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

Question Paper Code: 50309

B.E. / B.Tech. DEGREE EXAMINATION, MAY 2017

Third Semester

Mechanical Engineering

15UEE323 - ELECTRICAL MACHINES

(Regulation 2015)

Duration: Three hours Maximum: 100 Marks

Answer ALL Questions

PART A - (10 x 1 = 10 Marks)

1. The number of parallel paths for a 4 pole duplex lap winding will be

   (a) 8 (b) 4 (c) 5 (d) 2

2. The terminal voltage of a D.C. shunt generator drops on load because of all of the following reasons except

   (a) Armature reaction
   (b) Armature resistance drop
   (c) Field weakening due to armature reaction
   (d) commutation

3. A transformer transforms

   (a) frequency (b) voltage (c) current (d) voltage and current

4. The essential condition for parallel operation of two 1-phase transformers is that they should have the same

   (a) polarity (b) KVA rating
   (c) Voltage ratio (d) percentage impedance

5. What is the frequency of a alternator, if P = number of poles and N = revolution made per second?

(a) PN / 2 Hz (b) 120 / PN Hz (c) 120N / P Hz (d) 120P / N Hz

6. If the excitation of the synchronous generator fails, it acts as an

(a) synchronous generator (b) synchronous motor
(c) induction motor (d) induction generator

7. A synchronous motor working at leading power factor can be used as

(a) phase advancer (b) noise generator
(c) voltage booster (d) mechanical synchronizer

8. The damping winding in a synchronous motor is generally used

(a) to provide starting torque only
(b) to reduce noise level
(c) to reduce eddy currents
(d) to prevent hunting and to provide starting torque

9. A capacitor start, capacitor run single phase induction motor is basically a

(a) ac series motor (b) dc series motor
(c) 2 phase induction motor (d) 3 phase induction motor

10. Universal motors are used on_____.

(a) both AC and DC (b) AC only (c) DC only (d) none of these

PART - B (5 x 2 = 10 Marks)

11. What are the two effects of amature reation in a DC Generator?

12. Identify the purpose of laminating the core in a transformer?

13. Draw a Torque –Speed characteristics of squirrel cage induction motor.

14. Define pullout torque in synchronous motor.

15. List the application of shaded pole motor.

PART - C (5 x 16 = 80 Marks)

16. (a) Describe the construction and working of dc generator with neat sketch. (16)

Or

(b) Enumerate the types of DC motor and their characteristics. (16)

17. (a) Sketch the equivalent circuit of transformer with referred to primary & secondary & derive the impedance ratio. (16)

Or

(b) Derive the condition for maximum efficiency in a transformer. (16)

18. (a) Explain the construction and working of three phase induction motor. (16)

Or

(b) Discuss the theory of star – delta starter. (16)

19. (a) Derive the mechanical power developed per phase of a synchronous motor. (16)

Or

(b) Discuss the various starting methods of synchronous motor with suitable diagrams. (16)

20. (a) Explicate the operation of shaded pole induction motor with diagram. (16)

Or

(b) Elucidate the different types of stepper motor and give the two applications for each one. (16)

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