QUESTION BANK

FOR COMPETITIVE EXAM 1ST YEAR

1. Which of the following wires has the greatest cross-sectional area?
a.9 AWG
b.14 AWG
c.22 AWG
d.30 AWG

2. What is the unit of measure for electrical pressure or electromotive force?
a. amps
b. ohms
c. volts
d. watts

3. Which of the following circuit configurations has the same amount of voltage drop across each of its components?
a. parallel
b. series-parallel
c. series
d. combination

4. As temperature increases, what happens to the current-carrying ability of a wire?
a. There is no change.
b. The wire can carry more current.
c. The wire can carry less current.
d. The wire can carry no current.

5. In a series circuit consisting of 3 resistors of 45 Ω each and a 50-V source, what is the approximate amount of heat produced?
a. 16.6 W
b.18.5 W
c. 135 W
d. 150 W

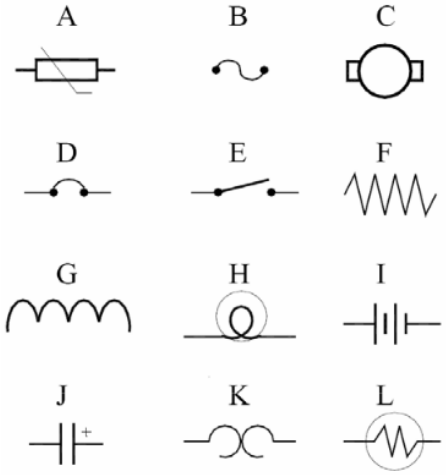
6.In a two-branch parallel circuit containing one 30-Ω resistor in each branch and powered from a 10-V source, what is the total current flowing in the circuit?
a. 33 A
b.67 A
c.40 A
d.60 A

7.Which of the following determines total power in a series circuit?
a.source voltage times the current
b.total voltage applied to the circuit
c.current flowing through a switch
d.average of the wattage consumed by each resistor

8.If a resistor suddenly decreases in value (resistance decreases), what will happen to the current through the resistor?
a.increases
b.remains unchanged
c.decreases
d.fluctuates

9.What is the applied voltage on a circuit in which .5A is flowing and 10 W is generated?
a.2 V
b.5 V
c.20 V
d.50 V

10. Refer to Figure, which drawing is the electrical symbol for a source of energy?



a.A
b.C
c.I
d.J

11.What is the classification of an AC circuit in which the capacitive reactance is 50 Ω, the inductive reactance is 30 Ωand the resistance is 100 Ω?
a.resistive
b.inductive
c.capacitive
d.resonant

12.When using a standard multimeter to measure AC voltage, what type of measurement will the multimeter indicate?
a.peak-to-peak
b.peak
c.average
d.rms

13.What happens to current flow in a capacitive circuit when the DC voltage across the capacitor is approximately equal to the source voltage?
a.Current flow is optimized.
b.Little current flows.
c.Current flow is maximum at the source.
d.Current flow is maximum at the capacitor.

14.What is the term used to describe the ability of a device to store energy in the form of an electrical charge?
a.inductance
b.conductance
c.reactance
d.capacitance

15.Refer to Figure 2. What is the total capacitance of this circuit?
a.15 pF
b.30 pF
c.105 pF
d.160 pF

16.If the distance between the plates ofa capacitor decreases while all other components of the capacitor remain the same, what happens to the capacitance of the device?
a.increases
b.remains the same
c.decreases
d.varies

17.In mutual induction, what passes between conductors in order to create voltage?
a. radiation
b. magnetic flux
c. current flow
d.resistance

18.The Henry is the unit of measurement for which of the following properties?
a. reactance

b.capacitance
c.resistance
d.induction

19.Which of the following devices can be used to test the windings of an inductor for continuity?
a.wattmeter
b.voltmeter
c.ohmmeter
d.Wheatstone bridge

20.Which of the following circuit conditions does a metal oxide varistor (MOV)protect against?
a.high voltage
b.high current
c.high circuit noise
d.high cross-talk

21.How should a fuse be installed in a circuit to insure proper operation?
a.parallel to the load
b.series with the load
c.in any way possible
d.at the ground point

22. a parallel circuit operating with a source of 30 VAC, designed to carry a total current of 6 A, what happens to the protection device (fuse) when the resistance suddenly changes to 2Ω?
a.closes
b.no change
c.shorts to ground
d.opens

23.How many watts are in 100 microwatts?
a..01 milliwatts
b.1 milliwatts
c.1.0 milliwatts
d.10 nanowatts

24.Which of the following is an appropriate use for a voltmeter?
a.To measure difference of potential
b.To measure current flow
c.To determine total resistance
d.To determine power output

25.What should be observed when connecting a voltmeter into a DC circuit?
a.rms

b.resistance
c.polarity
d.power factor

26. Electrostatics is a branch of electricity concerned with
(a) Energy flowing across a gap between conductors
(b) Charges at rest
(c) Charges in motion
(d) Energy in the form of charges

27. Four 2 μF capacitors are connected in series. The equivalent capacitance is
(a) 8 μF
(b) 0.5 μF
(c) 2 μF
(d) 6 μF

28. State which of the following is false.
The capacitance of a capacitor
(a) Is proportional to the cross-sectional area of the plates
(b) Is proportional to the distance between the plates
(c) Depends on the number of plates
(d) Is proportional to the relative permittivity of the dielectric

29. The capacitance of a capacitor is the ratio
(a) Charge to potential difference between plates
(b) Potential difference between plates to plate spacing
(c) Potential difference between plates to thickness of dielectric

(d) Potential difference between plates to charge

30. Which of the following statement is false?
(a) An air capacitor is normally a variable type
(b) A paper capacitor generally has a shorter service life than most other types of capacitor
(c) An electrolytic capacitor must be used only on a.c. supplies
(d) Plastic capacitors generally operate satisfactorily under conditions of high temperature

31. The potential difference across a 10 μF capacitor to charge it with 10mC is
(a) 10V
(b) 1 kV
(c) 1V
(d) 10V

32. The energy stored in a 10μF capacitor when charged to 500V is
(a) 1.25 mJ
(b) 0.025 μJ
(c) 1.25 J
(d) 1.25 C

33. The capacitance of a variable air capacitor is at maximum when
(a) The movable plates half overlap the fixed plates
(b) The movable plates are most widely separated from the fixed plates
(c) Both sets of plates are exactly meshed
(d) The movable plates are closer to one side of the fixed plate than to the other

34. The unit of magnetic flux density is the:
(a) Weber
(b) Weber per metre
(c) Ampere per metre
(d) Tesla

35. The charge on a 10 pF capacitor when the voltage applied to it is 10 kV is
(a) 100 μC
(b) 0.1 C (c) 0.1 mc (d) 0.01 μC
36. Four 2 μF capacitors are connected in parallel. The equivalent capacitance is
(a) 8 μF
(b) 0.5 μF
(c) 2 μF
(d) 6 μF

