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

QUESTION BANK (DESCRIPTIVE)

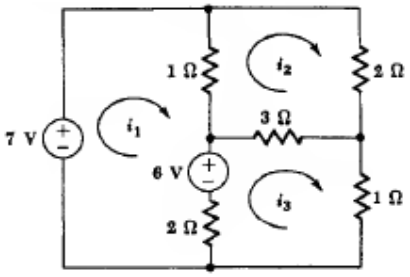
Subject with Code: BEEE(15A99301) **Course & Branch**: B.Tech-CSE

Year & Sem: II-B.Tech & I-Sem **Regulation:** R15

UNIT –I

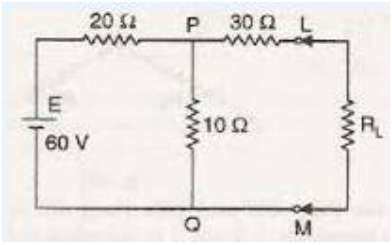
Introduction to Electrical Engineering

1. (a)Explain about Series networks of resistors?[L2] 5M
   (b)Explain about Parallel networks of resistors?[L2] 5M
2. Explain about active elements indetail.[L2] 10M
3. (a)Define KCL&KVL [L1] 5M
   (b)In the circuit shown below find i_1, i_2, i_3 by using Kirchhoff's laws?[L5] 5M



4. State and explain about super position theorem with an example.[L3] 10M

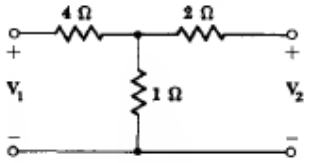
5. Determine the maximum power delivered to the load in the circuit shown in fig.[L6] 10M



6. State and explain about thevenins theorm with an example.[L3] 10M

7. The given A,B,C&D parameters are A=20,B=-14,C=25,D=-12 respectively find Z- parameters[L5] 10M

8. Find the short circuit admittance parameters for the circuit shown in fig.[L1] 10M



9. (a)Define and explain about Impedance parameters[L2]. 5M

(b) Define and expalin about Y- parameters[L2]. 5M

10 a) State ohm's law?[L1] 2M

b) Define average value and RMS value?[L1] 2M

c) Define form factor and peak factor?[L1] 2M

d) State superposition theorem?[L1] 2M

e) State Norton's theorem?[L1] 2M

UNIT –II

DC Machines

1. a) From fundamentals, derive the EMF equation of a DC generator[L4] 5M

b) Derive the torque equation of a DC motor[L4] 5M

2. Explain The following in detail(L1) 10M

i)Separately excited dc motors

ii)Self excited dc motors.

2. Explain the constructional details of DC generator[L2] 10M

3. a) Explain the principle of operation of DC motor[L2] 5M

b) Calculate the emf generated by a 4 pole wave wound armature having 45 slots with 18 conductors per slot when driven at 1200 rpm the flux per pole is 0.016Wb.[L3] 5M

4. Explain the classification of DC generators in detail?[L2] 10M

5. Explain the principle operation of DC generator?[L2] 10M

7. Explain The following in detail(L1) 10M

i)Separately excited dc generators

ii)Self excited dc generators.

8. Explain speed control of DC shunt motor?[L2] 10M

9. Explain about classification of dc motors.[L2] 10M

10. a) State Fleming's left hand rule?[L1] 2M

b) State the function of commutator and brushes?[L1] 2M

c) State Fleming's right hand rule?[L1] 2M

d) Write terminal voltage equation for dc shunt generator?[L1] 2M

e) What is the reason emf is called back emf incase of dc motors?[L1] 2M

UNIT –III

AC Machines

1. a) Derive EMF equation of a transformer[L4] 5M

b) What are the various losses in the transformer? Explain briefly.[L1,L2] 5M

2. a) What is meant by slip speed and slip in an induction motor?[L1] 5M

b) Explain constructional details of alternators?[L2] 5M

3. Explain OC and SC test of a single phase transformer?[L2] 10M

4. a) Define and explain efficiency, and losses in a transformer?[L1,L2] 5M

b) A 2000/200 V, 20 KVA transformer has 66 turns in the secondary. Calculate the primary turns and secondary full load currents, neglecting losses.[L3] 5M

