

For frequency of 50 Hz the reactance offered by a capacitor is 10 Ohm. If the frequency is increased to 100Hz the reactance becomes

- a) 40 Ohm
- b) 20 Ohm
- c) 5 Ohm
- d) 2.5 Ohm

Critical resistance of a DC generator is proportional to

- a) (speed)²
- b) Speed
- c) (speed)⁻²
- d) Independent of Speed

Three phase alternators are invariably star connected because

- a) Higher terminal voltage is obtained
- b) Less turns of wire are required
- c) Small conductors may be used
- d) Magnetic losses are the minimum

In Scott connection, if the turns ratio of primary to secondary of main transformer is K, then the lesser transformer has the transformation ratio of

- a) $K/2$
- b) $K/\sqrt{3}$
- c) $3\sqrt{K}/2$
- d) $2K/3$

A Shunt generator running at 1000 r.p.m has generated e.m.f as 200V if the speed increases to 1200 r.p.m the generated e.m.f will be nearly

- a) 150V
- b) 175V
- c) 240V
- d) 290V

A 3- phase 440 V, 50 Hz induction motor has 4% slip. The frequency of rotor emf will be

- a) 200Hz
- b) 50 Hz
- c) 2 Hz
- d) 0.2 Hz

Illumination of one lumen per sq. Meter is called

- a) Lumen meter
- b) Lux
- c) Foot candle
- d) Candela

The permissible duration for which a generator of rated frequency 50 Hz can run at 46 Hz is

- a) One cycle
- b) One second
- c) One minute
- d) Zero

The inductance of a coil can be increased by

- a) Decreasing the diameter of the core
- b) Decreasing the number of turns
- c) Increasing core length
- d) Choosing core material having high relative permeability

50Hz is generated by a 10 pole synchronous generator rotating at a speed of

- a) 100 rad/second
- b) 50 rad/second
- c) 62.83 rad/sec
- d) 31.415 rad/second

The gas filled in vacuum filament lamps is

- a) Nitrogen
- b) Argon
- c) Air
- d) None

The phase difference between voltage and current wave through a circuit element is given as 30° . The essential condition is that

- a) Both waves must have same frequency
- b) Both waves must have identical peak values
- c) Both waves must have zero value at the same time
- d) None of the above

The armature core of a DC generator is usually made of

- a) Silicon steel
- b) Copper
- c) Non-ferrous material
- d) Cast iron

Which of the following motors can be run on AC as well as DC supply

- a) Universal motor
- b) Repulsion motor
- c) Synchronous motor
- d) Reluctance motor

A voltage of about 200V can be measured

- a) Directly by a DC potentiometer
- b) A DC potentiometer in conjunction with a volt ratio box
- c) A DC potentiometer in conjunction with a known resistance
- d) None of the above

The pressure coil of a wattmeter should be connected on the supply side of the current coil when

- a) Load impedance is high
- b) Load impedance is low
- c) Supply voltage is low
- d) None of the above

In some transformers, the tapping are provided on

- a) L.V. side
- b) H.V. Side
- c) L.V. as well as H.V. side
- d) In the middle of both windings

In which of the following motors the stator and rotor fields rotate simultaneously]

- a) DC motor
- b) Universal motor
- c) Synchronous motor
- d) Induction motor

Electro dynamic types of instrument are used commonly for the measurement of

- a) Current
- b) Resistance
- c) Voltage
- d) Power

The rms value of a hlf wave rectified current is 100A. Its value for full wave rectification would be _____ Amperes

- a) 141.4
- b) 200
- c) $200/3.14(\pi)$
- d) $40/3.14(\pi)$

To avoid glare

- a) Object must be viewed from close vicinity
- b) Object should be viewed from a distance
- c) Object should be moved constantly
- d) Viewer must move constantly

In a lapwound DC generator having p as number of poles and Z as number of conductors, the maximum number of equalizer rings will

- a) Z
- b) P
- c) $2Z/p$
- d) $2p/Z$

A transformer is working at its full load and its efficiency is also maximum its iron loss is 1 kW its copper loss at half load will be