37. In a series a.c. circuit the voltage across a pure inductance is 12V and the voltage across a pure resistance is 5V. The supply voltage is
(a) 13V
(b) 17V
(c) 7V
(d) 2.4V

38. Inductive reactance results in a current that
(a) Leads the voltage by 90deg
(b) Is in phase with the voltage
(c) Leads the voltage by π rad
(d) Lags the voltage by π/2 rad

39. A 10Ω resistor is connected in parallel with a 15 Ω resistor and the combination in series with a 12 Ω resistor. The equivalent resistance of the circuit is:
(a) 37Ω
(b) 18 Ω

(c) 27 Ω
(d) 4 Ω

40. The equivalent resistance when a resistor of (1/3)Ω is connected in parallel with a (1/4)Ω resistance is:
(a) 1/7 Ω
(b) 7Ω
(c) 1/12 Ω
(d) 3/4 Ω

41. A 240V, 60W lamp has a working resistance of:
(a) 1400Ω
(b) 60Ω
(c) 960Ω
(d) 325Ω

42. The symbol for the unit of temperature coefficient of resistance is:
(a) Ω /°C
(b)Ω
(c) °C
(d) Ω /Ω°C

43. The length of a certain conductor of resistance 100Ω is doubled and its cross-sectional area is halved. Its new resistance is:
(a) 100Ω
(b) 200Ω
(c) 50Ω
(d) 400Ω

44. Voltage drop is the:
(a) Maximum potential
(b) Difference in potential between two points
(c) Voltage produced by a source
(d) Voltage at the end of a circuit

45. When an atom loses an electron, the atom:
(a) Becomes positively charged
(b) Disintegrates
(c) Experiences no effect at all
(d) Becomes negatively charged

46. The energy used by a 1.5kW heater in 5 minutes is:
(a) 5 J

(b) 450 J
(c) 7500 J
(d) 450 000 J

47. The unit of resistivity is:
(a) ohms
(b) ohm millimetre
(c) ohm metre
(d) ohm/metre

48. The resistance of a 2 km length of cable of cross-sectional area $2mm^2$ and resistivity of $2\times10^8\Omega$ m is:
(a) 0.02Ω
(b) 20Ω
(c) 0.02mΩ
(d) 200Ω

49. A piece of graphite has a cross-sectional area of $10mm^2$. If its resistance is 0.1Ω and its resistivity 10×10^8 Ωm, its length is:
(a) 10 km
(b) 10 cm
(c) 10 mm
(d) 10 m

50. A nickel coil has a resistance of 13Ω at 50°C. If the temperature coefficient of resistance at 0°C is 0.006/ °C, the resistance at 0°C is:
(a) 16.9Ω
(b) 10Ω
(c) 43.3Ω
(d) 0.1Ω

51. A coil of wire has a resistance of 10 at 0°C. If the temperature coefficient of resistance for the wire is 0.004/ °C, its resistance at 100°C is:
(a) 0.4Ω
(b) 1.4Ω
(c) 14Ω
(d) 10Ω

52. An inductance of 10mH connected across a 100V, 50 Hz supply has an inductive reactance of
(a) 10π
(b) 1000π
(c) π
(d) π H

53. The coulomb is a unit of:
(a) Energy
(b) Voltage
(c) Power
(d) Quantity of electricity

54. A charge of 240 C is transferred in 2 minutes. The current flowing is:
(a) 480A
(b) 120A
(c) 2A
(d) 8A

55. A resistance of 50 kΩ has a conductance of:
(a) 20S
(b) 0.02S
(c) 0.02 mS
(d) 20 kS

56. Which of the following statements is incorrect?
(a) 1N = 1 kgm/s^2
(b) 1V = 1 J/C
(c) 30mA = 0.03A
(d) 1 J = 1N/m

57. The power dissipated by a resistor of 10 ohm when a current of 2A passes through it is:
(a) 0.4W
(b) 20W
(c) 40W
(d) 200W

58. A mass of 1200g is accelerated at 200 cm/s^2 by a force. The value of the force required is:
(a) 2.4N
(b) 2400N
(c) 240 kN
(d) 0.24N

59. A current of 2A flows for 10 hour through a 100 ohm resistor. The energy consumed by the resistor is:
(a) 0.5 kWh
(b) 4 kWh
(c) 2 kWh (d) 0.02 kWh

60. The unit of quantity of electricity is the:
(a) volt
(b) coulomb
(c) ohm
(d) joule

61. Electromotive force is provided by:
(a) Resistance's
(b) A conducting path
(c) An electric current
(d) An electrical supply source

62. The unit of current is the:
(a) Volt
(b) Coulomb
(c) Joule
(d) Ampere

63. In order that work may be done:
(a) Two wires are necessary
(b) The circuit must have a switch
(c) Coal must be burnt
(d) A supply of energy is required

64. The ohm is the unit of:
(a) Charge
(b) Resistance
(c) Power
(d) Current

65. The unit of resistivity is:
(a) ohms
(b) ohm millimetre
(c) ohm metre
(d) ohm/metre

66. Voltage drop is the:
(a) Maximum potential
(b) Difference in potential between two points
(c) Voltage at the end of a circuit
(d) Voltage produced by a source

67. A 240V, 60W lamp has a working resistance of:
(a) 1400 ohm
(b) 60 ohm
(c) 960 ohm
(d) 325 ohm

68. High frequency transformers sometimes make use of ferrite cores because it has

A. High specific gravity
B. High resistance
C. High hysteresis
D. low permeability

69. Harmonics in transformer result in
A. Increased core losses
B. Increased I^2R losses
C. Magnetic interference with communication circuits
D. All of the above

70. The full load copper loss of a transformer is 1600W. At half-load the copper loss will be
A. 6400W
B. 1600W
C. 800W
D. 400W

71. Power transformers are generally designed to have maximum efficiency around
A. No load
B. Half load
C. Near full load
D. 10% overload

72. Two transformers are connected in parallel. These transformers do not have equal percentage impedance which results
A. Short-circuiting of the secondaries
B. Power factor of one of the transformers is leading while that of the other lagging
C. Transformers having higher copper losses will have negligible core losses
D. Loading of the transformers not in proportion to their kVA ratings.

