



SIDDHARTH GROUP OF INSTITUTIONS :: PUTTUR
Siddharth Nagar, Narayanavanam Road – 517583

QUESTION BANK (DESCRIPTIVE)

Subject with Code : EM-I(16EE211)

Course & Branch: B.Tech - EEE

Year & Sem: II B.Tech & I Sem

Regulation: R16

UNIT – I

ELECTROMECHANICAL ENERGY CONVERSION

1. Derive the expression for Torque in a multi excited field system? [L4] 10M
2. Explain field energy and co-energy in a singly excited system in magnetic system? [L2] 10M
3. Explain the principle of energy conversion of an electromechanical system? [L2] 10M
4. Explain energy and co-energy densities in a singly excited system in magnetic system? [L1] 10M
5. Derive the expression for force of a singly excited toroid in a magnetic field system? [L4] 10M
6. Write energy balancing Equation? [L1] 10M
7. Draw the concept map of electro mechanical system? [L1] 10M
8. Derive the dynamic equations of an electromechanical system? [L4] 10M
9. Explain torque in a singly excited system in magnetic system? [L2] 10M
10. a) Write energy balancing Equation. [L1] 2M
 - b) What is excitation? [L1] 2M
 - c) Write the formula for energy stored in electro mechanical system? [L1] 2M
 - d) Define M.M.F? [L1] 2M
 - e) Define reluctance? [L1] 2M

UNIT –II**D.C GENERATORS**

1. Explain the basic principle of operation of a DC Generator with a simple loop generator?[L2] 10M
2. (a). Explain different types of armature windings? [L2] 5M
 (b). Calculate the e.m.f. of a 4- pole wave wound generator having 45 slots with 18 conductors per slot at 1200 r.p.m. The flux per pole is 0.016 Wb. [L4] 5M
3. (a) How demagnetizing and cross magnetizing ampere turns per pole are calculated in a DC Machine? [L2] 5M
 (b) The brushes of a certain lap connected 400kw, 6-pole generator are given a lead of 18° electrical. From the data given, calculate (i) the demagnetizing ampere-turns (ii) the cross-magnetizing ampere-turns (iii) series turns required to balance the demagnetizing component. The full load current is 750A and total number of conductors are 900 and the leakage coefficient is 1.4. [L4] 5M
4. (a) Deduce an expression for e.m.f equation of DC Generator? [L4] 5M
 (b) An 8-pole lap connected armature has 960 conductors, a flux of 40 m Wb per pole and a speed of 400 r.p.m. Calculate the emf generated on open circuit. If the armature were wave connected, at what speed it must be driven to generate 400 V. [L4]5M
5. (a) what is the purpose of compensating winding? Explain in details'? [L2] 5M
 (b) Distinguish between Lap and Wave windings? [L2] 5M
6. Draw the developed winding diagram of a simple 2-layer lap –winding for a 4-pole generator with 16 Coils. [L5] 5M
7. Enumerate all the parts of a DC machine and indicate their function? [L1] 10M
8. Explain the effects of armature reaction in a DC Generator Briefly? [L2] 10M
9. (a) Derive the expression for reactance voltage? [L2] 5M
 (b) Give layout (winding table) of simplex lap progressive winding used for a 44 slot, 4 pole ,DC armature with 44 commutator segments. 5M
10. a) What is the purpose of yoke? [L1] 5M
 b) Write the purpose of the commutator? [L1] 5M
 c) What is meant by armature reaction? [L1] 5M
 d)What is the purpose of inter poles? [L1] 5M
 e) What is the purpose of pole shoe? [L1] 5M

UNIT –III**CHARACTERISTICS OF D.C GENERATORS**

1. What are the various characteristics of compound generators? [L1] 10M
2. How do you determine the magnetization characteristics of DC Shunt Generators? [L2]10M
3. Explain in detail about the parallel operation of DC Series generators? [L2]10M
4. (a) What is the experimental procedure to obtain the characteristics of DC series Generators? Explain. [L1] 5M
(b) Write the remedial measures for the failure of self-excitation. [L2] 5M
5. A DC Compound Generator has 110V as terminal voltage. The armature resistance, shunt field Resistance and series field resistance are 0.06Ω , 25Ω and 0.04Ω respectively. The load consists of 200A which rated at 55W. Find the total emf generated and armature current when the machine is connected as (i) Long Shunt (ii) Short Shunt. [L4] 10 M
6. Explain about self excited and separately excited D.C generators? [L1] 10 M
- 7.(a) what are the causes for the failure of self-excitation. [L2] 5M
(b) Explain the parallel operation of two DC series generators with equalizer bar connection. [L1] 5M
8. Draw and explain the characteristics of DC series and DC Shunt Generators. [L2] 10 M
9. (a) Write all the required conditions for self-excitation. [L5] 5M
(b) A 20KW, 200V DC Shunt Generator has an armature resistance of 0.05Ω and shunt field resistance of 200Ω . Calculate the power developed in the armature when it delivers rated output. [L4]5M
10. (a) Enlist types of dc generators? [L1]2M
(b) Draw the circuit diagram of Long Shunt Compound Generator. [L2]2M
(c) Draw the internal and external characteristics of DC Series Generator? [L2]2M
(d) Define critical field resistance? [L1]2M
(e) Draw the internal and external characteristics of DC Shunt Generator? [L2]2M

