



COLLEGE OF ENGINEERING, SCIENCE AND TECHNOLOGY
SCHOOL OF ELECTRICAL AND ELECTRONICS ENGINEERING
B.E. (HONORS) (ELECTRICAL ENGINEERING) PROGRAMME, (BENG 3)
EEB712 ELECTRICAL MACHINES

SUPPLEMENTARY/RE-SIT EXAMINATION
(SEMESTER 1, 2020)

DATE/TIME/ROOM – Refer to Timetable

Total Marks – 100

Time Duration – 3 hours & 10 Minutes

INSTRUCTIONS TO CANDIDATES

1. You are allowed 10 minutes extra time during which you are not to write.
2. Begin each answer on a fresh new page and use both sides of the sheets.
3. Write your identification number on the top of each attached sheet.
4. Insert all written foolscaps, graph paper, drawing paper etc. in their correct sequence and secure with string provided.
5. For all sheets of paper in which has been done, cross it through and you must attach to your answer script.
6. Write clearly the number(s) of the question(s) attempted on the top of each sheet.
7. *ANSWER ALL QUESTIONS.* Each question is of 10 marks.

1. Open circuit and short circuit test on a 5kVA, 220/400 V, 50 Hz, single phase transformer gave the following results:
 O.C. Test - 220 V, 2 A, 100 W (l.v. side)
 S.C. Test - 40 V, 11.4 A, 200 W (h.v. side)
 Determine the efficiency and approximate regulation of the transformer at full load 0.9 power factor lagging.
2. Define armature reaction in three-phase alternator. How it affects the main field under unity, 90° lagging and 90° leading power factor conditions.
3. What conditions should be satisfied to connect two three-phase alternators in parallel? Write in sequence the steps needed to connect a synchronous generator with infinite bus bar by one dark and two bright lamp method.
4. Write comparison between three phase induction motor and synchronous motor (at least five points).
5. A three phase, 6 pole, 50 Hz, induction motor has a slip of 1% at no-load and 3% at full load. Determine synchronous speed, no-load speed, full-load speed, frequency of rotor current at standstill and frequency of rotor current at full-load.
6. A 250 V shunt motor on no load runs at 1000 rpm and takes 5 A. the total armature and shunt field resistance are respectively 0.2 ohm and 250 ohm. Calculate the speed when loaded and taking a current of 50 A, if the armature reaction weakens the field by 3%.
7. A 200V dc series motor runs at 1000 rpm and takes 20A. Combined resistance of armature and field is 0.4 ohm. Calculate the resistance to be inserted in series so as to reduce the speed to 800 rpm, assuming torque to vary as square of the speed and linear magnetization curve.
8. A lap wound d c shunt generator having 80 slots with 10 conductors per slot generates at no load and e.m.f. of 400 V when running at 1000 r.p.m. At what speed it should be rotated to generate a voltage of 220 V on open circuit?
9. A 220V, single phase induction motor gave the following test results:
 Blocked rotor test: 120 V, 9.6 A, 460 W
 No-load test: 220 V, 4.6 A, 125 W
 The stator winding resistance is 1.5 ohm and during the blocked rotor test, the starting winding is open. Determine the equivalent circuit parameters.
10. Write short notes on ANY ONE of the following
 - (a) Split phase induction motor
 - (b) Two value capacitor motor

[THE END]