73. The changes in volume of transformer cooling oil due to variation of atmospeheric temperature during day and night is taken care of by which part of transformer?
A. Conservator
B. Breather
C. Bushings
D. Buchholz relay

74.The transformer laminations are insulated from each other by
A. Mica strip
B. Thin coat of varnish
C. Paper
D. Any of the above

75. Which type of winding is used in 3 phase shell type transformer?
A. Circular type
B. Sandwich type
C. Cylindrical type
D. Rectangular type

76. 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

77. Which of the following is not standard voltage for power supply in India
A. 11kV
B. 33kV
C. 66 kV
D. 122 kV

78. The ratio of voltage and electric current in a closed circuit
a. remains constant b. varies c. increases d. falls

79.The curve representing ohm's law is

a. sine function b. Linear c. a parabola d. a hyperbola

80.The resistance of a conductor having length l area of cross section a and resistivity ρ is given as:

a. ρa/l b. ρl/a c. ρla d. l/ρ

81.The resistance of wire varies inversely as

a. area of cross section b. length c. resistivity d. temperature

82.Which of the following quantities are same in all parts of a series circuit?
a. voltage b. power c. current d. resistance

83.Which of the following statements is false in case of a series circuit?

a. the voltage drop across each resister is same

b. the current flowing through each resistor is the same

c. applied voltage is equal to the sum of voltage drops across individual resistors are additive

d.none

84.A resistance of 30 ohm is connected across 240v supply. If a resistance R ohm is connected in parallel with 30ohm resistor across the same supply, the current drawn becomes triple of original one The unknown resistor R is

a. 15ohm b. 10ohm c. 5ohm d.30ohm

85.Three resistors, each of R ohms, are connected to form a triangle. The resistance between any two terminals will be:

a. 2/3 R b. 3/2R c. R d. 3R

86.Which of the following is not correct?

a. P=V/R^2 b. P=VI c. I=√ (P/R) d. V=√PR

87.A 100W bulb is connected in series with a room heater. If now 100W bulb is replaced by a 40w bulb, the heater output will :

a. increase b. decrease c. remain the same

88.The voltage applied across an electric iron is halved. The power consumption of the iron will be:

a. one-half b. one-fourth c. 1/√2times d. three-fourth

89.Resistance of 200w,250v lamp will be

a. 625ohm b. 1250ohm c.312.5ohm d.31.25ohm

90.Two heaters rated at 1000w, 250v each are connected in series across a 250v, 50Hz ac supply. The total power drawn from the supply will be:

a. 1000w b. 500w c. 250w d.2000w

91.A 200w, 100v lamp is to be operated on 250v supply. The additional resistance required to be connected in series will be:

a. 125ohm b. 50ohm c. 75ohm d.25ohm

92. Kirchoff's laws are valid for

a. linear ckt only b. passive time invariant ckt

c. non-linear ckt only d. both linear & non-linear ckt

93.KCL is applicable only to

a. electric circuits b. electronic circuits

c. junctions in a network d. closed loop in a network

94.KVL is concerned with

a. IR drop b. battery emf c. junction node d. both a and b

95.A wye arrangement of resistances has each resistance of 3ohm, the equivalent delta arrangement will have each resistance of values.

a. 9ohm b. 6ohm c. 3ohm d. 1ohm

96.A battery is connected to a resistance causing a current of 0.5A in the circuit. The current drops to 0.4 when an additional resistance of 5? is connected in series . The current will drop to 2A when the resistance is further increased by

a.10 ohm b. 15ohm c. 25ohm d.5 ohm

97.Cells are connected in series in order to increase the

a. current capacity b. life of the cells c. voltage rating d. terminal voltage

98.Cells are connected in parallel in order to increase

a. life of the cells b. efficiency c. current capacity d. voltage rating

99.When two cells are connected in parallel , it should ensure that have
a. identical internal resistances b. equal emfs c. same ampere hour capacity

100.The capacity of a battery is expressed in

a. amperes b. amperes-hour c. watts d. watt-hour

QUESTION BANK
FOR COMPETITIVE EXAM (2ND YEAR)

[1] In a series RLC circuit with output taken across C, the poles of the transfer function are located at $-\alpha \pm j\beta$. The frequency of maximum response is given by

(A) $\sqrt{\beta^2 - \alpha^2}$. **(B)** $\sqrt{\alpha^2 - \beta^2}$.

(C) $\sqrt{\beta^2 + \alpha^2}$. **(D)** $\sqrt{\alpha\beta}$.

[2] A network function can be completely specified by:

(A) Real parts of zeros **(B)** Poles and zeros
(C) Real parts of poles **(D)** Poles, zeros and a scale factor

[3] In the complex frequency $s = \sigma + j\omega$, ω has the units of rad/s and σ has the units of:

(A) Hz **(B)** neper/s
(C) rad/s **(D)** rad

[4] If the impulse response is realisable by delaying it appropriately and is bounded for bounded excitation, then the system is said to be :

(A) causal and stable **(B)** causal but not stable
(C) noncausal but stable **(D)** noncausal, not stable

[5] Superposition theorem is applicable only to networks that are:

(A) linear. **(B)** nonlinear.
(C) time-invariant. **(D)** passive.

[6] In the solution of network differential equations, the constants in the complementary function have to be evaluated from the initial conditions, and then the particular integral is to be added. This procedure is

(A) correct
(B) incorrect.
(C) the one to be followed for finding the natural response.
(D) the one to be followed for finding the natural and forced responses.

[7] In a 2-terminal network containing at least one inductor and one capacitor, resonance condition exists only when the input impedance of the network is:

(A) purely resistive. **(B)** purely reactive.
(C) finite. **(D)** infinite.

[8] If a network function has zeros only in the left-half of the s-plane, then it is said to be

(A) a stable function. **(B)** a non-minimum phase function.
(C) a minimum phase function. **(D)** an all-pass function.

[9] Zeros in the right half of the s-plane are possible only for

(A) d.p. impedance functions. **(B)** d.p. admittance functions.

(C) d.p. impedance as well as functions. admittance functions. **(D)** transfer

[10] The natural response of a network is of the form $\left(A_1 + A_2 t + A_3 t^2\right) e^{-t}$. The network must have repeated poles at s = 1 with multiplicity

(A) 5 **(B)** 4

(C) 3 **(D)** 2

[11] An L-C impedance or admittance function:

(A) has simple poles and zeros in the left half of the s-plane.

(B) has no zero or pole at the origin or infinity.

(C) is an odd rational function.

(D) has all poles on the negative real axis of the s-plane.

[12] The Thevenin equivalent resistance R_{th} for the given network is equal to

(A) 2Ω .

(B) 3Ω .

(C) 4Ω .

(D) 5Ω .

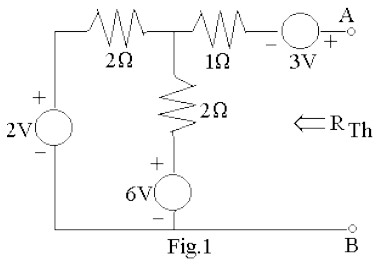


Fig.1

[13] The Laplace-transformed equivalent of a given network will have $\frac{5}{8}$ F capacitor replaced by

(A) $\frac{5}{8s}$. **(B)** $\frac{5s}{8}$.

(C) $\frac{8s}{5}$. **(D)** $\frac{8}{5s}$.

[14] A network function contains only poles whose real-parts are zero or negative. The network is

(A) always stable.

