

SECTION -B (ESSAY TYPE QUESTIONS)
(5x5=25 Marks)

1. Each phase of a star – connected load consists of a resistance of 100 ohm in parallel with a capacitance of 31.8 micro- farad. Calculate the line current, power absorbed, the total KVA and the power factor of the load when connected to a 416 Volt, 3- Phase, 4- wire, 50 Hz Respectively.
2. A 10 KVA 5000/ 440 V, 25 Hz single phase transformer has copper, eddy current and hysteresis loss of 1.5, 0.5 and 0.6 percent of output on full load. What will be the percentage losses if the transformer is used on 10 KV, 50Hz system keeping full load current constant? Assume unity power factor operation. Compare the full – load efficiencies for the two cases.
3. Derive the general torque relation for a rotating electrical machine in terms of two magnetic fields?
4. What is commutation? Give causes of sparking on the commutator and state how it can be avoided?
5. A dc series motor, with unsaturated magnetic circuit and negligible resistance, when running at a certain speed on a given load, takes 50 Ampere at 500 volt. If the load torque varies as the cube of the speed, find the resistance to be inserted to reduce the speed by 50 percent?
6. What is meant by an instrument transformer? How do they differ in principles of operation from that of a power transformer?
7. Explain why the speed of a 3- phase synchronous motor remains constant at various loads when fed from a constant frequency.
8. Explain with the help of suitable diagrams, how rotating magnetic field is produced in a 3-phase induction motor?

==END OF PAPER==

DIPLOMA OF VOCATION
Industrial Electronics
Subject: Electrical Machines
Subject Code: EDES-309
Semester: Fifth
July 2021
Theory (External): 35 Marks
Time: 03 Hours

Instructions to the Students

1. This Question paper consists of two Sections. All sections are compulsory.
2. Section A comprises 10 questions of objective type in nature. All questions are compulsory. Each question carries 1 mark.
3. Section B comprises 8 essay type questions out of which students need to do any 5. Each question carries 5 marks.
4. Read the questions carefully and write the answers in the answer sheets provided.
5. Do not write anything on the question paper.
6. Wherever necessary, the diagram drawn should be neat and properly labelled

Roll Number									

SECTION -A (SHORT/OBJECTIVE TYPE QUESTIONS)
(10x1=10 Marks)

- A. The algebraic sum of instantaneous phase voltages in a three- phase circuit is equal to?
a) Zero
b) line voltage
c) phase voltage
d) none of the above
- B. The phase sequence of a three phase system is RYB. The other possible phase sequence can be
a) BRY
b) YRB
c) RBY
d) none of the above
- C. The value of back e.m.f in a D.C motor is maximum at
a) No-load
b) Full-load
c) Half full load
d) None of the above
- D. A 10- pole D.C machine has a lap-wound armature. It has 600 conductors, each of resistance 0.05 ohm. What is the armature resistance?
a) 1.5 Ohms
b) 1ohms
c) 3 Ohms
d) 0.3 ohm.
- E. A transformer is so designed that primary and secondary have
a) High leakage resistance
b) Large resistance
c) Tight magnetic locking
d) Good electric coupling

- F. A transformer has 200 watt as iron loss at full - load. The iron loss at half full-load will be.....?
a) 100 w
b) 200 w
c) 400 w
d) None of the above
- G. If the frequency of a 3- phase supply to the stator of a 3- phase induction motor is increased, then synchronous speed
a) is decreased
b) is increased
c) remains unchanged
d) none of the above
- H. The no-load speed of an induction motor depends upon
a) The supply frequency
b) The number of its poles
c) The maximum flux/phase
d) Only a and b
- I. The full-load slip of a synchronous motor is.....
a) 5 %
b) 1%
c) 2%
d) zero
- J. In order to reverse the direction of a synchronous motor,
a) interchange any two stator lines
b) reduce D.C field excitation to zero
c) change supply frequency
d) none of the above