UNIT –IV
D.C MOTORS

1. A 25HP, 250V DC Series motor has armature resistance 0.1Ω and field resistance 0.05Ω and brush Contact drop 3V. When the line current is 80A, the speed is 600rpm. Find the speed when the line Current is 100A. [L4]10 M
2. Draw and explain the characteristics of DC series and DC Shunt Motors. [L2] 10 M
3. Explain the principle of operation of a D.C motor . Derive the equation for the torque Developed by a D.C. motor? [L2] 10M
4. (a)Distinguish between generator and motor action. Derive the equation for the back e.m.f of DC motor? [L4]5M
b) (b) Find the torque exerted by a 4-pole series motor whose armature has 1200 conductors Connected up in wave winding. The motor current is 10A and the flux per pole is 0.02Wb. [L4] 5M
5. Explain in detail about the types of D.C motors. Also mention their applications? [L1]10M
6. Explain the operation of four point starter for a DC motor with neat diagram? [L2]10M
7. Explain the armature voltage and field flux control methods for the Speed control of a DC Motor. [L2]10M
8. Why is a starter necessary for a DC motor? Explain the working of a three-point starter with the help of a neat diagram? [L1]10M
9. Draw and explain the various characteristics of a DC Motor? [L1]10M
10. (a) Define torque ? [L1]2M
(b) If the applied voltage of a DC motor is 230 V, then back emf, for maximum power developed is? [L4]2M
(c) What is the emf generated by a 4 pole lap connected DC motor rotating at 1500 rpm having 200 conductors and useful flux per pole is 0.4 mwb. [L4]2M
(d) The speed of a motor falls from 1100 r.p.m at no-load to 1050 r.p.m at rated load. The speed regulation of motor is. [L4]2M
(e) Write the working principle of a DC motor. [L1] 2M

UNIT -V**TESTING OF D.C MACHINES**

1. What do you mean by power stages in a D.C machine? Also explain (i) Electrical efficiency ii) Mechanical efficiency (iii) commercial efficiency? [L2] 10M
2. Explain Swinburne's test on DC machines? What are its advantages and disadvantages? [L2] 10M
3. Explain the procedure for obtaining the efficiency by using brake test on DC shunt machine. [L2] 10M
4. Describe Hopkinson test in detail. What are its advantages and disadvantages? [L2] 10M
5. A Shunt generator delivers 195A at terminal Voltage of 250V. The armature resistance and shunt Field resistances are 0.02Ω and 50Ω respectively. The iron and friction losses equal 950W. Find (a) EMF generated (b) Copper losses (c) output of the prime mover (d) commercial, mechanical and electrical efficiencies. [L4]10M
6. Describe Field's test in detail. What are its advantages and disadvantages? [L2]10M
7. Describe Retardation test n detail . What are its advantages and disadvantages ? [L2]10M
8. (a) Enumerate the losses in DC machine. [L1]5M
(b) Derive the condition for maximum efficiency. [L1]5M
9. Describe separation of stray losses in a DC motor test in detail. [L2]10M
10. (a) Write the condition for maximum efficiency? [L1]2M
(b) Which losses are called variable losses? [L1]2M
(c) Which losses are called constant losses? [L1]2M
(d) Define efficiency and write the equation for efficiency? [L1]2M
(e) Name the methods of direct and indirect testing? [L1]2M

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UNIT-I

ELECTROMECHANICAL ENERGY CONVERSION

- If B is the flux density, l the length of conductor and v the velocity of conductor, then induced e.m.f is given by []
(A) Blv (B) Blv^2 (C) Bl^2v (D) Bl^2v^2
- An electro-mechanical energy conversion device is one which converts _____ []
(A) Electrical energy to mechanical energy only (B) Mechanical energy to electrical energy only
(C) All of the mentioned (D) None of the mentioned
- What is the coupling field used between the electrical and mechanical systems in an energy conversion devices? []
(A) Magnetic field (B) Electric field (C) Magnetic field or Electric field (D) None of the mentioned
- The energy storing capacity of magnetic field is about ___ times greater than that of electric field? []
(A) 50,000 (B) 25,000 (C) 10,000 (D) 40,000
- The formula for energy stored in the mechanical system of linear motion type is _____ []
(A) $1/2J\omega^2$ (B) $1/2mv^2$ (C) $1/2mv$ (D) $J\omega^2$
- In an electro-mechanical energy conversion device, the coupling field on the []
(i) electrical side is associated with emf and current
(ii) electrical side is associated with torque and speed
(iii) mechanical side is associated with emf and current
(iv) mechanical side is associated with torque and speed
From the above, the correct statements are
(A) (i)&(ii) (B) (ii)&(iii) (C) (iii)&(iv) (D) (i) and (iv)
- A coupling magnetic field must react with []
(i) electrical system in order to extract energy from mechanical system
(ii) mechanical system in order to extract energy from mechanical system
(iii) electrical system in order to extract energy from electrical system
(iv) mechanical system in order to extract energy from electrical system
(v) electrical or mechanical system for electro-mechanical energy conversion
From the above, the correct statements are
(A) (i), (ii) & (iii) (B) (ii), (iii) & (v) (C) (ii), (iii) & (iv) (D) (ii), (iii) & (v)
- For a linear electromagnetic circuit, the following statement is true []