(B) stable, if the j ω -axis poles are simple.

(C) stable, if the j ω -axis poles are at most of multiplicity 2

(D) always unstable.

[15] The admittance and impedance of the following kind of network have the same properties:

(A) LC **(B)** RL

(C) RC **(D)** RLC

[16] A 2-port network using z-parameter representation is said to be reciprocal if

(A) $z_{11} = z_{22}$. **(B)** $z_{12} = z_{21}$.

(C) $z_{12} = -z_{21}$. **(D)** $z_{11}z_{22} - z_{12}z_{21} = 1$.

[17] A system is described by the transfer function $H(s) = \frac{1}{s-1}$. The value of its step response at very large time will be close to

(A) -1 **(B)** 0
(C) 1 **(D)** ∞

[18] A stable system must have

(A) zero or negative real part for poles and zeros.
(B) atleast one pole or zero lying in the right-half s-plane.
(C) positive real part for any pole or zero.
(D) negative real part for all poles and zeros.

[19] A two port network is simply a network inside a black box and the network has only

(A) two terminals.
(B) two pairs of accessible terminals.
(C) two pairs of ports.

[20] The number of possible combinations generated by four varaiables taken two at a time in a two port network is

(A) four **(B)** two
(C) six

[21] Which parameters are widely used in transmission line theory

(A) Z parameters **(B)** Y parameters
(C) ABCD parameters **(D)** h parameters

[22] The driving point impedence is defined as

(A) the ratio of transform voltage to transform current at the same port
(B) the ratio of transform voltage at one port to the current transform at the other port
(C) both (a) and (b)
(D) none of the above

[23] The function is said to be having poles and zeros and only if

(A) the poles are not repeated
(B) the zeros are not repeated
(C) both poles and zeros are not repeated
(D) none of the above

[24] For two port network to be reciprocal

(A) Z11 = Z22 **(B)** Y21 = Y12

(C) H21=-h12 **(D)** AD – BC =0

[25] For a two port network, the o/p short circuit current was measured with a 1 V source at the i/p terminal, the value of the current gives

(A) h12 **(B)** y12

(C) h21 **(D)** y21

[26] The necessary condition for driving point function is

(A) The real part of all the poles and zeros must not be zero or negligible

(B) The polynomial P(s) and Q(s) may not have any missing terms between the highest and lowest degree unless all even or odd terms are missing.

(C) The degree of P(s) and Q(s) may differ by more than one

(D) The lowest degree in P(s) and Q(s) may differ by more than two

[27] The necessary condition for transfer function is that

(A) The coefficient in polynomial P(S) and Q(s) must be real

(B) Coefficient in Q(s) may be negligible

(C) complex and imaginary poles and zeros may not conjugate

(D) if the real part of pole is zero then that pole must be multiple

[28] Laplace transform of unit step function is

(A) $1/s^2$ **(B)** 1/s

(C) s **(D)** s^2

[29] Laplace transform of ramp function is

(A) 1/s2 **(B)** 1/s

(C) s **(D)** s 2

[30] Inverse laplace trnsform of 1 is ____function.

(A) Step

(B) Ramp

(C) Impulse

[31] If F(s) is laplace transform of f(t) then LT of e^{at} f(t) is

(A) F(s- a)

(B) F(s+a)
(C) e^{as} F(s)
(D) none of the above.

[32] Laplace transform of e^{at} is
(A) 1/(s+a)
(B) 1/(s – a)
(C) a / s
(D) s / a.

[33] Convolution theorem is used to find inverse laplace transform of
(A) product of two transform
(B) quotient
(C) addition
(D) none of the above

[34] Zeros in the right half of the s-plane are possible only for
(**A)** d.p. impedance functions.
(B) d.p. admittance functions.
(C) d.p. impedance as well as
(D) transfer functions. admittance functions.

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(A) always stable.
(B) stable, if the j ω -axis poles are simple.
(C) stable, if the j ω -axis poles are at most of multiplicity 2
(D) always unstable.

[37] The rms value of the a-c voltage $v(t) = 200 \sin 314\, t$ is:
(A) 200 V. **(B)** 314 V.
(C) 157.23 V. **(D)** 141.42 V.

[38] In a practical voltage source, the terminal voltage

(A) cannot be less than source voltage
(B) cannot be higher than source voltage
(**C**) is always less than source voltage
(D) is always equal to source voltage

[39] An ideal current source has

(A) infinite source resistance
(B) zero source resistance
(**C**) large value of source resistance
(D) finite value of source resistance

[40] A tree has

(A) A Closed Path **(B**) No Closed Path
(C) None

[41] kirchoff's current law is applicable to only

(a) Junction in a network
(b) Closed loop in a network
(c) Electric circuits
(d) Electronic circuits

[42] **super**position theorem can be applied only to circuits having

(a) resistive elements
(b) passive elements
(c) non-linear elements
(d) linear bilateral elements

[43] **A**n 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

[44] Which of the following is non-linear circuit parameter.

(a) Inductance
(b) Condenser
(c) Wire wound resistor
(d) Transistor

[45] kirchoff's law is applicable to

(a) a.c circuits only

(b) passive networks only

(c) d.c circuits only

(d) both a.c as well as d.c circuits

[46] **For** maximum transfer of power ,internal resistance of the source should be

(a) equal to load resistance

(b) less than the load resistance

(c) greater than the load resistance

(e) none of the above

[47] **The** circuit whose properties are same in either direction is known as

(a) unilateral circuit

(b) bilateral circuit

(c) irreversible circuit

(d) reversible circuit

[48] **The reciprocity** theorem is applicable to

(a) linear networks only

(b) bilateral networks only

(c) both (a) and (b)

(d) neither of the two

[49] **Norton**'s equivalent circuit consists of

(a) voltage source in parallel with impedance

(b) voltage source in series with impedance

(c) current source in series with impedance

(d) current source in parallel with impedance

[50] A practical voltage source consists of

(a) An ideal voltage source in series with an internal resistance
(b) An ideal voltage source in parallel with an internal resistance
(c) Both (a) and (b)
(d) None of the above

[51] Identify the passive element of the following

(a) voltage source

(b) current source

(c) inductor

(d) transistor

[52] A low pass filter is one which

(a) Passes all low frequencies

(b) Attenuates all high frequencies

(c) Passes all frequencies up to cut off frequency and attenuates all other frequencies

(d) none of all

[53] A high pass filter is one which

(a) Passes all high frequencies

(b) Attenuates all low frequencies

(c) attenuates all frequencies below to cut off frequency and passes all other frequencies above it

(d) none of all

[54] A band pass filter is one which

(a) attenuates frequencies between two designed cut-off frequencies and passes all other frequencies

(b) passes frequencies between two designated cut-off frequencies and attenuates all other frequencies

(c) passes all frequencies

(d) both (b) and (c)