- a) 0.1KW
- b) .2 KW
- c) .25 KW
- d) .5 KW

Which of the following motors will be used in eectic fields

- a) DC shunt motor
- b) DC series motor
- c) AC induction motor
- d) AC synchronous motor

The double energy transient occur in the

- a) Purely inductive circuit
- b) R-L circuit
- c) R-C circuit
- d) R-L-C circuit

Operating torque in analogue instruments are

- a) Deflecting and control
- b) Deflecting and damping
- c) Deflecting, control and damping

The armature voltage control of DC motor provides

- a) Constant torque drive
- b) Constant voltage drive
- c) Constant current drive
- d) None of the above

The standard full load power factor ratings for synchronous motors are

- a) Zero or 0.8 leading
- b) Unity or 0.8 lagging
- c) Unity or 0.8 leading
- d) Unity or zero

During short circuit test iron losses of a transformers are negligible because

- a) The current on secondary side is negligible
- b) The voltage on secondary side is not vary
- c) The voltage applied on primary side is low
- d) Full load current is not supplied to the transformer

If an instrument has cramped scale for larger values, then it follows

- a) Square law
- b) Logarithmic law
- c) Uniform law
- d) None of the above

A wound induction motor is not selected when

- a) Variable speed operation is needed
- b) Cost is the main consideration
- c) High starting torque is the main consideration
- d) External voltage is to be fed into motor

Synchronous impedance method gives more regulations as compared to ampere turn method because

- a) Armature reaction is considered negligible
- b) Saturation effect is ignored in the synchronous impedance
- c) Saturation effect is taken into account in the synchronous impedance method
- d) None of the above

Which of the following instruments indicate the instantaneous value of the electrical quantity being measured at the time at which it is being measured?

- a) Absolute instruments
- b) Indicating instruments
- c) Recording instruments
- d) Integrating instruments

A balanced star connected load is supplied from a symmetrical three phase 440V system. It draws current of 40 A at 0.866 power factor lagging. The total power taken by the load will be

- a) 13.2 KW
- b) 26.4 KW
- c) 30.4 KW
- d) 40.4 KW

The number of different speeds that can be obtained from two different 3 phase induction motors in cascade is

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

The maximum load that a power transformer can carry is limited by its

- a) Temperature rise
- b) Dielectric strength of oil
- c) Voltage ratio
- d) Copper loss

Single phase induction motor usually operate on

- a) 0.6 power factor lagging
- b) 0.8 power factor lagging
- c) 0.8 power factor leading
- d) Unit power factor

A star delta starter of a 3phase induction motor is equivalent to an auto transformer starter having a tapping of

- a) $\sqrt{3}/2$
- b) $1/2$
- c) $1/\sqrt{3}$
- d) $\sqrt{3}$

An induction motor having full load torque of 60 N-m when delta connected develops a starting torque of 120 N-m. for the same supply voltage, if the motor is changed to star connection. The starting torque developed will be

- a) 90 N-m
- b) 120 N-m
- c) 40 N-m
- d) 60 N-m

Which of the following devices may be used for extending the range of instruments?

- a) Shunts
- b) Multipliers
- c) Current transformers
- d) All of the above

In which of the following the highest rating transformer is likely to find application

- a) Transmission
- b) Substation
- c) Generator
- d) Distribution

A synchronous machine with low value of short circuit ratio has

- a) Lower stability limit
- b) High stability limit
- c) Good speed regulation
- d) Good voltage regulation

The power drawn by the prime mover of an alternator, under no load condition, goes to

- a) Meet copper losses both in armature and rotor windings
- b) Produce power in armature
- c) Meet no-load losses
- d) Produce e.m.f. in armature winding

If starting winding of a single phase induction motor is left in the circuit, it will

- a) Run faster
- b) Spark at light loads
- c) Draw excessive current and overheat
- d) Run slower

Synchronous motors are generally not self starting because

- a) The direction of rotation is not fixed
- b) The direction of instantaneous torque reverses after half cycle
- c) Starters can not be used on these machines
- d) Starting winding is not provided on the machine

A 220v dc generator is run at full speed without any excitation. The open circuit voltage will be