- (A)field energy is equal to the co energy (B)field energy is lesser than the co energy (C)Field energy is greater than the co energy (D)co-energy is zero
9. An _____ energy conversion device is one which converts electrical energy into Mechanical energy and vice versa. []
 (A) Electro mechanical (B) Law of conversion of energy
 (C) Faradays (D) Electro Magnetic
10. Faradays _____ law states that the magnitude of induced emf is equal to the rate of change of flux linkages. []
 (A) First (B) Second (C) Third (D) Fourth
11. The principle of _____ State that energy can neither be created nor be destroyed it can merely be converted from one form to another. []
 (A) Conservation of energy (B) conservation of power (C) mechanical energy
 (D) none
12. An alternator is an example of _____ excited magnetic field system. []
 (A) Multiply (B) singly (C) both (D) none
13. An exciter for a turbo generator is a _____ generator. []
 (A) Series (B) shunt (C) compound (D) none.
14. The unit for Magneto-motive force? []
 (A) amperturns (B) mmf/flux (C) flux/mmf (D) none.
15. The unit for Magneto-motive force? []
 (A) amperturns (B) mmf/flux (C) flux/mmf (D) none.
16. The Magneto-motive force is? []
 (A) the voltage across the two ends of exciting coil
 (B) the sum of all currents embraced by one line of magnetic field
 (C) flux/mmf (D) none.
17. Tesla is a unit of []
 (A) field strength (B) inductance (C) flux density (D) None of the above
18. Fleming's left hand rule is used to find ? []
 (A) Direction of magnetic field due to current carrying conductor
 (B) Direction of flux in a solenoid
 (C) Direction of force on current carrying conductor in a magnetic field
 (D) Polarity of magnetic pole .
19. Fleming's left hand rule forefinger always represents []
 (A) Voltage (B) current (C) magnetic field (D) direction of force on a conductor
20. Which of the following is a vector quantity? []
 (A) Relative permeability (B) Magnetic field intensity (C) Flux density (D) Magnetic potential
21. The unit of Relative permeability is? []
 (A) henry/meter (B) henry (C) henry/sq.m (D) it is dimensionless
22. Reciprocal of permeability is? []
 (A) reluctivity (B) susceptibility (C) henry/sq.m (D) none of the above
23. Reciprocal of reluctance is? []
 (A) reluctivity (B) permeance (C) Permeability (D) susceptibility

24. The unit of reluctance is? []
 (A)henry/meter (B)1/henry (C)henry/sq.m (D)it is dimensionless
25. Which of the following is the unit of magnetic flux density? []
 (A)Weber (B)lumens (C)tesla (D)none of the above
26. Which of the following is the unit of flux? []
 (A)Maxwell (B) Weber (C) teals (D) All of the above
27. Which of the following is not a unit of flux? []
 (A)Maxwell (B) Weber (C) teals (D) All of the above
28. One tesla is equal to? []
 (A) 1Wb/mm² (B)1Wb/m (C)1Wb/m² (D)1mWb/m²
29. The ratio of intensity of magnetization to the magnetization force is known as?[]
 (A) Susceptibility (B) inductance (C) flux density (D) None of the above
30. The ratio of intensity of magnetization to the magnetization force is known as?[]
 (A) Susceptibility (B) inductance (C) flux density (D) None of the above
31. Ampere-turns is the product of current in amperes and the turns in the coils? []
 (A) yes (B)No (C)both (D)none
32. The route or path which is followed by a magnetic flux is called a _____ circuit
 (A) Electric (B)magnetic (C)mechanical (D)none of these []
- 33.The property of a material which opposes the creation of magnetic flux in it is knownas?
 (A)reluctivity (B)permeance (C)reluctance (D)susceptibility []
34. _____ of a magnetic circuit is the ratio of m.m.f and flux []
 (A) Reluctance (B) permeance (C) both (D) it is dimensionless
35. The reciprocal of reluctance is known as []
 (A) Reluctance (B)permeance (C)both (D)it is dimensionless
36. A _____ is a magnetic product from a coil carrying a current? []
 (A) Solenoid (B)to roid (C)none (D)All of the above
37. Relative permeability of vacuum is? []
 (A)1 (B)1H/m (C)1/4 π (D)4 π *10-7H/m
38. The magnetizing force (H)and magnetic flux density(B)are connected by the relation?
 (A)B= μ rH/ μ 0 (B)B= μ H (C)B=H/ μ 0 μ r (D)B= μ 0H/ μ r []
39. _____ fluxisdirectlyproportionalto the current(I)and theturns(N)in a coil.
 (A)electric (B)magnetic (C)flux density (D)None of the above []
40. Laminated cores, in electric machines, are used to reduce []
 (A)copper loss (B)eddy current loss (C)hysteresis loss (D)All of the above

UNIT-II

D.C GENERATORS

- 1.The D.C.Generator works on the principle of []
 (A)Flemings left hand rule (B)Ampere'slaw
 (C)Lenz'slaw (D)Faradays laws of Electromagnetic induction
- 2.AD.C.Generator is a machine that converts []