[55] An ideal filter should have

(a) Zero attenuation in pass band

(b) Infinite attenuation in the pass band

(c) Zero attenuation in attenuation band

(d) none of above

[56] The values of L and C for a low pass filter with cut off frequency of 2.5 khz to operate with a terminated load resistance of 450 ohms are given by

(a) 57.32 mH,0.283 mF

(b) 28.66 mH,0.14 mF

(c) 114.64 mH,0.566 mF

(d) 3.66 mH.0.88mF

[57] The attenuation is sharp in the stop band for k-type filter

(a) true

(b) false

[58] In the m-derived low pass filter ,the resonant frequency is to be choosen so that it is

(a) above the cut-off frequency

(b) below the cut-off frequency

(c) none of the above

[59] A band pass filter may be obtained by using a high pass filterfollowed by low pass filter

(a) True

(b) False

[60] In the m-derived high pass filter ,the resonant frequency is to be choosen so that it is

(a) above the cut-off frequency

(b) below the cut-off frequency
(c) none of the above

[61] Design a high pass filter having a cut-off frequency of 1 khz with a load resistance of 600 ohms
(a) 0.266mF,47.74 mH
(b) 39.5 mF ,89.3 mH
(c) 24.3 mF ,45.09 mH

[62] To calculate Thevenin's equivalent value in a circuit

(a) all independent voltage sources are opened and all independent currentsources are short circuited.

(b) both voltage and current sources are open circuited

(c) all voltage and current sources are shorted.

(d) all voltage sources are shorted while current sources are opened.

[63] A26 dBm output in watts equals to

(A) 2.4W.

(B) 0.26W.

(C) 0.156W.

(D) 0.4W.

[64] The Characteristic Impedance of a low pass filter in attenuation Band is

(A) Purely imaginary.

(B) Zero.

(C) Complex quantity.

(D) Real value.

[65] The real part of the propagation constant shows:

(A) Variation of voltage and current on basic unit.

(B) Variation of phase shift/position of voltage.

(C) Reduction in voltage, current values of signal amplitude.

(D) Reduction of only voltage amplitude.

[66] The purpose of an Attenuator is to:

(A) increase signal strength.

(B) provide impedance matching.

(C) decrease reflections.

(D) decrease value of signalstrength.

[67] In Parallel Resonance of:R – L – C circuit having a R – L as series branch and 'C' forming parallel branch.

Tick the correct answer only.

(A) Max Impedance and current is at the frequency that of resonance.

(B) Value of max Impedance = L / (CR).

(C) branch currents are 180 Degree phase shifted with each other.

(D) In parallel resonance of R-L-C circuit having a R-L branch and 'C' forming parallel branch,

[68] In a transmission line terminated by characteristic impedance, Zo

(A) There is no reflection of the incident wave.

(B) The reflection is maximum due to termination.

(C) There are a large number of maximum and minimum on the line.

(D) The incident current is zero for any applied signal.

[69] For a coil with inductance L and resistance R in series with a capacitor C has

(A) Resonance impedance as zero.

(B) Resonance impedance R.

(C) Resonance impedance L/CR.

(D) Resonance impedance as infinity.

[70] Laplace transform of a unit Impulse function is

(A) s.

(B) 0.

(C) 1/s

(D) 1.

[71] To calculate thevenin's equivalent value in a circuit

(a) all independent voltage sources are opened and all independent current sources are short circuited.

(b) both voltage and current sources are open circuited.

(c) all voltage and current sources are shorted.

(d) all voltage sources are shorted while current sources are opened

[72] An attenuater is a

(a) R's network

(b) RL network

(c) RC network

(d) LC network

[73] The following constitutes a bilateral element

(a) A resistor

(b) FET

(c) Vacuum tube

(d) metal rectifier

[74] For an m-derived HPF ,the cut off frequency is 4 khz and the filter has an infinite attenuation at 3.6 khz ,the value of m is

(a) 0.436

(b) 4.36

(c) 0.34

(d) 0.6

[75] If Z_{oc} = 100 ohms and Z =64 ohms ,the characteristics impedance is

(a) 400 ohms

(b) 60 ohms

(c) 80 ohms

(d) 170 ohms

[76] **A**n 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

[77] Which of the following is non-linear circuit parameter.

(a) Inductance
(b) Condenser
(c) Wire wound resistor
(d) Transistor

[78] Laplace transform of e^{at} is

(A) 1/(s+a)
(B) 1/(s – a)
(C) a / s
(D) s / a.

[79] **A** series LCR type band stop filter has R = 1.5 ohms , L = 140 mh and C = 300 pf.what will be the resonant frequency

(a) 24.57

(b) 34.56

(c) 0.99

(d) Zero

[80] **A**n ideal current 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

[81]. 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

[82] Which of the following instruments indicate the instantaneous value of the electrical quantity being measured at the time at which it is being measured?

(a) Absolute instruments
(b) Indicating instruments
(c) Recording instruments
(d) Integrating instruments

[83]. _____ instruments are those which measure the total quantity of electricity delivered in a particular time.

(a) Absolute
(b) Indicating
(c) Recording
(d) Integrating

[84]Which of the following are integrating instruments?

(a) Ammeters
(b) Voltmeters
(c) Wattmeters

[85] Resistances can be measured with the help of

(a) wattmeters
(b) voltmeters
(c) ammeters
(d) ohmmeters and resistance bridges
(e) all of the above

[86] According to application, instruments are classified as

(a) switch board

(b) portable
(c) both (a) and (b)
(d) moving coil
(e) moving iron
(f) both (d) and (e)

[87] 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

[88]. A _____ device prevents the oscillation of the moving system and enables the latter to reach its final position quickly
(a) deflecting
(b) controlling
(c) damping
(d) any of the above

[89] The spring material used in a spring control device should have the following property.
(a) Should be non-magnetic
(b) Most be of low temperature co-efficient
(c) Should have low specific resistance
(d) Should not be subjected to fatigue
(e) All of the above

[90] Which of the following properties damping oil must possess?
(a) Must be a good insulator
(b) Should be non-evaporating
(c) Should not have corrosive action upon the metal of the vane
(d) The viscosity of the oil should not change with the temperature
(e) All of the above

[91] A moving-coil permanent-magnet instrument can be used as _____ by using a low resistance shunt.
(a) ammeter
(b) voltmeter
(c) flux-meter
(d) ballistic galvanometer

[92] A moving-coil permanent-magnet instrument can be used as flux-meter
(a) by using a low resistance shunt

(b) by using a high series resistance
(c) by eliminating the control springs
(d) by making control springs of large moment of inertia

[93] 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

[94] An induction meter can handle current up to
(a) 10 A
(b) 30 A
(c) 60 A
(d) 100 A

[95] 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

[96] Induction type single phase energy meters measure electric energy in
(a) kW
(b) Wh
(c) kWh
(d) VAR

