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Question Paper Code: 34326

B.E. / B.Tech. DEGREE EXAMINATION, DEC 2020

Fourth Semester

Electronics and Instrumentation Engineering

01UEE426 - PRINCIPLES OF ELECTRICAL MACHINES

(Regulation 2013)

Duration: 1:15hrs

Maximum: 30 Marks

PART A - (6 x 1 = 6 Marks)

(Answer any six of the following questions)

- The relative permeability of a ferromagnetic material is
 - less than one
 - more than one
 - more than 10
 - more than 100 or 1000
- The material for brushes is generally
 - mica
 - copper
 - carbon
 - cast iron
- The all day efficiency of a transformer depends primarily on
 - its copper loss
 - the amount of load
 - the duration of load
 - both amount and duration of load
- A step up transformer increases
 - Voltage
 - Current
 - Power
 - Frequency
- _____ is called Slip speed.
 - Difference of synchronous speed and rotor speed
 - Sum of synchronous and rotor speeds
 - Half of the sum of synchronous and rotor speeds
 - None of these

6. The frequency of the rotor current in a 3Φ , 4pole, 50Hz induction motor at full load speed is about
 (a) 50 Hz (b) 20 Hz (c) 2 Hz (d) Zero
7. The purpose of starting winding in a single phase induction motor is to _____
 (a) reduce losses
 (b) limit temperature rise of the machine
 (c) produce rotating flux in conjunction with main winding
 (d) increase the efficiency
8. 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
9. Salient poles are generally used on
 (a) high speed prime movers only
 (b) medium speed prime movers only
 (c) low speed prime movers only
 (d) low and medium speed prime movers
10. A hysteresis motor
 (a) Is not a self-starting motor (b) Is a constant speed motor
 (c) Needs DC excitation (d) Cannot be run in reverse speed

PART – B (3 x 8= 24 Marks)

(Answer any three of the following questions)

11. Explain the construction and operating principle of DC generator with neat sketch. (8)
12. Explain the construction, operating principle of transformer with neat sketch. (8)
13. Derive an expression for the torque equation of a 3-phase induction motor. (8)
14. Draw the phasor diagram of a loaded alternator for the following conditions. (i) unity power factor (ii) power factor lag and (iii) power factor lead and then explain the diagram. (8)

15. Explain the principle of operation of a capacitor start and run single phase induction motor and mention its advantages.

(8)