5. Explain the torque-slip characteristics of three phase induction motor?[L2] 10M

6. Describe the constructional details of transformer?[L2] 10M

7. a) Derive the torque equation for three phase induction motor?[L4] 5M

b) A 3 phase, 4 pole $50H_Z$ induction motor at standstill has 180V induced across its star connected terminals. The rotor resistance and standstill reactance per phase are 0.6Ω and 0.3Ω respectively. Calculate the speed when the rotor is drawing a current of 6A at a particular load. Also calculate the speed at which the torque is maximum and the corresponding value of the rotor.[L3] 5M

8. a) Explain the principle operation of transformer?[L2] 5M

b) Obtain the condition for maximum efficiency of a transformer?[L4] 5M

9. a) Explain principle operation of alternator?[L2] 5M

b) Derive EMF equation for an alternator?[L4] 5M

10. a) Why Dc-supply is not give to transformer?[L1] 2M

b) What are the advantages of salient pole type of construction used for Synchronous machines?[L1] 2M

c) Write down the equation for frequency of emf induced in an alternator.[L1] 2M

d) What is meant by transformations ratio?[L1] 2M

e) What is rotating magnetic field?[L1] 2M

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

QUESTION BANK (OBJECTIVE)

Subject with Code : BEEE(15A99301) **Course & Branch:** B.Tech - CSE

Year & Sem: II-B.Tech & I-Sem **Regulation:** R15

UNIT – I

Introduction to Electrical Engineering

1. In a conductor, flow of current results due to the flow of [ ]
   A) Positive ions B) electrons
   C) protons D) atoms or molecules
2. Resistance is always measured in [ ]
   A) Ohms B) coulombs
   C) amperes D) henrys
3. In an electric circuit, if the current flows in only one path, the circuit is called a [ ]
   A) Parallel circuit B) series circuit
   C) series-parallel circuit D) compound circuit
4. According to kirchhoff's voltage law, the algebraic sum of the voltage drops in a series circuit is equal to [ ]
   A)The current in the circuit B) the applied emf
   C) Sum of all potential drops in the circuit D) sum of the emfs taken in the order
5. The resistance of a 1KW electric heater when energized by a 230v 1-phase AC is [ ]
   A) 52.9Ω B) 230Ω
   C) 1000Ω D) 4.2Ω
6. Determine the current if a 10 coulombs charge passes a point in 0.5 seconds [ ]
   A) 10A B) 20A
   C) 0.5A D) 2A
7. Determine the charge when C = 0.001μF and V = 1KV [ ]
   A) 0.001C B) 1μC

C) 1C D) 0.001C

8. How much energy is stored by a 0.05μF capacitor with a voltage of 100V [ ]

A) 0.025J B) 0.05J

C) 5J D) 100J

9. If one of the resistors in the parallel circuit is removed, what happens to the total resistance [ ]

A) Decreases B) increases

C) remains constant D) exactly doubles

10. How many cycles does a sine wave go through in 10 s when its frequency is 60 Hz [ ]

A) 10 cycles B) 60 cycles

C) 600 cycles D) 6 cycles

11. If the peak value of a certain sine wave voltage is 10 V, what is the peak to peak value [ ]

A) 20V B) 10V

C) 5V D) 7.07V

12. What is the average value of a sine wave over a full cycle [ ]

A) V_m B) $V_m/\sqrt{2}$

C) zero D) $\sqrt{2}V_m$

13. A series circuit has 3Ω, 10Ω and 20Ω and 2V DC in series. If 10Ω resistor is replaced by open circuit then current in the circuit is [ ]

A) Zero B) increased

C) decreased D) constant

14. An inductor of inductance 0.1H, carrying current of 6A will store energy of [ ]

A) 6J B) 36J

C) 1.8J D) 3.6J

15. Kirchhoff's current laws apply for [ ]

A) Resistive circuits only B) linear circuits only

C) nonlinear circuits only D) both (b), (c)

16. The nodal analysis is primarily based on the application of [ ]

A) ohm's law B) KCL

C) KVL D) both (a) and (b)

