

## AE Model Paper - Electrical

Q.1 The two windings of a transformer is

- (A) conductively linked.
- (B) inductively linked.
- (C) not linked at all.
- (D) electrically linked.

Ans : B

Q.2 A salient pole synchronous motor is running at no load. Its field current is switched off.

The motor will

- (A) come to stop.
- (B) continue to run at synchronous speed.
- (C) continue to run at a speed slightly more than the synchronous speed.
- (D) continue to run at a speed slightly less than the synchronous speed.

Ans: B

Q.3 The d.c. series motor should always be started with load because

- (A) at no load, it will rotate at dangerously high speed.
- (B) it will fail to start.
- (C) it will not develop high starting torque.
- (D) all are true.

Ans: A

Q.4 The frequency of the rotor current in a 3 phase 50 Hz, 4 pole induction motor at full load speed is about

- (A) 50 Hz.
- (B) 20 Hz.
- (C) 2 Hz.
- (D) Zero.

Ans: C

Q.5 In a stepper motor the angular displacement

- (A) can be precisely controlled.
- (B) it cannot be readily interfaced with micro computer based controller.
- (C) the angular displacement cannot be precisely controlled.
- (D) it cannot be used for positioning of work tables and tools in NC machines.

Ans: A

Q.6 The power factor of a squirrel cage induction motor is

- (A) low at light load only.
- (B) low at heavy load only.
- (C) low at light and heavy load both.
- (D) low at rated load only.

Ans: A

Q.7 The generation voltage is usually

- (A) between 11 KV and 33 KV.
- (B) between 132 KV and 400 KV.
- (C) between 400 KV and 700 KV.
- (D) None of the above.

Ans: A

Q.8 When a synchronous motor is running at synchronous speed, the damper winding produces

- (A) damping torque.
- (B) eddy current torque.
- (C) torque aiding the developed torque.
- (D) no torque.

Ans: D

Q.9 If a transformer primary is energised from a square wave voltage source, its output voltage will be

- (A) A square wave.
- (B) A sine wave.
- (C) A triangular wave.
- (D) A pulse wave.

Ans: A

Q.10 In a d.c. series motor the electromagnetic torque developed is proportional to

- (A)  $I_a$
- (B)  $(I_a)^2$
- (C)  $1/I_a$
- (D)  $1/(I_a)^2$

Ans: B

Q.11 In a 3 - phase induction motor running at slip 's' the mechanical power developed in terms of air gap power

- (A)  $(s-1)P_g$
- (B)  $P_g/(1-s)$
- (C)  $(1-s)P_g$
- (D)  $s.P_g$

Ans: C

Q.12 In a 3 - phase induction motor the maximum torque

- (A) is proportional to rotor resistance  $r_2$
- (B) does not depend on  $r_2$
- (C) is proportional to  $\sqrt{r_2}$
- (D) is proportional to  $(r_2)^2$

Ans: B

Q.13 In a d.c. machine, the armature mmf is

- (A) stationary w.r.t. armature.
- (B) rotating w.r.t. field.
- (C) stationary w.r.t. field.
- (D) rotating w.r.t. brushes.

Ans: C

Q.14 In a transformer the voltage regulation will be zero when it operates at

- (A) unity p.f.
- (B) leading p.f.
- (C) lagging p.f.
- (D) zero p.f. leading.

Ans: B

Q.15 The maximum power in cylindrical and salient pole machines is obtained respectively at load angles of

- (A) 90,90
- (B) <90,90
- (C) 90,>90
- (D) 90,<90

Ans: D

Q.16 The primary winding of a 220/6 V, 50 Hz transformer is energised from 110 V, 60 Hz supply. The secondary output voltage will be

- (A) 3.6 V.
- (B) 2.5 V.
- (C) 3.0 V.
- (D) 6.0 V.

Ans: C

Q.17 The emf induced in the primary of a transformer

- (A) is in phase with the flux.
- (B) lags behind the flux by 90 degree.
- (C) leads the flux by 90 degree.
- (D) is in phase opposition to that of flux.

Ans: C

Q.18 The relative speed between the magnetic fields of stator and rotor under steady state operation is zero for a

- (A) dc machine.
- (B) 3 phase induction machine.
- (C) synchronous machine.
- (D) single phase induction machine.

