Electrician - Block 1 - Module 2 : Basic Electrical - AC circuits

Questions: Level 1

1 How many electrons are there in the copper atom?

A 8
B 13
C 18
D 29

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2 What is the formula to calculate the equivalent resistance (RT) of the three resistors R1, R2 & R3 are connected in parallel circuit?

A RT = R1 + R2 + R3

B $\frac{1}{R_1} + \frac{1}{R2} + \frac{1}{R_3}$

C $R_T = \frac{1}{R_1 + R_2 + R_3}$

D $R_T = \frac{1}{\frac{1}{R1} + \frac{1}{R2} + \frac{1}{R3}}$

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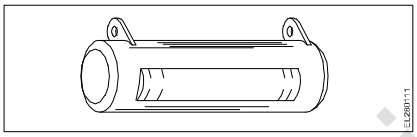
3 What is the name of the resistor?



A Metal film resistor
B Wire wound resistor
C Carbon – film resistor
D Carbon composition resistor

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4 What electrical quantities are related in Ohm's law?

A Current, resistance and power
B Current, voltage and resistivity
C Current, voltage and resistance
D Voltage, resistance and current density

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5 What is the unit of resistivity?

A ohm / cm
B ohm / cm^2
C ohm - metre
D ohm / metre

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6 What is the formula for Quantity of electricity (Q)?

A Current x Time
B Voltage x Current
C Current x Resistance
D Voltage x Resistance

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7 What is the unit of conductance??

A Mho
B Ohm
C Ohm-m
D Ohm/m

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8 What is the S.I unit of specific resistance?

A Ohm/cm
B $Ohm/metre_2$
C Ohm-metre
D $Micro\ ohm/cm_2$

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9 Which formula is used to calculate the power of a DC circuit?

A Voltage x time
B Current x voltage
C Current x resistance
D Voltage x resistance

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10 What is the specific resistance value of copper conductor?

A 1.72 Ohm/cm^3
B 1.72 Micro ohm
C 1.72 $Micro\ ohm/cm^3$
D 1.72 Micro ohm/m

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11 What is the formula to find 3 phase Reactive power (PR) if the line voltage is 'V_L' and line current is 'I_L'?

A $P_r = V_L I_L$
B $P_r = 3 V_L I_L \cos\theta$
C $P_r = \sqrt{3} V_L I_L \sin\theta$
D $P_r = \sqrt{3} V_L I_L \cos\theta$

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12 What is the formula for Reactive Power (Pr) in an AC circuit?

A $P_r = VI$
B $P_r = \sqrt{2}VI$
C $P_r = VI \cos\theta$
D $P_r = VI \sin\theta$

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13 What is the phase displacement in a 3-phase AC circuit?

A 90°
B 120°
C 180°
D 270°

14 What is the formula to calculate the impedence (Z) of the R.L.C series circuit, if the inductive reactance (X_L) is less than capacitve recatance (X_C)?

A $Z = R^2 + \sqrt{X_L{}^2 + X_C{}^2}$

B $Z = \sqrt{R^2 + (X_L - X_C)^2}$

C $Z = \sqrt{R^2 + (X_L{}^2 - X_C)^2}$

D $Z = \sqrt{R^2 + (X_C - X_L)^2}$

15 What is the formula to calculate the three phase active power (P) if the line voltage (VL) and line current is IL and phase angle is 'q'?