- a) Zero
- b) About 2V
- c) About 50 V
- d) 220V

A mercury vapour lamp gives ----- light

- a) White
- b) Pink
- c) Yellow
- d) Greenish blue

The chemical effect of current is used in

- a) DC amper hour meter
- b) DC ammeter
- c) DC energy meter
- d) None of the above

The function of shunt in an ammeter is to

- a) By pass the current
- b) Increase sensitivity of the ammeter
- c) Increase the resistance of ammeter
- d) None of the above

The effect of increasing the load on synchronous motor running with normal excitation

- a) Decrease both armature current and power factor
- b) Decrease armature current but decrease power factor
- c) Increase armature current but decrease power factor
- d) Increase both its armature current and power factor

In case of _____ power factor is the highest

- a) GLS lamps
- b) Mercury arc lamps
- c) Tube lights
- d) Sodium vapour lamps

A shaded pole motor does not possess

- a) Centrifugal switch
- b) Capacitor
- c) Commutator
- d) All of the above

The regulation of an alternator is likely to be negative in case of

- a) Lagging power factor of the load
- b) Leading power factor of the load
- c) High speed alternators
- d) Low speed alternators

The use of _____ instruments is merely confined within laboratories as standardizing instruments

- a) Absolute
- b) Indicating
- c) Recording
- d) Integrating

The purpose of performing sumpner's test is mainly to find out

- a) Regulation of the transformer
- b) Efficiency of the transformer
- c) The temperature rise on full load economically
- d) None of the above

In a shaded pole motor, rotating magnetic field is produced by using

- a) Salient poles
- b) Shading poles
- c) Copper windings
- d) A capacitor

The flicker effect of fluorescent lamp is more pronounced at

- a) Higher frequencies
- b) Lower frequencies
- c) Higher voltages
- d) Lower voltages

In a synchronous motor, damper windings are provided on

- a) Stator frame
- b) Rotor frame
- c) Pole faces
- d) None of the above

In a 3-phase induction motor, iron loss

- a) In rotor is negligible as compared to that in stator
- b) In stator does not occur
- c) In rotor is equal to iron loss in stator
- d) In rotor is much more than the iron loss in stator

Compensating windings are used in DC generators

- a) Mainly to reduce the eddy currents by providing local short circuits
- b) To provide path for the circulation of cooling air
- c) To neutralize the cross magnetizing effect of the armature reaction
- d) None of the above

Which of the following statements regarding single phase induction motor is correct

- a) It requires only one winding
- b) It can rotate in one direction only
- c) It is self starting
- d) It is not self starting

Neon tubes are widely used in

- a) Advertising
- b) Railway coaches
- c) Road signaling
- d) Airport lighting

Candela is the unit of which of the following

- a) Wave length
- b) Luminous intensity
- c) Luminous flux
- d) Frequency

Which of the following 3-phase connections of the transformer create disturbances in communication system

- a) Star/delta
- a) Delta/star
- b) Star/star
- c) Delta/delta

The current in a circuit is given by $I = 100 \sin 214t$ amperes. The maximum value and frequency of current are

- a) $50\sqrt{2}$ A, 100Hz
- b) $100\sqrt{2}$ A, 100Hz
- c) 100A, 50Hz
- d) 70.7 A 50 Hz

The starting winding of a single phase motor is placed in

- a) Armature
- b) Field
- c) Rotor
- d) Stator

Colour of light depends upon

- a) Frequency
- b) Wave length
- c) Both frequency and wave length
- d) Speed of light

A transformer having a turn ratio 1:5 and resistance of 1000 Ohm is connected across the secondary terminals, the resistance offered to a current flowing in the primary will be

- a) 10 Ohm
- b) 20 Ohm
- c) 40 Ohm
- d) 60 Ohm

Leakage reactance of the armature of a salient pole synchronous machine which varies with the position of the rotor is due to

- a) Leakage flux which remains with the slot
- b) Leakage flux of end connection
- c) Leakage flux which comes out of slot teeth, crosses the air gap and enters pole faces
- d) None of the above

The operating speed of a synchronous motor can be changed to new fixed value by

- a) Changing the load
- b) changing the supply voltage
- c) changing the frequency
- d) using brakes

