Branch: EE
Sem: VI
31/05/2022

University of Mumbai

Examinations Summer 2022

Subject: Special Electrical Machines

Time: 2hour 30 minutes

Max. Marks: 80

Q1.	**Choose the correct option for following questions. All the Questions are compulsory and carry equal marks**
1.	**In BLDC motor field winding is kept on _____**
Option A:	Stator
Option B:	Rotor
Option C:	Can be placed anywhere
Option D:	Absent
2.	**The speed-torque characteristics of the BLDC motor are similar to that of**
Option A:	DC Shunt Motor
Option B:	DC Series Motor
Option C:	Induction Motor
Option D:	Compound Motor
3.	**The stator of reluctance motor resembles**
Option A:	Induction Motor
Option B:	DC motor
Option C:	Synchronous Motor
Option D:	Compound Motor
4.	**Which of the following motor rotates in discrete angular steps?**
Option A:	Servo motor
Option B:	DC motor
Option C:	Stepper motor
Option D:	Linear Induction Motor (LIM)
5.	**Stepper motor runs in response to**
Option A:	a programmed sequence of input electrical pulses.
Option B:	Pulse Width Modulation (PWM).
Option C:	Feedback signal
Option D:	Pulse Position Modulation (PPM).
6.	**A hybrid stepper motor has stator and rotor teeth 40 and 50 respectively, the step angle is .**
Option A:	0.9 degree
Option B:	4 degree
Option C:	0.8 degree
Option D:	1.8 degree
7.	**The direction of rotation of Switch reluctance Motor can be reversed by**
Option A:	Changing the supply terminal
Option B:	Changing the Rotor terminal wire
Option C:	Changing the Stator terminal wire
Option D:	Rotation can't be reversed

8.	**A variable reluctance stepper motor has 8 main poles which have 5 teeth each. If rotor has 60 teeth, calculate the stepping angle.**
Option A:	0.9 degree
Option B:	3 degree
Option C:	0.5 degree
Option D:	1.8 degree
9.	**The secondary of a linear induction motor normally consists of a**
Option A:	Concentrated single phase winding.
Option B:	Distributed single phase winding.
Option C:	Solid conducting plate.
Option D:	Distributed three phase winding.
10.	**Which of the following mode of operation is possible in switched reluctance motor?**
Option A:	One quadrant
Option B:	Two quadrant
Option C:	Three quadrant
Option D:	Four quadrant

Q2	Solve any Two Questions out of Three 10 marks each
A	Explain the construction and working of a Permanent Magnet Stepper Motor.
B	With necessary block diagram explain the DSP-based control of BLDC motor.
C	What are the features of Permanent Magnet Synchronous Motor? What are its advantages and disadvantages

Q3	Solve any Two Questions out of Three 10 marks each
A	A stepper motor has a step angle of 1.8°. Find (a) Resolution (b) Number of steps required for 50 revolutions and (c) Shaft speed if the stepping frequency is 5000 pulse/sec.
B	What is the Switched Reluctance motor with necessary diagram? explain the construction and working of switched Reluctance motor.
C	Compare BLDC motor and Permanent Magnet Synchronous Motor(PMSM)

Q4.	Solve any Two Questions out of Three 10 marks each
A	Derive the torque equation of synchronous Reluctance motor.
B	Explain the sensorless control of BLDC motor? What are its advantages?
C	Explain the principle of working of an linear induction motor and write down its advantages and disadvantages.

CE8FC8BF836D3DA4C7A0BD14DC30FED2