WikiEd

Roll No. ☐☐☐☐☐☐☐☐☐☐☐☐☐   Total No. of Pages : 02

Total No. of Questions : 09

B.Tech. (Electrical & Electronics Engineering)/(Electrical Engg.) (Sem.–4)
ELECTRICAL MACHINES-II
Subject Code : BTEE-402-18 M.Code : 77607
Date of Examination : 05-07-22

Time : 3 Hrs.   Max. Marks : 60

INSTRUCTIONS TO CANDIDATES :
1.   SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2.   SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
3.   SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

SECTION-A

1.   Answer the following in short :

a)   Use diagrams to show the difference between a full-pitched and short-pitched coil. Also, indicate the coil side and the overhangs on it.

b)   The double layer winding is preferred over a single layer winding. Why?

c)   In case of three-phase induction motor, what is (i) the speed of rotor field (ii) the speed of stator speed (iii) the relative speed between the stator field and rotor field (iv) relative speed between the rotor field and the rotor.

d)   What material are the following parts of a three-phase induction motor made up of (i) stator and rotor core (ii) windings (iii) brushes (iv) frame.

e)   Define :
          (i) synchronous reactance (ii) plugging.

f)   What are the advantages of connecting a large number of synchronous generators in parallel to supply a common load?

g)   How do the salient pole and cylindrical pole type of rotor used in alternators differ?

h)   What is crawling in 3-phase induction motors?

i)   Why is a single phase induction motor not self-starting?

j)   When the speed control is done by using cascade connections, what are the four different possible synchronous speeds?

SECTION-B

2.   What are the advantages of a rotating filed system as compared to stationary field system.

3.   Using the double revolving theory prove that the field produced in single-phase induction motor is pulsating.

4.   Elaborate upon the phenomenon of armature reaction in a synchronous machine. Also, discuss armature reaction at different power-factor loads.

5.   A three-phase induction motor has a 4-pole star-connected stator winding. The motor runs at a line voltage of200 V, SO Hz supply. The rotor resistance and standstill reactance per phase are 0.1 and 0.9 ohm respectively. The ratio of rotor to stator turns is 0.67. Calculate the total torque at 4% slip.

6.   Name the different starters used for three phase induction motor. Discuss any two.

SECTION-C

7.   When a three-phase supply is given to a three windings that is spatially shifted by 120 degrees, prove that the electromagnetic field produced is revolving.

8.   Compare a three-phase synchronous machine and three-phase induction motor in detail.

9.   Two alternators A and B operate in parallel and supply a load of 8MW at 0.8pf lagging. The power output of A is adjusted to 5 MW by changing its steam supply and its *pf* is adjusted to 0.9 lagging by changing its excitation. Find the *pf* of alternator B.

NOTE : Disclosure of Identity by writing Mobile No. or Making of passing request on any page of Answer Sheet will lead to UMC against the Student.