Which of the following loss in transformer is zero even at full load

- a) core loss
- b) Friction loss
- c) Eddy current loss
- d) Hysteresis loss

Which motor can conveniently operate on lagging as well as leading power factor

- a) synchronous motor
- b) Capacitor motor
- c) Squirrel cage induction motor
- d) wound rotor induction motor

The Voltage applied across R-L circuit is equal to _____ of V_r and V_l

- a) Phasor sum
- b) Arithmetic sum
- c) sum of the squares
- d) algebraic sum

Hunting in a synchronous motor cannot be due to

- a) variable frequency
- b) Windage friction
- c) Variable load
- d) Variable supply voltage

In case of a 4 pole DC generator provided with a two layer lap winding with sixteen coils, the pitch will be

- a) 4
- b) 8
- c) 16
- d) 32

The power transformer is constant

- a) voltage device
- b) Current device
- c) power device
- d) main flux device

In a squirrel cage motor the induced emf is

- a) dependent on the shaft loading
- b) dependent on the number of slots
- c) slip times the stand still e.m.f induced in the rotor
- d) none of the above

In a power system, reactive power is necessary for

- a) Power transmission
- b) stabilizing the voltage level
- c) counteracting the effect of reactance in the transmission system
- d) none of the above

If the rotor circuit of a squirrel cage induction motor is open, the rotor will

- a) run at very high speed
- b) run at very low speed
- c) make noise
- d) not run

Two alternators are running in parallel. if the field of one of the alternators is adjusted it will

- a) change its power factor
- b) change its frequency
- c) reduce its speed
- d) change its load

The range of efficiency for shaded pole motor is

- a) 95% to 99%
- b) 80% to 90%
- c) 50% to 75%
- d) 5% to 35 %

The function of conservator in a transformer is

- a) to project against internal fault
- b) to reduce copper as well as core losses
- c) to cool the transformer oil
- d) to take care of the expansion and contraction of transformer oil due to variation of temperature of surroundings

in a 3 – phase, 400 V, 50 Hz, salient pole synchronous motor, the maximum power is obtained when the load angle is

- a) 45o
- b) 90o
- c) More than 90o
- d) Less than 90o

A shaded pole motor can be used for

- a) toys
- b) hair dryers
- c) circulators
- d) any of the above

In an alternator zero power factor method is used to find the

- a) synchronous impedance
- b) efficiency
- c) armature resistance
- d) voltage regulation

Energy stored by a coil is doubled when its current is increased by _____ percent

- a) 100
- b) 41.4
- c) 60
- d) 25

A 3- phase synchronous motor is running clockwise. in case the direction of its field current is reversed

- a) The winding of the motor will burn
- b) The motor will stop
- c) The motor will run in the reverse direction
- d) The motor will continue to run in the same direction

A direct line starter is used for starting motors

- a) Up to 5 H.P
- b) Up to 10 H.P
- c) Up to 15 H.P
- d) Up to 20 H.P

Which of the following motors is inherently self-starting

- a) Split motor
- b) Shaded pole motor
- c) reluctance motor
- d) None of the above

In which coil the harmonics component of the generated e.m.f. will be more?

- a) Full pitch coil
- b) Short pitch coil
- c) Long pitch coil
- d) same in all coils

The minimum number of wattmeters to measure power in a 3-phase unbalanced star connected load is

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

The percentage slip in case of a synchronous motor is

- a) 1%
- b) 100%
- c) .5%
- d) Zero

The cathode of a C.R.O. is usually coated with

- a) alkali metals
- b) tungsten or thorium oxide
- c) copper oxide
- d) barium or strontium oxide

In a three phase induction motors sometime copper bars are placed deep in the rotor to

- a) improve starting torque
- b) reduce copper losses
- c) improve efficiency
- d) improve power factor

a 3-Phase 6.6/0.4 kv transformer is to supply a load of 230 V. Its secondary should be connected in

- a) Star
- b) Delta
- c) open-delta
- d) series

Delta transformers works satisfactorily when

- a) **Load is balanced only**
- b) Load is unbalanced only
- c) On balanced as well as unbalanced loads
- d) None of the above

Which of the following essential features is possessed by an indicating instrument?

