



C16-EE-502

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**BOARD DIPLOMA EXAMINATION, (C-16)
OCTOBER/NOVEMBER—2023
DEEE - FIFTH SEMESTER EXAMINATION**

AC MACHINES—II

Time : 3 Hours]

[Total Marks : 80

PART—A

3×10=30

- Instructions :** (1) Answer **all** questions.
(2) Each question carries **three** marks.
(3) Answers should be brief and straight to the point and shall not exceed five simple sentences.

1. An under excited synchronous motor takes current at a lagging p.f. why?
2. What are the different methods of starting a synchronous motor?
3. Why are rotor slots of a 3-phase induction motor skewed?
4. Explain why a starter is needed for starting a large capacity induction motor.
5. Write down any four methods to make 1-phase induction motor a self-starting.
6. What are the applications of stepper motor?
7. List the merits and demerits of individual drive.
8. Explain the use of fly wheel.
9. List various braking systems of electric motors.
10. What is dynamic braking?

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1

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PART—B

10×5=50

- Instructions :** (1) Answer *any five* questions.
(2) Each question carries **ten** marks.
(3) Answers should be comprehensive and criterion for valuation is the content but not the length of the answer.

- 11.** Explain the V curves and inverted V curves of a synchronous motor at half load and full load.
- 12.** (a) Determine the induced e.m.f. in a 3-phase, 50 Hz, 400 V, star-connected synchronous motor having a resistance of 0.25Ω and synchronous reactance of 3.2Ω per phase. The motor takes a current of 52.5 A at a p.f. of 0.8 lead.
(b) Explain the speed control of induction motor by frequency changing method.
- 13.** A 746 kW, 3-phase, 50 Hz, 16-pole induction motor has a rotor impedance per phase of $0.02 + j0.15 \Omega$ at standstill. Full-load torque is obtained at 360 r.p.m. Calculate (a) resistance to be added to get maximum starting torque, (b) the ratio of maximum to full load torque and (c) the speed at which maximum torque occurs.
- 14.** Describe the construction of induction motor.
- 15.** Explain the construction and the operation of single-phase capacitor start motor.
- 16.** Explain the working principle of variable reluctance stepper motor with a neat diagram.
- 17.** A motor operates continuously on the following duty cycle :
40 kW for 10 sec, 80 kW for 10 sec, 120 kW for 6 sec, 100 kW for 20 sec and idle for 14 sec.
Draw the load diagram and compute the size of motor required.
- 18.** Explain the plugging method of electric braking.

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