

April 2025

Time – Three hours  
(Maximum Marks: 100)

[N.B. Answer all the questions, choosing any two subdivision from each question. Each subdivision carries 10 marks.]

1. (a) Explain the principle and construction of an alternator with neat sketch.  
(b) Discuss about the full pitch and short pitch windings in alternator with necessary diagrams.  
(c) Write short notes on excitation and exciters.  
(d) (i) State the differences between salient pole alternator and cylindrical alternator. (7)  
(ii) List the cooling methods of alternators. (3)
2. (a) Discuss the load characteristics of an alternator with necessary diagrams.  
(b) Write about the following: (3+3+4)  
(i) Effective Resistance (ii) Leakage Reactance (iii) Synchronous Reactance.  
(c) Discuss about any one method of synchronizing of alternators.  
(d) Explain about the determination of voltage regulation of alternator by conducting direct load test.
3. (a) Explain the working principle of three phase induction motor with neat sketch.  
(b) Write a note on the speed control methods of induction motor.

- (c) Explain the working of a star delta starter with a neat diagram.
  - (d) (i) Compare squirrel cage motor and slip ring induction motor. (7)  
(ii) What is cogging in Induction motor? (3)
- 4.
- (a) Explain the operation of three phase motor with single phase supply using necessary diagrams.
  - (b) Discuss about the various types of enclosures used for induction motors.
  - (c) Write short notes on split phase motor and capacitor motor.
  - (d) Discuss about the common troubles in induction motor and their remedies.
- 5.
- (a) Explain the principle of operation of synchronous motor with necessary diagrams.
  - (b) Write a note on the following:
    - (i) Permanent Magnet Synchronous Motor. (5)
    - (ii) Switched Reluctance Motor. (5)
  - (c) How 'V' curves and inverted 'V' curves are obtained in a synchronous motor? Explain.
  - (d) (i) Compare synchronous motor and three phase induction motor. (5)  
(ii) State the applications of synchronous motor. (5)

-----