

**ANURAG Engineering College****(An Autonomous Institution)****III B.Tech I Semester Regular/Supplementary Examinations, Dec-2023/Jan-2024****ELECTRICAL MACHINES – II****(ELECTRICAL AND ELECTRONICS ENGINEERING)****Time: 3 Hours****Max.Marks:75****Section – A (Short Answer type questions)****(25 Marks)****Answer All Questions**

	<b>Course Outcome</b>	<b>B.T Level</b>	<b>Marks</b>
1. Define the slip and slip speed of induction motor.	CO1	L1	2M
2. Why is the field producing winding of a 3-phase induction motor made stationary?	CO1	L2	3M
3. Which parameters are required to draw the circle diagram of an induction motor?	CO2	L1	2M
4. Write the applications for induction generator.	CO2	L2	3M
5. What is synchronous reactance of an alternator?	CO3	L1	2M
6. Define the pitch factor and winding factor?	CO3	L2	3M
7. Write the procedure for slip test of synchronous generator?	CO4	L1	2M
8. What is meant by load sharing in synchronous generator?	CO4	L2	3M
9. Give the classification of single-phase induction motor.	CO5	L1	2M
10. Discuss about the starting torque of capacitor start induction motor.	CO5	L2	3M

**Section B (Essay Questions)****Answer all questions, each question carries equal marks.****(5 X 10M = 50M)**

11. A) i) Draw and explain the torque-slip characteristics of induction motor.	CO1	L3	5M
ii) A 6 pole, 50 Hz, 3 ph-IM running full load with 4 % slip develops a torque of 160 N-m at its pulley rim. The mechanical losses 280W and stator copper loss & iron loss is 1680W. Calculate a) Rotor input. b) Rotor copper loss c) efficiency at full load.			5M
<b>OR</b>			
B) i) Explain the principal and operation of 3 phase induction motor.	CO1	L3	5M
ii) Discuss the crawling and cogging in induction motor.			5M
12. A) i) Explain the starting methods of induction motor.	CO2	L3	5M
ii) Demonstrate the procedure of No-load test on three phase induction motor.			5M
<b>OR</b>			
B) Why starters are necessary for starting an induction motor? What are the various types of starters used for Induction motor starting?	CO2	L3	10M
13. A) i) Explain suppression methods of harmonics for synchronous generator.	CO3	L3	5M
ii) Derive the EMF equation for an alternator.			5M
<b>OR</b>			
B) i) Explain the effect of distribution of winding and use of short-pitch coil on the magnitude of the generated voltage of an alternator.	CO3	L2	5M
ii) Discuss the effect of armature reaction in synchronous generator.		L3	5M

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|-----------|---|-----|----|-----|
| 14. A)    | What is the necessity of parallel operation of synchronous generator? State the conditions necessary for paralleling the synchronous generator. | CO4 | L3 | 10M |
| <b>OR</b> |   |     |    |     |
| B)        | i) Define voltage regulation of an alternator. Explain the various factors which may affect the regulation of an alternator.                    | CO4 | L3 | 5M  |
|           | ii) Explain the variation of power factor and current of 3 phase synchronous generator with excitation.   |     |    | 5M  |
| 15. A)    | i) Explain the concept of double field revolving theory.  | CO5 | L3 | 5M  |
|           | ii) Discuss the circle diagram of synchronous motor.  |     |    | 5M  |
| <b>OR</b> |   |     |    |     |
| B)        | i) Write short notes on the following:  | CO5 | L2 | 5M  |
|           | a) shaded pole motor      b) universal motor  |     |    |     |
|           | ii) Draw the circuit diagram of a capacitor-start capacitor-run single phase motor and explain its working.                                     |     | L3 | 5M  |