**ELECTRICAL MECHINES**

1. **Due to overdamping, the instrument will become**
2. Slow
3. Lethargic
4. Fast
5. Both (a) and (b)
6. None of these

ANS: d

1. **A differential relay comparator used for the protection of three phase transformers has**
2. One comparator
3. Two comparator
4. Three comparator
5. Six comparator

ANS: c

1. **In double delta transformation, a double delta refers to the case where there are two delta transformations in**
2. Parallel
3. Series
4. Both series and parallel
5. Neither series nor parallel
6. **Most familiar application of zig - zag transformer is as**
7. Ground reference on an ungrounded system
8. Converting single phase to two phase
9. Reducing harmonics
10. All of these

ANS: b

ANS: a

1. **In a single phase, full wave bridge circuit and in three phase, delta full wave bridge circuit, the ripple voltage frequency is always**
2. Twice the line frequency, six times the line frequency
3. Both will be twice the line frequency
4. Both will be six times the lines frequency
5. None of these

ANS: a

1. **In Scott connection, the voltage across the teaser leads the mains by**
2. 30 degree
3. 60 degree
4. 90 degree
5. 120 degree

ANS: c

1. **Scott connection is used for the conversion of**
2. Single phase to three phase
3. Three phase to single phase
4. Single phase to two phase
5. All of these

ANS: c

1. **In T-T connection, the ratio of actual capacity to the available capacity is**

**a.** 1

**b.** 0.928

**c.** 1.928

**d.** 0.5

ANS: b

1. **In T-T connection, the percentage tapping of main transformer and teaser transformer are**

**a.** 50%, 86.6%

**b.** 50%, 50%

**c.** 86.6%, 86.6%

**d.** 86.6%, 50%

ANS: a

1. **With a bank of two single phase transformers connected in V - V fashion supplying a balanced three phase load with Cosφ as power factor. The power factor of the two transformers is given by**
2. Cosφ, Cosφ
3. Cosφ, Cos(30+φ)

**c.** Cos(30-φ), Cos(30+φ)

**d.** Cos(30-φ), Cosφ

ANS: c

1. **The average power factor at which V-V bank is operating is less than that with the load. The power factor is**
2. 57.7% of the balanced load power factor
3. 66.7% of the balanced load power factor
4. 86.6% of the balanced load power factor
5. None of theses

ANS: c

1. **Consider three transformers connected in delta-delta fashion and supplying their rated load. Now if one of the transformer is removed then each of the remaining two transformer is overloaded. The overload on each transformer is given as**

**a.** 1

**b.** 1.232

**c.** 1.732

**d.** 1.872

1. **The load carried by V - V connection is**
2. 47.7% of the original load
3. 57.7% of the original load
4. 67.7% of the original load
5. 87.7% of the original load

ANS: c

ANS: b

1. **The most commonly used connections for power systems as a step - up and step - down transformers are**
2. Star - delta, star - star
3. Delta - star, star - delta
4. Star - star, delta - delta
5. Star - delta, delta - star

ANS: d

1. **In case of delta-star connection of three phase transformer, secondary line voltage with respect of primary line voltage is at**
2. 0 degree
3. 30 degree leading
4. 30 degree lagging
5. 60 degree lagging

ANS: b

1. **For large low voltage transformers, the most commonly used connections are**
2. Star - star connection
3. Delta - delta connection
4. V connection
5. All of these

ANS: b

1. **If K is the transformation ratio, then the secondary phase voltage of delta-delta connected three phase transformer will be**
2. 1 / K times of the primary phase voltage
3. Equal to the primary phase voltage
4. 1 / K ∧ 2 times of the primary phase voltage
5. K times the primary phase voltage

ANS: d

1. **The phase shift in a star-star connected three phase transformer is**
2. 0 degree
3. 30 degree
4. 60 degree
5. 120 degree

ANS: a

1. **In star-star connection of three phase transformer, if *VL* is the line voltage and *IL* is the line current then phase voltage and phase current is given by**
2. VL / √3, IL
3. VL , IL
4. √3VL , IL / √3
5. VL, IL / √3

ANS: a

1. **Due to presence of third harmonic component in the star-star connection of three phase transformer, the frequency of the circuit component becomes**
2. Three times of the circuit frequency
3. One third of the circuit frequency
4. Remains same
5. None of these

ANS: a

1. **For the parallel operation of three phase transformers, which among the following connection is not applicable?**
2. Δ - Δ to Y – Y
3. Y - Δ to Δ - Y
4. Y - Y to Y – Y
5. None of these

