# 6634

## BOARD DIPLOMA EXAMINATIONS

## SEPTEMBER/OCTOBER-2020

## DEEE – FIFTH SEMESTER

## A.C. MACHINES-II

Time: 3 hours

Max. Marks: 80

### PART – A

3 X 10 = 30

***Instructions***: 1. Answer **all** questions.
2. Each question carries **Three** Marks.
3. Answer should be brief and straight to the point and should not exceed five simple sentences.

1. List out any three applications of synchronous motor.

2. State how hunting is prevented.

3. Draw the Torque-Slip curves of 3- Phase induction motor for various values of rotor resistances.

4. List various methods of speed control of a 3-Phase induction motor.

5. State the applications of shaded pole motor.

6. Draw the circuit diagram of a single phase 'capacitor start induction motor'.

7. Classify the electric drives based on their applications.

8. State the use of fly wheels.

9. Define regenerate braking.

10. Compare mechanical braking and electrical braking in any three aspects.

**[Cont..,**

*Instructions*:   1.   *Answer any **Five** questions*
                  2.   *Each question carries **TEN** Marks.*
                  3.   *Answer should be comprehensive and criteria for*
                       *valuation are the content but not the length of the*
                       *answer.*

11.   A 3-Phase 11kv star connected synchronous motor draws a current of
      50amp. The effective resistance and synchronous reactance per phase
      are 0.8Ω and 22Ω respectively. Calculate the back emf and retardation
      angle at 0.8 p.f  lagging.

12.   a) Explain the performance of synchronous motor at load with phasor
      diagram.

      b) Derive torque equation of 3- phase induction motor.

13.   A 440 V, 50Hz, 3-Phase, 4 Pole induction motor has a star connected
      stator of resistance 0.164 ohms per phase.
      The test result are (Line values)
      No. load test = 22 A, 440 v, p.f = 0.2 lag.
      Blocked rotor test = 135 A, 200 V, p.f = 0.4 lag.
      Plot the circle diagram and find maximum power output, maximum
      torque and starting torque.

14.   a) Derive the relationship among rotor input, rotor copper loss and
      mechanical power developed in case of 3- Phase induction motor.
      b) What are the different losses in an induction motor.

**[Cont..,**

15. Explain the construction and working principle of universal motor with a neat diagram.

16. Explain the working principle of a single phase induction motor by double revolving field theory.

17. A motor has following duty cycle.
    100 HP for 10 minutes,
    No load for 5 minutes,
    60 HP for 8 minutes,
    No load for 4 minutes which is repeated indefinitely. Determine a suitable size of a continuously rated motor.

18. A 37.3 kW, 440 V, DC shunt motor is braked by plugging .Calculate the value of the resistance to be placed in series with the armature circuit to limit the initial braking current to 150 A. Calculate the braking torque so obtained and also the torque when the speed of the motor has fallen by 40% . Armature resistance is 0.1 ohm, full load armature current is 100A and full load is 600 rpm.