- a) Deflecting device
- b) Controlling device
- c) Damping device
- d) All of the above

A reflector is provided to

- a) Protect the lamp
- b) Provide better illumination
- c) Avoid glare
- d) Do all the above

In case of a shaded pole motor the direction of the motor is

- a) From main pole to shaded pole
- b) From shaded pole to main pole
- c) Either of the above depending on voltage
- d) Either of the above depending on power factor

A synchronous motor which on a leading power factor and does not drive a mechanical load is called a

- a) Static condenser
- b) Condenser
- c) Synchronous condenser
- d) None of the above

Starters are used with D.C. motors because

- a) These motors have high starting torque
- b) These motors are not self starting
- c) Back emf of these motors is zero initially
- d) To restrict armature current as there is no back emf while starting

The no load current drawn by transformer is usually what percent of the full load current?

- a) 0.2 to .5%
- b) 2 to 5 %
- c) 12 to 15 %
- d) 20 to 30%

Shading coils, in case of a shaded pole motor are used to

- a) Protect against sparking
- b) Reduce windage losses
- c) Reduce friction losses
- d) Produce rotating magnetic field

A moving coil permanent – magnet instrument can be used as ____ by using a low resistant shunt

- a) Ammeter
- b) Voltmeter

- c) Flux meter
- d) Ballistic galvanometer

The level of illumination on a surface least depends on

- a) Ambient temperature
- b) Candle power of the source
- c) Type of reflector used

If the applied voltage of a dc shunt motor is halved with the load torque doubled, the following approximate changes occur

- a) Speed is doubled, I_a is doubled
- b) Speed is same I_a increases four fold
- c) Speed is same, I_a is doubled]
- d) Speed is halved I_a is same

In core type transformers the concentric winding are used with

- a) Low voltage winding placed next to core
- b) Low voltage winding on the outer side
- c) High voltage winding placed next to core
- d) High voltage winding on the outer side

If the field winding of an unloaded dc shunt motor gets opened while running, it will

- a) Run with reduced speed
- b) Run with increased speed but not to a dangerous speed
- c) Race to a dangerous speed
- d) Stop

An external resistance added in the field of a DC shunt generator will

- a) Decrease the voltage of the generator
- b) Increase the voltage of the generator
- c) Increase the speed of the generator
- d) Decrease the speed of the generator

Torque developed by a single phase induction motor at starting is

- a) Pulsating
- b) Uniform
- c) None of the above
- d) Nil

The minimum armature current of the synchronous motor corresponds to the operation at

- a) Zero power factor leading
- b) Unity power factor
- c) 0.707 power factor lagging
- d) 0.707 power factor leading

The speed of an alternator is changed from 3000 rpm to 1500 rpm the generated emf/phase will become

- a) One fourth
- b) Half
- c) Double
- d) Unchanged

For power factor correction synchronous motors operate at

- a) No load and greatly over excited fields
- b) No load and under excited fields
- c) Normal load with minimum excitation
- d) Normal load with zero excitation

- d) Normal load with zero excitation

In squirrel cage induction motors, the rotor slots are usually given slight skew in order to

- a) Reduce winding losses
- b) Reduce eddy currents
- c) Reduce accumulation of dirt and dust
- d) Reduce magnetic hum

The type of the load for which the voltage regulation of a transformer is negative is

- a) Capacitive
- b) Inductive
- c) Resistive
- d) None of the above

- d) _____ photometer is used for comparing 0.707 power factor leading

the lights of different colours

- a) Grease spot
- b) Bunsen
- c) Lummer Brodhum
- d) Guilds flicker

In alternator, the armature reaction will be completely magnetizing in case the load power factor is

- a) Zero lagging
- b) Zero leading
- c) 0.866
- d) Unity

Which of the following meters are not used on DC circuits

- a) Mercury motor meters
- b) Commutator motor meters
- c) Induction meters
- d) None of the above

The household energy meter is

- a) An indicating instrument
- b) A recording instrument
- c) An integrating instrument
- d) None of the above

In a shaded pole meter, the shading coil usually consists of

- a) A single turn of heavy wire which is in parallel with running winding
- b) A single turn of heavy copper wire which is short circuited and carries only induced current
- c) A multilayer fube gayge copper wire in parallel with running winding
- d) None of the above

In sodium vapour lamp neon gas

- a) Acts as shield around the filament
- b) Assists in developing enough heat to vaporize the sodium
- c) Change the colour of light
- d) Prevents the vappourization of filament

A DC cumulative compound motor delivers rated load torque at rated speed. If the series field in short

circuited, then the armature current and speed will

- a) Increase and decrease
- b) Decrease and increase
- c) Both increase
- d) Both decrease

Which of the following generator will have negligible terminal voltage while running on no-load?