- (A)Electrical energy in to Mechanical energy
 (B)Electrical energy in to Electrical energy
 (C)Mechanical energy into Mechanical energy
 (D)Mechanical energy in to Electrical energy
- 3.Lap winding is suitable for _____ curent, _____ voltaged.c.generators. []
 (A)low,high (B)low,low
 (C)high,low (D)high,high
- 4.The armature of ad.c.machine is made of []
 (A)wrought iron (B)silicon steel
 (C)cast steel (D)soft iron
- 5.Inad.c.machine,the number of commutator segments is equal to []
 (A)numberofcoils (B)twice the number of poles
 (C)no.ofconductors (D)noneoftheabove
- 6.Function of yoke is []
 (A)To provide mechanical support to the poles (B)Reduce losses
 (C)carry current (D)All
- 7.In dc generators no of parallel paths? []
 (A) $P+2$ (B)2
 (C) P (D) $P-2$
- 8.Pole pitch is defined as []
 (A)No of pole pitch=armature slots (B)Pole pitch=No of armature slots/2
 (C)Pole pitch=armature conductors (D)none of the above
- 9.Laminated yoke in a dc generator reduces []
 (A)Iron losses (B)Temperature rise
 (C)Speed regulation (D)Sparking on load
- 10.The brush voltage drop in d.c machine is about..... []
 (A)0.1V (B)2V (C)10V (D)20V
- 11.A separately excited d.c generator is normally not used because []
 (A)It is costly (B)Separate d.c source is required for field circuit
 (C)Terminal voltage rises with increase in load (D)None of these
- 12.For a given d.c generator,the magnitude of generated voltage dependson..... []
 (A)Flux only (B)Speed only (C)No.of poles only (D)All
- 13.High voltage d.c generator consists of.....Winding []
 (A)Lap (B)Wave (C)Either lap or wave only (D)None
- 14.The stator frame of a D.C.Generator is made of []
 (A)Silicon steel (B)Cast iron (C)Aluminium (D)None
- 15.The EMF generated in a D.C.Generator depends on []
 (A)No.of turns in the armature (B)Flux/pole (C)Speed (D)All
- 16.Armature reaction in a D.C.Generator depends on []
 (A)Armature current (B)Speed (C)Armature resistance (D)None
- 17.D.C.Generator works on the principle of_____. []
 (A)Flemings left hand rule (B)Ohm's law

- (C)Kirchoff's law (D)Faradays laws of Electromagnetic induction
- 18.The advantage of Lap winding over wave winding is _____ []
(A)it has less no.of parallel paths (B)it is suitable for high voltage generation
(C)it is suitable for high current generation (D)none of the above
- 19.A lap connected Dc generator has 6 poles and 126 armature conductors with each Conductor having an induced EMF of 420V.The no.of armature parallel paths in its armature is _____ []
(A)2 (B)4 (C)6 (D)8
- 20.The purpose of commutator in a d.c.generator is to _____ []
(A)reduce sparking at brushes (B)convert the induced a.c.in to d.c.
(C)increase output voltage (D) provide smoother output
- 21.The armature of a d.c machine is made of..... []
(A)Silicon steel (B)Wrought Iron (C)Cast steel (D)Soft Iron
- 22.The purpose of a commutator in a d.c generator is to..... []
(A)Increase output voltage (B)Reduce sparking at brushes
(C)Provide smooth output (D)Convert induced AC to DC
- 23.In a d.c generator,the effect of armature reaction on the mainpole flux is to..... []
(A)Reduce it (B)Distort it(C)Reverse it (D)Both(A)&(B)
- 24.The main function of interpoles in a d.c generator is to minimize the..... []
(A)Friction (B)Sparking (C)Current (D)Wear & tear
- 25.Which of the following methods are used to improve commutation? []
(A)Resistance commutation (B) Shifting of brushes
(C)Using Inter-poles (D)All
- 26.The purpose of the compensating winding in a d.c generator is..... []
(A)To neutralize armature reaction (B)To increase the armature reaction
(C)To decrease the armature current (D) Decrease the armature voltage
- 27.The dummy coils in d.c.machine serves the purpose of _____. []
(A)maintaining mechanical balance of armature (B)increasing the efficiency
(C)improving commutation (D)reduce the cost of armature
- 28.The purpose of commutator in a d.c.generator is to _____ []
(A)reduce sparking at brushes (B)convert the induced a.c.in to d.c.
(C)increase output voltage (D)provide smoother output
- 29.The purpose of brush in a d.c.machine is to _____ []
(A)prevent sparking (B)clean the commutator
(C)collect current from the commutator (D)none of these
- 30.In a d.c.generator,the effect of armature reaction on the main pole flux is to []
(A)reduce it (B)distort it (C)reverse it (D)both(a)and(b)
31. In d.c.generators,armature reaction is produced actually by []
(A)its field current (B)armature conductors
(C)load current in armature (D)field pole winding
32. The no of parallel paths for a4-pole duplex lap winding will be []
(A)8 (B)4 (C)6 (D)2
33. In a dc generator,the generated emf is directly proportional to []
(A)Pole flux (B) Field current