ANS: d

1. **While connecting three phase transformer in star-star connection, the terminals of secondaries are wrongly joined. Then the mutual phase angle and magnitude of line to line voltages of secondaries will**
2. Equal to 120 degree and equal as before
3. Not equal to 120 degree and different
4. Equal to 120 degree and different
5. None of these

ANS: b

1. **For the star - star connection of three phase transformer, the phase angle between the phase voltages and line voltages on both primary and secondary side is**
2. 0 degree
3. 30 degree
4. 60 degree
5. 120 degree

ANS: b

1. **A bank of three single phase transformer can be used for obtaining the three phase output. Three magnetic circuits produced in case of a bank of three single phase transformer and in case of single phase transformer are**
2. Linked, independent
3. Independent, linked
4. Linked, linked
5. Both are independent

ANS: b

1. **In a three phase transformer, the current flowing in three primaries produces three corresponding fluxes. The sum of these three fluxes at any instant is**
2. Zero
3. Three times of any individual flux
4. One third of any individual flux
5. None of these

ANS: a

1. **In a three phase transformer, the angle between two consecutive cores is**
2. 30 degree
3. 60 degree
4. 120 degree
5. 150 degree

ANS: c

1. **Pulse transformers are small in size. The leakage inductance and permeability of alloy used is**
2. Low, high
3. Low, low
4. High, low
5. High, high

ANS: a

1. **Small iron core transformers used in certain frequency range is also called audio frequency transformer. The audio frequency range is**

**a.** 20 t0 2000 Hz

**b.** 20 to 20000 Hz

**c.** 2 to 2000 Hz

**d.** 200 to 20000 Hz

ANS: a

1. **The high leakage impedance transformers are suitable for the applications of**
2. Arc welding
3. Personal computers
4. Street lights
5. Electric lamp

ANS: a

1. **The constant current transformer are mainly used for**
2. Supplying series connected street light
3. Personal computers
4. Arc welding
5. Electric toys
6. **In the operation of constant current transformer, two magnetic fields are produced. The magnetic field produced in the secondary is**
7. In the same direction of magnetic field produced in the primary
8. In the opposite direction of magnetic field produced in the primary
9. Perpendicular to the direction of magnetic field produced in the primary
10. Both (b) and (c)
11. **The constant voltage transformers are most commonly used in**
12. Personal computers
13. Arc welding
14. Power distribution
15. Electric cars

ANS: a

ANS: b

ANS: a

1. **The output voltage of constant voltage transformer contains excessive harmonics which can be filtered out by using**
2. RC filter
3. RL filter
4. LC filter
5. None of these
6. **In a synchronous machine, damper windings are used to**
7. Help in starting as a motor
8. Run it as an induction motor
9. Help in starting as a motor and to reduce hunting
10. Increase efficiency

ANS: c

ANS: c

1. **In a constant voltage transformer, the primary winding and secondary winding is formed by the**
2. capacitor, linear inductor
3. Non linear inductor, capacitor
4. Linear inductor and non linear inductor
5. Capacitor, non linear inductor

ANS: c

1. **A ferro resonant transformer regulation is also known as**
2. Constant current transformer
3. Constant voltage transformer
4. Variable current transformer
5. Variable voltage transformer

ANS: a

1. **A star connected three phase transformer is provided with tertiary delta connected winding which allows the flow of**
2. Second harmonic of exciting current
3. Third harmonic of exciting current
4. Fifth harmonic of exciting current
5. Seventh harmonic of exciting current

ANS: b

1. **If a two winding transformer is converted into an autotransformer by applying additive polarity and subtractive polarity which results in the secondary voltages of 1840 and 1810 volts. Then the primary and secondary voltages of transformer are**

**a.** 1800V, 50V **b.** 1810V, 40V **c.** 1820V, 30V **d.** 1825V, 15V

ANS: d

1. **Compared to the two winding transformer, in an autotransformer the leakage reactance and copper losses is**
2. less, more
3. less, less
4. more, more
5. more, less
6. **Whether the given autotransformer is step up or step down, its VA rating is always**
7. Greater than the two winding transformer
8. Equal to the two winding transformer
9. lesser than the two winding transformer
10. cannot say
11. **For a two winding transformer if VA rating is given by (VA)tw and K is the**

ANS: b

ANS: a

transformation ratio of an autotransformer then the VA rating of the autotransformer is given by

**a.** (K/(K-1)) \* (VA)tw

**b.** (K/(1-K)) \* (VA)tw

**c.** ((1-K)/K) \* (VA)tw

**d.** ((K-1)/K) \* (VA)tw

ANS: a

1. **In an autotransformer if the power transferred inductively is equal to the power conducted through, then transformation ratio is given by**