Ans: all options are correct

Q.19 The current from the stator of an alternator is taken out to the external load circuit through

- (A) slip rings.
- (B) commutator segments.
- (C) solid connections.
- (D) carbon brushes.

Ans: C

Q.20 A motor which can conveniently be operated at lagging as well as leading power factors is the

- (A) squirrel cage induction motor.
- (B) wound rotor induction motor.
- (C) synchronous motor.
- (D) DC shunt motor.

Ans: C

Q.21 A hysteresis motor

- (A) is not a self-starting motor.
- (B) is a constant speed motor.
- (C) needs dc excitation.
- (D) can not be run in reverse speed.

Ans: B

Q.22 The most suitable servomotor for low power applications is

- (A) a dc series motor.
- (B) a dc shunt motor.
- (C) an ac two-phase induction motor.
- (D) an ac series motor.

Ans: B

Q.23 The size of a conductor used in power cables depends on the

- (A) operating voltage.
  - (B) power factor.
  - (C) current to be carried.
  - (D) type of insulation used.
- Ans: C
- Q.24 Out of the following methods of heating the one which is independent of supply frequency is
- (A) electric arc heating
  - (B) induction heating
  - (C) electric resistance heating
  - (D) dielectric heating

Ans: C

Q.25 A two-winding single phase transformer has a voltage regulation of 4.5% at full-load and unity power-factor. At full-load and 0.80 power-factor lagging load the voltage regulation will be

- (A) 4.5%.
- (B) less than 4.5%.
- (C) more than 4.5%.
- (D) 4.5% or more than 4.5%.

Ans: C

Q.26 In a dc shunt motor the terminal voltage is halved while the torque is kept constant. The resulting approximate variation in speed " $\omega$ " and armature current " $I_a$ " will be

- (A) Both  $\omega$  and  $I_a$  are doubled.
- (B)  $\omega$  is constant and  $I_a$  is doubled
- (C)  $\omega$  is doubled while  $I_a$  is halved
- (D)  $\omega$  is constant but  $I_a$  is halved

Ans: B

Q.27 A balanced three-phase, 50 Hz voltage is applied to a 3 phase, 4 pole, induction motor. When the motor is delivering rated output, the slip is found to be 0.05. The speed of the rotor m.m.f. relative to the rotor structure is

- (A) 1500 r.p.m.
- (B) 1425 r.p.m.
- (C) 25 r.p.m.
- (D) 75 r.p.m.

Ans: D

Q.28 An alternator is delivering rated current at rated voltage and 0.8 power-factor lagging case. If it is required to deliver rated current at rated voltage and 0.8 power-factor leading, the required excitation will be

- (A) less.
- (B) more.
- (C) more or less.
- (D) the same.

Ans: B

Q.29 A ceiling fan uses

- (A) split-phase motor.
- (B) capacitor start and capacitor run motor.
- (C) universal motor.
- (D) capacitor start motor.

Ans: D

Q.30 A stepper motor is

- (A) a dc motor.
- (B) a single-phase ac motor.
- (C) a multi-phase motor.
- (D) a two phase motor.

Ans: D

Q.31 The 'sheath' is used in cable to

- (A) provide strength to the cable.
- (B) provide proper insulation.
- (C) prevent the moisture from entering the cable.
- (D) avoid chances of rust on strands.

Ans: A

Q.32 The drive motor used in a mixer-grinder is a  
(A) dc motor. (B) induction motor. (C) synchronous motor. (D) universal motor.

Ans: D  
Q.33 A 1:5 step-up transformer has 120V across the primary and 600 ohms resistance across the secondary. Assuming 100% efficiency, the primary current equals  
(A) 0.2 Amp. (B) 5 Amps. (C) 10 Amps. (D) 20 Amps.

Ans: A

Q.34 A dc shunt generator has a speed of 800 rpm when delivering 20 A to the load at the terminal voltage of 220V. If the same machine is run as a motor it takes a line current of 20A from 220V supply. The speed of the machine as a motor will be  
(A) 800 rpm. (B) more than 800 rpm. (C) less than 800 rpm. (D) both higher or lower than 800 rpm.

Ans: C

Q.35 A 50 Hz, 3-phase induction motor has a full load speed of 1440 r.p.m. The number of poles of the motor are  
(A) 4. (B) 6. (C) 12. (D) 8.

Ans: A