- (C) No of dummy coils (D) No of armature parallel paths
34. The time during which the coil remains short circuited known as _____ []
 (A) Practical commutation (B) Commutation period
 (C) Theoretical commutation (D) Both a&b
35. The armature mmf wave in a machine is _____ []
 (A) Square (B) Rectangular
 (C) Triangular (D) Sinusoidal
36. Air gap at the pole tops of a dc machine is kept more than at the centre of the pole mainly
 To reduce _____ []
 (A) Noise if the machine (B) Reactance voltage
 (C) Effect of armature reaction (D) Losses of armature core
37. In a 6 pole dc machine, 90 degrees electrical correspond to mechanical degrees _____ []
 (A) 45 (B) 30 (C) 180 (D) 270
38. In a dc generator, the polarity of inter pole is _____ []
 (A) Opposite to that of main pole ahead (B) Same that of main pole behind
 (C) Same that of main pole ahead (D) none of the above
39. The commutation in d.c. machine is mainly due to _____ []
 (A) Reactance voltage in armature coils (B) Armature resistance
 (C) Field flux (D) None
40. Armature reaction can be reduced by using _____ []
 (A) Copper armature conductors (B) Compensating winding
 (C) Carbon brushes (D) None

UNIT-III

CHARACTERISTICS OF DC GENERATORS

1. Interpole winding is connected in series with _____ []
 (A) armature winding (B) field winding
 (C) both armature & field winding (D) None
2. A 200V DC Generator has a shunt field resistance of 200 ohms. Its field current is _____ []
 (A) 1A (B) 2A
 (C) 3A (D) 4A
3. The load current and field current of a DC shunt generator are 50A and 5A respectively.
 Its armature current is _____ []
 (A) 50A (B) 55A
 (C) 45A (D) 40A
4. Which of the following DC Generator is suitable for charging Batteries? []
 (A) Shunt generator (B) Series Generator
 (C) Differentially compounded Generator (D) None
5. In a 6-pole d.c. machine, 60 mechanical degrees correspond to _____ electrical degrees []
 (A) 270 (B) 180
 (C) 45 (D) 30
6. In a clockwise-rotating loaded d.c. generator, brushes have to be shifted []
 (A) clockwise (B) counter clockwise
 (C) either (a) or (b) (D) neither (a) nor (b)
7. The main function of interpoles is to minimize _____ between the brushes and the

- Commutator when the d.c. machine is loaded. []
 (A) friction (B) sparking
 (C) current (D) wear and tear
8. Armature reaction is increased when []
 (A) the field current increases (B) the armature current decreases
 (C) the armature current increases (D) none of the above
9. In a 6-pole d.c. machine, 90 mechanical degrees correspond to _____ electrical degrees []
 (A) 270 (B) 180
 (C) 45 (D) 30
10. In DC generators iron losses are made up of: []
 (A) hysteresis and friction losses (B) hysteresis, eddy current and brush contact losses
 (C) hysteresis and eddy current losses (D) hysteresis, eddy current and copper losses
11. What is M.N.A []
 (A) Mechanical Neutral Axis (B) Mean Neutral Axis
 (C) Magnetic Neutral Axis (D) None of the above
12. Practically, The field poles of dc generators possess some magnetic flux is called []
 (A) Magnetic flux (B) pole flux
 (C) Residual flux (D) None of the above
13. The critical resistance of the dc generator is the resistance of []
 (A) Field (B) Armature (C) Load (D) Brushes
14. The terminal voltage of a dc series generator running at rated speed and at no load is equal []
 (A) Half of its rated voltage (B) Rated voltage (C) zero (D) A very little voltage
15. If the field circuit resistance of a dc shunt generator exceeds its critical value the generator []
 (A) Produce power beyond its rating (B) Fails to build up
 (C) Builds up a very high voltage (D) Exceeds its current capacity
16. A dc generator beyond critical resistance will generate []
 (A) Maximum power (B) Maximum current
 (C) Maximum voltage (D) No Voltage
17. Internal characteristics of a dc generator is drawn between []
 (A) V_t versus I_L (B) E versus I_a (C) V_t versus I_a (D) All the above
18. For short shunt compound generator, which of the following equation is correct? []
 (A) $I_A = I_{SH} + I_L$ (B) $I_L = I_A + I_{SH}$ (C) $I_A = I_{SE}$ (D) I_A
19. The magnetization characteristics of a d.c generator gives relation between []
 { V_t = Terminal voltage, I_a = Armature current, E_g = No-load generated emf & I_f = field current }
 (A) V_t & I_a (B) E_g & I_a (C) E_g & I_f (D) V_t & I_f
20. Which of the following d.c generator cannot build up voltage on open circuit? []
 (A) Shunt (B) Long shunt compound (C) Short shunt compound (D) Series
21. In d.c generator, armature reaction is produced actually by..... []
 (A) Field current (B) Armature current (C) Field pole winding (D) None
22. A 4-pole, lap wound d.c generator generates a voltage of 200V. If the same machine is connected in wave winding, then the generated voltage is..... []
 (A) 200V (B) 100V
 (C) 400V (D) 800V
23. The polarity of an interpole in d.c generator should be as that of..... []