17. Energy stored in inductor is [ ]

A) LI^2 B) ½ LI^2

C) ½ LI D) none

18. The capacitor act as ……for DC [ ]

A) Short circuit B) open circuit

C) both (a), (b) D) none

19. An inductor act as……. For DC [ ]

A) Short circuit B) open circuit

C) both (a), (b) D) none

20. In parallel circuit which parameter is same [ ]

A) Power B) current

C) voltage D) energy

21. Norton's equivalent circuit consists of [ ]

A) Voltage source in parallel with resistance B) voltage source in series with resistance

C) Current source in series with resistance D)current source in parallel with resistance

22. Maximum power is transferred when load impedance is [ ]

A) Equal to source resistance B) equal to half of the source resistance

C) Equal to zero D) none of the above

23. While applying thevenin's theorem, the thevenin's voltage is equal to [ ]

A) Short circuit voltage at the terminals B) open circuit voltage at the terminals

C) Voltage of the source D) total voltage available in the circuit

24. Superposition theorem is valid only for [ ]

A) Linear circuits B) non-linear circuits

C) both linear and non-linear D) neither of the two

25. Superposition theorem is not valid for [ ]

A) Voltage responses B) current responses

C) power responses D) all the three

26. If the two-port network is reciprocal then [ ]

A) $Y_{11} = Y_{22}$ B) $Y_{12} = Y_{21}$

C) $Y_{12} = Y_{11}$ D) none

27. The h parameters h_{11} and h_{21} are obtained [ ]

A) By shorting output terminals B) By opening input terminals

C) By shorting input terminals D) By opening output terminals

28. Which parameters are widely used in transmission line theory [ ]

A) Z parameters B) Y parameters

C) ABCD parameters D) h parameters

29. The minimum number of the resistors required to form a series-parallel circuit is [ ]

A) One B) two

C) three D) four

30. Thevenin's theorem is based on the idea of [ ]

A) An equivalent current source B) An equivalent source of emf

C) An equivalent power source D) An equivalent resistance

31. In a two-port network, the condition for reciprocity in terms of h-parameters is [ ]

A) $h_{12} = h_{21}$ B) $h_{11} = h_{22}$

C) $h_{11} = -h_{22}$ D) $h_{12} = -h_{21}$

32. A two-port network is defined by the relation:

$I_1 = 5\ V_1 + 3\ V_2$, $I_2 = 2\ V_1 - 7\ V_2$ the value of Z_{12} is [ ]

A) 3 B) -3

C) 3/41 D) 2/31

33. In a two-port network, open circuit impedance parameters express [ ]

A) V_1, V_2 in terms of I_1, I_2 B) I_1 , I_2 in terms of V_1, V_2

C) V_1, I_1 in terms of V_2, I_2 D) V_1, I_2 in terms of V_2, I_1

34. A, B, C and D represent the transmission parameters of a network. When is the network reciprocal? [ ]

A) AB – CD = 1 B) AD – BC = 1

C) AB – CD = 0 D) AD – BC = 0

35. Admittance is the reciprocal of [ ]

A) Impedance B) inductance

C) susceptance D) reactance

36. Impedance $Z_1 = 20\angle 50^0\Omega$ and $Z_2 = 10\angle 30^0\Omega$ then Z_1/Z_2 is [ ]

A) $2\angle 80^0$ B) $2\angle 50^0$

C) $2\angle 30^0$ D) $2\angle 20^0$

37. With respect to transmission parameters, which one of the following is correct? [ ]

A) A and B are dimensionless B) B and C are dimensionless

C) A and D are dimensionless D) B and D are dimensionless

38. In a two-port network, hybrid parameters express [ ]

A) V_1 and V_2 in terms of I_1 and I_2 B) I_1 and I_2 in terms of V_1 and V_2

C) V_1 and I_1 in terms of V_2 and I_2 D) V_1 and I_2 in terms of V_2 and I_1

39. A two-port network is defined by the relations $I_1 = 2V_1 + V_2$ and $I2 = 2V_1 + 3V_2$. Then Z_{12} is [ ]

A) -2Ω B) -1Ω

C) -1/2Ω D) -1/4Ω

40. The h parameters h_{11} and h_{22} are related to Z and Y parameters as [ ]

A) $h_{11} = Z_{11}$ and $h_{22} = 1/Z_{22}$ B) $h_{11} = Z_{11}$ and $h_{22} = Y_{22}$

