

II B. Tech II Semester Supplementary Examinations, April - 2021**ELECTRICAL MACHINES-II**

(Electrical and Electronics Engineering)

Time: 3 hours

Max. Marks: 70

 Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B**)
2. Answer **ALL** the question in **Part-A**3. Answer any **FOUR** Questions from **Part-B****PART -A**

1. a) The power input to a 3-phase induction motor is 60 kW. The stator losses are 1 kW. Find the total mechanical power developed and the rotor copper loss per phase if the motor is running with a slip of 3% (3M)
- b) Draw the torque-slip characteristics of voltage frequency controlled induction motor (2M)
- c) Draw the schematic diagram and Phasor diagram for conductively coupled single phase ac series motor. (2M)
- d) Define Pitch Factor. (2M)
- e) What are the reasons of parallel operation of alternators? (3M)
- f) Discuss any few differences between synchronous and induction motors. (2M)

PART -B

2. a) Develop the equivalent circuit of a 3-phase induction motor and explain how the mechanical power developed is taken care in the equivalent circuit. (7M)
- b) A 4-pole 50 Hz, 3-phase induction motor has a rotor resistance of 0.02Ω per phase and standstill reactance of 0.5Ω per phase. Calculate the speed at which the maximum torque is developed. (7M)
3. a) Explain the phenomenon of cogging and crawling in the 3-phase induction motor. (7M)
- b) Explain the method of speed control of 3-phase induction motor by varying the supply frequency. (7M)
4. a) Discuss why single-phase induction motors do not have a starting torque. (7M)
- b) Draw and explain the Phasor diagram of an ac series motor. (7M)
5. a) Discuss and derive E.M.F equation for an alternator. (7M)
- b) Define voltage regulation of an alternator. Explain the various factors which may affect the regulation of an alternator. (7M)
6. a) What is the necessity of parallel operation of alternators? (7M)
- b) Explain why prime movers driving alternators operating in parallel should have drooping speed-load characteristics. (7M)
7. a) Discuss in detail about starting of synchronous motors with the help of damper windings. (7M)
- b) Derive the expression for torque developed in the synchronous motor. (7M)