

DR. BABASAHEB AMBEDKAR TECHNOLOGICAL UNIVERSITY, LONERE

Regular End Semester Examination – Summer 2022

Course: SY B. Tech. Branch : Electrical Engineering & Allied Branches

Subject Code & Name: BTEEC403 & Electrical Machine-II Semester : IV

Max Marks: 60

Date: 22-08-2022

Duration: 3.45 Hr.

Instructions to the Students:

1. All the questions are compulsory.
2. The level of question/expected answer as per OBE or the Course Outcome (CO) on which the question is based is mentioned in () in front of the question.
3. Use of non-programmable scientific calculators is allowed.
4. Assume suitable data wherever necessary and mention it clearly.

	(Level/CO)	Marks
Q.1 Solve Any Two of the following.		
A) With neat sketches discuss the construction of a 3-phase induction motor.	Understand	6
B) Show by Mathematically and Vectorially that in a three phase machine a rotating magnetic field is produced when supplied with three phase supply.	Apply	6
C) Discuss a brief note on Construction of Synchronous machine.	Understand	6
Q.2 Solve Any Two of the following.		
A) With neat sketches give a brief note on Harmonics in alternator and also give a reduction remedies'.	Apply	6
B) Memorize the following winding terminologies		6
i. Single layer and double layer winding		
ii. Full pitch and short pitch winding	Remember	
iii. Concentrated and distributed winding		
C) A 3-phase. Star-connected alternator supplies a load of 10MW at pf 0.85 lagging and at 11 KV (terminal voltage). Its resistance is 0.1 ohm per phase and synchronous reactance 0.66 ohm per phase Calculate the line value of emf generated.	Analysis	6
Q.3 Solve Any Two of the following.		
A) What is voltage regulation in alternator? Explain any one method to find voltage regulation in alternator.	Remember	6
i) Synchronous impedance method/ EMF Method		
ii) ZPF Method		
B) State the necessity of parallel operation of alternators. List the conditions for parallel operation.	Understand	6
C) A 3 phase star connected alternator is rated at 1600 KVA, 13,500 V, The armature resistance and synchronous reactance are 1.5 ohm and 30ohm respectively per phase. Calculate the percentage regulation for a load of 1280 KW at 0.8 leading power factor	Evaluation	6

Q.4 Solve Any Two of the following.

- A) Explain with neat diagram, construction and working of double cage induction motor. Understand 6
- B) A 4 pole, 3 phase induction motor operates from a supply whose frequency is 50Hz. Calculate Evaluation 6
- i) the speed at which the magnetic field of the stator is rotating
- ii) the speed of the rotor when the slip is 0.04
- C) Explain the tests conducted to draw circle diagram of three phase induction motor. Explain how, max. torque max. power output is obtained from circle diagram Understand 6

Q. 5 Solve Any Two of the following.

- A) Draw the circuit diagram of a capacitor start capacitor run single phase induction motor and explain its working. Understand 6
- B) Illustrate neat sketches and explain why single phase induction motor is not self starting; explain the phenomenon through Double field revolving theory. Apply 6
- C) Demonstrate the principle of operation and application of Permanent magnet motor. Apply 6

*** End ***