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Total Number of Pages : 02

B.Tech.
PEE6D001

6th Semester Regular Examination 2017-18
SPECIAL ELECTRO-MECHANICAL IN DEVICES
BRANCH : ELECTRICAL
Time : 3 Hours
Max Marks : 100
Q.CODE : C494

Answer Part-A which is compulsory and any four from Part-B.
The figures in the right hand margin indicate marks.
Answer all parts of a question at a place.

Part – A (Answer all the questions)

Q1. Answer the following questions: *multiple type or dash fill up type* : (2 x 10)

- a) The number of types of variable reluctance stepper motor is
 - i) 2
 - ii) 3
 - iii) 4
 - iv) 5
- b) The number of types of winding in stepper motor is
 - i) 2
 - ii) 3
 - iii) 4
 - iv) 5
- c) Stepper motors are used in printers. YES/NO
- d) Full form of PC motor is
- e) BLDC motors used in aeromodelling. TRUE/FALSE
- f) PCTELM is Persistent Current Tubular Electro Magnetic Launcher. YES/NO
- g) SyRM stands for
- h) SyRM drives are generate more/less heat.
- i) EML stands for
 - i) Electromagnet Launcher
 - ii) Electromechanical Launcher
 - iii) Electromotive Launcher
 - iv) None of the above
- j) LIM stands for and LSM stands for

Q2. Answer the following questions: *Short answer type* : (2 x 10)

- a) Draw the constructional and switching diagram of 4-phase 8-pole single stack variable reluctance stepper motor.
- b) What is HSM?
- c) Define split-link circuit and C-dump circuit.
- d) Write short note on Hall effect sensing scheme of SRM.
- e) What are the types of current regulators in SRM?
- f) What is SyRM? Draw its phasor diagram.
- g) Give two applications of SyRM.
- h) What is the difference between LIM and LSM?
- i) What is goodness factor in LIM?
- j) What are the types of DCLM?

Part – B (Answer any four questions)

- Q3.** a) What is Stepper motor? Explain working and constructional features of permanent magnet stepper motor with diagram. (10)
b) Describe multi stack variable reluctance stepper motor. (5)
- Q4.** a) Explain windings in stepper motor. Derive torque equation of stepper motor drive. (10)
b) Differentiate between open loop control of stepper motor and closed loop control of stepper motor. (5)
- Q5.** a) What is SRM? Explain the working principle and constructional features of SRM. Derive the torque equation of SRM. (10)
b) Write constraints on pole arc and tooth arc of SRM drive. (5)
- Q6.** a) What is PMDC? Describe its working principle, construction and derive the torque equation. (10)
b) What is PC motors. Explain. (5)
- Q7.** a) What is BLDC? What are its types? Explain its construction, operation and control mechanism. (10)
b) Write the comparison between Conventional DC Motor and BLDCMotor. (5)
- Q8.** a) What is PMSM? Describe its construction and operation. Derive the emf equation and torque equation of PMSM. (10)
b) Draw the phasor and circle diagram of PMSM. (5)
- Q9.** a) What is LIM? Describe its construction and operation. Derive the thrust equation of LIM. (10)
b) What is LSM? Derive the thrust equation of LSM. (5)