Ex. NO: 01

CIRCUIT THEORY

1. The form factor is the ratio of
(a) Peak value to r.m.s. value
(b) r.m.s. value to average value
(c) Average value to r.m.s. value
(d) None of the above ANS

2. The power consumed in a circuit element will be least when the phase difference between the current and voltage is
(a) 180"
(b) 90°
(c) 60°
(d) 0° ANS

3. For a frequency of 200 Hz, the time period will be
(a) 0.05 s
(b) 0.005 s
(c) 0.0005 s
(d) 0.5 s ANS

4. Capacitive reactance is more when
(a) Capacitance is less and frequency of supply is less
(b) Capacitance is less and frequency of supply is more
(c) Capacitance is more and frequency of supply is less
(d) Capacitance is more and frequency of supply is more
ANS

5. In a series resonant circuit, the impedance of the circuit is
(a) minimum
(b) Maximum
(c) Zero
(d) None of the above ANS

6. Power factor of an electrical circuit is equal to
(a) R/Z
(b) Cosine of phase angle difference between current and voltage
(c) kW/kVA
(d) All above ANS

7. Poor power factor
(a) Reduces load handling capability of electrical system
(b) Results in more power losses in the electrical system
(c) Overloads alternators, transformers and distribution lines
(d) Results in more voltage drop in the line
(e) Results in all above ANS

8. In series resonant circuit, increasing inductance to its twice value and reducing capacitance to its half value
(a) will change the maximum value of current at resonance
(6) will change the resonance frequency
(c) Will change the impedance at resonance frequency
(d) Will increase the selectivity of the circuit
ANS

9. Pure inductive circuit
(a) Consumes some power on average
(b) Does not take power at all from a line
(c) Takes power from the line during some part of the cycle and then returns back to it during other part of the cycle
(d) None of the above ANS

10. Inductance of a coil Varies
(a) Directly as the cross-sectional area of magnetic core
(b) directly as square of number of turns
(c) Directly as the permeability of the core
(d) Inversely as the length of the iron path
(e) as (a) to (d) ANS

11. Time constant of an inductive circuit
(a) Increases with increase of inductance and decrease of resistance
(b) Increases with the increase of inductance and the increase of resistance
(c) Increases with decrease of inductance and decrease of resistance
(d) Increases with decrease of inductance and increase of resistance ANS

12. Power factor of an inductive circuit is usually improved by connecting capacitor to it in
(a) Parallel
(b) Series
(c) Either (a) or (b)
(d) None of the above ANS

13. In a highly capacitive circuit the
(a) apparent power is equal to the actual power
(b) reactive power is more than the apparent power
(c) reactive power is more than the actual power
(d) actual power is more than its reactive power
ANS

14. The time constant of the capacitance circuit is defined as the time during which voltage
(a) falls to 36.8% of its final steady value
(b) rises to 38.6% of its final steady value
(c) rises to 63.2% of its final steady value
(d) none of the above ANS

15. Power factor of the following circuit will be unity
(a) inductance
(b) capacitance
(c) resistance
(d) both (a) and (b) ANS

16. The r.m.s. value of alternating current is given by steady (D.C.) current which when flowing through a given circuit for a given time produces
(a) the more heat than produced by A.C. when flowing through the same circuit
(b) the same heat as produced by A.C. when flowing through the same circuit
(c) the less heat than produced by A.C. flowing through the same circuit
(d) none of the above ANS

17. The transient currents are associated with the
(a) changes in the stored energy in the inductors and capacitors

(b) impedance of the circuit
(c) applied voltage to the circuit
(d) resistance of the circuit ANS

18. In a circuit containing R, L and C, power loss can take place in
(a) C only
(b) L only
(c) R only
(d) all above ANS

19. If a sinusoidal wave has frequency of 50 Hz with 30 A r.m.s. current which of the following equation represents this wave ?
(a) 42.42 sin 3141
(b) 60 sin 25 t
(c) 30 sin 50 t
(d) 84.84 sin 25 t ANS

20. The safest value of current the human body can carry for more than 3 second is
(a) 4 mA
(b) 9 mA
(c) 15 mA
(d) 25 mA ANS

21. The input of an A.C. circuit having power factor of 0.8 lagging is 40 kVA. The power drawn by the circuit is
(a) 12 kW
(b) 22 kW
(c) 32 kW
(d) 64 kW ANS

22. In AC. circuits, laminated iron is invariably used in order to
(a) reduce eddy current loss
(b) increase heat radiation
(c) make assembly cheap and easier
(d) reduce circuit permeability ANS

23. The apparent power drawn by an A.C. circuit is 10 kVA and active power is 8 kW. The reactive power in the circuit is
(a) 4 kVAR
(b) 6 kVAR
(c) 8 kVAR
(d) 16 kVAR ANS

24. The power is measured in terms of decibles in case of
(a) electronic equipment
(b) transformers
(c) current transformers
(d) auto transformers ANS

25. A phasor is
(a) a line which represents the magnitude and phase of an alternating quantity
(b) a line representing the magnitude and direction of an alternating quantity
(c) a coloured tag or band for distinction between different phases of a 3phase
supply
(d) an instrument used for measuring phases of an unbalanced 3phase
load ANS

26. Ohm is unit of all of the following except
(a) inductive reactance
(b) capacitive reactance
(c) resistance
(d) capacitance ANS

27. In a pure inductive circuit if the supply frequency is reduced to 1/2, the current will
(a) be reduced by half
(b) be doubled
(c) be four times as high
(d) be reduced to one fourth ANS

28. Kirchhoffs current law is applicable to only
(a) junction in a network
(b) closed loops in a network
(c) electric circuits
(d) electronic circuits ANS

29. Superposition theorem can be applied only to circuits having
(a) resistive elements
(b) passive elements
(c) nonlinear elements
(d) linear bilateral elements ANS

30. Thevenin resistance R_{th} is found
(a) by removing voltage sources along with their internal resistances
(6) by short circuiting the given two terminals
(c) between any two 'open' terminals
(d) between same open terminals as for E_{th}
ANS

31. An ideal voltage source should have
(a) large value of e.m.f.
(b) small value of e.m.f.
(c) zero source resistance
(d) infinite source resistance ANS

32. "Maximum power output is obtained from a network when the load resistance is equal to the output resistance of the network as seen from the terminals of the load". The above statement is associated with
(a) Millman's theorem
(b) Thevenin's theorem
(c) Superposition theorem
(d) Maximum power transfer theorem ANS

33. Kirchhoff s law is not applicable to circuits with
(a) lumped parameters
(b) passive elements
(c) distributed parameters
(d) non-linear resistances

34. The circuit whose properties are same in either direction is known as
(a) unilateral circuit
(b) bilateral circuit
(c) irreversible circuit

(d) reversible circuit ANS

35. A passive network is one which contains
(a) only variable resistances
(b) only some sources of e.m.f. in it
(c) only two sources of e.m.f. in it
(d) no source of e.m.f. in it ANS

36. Suppose Double the voltage in a simple dc circuit and cut the resistance in half , then the current will
(a) Become four times as great
(b) Become twice as great
(c) Stay the same as it was before
(d) Become half as great ANS

37. Three resistors each with a value of 0.069M ohm are in parallel. The total resistance is
(a) 23 Ω
(b) 23 KΩ
(c) 204 Ω
(d) 0.2 mΩ ANS

38. The average power delivered to an impedance (4 - j3) Ω by a current 5cos(100πt + 100π)A is
(a) 44.2W
(b) 50W
(c) 62.5W
(d) 125W ANS

39. Energy stored in a capacitor over a cycle, when excited by an ac source is
(a) The same as that due to a dc source of equivalent magnitude
(b) Half of that due to a dc source of equivalent magnitude
(c) Zero
(d) None of the above ANS

40. A very brief, high voltage spike on an ac power line is called as
(a) A bleeder
(b) An arc
(c) A transient
(d) An avalanche
(e) A clipped peak ANS

41. For the voltage u (t) = 3 + 4cos(3t), the RMS value is
(a) √17 V
(b) 3 V
(c) 4 V
(d) (3 + 2√2) V ANS

42. If two incandescent light bulbs of 40 W and 60 W rating are connected in series across mains then
(a) The bulbs together consumes 50 W
(b) The bulbs together consumes 100 W
(c) The 40 W bulb glows brighter
(d) The 60 W bulb glows brighter ANS

43. Consider a three-phase system supplying a balanced load. To measure the total power two watt meters are connected which reads 10.5kW and –2.5kW respectively. The total power and the power factor respectively are
(a) 8.0Kw, 0.334
(b) 8.0Kw, 0.553
(c) 10Kw, 0.7
(d) 10Kw, 0.45 ANS

44. The self inductances of two coils are 8 mH and 18 mH. If the coefficients of coupling is 0.5, the mutual inductance of the coils is
(a) 4 mH
(b) 5 mH
(c) 6 mH
(d) 12 mH ANS

45. The property of coil by which a counter e.m.f. is induced in it when the current through the coil changes is known as
(a) self inductance
(b) mutual inductance
(c) series aiding inductance
(d) capacitance ANS

46. Higher the self inductance of a coil,
(a) lesser its weber turns
(b) lower the e.m.f. induced
(c) greater the flux produced by it
(d) longer the delay in establishing steady current through it ANS

47. If current in a conductor increases then according to Lenz's law self induced voltage will
(a) aid the increasing current
(b) tends to decrease the amount of current
(c) produce current opposite to the increasing current
(d) aid the applied voltage ANS

48. Mutually inductance between two magnetically coupled coils depends on
(a) permeability of the core
(b) the number of their turns
(c) cross sectional area of their common core
(d) all of the above ANS

49. An e.m.f. of 16 volts is induced in a coil of inductance 4H. The rate of change of current must be
(a) 64 A/s
(b) 32 A/s
(c) 16 A/s
(d) 4 A/s ANS

50. The coefficient of coupling between two air core coils depends on
(a) self inductance of two coils only
(b) mutual inductance between two coils only
(c) mutual inductance and self inductance of two coils
(d) none of the above ANS

Ex. NO: 02

MEASUREMENTS AND INSTRUMENTATION

1. The use of _____ instruments is merely confined within laboratories as standardizing instruments.
(a) absolute
(b) indicating
(c) recording
(d) integrating
(e) none of the above ANS

2. Resistances can be measured with the help of
(a) wattmeter
(b) voltmeters
(c) ammeters
(d) ohmmeters and resistance bridges
(e) all of the above ANS

3. Which of the following essential features is possessed by an indicating instrument ?
(a) Deflecting device
(b) Controlling device
(c) Damping device
(d) All of the above ANS

4. The spring material used in a spring control device should have the following property.
(a) Should be nonmagnetic
(b) Most be of low temperature coefficient
(c) Should have low specific resistance
(d) Should not be subjected to fatigue
(e) All of the above ANS

5. A moving coil permanent magnet instrument can be used as _____ by using a low resistance shunt.
(a) ammeter
(b) voltmeter
(c) fluxmeter
(d) ballistic galvanometer ANS

6. Which of the following devices may be used for extending the range of instruments ?
(a) Shunts
(b) Multipliers
(c) Current transformers
(d) Potential transformers
(e) All of the above ANS

7. For handling greater currents induction wattmeters are used in conjunction with
(a) potential transformers
(b) current transformers
(c) power transformers
(d) either of the above
(e) none of the above ANS

8. Most common form of A.C. meters met with in every day domestic and industrial installations are
(a) mercury motor meters
(b) commutator motor meters
(c) induction type single phase energy meters
(d) all of the above ANS

9. A potentiometer may be used for
(a) measurement of resistance
(b) measurement of current
(c) calibration of ammeter
(d) calibration of voltmeter
(e) all of the above ANS

10. The household energy meter is
(a) an indicating instrument
(b) a recording instrument
(c) an integrating instrument
(d) none of the above ANS

11. In majority of instruments damping is provided by
(a) fluid friction
(b) spring
(c) eddy currents
(d) all of the above ANS

12. The function of shunt in an ammeter is to
(a) by pass the current
(b) increase the sensitivity of the ammeter
(c) increase the resistance of ammeter
(d) none of the above ANS

13. In a low power factor wattmeter the pressure coil is connected
(a) to the supply side of the current coil
(b) to the load side of the current coil
(c) in any of the two meters at connection
(d) none of the above ANS

14. In a 3phase power measurement by two wattmeter method the reading of one of the wattmeter was zero. The power factor of the load must be
(a) unity
(b) 0.5
(c) 0.3
(d) zero ANS

15. For measurements on high voltage capacitors, the suitable bridge is
(a) Wein bridge
(b) Modified De Santy's bridge
(c) Schering bridge
(d) Any of the above
(e) None of the above ANS

16. In an Anderson bridge, the unknown inductance is measured in terms of
(a) known inductance and resistance
(b) known capacitance and resistance
(c) known resistance
(d) known inductance ANS

17. For measurement of mutual inductance we can use
(a) Anderson bridge
(b) Maxwell's bridge
(c) Heaviside bridge
(d) Any of the above ANS

18. For measurement of inductance having high value, we should use
(a) Maxwell's bridge

(b) Maxwell Wein bridge
(c) Hay's bridge
(d) Any of the above ANS

19. If the current in a capacitor leads the voltage by 80°, the loss angle of the capacitor is
(a) 10°
(b) 80°
(c) 120°
(d) 170° ANS

20. To avoid the effect of stray magnetic field in A.C. bridges we can use
(a) magnetic screening
(b) Wagner earthing device
(c) wave filters
(d) any of the above ANS

21. If an inductance is connected in one arm of bridge and resistances in the remaining three arms
(a) the bridge can always be balanced
(b) the bridge cannot be balanced
(c) the bridge can be balanced if the resistances have some specific values ANS

22. A power factor meter has
(a) one current circuit and two pressure circuits
(b) one current circuit and one pressure circuit
(c) two current circuits and one pressure circuit
(d) none of the above ANS

23. In a single phase power factor meter the phase difference between the currents in the two pressure coils is
(a) exactly 0°
(b) approximately 0°
(c) exactly 90°
(d) approximately 90° ANS

24. In a vibrating reed frequency meter the natural frequencies of two adjacent reeds have a difference of
(a) 0.1 Hz
(b) 0.25 Hz
(c) 0.5 Hz
(d) 1.5 Hz ANS

25. In a Weston frequency meter, the magnetic axes of the two fixed coils are
(a) parallel
(b) perpendicular
(c) inclined at 60°
(d) inclined at 120° ANS

26. The desirable static characteristics of a measuring system are
(a) accuracy and reproducibility
(b) accuracy, sensitivity and reproducibility
(c) drift and dead zone
(d) static error ANS

27. The ratio of maximum displacement deviation to full scale deviation of the instrument is called
(a) static sensitivity
(b) dynamic deviation
(c) linearity
(d) precision or accuracy ANS

28. Standard resistor is made from
(a) platinum
(b) maganin
(c) silver
(d) nichrome ANS

29. If an instrument has cramped scale for larger values, then it follows
(a) square law
(b) logarithmic law
(c) uniform law
(d) none of the above ANS

30. Volt box is a component to
(a) extend voltage range
(6) measure voltage
(c) compare voltage in a box
(d) none of the above ANS

31. The gravity controlled instrument has crowded scale because current is proportional to
(a) balancing weight
(b) deflection angle
(c) sine of deflection angle ANS

32. The rectifier instrument is not free from
(a) temperature error
(b) wave shape error
(c) frequency error
(d) all of the above ANS

33. An instrument transformer is used to extend the range of
(a) induction instrument
(b) electrostatic instrument
(c) moving coil instrument
(d) any of the above ANS

34. Various adjustments in an energy meter include
(a) light load or friction
(b) lag and creep
(c) overload and voltage compensation
(d) temperature compensation
(e) all of the above ANS

35. Two holes in the disc of energy meter are drilled at the opposite sides of the spindle to
(a) improve its ventilation
(b) eliminate creeping at no load
(c) increase its deflecting torque
(d) increase its braking torque ANS

36. An ammeter whose internal resistance is 0.2Ω has current range of 0-5A. Which resistance is to be added in order to change the range to 0-25A?
(a) 0.05Ω in parallel with the meter.
(b) 0.2Ω in parallel with the meter
(c) 0.05Ω in series with the meter
(d) 1Ω in series with the meter ANS

37. _____ instruments are those which measure the total quantity of electricity delivered in a particular time.
(a) Absolute

(b) Indicating
(c) Recording
(d) Integrating ANS

38. Which of the following are integrating instruments?
(a) Ammeters
(b) Voltmeters
(c) Wattmeters
(d) Ampere hour and watt hour meters ANS

39. An ammeter is a
(a) secondary instrument
(b) absolute instrument
(c) recording instrument
(d) integrating instrument ANS

40. In a portable instrument, the controlling torque is provided by
(a) spring
(b) gravity
(c) eddy currents
(d) all of the above ANS

41. The multiplier and the meter coil in a voltmeter are in
(a) series
(b) parallel
(c) series parallel
(d) none of the above ANS

42. For measuring current at high frequency we should use
(a) moving iron instrument
(b) electrostatic instrument
(c) thermocouple instrument
(d) none of the above ANS

43. In a 3phase power measurement by two wattmeter method, both the watt meters had identical readings. The power factor of the load was
(a) Unity
(b) 0.8 lagging
(c) 0.8 leading
(d) zero ANS

44. The adjustment of position of shading bands, in an energy meter is done to provide
(a) friction compensation
(b) creep compensation
(c) braking torque
(d) none of the above ANS

45. Murray loop test can be used for location of
(a) ground fault on a cable
(b) short circuit fault on a cable
(c) both the ground fault and the short circuit fault
(d) none of the above ANS

46. It is required to measure the true open circuit e.m.f. of a battery. The best device is
(a) D.C. voltmeter
(b) Ammeter and a known resistance
(c) D.C. potentiometer
(d) None of the above ANS

47. In order to achieve high accuracy, the slide wire of a potentiometer should be
(a) as long as possible
(b) as short as possible
(c) neither too small not too large
(d) very thick ANS

