Reg. No. : | | | | | | | | | | |

Question Paper Code: 46301

B.E. / B.Tech. DEGREE EXAMINATION, NOV 2018

Sixth Semester

Electrical and Electronics Engineering

14UEE601 - ELECTRIC DRIVES AND CONTROL

(Regulation 2014)

Duration: Three hours Maximum: 100 Marks

Answer ALL Questions

PART A - (10 x 1 = 10 Marks)

1. 1. ---------- consists of single motor for the entire system
   (a) Group drive (b) Individual drive (c) Multi motor drive (d) Both a & b

2. In case of centrifugal pumps the starting torque is generally
   (a) double the running torque (b) slightly more than running torque
   (c) same as running torque (d) less than running torque

3. A four quadrant operation requires
   (a) Two full converters in series
   (b) Two full converters connected in parallel
   (c) Two full converters connected in back to back
   (d) Two semi converters connected in back to back

4. In dc choppers, id Ton is on-period and f is the chopping frequency, then output voltage in terms of the input voltage Vs is given by
   (a) $V_s.T_{on} / f$ (b) $V_s.f / T_{on}$ (c) $V_s / f.T_{on}$ (d) $V_s.f.T_{on}$

5. Stator voltage control for speed control of induction motors is suitable for
   (a) fan and pump drives (b) drive of a crane
   (c) running it as generator (d) Constant load drive

6. The concept of V/f control of inverters driving induction motors results in

(a) Constant torque operation (b) Speed reversal
(c) Reduced magnetic loss (d) Harmonic elimination

7. The advantage of self control mode of a synchronous motor is

(a) High hunting Oscillations
(b) Requires Damper Winding in the synchronous motor
(c) Eliminate Stability Problem
(d) All the above

8. The advantage of a synchronous motor in addition to its constant speed is

(a) better efficiency (b) high power factor
(c) lower cost (d) Less Noise

9. Which speed control method preferred for constant torque drive?

(a) Armature voltage control (b) Mechanical loading system
(c) Rotor Resistance control (d) Field Control

10. Which of the following is preferred for automatic drives?

(a) Synchronous motors (b) Squirrel cage induction motor
(c) Ward Leonard controlled dc motors (d) Slip ring Induction Motor

PART - B (5 x 2 = 10 Marks)

11. What are the three modes of operation for electric drive?

12. What are the three intervals present in discontinuous conduction mode of single phase half and fully controlled rectifier?

13. Where is the V/f control used?

14. What is meant by margin angle of commutation?

15. What are the roles of inner current control and outer speed control loops?

PART - C (5 x 16 = 80 Marks)

16. (a) Explain the multi quadrant operation of Electric Drives with neat diagram (16)

Or

(b) Explain different types of electric braking in detail (16)

17. (a) Explain the operation of a three phase fully controlled rectifier control of dc Self excited motor. (16)

Or

(b) Explain with a circuit diagram and waveform the operation of three phase fully controlled converter fed separately excited DC motor and obtain the expression of motor speed and torque for continuous conduction mode. (16)

18. (a) Explain the stator voltage control of induction motor with necessary diagram. (16)

Or

(b) Draw and explain the block diagram of feedback vector control with rotor flux orientation. (16)

19. (a) (i) Explain the concept of open loop V\F control of synchronous motor. (8)

(ii) Explain power factor control of synchronous motor drive. (8)

Or

(b) Explain self-control technique of synchronous motor with constant margin angle control. (16)

20. (a) Derive the expression for transfer function of armature controlled DC servomotor. (16)

Or

(b) With neat diagram, explain closed loop speed control of electrical drives. (16)

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