfer Function $H(s) = \frac{2}{(S+1)(S+2)}$.Determine H(Z) Using impulse invariance method. Assume T=1 Sec. i) $H(Z) = \frac{0.262}{(Z-0.37)(Z-0.14)}$. j) $H(Z) = \frac{0.5}{(Z+1)(Z+2)}$. k) $H(Z) = \frac{0.42}{(Z-0.49)(Z-0.14)}$.

	l) $H(Z) = \frac{0.32}{(Z-0.6)(Z-0.2)}$.
6	Convert the analog filter with the system function $H(s) = \frac{(S+0.1)}{(S+0.1)^2+16}$.Into a IIR digital filter by mean of bilinear transformation. The digital filter is to have resonance frequency $=\pi/2$. a) $H(Z) = \frac{0.2(Z-1)}{(Z^2-1.8Z+0.81)}$. b) $H(Z) = \frac{0.35(Z-0.9)}{(Z^2-1.6Z+0.64)}$. c) $H(Z) = \frac{0.5(Z+0.2)}{(Z^2-1.5Z+0.5)}$. d) $H(Z) = \frac{0.4(Z-0.8)}{(Z^2-1.7Z+0.72)}$.
7	Using the bilinear transform design a high-Pass filter, monotonic in pass-band with cut-off frequency of 1000 Hz and down 10 dB at 350 Hz. The sampling frequency is 5000 Hz. e) $H(Z) = \frac{0.52(Z-1)}{(Z^2-1.8Z+0.81)}$. f) $H(Z) = \frac{0.64(Z-1)}{(Z^2-1.5Z+0.64)}$. g) $H(Z) = \frac{0.48(Z-1)}{(Z^2-1.7Z+0.72)}$. h) $H(Z) = \frac{0.52(Z-1)}{(Z^2-1.6Z+0.69)}$.
8	Determine X(k) for N = 8 using DIT-FFT algorithm for the given function below: $x(n) = 2^n$ e) X(k)={255,−85.25−56.98j,−21−21j,−5.25−12.25j,−3,−5.25+12.25j,−21+21j,−85.25+56.98j} f) X(k)={255,−100.5−40j,−25−30j,−10−15j,−5,−10+15j,−25+30j,−100.5+40j}. g) X(k)={200,−80−60j,−20−25j,−7−10j,−4,−7+10j,−20+25j,−80+60j} h) X(k)={300,−90−50j,−30−20j,−15−8j,−7,−15+8j,−30+20j,−90+50j}
9	Find the eight-point IDFT using the DIT algorithm for the following input.X(k)={20, -5.828-j2.279, 0, -0.172-j0.279 , 0 , -0.172+j0.279, 0 , -5.828+j2.279} e) x(n)={2,3,4,5,6,5,4,3}. f) x(n)={1,2,3,4,5,4,3,2}. g) x(n)={3,4,5,6,7,6,5,4}. h) x(n)={2,2,2,2,2,2,2,2}.
10	Compute the eight point DFT of the sequence x= {0, 1, 2, 3, 4, 5, 6, 7} using DIF FFT algorithm. a) X(k)={28,−4+9.656j,−4+4j,−4+1.656j,−4,−4−1.656j,−4−4j,−4−9.656j}.

	b) $X(k)=\{28,-4+7j,-4+3j,-4+2j,-4,-4-2j,-4-3j,-4-7j\}$. c) $X(k)=\{30,-5+9j,-5+5j,-5+2j,-5,-5-2j,-5-5j,-5-9j\}$ d) $X(k)=\{28,-5+8j,-5+4j,-5+3j,-5,-5-3j,-5-4j,-5-8j\}$