[97] 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

[98] Which of the following meters are not used on D.C. circuits
(a) Mercury motor meters
(b) Commutator motor meters
(c) Induction meters
(d) None of the above

[99] Which of the following is an essential part of a motor meter?
(a) An operating torque system
(b) A braking device
(c) Revolution registering device
(d) All of the above

[100] 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

[101] ..... is an instrument which measures the insulation resistance of an electric circuit relative to earth and one another,
(a) Tangent galvanometer
(b) Meggar
(c) Current transformer
(d) None of the above

[102] The household energy meter is
(a) an indicating instrument
(b) a recording instrument
(c) an integrating instrument
(d) none of the above

[103] The pointer of an indicating instrument should be
(a) very light
(b) very heavy
(c) either (a) or (b)
(d) None

[104] In majority of instruments damping is provided by
(a) fluid friction
(b) spring
(c) eddy currents
(d) all of the above

[105] An ammeter is a
(a) secondary instrument
(b) Absolute instrument
(c) recording instrument
(d) integrating instrument

QUESTION BANK

FOR COMPETITIVE EXAM (3RD YEAR)

1. Generator transformers are _____
a) Step-up transformers
b) Step-down transformers
c) Auto-transformers
d) One-one transformers

2. In the CCGT, how many step-up transformers will require?
a) 3
b) 4
c) 5
d) 6

3. Which of the following is one of the criteria of selecting particular generator transformer?
a) Low HV voltage
b) Low LV currents
c) High impedance
d) On-load tap-changer

4. Generator transformers can undergo sudden load-changes.
a) True
b) False

5. Station transformers are generally used for _____
a) Providing generator voltage to transmission
b) Providing power to load from transmission
c) Isolating DC
d) To supply power section auxiliary

6. Which of the following does not follow the criteria of station transformer?
a) LV at 11 kV
b) HV at 275-400 kV
c) Low impedance
d) On-load tap-changer required

7. Operating load factor of station transformer must be _____
a) low
b) high
c) zero
d) infinite

8. For a unit transformer HV voltage must be _____
a) 400 kV
b) 200 kV
c) 24 kV
d) 100 kV

9. What voltage of On-load tap-changer is required for unit transformer?
a) 11 kV
b) 23 kV
c) 400 kV
d) Not required

10. On-load power factor for generator transformer is _____
a) high
b) low
c) can't define
d) zero

11. The majority of power transformers in use throughout the world are oil filled using a mineral oil.
a) True
b) False

12. Dielectric mineral oil is used in _____
a) Small transformers
b) Medium transformers
c) Large transformers
d) In all transformers

13. The purpose of the transformer core is to provide _____
a) High reluctance path
b) Low reluctance path
c) High inductive path

d) High capacitive path

14. Transformer core is designed to reduce _____
a) Hysteresis loss
b) Eddy current loss
c) Hysteresis loss and Eddy current loss
d) Cannot be determined

15. Transformers windings are generally made of _____
a) Steel
b) Iron
c) Copper
d) Steel iron alloy

16. Before using oil in transformers, insulation material was _____
a) Asbestos
b) Cotton
c) Low grade pressboard in air
d) Kraft paper

17. Which transformer insulation material is best compare to Kraft paper?
a) Oil
b) Asbestos
c) Low grade pressboard
d) Cotton

18. Which of the following is not the property of oil that should be fulfilled before using in transformer?
a) Low viscosity
b) High flash point
c) Low electrical strength
d) High chemical stability

19. Transformer ratings are given in _____
a) kW
b) kVAR
c) HP
d) kVA

20. Function of transformer is to _____
a) Convert AC to DC
b) Convert DC to AC
c) Step down or up the DC voltages and currents
d) Step down or up the AC voltages and currents

21. What is the dielectric strength of a transformer oil?
a) 1 kV
b) 35 kV
c) 100 kV
d) 330 kV

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

23. The insulating material that can withstand the highest temperature safely is _____
a) Cellulose
b) Asbestos
c) Mica
d) Glass fibre

24. The part of a transformer which is visible from outside _____
a) Bushings
b) Core
c) Primary winding
d) Secondary winding

25. In a given transformer for given applied voltage, which of the following losses remain constant irrespective of load changes?
a) Friction and windage losses
b) Copper losses
c) Hysteresis and eddy current losses
d) Cannot be determined

26. On which of the following degree of mechanical vibrations produced by the laminations of a transformer depends?
a) Tightness of clamping

b) Gauge of laminations
c) Size of laminations
d) Tightness of clamping, gauge and size of laminations

27. Variations in a hysteresis loss in a transformer (Bmax = maximum flux density) _____
a) Bmax
b) $Bmax^{1.6}$
c) $Bmax^{3.83}$
d) Bmax/2

28. Leakage flux in the transformer depends on _____
a) Load current
b) Load current and voltage
c) Load current, voltage and frequency
d) Load current, voltage, frequency and power factor

29. 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

30. Silicon steel used in laminations, because it reduces _____
a) Hysteresis loss
b) Eddy current losses
c) Copper losses
d) Cannot be determined

31. If the supply frequency to the transformer is increased, the iron loss will _____
a) Not change
b) Decrease
c) Increase
d) Cannot be determined

32. Which of the following can measure iron loss of a transformer?
a) Low power factor wattmeter
b) Unity power factor wattmeter
c) Frequency meter

d) Any type of wattmeter

33. How reduction in core losses and increase in permeability can be obtained simultaneously in a transformer?
a) Core built-up of laminations of cold rolled grain oriented steel
b) Core built-up of laminations of hot rolled sheet
c) Cannot be determined
d) Frequency Meter

34. Losses which occur in rotating electric machines and do not occur in transformer are _____
a) Friction and windage losses
b) Magnetic losses
c) Hysteresis and eddy current losses
d) Copper losses

35. In a given transformer for a given applied voltage, which losses remain constant irrespective of load changes?
a) Hysteresis and eddy current losses
b) Friction and windage losses
c) Copper losses
d) Cannot be determined

36. 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

37. A shell-type transformer has _____
a) High eddy current losses
b) Reduced magnetic leakage
c) Negligible hysteresis losses
d) Cannot be determined

38. Energy per unit charge is _____
a) Power
b) Voltage
c) Current
d) Capacitance

39. A conductor is said to have resistance of one ohm if a potential difference of one volt across its terminals causes a current of X ampere to flow through it. X=?
a) 4
b) 2
c) 3
d) 1

40. Resistance depends on the temperature of the conductor.
a) True
b) False

41. A 25 Ω resistor has a voltage of 150 sin377 t. Find the corresponding power.
a) 900 $\sin^2$ 337 t
b) 90 $\sin^2$ 337 t
c) 900 $\sin^2$ 377 t
d) 9 $\sin^2$ 337 t

