

Reg. No. :

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

R 3330

B.E./B.Tech. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2007.

Third Semester

(Regulation 2004)

Electronics and Communication Engineering

EE 1211 — ELECTRICAL MACHINES

(Common to Electronics and Instrumentation Engineering and
Instrumentation and Control Engineering)

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. The outer frame of a dc machine serves double purpose. What are they?
2. Mention the types of electric braking of dc motor.
3. State the condition for maximum efficiency of a transformer. Then what is the corresponding output current?
4. Define all-day efficiency.
5. A 4 pole, 3 phase induction motor operates from a supply of frequency 50 Hz. Calculate the speed at which the magnetic field of the stator is rotating.
6. What is the serious disadvantage of rotor rheostat control scheme?
7. Calculate the distribution factor for a 36-slots, 4 pole, single layer three phase winding of an alternator.
8. Define voltage regulation. Name two methods used to determine voltage regulation of alternators.
9. List out the types of power generation systems.
10. What is the voltage level of a sub-transmission system?

PART B — (5 × 16 = 80 marks)

11. (a) (i) Explain the significance of back emf. (6)
- (ii) The armature winding of a 200 V, 4 pole, series motor is lap connected. There are 280 slots and each slot has 4 conductors. The current is 45 A and the flux per pole is 18 m Wb. The field resistance is $0.3\ \Omega$; armature resistance $0.5\ \Omega$ and the iron and friction losses total 800 W. The pulley diameter is 0.41 m. Find the pull in Newton at the rim of the pulley. (10)

Or

- (b) Discuss about the characteristics of DC generators. (16)

12. (a) Derive the equivalent circuit of a transformer. (16)

Or

- (b) (i) Derive the emf equation of a transformer. (8)
- (ii) Discuss the constructional features of a transformer. (8)

13. (a) (i) Explain the principle of operation of 3 phase induction motor. (8)
- (ii) What is the torque-speed characteristic? (8)

Or

- (b) (i) What are the methods of starting single phase induction motors? Discuss briefly the two main types of these machines. (8)
- (ii) Discuss the stator side speed control schemes of 3 phase induction motor. (8)

14. (a) Write notes on :

- (i) Reluctance motor. (8)
- (ii) Stepper motor. (8)

Or

- (b) (i) Discuss the two types of synchronous generator. (8)
- (ii) How the synchronous motors are started? (8)

-
15. (a) Draw the schematic diagram of a electric power system. Briefly explain the structure. (16)

Or

- (b) (i) State the EHV transmission systems with the salient features. (6)
(ii) Discuss about the types of cables used in power systems. (10)
-