48. A universal RLC bridge uses
(a) Maxwell bridge configuration for measurement of inductance and De Santy's bridge for measurement of capacitance
(b) Maxwell Wein Bridge for measurement of inductance and modified De Santy's bridge for measurement of capacitance
(c) Maxwell Wein bridge for measurement of inductance and Wein bridge for measurement of capacitance
(d) Any of the above. ANS

49. In a vibrating reed frequency meter the natural frequencies of two adjacent reeds have a difference of
(a) 0.1 Hz
(b) 0.25 Hz
(c) 0.5 Hz
(d) 1.5 Hz ANS

50. In Weston synchronoscope the moving coil is connected across
(a) busbars
(b) incoming alternator
(c) fixed coils
(d) any of the above ANS

Ex. NO: 03

ELECTROMAGNETIC THEORY

1. The force between two charges is 120 N. If the distance between the charges is doubled, the force will be

(a) 60 N
(b) 30 N
(c) 40 N
(d) 15 N ANS

2. The electric field intensity at a point situated 4 metres from a point charge is 200 N/C. If the distance is reduced to 2 metres, the field intensity will be

(a) 400 N/C
(b) 600 N/C
(c) 800 N/C
(d) 1200 N/C ANS

3. The lines of force due to charged particles are

(a) always straight
(b) always curved
(c) sometimes curved
(d) none of the above ANS

4. The electric field at a point situated at a distance d from straight charged conductor is

(a) proportional to d
(b) inversely proportional to d
(c) inversely proportional to d
(d) none of the above ANS

5. The direction of electric field due +0 positive charge is

(a) away from the charge
(b) towards the charge
(c) both (a) and (6)
(d) none of the above ANS

6. A field line and an equipotential surface are

(a) always parallel
(b) always at 90°
(c) inclined at any angle 0
(d) none of the above ANS

7. The ability of charged bodies to exert force on 6ne another is attributed to the existence of

(a) electrons
(b) protons
(c) neutrons
(d) electric field ANS

8. If the sheet of a bakelite is inserted between the plates of an air capacitor, the capacitance will

(a) decrease
(b) increase
(c) remains unchanged
(d) become zero ANS

9. A capacitor stores 0.24 coulombs at 10 volts. Its capacitance is

(a) 0.024 F
(b) 0.12 F
(c) 0.6 F
(d) 0.8 F ANS

10. For making a capacitor, it is better to select a dielectric having

(a) low permittivity
(b) high permittivity
(c) permittivity same as that of air
(d) permittivity slightly more than that of air ANS

11. If three 15 μF capacitors are connected in series, the net capacitance is

(a) 5 μF
(6) 30 μF
(c) 45 μF
(d) 50 μF ANS

12. If three 10 F capacitors are connected in parallel, the net capacitance is

(a) 20 μF
(b) 30 μF
(c) 40 μF
(d) 50 μF ANS

13. A dielectric material must be

(a) resistor
(b) insulator
(c) good conductor
(d) semi conductor ANS

14. An electrolytic capacitor can be used for

(a) D.C. only
(b) AC. only
(c) both D.C. as well as A.C. ANS

15. The capacitance of a capacitor is not affected by

(a) distance between plates
(6) area of plates
(c) thickness of plates
(d) all of the above ANS

16. Which of the following is not a vector ?

(a) Linear momentum
(b) Angular momentum
(c) Electric field
(d) Electric potential ANS

17. "The total electric flux through any closed surface surrounding charges is equal to the amount of charge enclosed". The above statement is associated with

(a) Coulomb's square law
(b) Gauss's law
(c) Maxwell's first law
(d) Maxwell's second law ANS

18. Three capacitors each of the capacity C are given. The resultant capacity 2/3 C can be obtained by using them

(a) all in series
(b) all in parallel
(c) two in parallel and third in series with this combination
(d) two in series and third in parallel across this combination ANS

19. For which of the following parameter variation, the capacitance of the capacitor remains unaffected ?
(a) Distance between plates
(b) Area of the plates
(c) Nature of dielectric
(d) Thickness of the plates ANS

20. Which of the following expression is correct for electric field strength ?
(a) E = D/E
(b) E = D2/t
(c) E = jtD
(d) E= nD2 ANS

21. Which of the following materials has the highest value of dielectric constant?
(a) Glass
(b) Vacuum
(c) Ceramics
(d) Oil ANS

22. The power dissipated in a pure capacitor is
(a) zero
(6) proportional to applied voltage
(c) proportional to value of capacitance
(d) both (b) and (c) above ANS

23. When a dielectric slab is introduced in a parallel plate capacitor, the potential difference between plates will
(a) remain uncharged
(b) decrease
(c) increase
(d) become zero ANS

24. Air capacitors are generally available in the range
(a) 10 to 400 pF
(b) 1 to 20 pF
(c) 100 to 900 pF
(d) 20 to 100 pF ANS

25. A capacitor in a circuit became hot and ultimately exploded due to wrong connections, which type of capacitor it could be ?
(a) Paper capacitor
(b) Ceramic capacitor
(c) Electrolytic capacitor
(d) Any-of the above ANS

26. The relative permittivity of free space is given by
(a) 1
(b) 10
(c) 100
(d) 1000 ANS

27. When 4 volts e.m.f. is applied across a 1 farad capacitor, it will store energy of
(a) 2 joules
(b) 4 joules
(c) 6 joules
(d) 8 joules ANS

28. The capacitor preferred for high frequency circuits is
(a) air capacitor
(b) mica capacitor
(c) electrolytic capacitor
(d) none of the above ANS

29. The electrostatic force between two charges of one coulomb each and placed at a distance of 0.5 m will be
(a) 36 x 10fa
(b) 36 x 107 N
(c) 36 x 108 N
(d) 36 x 109 N ANS

30. When the dielectric is homogeneous, the potential gradient is
(a) uniform
(b) non-uniform
(c) zero
(d) any of the above ANS

31. A single core cable used on 33000 V has conductor diameter 10 mm and the internal diameter of sheath 25 mm. The maximum electrostatic stress in the cable is
(a) 62 x 105 V/m
(b) 72 x 105 V/m
(c) 82 x 105 V/m
(d) 92 x 105 V/m ANS

32. Two infinite parallel plates 10 mm apart have maintained between them a potential difference of 100 V. The acceleration of an electron placed between them is
(a) 0.56 x 1015 m/s2
(b) 1.5 x 1015 m/s2
(c) 1.6 x 1015 m/s2
(d) 1.76 x 1015 m/s2 ANS

33. The phenomenon of an uncharged body getting charged merely by the nearness of a charged body is known as
(a) photoelectric effect
(b) chemical effect
(c) magnetic effect
(d) induction ANS

34. The value of E within the field due to a point charge can be found with the help of
(a) Faraday's laws
(b) Kirchhoff s laws
(c) Coulomb's laws
(d) none of the above ANS

35. Electric displacement is a_____quantity.
(a) scalar
(b) vector
(c) both of the above
(d) none of the above ANS

36. Dielectric strength of a material depends on
(a) moisture content
(b) temperature
(c) thickness
(d) all of the above
(e) none of the above ANS

37. A potential of 400 V is applied to a capacitor, the plates of which are 4 mm apart. The strength of electric field is
(a) 100 kV/m
(b) 10 kV/m
(c) 5 kV/m
(d) 2 kV/m ANS

38. Consider a long solenoid of length 1000mm.It is wound uniformly with 3000 turns on a cylindrical paper tube of 60 mm diameter. The inductance of solenoid is
(a) 3.2 μH
(b) 0.32 mH
(c) 32.0 mH
(d) 3.2 mH ANS

39. Amplitude of electric field corresponding to the incoming solar radiation of 1.2KW/m^2 at a place on the surface of the earth is nearly equal to.
(a) 950 V/m
(b) 1000 V/m
(c) 420 V/m
(d) 220 V/m ANS

40. Match the following:
(F is force exerted on a charge q in the electric field E and S is the closed surface containing charge q, D is the flux density).

Equation	Nomenclature
(a) φ_s E dS = q / ε_0	(i) Poisson's equation
(b) ▼ .D = ρ	(ii) Laplace's equation
(c) ▼^{2} .φ = - ρ/ ε_0	(iii) Guass theorem
(d) ▼^{2} .φ = 0	(iv) Charge density

(a) a - (i), b - (ii), c - (iii), d - (iv)
(b) a - (ii), b - (i), c - (iv), d - (iii)
(c) a - (iv), b - (i), c - (ii), d - (iii)
(d) a - (iii), b - (iv), c - (i), d - (ii). ANS

41. When an iron piece is placed in a magnetic field
(a) the magnetic lines of force will bend away from their usual paths in order to go away from the piece
(b) the magnetic lines of force will bend away from their usual paths in order to pass through the piece
(c) the magnetic field will not be affected
(d) the iron piece will break ANS

42. The ratio of intensity of magnetisation to the magnetisation force is known as
(a) flux density
(b) susceptibility
(c) relative permeability
(d) none of the above ANS

43. The unit of relative permeability is
(a) henry/metre
(b) henry
(c) henry/sq. m
(d) it is dimensionless ANS

44. Substances which have permeability less than the permeability of free space are known as
(a) ferromagnetic
(b) paramagnetic
(c) diamagnetic
(d) bipolar ANS

45. One tesla is equal to
(a) 1 Wb/mm2
(b) 1 Wb/m
(c) 1 Wb/m2
(d) 1 mWb/m2 ANS

46. Out of the following statements, concerning an electric field, which statement is not true ?
(a) The electric intensity is a vector quantity
(b) The electric field intensity at a point is numerically equal to the force exerted upon a charge placed at that point
(c) An electric field is defined as a point in space at which an electric charge would experience a force
(d) Unit field intensity in the exertion of a force of one Newton on a charge of one coulomb ANS

47. One Maxwell is equal to
(a) 10 Weber
(b) 100Weber
(c) 10 mWebers
(d) 1Weber ANS

48. Two long parallel conductors carry 100 A. If the conductors are separated by 20 mm, the force per meter of length of each conductor will be
(a) 100 N
(b) 10 N
(c) 1 N
(d) 0.1 N ANS

49. A 300 mm long conductor is carrying a current of 10 A and is situated at right angles to a magnetic field having a flux density of 0.8 T ; the force on the conductor will be
(a) 240 N
(6) 24 N
(c) 2.4 N
(d) 0.24 N ANS

50. The electromagnet has 50 turns and a current of 1A flows through the coil. If the length of the magnet circuit is 200 mm, what is the magnetic field strength ?
(a) 2500 AT/m
(b) 250 AT/m
(c) 25 AT/m
(d) 2.5 AT/m ANS

Ex. NO: 04
ELECTRONIC DEVICES AND CIRCUITS

1. In order for a BJT to conduct under the conditions of no signal input, the bias must be
(a) In the reverse direction at the E-B junction, sufficient to cause forward break over.
(b) In the reverse direction at the E-B junction, but not sufficient to cause avalanche effect.
(c) Such that the application of a signal would cause the transistor to go into a state of cutoff.
(d) Such that the application of a signal would cause the transistor to go into a state of saturation.
(e) Such that the application of a signal would cause the transistor to become nonlinear. ANS

2. The high input impedance of a MOSFET makes this type of device ideal for use in
(a) Weak-signal amplifiers
(b) High-power oscillators
(c) High-current rectifiers
(d) Antenna tuning networks
(e) Graphic equalizers ANS

3. The drain of a JFET is the analog of the
(a) Plate of a vacuum tube
(b) Emitter of a BJT
(c) Cathode of diode
(d) Positive electrode in a solar cell
(e) Substrate of a MOSFET ANS

4. One of the technical limitations of capacitive proximity sensors is the fact that they
(a) Are not very sensitive to objects that are poor electrical conductors.
(b) Are insensitive to objects that reflect light.
(c) Are insensitive to metallic objects.
(d) Cannot be used with oscillators
(e) Require extreme voltages in order to function properly ANS

5. The power factor in an ac circuit is defined as
(a) The actual power divided by the maximum power the circuit can handle.
(b) The ratio of the real power to the imaginary power.
(c) The ratio of the apparent power to the true power.
(d) The ratio of the true power to the apparent power.
(e) The ratio of the imaginary power to the apparent power. ANS

6. The amount of current that a silicon photodiode can deliver in direct sunlight depends on
(a) The forward break over voltage.
(b) The thickness of the substrate.
(c) The surface area of the P-N junction.
(d) The applied voltage.
(e) The reverse bias. ANS

7. In an amplifier that employs a P-Channel JFET, the device can usually be replaced with an N-channel JFET having similar specifications, provided that
(a) All the resistors are reversed in polarity for the circuit in question
(b) The power supply polarity is reversed for the circuit in question
(c) The drain, rather than the source, is placed at signal ground
(d) The output is taken from the source, rather than from the drain. ANS

8. Secondary breakdown occurs in
(a) MOSFET but not in BJT
(b) Both MOSFET and BJT
(c) BJT but not in MOSFET
(d) None of these ANS

9. In a transistor
(a) $\beta = \alpha/(\alpha+1)$
(b) $\beta = \alpha/(1-\alpha)$
(c) $\alpha = \beta/(\beta-1)$
(d) $\alpha = (\beta+1)/\beta$ ANS

10. The interbase resistance of a UJT is
(a) Less than forward biased PN diode
(b) Higher than a FET
(c) Of the order of 1K and less
(d) In the range of 5K to 10K ANS

11. The VI characteristics of emitter of a UJT is
(a) Similar to CE with a linear and saturation region
(b) similar to FET with a linear and saturation region
(c) Similar to tunnel diode in some respects
(d) Linear between the peak point and valley point ANS

12. An UJT used for triggering as SCR has the supply voltage V_{BB} = 25V. The intrinsic standoff ratio n = 0.75. The UJT will conduct when the bias voltage V_E is
(a) 25V
(b) >=18.75V
(c) 33.3V
(d) >=19.35V ANS

13. The Oscillator which is not dependent on phase shift is
(a) Wien Bridge
(b) Clapp
(c) Relaxation
(d) Crystal ANS

14. For an UJT to function, the load line must extend
(a) from saturation region to ohmic region
(b) from saturation to peak value of emitter voltage
(c) from valley point to peak point
(d) within valley and peak points in the negative resistance region ANS

15. A common-collector transistor circuit is often used
(a) To provide high gain and sensitivity over a wide range of frequencies
(b) To match a high impedance to a low impedance
(c) As a high-fidelity audio power amplifier
(e) As the rectifier in a dc power supply ANS

16. The output wave of a common-gate amplifier circuit with a pure sine-wave input
(a) Is in phase with the input wave.
(b) Lags the input wave by 90° of phase.
(c) Leads the input wave by 90° of phase.
(d) Is 180° out of phase with the input wave
ANS

17. A diode can be used as a frequency multiplier because of its
(a) Junction capacitance
(b) Non linearity
(c) Avalanche voltage
(d) Forward breakover ANS

18. Which of the following is not characteristic of an oscillator?
(a) Negative feedback
(b)Good output to input coupling
(c) Reasonably high transistor gain
(d) Alternating current signal output ANS

19. The other name for beta of BJT is
(a) Current amplification factor
(b) Voltage amplification factor
(c) Power amplification factor
(d) Maximum amplification frequency ANS

20. You can find the zener diode in
(a) The mixer in a super heterodyne receiver
(b) The PLL in a circuit for detecting FM
(c) The product detector in a receiver for SSB
(d) The voltage regulator in a power supply
(e) The AF oscillator in an AFSK transmitter
ANS

21. When the bias in an FET stops the flow of current, the condition is called
(a) Forward breakover
(b) Cutoff
(c) Reverse bias
(d)Pinch off
(e) Avalanche ANS

22. In N-type semiconductor, the minority carriers are
(a) Electrons
(b) Protons
(c) Holes
(d) Positrons ANS

23. Proper biasing in an amplifier circuit
(a) Causes it to oscillate
(b) Prevents an impedance match
(c) Can be obtained using a voltage divider network
(d) Maximizes current flow ANS

24. A network designed to pass signals with all frequencies except those between two specified cut-off frequencies is called a
(a) low-pass filter
(b) high-pass filter
(c) band-pass filter
(d) band-stop filter ANS

25. It is required to construct a counter to count upto 100(decimal). The minimum number of flipflops required to construct the counter is
(a) 8
(b) 7
(c) 6
(d) 5 ANS

26. The gate that assumes the 1 state, if and only if the input does not take a 1 state is called.....
(a) AND gate
(b) NOT gate
(c) NOR gate
(d) Both b and c ANS

27. For NOR circuit SR flip flop the not allowed condition is....
(a) S=0, R=0
(b) S=0, R=1
(c) S=1, R=1
(d) S=1, R=0 ANS

28. A bi-stable multi-vibrator is a
(a) Free running oscillator
(b) Triggered oscillator
(c) Saw tooth wave generator
(d) Crystal oscillator ANS

29. For a large values of $|V_{DS}|$, a FET behave as
(a) Voltage controlled resistor
(b) Current controlled current source
(c) Voltage controlled current source
(d) Current controlled resistor ANS

30. When a step input is given to an op-amp integrator, the output will be
(a) a ramp
(b) a sinusoidal wave
(c) a rectangular wave
(d) a triangular wave with dc bias ANS

31. Hysteresis is desirable in Schmitt-trigger, because
(a) Energy is to be stored/discharged in parasitic capacitance
(b) Effects of temperature would be compensated
(c) Devices in the circuit should be allowed time for saturation and de-saturation
(d) It would prevent noise from causing false triggering
ANS

32. For a 10-bit DAC, the Resolution is defined by which of the following
(a) 1024
(b) 1/1024
(c) 10
(d) None ANS

33. SRAM full form is
(a) Serial Read Access Memory
(b) Static Random Access Memory
(c) Static Read-only Access memory ANS

