



Reg. No. :

--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Question Paper Code : X 20492

B.E./B.Tech. DEGREE EXAMINATIONS, NOVEMBER/DECEMBER 2020 AND
APRIL/MAY 2021

Fifth Semester

Electrical and Electronics Engineering
EE 6504 – ELECTRICAL MACHINES – II
(Regulations 2013)

(Common to : PTEE6504 – Electrical Machines – II for B.E. (Part-Time) –
Electrical and Electronics Engineering – Fourth Semester (Regulations – 2014))

Time : Three Hours

Maximum : 100 Marks

Answer ALL questions

PART – A

(10×2=20 Marks)

1. What is meant by single layer and double layer winding ?
2. Define voltage regulation.
3. What are the various functions of damper winding provided with synchronous motor ?
4. What is meant by hunting ?
5. Why slots on the rotor of a 3-phase induction motor are skewed ?
6. List the salient characteristic features of double-squirrel cage induction motor.
7. Name the two windings of a single-phase induction motor.
8. Specify the use of single-phase induction motor.
9. Why single phase induction motor is not self starting ?
10. How can the direction of a capacitor run motor be reversed ?



11. a) List the methods used to predetermine the voltage regulation of synchronous machine and explain the MMF method.

(OR)

- b) i) Describe with neat sketches, the constructional details of a salient pole type alternator. (8)
- ii) Derive the emf equation of an Alternator. (5)

12. a) i) Explain V and inverted V curves as applied to synchronous motors. (8)
- ii) Briefly describe the phenomenon of 'hunting' in a synchronous machine. How is it remedied? (5)

(OR)

- b) i) Describe in brief two methods used for starting a synchronous motor. (8)
- ii) With a suitable phasor diagram, explain the improvement of power factor of a load by synchronous condenser. (5)

13. a) Explain in detail the construction of circle diagram of an induction motor.

(OR)

- b) i) Sketch and explain the torque slip characteristics of the 3 phase cage and slip-ring induction motors. Show the stable region in the graph. (6)
- ii) A 3 phase, 25 kW, 400 V, 50 Hz, 8-pole induction motor has rotor resistance of 0.08 ohm and standstill resistance of 0.4 ohm. The effective stator/ rotor turn ratio is 2.5/1. The motor is to drive a constant-torque load of 250 N-m. Neglect stator impedance.
- 1) Calculate the minimum resistance to be added in rotor circuit for the motor to start up on load.
- 2) At what speed would the motor run, if the added rotor resistance is (A) left in the circuit, and (B) subsequently short circuited. (7)



14. a) Explain the concept of crawling and cogging of induction motor in detail.

(OR)

b) Describe the constructional features and operating characteristics of single-phase shaded pole motor.

15. a) i) Explain the operating principle of hysteresis motor with neat diagram. (7)

ii) Explain the operating principle of Linear Induction motor with neat diagram. (6)

(OR)

b) Using double field revolving theory, explain why a single phase induction motor is not self starting. Also obtain the equivalent circuit of single phase induction motor with necessary equations.

PART – C

(1×15=15 Marks)

16. a) Explain two reaction theory as applied to synchronous machines. (15)

(OR)

b) Explain with necessary circuit diagrams, the experimental tests conducted on an induction motor to draw the circle diagram. How will you determine the motor characteristics from the circle diagram ? (15)
