

Time:3 Hrs

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

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| 1 (a) | Compare direct torque and flux control of induction motor with that of vector control. | 5 |
| (b) | Explain fuzzy control of induction motor. | 5 |
| (c) | Compare stator field oriented control and rotor field oriented control of an IM. | 5 |
| (d) | Explain closed-loop V/f control of induction motor with slip regulation. | 5 |
| 2 (a) | Compare scalar control and vector control methods of IM. | 10 |
| (b) | With block diagram explain the voltage model for flux estimation. Compare it with current model. | 10 |
| 3 (a) | Explain the current fed inverter drive of an induction motor with speed and flux control. | 10 |
| (b) | State and explain adaptive control of IM. State its applications. | 10 |
| 4 (a) | What is the basic difference between true synchronous mode and self-control mode for variable frequency control of synchronous motor? Discuss. | 10 |
| (b) | Explain efficiency optimization of IM by flux programming. | 10 |
| 5 (a) | With a neat block diagram explain extended Kalman filter for estimation of speed. | 10 |
| (b) | Explain the sensorless vector control of an induction motor using neural network control. | 10 |
| 6 (a) | Draw the block diagram and explain Direct Torque Control (DTC) of 3 phase Induction Motor with switching table. | 10 |
| (b) | State and explain direct synthesis of induction motor from state equations. | 10 |