42. Unit of inductance is _____
a) Weber
b) Henry
c) Farad
d) Tesla

43. Inductance of an inductor is inversely proportional to its _____
a) Number of turns
b) Area of cross section
c) Absolute permeability
d) Length

44. Energy stored in an inductor is _____
a) LI
b) LI^2
c) LI/2
d) $LI^2/2$

45. An inductor of 3mH has a current $i = 5(1 - e^{-5000t})$. Find the corresponding maximum energy stored.
a) 37.5 mJ
b) 375 J
c) 37.5 kJ

d) 3.75 mJ

46. The capacitance of a capacitor does not depend on the absolute permittivity of the medium between the plates.
a) True
b) False

47. Which of the following is not the energy stored in a capacitor?
a) $CV_2 2$
b) $QV2$
c) $Q_2 2C$
d) $QC2$

48. Kirchhoff's voltage law is based on principle of conservation of
a) energy
b) momentum
c) mass
d) charge

49. In a circuit with more number of loops, which law can be best suited for the analysis?
a) KCL
b) Ohm's law
c) KVL
d) None of the mentioned

50. Determine the unknown voltage drop in the circuit below
a) 11V
b) 10V
c) 19V
d) 5V

51. Determine V in the circuit
a) 28.8V
b) 34.4v
c) -28.8V
d) 28V

52. Find V and I in the circuit
a) -39V , -4.875A
b) 39V , -4.875A

c) -39v , 4.875a
d) 39V , 4.875A

53. Mathematically, Kirchhoff's Voltage law can be as
a) $\sum_{(k=0)}^{n}(V) = 0$
b) $V2\sum_{(k=0)}^{n}(V) = 0$
c) $V\sum_{(k=0)}^{n}(V) = 0$
d) none of the mentioned

54. Determine the value of V and the power supplied by the independent current source
a) 20V , 300mw
b) 27V , 498mW
c) 26.6v , 532mW
d) 25V , 322mW

55. Determine V in the circuit
a) -11.6V
b) 23.2V
c) -23.2V
d) 11.6V

56. Find V and I in the circuit
a) 19V, 0.0633A
b) -19V, 0.0633A
c) 19V, -0.0633A
d) -19V,- 0.0633A

57. DC average current of a center taped full wave rectifier is _____
(Where I_m is the maximum peak current of input)
a) $2I_m/\pi$
b) I_m/π
c) $I_m/2\pi$
d) $1.414I_m/\pi$

58. DC power output of center tapped full wave rectifier is equal to _____
(I_m is the peak current and R_L is the load resistance)
a) $(2I_m^2/\pi^2)R_L$
b) $(I_m^2/2\ \pi^2)R_L$
c) $(I_m^2/\pi^2)R_L$

d) $(4I_m^2/\pi^2)R_L$

59. Ripple factor of center tapped full wave rectifier is _____
a) 1.414
b) 1.21
c) 1.3
d) 0.48

60. If input frequency is 50Hz then ripple frequency of center tapped full wave rectifier will be equal to _____
a) 100Hz
b) 50Hz
c) 25Hz
d) 500Hz

61. Transformer utilization factor of a center tapped full wave rectifier is equal to _____
a) 0.623
b) 0.678
c) 0.693
d) 0.625

62. If peak voltage on a center tapped full wave rectifier circuit is 5V and diode cut-in voltage is 0.7, then peak inverse voltage on diode will be _____
a) 4.3 V
b) 10 V
c) 5.7 V
d) 9.3 V

63. Efficiency of center tapped full wave rectifier is _____
a) 50%
b) 81.2%
c) 40.6%
d) 45.3%

64. In a center tapped full wave rectifier, the input sine wave is 20sin500 πt. The average output voltage is _____
a) 12.73V
b) 6.93V
c) 11.62V

d) 3.23V

65. In a center tapped full wave rectifier, the input sine wave is 200sin50 πt. If load resistance is of 1k then average DC power output of half wave rectifier is _____
a) 12.56W
b) 16.20W
c) 4.02W
d) 8.04W

66. In a center tapped full wave rectifier, the input sine wave is 250sin100 πt. The output ripple frequency of rectifier will be _____
a) 50Hz
b) 200Hz
c) 100Hz
d) 25Hz

67. Which of the following is not a valid type of a BJT?
a) PNP
b) NPN
c) PPN
d) NNP

68. In a BJT, the outer layers are much more thick as compared to the middle layer.
a) True
b) False

69. In a BJT, which of the following layers is heavily doped?
a) Collector
b) Emitter
c) Base
d) Electron

70. Considering the resistances of emitter, collector and base to be R_e, R_c and R_b respectively, which of the following is the correct statements?
a) $R_e > R_b > R_c$
b) $R_c > R_b > R_e$
c) $R_b > R_c > R_e$
d) $R_b = R_c > R_e$

71. In a pnp-BJT, when the E-B junction is forward biased and no voltage is applied across C-B junction, what happens to the width of the depletion region in the E-B junction?
a) Increases
b) Decreases
c) Remains same
d) Can't be determined

72. Which of the following statements is true about proper functioning of a BJT?
a) One junction is forward biased and one is reverse biased.
b) Both junctions are forward biased
c) Both junctions are reverse biased
d) Can't be determined

73. What is the typical order of magnitude of the base current for a BJT?
a) 10^{-8}
b) 10^{-9}
c) 10^{-6}
d) 10^{-3}

74. The collector current in a BJT is temparature-independent.
a) True
b) False

75. Which of the following currents in a BJT is also called leakage current?
a) I_C
b) I_E
c) I_{CO}
d) I_{CBO}

76. Which of the following relations are correct?
a) $I_E + I_B = I_C$
b) $I_C + I_B = I_E$
c) $I_E + I_C = I_B$
d) $I_B + I_E = I_B$

77. The abbreviation PIV in the case of a diode stands for _____
a) Peak Inferior Voltage
b) Problematic Inverse Voltage
c) Peak Inverse Voltage
d) Peak Internal Voltage

78. What is meant by the PIV rating of a diode?
a) Maximum reverse bias potential which can be applied across a diode without breakdown
b) Maximum forward bias potential which can be applied across a diode without breakdown
c) Minimum potential required by a diode to reach conduction state
d) Maximum power allowable to a diode

79. The voltage after which the diode current exponentially increases with forward bias is NOT known as _____
a) Offset voltage
b) Threshold potential
c) Firing potential
d) Peak forward voltage

80. The diode current equation is not applicable in _____
a) Forward biased state
b) Reverse biased state
c) Unbiased state
d) It is applicable in all bias states

81. Emission coefficient of Germanium is _____
a) 1
b) 1.1
c) 1.5
d) 2

82. The ideality factor of Silicon is _____
a) 1
b) 2
c) 1.3
d) 1.7

83. What is the value of the voltage equivalent of temperature at room temperature (27^{o}C)?
a) 26mV
b) 36mV
c) 0.26mV
d) 260mV

