

- (b) Explain the significance of back emf in dc motors. (4 Marks)
- (c) A 4- pole 250V series motor has wave connected armature with 1254 conductors. The flux per pole is 22wb, when the motor is taking 50A. The armature and series field coil resistances are respectively 0.3Ω and 0.2Ω . Calculate the speed and torque of the motor and also the power developed in Watts. (10 Marks)
5. (a) Draw the typical speed/ load characteristics of i) Shunt and ii) Series motors and draw the comments on their shapes and mention the applications of these motors. (10 Marks)
- (b) Explain the need of starter for DC motors. (5 Marks)
- (c) 'A series motor should never be started without a load on it'. Justify this statement. (5 Marks)
6. (a) What are the losses in a transformer? On what factors do they depend? and how are they be minimised? (3 Marks)
- (b) A single phase transformer has 400 primary and 1000 secondary turns. The net cross sectional area of the core is 60cm^2 . The supply is 500V, 50Hz. Calculate:
i) the peak value of flux density
ii) voltage induced in the secondary and
iii) the number of secondary turns to induce a voltage of 2500V. (8 Marks)
- (c) Derive an expression for the terminal voltage on no load of a star connected three phase alternator. (6 Marks)
7. (a) Explain how torque is produced in a three phase induction motor. (6 Marks)
- (b) A three phase 10 pole induction motor is supplied by a 6-pole alternator running at 1200 rpm. Calculate the speed of the motor for a slip of 3 percent. (6 Marks)
- (c) Find the number of armature conductors in series per phase of a three phase, 50Hz, 10 pole alternator having 90 slots. The winding is to be star connected to give a line voltage of 11kV, when the flux is 160 mwb. The winding factor is unity. Also find the voltage regulation when the full load terminal voltage is 10.60KV. (8 Marks)
8. (a) With a neat sketch explain the construction and working of a single phase energy meter. (8 Marks)
- (b) Explain the different types of wiring used in practice. (6 Marks)
- (c) Explain the brief:
i) Fuses
ii) Specification of wires
iii) Earthing and its necessity (6 Marks)

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