

## Electrical machinery

QP Code : 12586

(3 Hours)

[ Total Marks : 60

- N.B. (1) Question No-1 is compulsory.  
 (2) Solve any three out of remaining five questions.  
 (3) Figures on right indicate full marks.  
 (4) Assume suitable data if necessary.

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| 1. | (a) Explain significance of back emf in DC motor.<br>(b) Draw the block diagram and explain v/f control using converter inverter scheme for 3 phase induction motor.<br>(c) A 230V D.C. motor has an armature circuit resistance of $0.6\ \Omega$ if the full load armature current is 30A and no-load armature current is 4A. Find the change in back emf from no load to full load. | 15     |
| 2. | (a) Draw and explain 3-point starter of DC shunt motor.<br>(b) A 6-pole lap wound shunt motor has 500 conductors. the armature and shunt Filed resistance are $.05\ \Omega$ and $25\ \Omega$ respectively. find the speed of the motor if it takes 120A from a dc supply of 100V. flux per pole is 20 mwb.  | 7<br>8 |
| 3. | (a) Explain construction and working principle of 3 phase squirrel cage induction motor.<br>(b) Draw and explain torque speed characteristic of 3 phase induction motor.  | 8<br>7 |
| 4. | (a) Explain in detail different starting methods of single phase induction motor.<br>(b) A 600W, 115V, 60 Hz capacitor start motor draws 13.8 A From the supply at rated load. if the efficiency is 65% and rated speed is 1750rpm, calculate<br>(i) Input power at rated load.<br>(ii) Power Factor at rated load.<br>(iii) Rated motor horse power.                                 | 7<br>8 |
| 5. | (a) Classify the brushless DC motor and explain in detail unipolar brushless DC motor.<br>(b) Explain construction, Working and control requirements of switched reluctance motor.  | 7<br>8 |
| 6. | Write a short note on:—<br>(a) Star-Delta starter of 3 phase induction motor.<br>(b) Different speed control methods of DC shunt motor.<br>(c) Explain the double field revolving theory in single phase induction motor.   | 15     |