

**ANNA UNIVERSITY - QUESTION BANK**

**UNIT – I  
PART – B  
[GENERATORS]**

1. Explain in detail about the constructional details of DC machine.
2. Derive the e.m.f. equation of DC Generators
3. Draw and explain All the characteristics of DC generator
4. Explain in details about Classification of the generators based on the Excitations

**[MOTORS]**

5. Derive the torque equation of dc motors
6. Write down the significance of back e.m.f
7. Write down the principle of operation of DC motor.
8. Draw and explain the characteristics of DC motor.
9. Draw and explain the working of 3 point starter for Dc motors
10. Explain the functions of NO- volt coil and over load relays
11. Draw and explain the speed control methods of DC motor.
12. Explain in detail about the ward-leonard system of speed control of DC motor?
13. Explains the Swinburne's test. to predetermine the efficiency of Dc Machines
14. Explains the Brake test to determine the efficiency of Dc Machines

**15. Problems**

**[Refer the problem type only asked in the university for the past 5 Years]**

### PART – A

1. Define electric motor.
2. Define electric generator.
3. Define excitation.
4. What are the methods of excitation?
5. What do you mean by self excited machine?
6. What do you mean by separately excited machine?
7. State the function of commutator.
8. What do you mean by commutation?
9. What is the purpose of brushes?
10. By which material yoke can be manufactured?
11. Why the brushes are made upon carbon?
12. What are the types of self excited generator?
13. Define shunt generator.
14. Define series generator.
15. Define compound generator.
16. Draw the open circuit characteristics of dc separately excited generator.
17. What do you mean by magnetization curve?
18. Draw the load characteristics of separately excited dc generator.
19. Draw the characteristics for DC shunt generator.
20. Draw the characteristics of DC series generator.
21. Draw the characteristics of DC compound generator.
22. What is the principle of operation of dc generator?
23. Write down faraday's law of electromagnetic induction.
24. What is the principle of operation of DC motor?
25. State lenz's law.
26. How Lenz's law is helpful for the operation of DC motor?
27. Write the significance of back e.m.f.

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28. Define back e.m.f.
29. Write the e.m.f. equation of DC generator.
30. Write down the voltage equation of DC motor.
31. Write the torque equation of DC motor.
32. Draw the characteristics of DC shunt motor.
33. Draw the characteristics of DC series motor.
34. Draw the characteristics of DC compound motor.
35. Differentiate differentially compound and cumulatively compound motor.
36. What are the applications of DC shunt motor?
37. What are the applications of DC series motor?
38. What are the applications of DC compound motor?
39. Why shunt motor is called as constant speed machine?
40. Why starter is needed in DC motor?
41. What is the advantage of 4 point starter over 3 point starter?
42. State the function of no volt coil.
43. State the function of over load release.
44. What is the advantage of conducting Swinburne's test?
45. Draw the diagram of ward-leanord system of speed control.
46. By which method, we can control the speed of the motor below the base Speed?
47. By which method, the speed control of the DC motor be above the base Speed?
48. What are the various methods of speed control of DC motor?
49. Differentiate armature voltage control method and field flux control Method.
50. What do you mean by brake test?

**UNIT – II**

**PART – B**

1. Explain the construction & working principle of transformers
2. Derive the EMF equation of transformers
3. Draw the phasor Diagram & explain the operation of practical Transformers on load

**(Or)**

Draw the vector diagram of ideal transformers on Resistive, Inductive and capacitive load

4. Draw the phasor Diagram & explain the operation of practical Transformers on **NO** load
5. Draw the Approximate Equivalent circuit of transformers and identify The various parameters while referring to primary or secondary side
6. Define voltage regulations & derive their expressions of them.
7. Explain in details about the OC & SC tests of transformers
8. Problem.

**[Refer the problem type only asked in the university for the past 5 Years]**

**UNIT – II**

**PART – A**

1. State the principle of operation of transformer.
2. What are the types of transformer according to its construction?
3. Differentiate core type transformer and shell type transformer.
4. Write down the e.m.f equation of transformer.
5. Write down the transformation ratio.
6. Define magnetizing current component.
7. Define working current component.
8. Draw the vector diagram of transformer of an no load.
9. How the resistance of the secondary be referred in the primary?
10. Draw the approximate equivalent circuit of the transformer.
11. Draw the vector diagram for the transformer under resistive load.
12. Draw the vector diagram for the transformer under inductive load.
13. Draw the vector diagram of the transformer under comparative load.
14. When the transformer is said to be ideal?
15. Define voltage regulation of transformer.
16. Define voltage regulation up.
17. Define voltage regulation down.
18. By conducting no load test, which losses can be found out?
19. Which losses can be found out by conducting short circuit test?
20. What are the tests to be conducted on the transformer?

