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Reg. No. :

Question Paper Code: 54302

B.E. / B.Tech. DEGREE EXAMINATION, DEC 2021

Fourth Semester

Electrical and Electronics Engineering

15UEE402- AC MACHINES

(Regulation 2015)

Duration: Three hours   Maximum: 100 Marks

Answer ALL Questions

PART A - (10 x 1 = 10 Marks)

1. The frame of an induction motor is usually made of   CO1- R

    (a) Silicon steel   (b) Cast iron   (c) Aluminum   (d) Bronze

2. A 3-phase 440 V, 50 Hz induction motor has 4% slip. The frequency of rotor current will be   CO1- R

    (a) 50 Hz   (b) 25 Hz   (c) 5 Hz   (d) 2 Hz

3. For starting of an induction motor, star/delta starting can be considered equivalent to an autotransformer starter with the ratio of   CO2- R

    (a) 33.3%   (b) 50%   (c) 100%   (d) 57.7%

4. Rotor resistance speed control method is not applicable in   CO2- R

    (a) Slip Ring induction motor   (b) Squirrel cage induction motor

    (c) Synchronous motor   (d) None of the above

5. The main reason for voltage drop in an alternator is   CO3- R

    (a) Armature resistance   (b) Synchronous Reactance

    (c) Armature Reactance   (d) All of the above

6. The maximum power in a synchronous machine is obtained when the load angle is   CO3- R

    (a) 0 degree   (b) 120 degree   (c) 90 degree   (d) 45 degree

7. The speed regulation of a synchronous motor is   CO4- R

   (a) 100%   (b) 50%   (c) 25%   (d) 0%

8. For a synchronous motor, the breakdown torque will be proportional to   CO4- R

   (a) Applied voltage V   (b) V^2 (c) $1/V$ (d) $1/V^2$

9. The motor used for the compressors is   CO5- R

   (a) Reluctance motor   (b) Shaded pole motor

   (c) DC series motor   (d) Capacitor start-capacitor run motor

10. Which of the following motor is used in the mixer?   CO5- R

   (a) Repulsion Motor   (b) Reluctance Motor

   (c) Hysteresis Motor   (d) Universal Motor

PART – B (5 x 2= 10 Marks)

11. Define slip of the Induction motor.   CO1 R

12. Classify the types of starters in three phase induction motor.   CO2 R

13. Compare salient pole rotor and cylindrical pole rotor.   CO3 R

14. What is Synchronous capacitor?   CO4 R

15. What is universal motor?   CO5 R

PART – C (5 x 16= 80 Marks)

16. (a) (i) Explain the construction and working principle of a 3-phase   CO1- U   (8)
    Induction motor.

    (ii) Explain Torque – Slip characteristics of three phase induction   CO1- U   (8)
    motor.

    Or

    (b) Explain the construction and performance of   CO1- U   (8)

    (i) Double cage rotor

    (ii) Induction generator   CO1- U   (8)

17. (a) Describe with neat diagram the principle of working of a   CO2- U   (16)
    star – delta starter in three phase Induction motor.

    Or

    (b) Explain any two speed control method of 3phase induction   CO2- U   (16)
    motor.

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18. (a) Explain any one method of predetermine the regulation of an alternator.   CO3- U   (16)

Or

(b) Explain Blondel's two reaction theory.   CO3- U   (16)

19. (a) Explain the methods of starting the Synchronous motor.   CO4- U   (16)

Or

(b) Derive the expression for power developed by a synchronous motor with phasor diagram in terms of load angle.   CO4- U   (16)

20. (a) Explain the Double field revolving theory of operation of single phase induction motor.   CO5- U   (16)

Or

(b) Explain construction, working , characteristics and applications of   CO5- U   (8)

(i) Hysteresis motor

(ii) Reluctance motor   CO5- U   (8)

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