C) $h_{11} = 1/Y_{11}$ and $h_{22} = 1/Z_{22}$ D) $h_{11} = 1/Y_{11}$ and $h_{22} = Y_{22}$

UNIT-II

DC Machines

1. A DC generator is a machine that converts [ ]

A) Electrical energy into mechanical energy B) mechanical energy into electrical energy

C) Low electrical energy into high electrical energy D) low currents into high currents

2. The mechanical energy source used to drive a dc generator is called a [ ]

A) rotor B) prime mover

C) alternator D) motor drive

3. In a dc machine, the commutator and brushes are used to [ ]

A) increase the generated emf B) reduce the generated emf

C) to make the generated emf unidirectional D) to make the generated emf alternating

4. The brushes that carry the current to the load are made of [ ]

A) carbon B) graphite

C) Carbon and graphite D) graphite and lead

5. In a dc generator the emf is induced in the [ ]

A) field coils B) armature coils

C) commutator segments D)brushes

6. Power lost as heat in the armature and field windings of a dc machine is called the [ ]

A) hysteresis loss B) eddy current loss

C) copper loss D) mechanical loss

7. The EMF generated in a D.C. Generator depends on [ ]

A) No. of turns in the armature B) Flux / pole

C) Speed D) All

8. The load current and field current of a DC shunt generator are 50A and5A respectively. It armature current is_____ [ ]

A) 50A B) 55A

C) 45A D) 40A

9. The D.C. Generator works on the principle of [ ]

A) Flemings left hand rule B) Ampere's law

C) Lenz's law D)Faradays laws of Electromagnetic induction

10. In a d.c shunt generator the field winding is connected in..... to the armature. [ ]

A) parallel B) series

C) both A & B D) none of the above

11. The current relation in dc Separately excited generator is [ ]

A) I_f=Ia B) I_L=Ia

C) Ia=-I_L D) Ia=0

12. The purpose of commutator in a d.c.generator is to_____ [ ]

A)convert the induced a.c. into d.c (B)reduce sparking at brushes

C) increase output voltage (D) provide smoother output

13. If the flux in the air gap is φ, then the flux in the armature core section of dc machine is [ ]

A) 2φ B) φ/2

C) φ D) 1.1φ

14. In a dc machines, the laminated parts are armature and [ ]

A) core B) yoke

C) pole D) pole shoe

15. The current in armature conductors of a dc machine is [ ]

A) pure dc B) pulsating dc

C) ac D) pure dc pulsating dc

16. 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

17. The induced emf in the armature of d.c generator is …… [ ]

A) Statically induced emf B) Dynamically induced emf

C) Self inducedemf` D) None

18. A 200V DC Generator has a shunt field resistance of 200ohms. Its field current is___ [ ]

A) 1A B) 2A

C) 3A D) 4A

19. Which of the following machine converts mechanical energy into electrical energy [ ]

A) Motor B) Generator

C) Both D) None

20. The Commutator segments of a D.C. Machine are insulated from each other by a thin Layer of _____ [ ]

A)Bakelite B)PVC

C)Hard rubber D) Mica

21. A D.C.Motor is a machine that converts [ ]

A) Electrical energy into Mechanical energy B) Electrical energy into Electrical energy

C) Mechanical energy into Mechanical energy D) Mechanicalenergy into Electrical energy

22. The EMF generated in a D.C. Motor is called as [ ]

A) Back emf B) Generated emf

C) Both(A)&(B) D) None

23. Which of the following rule/law can be used to determine the direction of rotation of dc motor [ ]

A) Lenz's law B)Faraday's law

C)Coloumb's law D)Fleming's left hand rule

24. Which of the following is a electrical machine [ ]

A)Motor B)Generator

C)Both D)None

25. The D.C.Motor works on the principle of [ ]

A) Flemings left hand rule B) Ampere's law

C) Lenz's law D)Faradays laws of Electromagnetic induction

26. The speed of a dc motor can be controlled by varying [ ]

A) Its flux per pole B) resistance of the armature circuit

C) applied voltage D) all of the above

27. The shaft torque of a D.C. motor is less than the armature torque because of __losses [ ]

A) copper B) mechanical

C) iron D) rotational

28.A 220V shunt motor develops a torque of 54 N-m at armature current of 10A. The torque produced when armature current is 20A,is [ ]