A $P = 3\ V_L\ I_L\ \text{Sin}\theta$

B $P = 3\ V_L\ I_L\ \text{Cos}\theta$

C $P = \sqrt{3}\ V_L\ I_L\ \text{Sin}\theta$

D $P = \sqrt{3}\ V_L\ I_L\ \text{Cos}\theta$

16 What is the form factor (K_f) for sinusoidal AC?

A 1

B 1.11

C 2.22

D 4.44

17 Which formula is used to calculate the impedance (z) of a RLC series circuit?

A $Z = R^2 + (x_L \sim x_c)^2$

B $Z = \sqrt{R^2 + (x_L \sim x_c)}$

C $Z = \sqrt{R + (x_L \sim x_c)}$

D $Z = \sqrt{R^2 + (x_L \sim x_c)^2}$

18 How many electrons are there in the valence shell of a copper atom?

A 1

B 2

C 8

D 18

19 What is the unit for Quantity of electricity?

A Mho

B Coulomb

C Volt /second

D Ampere/second

20 What formula is used to calculate Electro Motive Force (EMF)??

A EMF = Potential difference – voltage drop

B EMF = Potential difference + voltage drop

C EMF = Potential difference + voltage drop/2

D EMF = Potential difference + 2 x voltage drop

Questions: Level 2

1 Calculate the electrical energy in unit consumed by 500W lamp for 5 hours.
A 0.5 unit
B 1.0 unit
C 1.5 unit
D 2.5 unit

2 What is the value of hot resistance of a bulb rated as 100W/250V?
A 31.25 ohm
B 62.50 ohm
C 312.50 ohm
D 625.00 ohm

3 Calculate the total power of the circuit of two lamps rated as 200W/240V are connected in series across 240V supply?
A 50 W
B 100 W
C 200 W
D 400 W

4 What is the change of resistance value of the conductor as its diameter is doubled?
A Increases to two times
B Decreases to four times
C Decrease to half of the value
D No change in value of resistance

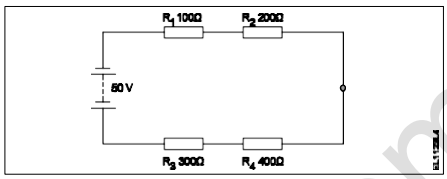
5 What is the effect of the parallel circuit with one branch opened?
A Current will remain same
B Whole circuit will not function
C No current will flow in that branch
D Voltage drop increase in the opened branch

6 Which is the application of series circuit?
A Voltmeter connection
B Lighting circuits in home
C Shunt resistor in ammeter
D Multiplier resistor of a voltmeter

7 What is the effect on opened resistor in series circuit?
A No effect in opened resistor
B Full circuit current will flow in opened resistor
C Total supply voltage will appear across the opened resistor
D No voltage will appear across the opened resistor

8 Which type of meter is used to test the polarity of battery?
A Moving iron ammeter
B Moving coil voltmeter
C Moving iron voltmeter
D Dynamo meter type wattmeter

9 What is the voltage drop in resistor 'R_2' in the series circuit?



A 5 volt
B 10 volt
C 15 volt
D 20 volt

10 Which is the application of series circuit?
A Fuse in circuit
B Voltmeter connection
C Electrical lamp in homes
D Shunt resistor in ammeter

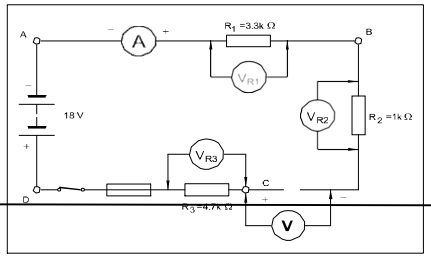
11 What is the change in value of resistance of the conductor, if its cross section area is doubled?
A No change
B Decreases 2 times
C Increases 2 times
D Decreases 4 times

12 What is the value of resistance in an open circuit?
A Zero
B Low
C High
D Infinity

13 Which resistor the lowest current flows in a parallel circuit having the values of 50 $\wedge$, 220 $\wedge$, 450 $\wedge$ and 560 $\wedge$ connected with supply?
A 50 $\wedge$
B 220 $\wedge$
C 450 $\wedge$
D 560 $\wedge$

14 Which is inversely proportional to the resistance of a conductor?
A Length
B Resistivity
C Temperature
D Area of cross section

15 What is the reading of the voltmeter 'V'?



A 0 V
B 6 V
C 9 V
D 18 V

16 What is the main cause for below 0.5 lagging power factor in 3 phase system?
A Due to fluctuation of voltage
B True power due to resistive load
C Reactive power due to more inductive load
D Reactive power due to more capacitive load

