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C09–EE–402

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BOARD DIPLOMA EXAMINATION, (C–09)
OCT/NOV—2018
DEEE—FOURTH SEMESTER EXAMINATION

A.C. MACHINES-I

Time : 3 hours] [*Total Marks* : 80

PART—A 3×10=30

Instructions : (1) Answer **all** questions.
(2) Each question carries **three** marks.
(3) Answers should be brief and straight to the point and shall not exceed *five* simple sentences.

1. Draw the phasor diagram of single phase transformer when it is supplying leading power factor load.

2. Distinguish between core type and shell type transformers.

3. Define voltage regulation of single phase transformer.

4. State any three advantage of three phase transformers over bank of three single phase transformers.

5. State any three advantages of auto transformer.

6. State the necessity of cooling of power transformers.

7. State the working principle of an alternator.

8. Compare salient pole type rotor with cylindrical type rotor in any three aspects.

9. Define pitch factor of an atternator.

10. What is the necessity for parallel operation of alternators.

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PART–B

10×5=50

Instructions : (1) Answer *any* **five** questions.
(2) Each questions carries **ten** marks.
(3) Answers should be comprehensive and the criteria for valuation are the content but not the length of the answer.

11. (a) Derive the E.M.F equation of a single phase transformer.

(b) A10 KVA , 2200/220V, 50Hz single phase transformer has a net core area of 300 cm^2 and a maximum flux density of 1.5wb/m^2. Calculate the number of turns in primary and secondary winding.

12. A 400/200V single phase transformer is supplying a load of 25 A at a power factor of 0.866 lagging. On no load the current and the power factor are 2A and 0.208 lagging respectively. Find the primary current and power factor.

13. Explain the construcion and working of single phase transformer with neat sketch.

14. A 10 KVA 450/120 V, 50 Hz transformer gave the following test results :

OC rest: 120 V, 4.2 A, 80 W..L.V side

SC test: 9.65 V, 22.2A, 120W,,,H.V side

Calculate the efficiency and voltage regulation for 0.8 p.f lagging at full load.

15. State the location and function of (a) Breather, (b) Explosion vent, (c) Conservator, (d) Oil level indicator in a transformer.

16. (a) Derive the E.M.F equation of an alternator.

(b) Calculate the e.m.f induced per phase in a three phase, 8-pole, 50Hz, star connected alternator . The stator has 160 slots and 6 conductors per slot. Assume K_p=1 and K_d=0.96. The flux per pole is 0.16 wb.

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17. Explain with neat diagram the procedure to conduct open circuit test and short circuit test on three phase alternator and draw its characteristics.

18. Define synchronisation and draw a neat sketch showing the connections to synchronise the alternators using lamp method.

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