A) 54 N-m B) 81 N-m

C) 108 N-m D) None of the above

29. A D.C. motor develops a torque of 200 N-m at 25 rps. At 20 rps it will develop a torque of ----N-m [ ]

A) 200 B) 160

C) 250 D) 128

30. The speed of a D.C motor is directly proportional to [ ]

A) $E_b/Ø$ B) $E_b*Ø$

C) E_b^2 D) none

31. The _____ torque which is used to do the useful work [ ]

A) shaft torque B) Loss torque

C) armature torque D) none

32. The _____ torque which is used to overcome the losses [ ]

A) shaft torque B) Loss torque

C) armature torque D) none

33. Turning or Twisting force about an axis is known as [ ]

A) shaft torque B) Loss torque

C) torque D) none

34. The O.C. Characteristics of a D.C. generator gives the relation between [ ]

A) V and I_L B) E and I_a

C) E_o and I_f D) V and I_f

35. Brushes in D.C machines are made of [ ]

A) Carbon B) Soft Copper

C) Hard Copper D) all the above

36.Magnetic field in a D.C generator is produced by [ ]

A) Electro magnets B) Permanent magnets

C) both (a) and (b) D) None

37. The armature of a d.c. machine is made of_____. [ ]

A) cast iron B) silicon steel

C) cast steel D) soft iron

38. 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

39. 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

40. In a d.c series motor the field winding is connected in..... to the armature. [ ]

A) series B) parallel

C) both A & B D) none of the above

UNIT – III

AC MACHINES

1. The principle of operation of a transformer is [ ]
   A) electromagnetic induction B) mutual induction
   C) varying a conductor in a magnetic field D) thermionic emission
2. The no-load current of a transformer is generally of the order of [ ]
   A) less than 5% of the full-load current B) more than 5% of the full-load current
   C) almost equal to the full-load current D) zero
3. The efficiency of a transformer is maximum when [ ]
   A) copper loss is zero B) iron losses are zero
   C) copper losses are equal to the iron losses D) copper losses are maximum
4. The performance of a transformer is better, if its [ ]
   A) regulation is lower B) regulation is very high
   C) power factor is zero D) all the above
5. When the primary of a transformer is connected to a dc supply [ ]
   A) primary draws small current B) core losses are increased
   C) primary leakage reactance is increased D) primary may burn out
6. The most suitable material for transformer core is [ ]
   A) hot rolled grain oriented steel B) cold rolled grain oriented steel
   C) aluminium D) copper
7. The primary and secondary of a transformer are……..coupled [ ]
   A) electrically B) magnetically
   C) electrically and magnetically D) none
8. An ideal transformer is one which…… [ ]
   A) has no losses and leakage reactance B) does not work
   C) has same number of primary and secondary turns D) none of the above
9. A transformer has full-load copper loss of 400W. the copper loss at half full-load will be [ ]
   A) 50W B) 200W
   C) 400W D) 100W
10. The efficiency of a power transformer can be determined indirectly by [ ]
    A) open-circuit test alone B) short circuit test alone
    C) open circuit and short circuit test D) back-to-back test

11. A 12-pole, 3-phase induction motor runs at a speed of 485 rpm on a 50 Hz supply. The slip of the motor is [ ]

A) 3% B) 0.3%

C) 4% D) 0.4%

12. When the stator supply voltage frequency is f, then the frequency of the rotor current is [ ]

A) sf B) f

C) zero D) 2f

13. The synchronous speed of a 3-phase induction motor having 6-poles and running at 970 rpm when connected to a 50Hz supply is [ ]