17 What is the current in neutral conductor in 3 phase unbalanced load in star connected system?
A No current will flow
B The algebraic sum of current in 3 phases
C The algebraic sum of current in 2 phases only
D Higher than the lowest current in any one of the phases

18 What will be the readings of two watt meters (W_1& W_2) in 3 phase power measurement, if the power factor is zero?
A W_1 & W_2 both are positive reading
B W_1 is Positive and W_2 is negative reading
C W_1 is equal to W_2 but with opposite signs
D W_1 is zero reading, and W_2 is negative reading

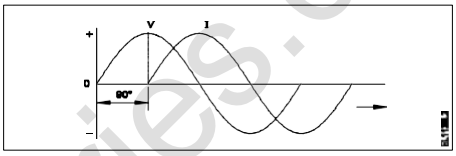
19 What is the maximum value of voltage for 240 volt RMS?
A 240V
B 415V
C 339.5V
D 376.8V

20 What is the relation between the line voltage (V_L) and phase voltage (Vp) in star connected system?
A $V_L = 3\sqrt{V_P}$
B $V_L = 3V_P$
C $V_L = V_P / \sqrt{3}$
D $V_L = V_P / 3$

21 At what power factor in a 3 phase power measurement the reading of two wattmeters are equal and positive?
A 0
B 1
C 0.5
D 0.8

22 What is the relation between the line current (I_L) and phase current (I_P) in delta connected system?
A $I_L = I_P$
B $I_L = 3\, I_P$
C $I_L = \sqrt{3}\, I_P$
D $I_L = I_P / \sqrt{3}$

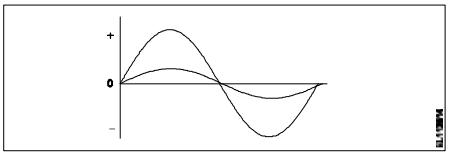
23 Which AC circuit contains the phase relation between voltage (V) and current (I)?



A Pure resistive circuit
B Pure capacitance
C Pure inductance
D Pure resistance and inductance series circuit

24 In a 3 phase system, if the active power is 4 kw and the apparent power is 5 KVA, calculate the reactive power?
A 1 KVAR
B 2 KVAR
C 3 KVAR
D 4 KVAR

25 What relationship is illustrated in between the current and voltage?

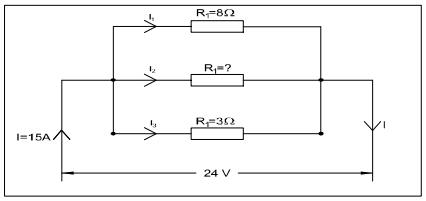


A Current and voltage are "in phase"
B Current and voltage are in out of phase
C Current lags behind the voltage
D Current leads ahead of the voltage

26	Calculate the total power by two wattmeter (W1 & W2) method, if one of the wattmeter (W2) reading is taken after reversing?
A	W_1 x 2
B	W_1 only
C	$W_1 - W_2$
D	$W_1 + W_2$
27	In which 3 phase system, the artificial neutral is required to measure the phase voltage?
A	3 wire star connected system
B	4 wire star connected system
C	3 wire delta connected system
D	4 wire delta connected system

