Important Questions

Unit – 1

1. Draw a neat sketch of a dc generator. state the function of each part.

   or Discuss the construction part of dc generator with its function.

2. State the principle of operation of d.c generator.

   or Explain the working principle of dc generator.

3. Describe a d.c generator. How many types of dc generator. Write short-notes on each type.

4. Discuss the classification of dc generator.

5. Derive the e.m.f equation of a dc generator.

6. Explain the type of armature winding.

7. Explain the term 'Lap winding' and "Wave winding" with neat sketches.
8. Differentiate between lap and wave winding.
9. What is armature reaction? Describe the effect of armature reaction on the operation of dc generator. How is the armature reaction minimised

10. What is commutation in a dc generator? Describe the various method of improving commutation.
11. Explain the methods of improving commutation?
12. State the application of different type of dc generator.

13. Explain the classification of measuring instruments.

or What is meant by (i) an indicating type instrument (ii) an integrating type instrument and (iii) recording type instrument ? Give an example of each.

14. What is demagnetisation and cross-magnetisation effect.

Numerical

1 Calculate the emf generated by 4-pole wave wound generator having 65 slots with 12 conductor per slot when driven at 1200 r.p.m. The flux per pole is 0.02 Wb.

2. A 6-pole lap-wound dc generator has 600 conductors on its armature. The flux per pole is 0.02 Wb. Calculate (i) the speed at which the generator must be run to generate 300 V (ii) What would be the speed if the generator ~~wave~~

were wave – wound ?

3. An 8-pole, lap-wound armature rotated at 350 r.p.m is required to generate 260 V. The useful magnetic flux per pole is 0.05 Wb. If the armature has 120 slots, calculate the number of conductor per slot.

4. A 6 pole machine has an armature with 90 degree slots and 8 conductors per slot and runs at 1000 rpm, the flux per pole is 0.05 Wb. Determine the induced emf if winding is (a) lap connected (b) wave connected.

5. An 8-pole generator has a flux of 40 mWb per pole and a lap connected armature with 960 conductors. Calculate the generated e.m.f on open circuit when it runs at 400 r.p.m, if the armature were wave connected, at what speed

must the machine be driven to generate the same voltage?

6. A series generator supplies a load of 50 kW at 200V. If the resistance of the armature and the series field are 0.04 Ω and 0.02 Ω respectively, find the generated e.m.f.

7. A long-shunt compound generator has a full-load output of 75 kW at 250V. If the armature resistance is 0.075 Ω, the series field resistance 0.025 Ω and the shunt field resistance 50 Ω, find

(a) Armature current

(b) E.M.F generated.

8. A shunt generator supplies 96 A at a terminal voltage of 200 volts. The armature and shunt field resistance are 0.1 Ω and 50 Ω respectively. The iron and friction losses are 2500 W. Find (i) e.m.f generated (ii) copper losses (iii) commercial efficiency.

Unit 2

1. State the types of dc motor.
   or Describe the dc motor. Also explain the types of dc motor.
2. Explain the working principle of DC motor ?
3. What is back e.m.f and its significance in a dc motor ?
4. State the voltage equation of DC motor.
5. Derive the armature torque and shaft torque equation of a DC motor.
6. Define and derive brake horse power (B.H.P)
7. Define efficiency and find the condition for maximum efficiency of a dc generator.
8. What is the necessity of a starter in a dc motor ?
9. Explain with neat sketch the working and function of two point starter ?
10. Explain with neat sketch the working and function of three point starter ?

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11. Explain the speed control of dc shunt motor ?

12. Explain the methods of controlling the speed of a dc series motor.

13. What are the application of DC motors ?

14. Discuss the construction and working of brushless dc motor with advantages disadvantages and application.

15. Numerical done in class and given in question bank (only basic numerical).

Unit 3

1. What is a single phase transformer? How transformer are classified on the basis of construction.

or How transformer are classified on the basis of core construction? Explain in brief with rough sketches.

2. Explain the construction and function of each part of a transformer with neat sketch.

or State the basic component part of transformer?

