



# MAULANA ABUL KALAM AZAD UNIVERSITY OF TECHNOLOGY, WEST BENGAL

Paper Code : PE- EE 801C/PE- EEE-801B Advanced Electric Drives

UPID : 008251

Time Allotted : 3 Hours

Full Marks : 70

The Figures in the margin indicate full marks.

Candidate are required to give their answers in their own words as far as practicable

## Group-A (Very Short Answer Type Question)

1. Answer *any ten* of the following :

[ 1 x 10 = 10 ]

- (I) What is the Homogenous equation?
- (II) For the speed control of AC drives the preferred method using thyristor is-
- (III) In which slip region induction motor operation is stable?
- (IV) A Synchronous motor can develop synchronous torque at which speed?
- (V) The speed of a BLDC motor can be controlled by which method?
- (VI) Which motors is generally used in toys?
- (VII) The system given by  $y(n) = x(n) + 1/x(n - 1)$  is a causal function?
- (VIII) In current source inverters (CSIs) the amplitude of the output current is depends on the load?
- (IX) Is torque remain constant during V/f control of inverters driving induction motors?
- (X) How the field winding is usually placed, while starting a synchronous motor by induction motor action?
- (XI) Is commutator required in BLDC motor?
- (XII) For a reluctance motor, the maximum average torque occurs when  $\delta$  ?

## Group-B (Short Answer Type Question)

Answer *any three* of the following :

[ 5 x 3 = 15 ]

2. Write down the working principle of switch reluctance motor? [5]
3. Show the advantages and disadvantages of digital signal processing control? [5]
4. Write down the difference between VSI and CSI? [5]
5. Explain v/f control of induction motor drives. [5]
6. Draw the circuit of Boost Chopper and explain in brief. [5]

## Group-C (Long Answer Type Question)

Answer *any three* of the following :

[ 15 x 3 = 45 ]

7. Draw and explain the torque speed characteristics of switch reluctance motor? [ 15 ]
8. Explain different types of DSP based motion control system? [ 15 ]
9. Explain the different methods to reduce the harmonics in the output voltage of Inverter? [ 15 ]
10. Explain direct torque control (DTC) and flux control of Induction motor? [ 15 ]
11. How to control position and speed of BLDC using DSP? [ 15 ]

\*\*\* END OF PAPER \*\*\*