- a) Series generator
- b) Shunt generator
- c) Co mpound generator
- d) Separately excited generator

In a synchronous motor, the magnitude of stator back emf E_b depends on

- a) DC excitation only
- b) Speed of the motor
- c) Load of the motor
- d) Both the speed and rotor flux

The maximum efficiency of a distribution transformer is

- a) At no load
- b) At 50% full load
- c) At 80% full load
- d) At full load

Size of a high speed motor as compared to low speed motor for the same HP will be

- a) Bigger
- b) Smaller
- c) Same
- d) Any of the above

In case of 3-Phase induction motor plugging means

- a) Pulling the motor directly online without a starter
- b) Locking of rotor due to harmonics
- c) Starting the motor on load which is more than the rated load
- d) Interchanging two supply phases for quick stopping

Kirchoff's current law is applicable only to

- a) Electric circuits
- b) Electronic circuits
- c) Closed loops in a network
- d) Junctions in network

A transformer can have zero voltage regulation at

- a) Leading power factor
- b) Lagging power factor
- c) Unity power factor
- d) Zero power factor

The illumination is directly proportional to the cosine of the angle made by the normal to the illuminated surface with the direction of the incident flux above statement is associated with

- a) Lambert's cosine law
- b) Planck's law
- c) Bunsen's law
- d) Macbeth's law of illumination

The crawling in the induction motor is caused by

- a) Low voltage supply
- b) Highload
- c) Harmonics developed in the motor
- d) Improper design of the machine

Which of the following lamp gives nearly monochromatic light

- a) GLS lamp
- b) Sodium vapor lamp
- c) Tube light
- d) Mercury vapor lamp

For which application a DC motor preferred over an AC motor?

- a) High speed operation
- b) Low speed operation
- c) Fixed speed operation
- d) Variable speed operation

A transformer cannot raise or lower the voltage of a D.C. supply because

- a) There is no need to change the D.C. voltage
- b) A D.C. circuit has more losses
- c) Faraday's laws of electromagnetic induction are not valid since the rate of change of flux is zero
- d) None of the above

A gravity control instruments have scales which are not uniform but are crowded because

- a) Balance weight itself is not uniform
- b) Balance weight is greater than control weight
- c) Current is proportional to $\sin(\theta)$ where θ is deflection angle
- d) Current is proportional to deflection angle

Fine diameter tungsten wires are made by

- a) Turning
- b) Swaging
- c) Compressing
- d) Wire drawing

When V is the applied voltage, then the breakdown torque of synchronous motor varies as

- a) V
- b) $V^{3/2}$
- c) V^2
- d) $1/V$

The mechanical load in the induction motor is equivalent to electrical load of

- a) $R_2^2(1/s-1)$
- b) $R_2(1/s-1)$
- c) $R_2^2(s-1)$
- d) $1/R_2(s-1)$

The rotor preferred for alternators applied by hydraulic turbines are

- a) Salient pole type
- b) Cylindrical rotor type
- c) Solid rotor type
- d) Any of the above

The number of equations required to solve network by nodal analysis is equal to number of

- a) Independent nodes
- b) Nodes
- c) Independent nodes - 1
- d) None of these

The purpose of providing dummy coils in a generator is

- a) To enhance flux density
- b) To amplify voltage
- c) To provide mechanical balance for the rotor
- d) To reduce eddy currents

A transformer transforms

- a) Voltage
- b) Current
- c) Power
- d) Frequency

An alternator coupled to which prime mover will usually have the highest speed

- a) Steam engine
- b) Reciprocating diesel engine
- c) Francis turbine
- d) Steam turbine