

EEM32 - Electrical Machines - I

725 /

REG. NO

OCTOBER 2021

Time: Three hours

Maximum Marks: 75

- Note:
1. Answer ALL the questions in PART-A (1 mark each)
 2. Answer any ONE question from each unit in PART-B (3 marks each)
 3. Answer any ONE question from each unit in PART-C (10 marks each)
 4. The question paper contains TWO Pages

PART-A (1x10=10)

1. Define Magnetic field strength.
2. State lenz's law.
3. What are the two types of armature winding?
4. Why the armature core of a DC machine is laminated?
5. Write the expression for back emf of a dc motor.
6. Name the two protective devices used in a three point starter.
7. What are the equivalent circuit constants of a transformer?
8. What is all day efficiency?
9. Mention the different connection of three phase distribution transformer.
10. Why cooling is necessary in transformers?

PART-B (3x5=15)

UNIT-I

11. Derive the force on a current carrying conductor lying in a magnetic field.
12. State Fleming's Right Hand Rule.

UNIT-II

13. What are the conditions to be fulfilled for a self-excited DC generator to build up voltage?
14. What are the effects of armature reaction in a dc generator?

UNIT-III

15. State the difference between dc shunt and series motors.
16. List the applications of dc motors.

UNIT-IV

17. Draw the no load vector diagram of single phase transformer.
18. Derive the conditions for maximum efficiency of a transformer.

UNIT-V

19. What are the conditions for parallel operation of three phase transformer?
20. What is meant by acidity of transformer oil?

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PART-C (10x5=50)

UNIT-I

21. Derive the lifting power of an electro magnet.
22. State and explain Faraday's laws of electromagnetic induction.

UNIT-II

23. Derive an expression for emf induced in a dc generator.
24. Explain the load test on dc shunt generator to plot its internal and external characteristic curves.

UNIT-III

25. Explain how speed control of a dc shunt motor can be achieved by armature control and field control.
26. A 220V DC shunt motor takes 3A at rated voltage on no load. Armature and field resistances are 0.5Ω and 220Ω respectively. Calculate the efficiency of the motor for a load current of 50A.

UNIT-IV

27. Explain the step by step procedure to draw an equivalent circuit of a transformer.
28. Derive how the copper is saved in auto transformer than two winding transformer.

UNIT-V

29. Explain the operation of i) bucholz relay and ii) breather.
30. Explain with a neat diagram the working of ON-load tap changer.
