

Con. 4935-07.

Electrical Drives & control
(OLD COURSE)

CD-6855

NASIR

(3 Hours)

[Total Marks : 100

- N.B.** (1) Question No. 1 is compulsory.
 (2) Attempt any four questions out of remaining six questions.
 (3) Assume any suitable data, if required.

1. (a) Explain four quadrant operation of electrical drive. 10
 (b) Explain the block diagram of an electrical drives. What are the functions of power modulators? 10
2. (a) What are the different types of load torques? Explain with examples and its speed torque characteristics. 10
 (b) What are the different types of speed control methods of 3-phase induction motor? Explain any two. 10
3. (a) A drive has following parameters $J = 10 \text{ kg-m}^2$, $t = 100 - 0.1 N$, load torque (Tl) $T_l = 0.05 N$ where N is in rpm. Initially, the drive is operating in steady state. Now it is to be reversed for this motor characteristics is changed to $T = -10D - 0.1 N$. Calculate the time of reversal. (Torques are in Nm). 10
 (b) Explain the principle of operation of Phase-Locked-Loop (PLL) control. 10
4. (a) Explain Dynamic Braking of D.C. motor. 10
 (b) Explain the principle of slip power recovery. Explain with neat diagram static scherbius drive. 10
5. (a) A 200 V d.c. series motor runs at 950 r.p.m. and takes an armature current of 90 A. It is operated under dynamic braking at twice the rated torque and 800 r.p.m. Calculate the value of braking current and braking resistor. 12
 (b) Explain the different types of drive circuits for stepper motors. 8
6. (a) A 220 V, 950 r.p.m., 90 A d.c. separately excited motor has an armature resistance of 0.05 ohm. It is braked by plugging from an initial speed of 1050 r.p.m. Calculate : 12
 (i) resistance to be placed in armature circuit to limit braking current to twice the full load value.
 (ii) Braking torque.
 (b) Explain "Load equalisation". 8
7. Explain any two :— 20
 (a) Steady state stability
 (b) Selection of motor power rating
 (c) Controlled rectifier fed d.c. drive.