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FOURTH SEMESTER B.TECH. (09 SCHEME) (ENGINEERING) DEGREE EXAMINATION, APRIL 2015

EE 09 404/PTEE 09 403—D.C. MACHINES AND TRANSFORMERS

Time : Three Hours   Maximum : 70 Marks

Part A

All *questions are* **Compulsory.**
Each question carries 2 marks.

1. What is the role of dummy coils in a wave-wound d.c. machine ?

2. Explain critical resistance of a d.c. generator.

3. What are the different losses in a d.c. generator ?

4. Why are the brushes given a backward shift in a d.c. motor ?

5. How are the high voltage and low voltage coils arranged in a transformer with respect to core and why ?

                                                                    $(5 \times 2 = 10$ marks$)$

Part B

Answer any **four** *questions.*
Each question carries 5 marks.

6. Compare lap and wave windings of a d.c. machine.

7. What are equalizer rings ? Where is it used and why ?

8. What is the role of compensating windings in d.c. machines ? How is it connected in d.c. machines ?

9. Explain the applications of d.c. generators.

10. What is the significance of back emf in a d.c. motor ?

11. Explain why d.c. series motor is never started on no load.

12. Define voltage regulation of a transformer. Derive the expression for power factor at zero voltage regulation.

                                                                    $(4 \times 5 = 20$ marks$)$

Part C

13. With neat sketch, explain the construction of a d.c. machine.

                                              Or

14. (a) Explain the difference between Dynamically and Statically induced emfs.   (5 marks)

    (b) Write short notes on magnetic hysteresis and hysteresis loss.   (5 marks)

                                                                    Turn over

15. Define Commutation. Explain the different methods of improving commutation.

Or

16. Explain armature reaction in a d.c. generator. Derive the expressions for cross magnetising and demagnetising ampere turns in a d.c. generator.

17. Explain retardation test on d.c. machines. Also explain how the moment of inertia of armature can be found out using this test.

Or

18. Explain in detail the different speed control methods of d.c. shunt motor.

19. Explain how 3-phase to 3-phase transformation is possible with the help of two transformers.

Or

20. Explain in detail with sketches the construction of single-phase transformers.

(4 × 10 = 40 marks)