34. What are the minimum number of 2 to 1 multiplexers required to generate a 2 input AND gate and a 2 input Ex-OR gate?

(a) 1 and 2
(b) 1 and 3
(c) 1 and 1
(d) 2 and 2 ANS

35. The output of a logic gate is '1' when all its inputs are at logic '0'. Then gate is either
(a) A NAND or an EX-OR gate
(b) A NOR or an EX-NOR gate
(c) An OR or EX-NOR gate
(d) An AND or an Ex-OR gate ANS

36. A PLA can be used
(a) As a microprocessor
(b) As a dynamic memory
(c) To realise a sequential logic
(d) To realise a combinational logic ANS

37. A dynamic RAM consists of
(a) 6 Transistors
(b) 2 Transistors and 2 Capacitors
(c) 1 Transistor and 1 Capacitor
(d) 2 Capacitor only ANS

38. The most commonly used amplifier in sample & hold circuits is
(a) A unity gain non-inverting amplifier
(b) A unity gain inverting amplifier
(c) An inverting amplifier with a gain of 10
(d) An inverting amplifier with a gain of 100
ANS

39. Three identical amplifiers with each one having a voltage gain of 50, input resistance of 1K & output resistance of 250,are cascaded. The open circuit voltage gain of combined amplifier is
(a) 49dB
(b) B. 51dB
(c) C. 98dB
(d) D. 102dB ANS

40. The cascade amplifier is a multistage configuration of
(a) CC-CB
(b) CE-CB
(c) CB-CC
(d) CE-CC ANS

41. The current gain of a BJT is
(a) $g_m r_0$
(b) g_m / r_0
(c) $g_m r_\pi$
(d) g_m / r_π ANS

42. Introducing a resistor in the emitter of a common amplifier stabilizes the dc operating point against variations in
(a) Only the temperature
(b) Only the β of the transistor
(c) Both Temperature & β
(d) None of the above ANS

43. Voltage Series feedback (also called series-shunt feedback) results in
(a) Increase in both input & output impedances
(b) Decrease in both input & output impedances
(c) Increase in input impedance& decrease in output impedance
(d) Decrease in input impedance& increase in output impedance ANS

44. An amplifier without feedback has a voltage gain of a 50,input resistance of 1K & Output resistance of 2.5K. The input resistance of the current-shunt negative feedback amplifier using the above amplifier with a feedback of 0.2 is
(a) 1/11K
(b) 1/5K
(c) 5K
(d) 11K ANS

45. The minimum number of flip-flops required to construct a mod-75 counter is
(a) 5
(b) 6
(c) 7
(d) 8 ANS

46. The frequency of oscillation of a tunnel-collector oscillator having L= 30μH and C = 300pF is nearby
(a) 267 kHz
(b) 1677 kHz
(c) 1.68 kHz
(d) 2.67 kHz ANS

47. In class-A amplifier, the output current flows for
(a) A part of the cycle or the input signal
(b) The full cycle of the input signal
(c) Half the cycle of the input signal
(d) 3/4th of the cycle of the input signal ANS

48. Wien bridge oscillator can typically generate frequencies in the range of
(a) 1kHz - 1 Mhz
(b) 1 Mhz - 10MHz
(c) 10MHz - 100MHz
(d) 100MHz - 150MHz ANS

49. A differential amplifier, amplifies ...
(a) And mathematically differentiates the average of the voltages on the two input lines
(b) And differentiates the input waveform on one line when the other line is grounded
(c) The difference of voltages between the two input lines
(d) And differentiates the sum of the two input waveform ANS

50. In a bistable multivibrator circuit, commutating capacitor is used
(a) To increase the base storage charge
(b) To provide ac coupling
(c) To increase the speed of response
(d) To provide the speed of oscillations ANS

Ex. NO: 05
TRANSFORMERS

1. Which of the following does not change in a transformer ?
(a) Current
(b) Voltage
(c) Frequency
(d) All of the above ANS

2. A transformer core is laminated to
(a) reduce hysteresis loss
(b) reduce eddy current losses
(c) reduce copper losses
(d) reduce all above losses ANS

3. The degree of mechanical vibrations produced by the laminations of a transformer depends on
(a) tightness of clamping
(b) gauge of laminations
(c) size of laminations
(d) all of the above ANS

4. The path of a magnetic flux in a transformer should have
(a) high resistance
(b) high reluctance
(c) low resistance
(d) low reluctance ANS

5. The purpose of providing an iron core in a transformer is to
(a) provide support to windings
(b) reduce hysteresis loss
(c) decrease the reluctance of the magnetic path
(d) reduce eddy current losses ANS

6. Which of the following is not a part of transformer installation ?
(a) Conservator
(b) Breather
(c) Buchholz relay
(d) Exciter ANS

7. While conducting short circuit test on a transformer the following side is short circuited
(a) High voltage side
(b) Low voltage side
(c) Primary side
(d) Secondary side ANS

8. A transformer cannot raise or lower the voltage of a D.C. supply because
(a) there is no need to change the D.C. voltage
(b) a D.C. circuit has more losses
(c) Faraday's laws of electromagnetic induction are not valid since the rate of change of flux is zero
(d) none of the above ANS

9. In a given transformer for given applied voltage, losses which remain constant irrespective of load changes are
(a) friction and windage losses
(b) copper losses
(c) hysteresis and eddy current losses
(d) none of the above ANS

10. A common method of cooling a power transformer is
(a) natural air cooling
(b) air blast cooling
(c) oil cooling
(d) any of the above ANS

11. In the transformer the function of a conservator is to
(a) provide fresh air for cooling the transformer
(b) supply cooling oil to transformer in time of need
(c) protect the transformer from damage when oil expends due to heating
(d) none of the above ANS

12. No load current of a transformer has
(a) has high magnitude and low power factor
(b) has high magnitude and high power factor
(c) has small magnitude and high power factor
(d) has small magnitude and low power factor ANS

13. Greater the secondary leakage flux
(a) less will be the secondary induced e.m.f.
(b) less will be the primary induced e.m.f.
(c) less will be the primary terminal voltage
(d) none of the above ANS

14. What will happen if the transformers working in parallel are not connected with regard to polarity ?
(a) The power factor of the two transformers will be different from the power factor of common load
(b) Incorrect polarity will result in dead short circuit
(c) The transformers will not share load in proportion to their kVA ratings
(d) none of the above ANS

15. The use of higher flux density in the transformer design
(a) reduces weight per kVA
(6) reduces iron losses
(c) reduces copper losses
(d) increases part load efficiency ANS

16. The chemical used in breather for transformer should have the quality of
(a) ionizing air
(b) absorbing moisture
(c) cleansing the transformer oil
(d) cooling the transformer oil. ANS

17. The transformer ratings are usually expressed in terms of
(a) volts
(b) amperes
(c) kW
(d) kVA ANS

18. The noise resulting from vibrations of laminations set by magnetic forces, is termed as
(a) magnetostrication
(b) boo

(c) hum
(d) zoom ANS

19. The thickness of laminations used in a transformer is usually
(a) 0.4 mm to 0.5 mm
(b) 4 mm to 5 mm
(c) 14 mm to 15 mm
(d) 25 mm to 40 mm ANS

20. A Buchholz relay can be installed on
(a) auto transformers
(b) air cooled transformers
(c) welding transformers
(d) oil cooled transformers ANS

21. Buchholz's relay gives warning and protection against
(a) electrical fault inside the transformer itself
(b) electrical fault outside the transformer in outgoing feeder
(c) for both outside and inside faults
(d) none of the above ANS

22. Which of the following is not a routine test on transformers ?
(a) Core insulation voltage test
(b) Impedance test
(c) Radio interference test
(d) Polarity test ANS

23. The full load copper loss of a transformer is 1600 W. At half load, the copper loss will be
(a) 6400 W
(b) 1600 W
(c) 800 W
(d) 400 W ANS

24. The value of flux involved m the e.m.f. equation of a transformer is
(a) average value
(b) r.m.s. value
(c) maximum value
(d) instantaneous value ANS

25. Which of the following is the main advantage of an autotransformer over a two winding transformer ?
(a) Hysteresis losses are reduced
(b) Saving in winding material
(c) Copper losses are negligible
(d) Eddy losses are totally eliminated ANS

26. An ideal transformer will have maximum efficiency at a load such that
(a) copper loss = iron loss
(b) copper loss < iron loss
(c) copper loss > iron loss
(d) none of the above ANS

27. Negative voltage regulation is indicative that the load is
(a) capacitive only
(b) inductive only
(c) inductive or resistive
(d) none of the above ANS

28. Iron loss of a transformer can be measured by
(a) low power factor wattmeter
(b) unity power factor wattmeter
(c) frequency meter
(d) any type of wattmeter ANS

29. During open circuit test of a transformer
(a) primary is supplied rated voltage
(b) primary is supplied full load current
(c) primary is supplied current at reduced voltage
(d) primary is supplied rated kVA ANS

30. Open circuit test on transformers is conducted to determine
(a) hysteresis losses
(b) copper losses
(c) core losses
(d) eddy current losses ANS

31. Short circuit test on transformers is conducted to determine
(a) hysteresis losses
(b) copper losses
(c) core losses
(d) eddy current losses ANS

32. The secondary winding of which of the following transformers is always kept closed ?
(a) Step up transformer
(b) Step down transformer
(c) Potential transformer
(d) Current transformer ANS

33. A shell type transformer has
(a) high eddy current losses
(b) reduced magnetic leakage
(c) negligibly hysteresis losses
(d) none of the above ANS

34. Which of the following is not the standard voltage for power supply in India ?
(a) llkV
(b) 33kV
(c) 66 kV
(d) 122 kV ANS

35. Losses which occur in rotating electric machines and do not occur in transformers are
(a) friction and windage losses
(b) magnetic losses
(c) hysteresis and eddy current losses
(d) copper losses ANS

36. A good voltage regulation of a transformer means
(a) output voltage fluctuation from no load to full load is least
(b) output voltage fluctuation with power factor is least
(c) difference between primary and secondary voltage is least
(d) difference between primary and secondary voltage is maximum ANS

37. Which of the following protection is normally not provided on small distribution transformers ?

(a) Overfluxing protection
(b) Buchholz relay
(c) Overcurrent protection
(d) All of the above ANS

38. The efficiency of two identical transformers under load conditions can be determined by
(a) short circuit test
(b) back to back test
(c) open circuit test
(d) any of the above ANS

39. Which of the following loss in a transformer is zero even at full load ?
(a) Core loss
(b) Friction loss
(c) Eddy current loss
(d) Hysteresis loss ANS

40. Consider a single-phase transformer. Maximum efficiency of transformer is 90% at full load and unity power factor. What will be the efficiency at half load at same power factor?
(a) 87.8 %
(b) 88.9%
(c) 89.6%
(d) 98.2% ANS

41. Spacers are provided between adjacent coils
(a) to provide free passage to the cooling oil
(b) to insulate the coils from each other
(c) both (a) and (b)
(d) none of the above ANS

42. Two transformers operating in parallel will share the load depending upon their
(a) leakage reactance
(b) per unit impedance
(c) efficiencies
(d) ratings ANS

43. The chemical used in breather is
(a) asbestos fiber
(b) silica sand
(c) sodium chloride
(d) silica gel ANS

44. Material used for construction of transformer core is usually
(a) wood
(b) copper
(c) aluminium
(d) silicon steel ANS

45. Star/star transformers work satisfactorily when
(a) load is unbalanced only
(b) load is balanced only
(c) on balanced as well as unbalanced loads
(d) none of the above ANS

46. The leakage flux in a transformer depends upon
(a) load current
(b) load current, voltage and frequency
(c) load current, voltage, frequency and power factor
(d) load current and voltage ANS

47. Noise level test in a transformer is a
(a) special test
(b) routine test
(c) type test
(d) none of the above ANS

48. Helical coils can be used on
(a) low voltage side of high kVA transformers
(b) high frequency transformers
(c) high voltage side of small capacity transformers
(d) high voltage side of high kVA rating transformers
ANS

49. If the supply frequency to the transformer is increased,"the iron loss will
(a) not change
(b) decrease
(c) increase
(d) any of the above ANS

50. The transformer laminations are insulated from each other by
(a) mica strip
(b) thin coat of varnish
(c) paper
(d) any of the above ANS

Ex. NO: 06
DC MACHINES

1. No load speed of which of the following motor will be highest ?
(a) Shunt motor
(b) Series motor
(c) Cumulative compound motor
(d) Differentiate compound motor ANS

2. Which of the following application requires high starting torque ?
(a) Lathe machine
(b) Centrifugal pump
(c) Locomotive
(d) Air blower ANS

3. If a D.C. motor is to be selected for conveyors, which motor would be preferred ?
(a) Series motor
(b) Shunt motor
(c) Differentially compound motor
(d) Cumulative compound motor ANS

4. Differentially compound D.C. motors can find applications requiring
(a) high starting torque
(b) low starting torque
(c) variable speed
(d) frequent on off cycles ANS

5. If the field of a D.C. shunt motor gets opened while motor is running
(a) the speed of motor will be reduced %
(b) the armature current will reduce
(c) the motor will attain dangerously high speed
(d) the motor will continue to run constant speed
ANS

6. Starters are used with D.C. motors because
(a) these motors have high starting torque
(b) these motors are not self starting
(c) back e.m.f. of these motors is zero initially
(d) to restrict armature current as there is no back e.m.f. while starting ANS

7. If a D.C. motor is connected across the A.C. supply it will
(a) run at normal speed
(b) not run
(c) run at lower speed
(d) burn due to heat produced in the field winding by eddy currents ANS

8. To get the speed of D.C, motor below the normal without wastage of electrical energy is used.
(a) Ward Leonard control
(b) rheostatic control
(c) any of the above method
(d) none of the above method ANS

9. In a D.C. shunt motor, speed is
(a) independent of armature current
(b) directly proportional to the armature current
(c) proportional to the square of the current
(d) inversely proportional to the armature current
ANS

10. In D.C. machines fractional pitch winding is used
(a) to improve cooling
(b) to reduce copper losses
(c) to increase the generated e.m.f.
(d) to reduce the sparking ANS

11. Which of the following law/rule can he used to determine the direction of rotation of D.C. motor ?
(a) Lenz's law
(b) Faraday's law
(c) Coloumb's law
(d) Fleming's lefthand rule ANS

12. The power mentioned on the name plate of an electric motor indicates
(a) the power drawn in kW
(b) the power drawn in kVA
(c) the gross power
(d) the output power available at the shaft
ANS

13. For the same H.P. rating and full load speed, following motor has poor starting torque
(a) shunt
(b) series
(c) differentially compounded
(d) cumulatively compounded ANS

14. Speed control by Ward Leonard method gives uniform speed variation
(a) in one direction
(b) in both directions
(c) below normal speed only
(d) above normal speed only. ANS

15. In a differentially compounded D.C. motor, if shunt field suddenly opens
(a) the motor will first stop and then run in opposite direction as series motor
(b) the motor will work as series motor and run at slow speed in the same direction
(c) the motor will work as series motor and run at high speed in the same direction
(d) the motor will not work and come to stop
ANS

16. The speed of a motor falls from 1100 r.p.m. at noload to 1050 r.p.m. at rated load. The speed regulation of the motoris
(a) 2.36%
(6) 4.76%
(c) 6.77%
(d) 8.84% ANS

17. The plugging gives the
(a) zero torque braking
(b) smallest torque braking
(c) highest torque braking
(d) none of the above ANS

18. Regenerative method of braking is based on that
(a) back e.m.f. is less than the applied voltage
(b) back e.m.f. is equal to the applied voltage
(c) back e.m.f. of rotor is more than the applied voltage
(d) none of the above ANS ☐

19. The condition for maximum efficiency for a D.C. generator is
(a) eddy current losses = stray losses
(b) hysteresis losses = eddy current losses
(c) copper losses = 0
(d) variable losses = constant losses ANS ☐

20. The purpose of retardation test on D.C. shunt machines is to find out
(a) stray losses
(b) eddy current losses
(c) field copper losses
(d) windage losses ANS ☐

21. Which of the following tests will be suitable for testing two similar D.C. series motors of large capacity ?
(a) Swinburne's test
(b) Hopkinson's test
(c) Field test
(d) Brake test ANS ☐

22. Hopkinson's test on D.C. machines is conducted at
(a) noload
(b) part load
(c) full load
(d) over load ANS ☐

23. In lap winding, the number of brushes is always
(a) double the number of poles
(b) same as the number of poles
(c) half the number of poles
(d) two ANS ☐

24. For a D.C. generator when the number of poles and the number of armature conductors is fixed, then which winding will give the higher e.m.f. ?
(a) Lap winding
(b) Wave winding
(c) Either of (a) and (b) above
(d) Depends on other features of design ANS ☐

25. Copper brushes in D.C. machine are used
(a) where low voltage and high currents are involved
(b) where high voltage and small currents are involved
(c) in both of the above cases
(d) in none of the above cases ANS ☐

26. A separately excited generator as compared to a self excited generator
(a) is amenable to better voltage control
(b) is more stable
(c) has exciting current independent of load current
(d) has all above features ANS ☐

27. 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 ANS ☐

28. Armature reaction of an unsaturated D.C. machine is
(a) cross magnetising
(b) demagnetising
(c) magnetizing
(d) none of above ANS ☐

29. D.C. generators are connected to the busbars or disconnected from them only under the floating condition
(a) to avoid sudden loading of the prime mover
(b) to avoid mechanical jerk to the shaft
(c) to avoid burning of switch contacts
(d) all above ANS ☐

30. Welding generator will have
(a) lap winding
(b) wave winding
(c) delta winding
(d) duplex wave winding ANS ☐

31. The function of pole shoes in the case of D.C. machine is
(a) to reduce the reluctance of the magnetic path
(b) to spread out the flux to achieve uniform flux density
(c) to support the field coil
(d) to discharge all the above functions ANS ☐

32. The demagnetising component of armature reaction in a D.C. generator
(a) reduces generator e.m.f.
(b) increases armature speed
(c) reduces interpoles flux density
(d) results in sparking trouble ANS ☐

33. Magnetic field in a D.C. generator is produced by
(a) electromagnets
(b) permanent magnets
(c) both (a) and (b)
(d) none of the above ANS ☐

