No. of Printed Pages : 4 202442/122442/062443
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4th Sem / Mechatronics
Subject:- DC and AC Machines

Time : 3Hrs. M.M. : 100

SECTION-A

Note: Multiple choice questions. All questions are compulsory (10x1=10)

Q.1 The speed of 4 pole 60hz Synchronous machine will be (CO5)
a) 3600 rpm b) 3000 rpm
c) 2400 rpm d) 1800 rpm

Q.2 The frequency of voltage generated in large alternators in India is (CO1)
a) 0 Hz b) 230 Hz
c) 60 Hz d) 50 Hz

Q.3 Noise in an electric motor may be due to (CO3)
a) magnetic effects b) cooling
c) bearing d) all of these

Q.4 Slip rings of phase wound induction motor are made of (CO3)
a) wood b) cast iron
c) steel d) copper

Q.5 Which motor is generally used in tape recorders (CO4)
a) Hysteresis motor b) Split phase motor
c) Reluctance motor d) Universal motor

Q.25 Define power. Relation between phase voltage and line voltage for 3 phase systems. (CO1)

Q.26 Define power factor. Different types of power in detail. (CO1)

Q.27 Explain construction of D.C generator. (CO2)

Q.28 Explain single phase induction motor types. (CO6)

Q.29 Give relation between Phase current and line current in detail.

Q.30 Write a note on armature reaction of D.C. generator. (CO2)

Q.31 Explain a 3 point starter with a diagram. (CO3)

Q.32 List the various applications of synchronous motors. (CO4)

Q.33 Derive the emf equation for alternator. (CO7)

Q.34 Describe stepper motor working and their applications. (CO8)

Q.35 What is back e.m.f. Explain? (CO3)

SECTION-D

Note: Long answer type questions. Attempt any two questions out of three questions. (2x10=20)

Q.36 Explain the different methods of speed control in 3 phase induction motors. (CO4)

Q.37 Write principle, construction and working of synchronous motor. (CO5)

Q.38 Write a note on the following (CO6)
i) Servo motor
ii) Universal motor

Q.6 Various phases of a 3 phase system have a phase difference of (CO1)

a) 60^{o} b) 120^{o}

c) 90^{o} d) 180^{o}

Q.7 What will happen if the DC shunt motor is connected across the AC supply ? (CO3)

a) Will run at normal speed

b) Will not run

c) Will Run at lower speed

d) Burn due to heat produced in the field winding

Q.8 Direction of rotation of motor is determined by _____ (CO2)

a) Faraday's law

b) Lenz's law

c) Coulomb's law

d) Fleming's left-hand rule

Q.9 A universal motor is (CO6)

a) constant speed

b) constant output

c) operating on both a.c and d.c

d) maximum efficiency

Q.10 Which DC motor is generally preferred for cranes and hoists? (CO3)

a) Series motor

b) Shunt motor

c) Cumulatively compounded motor

d) Differentially compounded motor

SECTION-B

Note: Objective type questions. All questions are compulsory. (10x1=10)

Q.11 The windings of the motor are made of_____ (CO3)

Q.12 Induction motor cannot run at _____ speed. (CO4)

Q.13 The yoke of a small d.c. machine made of_____ (CO2)

Q.14 D.C. motor starter is used to _____ the starting current. (CO3)

Q.15 Write a formula for synchronous speed. (CO5)

Q.16 Define power factor. (CO1)

Q.17 Unit of Apparent power is_____ (CO1)

Q.18 Phase current is _____ times line current in 3 phase systems. (CO1)

Q.19 Universal motor has _____ brushes. (CO6)

Q.20 Ceiling fans use_____ motors. (CO8)

SECTION-C

Note: Short answer type questions. Attempt any twelve questions out of fifteen questions. (12x5=60)

Q.21 State Fleming's left hand rule and right hand rule. (CO2)

Q.22 Write down advantages of a three phase system over a 1-phase system. (CO1)

Q.23 How the concept of slip works in Induction motors. (CO4)

Q.24 Draw different characteristics for the D.C. shunt motor. (CO3)