**a.** 1

**b.** 0.5

1. 2
2. 0

ANS: b

1. **If an autotransformer having transformation ratio equal to 0.6 is supplying a load of 8kw then its power transferred from primary to secondary is given by**
2. 3 kW
3. 3.2 kW
4. 3.4 kW
5. 3.5 kW
6. **Use of an autotransformer is economical when its transformation ratio is**
7. Near unity
8. Much greater than unity
9. Much lesser than unity
10. None of these

ANS: b

ANS: a

1. **If the transformation ratio of an autotransformer is given by V2 / V1 then the ratio of power transferred to that of input power is given by**

**a.** (V2-V1) / V1 **b.** (V2+V1) / V1 **c.** (V1-V2) / V1

**d.** V2 / V1

ANS: d

1. **In a step down autotransformer, if the transformation ratio increases then the saving of copper**
2. Increases
3. Decreases
4. Remains same
5. None of these

ANS: a

1. **If K is the transformation ratio of step up autotransformer and Wtw is the total weight of copper in two winding transformer. Then the saving of copper is given by**
2. K Wtw
3. Wtw/ K
4. Wtw/ K ∧ 2
5. K2 Wtw

ANS: b

1. **For the same excitation voltage and winding currents, the autotransformer gives**
2. Less output than two winding transformer
3. Equal to the output of two winding transformer
4. Half of the output of two winding transformer
5. More than the output of the two winding transformer

ANS: d

1. **If two transformers are operated in parallel with voltage ratio of transformer 1 slightly greater than that of 2. E1 and E2 are the induced emf of transformer 1 and 2, and Z1 and Z2 are the impedances then the circulating current is given by**

**a.** (E1-E2) / (Z1+Z2) **b.** (E1+E2) / (Z1+Z2) **c.** (Z1-Z2) / (E1-E2)

**d.** (Z1-Z2) / (E1+E2)

1. **A load of 110kW at 0.8 power factor is to be shared by two single phase**

ANS: a

transformer with equal turns have impedances equal to (0.4 + j 0.2) and (0.6 + j 0.8) with respect to secondary. How will they share the load if they are operating in parallel?

**a.** 80kW, 30kW

**b.** 82.55kW, 28.45kW **c.** 75.55kW, 24.45kW **d.** 85.45kW, 24.55kW

ANS: d

1. **For moment of inertia to be small in two phase servomotor, the ratio of rotor diameter to its length should be**
2. Equal to 1
3. small
4. large
5. All of these

ANS: b

1. **A two phase servomotor is commonly used in feedback control system to drive the loads and as sensors to measure**
2. Speed of controlled element
3. Position of controlled element
4. Both (a) and (b)
5. None of these
6. **The flux under the unshaded pole of shaded pole induction motor**
7. Is in equal phase of flux under the shaded pole
8. Lags the flux under the shaded pole
9. Leads the flux under the shaded pole
10. None of these

ANS: c

ANS: c

1. **The stator of split phase induction motor has two windings, main winding and auxiliary winding. These windings are displaced in space by**
2. 30 electrical degrees
3. 90 electrical degrees
4. 120 electrical degrees
5. 180 electrical degrees

ANS: b

1. **The torque equation of single phase induction motor contains a constant term superimposed over by a pulsating torque. The pulsating frequency is**
2. Equal to the supply frequency
3. Twice of the supply frequency
4. Half of the supply frequency
5. None of these
6. **In a single phase induction motor, the motor speed on no load is**
7. Almost equal to its synchronous speed
8. Less than its synchronous speed
9. Greater than synchronous speed
10. None of these
11. **The starting torque and power factor of shaded pole induction motor**
12. High, low
13. Low, high
14. Low, low
15. High, high

ANS: b

ANS: a

ANS: c

1. **In shaded pole induction motor, direction of rotation of magnetic field is from non shaded pole to shaded pole**
2. Shaded pole to non shaded pole
3. Non shaded pole to shaded pole
4. None of these
5. **In refrigerators the commonly used motors are**
6. Split phase induction motors
7. Capacitor induction motors
8. Shaded pole induction motors
9. None of these

ANS: b

ANS: b

1. **The capacitor connected permanently in capacitor run motor**
2. Improves power factor
3. Lowers power factor
4. Does not affect power factor

ANS: a

1. **In capacitor start capacitor run induction motor, the capacitor remains in circuit**
2. Only at start
3. Only during running condition
4. At start as well as during running condition
5. None of these
6. **Split phase induction motors are available in the range of a.** 1/2 to 1/10 kW