**UNIT – III**

**PART – B**

**[3PHASE INDUCTION MOTOR.]**

1. Explain the constructional & working principle's of 3phase induction motor.
2. Draw the Approximate Equivalent circuit of 3phase induction motor and Identify the various parameters while referring to stator or rotor side
3. Draw the speed –torque characteristics of an induction motors and Explains Their different operating modes
4. Derive the performance calculation based on torque slip characteristics' of 3 Phase induction motors

**[STARTING & SPEED CONTROL OF PHASE INDUCTION MOTOR.]**

1. Explain the necessity of starters of induction motors **[5 types]**
2. Explain the speed control methods of 3 phase induction motors
3. Explain the constructional & working principle's of 1 phase induction motor
4. Explain the different starting methods of 1 phase induction motors

### PART – A

1. Write the working principle of induction motor.
2. How RMF is produced with the help of 3 phase supply?
3. Define slip.
4. Write the working principle of 3f induction motor.
5. Why 3f induction motor is called as rotating transformer?
6. Can the rotor speed of induction motor be synchronous speed?
7. What are the types of induction motor?
8. Write down the torque equation of 3f induction motor.
9. Draw the slip-torque characteristics.
10. Draw the speed-torque characteristics.
11. State the relation between  $P_2$ ,  $P_c$  and  $P_m$ .
12. Draw the Power flow diagram of 3 phase induction motor.
13. Draw the equivalent circuit of 3 f induction motor.
14. Why starter is necessary in AC induction motor?
15. What are the types of starters available to start 3 f induction motor?
16. Why single phase induction motor is not self starting?
17. How single phase induction motor is made to start?
18. How the rotor is classified in 3f induction motor?
19. How Rmf is produced in the stator of the induction motor
20. What is Rmf?

**UNIT IV**

**PART – B**

**[SYNCHRONOUS]**

1. Expalin in details about the construction of brushless alternators or Generators
2. Derive the EMF equations of Alternators
3. Write down the procedure of finding voltage regulation of alternator using Synchronous impedance method [EMF method]
4. Write down the procedure of finding voltage regulation of alternator using Ampere-turn-method [MMF method]
5. Explain in details about the working principle of synchronous motors
6. Discuss the procedure for starting an synchronous motor.

**[SPECIAL MACHINES]**

1. Discuss the principle of operation of hysteresis motor.
2. Discuss the principle of operation of reluctance motor.
3. Discuss the principle of operation of stepper motor. And Explain their types



### PART – A

1. What are the types of synchronous machines?
2. What is the basic principle of operation 3f alternator?
3. Why stationary armature is there in 3f alternator?
4. Write down the e.m.f. equation of alternator.
5. What are the types of 3 f alternator?
6. Define voltage regulation of alternator?
7. What are the methods to find out voltage regulation?
8. Why a synchronous impedance method is called as pessimistic method?
9. What are the methods to find out voltage regulation
10. Why synchronous impedance method is called as pessimistic method?
11. Define synchronous impedance.
12. Why ampere-turns method is called as optimistic method?
13. Draw the phasor diagram for voltage regulation in synchronous Impedance method.
14. How emf is induced in brushless alternator?
15. What is the function of rotating diode assembly in brush can alternator?
16. What do you mean by brushless excitation?
17. How reluctance motor is running?
18. What is the operating principle of hysteresis motor?
19. What are the types of stepper motor?
20. How do you find step angle in stepper motor?
21. Give the application of stepper motor.
22. Derive the emf equation of alternator.
23. Write down the procedure of finding voltage regulation of alternator using Synchronous impedance method.

24. Write down the procedure for finding voltage regulation using ampere-Turns method.
25. Explain in detail the construction of synchronous machine.
26. Write short notes on (i) Brushless alternator (ii) Reluctance motor (iii) Hysteresis motor (iv) Stepper motor.

### UNIT V

#### **PART – B** **[TRANSMISSION]**

1. Explain in detail, about the single line diagram of electrical power system.
2. Explain in details about the method of Generating power
3. Explain in details about the types of transmissions [EHV AC & EHV DC]

#### **[DISTRIBUTION]**

4. What is distribution & explain their classification based on AC & DC
5. Explain in detail about the DC distribution systems based on the Connections schemes
6. Write short notes as (i) Insulators (ii) cable
7. What is substations and classify their each one of them

### PART – A

1. What are the various sources of electric power generating system?
2. What is the purpose of step up transformer in electrical power system?
3. What do you mean by carona loss?
4. What is meant by Ferranti effect?
5. What are the advantages of AC transmission?
6. What are the advantages of DC transmission?
7. What are the types of distribution system?
8. What is EHVAC?
9. Define EHVDC.
10. What is the purpose of circuit breakers?
11. Define insulators.
12. Why the transmission is done through underground cable?
13. What are the advantages of underground cables?
14. What are the types of underground cables?
15. What are types of insulators?
16. What is pin insulator? Where it is used?
17. What is stay insulator? Where it is used?
18. What are the purposes of insulator?
19. Define service mains.
20. Define grid.
21. Differentiate feeders and distributors.