A) 1500rpm B) 1000rpm

C) 1200rpm D) 3000rpm

14. The maximum torque developed by an induction motor depends upon the [ ]

A) rotor reactance B) rotor resistance

C) length of the rotor D) size of the rotor

15. The 3-phase induction motor is so designed that the rotor should have……....under running conditions [ ]

A) high resistance B) high reactance

C) low resistance D) large slip

16. The phase sequence of an alternator is RBY. The direction of its rotor rotation is reversed. The phase sequence will be [ ]

A) RYB B) YRB

C) BRY D) both a & c

17. The type of rotor preferred for alternator driven by steam turbine is [ ]

A) Cylindrical rotors B) slip ring rotor

C) Salient pole rotor D) squirrel cage rotor

18. For a P-pole machine, the relation between electrical degrees is [ ]

A) $\theta_{elec} = 2/P\ \theta_{mech}$ B) $\theta_{elec} = 4/P\ \theta_{mech}$

C) $\theta_{elec} = \theta_{mech}$ D) $\theta_{elec} = p/2\ \theta_{mech}$

19. To reduce the harmonics in the emf generated in an alternator [ ]

A) slots are skewed B) salient pole tips are chamfered

C) winding is well distributed D) all of the above

20. For a uniformly distributed winding with phase spread of 'ϱ' the distribution factor for 'r' the harmonic [ ]

A) sin(ϱ/2)/(ϱ/2) B) sin(rϱ/2)/(rϱ/2)

C) sin ϱ /ϱ D) sin(rϱ)/(rϱ)

21. Which of the following does not change in transformer [ ]

A) Voltage B) Current

C) Power D) Frequency

22. Silicon steel used for laminating the core to reduce [ ]

A) Hysteresis loss B) Eddy current loss

C) Copper loss D) All

23. Open circuit test on transformer is conducted to determine [ ]

A) Current loss B) Copper loss

C) Voltage loss D) Iron loss

24. Short circuit test on transformer is conducted to determine [ ]

A) Current loss B) Copper loss

C) Voltage loss D) Iron loss

25. Induction motor will not run if slip(S)=_____ [ ]

A) 1 B) 2

C) 0 D) 10

26. Which of the following machine converts mechanical energy into electrical energy [ ]

A) Motor B) Induction motor

C) Battery D) Alternator

27. Electromotive force is also known as [ ]

A) Voltage B) Power

C) Energy D) All

28. Which of the following is step up transformer [ ]

A) If K<1 B) If K>1

C) If K=1 D) All

29. Which of the following is step down transformer [ ]

A) If K<1 B) If K>1

C) If K=1 D) All

30. Transformation ratio is denoted by a letter of [ ]

A) V B) I

C) K D) P

31. Ac generator is also called as [ ]

A) Induction motor B)Alternator

C)Turbine D)All

32. Rotating magnetic field is produced in which of the following motor [ ]

A) dc motor B) 1-phase induction motor

C) 3-phase induction motor D) All

33. Speed is zero when_____ [ ]

A) S=0 B)S=1

C) S=2 D) None

34. The principle of operation of 3-phase induction motor is most similar to that of a [ ]

A) Synchronous motors B) transformer with a shorted secondary

C) d.c generator D) none

35. In case of synchronous generators the rotor is [ ]

A)armature winding B)poles

C)both D)None

36. In Ns is the synchronous speed and s the slip, then actual running speed of an induction motor will be [ ]

A) Ns B) S*Ns

C) (l-S)Ns D) (Ns-l)S

37. Find the number of poles required, when the frequency is 50Hz and speed of the motor is 500 rpm? [ ]

A) 5 B) 10

C) 12 D) 24

38. The synchronous speed of an alternator having 2 poles and operating on a 50Hz supply is [ ]

A) 1500rpm B) 1800rpm

C) 3000rpm D) 6000rpm

39. A 10 pole AC generator rotates at 1200 rpm. The frequency of AC voltage in cycles per second will be [ ]

A)120 B)110

C) 100 D) 50

40. Which winding in a transformer has more number of turns? [ ]

A) Low voltage winding B) High voltage winding

C) Primary winding D) Secondary winding

Prepared by: **E.CHUDAMANI &K.BHARGAVI**