34. Compensating windings are used in D.C. generators
(a) mainly to reduce the eddy currents by providing local short circuits
(b) to provide path for the circulation of cooling air
(c) to neutralise the cross magnetising effect of the armature reaction
(d) none of the above ANS ☐

35. The e.m.f. generated by a shunt wound D.C. generator is E. Now while pole flux remains constant, if the speed of the generator is doubled, the e.m.f. generated will be
(a) E/2
(b) 2E

(c) slightly less than E
(d) E ANS

36. Interpole flux should be sufficient to
(a) neutralise the commutating self inducede.m.f.
(b) neutralise the armature reaction flux
(c) neutralise both the armature reaction flux as well as commutating e.m.f. induced in the coil
(d) perform none of the above functions ANS

37. A shunt generator running at 1000 r.p.m. has generated e.m.f. as 200 V. If the speed increases to 1200 r.p.m., thegeneratede.m.f. will be nearly
(a) 150 V
(b) 175 V
(c) 240 V
(d) 290 V ANS

38. The e.m.f. induced in the armature of a shunt generator is 600 V. The armature resistance is 0.1 ohm. If the armature current is 200 A, the terminal voltage will be
(a) 640 V
(b) 620 V
(c) 600 V
(d) 580 V ANS

39. An exciter for a turbo generator is a
(a) separately excited generator
(b) shunt generator
(c) series generator
(d) compound generator ANS

40. The critical resistance of the D.C. generator is the resistance of
(a) field
(b) brushes
(c) armature
(d) load ANS

41. Which of the following generating machine will offer constant voltage on all loads ?
(a) Self excited generator
(b) Separately excited generator
(c) Level compounded generator .
(d) All of the above ANS

42. The series field of a shortshunt D.C. generator is excited by
(a) external current
(b) armature current
(c) shunt current
(d) load current ANS

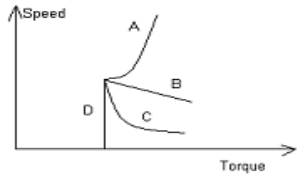
43. If a self excited D.C. generator after being installed, fails to build up on its first trial run, the first thing to do is to
(a) reverse the field connections
(b) increase the field resistance
(c) increase the speed of prime mover
(d) check armature insulation resistance ANS

44. Which one of the following statement is true? The compensating winding in a dc machine is located
(a) On commutating poles for improving the commutation
(b) On pole shoes to avoid the sparking at the brushes
(c) In armature slots for compensating of the armature reaction
(d) On pole shoes for avoiding the flashover at the commutator surface ANS

45. Consider a p-pole machine where θe is the electrical degree and θm is the mechanical degree. The relation between θe and θm is given by
(a) $\theta e = p/2\ \theta m$
(b) $\theta e = 2/p\ \theta m$
(c) $\theta e = \theta m$
(d) $\theta e = p\ \theta m$ ANS

46. Consider a dc generator operating on load. The brushes of generator are on the geometrical neutral axis (GNA). The magnetic neutral axis (MNA) is shifted in the direction of rotation. What will happen if the brushes are given a lead of 90° (electrical)?
(a) The MNA will shift forward by less than 90°
(b) The MNA will shift forward by more than 90°
(c) The MNA will coincide with GNA
(d) The MNA will shift forward by 90° ANS

47. Consider a dc series motor that is fed from a rated supply voltage. It is overloaded and its magnetic circuit is saturated. Which curve represents the torque speed characteristic of this motor?



(a) Curve D
(b) Curve C
(c) Curve B
(d) Curve A ANS

48. When the armature of a D.C. motor rotates, e.m.f. induced is
(a) self inducede.m.f.
(b) mutually induced e.m.f.
(c) back e.m.f.
(d) none of the above ANS

49. The losses occurring in a D.C. generator are given below. Which loss is likely to have highest proportion at rated load of the generator ?
(a) hysteresis loss
(b) field copper loss
(c) armature copper loss
(d) eddy current loss ANS

50. As there is no back e.m.f. at the instant of starting a D.C. motor, in order to prevent a heavy current from flowing though the armature circuit
(a) a resistance is connected in series with armature
(b) a resistance is connected parallel to the armature
(c) armature is temporarily open circuited
(d) a high value resistor is connected across the field winding ANS

Ex. NO: 07

AC MACHINES

1. If the capacitor of a single phase motor is short circuited

(a) the motor will not start
(b) the motor will run
(c) the motor will run in reverse direction
(d) the motor will run in the same direction at reduced r.p.m. ANS

2. In a capacitor start and run motors the function of the running capacitor in series with the auxiliary winding is to

(a) improve power factor
(b) increase overload capacity
(c) reduce fluctuations in torque
(d) to improve torque ANS

3. In a shaded pole motor, the shading coil usually consist of

(a) a single turn of heavy wire which is in parallel with running winding
(b) a single turn of heavy copper wire which is short circuited
and carries only induced current
(c) a multilayer fine gauge copper wire in parallel with running winding
(d) none of the above ANS

4. A centrifugal switch is used to disconnect starting winding when motor has

(a) run for about 1 minute
(b) run for about 5 minutes
(c) picked up about 50 to 70 per cent of rated speed
(d) picked up about 10 to 25 per cent of rated speed ANS

5. If a particular application needs high speed and high starting torque, then which of the following motor will be preferred ?

(a) Universal motor
(b) Shaded pole type motor
(c) Capacitor start motor
(d) Capacitor start and run motor ANS

6. Which of the following motors is inherently self starting ?

(a) Split motor
(b) Shaded pole motor
(c) Reluctance motor
(d) None of these ANS

7. The direction of rotation of an hysteresis motor is determined by

(a) inter changing the supply leads
(b) position of shaded pole with respect to main pole
(c) retentivity of the rotor material
(d) none of these ANS

8. Short circuiter is used in

(a) repulsion induction motor
(b) repulsion motor
(c) repulsion start induction run motor
(d) none of the above

9. Which of the following motors is preferred for tape recorders ?

(a) Shaded pole motor
(b) Hysteresis motor
(c) Two value capacitor motor
(d) Universal motor ANS

10. The repulsion start induction runmotor is used because of

(a) good power factor
(b) high efficiency
(c) minimum cost
(d) high starting torque ANS

11. In squirrel cage induction motors, the rotor slots are usually given slight skew in order to

(a) reduce windage losses
(b) reduce eddy currents
(c) reduce accumulation of dirt and dust
(d) reduce magnetic hum ANS

12. A 3phase 440 V, 50 Hz induction motor has 4% slip. The frequency of rotor e.m.f. will be

(a) 200 Hz
(b) 50 Hz
(c) 2 Hz
(d) 0.2 Hz ANS

13. The number of slip rings on a squirrel cage induction motor is usually

(a) two
(b) three
(c) four
(d) none ANS

14. The starting torque of a squirrel cage induction motor is

(a) low
(b) negligible
(c) same as full load torque
(d) slightly more than full load torque ANS

15. An induction motor with 1000 r.p.m. speed will have

(a) 8 poles
(b) 6 poles
(c) 4 poles
(d) 2 poles ANS

16. An induction motor is identical to

(a) D.C. compound motor
(b) D.C. series motor
(c) synchronous motor
(d) asynchronous motor ANS

17. When the equivalent circuit diagram of double squirrel cage induction motor is constructed the two cages can be considered

(a) in series
(b) in parallel
(c) in series parallel
(d) in parallel with stator ANS

18. Rotor rheostat control method of speed control is used for
(a) squirrelcage induction motors only
(b) slip ring induction motors only
(c) both (a) and (b)
(d) none of the above ANS

19. In the circle diagram for induction motor, the diameter of the circle represents
(a) slip
(b) rotor current
(c) running torque
(d) line voltage ANS

20. An induction motor is
(a) self starting with zero torque
(b) self starting with high torque
(c) self starting with low torque
(d) non-self starting ANS

21. In a three phase induction motor, the number of poles in the rotor winding is always
(a) zero
(b) more than the number of poles in stator
(c) less than number of poles in stator
(d) equal to number of poles in stator ANS

22. The 'crawling" in an induction motor is caused by
(a) high loads
(6) low voltage supply
(c) improper design of machine
(d) harmonics developed in the motor ANS

23. The 'cogging' of an induction motor can be avoided by
(a) proper ventilation
(b) using DOL starter
(c) autotransformer starter
(d) having number of rotor slots more or less than the number of stator slots (not equal) ANS

24. Slip of an induction motor is negative when
(a) magnetic field and rotor rotate in opposite direction
(b) rotor speed is less than the synchronous speed of the field and are in the same direction
(c) rotor speed is more than the synchronous speed of the field and are in the same direction
(d) none of the above ANS

25. It is advisable to avoid line starting of induction motor and use starter because
(a) it will run in reverse direction
(b) it will pick up very high speed and may go out of step
(c) motor takes five to seven times its full load current
(d) starting torque is very high ANS

26. Which type of bearing is provided in small induction motors to support the rotor shaft ?
(a) Ball bearings
(b) Cast iron bearings
(c) Bush bearings
(d) None of the above ANS

27. Short circuit test on an induction motor cannot be used to determine
(a) windage losses
(b) copper losses
(c) transformation ratio
(d) power scale of circle diagram ANS

28. Which is of the following data is required to draw the circle diagram for an induction motor ?
(a) Block rotor test only
(b) No load test only
(c) Block rotor test and no load Test
(d) Block rotor test, no load test and stator resistance test ANS

29. The shape of the torque/slip curve of induction motor is
(a) parabola
(b) hyperbola
(c) rectangular parabola
(d) straigth line ANS

30. A 500 kW, 3phase, 440 volts, 50 Hz, A.C. induction motor has a speed of 960 r.p.m. on full load. The machine has 6 poles. The slip of the machine will be
(a) 0.01
(b) 0.02
(c) 0.03
(d) 0.04 ANS

31. In a squirrel cage motor the induced e.m.f. is
(a) dependent on the shaft loading
(b) dependent on the number of slots
(c) slip times the stand still e.m.f. induced in the rotor
(d) none of the above ANS

32. In a stardelta starter of an induction motor
(a) resistance is inserted in the stator
(b) reduced voltage is applied to the stator
(c) resistance is inserted in the rotor
(d) applied voltage per stator phase is 57.7% of the line voltage ANS

33. Synchronous motors are generally not self starting because
(a) the direction of rotation is not fixed
(b) the direction of instantaneous torque reverses after half cycle
(c) startes cannot be used on these machines
(d) starting winding is not provided on the machines ANS

34. A pony motor is basically a
(a) small induction motor
(b) D.C. series motor
(c) D.C. shunt motor
(d) double winding A.C./D.C. motor ANS

35. A synchronous motor is running on a load with normal excitation. Now if the load on the motor is increased
(a) power factor as well as armature current will decrease

(b) power factor as well as armature current will increase
(c) power factor will increase but armature current will decrease
(d) power factor will decrease and armature current will increase ANS

36. The synchronous motor is not inherently selfstarting because
(a) the force required to accelerate the rotor to the synchronous speed in an instant is absent
(b) the starting device to accelerate the rotor to near synchronous speed is absent
(c) a rotating magnetic field does not have enough poles
(d) the rotating magnetic field is produced by only 50 Hz frequency currents ANS

37. An overexcited synchronous motor takes
(a) leading current
(b) lagging current
(c) both (a) and (b)
(d) none of the above ANS

38. In a synchronous motor, the magnitude of stator back e.m.f. £& depends on
(a) d.c. excitation only
(b) speed of the motor
(c) load on the motor
(d) both the speed and rotor flux ANS

39. For V curves for a synchronous motor the graph is drawn between
(a) field current and armature current
(b) terminal voltage and load factor
(c) power factor and field current
(d) armature current and power factor ANS

40. The oscillations in a synchronous motor can be damped out by
(a) maintaining constant excitation
(b) running the motor on leading power factors
(c) providing damper bars in the rotor pole faces
(d) oscillations cannot be damped ANS

41. The speed regulation of a synchronous motor is always
(a) 1%
(b) 0.5%
(c) positive
(d) zero ANS

42. The operating speed of a synchronous motor can be changed to new fixed value by
(a) changing the load
(b) changing the supply voltage
(c) changing frequency
(d) using brakes ANS

43. Synchronsizing power of a synchronous machine is
(a) direcly proportional to the synchronous reactance
(6) inversely proportional to the synchronous reactance
(a) equal to the synchronous reactance
(d) none of the above ANS

44. In a synchronous motor running with fixed excitation, when the load is increased three times, its torque angle becomes approximately
(a) onethird
(b) twice
(c) thrice
(d) six times
(e) nine times ANS

45. Which of the following methods is used to start a synchronous motor ?
(a) Damper winding
(b) Star delta starter
(c) Damper winding in conjunction with star delta starter
(d) Resistance starter in the armature circuit ANS

46. Change of D.C. excitation of a synchronous motor changes
(a) applied voltage of the motor
(b) motor speed
(c) power factor of power drawn by the motor
(d) any of the above
(e) all of the above ANS

47. Stability of a synchronous machine
(a) decreases with increase in its excitation
(b) increases with increase in its excitation
(c) remains unaffected with increase in excitation
(d) any of the above ANS

48. If one phase of a 3phase synchronous motor is short circuited, motor
(a) will refuse to start
(b) will overheat in spots
(c) will not come upto speed
(d) will fail to pull into step ANS

49. Due to which of the following reasons a synchronous motor fails to pull into synchronism after applying D.C. field current ?
(a) High field current
(b) Low short circuit ratio
(c) High core losses
(d) Low field current ANS

50. For power factor correction, synchronous motors operate at
(a) no load and greatly overexcited fields
(b) no load and under excited fields
(c) normal load with minimum excitation
(d) normal load with zero excitation ANS

Ex. NO: 08

CONTROL SYSTEMS

1. In an open loop control system

(a) Output is independent of control input

(b) Output is dependent on control input

(c) Only system parameters have effect on the control output

(d) None of the above ANS ☐

2. A control system in which the control action is somehow dependent on the output is known as

(a) Closed loop system

(b) Semi closed loop system

(c) Open system

(d) None of the above ANS ☐

3. In closed loop control system, with positive value of feedback gain the overall gain of the system will

(a) decrease

(b) increase

(c) be unaffected

(d) any of the above ANS ☐

4. Which of the following is an open loop control system?

(a) Field controlled D.C. motor

(b) Ward leonard control

(c) Metadyne

(d) Stroboscope ANS ☐

5. A good control system has all the following features except

(a) good stability

(b) slow response

(c) good accuracy

(d) sufficient power handling capacity ANS ☐

6. A car is running at a constant speed of 50 km/h, which of the following is the feedback element for the driver ?

(a) Clutch

(b) Eyes

(c) Needle of the speedometer

(d) Steering wheel

(e) None of the above ANS ☐

7. The initial response when tne output is not equal to input is called

(a) Transient response

(b) Error response

(c) Dynamic response

(d) Either of the above ANS ☐

8. A control system working under unknown random actions is called

(a) computer control system

(b) digital data system

(c) stochastic control system

(d) adaptive control system ANS ☐

9. An automatic toaster is a _____ loop control system.

(a) open

(b) closed

(c) partially closed

(d) any of the above ANS ☐

10. Any externally introduced signal affecting the controlled output is called a

(a) feedback

(b) stimulus

(c) signal

(d) gain control` ANS ☐

11. Which of the following should be done to make an unstable system stable ?

(a) The gain of the system should be decreased

(b) The gain of the system should be increased

(c) The number of poles to the loop transfer function should be increased

(d) The number of zeros to the loop transfer function should be increased ANS ☐

12. A.C. servomotor resembles

(a) two phase induction motor

(b) Three phase induction motor

(c) direct current series motor

(d) universal motor ANS ☐

13. As a result of introduction of negative feedback which of the following will not decrease ?

(a) Band width

(b) Overall gain

(c) Distortion

(d) Instability ANS ☐

14. Zero initial condition for a system means

(a) input reference signal is zero

(b) zero stored energy

(c) tne initial movement of moving parts

(d) system is at rest and no energy is stored in any of its components ANS ☐

15. On which of the following factors does the sensitivity of a closed loop system to gain changes and load disturbances depend ?

(a) Frequency

(b) Loop gain

(c) Forward gain

(d) All of the above ANS ☐

16. The transient response, with feedback system,

(a) rises slowly

(b) rises quickly

(c) decays slowly

(d) decays quickly ANS ☐

17. The second derivative input signals modify which of the following ?

(a) The time constant of the system

(b) Damping of the system

(c) The gain of the system

(d) The time constant and suppress the oscillations

(e) None of the above ANS ☐

18. Which of the following statements is correct for a system with gain margin close to unity or a phase margin close to zero?

