Q.26 Explain the starting method of single-phase induction motor in brief.
Q.27 Explain the effect or rotor resistance on torque in induction motor?
Q.28 Write a short note on D.C motor.
Q.29 Explain the construction and working of 3-pointer starter.
Q.30 Give relation between phase voltage and line voltage in detail.
Q.31 Draw and explain speed torque characteristics of D.C motor.
Q.32 Give the applications of Universal motor.
Q.33 What is the effect of load on a synchronous motor when field excitation is kept constant?
Q.34 Describe the various losses in d.c generator
Q.35 Explain the main parts of induction motor.

SECTION-D

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

Q.36 Define stepper motor. Explain its various types and also give their working?
Q.37 Explain the principle construction and working of Universal motor with the help of diagram?
Q.38 Explain the working principle and construction of DC motor with suitable diagram?

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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 In a 3-phase, balanced load, the power consumed is given by relation_____
a) $3V_L . I_L \cos\phi$ b) $\sqrt{3} V_L . I_L \cos\phi$
c) $\sqrt{3} V_{ph} . I_{ph} \cos\phi$ d) $3V_L . I_L$

Q.2 The yoke of d.c machine is made of
a) silicone steel b) soft iron
c) aluminium d) caste steel

Q.3 Synchronous speed is given by the equation_____
a) $N_s = 120 f / P$ b) $N_s = 120 f / P^2$
c) $N_s = 120 f^2 / P$ d) $N_s = 120 f^2 / P^2$

Q.4 What is the reason behind the armature structure for both AC and DC machines being laminated?
a) reduce i^2R losses
b) reduce the leakage flux
c) reduce the eddy current losses
d) for better operating power factor

Q.5 The direction of rotation of a d.c. shunt motor can be reversed by interchanging_____

a) The supply terminals
b) the field terminals only
c) the armature terminals only
d) either field or armature only

Q.6 The difference between the synchronous speed and the actual speed of an induction motor is
a) regulation b) slip
c) lag d) lead

Q.7 Speed of the universal motor is_____
a) Dependent on frequency of supply
b) Proportional to frequency of supply
c) Independent on frequency of supply
d) All of the above

Q.8 Capacitor run motor will have relatively _____ power factor.
a) very low b) low
c) high d) none of the above

Q.9 Power factor is a ratio of_____
a) Apparent power to true power
b) Sum of real and reactive to apparent power
c) True power to apparent power
d) Apparent power to (real-reactive) power

Q.10 In Lap winding, the number of brushes is always _____ the number of poles.
a) Double b) same as
c) half d) None of the above

SECTION-B

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

Q.11 Define the line voltage?
Q.12 Why is starter used in DC motor?
Q.13 Name the material used for the frame of induction motor.
Q.14 What is servo motor?
Q.15 What is alternator?
Q.16 What is effect on power factor when load current decreases?
Q.17 Define back EMF.
Q.18 What is the function of commutator?
Q.19 Name the different method of speed control of Universal motor.
Q.20 Give the two applications of Servo Motor.

SECTION-C

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

Q.21 Give advantages of three phase system over single-phase system in detail.
Q.22 Define power factor and give importance of power factor in detail.
Q.23 Explain armature reaction in DC Generator.
Q.24 Explain any one method of speed control of DC motor.
Q.25 Give the EMF equation of alternator in detail.