B. E. SEM V (ELECTRICAL ENGINEERING) Question Bank

(ELEMENTS OF ELECTRICAL DESIGN & COSTING)

All questions carry equal marks(10 marks)

Q.1	Explain Short Note on: Real and apparent flux density.
Q.2	What is Carter's Coefficient? How does the radial duct either on stator or rotor affect the air gap mmf? The following design data pertains to a 90 KW, 1500 rpm dc motor: average air gap flux density = 0.5 T; field form factor= 0.65; armature diameter = 40 cm; armature length = 20.42 cm, length of air gap = 4 mm; number of ducts = 2 with width = 5.2 mm, Carter's coefficient for ducts = 0.32, for slots = 0.41, number of slots = 40, opening of the slot = 14.5 mm; estimate the mmf required for the air gap.
Q.3	How is the apparent flux density for a highly saturated tooth of an armature tooth of an armature core corrected to obtain the true density? Explain in detail.
Q.4	Calculate the apparent flux density at a section of the teeth of an armature of a dc machine from the following data at that section: Slot pitch = 20mm; Slot width= 11mm; Length of armature core including 10 ducts each 8 mm= 95mm; Stacking factor = 0.9; Real flux density at that section = 2.2 T for which the MMF is 65000A/m;
Q.5	Find out the true density in the case when the apparent density is 2.23 T, the effective slot pitch = 2.8 cm, the slot width = 1 cm the gross length = 35 cm the number of the ducts = 5 each of 1 cm wide and the iron space factor=0.89. Details of magnetization curve for the material used are: AT/cm 50 100 200 300 400 500 600 700 800 900 1000 B (T) 1.7 1.84 1.96 2.04 2.09 2.13 2.16 2.18 2.20 2.22 2.23
Q.6	Estimate the mmf required for the air gap of a dc machine having open slot given the following particulars: Slot pitch =4.3 cm; slot opening =2.1 cm; Gross length of the core =50 cm; pole arc =18 cm; Air gap length =0.58 cm flux per pole =56 mWb; There are 6 ventilating ducts each 1 cm each. Ratio slot opening/gap length 1 2 3 3.5 4.0 Carter's coefficient 0.15 0.28 0.37 0.41 0.43 The above data may be used for ducts also.
Q.7	Calculate the air gap length of a dc machine from the following particulars: gross length of core = 0.12 m; number of ducts = one and is 10 mm wide ; slot pitch = 25 mm ; slot width = 10 mm carter's coefficient for the slots and ducts = 0.32 ; gap density at pole center = 0.7 Wb/ b2 , field mmf per pole = 3900 A mmf per pole = 3900 A , mmf required for iron parts of magnetic circuit = 800 A.
Q.8	Estimate the effective gap area per pole of a 12-pole induction motor with a bore of 90 cm, core length 25 cm, 108 stator slots with 3 mm opening, 144 rotor slots with 1.8 mm opening and gap length 1 mm. The carter's coefficient is given by above table.
Q.9	Classify Electromagnets and state various applications of it.

Q.10	Explain steps for designing of small Flat-faced armature.
Q.11	Calculate the MMF required for the air gap of a machine having following data: Gross core length = 300mm; Number of ducts = 5; Width of each duct = 12 mm; Pole arc = 180 mm; Slot pitch = 64 mm; Slot opening = 6 mm; Air gap length = 4 mm; Flux per pole = 40 mWb; Given Carter's coefficient is 0.3 for slot opening /gap length =1.5 and is 0.4 for duct opening/gap length =2.5.
Q.12	Explain steps for designing of Horse shoe type magnet.
Q.13	Explain steps for designing of plunger type magnet.
Q.14	Explain design steps of magnetic clutches.
Q.15	Describe the design steps for DC starter.
Q.16	**Explain** Design of Small single-phase transformers
Q.17	Explain Design of welding transformers
Q.18	Explain Design of variable air gap single-phase choke coil
Q.19	Explain Design of variable air gap three-phase choke coil
Q.20	Explain Design of ballast
Q.21	Explain electric wiring of a Hostel which has two floors.
Q.22	Explain common layout of electrical wiring diagram – including the distribution board and main board.
Q.23	How can one estimate the fuse rating of a Bungalow? Estimate fuse rating of your own house?
Q.24	Explain wiring of a multistory building with suitable example.
Q.25	Explain various symbols of electrical wiring design.
Q.26	Explain various illumination schemes.
Q.27	Explain various types of loads.
Q.28	Explain various electrical supply systems.
Q.29	Explain the selection of permissible voltage drop and conductor size during design of an electric wiring.
Q.30	Explain the need of earthing at domestic level.
Q.31	Write a detail note on street lighting.
Q.32	Write a detail note on the lighting scheme.
Q.33	Compare indoor and outdoor substations. Also list the equipments used in substations.
Q.34	Explain and draw the layout of a substation of 11kv.
Q.35	What are the normal ratings of the lamps and streetlights? Explain each in detail.
Q.36	What are the general problems with lamps? State their remedies.