

Duration : (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

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| 1 (a) | Compare scalar control and vector control techniques of induction motor. | 5 |
| (b) | What are the advantages of voltage source inverter fed drives? | 5 |
| (c) | With a neat block diagram explain closed loop speed control of induction motor with torque and flux control. | 5 |
| (d) | What is field weakening mode of induction motor? | 5 |
| 2 (a) | Explain with neat block diagram and phasor diagram, direct vector control scheme of induction motor. | 10 |
| (b) | Explain speed estimation of induction motor based on model reference adaptive control. | 10 |
| 3 (a) | Explain the acceleration and deceleration characteristic of voltage fed inverter control drive. | 10 |
| (b) | Explain flux optimization in induction motor and state its relevance. | 10 |
| 4 (a) | Explain adaptive self-tuning speed control for induction motor drive | 10 |
| (b) | Explain with the block diagram the voltage model of flux vector estimation in induction motors | 10 |
| 5 (a) | What is the basic difference between true synchronous mode and self control mode for variable frequency control of synchronous motor? Discuss. | 10 |
| (b) | With a neat block diagram explain extended Kalman filter for estimation of speed. | 10 |
| 6 (a) | Draw the block diagram and explain Direct Torque Control (DTC) of 3 phase Induction Motor. | 10 |
| (b) | Explain closed loop V/f speed control of synchronous motor drives in detail. | 10 |