(a) The system is relatively stable

(b) The system is highly stable
(c) The system is highly oscillatory
(d) None of the above ANS

19. In a stable control system backlash can cause which of the following?
(a) Under damping
(b) Over damping
(c) Poor stability at reduced values of open loop gain
(d) Low level oscillations ANS

20. A controller, essentially, is a
(a) sensor
(b) clipper
(c) comparator
(d) amplifier ANS

21. Which of the following is the input to a controller ?
(a) Servo signal
(b) Desired variable value
(c) Error signal
(d) Sensed signal ANS

22. The capacitance, in force current analogy, is analogous to
(a) momentum
(b) velocity
(c) displacement
(d) mass ANS

23. The temperature, under thermal and electrical system analogy, is considered analogous to
(a) voltage
(b) current
(c) capacitance
(d) charge
(e) none of the above ANS

24. In electrical pneumatic system analogy the current is considered analogous to
(a) velocity
(b) pressure
(c) air flow
(d) air flow rate ANS

25. The transient response of a system is mainly due to
(a) inertia forces
(b) internal forces
(c) stored energy
(d) friction ANS

26. _____signal will become zero when the feedback signal and reference signs are equal.
(a) Input
(b) Actuating
(c) Feedback
(d) Reference ANS

27. From which of the following transfer function can be obtained ?
(a) Signal flow graph
(b) Analogous table
(c) Output input ratio
(d) Standard block system
(e) None of the above ANS

28. The term backlash is associated with
(a) servomotors
(b) induction relays
(c) gear trains
(d) any of the above ANS

29. With feedback _____ increases.
(a) system stability
(b) sensitivity
(c) gain
(d) effects of disturbing signals ANS

30. By which of the following the system response can be tested better?
(a) Ramp input signal
(b) Sinusoidal input signal
(c) Unit impulse input signal
(d) Exponentially decaying signal ANS

31. A conditionally stable system exhibits poor stability at
(a) low frequencies
(b) reduced values of open loop gain
(c) increased values of open loop gain
(d) none of the above ANS

32. The type 0 system has _____ at the origin.
(a) no pole
(b) net pole
(c) simple pole
(d) two poles
(e) none of the above ANS

33. The position and velocity errors of a type2 system are
(a) constant, constant
(b) constant, infinity
(c) zero, constant
(d) zero, zero ANS

34. Velocity error constant of a system is measured when the input to the system is unit _____ function.
(a) parabolic
(b) ramp
(c) impulse
(d) step ANS

35. In case of type1 system steady state acceleration is
(a) unity
(b) infinity
(c) zero
(d) 10 ANS

36. Which of the following is the best method for determining the stability and transient response ?
(a) Root locus
(b) Bode plot
(c) Nyquist plot
(d) None of the above ANS

37. Phase margin of a system is used to specify which of the following ?
(a) Frequency response

(b) Absolute stability
(c) Relative stability
(d) Time response ANS

38. Addition of zeros in transfer function causes which of the following ?
(a) Lead compensation
(b) Lag compensation
(c) Lead lag compensation
(d) None of the above ANS

39. _____technique is not applicable to nonlinear system ?
(a) Nyquist Criterion
(b) Quasi linearization
(c) Functional analysis
(d) Phase plane representation ANS

40. Which of the following can be measured by the use of a tacho generator ?
(a) Acceleration
(b) Speed
(c) Speed and acceleration
(d) Displacement
(e) None of the above ANS

41. In pneumatic control systems the control valve used as final control element converts
(a) pressure signal to electric signal
(b) pressure signal to position change
(c) electric signal to pressure signal
(d) position change to pressure signal
(e) none of the above ANS

42. The effect of error damping is to
(a) provide larger settling lime
(b) delay the response
(c) reduce steady state error
(d) any of the above
(e) none of the above ANS

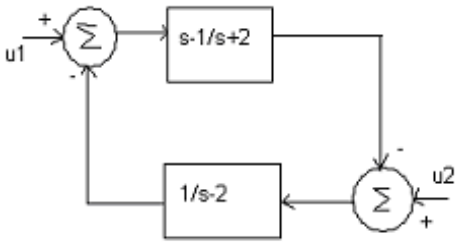
43._____ can be extended to systems which are time varying ?
(a) Bode Nyquist stability methods
(b) Transfer functions
(c) Root locus design
(d) State model representatives ANS

44. A differentiator is usually not a part of a control system because it
(a) reduces damping
(b) reduces the gain margin
(c) increases input noise
(d) increases error ANS

45. In a control system integral error compensation _____ steady state error
(a) increases
(b) minimizes
(c) does not have any effect on
(d) any of the above ANS

46. Which of the following is exhibited by Root locus diagrams ?
(a) The poles of the transfer function for a set of parameter values
(b) The bandwidth of the system
(c) The response of a system to a step input
(d) The frequency response of a system
(e) None of the above ANS

47. The system shown below is

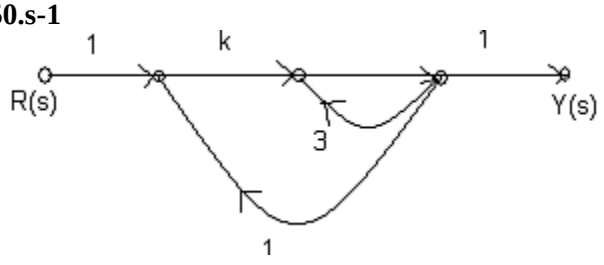


(a) Stable for input u1 but unstable for input u2
(b) Conditionally stable
(c) Unstable
(d) Stable ANS

48. The number of roots in the left half of s plane for the equation, $s^3 - 4s^2 + s + 6 = 0$ will be
(a) 1
(b) 2
(c) 3
(d) 4 ANS

49. We have the third order equation whose first two rows of Routh's tabulation are as follows
S^3 2 2
S^3 4 4
This means that there are
(a) Two roots at s = ± j and one root in the right half of s plane
(b) Two roots at s = ± j and one root in the left half of s plane.
(c) Two roots at s = ± j2 and one root in the right half of s plane
(d) Two roots at s = ± j2 and one root in the left half of s plane ANS

50.s-1



what should be the value of k for the system to remain stable?
(a) 1< k < 3
(b) k < -1
(c) k > 3
(d) 1 < k < -1 ANS

Ex. NO: 09

DIGITAL ELECTRONICS

1. It is required to construct a counter to count upto 100(decimal). The minimum number of flip flops required to construct the counter is

(a) 8
(b) 7
(c) 6
(d) 5 ANS

2. The gate that assumes the 1 state, if and only if the input does not take a 1 state is called.....

(a) AND gate
(b) NOT gate
(c) NOR gate
(d) Both b and c ANS

3. For NOR circuit SR flip flop the not allowed condition is....

(a) S=0, R=0
(b) S=0, R=1
(c) S=1, R=1
(d) S=1, R=0 ANS

4. A bistable multi vibrator is a

(a) Free running oscillator
(b) Triggered oscillator
(c) Saw tooth wave generator
(d) Crystal oscillator ANS

5. For a large values of $|V_{DS}|$, a FET behave as

(a) Voltage controlled resistor
(b) Current controlled current source
(c) Voltage controlled current source
(d) Current controlled resistor ANS

6. When a step input is given to an op-amp integrator, the output will be

(a) a ramp
(b) a sinusoidal wave
(c) a rectangular wave
(d) a triangular wave with dc bias ANS

7. In a full-wave rectifier without filter, the ripple factor is

(a) 0.482
(b) 1.21
(c) 1.79
(d) 2.05 ANS

8. Hysteresis is desirable in Schmitt-trigger, because

(a) It would prevent noise from causing false triggering
(b) Effects of temperature would be compensated
(c) Devices in the circuit should be allowed time for saturation and desaturation
(d) Energy is to be stored/discharged in parasitic capacitance ANS

9. For a 10-bit DAC, the Resolution is defined by which of the following

(a) 1024
(b) 1/1024
(c) 10
(d) None ANS

10. SRAM full form is

(a) Serial Read Access Memory
(b) Static Random Access Memory
(c) Static Read-only Access memory ANS

11. What are the minimum number of 2 to 1 multiplexers required to generate a 2 input AND gate and a 2 input Ex-OR gate?

(a) 1 and 2
(b) 1 and 3
(c) 1 and 1
(d) 2 and 2 ANS

12. The output of a logic gate is '1' when all its inputs are at logic '0'. Then gate is either

(a) A NAND or an EX-OR gate
(b) A NOR or an EX-NOR gate
(c) An OR or an EX-NOR gate
(d) An AND or an Ex-OR gate ANS

13. A PLA can be used

(a) As a microprocessor
(b) As a dynamic memory
(c) To realise a sequential logic
(d) To realise a combinational logic ANS

14. A dynamic RAM consists of

(a) 6 Transistors
(b) 2 Transistors and 2 Capacitors
(c) 1 Transistor and 1 Capacitor
(d) 2 Capacitor only ANS

15. When a CPU is interrupted, it

(a) Stops execution of instructions
(b) Acknowledges interrupt and branches of subroutine
(c) Acknowledges interrupt and continues
(d) Acknowledges interrupt and waits for the next instruction from the interrupting device. ANS

16. An ideal OP-AMP is an ideal

(a) Current controlled Current source
(b) Current controlled Voltage source
(c) Voltage controlled Voltage source
(d) Voltage controlled Current source ANS

17. A 741-Type OP-AMP has a gain-bandwidth product of 1MHz. A non-inverting amplifier using this opamp& having a voltage gain of 20db will exhibit -3db bandwidth of

(a) 50KHz
(b) 100KHz
(c) 1000/17KHz
(d) 1000/7.07KHz ANS

18. An amplifier using an op-amp with slew rate SR=1v/sec has a gain of 40db.If this amplifier has to faithfully amplify sinusoidal signals from dc to 20KHz without introducing any slew-rate induced distortion, then the input signal level exceed

(a) 795mV
(b) 395mV
(c) 795mV
(d) 39.5mV ANS

19. The ideal OP-AMP has the following characteristics

(a) $R_i=\infty, A=\infty, R_0=0$
(b) $R_i=0, A=\infty, R_0=0$
(c) $R_i=\infty, A=\infty, R_0=\infty$
(d) $R_i=0, A=\infty, R_0=\infty$ ANS

20. The approximate input impedance of the op-amp circuit which has Ri=10k, Rf=100k, RL=10k

(a) ∞
(b) 120k
(c) 110k
(d) 10k ANS

21. An opamp has a slew rate of 5V/ S. the largest sine wave o/p voltage possible at a frequency of 1MHz is

(a) 10 V
(b) 5 V
(c) 5V
(d) 5/2 V ANS

22. Assume that the op-amp of the fig. is ideal. If Vi is a triangular wave, then V_0 will be

(a) Square wave
(b) Triangular wave
(c) Parabolic wave
(d) Sine wave ANS

23. A differential amplifier is invariably used in the i/p stage of all op-amps. This is done basically to provide the op-amps with a very high

(a) CMMR
(b) Bandwidth
(c) Slew rate
(d) Open-loop gain ANS

24. A differential amplifier has a differential gain of 20,000. CMMR=80dB. The common mode gain is given by

(a) 2
(b) 1
(c) 1/2
(d) D.0 ANS

25. In the differential voltage gain & the common mode voltage gain of a differential amplifier are 48db & 2db respectively, then its common mode rejection ratio is

(a) 23dB
(b) 25dB
(c) 46dB
(d) 50dB ANS

26. Which of the following amplifier is used in a digital to analog converter?

(a) Non inverter
(b) Voltage follower
(c) Summer
(d) Difference amplifier ANS

27. Differential amplifiers are used in

(a) Instrumentation amplifiers
(b) Voltage followers
(c) Voltage regulators
(d) Buffers ANS

28. For an ideal op-amp, which of the following is true?

(a) The differential voltage across the input terminals is zero
(b) The current into the input terminals is zero
(c) The current from output terminal is zero
(d) The output resistance is zero ANS

29. The two input terminals of an op-amp are labeled as

a) High and low
b) Positive and negative
c) Inverting and non inverting
d) Differential and non differential ANS

30. When a step-input is given to an op-amp integrator, the output will be

(a) A ramp.
(b) A sinusoidal wave.
(c) A rectangular wave.
(d) A triangular wave with dc bias ANS

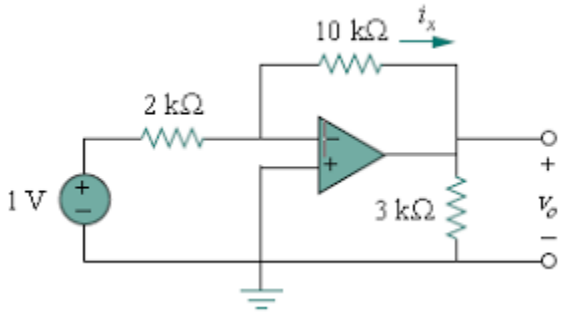
31. For an op-amp having differential gain Av and common-mode gain Ac the CMRR is given by

(a) Av + Ac
(b) Av / Ac
(c) 1 + [Av / Ac]
(d) Ac / Av ANS

32. Hysteresis is desirable in Schmitt-trigger, because

(a) It would prevent noise from causing false triggering.
(b) Effects of temperature would be compensated.
(c) Devices in the circuit should be allowed time for saturation and desaturation.
(d) Energy is to be stored/discharged in parasitic capacitances. ANS

Circuit for questions 33 & 34



33. The output voltage Vo of the above circuit is

(a) -6V
(b) -5V
(c) -1.2V
(d) -0.2V ANS

34. In the above circuit the current *ix* is

(a) 0.6A
(b) 0.5A
(c) 0.2A
(d) 1/12A ANS

35. Op-amp circuits may be cascaded without changing their input output relationships

(a) True
(b) False ANS

36. A non inverting closed loop op amp circuit generally has a gain factor
(a) Less than one
(b) Greater than one
(c) Of zero
(d) Equal to one ANS

37. If ground is applied to the (+) terminal of an inverting op-amp, the (–) terminal will
(a) Not need an input resistor
(b) Be virtual ground
(c) Have high reverse current
(d) Not invert the signal ANS

38. The closed-loop voltage gain of an inverting amplifier equal to
(a) The ratio of the input resistance to feedback resistance
(b) The open-loop voltage gain
(c) The feedback resistance divided by the input resistance
(d) The input resistance ANS

39. When a number of stages are connected in parallel, the overall gain is the product of the individual stage gains
(a) True
(b) False ANS

40. An ideal OP-AMP is an ideal
(a) Current controlled Current source
(b) Current controlled voltage source
(c) Voltage controlled voltage source
(d) voltage controlled current source ANS

41. The ideal OP-AMP has the following characteristics.
(a) Ri=∞ ,A=∞ ,R0=0
(b) Ri=0 ,A=∞ ,R0=0
(c) Ri=∞ ,A=∞ ,R0=∞
(d) Ri=0 ,A=∞ ,R0=∞ ANS

42. Calculate the cutoff frequency of a first-order low-pass filter for R1 = 2.5kΩ and C1 = 0.05μF
(a) 1.273kHz
(b) 12.73kHz
(c) 127.3 kHz
(d) 127.3 Hz ANS

43. How many op-amps are required to implement this equation

$$V_o = -\left(\frac{R_f}{R_1}V_1 + \frac{R_f}{R_2}V_2 + \frac{R_f}{R_3}V_3\right)$$

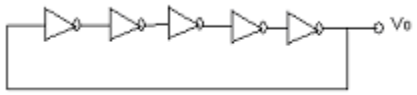
(a) 2
(b) 3
(c) 4
(d)1 ANS

44. How many op-amps are required to implement this equation Vo = V_1
(a) 4
(b) 3
(c) 2
(d) 1 ANS

45. An OPAMP has a slew rate of 5 V/μ S .The largest sine wave O/P voltage possible at a frequency of 1 MHZ is
(a) 10 volts
(b) 5 volts
(c) 5/ volts
(d) 5/2 volts ANS

46. Shift register ceases to work as a shift register in _____ mode of operation.
(a) SIPO
(b) PIPO
(c) PISO
(d) SISO ANS

47. Figure shows the ring oscillator. 100pico sec is the propagation delay of each inverter. The fundamental frequency of the oscillator output is

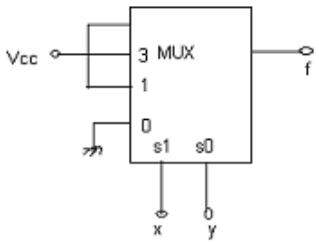


(a) 1 GHz
(b) 100 MHz
(c) 1 MHz
(d) 20 GHz ANS

48. Total 8 memory chips are present in a memory system. Each memory chips has 12 address lines and 4 data lines. The **total size of the memory system is**
(a) 32 K bytes
(b) 16 K bytes
(c) 48 K bytes
(d) 64 K bytes ANS

49. When all the input of a logic gate is "0", the output is "1". The type of gate is either
(a) A NOR or an EX-NOR
(b) A NAND or an EX-OR
(c) An AND or a NOR
(d) A NAND or a NOR ANS

50. Figure shows the 4-to-1 MUX. The output f is



(a) xy + x
(b) xy + y
(c) x + y
(d) None of the above ANS

Ex. NO: 10

TRANSMISSION AND DISTRIBUTION

1. By which of the following systems electric power may be transmitted ?

(a) Overhead system
(b) Underground system
(c) Both (a) and (b)
(d) None of the above ANS

2. _____ are the conductors, which connect the consumer's terminals to the distribution

(a) Distributors
(b) Service mains
(c) Feeders
(d) None of the above ANS

3. If variable part of annual cost on account of interest and depreciation on the capital outlay is equal to the annual cost of electrical energy wasted in the conductors, the total annual cost will be minimum and the corresponding size of conductor will be most economical. This statement is known as

(a) Kelvin's law
(b) Ohm's law
(c) Kirchhoffs law
(d) Faraday's law
(e) none of the above ANS

4. Which of the following materials is not used for transmission and distribution of electrical power ?

(a) Copper
(b) Aluminium
(c) Steel
(d) Tungsten ANS

5. The corona is considerably affected by which of the following ?

(a) Size of the conductor
(b) Shape of the conductor
(c) Surface condition of the conductor
(d) All of the above ANS

6. Which of the following are the constants of the transmission lines ?

(a) Resistance
(b) Inductance
(c) Capacitance
(d) All of the above ANS

7. 310 km line is considered as

(a) a long line
(b) a medium line
(c) a short line
(d) any of the above ANS

8. The phenomenon of rise in voltage at the receiving end of the open circuited or lightly loaded line is called the

(a) Seeback effect
(b) Ferranti effect
(c) Raman effect
(d) none of the above ANS

9. Due to which of the following reasons the cables should not be operated too hot?

(a) The oil may lose its viscosity and it may start drawing off from higher levels
(b) Expansion of the oil may cause the sheath to burst
(c) Unequal expansion may create voids in the insulation which will lead to ionization
(d) The thermal instability may rise due to the rapid increase of dielectric losses with temperature
(e) All of the above ANS

10. Which of the following D.C. distribution system is the simplest and lowest in first cost ?

(a) Radial system
(b) Ring system
(c) Interconnected system
(d) None of the above ANS

11. Most of the high voltage transmission lines in India are

(a) underground
(b) overhead
(c) either of the above
(d) none of the above ANS

12. High voltage transmission lines use

(a) suspension insulators
(b) pin insulators
(c) both (a) and (b)
(d) none of the above ANS