- (A) The pole head in the direction of rotation (B) The pole behind the direction of rotation
(C) Any of the Above (D) None
24. The shunt field resistance of a 200V d.c generator is 200Ω . Then its shunt field current is []
(A) 1 A (B) 2 A
(C) 3 A (D) 0.5 A
25. Which of the following DC Generators is suitable for supplying Arc welding? []
(A) Shunt generator (B) Series Generator
(C) Differentially compounded Generator (D) None
26. The compensating winding is placed _____ []
(A) in armature (B) on pole body
(C) in pole shoe (D) None
27. Shunt Field Winding of a dc machine consists of []
(A) many turns of thin wire (B) many turns of thick wire
(C) few turns of thin wire (D) few turns of thick wire
28. The Field of Self Excited Generator is Excited []
(A) AC (B) DC
(C) by its own current (D) either dc or ac
29. The difference in voltage between internal and external characteristics of DC shunt generator is equal to _____ []
(A) armature resistance drop (B) armature reaction drop
(C) sum of armature resistance and reaction drops (D) None
30. External characteristic of a Dc Generator is the curve drawn between _____ []
(A) V_a and I_a (B) V_L and I_L
(C) V_a and I_L (D) V_a and I_F
31. A 6-pole wave wound dc generator has 650 conductors the flux per pole is 0.05wb. Calculate the speed at which it is to be driven to generate an emf of 550volts []
(A) 368.61rpm (B) 338.461rpm
(C) 330.46rpm (D) 383.461rpm
32. The current relation in dc compound generator is []
(A) $I_a = I_{sh} + I_L$ (B) $I_a = I_{sh}$
(C) $I_a = I_L$ (D) $I_a = 0$
33. A P-pole Lap Wound DC Machine had an armature current I_a . The conductor current in the armature winding is []
(A) I_a (B) I_a/P
(C) $P I_a$ (D) None of the above
34. The induced emf in the armature of d.c generator is..... []
(A) Statically induced emf (B) Dynamically induced emf
(C) Self induced emf (D) None
35. The series Field of a short shunt dc generator is excited by ----- current []
(A) Armature (B) Shunt Field (C) Load (D) $I_L = I_{sh}$
36. A d.c generator generates a voltage of 200V at 1000 rpm. If the speed is increased to 1500rpm, then the generated voltage is.....V (Assume flux is constant) []
(A) 300V (B) 133.33V
(C) 150V (D) None

37. A dc generator beyond critical field resistance will generate []
 (A)Maximum power (B) Maximum voltage
 (C) Maximum current (D) very small voltage
- 38.In a d.c shunt generator the field winding is connected into the armature. []
 (A)series (B)paralel
 (C)bothA&B (D)none of the above
- 39.Residual magnetism is essential in the field electromagnets for building up of voltage of all types of d.c generators except []
 (A)shunt (B)compound
 (C)separately excited (D)series
- 40.Which of the folowing is minimized by laminating the armature core of a d.c machine? []
 (A)Copper loss (B)Hysteresis loss
 (C)stray loss (D)Eddy curent loss

UNIT-IV

D.CMOTORS

- 1.The DC motor, which can provide zero speed regulation at full load without any controller is []
 (A)series (B)shunt
 (C)Cumulativecompound (D)Differentialcompound
- 2.Which of the folowing statements is false? []
 (1)A DC motor converts electrical energy to mechanical energy
 (2)The efficiency of a DC motor is the ratio input power to output power
 (3)A DC generator converts mechanical power to electrical power
 (4)The efficiency of a DC generator is the ratio output power to input power
 Options:
 (A)3only (B)3and4only
 (C)2only (D).Noneoftheabove
- 3.If the speed of a DC machine is doubled and the flux remains constant,the generated e.m.f. []
 (A).remainsthesame (B)isdoubled
 (C)ishalved (D)Noneoftheabove
- 4.If the flux per pole of a shunt-wound DC generator is increased, and all other variables are kept the same,the speed []
 (A)decreases (B)staysthesame
 (C)increases (D)None of the above
- 5.When Load is removed -----Motor will run at the highest speed []
 (A)shunt (B)cumulative –compound
 (C)Differential compound (D)Series
- 6.If the flux per pole of a shunt-wound DC generator is halved, the generated e.m.f. at constant speed []
 (A)is doubled (B)is halved
 (C)remains the same (D)Noneoftheabove

7. In a dc series generator running at constant speed, as the load current increases, The terminal voltage []
(A) increases (B) decreases
(C) stays the same (D) None of the above
8. Which of the following statements is false for a series-wound DC motor? []
(A) The speed decreases with increase of resistance in the armature circuit
(B) The speed increases as the flux decreases
(C) The speed can be controlled by a diverter
(D) The speed can be controlled by a shunt field regulator
9. The armature resistance of a DC motor is 0.5Ω , the supply voltage is 200V and the back e.m.f. is 196V at full speed. The armature current is: []
(A) 4A (B) 8A (C) 400A (D) 392A
10. The effect of inserting a resistance in series with the field winding of a shunt []
(A) increase the magnetic field (B) increase the speed of the motor
(C) decrease the armature current (D) reduce the speed of the motor
11. If field current is decreased in shunt dc motor, the speed of the motor []
(A) remains same (B) increases
(C) decrease (D) none of the above
12. Which of the following starter is sufficient to start the DC series motor? []
(A) 3point starter (B) 2pointstarter
(C) 4point starter (D) All the above
13. Which of the following represents the rotating losses of machine? []
(A) Eddy current losses (B) Hysteresis losses
(C) All of these (D) Friction and windage losses
14. The current drawn by the a 230V DC motor of armature resistance 0.5Ω and Back emf 200V is []
(A) 60V (B) 40V (C) 600V (D) 660V
15. Which of the following methods are used to control the speed of DC motors is []
(A) field current control (B) armature circuit resistance control
(C) supply voltage control (D) All of these
16. Which of the following motor has negative speed regulation? []
(A) series (B) shunt
(C) Cumulative compound (D) Differential compound
17. Dynamic braking is very effective for? []
(A) shunt motors (B) separately excited motors
(C) Series motors (D) differential compound motors
18. Dynamic braking can be used for? []
(A) shunt motors (B) separately excited motors
(C) Series motors (D) All of the above
19. Rotating part of DC motor is known as []
(A) pole (B) armature
(C) carbon brush (D) stator
20. In DC shunt motor if load is increased, the speed []

