PAPER ID-310537

Roll No: | | | | | | | | | | | | | |

B. TECH
(SEM-V) THEORY EXAMINATION 2020-21
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.	Define the voltage regulation of an alternator.	2	CO1
b.	Derive e.m.f. equation of an alternator.	2	CO1
c.	What do you mean by hunting of synchronous motor?	2	CO2
d.	What is the role of damper winding?	2	CO2
e.	Show the advantages of rotating field over stationary field	2	CO3
f.	Why cannot an induction motor run at synchronous speed?	2	CO3
g.	What is crawling?	2	CO4
h.	Explain cogging of three phase induction motor.	2	CO4
i.	How universal motor works on AC or on Dc supply?	2	CO5
j.	What is a double revolving theory?	2	CO5

SECTION B

2.   Attempt any *three* of the following:

Q no.	Question	Marks	CO
a.	Describe the working principle of synchronous motor. Explain why a synchronous motor have does not have a starting torque?	10	CO1
b.	Compare single layer and double layer winding. What are the advantages of distributed and fractional pitched winding?	10	CO2
c.	Explain with neat diagram the torque slip characteristics of three phase induction motor.	10	CO3
d.	A three phase 440 V, six pole 50 Hz induction motor develops 45 HP at 900 rpm at a power factor of 0.9 lagging. Determine the rotor copper loss, frequency of rotor emf and total power input. Neglect mechanical and iron losses of the rotor and assume stator losses to be 1500 watts.	10	CO3
e.	Explain the no load test and block rotor tests of single phase induction motor.	10	CO5

SECTION C

3.   Attempt any *one* part of the following:

Q no.	Question	Marks	CO
a.	What is the synchronizing power? Derive equations for synchronizing power of cylindrical rotor and salient pole alternators.	10	CO1
b.	A 4 pole, 50 Hz star connected alternator has 6 slots per phase and two layer winding with 4 conductors per slot. If the coil span is 150°, find the no load terminal emf if the flux per pole is 300 mwb.	10	CO1

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4. **Attempt any *one* part of the following:**

Q no.	Question	Marks	CO
a.	Explain V curves and synchronous condenser.	10	CO2
b.	Derive and explain the power flow equation of cylindrical pole machine.	10	CO2

5. **Attempt any *one* part of the following:**

Q no.	Question	Marks	CO
a.	A 8 pole, 50 Hz, three phase induction motor has rotor resistance of 0.3 ohm per phase. Find the additional rotor resistance to get three-fifth of the maximum torque at starting. Neglect stator impedance. the maximum torque is 100 NM at 700 rpm.	10	CO3
b.	Derive the condition of maximum torque in three phase induction motor and find the magnitude of maximum torque.	10	CO3

6. **Attempt any *one* part of the following:**

Q no.	Question	Marks	CO
a.	Explain the speed control methods of three phase induction motor.	10	CO4
b.	Explain the working of deep bar rotor and its applications.	10	CO4

7. **Attempt any *one* part of the following:**

Q no.	Question	Marks	CO
a.	Explain the double revolving field theory of a single-phase induction motor.	10	CO5
b.	With the help of neat diagram, describe the main starting methods of single-phase motors.	10	CO5