**b.** 1/20 to 1/2 kW

**c.** 1/10 to 1/20 kW

**d.** None of these

1. **In washing machines, most commonly used motors are**
2. Split phase induction motors
3. Slip ring induction motors
4. Capacitor start induction motors
5. Shaded pole induction motors
6. **The spit phase induction motor has**
7. Low starting current and high starting torque
8. Moderate starting current and moderate starting torque
9. Low starting current and moderate starting torque
10. Moderate starting current and low starting torque
11. **According to double revolving field theory, any alternating quantity can be resolved into two rotating components. The directions and magnitude of these components are**

ANS: c

ANS: b

ANS: a

ANS: c

1. Same directions, each having magnitude equal to the maximum magnitude of alternating current
2. Opposite directions, each having magnitude equal to the maximum magnitude of alternating current
3. Opposite directions, each having magnitude half of the maximum magnitude of alternating current
4. Same directions, each having magnitude half of the maximum magnitude of alternating current
5. **Single phase induction motors are**
6. Self starting
7. Not self starting
8. None of these

ANS: c

ANS: b

1. **The disadvantages of scherbius system used for speed controlling in 3 phase induction motor is**
2. It cannot be used for slip ring induction motors
3. It cannot be used for squirrel cage induction motors
4. It can be used for large induction motors
5. None of these

ANS: b

1. **Kramer system for controlling the speed of 3 phase induction motor is mostly used for motors of**
2. Above 4000 kW
3. Below 4000 kW
4. Below 3000 kW
5. None of these
6. **In cascade control method, the set cannot be operated if**
7. PA > PB
8. PA < PB
9. PA = PB
10. None of these

ANS: a

ANS: c

1. **In cumulatively cascade method for speed controlling, if PA is the number of poles of main motor and PB is the number of poles of auxiliary method. Then the speed of the rotor B is given by**
2. 120f / PA + PB
3. 120f / PA - PB
4. 120f / PA
5. 120f / PB

ANS: a

1. **In pole amplitude modulation method for controlling number of poles, practically, the wave used for modulation is**
2. Square wave
3. Triangular wave
4. Saw tooth wave
5. Sinusoidal wave

ANS: a

1. **The best suited method for smooth speed control by controlling number of poles is**
2. Consequent poles method
3. Multiple stator winding method
4. Pole amplitude modulation method
5. None of these

ANS: c

1. **The consequent pole method used for controlling the number of poles can be used for**
2. Only squirrel cage type motors
3. Only slip ring induction motor
4. For both squirrel cage and slip ring induction motor
5. None of these

ANS: a

1. **The method which can be used for the speed control of induction motor from stator side is**
2. V / f control
3. Controlling number of stator poles to control Ns
4. Adding rheostats in stator circuit
5. All of these
6. **In textile machines, to avoid breaking of threads, soft starters are used. The commonly used method in soft starter is**
7. Direct online method
8. Star-delta method
9. Thyristor voltage controller method
10. Thyristor current controller method

ANS: d

ANS: c

1. **A 3 phase induction motor in a short circuit current is equal 3 times of the full load current. If the full load slip is 2%, then the starting torque as a percentage of full load torque is**
2. 6% of full load torque
3. 18% of full load torque
4. 36% of full load torque
5. None of these

ANS: b

1. **For parallel operation of transformers, the p.u. impedances of transformer must be (based on their own kVA rating)**
2. directly proportional to their ratings
3. inversely proportional to their ratings
4. equal
5. none of these

ANS: c

1. **For satisfactory parallel operation, the circulating current should not exceed**
2. 5% of normal rated current
3. 50% of normal rated current
4. 10% of normal rated current
5. 25% of normal rated current

ANS: c

1. **If the transformers have different kVA ratings, then for parallel operation the equivalent impedances should be**
2. Directly proportional to individual kVA rating
3. Inversely proportional to individual kVA rating
4. Inversely proportional to the square of the individual kVA rating
5. Directly proportional to the square of individual kVA rating

ANS: b

1. **For carrying out parallel operation, transformers should have same X / R ratio in order to avoid**
2. Leakage reactance
3. Insulation failure
4. Circulating current
5. Inrush current

ANS: c

1. **Two transformers are operated in parallel, most essential condition to be satisfied is**
2. Polarities should be same
3. Leakage reactance should be equal
4. Turns ratios should be equal
5. Impedances should be in proportion to their kVA rating