13. The power factor of industrial loads is generally

(a) unity
(b) lagging
(c) leading
(d) zero ANS

14. Overhead lines generally use

(a) copper conductors
(b) all aluminium conductors
(c) A.C.S.R. conductors
(d) none of these ANS

15. Transmitted power remaining the same, if supply voltage of a D.C. 2wire feeder is increased 100 percent, saving in copper is

(a) 25 percent
(b) 50 percent
(c) 75 percent
(d) 100 percent ANS

16. A uniformly loaded D.C. distributor is fed at both ends with equal voltages. As compared to a similar distributor fed at one end only, the drop at the middle point is

(a) one-fourth
(b) one-third
(c) one-half
(d) twice
(e) none of the above ANS

17. As compared to a 2wire D.C. distributor, a 3wire distributor with same maximum voltage to earth uses only

(a) 31.25 percent of copper
(b) 33.3 percent of copper
(c) 66.7 percent of copper
(d) 125 percent of copper ANS

18. For an overhead line, the surge impedance is taken as
(a) 2030 ohms
(b) 70—80 ohms
(c) 100—200 ohms
(d) 500—1000 ohms
(e) none of the above ANS

19. The presence of ozone due to corona is harmful because it
(a) reduces power factor
(b) corrodes the material
(c) gives odour
(d) transfer energy to the ground
(e) none of the above ANS

20. A feeder, in a transmission system, feeds power to
(a) distributors
(b) generating stations
(c) service mains
(d) all of the above ANS

21. The power transmitted will be maximum when
(a) corona losses are minimum
(b) reactance is high
(c) sending end voltage is more
(d) receiving end voltage is more ANS

22. A 3phase 4 wire system is commonly used on
(a) primary transmission
(b) secondary transmission
(c) primary distribution
(d) secondary distribution ANS

23. Which of the following relays is used on long transmission lines ?
(a) Impedance relay
(b) Mho's relay
(c) Reactance relay
(d) None of the above ANS

24. Which of the following distribution systems is more reliable ?
(a) Radial system
(b) Tree system
(c) Ring main system
(d) All are equally reliable ANS

25. A conductor, due to sag between two supports, takes the form of
(a) semicircle
(b) triangle
(c) ellipse
(d) catenary ANS

26. Which of the following busbar schemes has the lowest cost ?
(a) Ring busbar scheme
(b) Single busbar scheme
(c) Breaker and a half scheme
(d) Main and transfer scheme ANS

27. Owing to skin effect
(a) current flows through the half cross section of the conductor
(b) portion of the conductor near the surface carries more current and core of the conductor carries less current
(c) portion of the conductor near the surface carries less current and core of the conductor carries more current
(d) any of the above
(e) none of the above ANS

28. By which of the following methods string efficiency can be improved ?
(a) Using a guard ring
(b) Grading the insulator
(c) Using long cross arm
(d) Any of the above
(e) None of the above ANS

29. A circuit is disconnected by isolators when
(a) line is energized
(b) there is no current in the line
(c) line is on full load
(d) circuit breaker is not open ANS

30. For which of the following equipment current rating is not necessary ?
(a) Circuit breakers
(b) Isolators
(c) Circuit breakers and load break switches
(d) Load break switch ANS

31. Corona usually occurs when the electrostatic stress in air around the conductor exceeds
(a) 6.6 kV (r.m.s. value)/cm
(b) 11 kV (r.m.s. value)/cm
(c) 22 kV (maximum value)/cm
(d) 30 kV (maximum value)/cm ANS

32. The use of strain type insulators is made where the conductors are
(a) dead ended
(b) at intermediate anchor towers
(c) any of the above
(d) none of the above ANS

33. Pin type insulators are generally not used for voltages beyond
(a) 1 kV
(b) 11 kV
(c) 22 kV
(d) 33 kV ANS

34. Which of the following equipment, for regulating the voltage in distribution feeder, will be most economical ?
(a) Static condenser
(b) Synchronous condenser
(c) Tap changing transformer
(d) Booster transformer ANS

35. The effect of corona can be detected by
(a) presence of ozone detected by odour
(b) hissing sound

(c) faint luminous glow of bluish colour
(d) all of the above ANS

36. In the analysis of which of the following lines shunt capacitance is neglected ?
(a) Short transmission lines
(b) Medium transmission lines
(c) Medium as well as long transmission lines
(d) Long transmission lines ANS

37. The frequency of voltage generated, in case of generators, can be increased by
(a) using reactors
(b) increasing the load
(c) adjusting the governor
(d) reducing the terminal voltage
(e) none of the above ANS

38. Series capacitors on transmission lines are of little use when the load VAR requirement is
(a) large
(b) small
(b) fluctuating
(d) any of the above ANS

39. When a live conductor of public electric supply breaks down and touches the earth which of the following will happen?
(a) Current will flow to earth
(b) Supply voltage will drop
(c) Supply voltage will increase
(d) No current will flow in the conductor
(e) None of the above ANS

40. In a cable immediately above metallic sheath _____ is provided.
(a) earthing connection
(b) bedding
(c) armouring
(d) none of the above ANS

41. The current carrying capacity of cables in D.C. is more thanthat in A.C. mainly due to
(a) absence of harmonics
(b) nonexistence of any stability limit
(c) smaller dielectric loss
(d) absence of ripples
(e) none of the above ANS

42. The minimum dielectric stress in a cable is at
(a) armour
(b) bedding
(c) conductor surface
(d) lead sheath ANS

43. In a cable, the maximum stress under operating conditions is at
(a) insulation layer
(b) sheath
(c) armour
(d) conductor surface ANS

44. In capacitance grading of cables we use a _____ dielectric.
(a) composite
(b) porous
(c) homogeneous
(d) hygroscopic ANS

45. Pressure cables are generally not used beyond
(a) 11 kV
(b) 33 kV
(c) 66 kV
(d) 132 kV ANS

46. A certain cable has an insulation of relative permittivity 4. If the insulation is replaced by one of relative permittivity 2, the capacitance of the cable will become
(a) one half
(6) double
(c) four times
(d) none of the above ANS

47. If a cable of homogeneous insulation has a maximum stress of 10 kV/mm, then the dielectric strength of insulation should be
(a) 5 kV/mm
(b) 10 kV/mm
(a) 15 kV/mm
(d) 30 kV/mm ANS

48. The breakdown of insulation of the cable can be avoided economically by the use of
(a) intersheaths
(b) insulating material with different dielectric constants
(c) both (a) and (b)
(d) none of the above ANS

49. The advantage of cables over overhead transmission lines is
(a) easy maintenance
(b) low cost
(c) can be used in congested areas
(d) can be used in high voltage circuits ANS

50. The breakdown voltage of a cable depends on
(a) presence of moisture
(b) working temperature
(c) time of application of the voltage
(d) all of the above ANS

Ex. NO: 11
POWER ELECTRONICS

1. The reverse recovery time of the diode is defined as the time between the instant diode current becomes zero and the instant reverse recovery current decays to
(a) Zero
(b) 10% of the reverse peak current (IRM)
(c) 25% of (IRM)
(d) 15% of (IRM) ANS

2. The softness factor for soft-recovery and fast-recovery diodes are respectively
(a) 1, >1
(b) <1, 1
(c) 1, 1
(d) 1, <1 ANS

3. Reverse recovery current in a diode depends on
(a) Forward field current
(b) Storage charge
(c) Temperature
(d) PIV ANS

4. The three terminals of power MOSFET
(a) Collector, Emitter, base
(b) Drain, source, base
(c) Drain, source, gate
(d) Collector, emitter, gate ANS

5. Compared to Power MOSFET, the Power BJT has
(a) Lower switching losses but higher conduction loss
(b) Higher switching losses and higher conduction loss
(c) Higher switching losses but lower conduction loss
(d) Lower switching losses and lower conduction loss
ANS

6. Which one of the following statement is true
(a) Both MOSFET and BJT are voltage controlled devices
(b) Both MOSFET and BJT are current controlled devices
(c) MOSFET is a voltage controlled device and BJT is current controlled device
(d) MOSFET is a current controlled device and BJT is voltage controlled device ANS

7. For series connected SCRs, dynamic equalizing circuit consists of
(a) Resistor R and capacitor C in series but with a diode D across C
(b) Series R and D circuit but with C across R
(c) Series R and C circuit but with D across R
(d) Series C and D circuit but with R across C
OPTIONS:
1) A
2) B
3) C
4) D
5) None of the above options ANS

8. During forward blocking of two series connected SCRs, a thyristor with
(a) High leakage impedance shares lower voltage
(b) High leakage impedance shares higher voltage
(c) Low leakage impedance shares higher voltage
(d) Low leakage impedance shares lower voltage
OPTIONS:
1) B
2) D
3) B, D
4) A, C
5) None of the above options ANS

9. Thyristors A has rated gate current of 1A and thyristor B rated gate current of 100mA
(a) A is a GTO and B is a conventional SCR
(b) B is a GTO and A is a conventional SCR
(c) A may operate as a transistor
(d) B may be operate as a transistor
OPTIONS:
1) A
2) B
3) C
4) A, C
5) B, D ANS

10. A resistor connected across the gate and cathode of an SCR increases its
(a) dv/dt rating
(b) Holding current
(c) Noise immunity
(d) Turn-off time
OPTIONS:
1) A, C
2) A, B
3) B, C
4) A, B, C
5) D ANS

11. Silicon based rectifiers are preferred than germanium based rectifiers because
(a) Si is available easily compared to Ge
(b) Only Si has a stable off state
(c) Ge is very temperature sensitive
(d) Si only has the characteristics $\alpha 1 + \alpha 2 < 1$ at low collector currents and reaches 1 at high currents
Which of the above statements are true?
Options:
1. A, B, D
2. B, D
3. B Only
4. D Only
5. None of the above options ANS

12. In a triac,
(a) The triggering pulse to main terminal 1 should be of the same polarity as the anode potential between MT1 and MT2
(b) The triggering pulse should be of opposite polarity to that of anode potential

(c) When the triggering pulse is positive and anode is positive, it is operating in the first quadrant
(d) When the triggering pulse is negative and anode is negative its sensitivity is highest.
Which of the above statements are true?
Options:
1. A, D
2. A, C
3. C, D
4. A, C, D
5. None of the above options ANS

13. In a single phase full wave SCR circuit with R, L load
(a) Power is delivered to the source for firing angle of less than 90°
(b) The SCR changes from inverter to converter at α = 90°
(c) The negative dc voltage is maximum at α = 180°
(d) To turn off the scr, the maximum delay angle must be less than 180°
Which of the above statements are true?
Options:
1. C, D
2. C Only
3. D Only
4. A , B
5. None of the above options ANS

14. While comparing triac and SCR,
(a) Both are unidirectional devices
(b) Triac requires more current for turn on than SCR at a particular voltages
(c) A triac has less time for turn off than SCR
(d) Both are available with comparable voltage and current ratings
Which of the above statements are true?
Options:
1. A, C
2. B, C
3. A, B
4. D Only
5. None of the above options ANS

15. Which of the following statements are true
(a) If the SCR, even with proper gate excitation and anode-cathode voltage does not conduct for a particular load resistance, then it would be necessary to decrease the load resistance to turn ON the SCR
(b) The SCR would be turned OFF by voltage reversal of the applied anode-cathode ac supply of frequencies up to 30kHz
(c) If the gate current of the SCR is increased, then the forward breakdown voltage will decrease
Options:
1. A, B, C
2. B, C
3. A , C
4. A, B
5. None of the above options ANS

16. Which of the following statements are true When gate triggering is employed, a SCR can withstand higher values of di/dt, if the
1. Gate current is increased
2. Rate of rise of gate current is increased
3. Gate current is increased
4. Rate of rise of gate current is decreased
OPTIONS:
(a) 3, 4
(b) 1, 4
(c) 2, 3
(d) 1, 2
(e) None of the above options ANS

17. In a SCR based converter, the free wheeling diode is used to
(a) Add to the conduction current of thyristors
(b) Oppose the SCR conduction
(c) Conduct current during the OFF period of the SCR
(d) Protect the SCR by providing a shunt path
ANS

18. When an inductance is inserted in the load circuit of SCR
(a) The turn on time of SCR is increased
(b) Output voltage is reduced for the same firing angle
(c) Conduction continues even after reversal of phase of input voltage
(d) A free wheeling diode is connected in such circuits
Which of the above statements are true?
(1) a, d
(2) b, c, d
(3) a, b, c,d
(4) c, d ANS

19. Snubber circuit is used to limit the rate of
(a) Rise of current
(b) Conduction period
(c) Rise of voltage across SCR
(d) None of the above ANS

20. The provision of a free wheeling diode across an inductive load is
(a) To restore conduction angle on phase
(b) To avoid negative reversal voltage drop
(c) To reduce the PRV
(d) None of the above ANS

21. While working in series operation, equalising circuits are added across each SCR to provide uniform
(a) Current distribution
(b) Firing of SCRs
(c) Voltage distribution
(d) None of the above ANS

22. When the SCR conducts, the forward voltage drop
(a) Is 0.7V

(b) Is 1 to 1.5V
(c) Increases slightly with load current
(d) Remains constant with load current
Which of the above statements are true?
(1) a only
(2) b, c
(3) d only
(4) a, c ANS

23. The latching current of a SCR is 18mA. Its holding current will be
(a) 6mA
(b) 18mA
(c) 54mA
(d) 12mA ANS

24. The turn off time is longer than turn on time because
(a) The anode and cathode junctions get reverse biased while gate junction is still forward biased
(b) There is flow of reverse current
(c) The gate pulse has been removed
(d) The forward break over voltage is high.
Which of the above statements are true?
(1) b, c
(2) c, d
(3) a, b
(4) a, b, c, d ANS

25. The thyristor will turn on faster with
(a) Pulse signal applied to the gate terminal of the SCR
(b) Continuous signal applied to the gate terminal of the SCR
(c) Both are same
(d) Pulse signal but with minimum duration
Which of the above statements are true?
(1) a only
(2) b only
(3) a, d
(4) none of the above ANS

26. In an SCR,
(a) The holding current is less than latching current
(b) The holding current is greater than latching current
(c) The two currents are equal
(d) The latching current is about 3 times the holding current
Which of the above statements are true?
(1) a only
(2) d only
(3) a, c, d
(4) a, d
(5) b only ANS

27. When a positive voltage is applied to the gate of a reverse biased SCR
(a) It injects more electrons into junction J1
(b) It increases reverse leakage current into anode
(c) Heating of junction is unaffected
(d) Failure of junctions occurs due to thermal runaway
Which of the above statements are true?
(1) b only
(2) a, b ,d
(3) b, d
(4) d only ANS

28. During forward blocking state, the SCR has
(a) Low current, medium voltage
(b) Low current, large voltage
(c) Medium current, large voltage
(d) Large current, low voltage ANS

29. Once SCR starts conducting a forward current, its gate loses control over
(a) Anode circuit voltage, current and time
(b) Anode circuit voltage only
(c) Anode circuit voltage and current
(d) Anode circuit current only ANS

30. In a SCRs
(a) Both Latching current and holding current are associated with turn-off process
(b) Latching current is associated with turn-off process and holding current with turn on process
(c) Holding current is associated with turn-off process and Latching current with turn-on process
(d) Both Latching current and holding current are associated with turn on process ANS

31. The SCR can be termed as
(a) DC switch
(b) AC switch
(c) Square-wave switch
(d) Either A or B ANS

32 Turn on time of an SCR can be reduced by using a
(a) Rectangular pulse of high amplitude and narrow width
(b) Rectangular pulse of low amplitude and wide width
(c) Triangular pulse
(d) Trapezoidal pulse ANS

33. Turn off time of an SCR in series with RL circuit can be reduced by
(a) Increasing circuit resistance R
(b) Decreasing circuit resistance R
(c) Increasing circuit inductance L
(d) Decreasing circuit inductance L
Options:
1) B, C
2) A, D
3) B, D
4) D only ANS

34. A forward voltage can be applied to an SCR after its

(a) Anode current reduces to zero
(b) Gate recovery time
(c) Reverse recovery time
(d) Anode voltage reduces to zero ANS

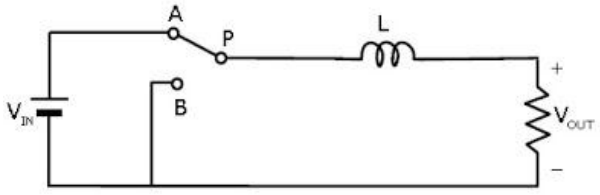
35. Gate characteristic of a thyristor
(a) Is straight line passing through origin
(b) Is of the type Vg = a + bIg
(c) Has a spread between two curves of Vg-Ig
(d) Is a curve between Vg and Ig ANS

36. The di/dt rating of an SCR is specified for its
(a) Decaying anode current
(b) Decaying gate current
(c) Rising gate current
(d) Rising anode current ANS

37. "Six MOSFETs connected in a bridge configuration (having no other power device) MUST be operated as a Voltage Source Inverter (VSI) ". This statement is
(a) True, because being majority carrier devices, MOSFETs are voltage driven
(b) True, because MOSFETs have inherently anti parallel diodes
(c) False, because it can be operated both as current source Inverter (CSI) or a VSI
(d) False, because MOSFETs can be operated as excellent constant current sources in the saturation region ANS

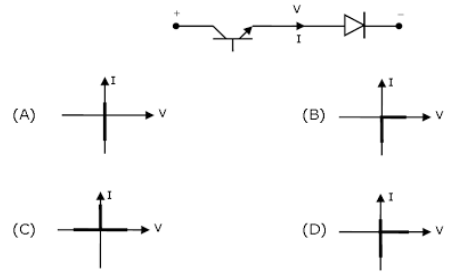
38. A single phase full - wave half controlled bridge converter feeds an inductive load. The two SCRs in the converter are connected to a common DC bus. The converter has to have a free wheeling diode
(a) because the converter inherently does not provide for free wheeling
(b) Because the converter does not provide for free wheeling for high values of triggering angles
(c) Or else the free wheeling action of the converter will cause shorting of the AC supply
(d) Or else if a gate pulse to one of the SCRs is missed, it will subsequently cause a high load current in the other SCR ANS

39. The power electronic converter shown in the figure has a single pole double throw switch. the pole P of the switch is connected alternately to throws A and B. The converter shown is a



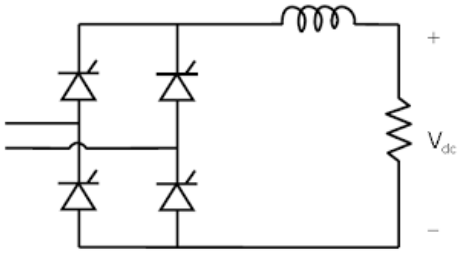
(a) Step down chopper(buck converter)
(b) Half- wave rectifier
(c) Step Up chopper (boost converter)
(d) Full wave converter ANS

40. Figure shows a composite switch consisting of a power transistor (BJT) in series with a diode. Assuming that the transistor switch and the diode are ideal, the I-V characteristic of the composite switch is



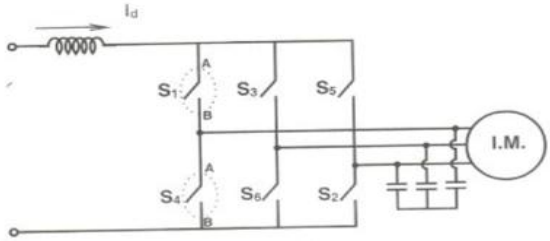
ANS

41. The fully controlled thyristor converter in the figure is fed from a single-phase source. When the firing angle is 0°, the dc output voltage of the converter is 300 V. What will be the output voltage for a firing angle of 60°, assuming continuous conduction?

