

C 80776

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**SIXTH SEMESTER B.TECH. (09 SCHEME) (ENGINEERING) DEGREE
EXAMINATION, APRIL 2015**

EE/PTEE 09 604—ELECTRIC DRIVES

Time : Three Hours

Maximum 70 Marks

Part A

Answer all questions.

1. State the essential parts of an electric drive.
2. What is meant by steady-state stability of a drive ?
3. Draw the torque-speed characteristics of a separately excited d.c. motor during dynamic braking.
4. List the methods of speed control of a single-phase induction motor.
5. What you mean by microstepping in a stepper motor ?

(5 × 2 = 10 marks)

Part B

Answer any four questions.

6. Explain how a phase locked loop (PLL) is employed for speed control.
7. A 230 V, 960 r.p.m., 200 A separately excited d.c. motor has an armature resistance of 0.02 Ω. The motor is fed from a chopper which provides both motoring and braking operations. The source has a voltage of 230 V. Assuming continuous conduction, calculate the duty ratio of chopper from motoring and braking operation at rated torque and 350 rpm.
8. Explain plugging operation of d.c. motors.
9. Compare Current Source Inverter (CSI) and Voltage Source Inverter (VSI) drives for an induction motor.
10. Explain static rotor resistance control of a three-phase induction motor.
11. Explain the operation of synchronous reluctance motor.

(4 × 5 = 20 marks)

Part C

12. Explain the components of load torque, with examples.

Or

13. Explain the steady-state and transient modes of operation of an electric drive.
14. Explain single-phase fully controlled rectifier control of d.c. separately excited motor in discontinuous conduction mode.

Or

Turn over

15. A fully controlled rectifier fed separately excited d.c. motor is required to operate in motoring and braking operations in the forward direction. What should be the switching arrangement? Explain with neat sketches.
16. Explain direct vector control of a 3ϕ induction motor.

Or

17. Explain variable frequency control method of an induction motor, operating in below frequency mode and above frequency mode.
18. Explain current regulated VSI fed sinusoidal PMAC motor drive for servo application.

Or

19. Explain a brushless D.C. motor drive with relevant waveforms.

(4 × 10 = 40 marks)