ANS: a

1. **For parallel operation of transformers, the most satisfactory condition is achieved when the load shared by the transformers is in exact proportion with their**
2. Efficiency
3. Ratings
4. Impedances
5. None of these

ANS: b

83) If W1 is the input power measured by the wattmeter connected across the primaries and W2 is the measurement of wattmeter connected in secondary’s while performing sumpner’s test then iron losses and copper losses is equal to

**a.** W1, W2

**b.** W1 / 2, 2 \* W2

**c.** 2 \* W1, W2 / 2

**d.** W1 / 2, W2 / 2

ANS: d

1. **While performing sumpner’s test on transformer, if the secondary are not in series opposition then the meter will read**
2. 0
3. Twice of the induced emf in each secondary’s
4. Equal to the induced emf in each secondary’s
5. Keep fluctuating

ANS: b

1. **In sumpner’s test, the net voltage in the local circuit of secondary’s is**
2. Equal to zero
3. Twice of the induced emf in each secondary’s
4. Equal to the induced emf in each secondary’s
5. Square of the induced emf in each secondary’s
6. **While conducting the sumpner’s test, the primaries of the two identical**

ANS: a

transformers are connected in parallel across the supply. The secondary’s are connected in

1. Parallel
2. Series opposition
3. Both in series and parallel
4. Not connected at all
5. **Which test is also called as back to back test?**
6. Retardation test
7. Sumpner’s test
8. Field test
9. Voltage drop test

ANS: b

ANS: b

1. **If short circuit test is performed on the transformer with constant rated voltage and increased frequency, then the short circuit current and power factor**
2. Both will increase
3. Both will decrease
4. Increase, decrease
5. Decrease, remains constant

ANS: b

1. **If the transformer is step - up transformer then for performing short circuit test meter is connected to the**
2. H.V. side
3. L.V. side
4. Any side
5. Test cannot be performed on step up t / f
6. **Open circuit test is to be performed on transformer to find**
7. Constant losses
8. Copper losses
9. Both (a) and (b)
10. None of these

ANS: a

ANS: a

1. **If the magnitude of leakage reactance is equal to the resistance of both primary and secondary of a single phase transformer. Then the input power factor is**

**a.** 1 / √2

1. 1
2. √2
3. zero

ANS: a

1. **While performing a circuit test on transformer at 30v, 30 Hz it gives Φ1 as lagging power factor. If the same test is performed at 30V, 50Hz, then**
2. Φ1 > Φ2
3. Φ1 < Φ2
4. Φ1 = Φ2
5. None of these

ANS: b

93) A 500 kVA single phase transformer has 90% efficiency at both half load and full load at unity power factor.Then iron losses will be

**a.** 12.55 KW

**b.** 13.55 kW

**c.** 16.55 kW

**d.** 18.55 KW

ANS: d

1. **In a 20 kVA, 2200 / 220 volts transformer iron and copper losses are 300 and 400 watts respectively. Its efficiency at half load and unity power factor is a.** 95.11%

**b.** 96.15%

**c.** 97.77%

**d.** 98%

ANS: b

1. **A 600 kVA transformer has iron losses of 400 kW and copper losses of 500 kW. Its kVA rating for maximum efficiency is given by**
2. 537 kVA
3. 548 kVA
4. 555 kVA
5. 585 kVA

ANS: a

1. **When a transformer is supplied by full load at 0.8 p.f. lagging its copper losses is given by Pcu. if it is supplied by half load then copper losses will be**
2. Pcu
3. 2Pcu
4. Pcu / 2
5. Pcu / 4

ANS: d

1. **If the power factor of a transformer increases, then its efficiency will**
2. Increases
3. Decreases
4. Remains constant
5. Not related to each other

ANS: a

1. **For maximum efficiency in a transformer**
2. Core losses = 2 \* copper losses
3. Core losses = copper losses / 2
4. Core losses = copper losses
5. Core losses = copper losses ∧ 2

ANS: c

1. **What happens to the hysteresis losses and eddy current losses, if the frequency of a transformer is increased keeping the supply voltage constant?**
2. Both will decrease
3. Hysteresis losses will increase and eddy current losses will decrease
4. Hysteresis losses will remain same and eddy current losses will decrease
5. Hysteresis losses will decrease and eddy current losses will remain same

ANS: d

1. **A 600kVA transformer has core losses of 1w at 25 Hz and 2.5w at 50 Hz (neglecting resistances and assuming flux density to be constant). The power required at 60 Hz is**
2. 3 watt
3. 3.5 watt
4. 3.24 watt
5. 3.54 watt

ANS: c