- (A)Increased slightly. (B)decreased slightly.
 (C)Remains constant. (D)Increased proportional.
21. When the armature current of dc series motor is reduced by half it []
 (A)reduce by half (B)reduced by four time
 (C) remain same (D) before double
22. Direction of rotation of DC motor is reversed by? []
 (A)Reversing supply connection. (B) Interchanging armature and field connection
 (C) Adding resistance to field circuit (D)Reversing armature connection Or field connection
23. If the field connection of a DC Shunt Motor is changed then []
 (A)it wil run in same direction by slowly. (B)motor wil no trun
 (C)it wil run in opposite direction (D)it wil run in same direction
24. With the increase in speed of a DC motor? []
 (A)Back emf increase but line curent fals (B)Back emf fals and line curent increase
 (C)Both back emf as wel as line curent increase (D)Both back emf as wel as line current fal
25. If the back emf in DC motor vanishes suddenly the motor wi []
 (A)Burn. (B)Run at very high speed
 (C)Run at very low speed (D)Start haunting
26. which of the following instrument is used to measure the speed of dc motor ? []
 (A)barometer (B)tachometer
 (C)anemometer (D) multimeter
27. DC machine is a []
 (A)conduction machine (B)convection machine
 (C)both are correct (D)none of above are corect
28. DC Shunt Motor if the load current increases then field flux? []
 (A)Decreases (B)increases
 (C)remains constant (D)none of above are corect
29. The armature of a DC motor is laminated to reduce []
 (A)hysteresis loss. (B)eddy curent loss
 (C)copper loss (D)friction and windage loss.
30. The output power of any electrical motor is taken from the? []
 (A)Field. (B) coupling mounted on the shaft
 (C)noload (D)any one of the above
31. The dc motor which can provide zero speed regulation at ful load without any controler, is []
 (A)DC shunt motors. (B)DC Series motor
 (C)cumulative compound (D)none of above are corect
32. Which of the folowing Motor expensive for same Kw output rates? []
 (A)Dc shunt motors. (B)DC Series motor (C)cumulative compound
 (D)none of above are correct
33. On which of the folowing factor/factors the speed of a DC motor depends upon? []
 (A)Applied voltage. (B)Field flux
 (C)Armature current (D)none of the above
34. Which of the folowing DC Motor is used in paper machines? []
 (A)DC shunt motors. (B)DC Series motor

- (C)separately excited DC motor (D)none of above are corect
- 35.For a DC Shunt Motor having armature resistance of 0.5Ω and 2A armature current at no-load, when the armature current is changed to 20A at loaded condition the speed is 1000 r.p.m.What is the speed at no-load? []
 (A)1037.5r.p.m. (B)1200r.p.m.
 (C)1000.5r.p.m. (D)1020r.p.m.
- 36.)For 250 volt DC Shunt Motor the armature and field resistance are 0.5 ohm and 250 ohm Respectively . What will be the back e.m.f. produced when it takes a load curent of 21A. []
 (A)240 (B)220
 (C)300 (D)none of the above
- 37A 250 volt dc series motor having an armature resistance of 0.2Ω takes an load current of 60A.What will be the torque produced at the shaft of the motor? Consider brush drop of 1V. []
 (A)133.22 (B)144.22 (C) 1200 (D) none of the above
- 38.The critical resistance of the D.C. generator is the resistance of []
 (A)field (B)brushes
 (C)armature (D)load
- 39.For parallel operation the dc generator normally preferred are []
 (A)shunt (B)Series (C) under compound (D) both shunt and under compound
- 40.the most likely causes of sparking at the brushes in a dc machine is []
 (A)open coil in the armature (B) defective interpoles
 (C)incorrect brush spring pressure (D)all of the above

UNIT-V
TESTING OF DC MACHINES

- 1.Swinburne test is conducted under which of the folowing condition? []
 (A)no load (B)full load
 (C)half load (D)None of the above
- 2.Hopkinson test is conducted under which of the folowing condition? []
 (A)no load (B)full load
 (C)half load (D)None of the above
- 3.Which of the folowing represents the rotating losses of machine? []
 (A)Eddy current losses (B)Hysteresis losses
 (C)Al of these (D)Friction and windage losses
- 4.Which of the folowing represents the rotating losses of machine? []
 (A)Eddy current losses (B)Hysteresis losses (C)Al of these (D)Friction and windage losses
- 5.The current drawn by the a 230V DC motor of armature resistance 0.5Ω and back emf 200V is []
 (A)60 (B)40 (C)600 (D)660
- 6.Swinburne test is applicable to? []
 (A)DC compound motor (B)DC shunt motor
 (C)DC series motor (D)None of the above
- 7.Which of the set ypes of motor is used in elevators? []