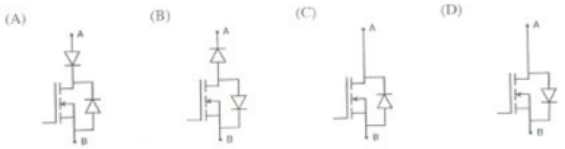


(a) 150V
(b) 210V
(c) 300V
(d) 100πV ANS

42. A three phase current source inverter used for the speed control of an induction motor is to be realized using MOSFET switches as shown below. Switches S1 to S6 are identical switches



The proper configuration for realizing switches S1 to S6 is



ANS

43. Circuit turn-off time of an SCR is defined as the time
(a) Taken by the SCR to turn off

(b) Required for SCR current to become zero
(c) For which the SCR is reverse biased by the commutation circuit
(d) For which the SCR is reverse biased to reduce its current below the holding current ANS

44. A single phase fully controlled thyristor bridge ac-dc converter is operating at a firing angle of 25 degree, and an overlap angle 10 degree with constant dc output current of 20A. The fundamental power factor (displacement factor) at input ac mains is
(a) 0.78
(b) 0.827
(c) 0.866
(d) 0.9 ANS

45. A three phase fully controlled thyristor bridge converter is used as line commutated inverter to feed 50 KW power at 420 V DC to a three phase 415V(line), 50Hz as mains. Consider Dc link current to be constant. The rms current of the thyristor is
(a) 119.05A
(b) 79.37A
(c) 68.73A
(d) 39.68A ANS

46. The firing angle of a single-phase fully controlled thyristor bridge ac-dc converter is 25 and an overlap angle is 10. The constant dc output current is 20 A. The fundamental power factor (displacement factor) at input ac mains is
(a) 0.8
(b) 0.78
(c) 0.9
(d) 1.2 ANS

47. The width of the diode current pulse in a 2-pulse bridge converter with freewheeling diode is (α is firing angle)
(a) 2α
(b) $\alpha/2$
(c) $\pi - \alpha$
(d) π ANS

48. For a power MOSFET, the conduction loss versus device current characteristic is best approximated by
(a) An exponentially decaying function
(b) A rectangular hyperbola
(c) A straight line
(d) A parabola ANS

49. The reason to consider an SCR as a semi-controlled device is that
(a) It can be turned ON but not OFF with a gate pulse.
(b) It can be turned OFF but not ON with a gate pulse.
(c) None of the above reasons are valid.
(d) It can be turned ON only during one half cycle of an alternating voltage wave. ANS

50. Let D be the constant duty ratio of a step down chopper, which is operated in the continuous conduction mode in steady state. Vo = Magnitude of the dc output voltage and Vs = Magnitude of the dc input voltage. The ratio Vo/Vs is given by
(a) 1/D
(b) D
(c) 1-D
(d) 1/1-D ANS

Ex. NO: 12

HIGH VOLTAGE ENGINEERING

1. Dielectric strength in case of mica can be expected to be more than

(a) 500 kV/mm
(b) 1500 kV/mm
(c) 2500 kV/mm
(d) 3500 kV/mm. ANS

2. All of the following dielectric materials are preferred for high frequency applications EXCEPT

(a) Polyethylene
(b) Butyl rubber
(c) Teflon
(d) Polystyrene ANS

3. Polar dielectrics are normally used for

(a) high frequencies
(b) microwaves
(c) dc and power frequencies
(d) none of the above ANS

4. Which of the following is a polar dielectric ?

(a) Teflon
(b) Quartz
(c) Nylon
(d) Polyethylene ANS

5. Which of the following is a non-polar dielectric ?

(a) Polystyrene
(b) Phenolic plastics
(c) Plasticized cellulose acetate
(d) Castor oil ANS

6. The impurity in liquid dielectric which has significant effect in reducing the breakdown strength, is

(a) dust
(b) dissolved gases
(c) moisture
(d) ionic impurities ANS

7. The relationship between the breakdown voltage V and gap d is normally given as

(a) $d = kV^2$
(b) $d=kV^3$
(c) $V = kd$
(d) $v = kd^n$ ANS

8. A good dielectric should have all the following properties EXCEPT

(a) high mechanical strength
(b) high resistance to thermal deterioration
(c) high dielectric loss
(d) freedom from gaseous inclusions ANS

9. The variety of paper used for insulation purpose is

(a) blotting paper
(b) rice paper
(c) craft paper
(d) mill-board ANS

10. Which variety of mica is hard and brittle ?

(a) Muscovite
(b) Phlogopite
(c) Fibiolite
(d) Lipidolite. ANS

11. Corona effect can be identified by

(a) bushy sparks
(b) faint violet glow
(c) arcing between conductors and earth
(d) red light ANS

12. The phenomenon of corona is generally accompanied by

(a) a bang
(b) a hissing sound
(c) magnetic hum
(d) all of the above ANS

13. Van de Graff generators are useful for

(a) Very high voltage and low current applications
(b) Very high voltage and high current applications
(c) Constant high voltage and current applications
(d) High voltage pulses only ANS

14. In Van de Graff generators output voltage is controlled by

(a) controlling the corona source voltage
(b) controlling the belt speed
(c) controlling the lower spray point
(d) any of the above ANS

15. A Tesla coil is a

(a) cascaded transformer
(b) coreless transformer
(c) high frequency resonant transformer
(d) low impedance transformer ANS

16. Switching surge is

(a) high voltage dc
(b) high voltage ac
(c) short duration transient voltage
(d) hyperbolically dying voltage ANS

17. Moles bridge is used to measure

(a) properties of dielectric at dc
(b) dispersion in insulation
(c) high frequency high voltages
(d) modulation ratio frequencies ANS

18. Insulators for high voltage applications are tested for

(a) power frequency tests
(b) impulse tests
(c) both (A) and (B) above
(d) none of the above ANS

19. Impulse testing of transformers is done to determine the ability of

(a) bushings to withstand vibrations
(b) insulation to withstand transient voltages
(c) windings to withstand voltage fluctuations
(d) all of the above ANS

20. Transformers contribute to radio interference due to

(a) corona discharges in air
(b) internal or partial discharges in insulation

(c) sparking
(d) any of the above ANS

21. As compared to air the relative dielectric strength of sulphur hexafluoride is nearly
(a) 1.5 times
(b) 2.5 times
(c) 4.0 times
(d) 5.0 times ANS

22. The electrical breakdown strength of insulating materials depends on
(a) nature of applied voltage
(b) imperfections in dielectric material
(c) pressure, temperature and humidity
(d) all of the above ANS

23. Which of the following gas has been used as insulating medium in electrical appliances?
(a) Nitrogen
(b) Carbon dioxide
(c) Sulphur hexafluoride
(d) Freon ANS

24. Vacuum insulation is used in all of the following EXCEPT
(a) Particle accelerators
(b) EHT of color TV
(c) Field emission tubes
(d) X-rays ANS

25. Liquids are generally used as insulating materials up to voltage stresses of about
(a) 100 MV/cm
(b) 50 MV/cm
(c) 50 kV/cm
(d) 500 V/cm ANS

26. Electro-mechanical breakdown of solid insulating materials occurs due to
(a) magnetic bum
(b) vibrations
(c) mechanical stresses produced by the electrical field
(d) electrical stresses produced by the voltage fluctuations. ANS

27. Match the following :
(F is force exerted on a charge q in the electric field E and S is the closed surface containing charge q, D is the flux density).

Equation	Nomenclature
(a) φ_s E dS = q / ε_0	**(i) Poisson's equation**
(b) ▼ .D = ρ	**(ii) Laplace's equation**
(c) $\nabla^2 .\varphi = - \rho / \varepsilon_0$	**(iii) Guass theorem**
(d) $\nabla^2 .\varphi = 0$	**(iv) Charge density**

(a) a - (i), b - (ii), c - (iii), d - (iv)
(b) a - (ii), b - (i), c - (iv), d - (iii)
(c) a - (iv), b - (i), c - (ii), d - (iii)
(d) a - (iii), b - (iv), c - (i), d - (ii) ANS

28. Surge voltage originate in power systems due to
(a) lightning
(b) switching operations
(c) faults
(d) any of the above ANS

29. All of the following are the preferred properties of a dielectric gas EXCEPT
(a) high dielectric strength
(b) physiological inertness
(c) low atomic number
(d) good heat transfer ANS

30. Corona results in
(a) improvement in power factor
(b) increased capacitive reactance of transmission lines
(c) radio interference
(d) better regulation ANS

31. Which of the following technique/method is-used for the measurements of ac high frequency voltages ?
(a) Peak voltmeter
(b) Series resistance micro ammeter
(c) Resistance potential divider
(d) Any of the above ANS

32. Which of the following method or technique can be used for the measurement of high dc voltages ?
(a) Generating voltmeter
(b) Electrostatic voltmeter
(c) Peak voltmeter
(d) Any of the above ANS

33. All of the following methods/techniques can be used for the measurement of high ac voltages EXCEPT
(a) Potential dividers
(b) Potential transformers
(c) Electrostatic voltmeters
(d) Half effect generators ANS

34. Surge diverters are
(a) non-linear resistors in series with spark gaps which act as fast switches
(b) shunt reactors to limit the voltage rise due to Ferranti effect
(c) over-voltages of power frequency harmonics
(d) arc quenching devices ANS

35. Impulse voltages are characterized by
(a) polarity
(b) peak value
(c) time of half the peak value
(d) all of the above ANS

36. Paschen's law is associated with
(a) breakdown voltage
(b) ionization
(c) thermal radiations

(d) none of the above ANS

37. The essential condition for the Paschen's law to be valid is that

(a) voltage must be dc
(b) voltage must be ac
(c) temperature must be constant
(d) humidity must be low ANS

38. The breakdown voltage in gases depends on

(a) distance between the electrodes
(b) relative air density
(c) humidity
(d) all of the above ANS

39. At unvarying temperature breakdown voltage in a uniform field is a function of the product of gas pressure and distance between the electrodes. The above statement is known as

(a) Electron avalanche
(b) Thermal stability principle
(c) Paschen's law
(d) Breakdown voltage law ANS

40. Large capacity generators are manufactured to generate power at

(a) 440 V
(b) 6.3 to 10.5 kV
(c) 132 kV to 220 kV
(d) 400 kV ANS

41. Which soil has the least specific resistance ?

(a) Land
(b) Loamy soil
(c) Clay
(d) Peat ANS

42. Which soil has the maximum specific resistance ?

(a) Black cotton soil
(b) Sand
(c) Peat
(d) Loamy soil ANS

43. In sphere gaps, the sphere are made of

(a) aluminium
(b) brass
(c) bronze
(d) any of the above ANS

44. In 'plasma' state a gas

(a) loses electrical conductivity
(b) conducts electricity
(c) becomes perfect insulator
(d) attracts moisture ANS

45. Which of the following statement about corona is incorrect ?

(a) Corona gives rise to radio interference
(b) Corona results in loss of power in transmission
(c) Corona is always accompanied by a hissing noise
(d) Corona discharge can be observed as red luminescence ANS

46. SF_6 is a

(a) Ionizes easily to form ions
(b) Electronegative gas
(c) Non attaching gas
(d) Neutral gas ANS

47. For generator coil insulation the class of insulation used is

(a) Class A
(b) Class B
(c) Class C
(d) Class F ANS

48. A generating voltmeter is used to measure

(a) impulse voltages
(b) ac voltages
(c) dc voltages
(d) high-frequency ac voltages ANS

49. Sphere gaps are used to measure

(a) dc voltages
(b) ac peak voltages
(c) dc, ac peak impulse voltages
(d) only dc and ac peak voltages ANS

50. Fault location in an HV cable is done by

(a) voltage withstand test
(b) partial discharge scanning tests
(c) life tests
(d) impulse testing ANS

Ex. NO: 13
POWER SYSTEM

1. For a fixed value of complex power flow in a transmission line having a sending end voltage V, the real power loss will be proportional to
(a) V
(b) V^2
(c) $1/V^2$
(d) 1/V ANS

2. How many 200W/220V incandescent lamps connected in series would consume the same total power as a single 100W/220V incandescent lamps?
(a) Not possible
(b) 4
(c) 3
(d) 2 ANS

3. Match the items in list I with the items in list II and select the correct answer using the codes given below the lists

LIST 1 TO	LIST2 USE
a. Improve power factor	1.shunt reactor
b. Reduce the current ripples	2.shunt capacitor
c. Increase the power flow in line	3.series capacitor
d. Reduce the ferranti effect	4.series reactor

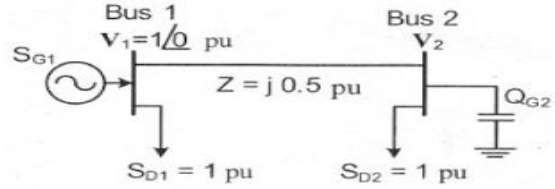
(a) a→2,b→3,c→4,d→1
(b) a→2,b→4,c→3,d→1
(c) a→4,b→3,c→1,d→2
(d) a→4,b→1,c→3,d→2 ANS

4. Match the items in list I with the items in list II and select the correct answer using the codes given below the lists

LIST 1 Type of Transmission Line	LIST2 Type of Distance Relay Preferred
a.short line	1.Ohm Relay
b.Medium line	2.Reactance Relay
c.Long line	3.Mho Relay

(a) a→2,b→1,c→3
(b) a→3,b→2,c→1
(c) a→1,b→2,c→3
(d) a→1,b→3,c→2 ANS

5. For the system shown below, S_{D1} and S_{D2} are complex power demands at bus 1 and bus 2 respectively. If $|V_2|$=1pu, the VAR rating of the capacitor (Q_{G2}) connected at bus 2 is



(a) 0.2 pu
(b) 0.268
(c) 0.312
(d) 0.4pu ANS

6. A cylindrical rotor generator delivers 0.5 pu power in the steady-state to an infinite bus through a transmission line of reactance 0.5 pu. The generator no-load voltage is 1.5 pu and the infinite voltage is 1.5 pu. The inertia constant of the generator is 5MW$_s$/MV and the generator reactance is 1 pu.The critical clearing angle, in degrees, for a three-phase dead short circuit fault at the generator terminal is
(a) 53.5
(b) 60.2
(c) 70.8
(d) 79.6 ANS

7. For a fault at terminals of the synchronous generator the fault current is max for a
(a) 3 phase fault
(b) 3 phase to ground fault
(c) Line to ground fault
(d) Line to line fault ANS

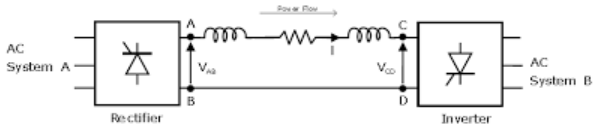
8. Reactance relay is normally preferred for protection against
(a) Earth faults
(b) Phase faults
(c) Open circuit faults
(d) None of the above ANS

9. A 100 MVA, 11kV, 3 phase, 50Hz, 8 pole synchronous generator has a inertia constant H = 4 seconds. The stored in the rotor of the generator at synchronous speed will be
(a) 100MJ
(b) 400MJ
(c) 800MJ
(d) 12.5MJ ANS

10. The use of high speed circuit breakers
(a) Reduces the short circuit current
(b) Improves system stability
(c) Decreases system stability
(d) Increases the short circuit current ANS

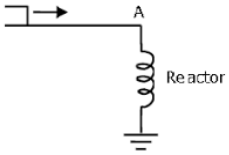
11. Bundled conductors are employed to improve the
(a) Appearance of the transmission line
(b) Mechanical stability of the line
(c) Current carrying capability of the line
(d) Corona performance of the line ANS

12. Power is transfered from system A to system B by an HVDC link as shown in the figure.If the voltages V_{AB} and V_{CD} are as indicated in the figure, and I>0,then



(a) $V_{AB}<0, V_{CD}<0, V_{AB}>V_{CD}$
(b) $V_{AB}>0, V_{CD}>0, V_{AB}>V_{CD}$
(c) $V_{AB}>0, V_{CD}>0, V_{AB}<V_{CD}$
(d) $V_{AB}>0, V_{CD}<0$ ANS

13. Consider a step voltage wave of magnitude 1pu travelling along a lossless transmission line that terminates in a reactor. The voltage magnitude across the reactor at the instant the travelling wave reaches the reactor is



