

(3 Hours)

Total Marks: 80

- NB:** (1) **Question No. 1 is compulsory**
(2) **Answer any THREE questions out of the remaining FIVE questions.**
(3) **Assume suitable data if necessary and justify them**
(4) **Figure to the right indicates marks**

1. (a) Explain in detail the concept of lead angle in stepper motor. 5
(b) State the advantages and disadvantages of PMSM. 5
(c) Compare PMBLDC motor with PMSM. 5
(d) Draw and explain phasor diagram of synchronous reluctance motor. 5
2. (a) Explain the open loop speed control of stepper motor. What is bipolar converter circuit? State any two applications of stepper motor. 10
(b) Compare variable reluctance, permanent magnet and hybrid stepper motor stating its merits and demerits. 10
3. (a) Draw the cross sectional view of switched reluctance motor and explain its principle of operation. What is its difference compared to stepper motor? 10
(b) Describe with neat sketch any two configuration of power converters used for the control of switched reluctance motor. 10
4. (a) Write a note on power controllers used for PMBLDC motor. Explain each block associated in it. 10
(b) Explain the closed loop control scheme of a PMBLDC motor drive with a suitable schematic diagram. 10
5. (a) State the principle of operation and applications of linear induction motor. Compare it with rotating IM. 10
(b) With a neat block diagram, explain microcontroller based closed loop speed control of PMSM. 10
6. (a) With neat diagrams, write down the principle of operation of a Synchronous Reluctance Motor. 10
(b) Compare the performance of synchronous reluctance motor with switched reluctance motor. 10