3. Define conservator, tank, breather and explosion.

4. Explain the working principle of transformer.

~~or Principle~~

5. What is transformer? Derive and e.m.f equation for a single phase transformer and deduce expression for transformation ratio.

6. Why is the transformer core laminated? Explain.

7. What is transformer ratio or turn ratio? What is its significances?

8. Draw a no-load phasor diagram of a transformers and explain the function of the no load current.

or Draw and explain the no load phasor diagram of a 1-ϕ transformer. Discuss how primary leakage flux is accounted for in the phasor diagram.

9. Draw and explain the phasor diagram of a single ~~phase~~ phase transformer under lagging power factor.

10. Draw a on load phasor diagram of a transformer and explain the function of the no load current.

or Draw and explain the on load phasor diagram of a 1-phase transformer.

11. Write short notes on leakage reactance.

12. Develop the equivalent circuit of a transformer and draw the complete phasor diagram of the transformer on load with different power factor.

13. Define voltage regulation of a transformer. Develop an expression for calculating the voltage regulation of a two winding transformer under (i) lagging p.f (ii) unity p.f and (iii) leading p.f

14. State the condition of minimum or zero voltage regulation and maximum voltage regulation.

15. Describe the test for finding the efficiency and regulation of a transformer by direct loading. Why this test is normally conducted in case of small transformers only ?

16. How the short circuit test in a transformer is carried out? Explain with necessary diagram?

<u>OR</u> Explain how equivalent circuit parameters are determined from O.C test and S.C test.

<u>OR</u> Draw the connection diagram for open circuit and short circuit tests of a single phase transformer showing all necessary instruments. Explain briefly how would you perform the above tests.

17. Write an expression for efficiency and develop a condition for maximum efficiency.

18. Numerial done in class and question bank.

Unit – 4

1. What is three phase transformer ? What is the difference between a 3 phase transformer bank and a 3-phase transformer unit ?
2. What are the advantages of a three phase unit single unit transformer over three single phase transformer bank of the same kVA rating ?
3. What are the advantages of a transformer bank of three 1- phase transformer over a unit three phase transformer of the same kVA rating.
4. Explain the construction of 3-phase transformer.
5. List the advantages and disadvantages of three phase transformer.
6. Explain distribution transformer and power transformer.
7. Distinguish between power transformer and distribution transformer.

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8. What is cooling of transformers? State the methods.

9. Explain the different connection of ~~three~~ three phase transformer with merits of the particular combination.

10. Draw the scott connection of transformers and mark the terminals and turn ratio. What are the application of Scott connections?

<u>or</u> Explain with the help of connection and phasor diagrams, how scott connections are used to obtain two phase supply from 3-phase supply mains.

11. State the criteria for selection of distribution transformer as per IS 10028 (part 1) : 1985 ?

12. State the criteria for selection of power transformer as per IS 10028 (part 1) : 1985?

13. Explain amorphous core type distribution transformers with its advantages. ?

14. Give the specification of three phase distribution transformer as per IS 1180 (part 1) : 1989 ?

15. What is parallel operatio of transformers? Also state their need.

16. State the condition for parallel operation of single and three phase transformer.

17. Explain the polarity test and phasing out test of a three phase transformer ?

~~18.~~ ~~Numerica~~ Basic numerical

Unit - 5

(15)

1. Explain the construction, working and applications of a single phase ~~transformer~~. autotransformer

2. State the advantages and disadvantages of autotransformer.
3. Explain the construction, working and application of three autotransformer.
4. State the advantages and disadvantages of three phase autotransformer.
5. What are the instrument transformer ? How many types of instrument transformer.
6. Explain current transformer with neat sketch ?
7. Explain potential transformer with neat sketch.
8. Compare potential and current transformer.
9. Explain Isolation transformer with neat sketch.

10. Write short notes on Welding transformer

11. Draw schematic diagram of a welding transformer showing constructional features of a welding transformer. Also explain its working.

12. What is pulse transformer? State its feature, performance with input-output waveforms and its application.