(a) -1pu
(b) 1pu
(c) 2pu
(d) 3pu ANS

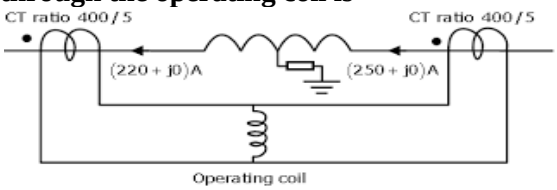
14. Consider two buses connected by an impedance of (0+j5)Ω. The bus 1 voltage is 100∠30° V, and bus 2 voltage is 100∠0° V. The real and reactive power supplied by bus 1, respectively are

(a) 1000W,268Var
(b) -1000W,-134Var
(c) 276.9W,-56.7Var
(d) -276.9W,56.7Var ANS

15. A three-phase, 33kV oil circuit breaker is rated 1200A, 2000MVA, 3s. The symmetrical breaking current is

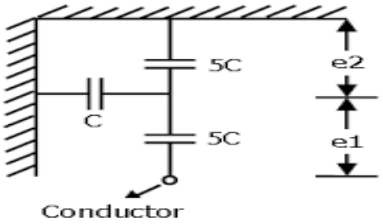
(a) 1200A
(b) 3600A
(c) 35kA
(d) 104.8kA ANS

16. Consider a stator winding of an alternator with an internal high-resistance ground fault. The currents under the fault condition are as shown in the figure. The winding is protected using a differential current scheme with current transformers of ratio 400/5A as shown. The current through the operating coil is



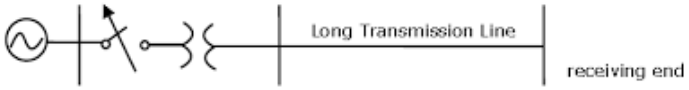
(a) 0.17875A
(b) 0.2A
(c) 0.375A
(d) 60kA ANS

17. Consider a three-phase, 50Hz, 11kV distribution system. Each of the conductors is suspended by an insulator string having two identical porcelain insulators. The self capacitance of the insulator is 5 times the shunt capacitance between the link and the ground, as shown in the figure. The voltage across the two insulators is



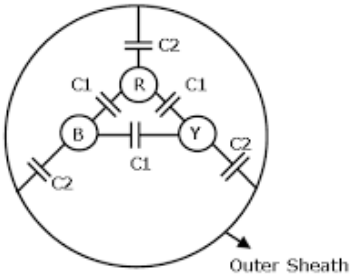
(a) e1=3.74kV,e2=2.61kV
(b) e1=3.46kV,e2=2.89kV
(c) e1=6.0kV,e2=4.23kV
(d) e1=5.5kV,e2=5.5kV ANS

18. A 50Hz synchronous generator is initially connected to a long lossless transmission line which is open circuited at the receiving end. With the field voltage held constant, the generator is disconnected from the transmission line. Which of the following may be said about the steady state terminal voltage and field current of the generator?



(a) The magnitude of terminal voltage decreases, and the field current does not change
(b) The magnitude of terminal voltage increases, and the field current does not change
(c) The magnitude of terminal voltage increases, and the field current increases
(d) The magnitude of terminal voltage does not change, and the field current decreases
(e) none of the above ANS

19. Consider a three-core, three-phase, 50Hz, 11kV cable whose conductors are denoted as R,Y and B in the figure. The inter-phase capacitance (C1) between each pair of conductors is 0.2μF and the capacitance between each line conductor and the sheath is 0.4μF.The per-phase charging current is

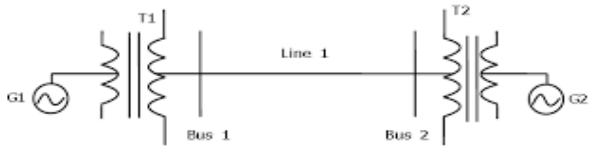


(a) 2.0A
(b) 2.4A
(c) 2.7A
(d) 3.5A ANS

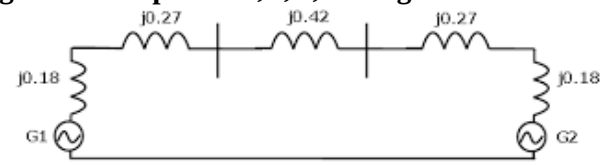
20. For the power system shown in the figure below, the specifications of the components are the following:

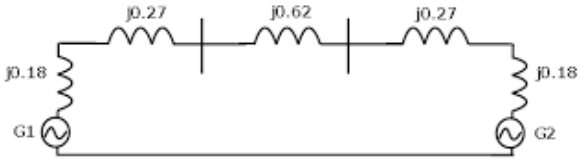
G1: 25kV,100MVA, X=9%

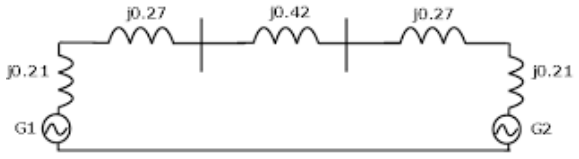
G2: 25'kV,100MVA,X=9%
T1: 25kV/220kV,90MVA,X=12%
T2: 220kV/25kV,90MVA,X=12%
Line1: 220kV, X=150 ohms.

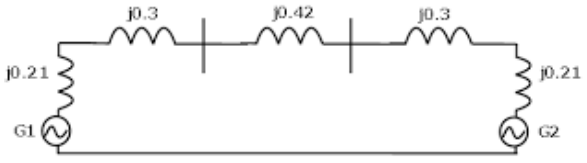


Choose 25kV as the base voltage at the generator G1 and 200MVA as the MVA base. The impedance diagram is.....Options A,B,C,D are given below

(a)


(b)


(c)


(d)


ANS

21. For enhancing the power transmission in a long EHV transmission line, the most preferred method is to connect a
(a) Series inductive compensator in the line
(b) Shunt inductive compensator at the receiving end
(c) Series capacitive compensator in the line
(d) Shunt capacitive compensator at the sending end
ANS

22. Which one of the following statement is incorrect for the Gauss seidal load flow method?
(a) Initial guess for voltages is essential for convergence
(b) Choice of slack bus affects convergence
(c) Unreliable convergence
(d) Slow convergence ANS

23. Consider a relay with a negative sequence whose plug setting is 0.2 A. For the operation of relay the minimum value of line to line fault current when the current transformer ratio is 5:1, is
(a) 0.245A
(b) 0.543A
(c) 1.732A
(d) 1/1.732A ANS

24. What will be the corona loss on a particular system at 60 Hz if the corona loss at 50 Hz is 1Kw/km per phase?
(a) 1.23 kW/km per phase
(b) 1.13 kW/km per phase
(c) 2 kW/km per phase
(d) 1.25 kW/km per phase ANS

25. For a transmission line, if the magnitude of open circuit input impedance is 100 Ω and magnitude of short circuit input impedance is 25 Ω then the characteristic impedance of transmission line will be
(a) 10 Ω
(b) 20 Ω
(c) 100 Ω
(d) 50 Ω ANS

26. Bundled conductors are employed to
(a) reduced the short circuit current
(b) improve system stability
(c) decrease system stability
(d) increase the short circuit current ANS

27. The X:R ratio of 220 kV line has compared to 400 kV line is
(a) greater
(b) smaller
(c) equal
(d) it could be anything ANS

28. With 100% series compensation of lines
(a) the circuit is series resonant at power frequency
(b) low transient voltage
(c) high transient current
(d) both a and c ANS

29. An RLC series circuit remains predominantly inductive
(a) at resonance frequency
(b) below resonance frequency
(c) above resonance frequency
(d) at lower half power frequency ANS

30. If an induction machine is run at above synchronous speed, it act as
(a) a synchronous motor
(b) an induction generator
(c) an inductor motor
(d) none of these ANS

31. The transmission line feeding power on either side of the main transmission line is called
(a) secondary distribution
(b) secondary transmission
(c) primary transmission
(d) primary distribution ANS

32. If the excitation of the synchronous generator fails, it acts as a

(a) Synchronous motor
(b) synchronous generator
(c) induction motor
(d) induction generator ANS

33. The unit protection scheme provides
(a) primary protection
(b) backup protection
(c) simultaneous protection
(d) remote protection ANS

34. Resistance switching in normally employed in
(a) all breakers
(b) bulk oil breakers
(c) minimum oil breakers
(d) air blast circuit breakers ANS

35. Reactance relay is normally preferred for protection against
(a) earth faults
(b) phase faults
(c) open circuit fault
(d) none of these ANS

36. The operation of the relay which is most affected due to arc resistance is
(a) mho relay
(b) reactance relay
(c) impedance relay
(d) all are equally affected ANS

37. A reactance relay is
(a) voltage restrained directional relay
(b) directional restrained over current relay
(c) voltage restrained over current relay
(d) none of these ANS

38. The capacitor switching is easily done with
(a) air blast circuit breaker
(b) oil circuit breaker
(c) vacuum circuit breaker
(d) any one of these ANS

39. The insulation level of 400 kV EHV overhead transmission line is decided on the basis of
(a) lightning over voltage
(b) switching over voltage
(c) corona inception voltage
(d) radio and TV interference ANS

40. Load frequency control is achieved by properly matching the individual machines
(a) reactive powers
(b) generated voltages
(c) turbine inputs
(d) turbine and generator rating ANS

41. For a fault at the terminals of a synchronous generator, the fault current is maximum for a
(a) 3-phase fault
(b) 3-phase to ground fault
(c) line- to ground fault
(d) line-to -line fault ANS

42.If the excitation of the synchronous generator fails, it acts as a
(a)Synchronous motor
(b) Synchronous generator
(c)Induction motor
(d)Induction generator ANS

43. The use of high -speed circuit breakers
(a) reduces the short circuit current
(b) improves the system stability
(c) decreases system stability
(d) increases the short circuit current ANS

44. The current chopping tendency is minimized by using the SF_6 gas at relatively
(a) high pressure and low velocity
(b) high pressure and high velocity
(c) low pressure and low velocity
(d) low pressure and high velocity ANS

45. Where voltage are high and current to be interrupted is low, the breaker preferred is
(a) air blast C.B.
(b) oil C.B.
(c) vacuum C.B.
(d) any of these ANS

46. Plug setting of a relay can be altered by varying
(a) number of ampere turns
(b) air gap of magnetic path
(c) adjustable back up stop
(d) none of these ANS

47. Steady – state stability limit is
(a) greater than transient stability limit
(b) equal to transient stability limit
(c) less than the transient stability limit
(d) none of these ANS

48. The critical clearing time of a fault in power systems is related to
(a) reactive power limit
(b) short circuit current limit
(c) steady state stability limit
(d) transient stability limit ANS

49. Bulk power transmission over long HVDC lines are preferred, on account of
(a) low cost of HVDC terminals
(b) no harmonic problems
(c) minimum line power losses
(d) simple protection ANS

50. The main consideration for higher and higher operating voltage of transmission is to
(a) increasing efficiency of transmission
(b) reduce power losses
(c) increase power transfer capability
(d) both(a) and (b) ANS

CIRCUIT THEORY	MEASUREMENTS AND INSTRUMENTATION	ELECTROMAGNETIC THEORY	ELECTRONIC DEVICES AND CIRCUITS	TRANSFORMERS
1. b	1. a	1. b	1. a	1. c
2. b	2. d	2. c	2. a	2. b
3. b	3. d	3. b	3. a	3. d
4. a	4. e	4. b	4. a	4. d
5. a	5. a	5. a	5. d	5. c
6. d	6. e	6. b	6. c	6. d
7. e	7. b	7. d	7. b	7. b
8. d	8. c	8. b	8. c	8. c
9. c	9. e	9. a	9. c	9. c
10. e	10. c	10. b	10. d	10. c
11. a	11. c	11. a	11. c	11. c
12. a	12. a	12. b	12. d	12. d
13. c	13. b	13. b	13. c	13. a
14. c	14. b	14. a	14. d	14. b
15. c	15. c	15. c	15. b	15. a
16. b	16. b	16. b	16. a	16. b
17. a	17. c	17. b	17. b	17. d
18. c	18. c	18. c	18. a	18. c
19. a	19. a	19. d	19. a	19. a
20. b	20. a	20. a	20. d	20. d
21. c	21. b	21. c	21. d	21. a
22. a	22. a	22. a	22. c	22. c
23.b	23. c	23. b	23. c	23. d
24. a	24. c	24. a	24. d	24. c
25. a	25. b	25. c	25. a	25. b
26. d	26. b	26. a	26. d	26. a
27. b	27. c	27. d	27. c	27. a
28. a	28. b	28. b	28. b	28. a
29. d	29. b	29. d	29. c	29. a
30. d	30. a	30. a	30. a	30. c
31. c	31. c	31. b	31. c	31. b
32. d	32. c	32. d	32. b	32. d
33. c	33. a	33. d	33. b	33. b
34. b	34. e	34. c	34. a	34. d
35. d	35. b	35. b	35. b	35. a
36. **a**	36. **a**	36. d	36. d	36. a
37. **b**	37. d	37. a	37. c	37. b
38. **b**	38. d	38. **c**	38. b	38. b
39. **c**	39. a	39. **a**	39. c	39. b
40. **c**	40. a	40. d	40. b	40. **a**
41. a	41. a	41. b	41. c	41. a
42. **c**	42. c	42. b	42. c	42. b
43. **a**	43. a	43. d	43. c	43. d
44. c	44. a	44. c	44. a	44. d
45. a	45. c	45. c	45. c	45. b
46. d	46. c	46. b	46. b	46. a
47. c	47. a	47. d	47. b	47. c
48. d	48. b	48. d	48. a	48. a
49. d	49. c	49. c	49. c	49. c
50. c	50. a	50. b	50. c	50. b

DC MACHINES

1. b
2. c
3. a
4. b
5. c
6. d
7. d
8. a
9. a
10. d
11. d
12. d
13. c
14. b
15. a
16. b
17. c
18. b
19. d
20. a
21. c
22. c
23. b
24. b
25. a
26. d
27. a
28. a
29. d
30. a
31. d
32. a
33. a
34. c
35. b
36. c
37. c
38. d
39. b
40. a
41. c
42. d
43. a
44. b
45. a
46. c
47. **c**
48. c
49. c
50. a

AC MACHINES

1. a
2. a
3. b
4. c
5. a
6. b
7. b
8. c
9. b
10. d
11. d
12. c
13. d
14. a
15. b
16. d
17. b
18. b
19. b
20. c
21. d
22. d
23. d
24. c
25. c
26. a
27. a
28. d
29. c
30. d
31. c
32 d
33. b
34. a
35. d
36. a
37. a
38. a
39. a
40. c
41. d
42. c
43. b
44. c
45. c
46. c
47. b
48. a
49. d
50. a

CONTROL SYSTEMS

1. a
2. a
3. a
4. a
5. b
6. c
7. a
8. c
9. a
10. b
11. b
12. a
13. a
14. d
15. d
16. d
17. d
18. c
19. d
20. c
21. c
22. d
23. a
24. d
25. c
26. b
27. a
28. c
29. a
30. c
31. b
32. a
33. d
34. b
35. b
36. a
37. c
38. b
39. a
40. b
41. b
42. c
43. d
44. c
45. b
46. a
47 a
48. b
49. b
50. c

DIGITAL ELECTRONICS

1. a
2. d
3. c
4. b
5. c
6. a
7. a
8. c
9. b
10. b
11. a
12. b
13 d
14. c
15. b
16. c
17. a
18. c
19. a
20. c
21. a
22. d
23. c
24. c
25. b
26. c
27. a
28. c
29. c
30. a
31. b
32. c
33. b
34. b
35. a
36. b
37. b.
38. c
39. b
40. c.
41. a.
42. a.
43. d. .
44. d.
45. d
46. b
47. a
48. a
49. a
50. c

TRANSMISSION AND DISTRIBUTION

1. c
2. b
3. a
4. d
5. d
6. d
7. a
8. b
9. e
10. a
11. b
12. a
13. b
14. c
15. b
16. a
17. a
18. c
19. b
20. a
21. c
22. d
23. b
24. c
25. d
26. b
27. b
28. d
29. b
30. b
31. d
32. c
33. d
34. d
35. d
36. a
37. c
38. b
39. a
40. b
41. c
42. d
43. d
44. a
45. c
46. a
47. b
48. c
49. c
50. d

POWER ELECTRONICS

1. c
2. d
3. a
4. c
5. c
6. c
7. 3
8. 3
9. 4
10. 4
11. 2
12. 4
13. 1
14. 2
15. 3
16. a
17. c
18. 3
19. c
20. a
21. c
22. 2
23. a
24. 3
25. 3
26. 4
27. 3
28. b
29. c
30. d
31. a
32 . a
33. 4
34. b
35. d
36. d
37. d
38. b
39. a
40. c
41. a
42. c
43. c
44. a
45. d
46. b
47. a
48. d
49. a
50. b

HIGH VOLTAGE ENGINEERING

1. a
2. b
3. c
4. c
5. a
6. c
7. d
8. c
9. c
10. d
11. b
12. b
13. a
14. a
15. c
16. c
17. b
18. c
19. b
20. d
21. b
22. d
23. c
24. b
25. c
26. c
27. d
28. d
29. c
30. c
31. a
32. a
33. d
34. a
35. d
36. a
37. c
38. d
39. c
40. b
41. d
42. b
43. d
44. b
45. c
46. b
47.d
48. c
49. c
50. b

POWER SYSTEM

1. c
2. d
3. b
4. a
5. b
6. d
7. a
8. b
9. b
10. b
11. d
12. c
13. a
14. a
15. c
16. c
17. b
18. e
19. a
20. b
21. c
22. c
23. c
24. b
25. d
26. c
27. b
28. c
29. c
30. b
31. b
32. d
33. a
34. d
35. c
36. c
37. b
38. c
39. b
40. c
41. c
42. d
43. b
44. c
45. c
46. a
47. a
48.d
49. b
50. c