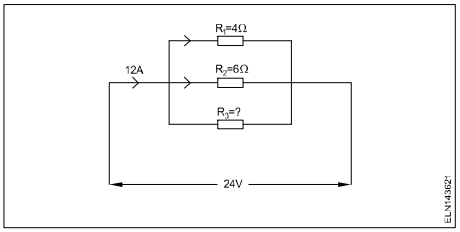
Questions: Level 3

1 Calculate the value of resistance 'R_2' in the parallel circuit?



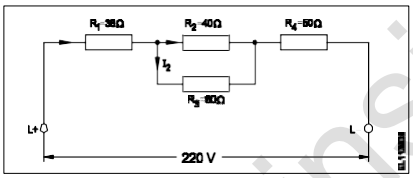
A 2 Ω
B 4 Ω
C 6 Ω
D 8 Ω

2 Calculate the resistance value in R_3 resistor.



A 4 Ohm
B 6 Ohm
C 8 Ohm
D 12 Ohm

3 Calculate the voltage drop across the resistor 'R_4' in the circuit?



A 48 V
B 72 V
C 80 V
D 100 V

4 What happens to the voltmeter if it is connected as an ammeter?

A Low reading
B No deflection
C Meter burns out
D Overshoot deflection

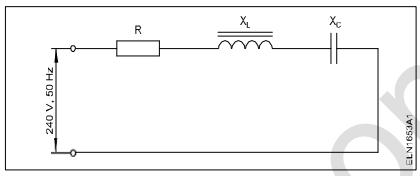
5 What is the effect of electric current on neon lamp?

A Heating effect
B Magnetic effect
C Chemical effect
D Gas ionization effect

6 What is the resistance of the inductive coil takes 5A current across 240V, 50Hz supply at 0.8 power factor?

A 48 ∧
B 42.5∧
C 38.4∧
D 26.6∧

7 Calculate the impedance of the circuit R = 5Ω, XL= 36Ω and XC = 24 Ω.?



A 69 Ω
B 65 Ω
C 13 Ω
D 12 Ω

8 Calculate the line current of the 3 phase 415V 50 HZ supply for the balanced load of 3000 watt at 0.8 power factor is connected in star.

A 8.5 A
B 5.2 A
C 4.5 A
D 3.4 A

9 Calculate the power factor of coil having resistance of 24Ω, draws the current of 5A, at 240V/ 50HZ AC supply.

A 0.8
B 0.6
C 0.5
D 0.3

10 Calculate the power factor of R.L.C circuit having resitance (R) = 15W, resultant reactance (X) = 20W connected across 240V /50Hz AC supply?

A 0.5
B 0.6
C 0.7
D 0.8

11 How the low power factor (P.F) can be improved in AC circuits?

A By connecting resistors in series
B By connecting capacitors in series
C By connecting inductors in series
D By connecting capacitors in parallel

12 What is the P.F in 2 wattmeter method of 3 phase power measurement, if one of the wattmeters reading is zero and the other reads total power?

A 0.5
B Zero
C Unity
D Below 0.5

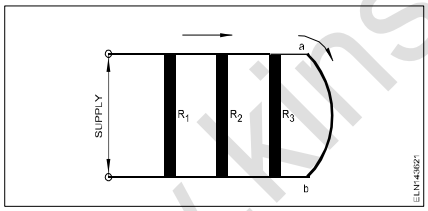
13 How will you obtain positive reading in the wattmeter reads negative reading during 3-phase two wattmeter method?

A By interchanging the connections of input terminals
B By disconnecting the connection of current coil in meter
C By reversing the connection of pressure coil in meter
D By reversing the pressure coil and current coil connection in meter

14 What is the power factor if one of the wattmeter gives negative reading in two wattmeter method of 3 phase power measurement?

A 0.5
B Unity
C Between 1 to 0.5
D Between 0.5 to zero

15 What is the effect of the circuit, if 'ab' points are shorted?



A Circuit resistance will be zero
B Same current will flow in all branches
C Supply voltage will exist in each branch
D Total circuit current is equal to each branch circuit current

Module 2 : Basic Electrical - AC circuits - Key paper

Questions: Level 1

SL.No	Key
1	D
2	D
3	B
4	C
5	C
6	A
7	A
8	C
9	B
10	C
11	C
12	D
13	B
14	D
15	D
16	B
17	D
18	A
19	B
20	B

Questions: Level 2

SL.No	Key
1	D
2	D
3	B
4	B
5	C
6	D
7	C
8	B
9	B
10	A
11	B
12	D
13	D
14	D
15	D
16	C
17	D
18	C
19	C
20	A
21	B
22	C
23	B
24	C
25	A
26	C
27	C

Question: Level 3

SL.No	Key
1	C
2	D
3	D
4	A
5	D
6	C
7	C
8	B
9	C
10	B
11	D
12	A
13	C
14	D
15	A