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B. TECH
(SEM-V) THEORY EXAMINATION 2023-24
ELECTRICAL MACHINES-II

Time: 3 Hours

Total Marks: 100

Note: 1. Attempt all Sections. If require any missing data; then choose suitably.

SECTION A

1. Attempt all questions in brief.

2 x 10 = 20

Q no.	Question	Marks	CO
a.	Explain the term cogging	2	CO3
b.	Write a short note on two phase rotating field.	2	CO3
c.	Briefly explain the working principle of repulsion motor	2	CO5
d.	What is the role of damper winding?	2	CO2
e.	Draw V curve of 3 phase synchronous motor and state their significance.	2	CO2
f.	Briefly explain the concept two phase rotating field.	2	CO3
g.	Explain how the rotor resistance starting of slip ring induction motor reduces starting current and increase starting torque.	2	CO4
h.	Explain cogging of three phase induction motor.	2	CO4
i.	. Why the induction motor can't run at synchronous speed?	2	CO2
j.	Differentiate between cylindrical and salient pole type rotors construction and operation.	2	CO2

SECTION B

2. Attempt any three of the following:

Q no.	Question	Marks	CO
a.	Explain synchronous impedance method of determining the regulation of alternator	10	CO3
b.	Derive an expression for finding regulation of salient pole synchronous alternator using two reaction theory Draw its phasor diagram.	10	CO2
c.	Explain with neat diagram the torque slip characteristics of three phase induction motor.	10	CO3
d.	Explain revolving field theory of single-phase induction motor	10	CO4
e.	Explain power angle characteristic of the synchronous machine and describe the operation of synchronous machine at constant load with variable excitation.	10	CO2

SECTION C

3. Attempt any one part of the following:

Q no.	Question	Marks	CO
a.	Derive emf equation for an alternator. Also, develop expressions of pitch factor and distribution factor	10	CO1
b.	A pole , 3 phase ,50 Hz induction motor is running at a speed of 710 rpm with an input power of 35 KW. The stator copper loss at this operating condition is known to be 1200W while the rotational losses are 600 W. Find (a) the rotor copper loss, (b) the gross torque developed, (c) the gross mechanical power developed, and (d) the net torque and mechanical power output.	10	CO4

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4. Attempt any one part of the following:

Q no.	Question	Marks	CO
a.	Derive the relation for torque developed in 3 phase induction motor; also derive the condition for maximum torque.	10	CO3
b.	Write short notes on (i) Capacitor start motor (ii) Shaded pole motor and (iii) Repulsion motor	10	CO5

5. Attempt any one part of the following:

Q no.	Question	Marks	CO
a.	Explain brushless D.C. motor. Also give specific applications of it.	10	CO5
b.	Explain the production of torque in repulsion motor Explain pole amplitude modulation technique of speed control of 3 phase induction motor.	10	CO3

6. Attempt any one part of the following:

Q no.	Question	Marks	CO
a.	Differentiate and explain deep bar and double cage rotor construction and operation.	10	CO4
b.	With the help of circuit diagram discuss speed control of induction motor by (i) consequent pole method (ii) Rotor rheostat control and (iii) stator voltage control.	10	CO4

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Attempt any one part of the following

Q no.	Question	Marks	CO
a.	Develop equivalent circuit diagram of single-phase induction motor based on double revolving field theory.	10	CO5
b.	What is armature reaction? Explain the effect of load power factor on armature reaction	10	CO5