- (A)DC compound motor (B)DC shunt motor
(C)DC series motor (D)None of the above
8. Which type motors are preferred for lathes? []
(A)DC shunt motors. (B)Squirrel Cage induction motor
(C)Synchronous motor. (D)Either A or B
- 9.) In DC series motor the speed is _____ proportional to the armature current. []
(A)directly. (B)inversely
(C)has no relation. (D)none of these.
10. Which type of DC Motor is preferred for Paper mills? []
(A)DC shunt motors. (B)DC Series motor. (C)Separately excited motor. (D)DC compound motor
11. In electric locomotive which of the following motor are used []
(A)DC shunt motors. (B)DC Series motor (C)Synchronous motor. (D)Either A or B
12. Which type of motors are preferred in lifts? []
(A)DC compound motor (B)DC shunt motor (C)DC series motor (D)None of the above
13. The speed of a motor falls from 1100 r.p.m at no-load to 1050 r.p.m at rated load. the speed regulation of motor is []
(A)2.56%. (B)2.57%. (C)3.76%. (D)4.76%.
14. In DC machine shape of armature MMF wave is? []
(A).triangular and directed towards brush axis (B)triangular and directed towards Main pole (C)saddle shape (D)None of the above
15. Series generators are used in which of the following applications []
(A)aircrafts (B)arc welding
(C)used as boosters in dc distribution or transmission (D)None of the above
16. Which of the following generators are used in arc welding? []
(A)DC compound motor (B)DC differential compound generators
(C)DC series motor (D)None of the above
17. Which of these types of motor has high starting torque? []
(A)synchronous motor (B)D.C series motor
(C)A.C series motor (D)induction motor
18. A series motor is best suited for driving? []
(A)machine tools. (B)cranes and hoists (C)Shear and punches. (D) none of the above
- 19.) The mechanical power developed by a d.c motor is equal to? []
(A)power input + losses. (B)back e.m.f x armature current
(C)power output x losses. (D) power output x efficiency.
20. In which of the following tests only one motor is required? []
(A)Brake test. (B)Hopkinson's test.
(C)Field's test. (D)Swinburne's test
21. Hopkinson's test requires ----- []
(A)one dc machine on which test is carried out (B)Two different dc machines
(C)two identical dc machines (D)can be worked with one or two machines
22. Which motor should be used for centrifugal pumps? []
(A)series motor (B)shunt motor

- (C)Either of the above (D)None of the above
23. which of the following methods is most effective in finding out the no-load losses in a large D.c shunt motor? []
 (A)Blocked rotor test. (B)Hopkinson's test.
 (C)Field's test. (D)Swinburne's test
24. A DC motor can be easily identified by? []
 (A).Winding (B)commutator (C)Size of conductor (D)Yoke
25. The main disadvantage of Hopkinson's test for finding efficiency of the shunt D.C motors is that it []
 (A)needs one motor and one generator (B)requires two identical shunt machines
 (C)Requires full load power (D)None of the above
26. Which of the following generators are used in arc welding? []
 (A)DC compound motor (B)DC differential compound generators
 (C)DC series motor (D)None of the above
27. The back to back is best suited for? []
 (A)small machines (B)medium size machines (C)large machines (D)all of the these
28. Hopkinson's test is conducted at []
 (A)no load. (B)part load (C)low load (D)full load
29. The test which can be performed on the dc series motor is []
 (A)Brake test (B)Hopkinson's test (C)Swinburne's test (D)Field test
30. Which of the following tests can be used to determine no-load losses in a D.C shunt Motor []
 (A)Brake test. (B)Hopkinson's test. (C)Field's test. (D)Swinburne's test
31. The generated e.m.f and the current are in the opposite direction in case of []
 (A)DC generator. (B)DC motor
 (C) both A&B. (D)none
32. Between Field's test and Hopkinson's test remain common thing is that both []
 (A)use negligible power (B)are regenerative tests
 (C)need two similar mechanically coupled motors (D)need two similar electrically coupled series
33. Which of the following can be used for controlling the speed of a D.C motor []
 (A)Thermistor (B)transistor (C) thyatron (D) thyristor
34. Hopkinson's test is an economical? []
 (A).Yes (B)No (C) both A and B (D)None of the above
35. Brake test is a typical example of an indirect test? []
 (A).Yes (B)No (C) both A and B (D)None of the above
36. Swinburne's test and brake test []
 (A).Both are direct method of testing (B) direct method of testing, indirect method of testing
 (C) indirect method of testing, direct method of testing (D) both are indirect method of testing
- 37) Three point starter can be used for []
 (A).series motor only (B)shunt motor only
 (C) compound motor only (D)both shunt and compound motors
38. Four point starter in the d motor is used []
 (A)To increase the field current (B)To decrease the field current

(C)not to effect the current passing through hold on coil even if any change in the field current takes place

(D)None of the above

39. Which starter does not provide high speed protetion to the dc shunt motor? []

(A).3-point starter (B)4- point starter

(C)2- point starter (D)Noneoftheabove

40. For the protection of dc series motor, which starter is commonly used? []

(A). 2- point starter (B) 3- point starter

(C) 4- point starter (D)None of the above

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