84. What happens to cut-in voltage when the temperature increases?
a) Cut-in voltage increases
b) Cut-in voltage decreases
c) Cut-in voltage either increases or decreases

d) Cut-in voltage doesn’t depend on temperature

85. When temperature increases, reverse saturation current _____
a) Increases
b) Decreases
c) Doesn’t depend on temperature
d) Either increases or decreases

86. 4. The work done of vectors force F and distance d, separated by angle θ can be calculated using,
a) Cross product
b) Dot product
c) Addition of two vectors
d) Cannot be calculated

87. Find whether the vectors are parallel, (-2,1,-1) and (0,3,1)
a) Parallel
b) Collinearly parallel
c) Not parallel
d) Data insufficient

88. Lorentz force is based on,
a) Dot product
b) Cross product
c) Both dot and cross product
d) Independent of both

89. Electromagnetic forces are defined by
a) Fleming’s right hand rule
b) Fleming’s left hand rule
c) Faraday’s law
d) Ampere law

90. The gradient can be replaced by which of the following?
a) Maxwell equation
b) Volume integral
c) Differential equation
d) Surface integral

91. When gradient of a function is zero, the function lies parallel to the x-axis. State True/False.
a) True
b) False

92. Find the gradient of the function sin x + cos y.
a) cos x i – sin y j
b) cos x i + sin y j
c) sin x i – cos y j
d) sin x i + cos y j

93. Find the force that exists in an electromagnetic wave.
a) Electrostatic force
b) Magnetostatic force
c) Lorentz force
d) Electromotive force

94. In an field having a force of 12N and distance 20cm, the torque will be
a) 0.24
b) 2.4
c) 24
d) 12/20

95. Find the torque in a conductor having current 2A, flux density 50 units, length 15cm and distance of 8m.
a) 120
b) 240
c) 800
d) 350

96. The distance of the conductor when the area and length of the conductor is 24m2 and 13.56m.
a) 1.76
b) 2.67
c) 1.52
d) 2.15

97. The torque on a conductor with flux density 23 units, current 1.6A and area 6.75 units will be
a) 248.4
b) 192.6
c) 175.4
d) 256.9

98. Consider the conductor to be a coil of turns 60 and the flux density to be 13.5 units, current 0.12A and area 16units. The torque will be
a) 1555.2
b) 1222.5
c) 525.1
d) 255.6

99. The torque of a conductor is defined only in the case when
a) The field is perpendicular to the loop
b) The plane of the loop is parallel to the field
c) The plane of the loop is perpendicular to the current direction
d) The field and the current direction are same

100. Find the angle at which the torque is minimum.
a) 30
b) 45
c) 60
d) 90

101. The magnetic moment and torque are related as follows
a) T = BM
b) B = TM
c) M = TB
d) T = M

102. Calculate the magnetic moment when a field of B= 51 units is subjected to a torque of 20 units.
a) 0.39
b) 4.2
c) 2.55
d) 3.21

103. The skin effect is a phenomenon observed in
a) Insulators
b) Dielectrics
c) Conductors
d) Semiconductors

QUESTION BANK

FOR COMPETITIVE EXAM (4TH YEAR)

1. A short circuit current is identified by
(a) Heavy current flow
(b) Voltage rise
(c) Voltage drop
(d) None of these
2. Short –circuit currents are due to
   (a) Single phase to earth fault
   (b) Phase to phase fault
   (c) All the three phases to earth fault
   (d) All the three phases short-circuited
   (e) Any of the above
3. The most serious consequence of a major uncleared short circuited fault could be
   (a) Blowing of fuse
   (b) Fire
   (c) Heavy voltage drop
   (d) None of these
4. Which portion of the transmission system is more prone to faults
   (a) Alternator
   (b) Transformer
   (c) Overhead lines
   (d) Underground cable
5. Which portion of the power system is least prone to fault
   (a) Alternator
   (b) Transformer
   (c) Overhead lines
   (d) Underground cable
6. The most common type of fault is
   (a) Single phase to ground
   (b) Phase to phase
   (c) Two-phase to ground
   (d) Three phase to ground
7. Base impedance of a power system is given by
(a) $(\text{base kV})^2/\text{base MVA}$
(b) (base kV)/base MVA
(c) $\text{base MVA}/(\text{base kV})^2$
(d) $(\text{base MVA})^2/\text{Base kV}$
8. An equipment has per unit impedance of 0.9 pu to a base of 20 MVA,33kV. The pu impedance to the base of 50 MVA ,11kV will be
   (a) 4.7
   (b) 20.25
   (c) 0.9
9. On the occurance of fault on the connected network ,a circuit breaker operates
   (a) Manually

(b) Automatically
(c) Manually through a control switch
(d) Depending upon the circuit breaker design

10. A circuit breaker ,under normal conditions , should be inspected once in
    (a) A week
    (b) A month
    (c) 3 or 6 months
    (d) 5 years
11. Steady state stability of a power system is the ability of power system to
    (a) Maintain voltage at the rated voltage level
    (b) Maintain frequency exactly at 50 Hz
    (c) Maintain a spinning reserve margin at all times
    (d) Maintain synchronism between machines and on external tie lines
12. Transient disturbances are caused by
    (a) Sudden load changes
    (b) Switching operations
    (c) Inadvertent tripping of lines and generators
    (d) Faults in the power system
    (e) All of the above
13. For stability and economic reasons, the transmission lines are operated with power angle in the range
    (a) 10 degree to 25 degree
    (b) 30 degree to 45 degree
    (c) 60 degree to 75 degree
    (d) 65 degree to 80 degree
14. Steady state stability of power system is improved by
    (a) Reducing fault clearing time
    (b) Using double circuit line instead of single circuit line
    (c) Single pole switching
    (d) Decreasing generator inertia
15. Series capacitors are used to
    (a) Compensate for line inductive reactance and improve the stability of the power system
    (b) Improve the voltage
    (c) Reduce fault current
    (d) Improve the power factor

16. The inertia of two groups of machines, which swing together are M_1 and M_2. The inertia constant of the system is
    (a) $M_1=M_2$
    (b) $M_1 + M_2$
    (c) M_1M_2/M_1+M_2
    (d) M_1/M_2
17. The equal area criterion of stability is used for
    (a) No load on the bus bar
    (b) One machine and infinite bus-bar
    (c) More than one machine and infinite bus-bar

(d) None of the above

18. Equal area criterion gives the information regarding
    (a) Stability region
    (b) Absolute stability
    (c) Relative stability
    (d) Swing curves
19. The critical clearing time of a fault in power system is related to
    (a) Reactive power limit
    (b) Short circuit limit
    (c) Steady state stability limit
    (d) Transient stability limit
20. The use of high speed circuit breakers
    (a) Improves transient stability
    (b) Decreases transient stability
    (c) Has no effect on system stability
21. Load –flow study is carried out for
    (a) Load frequency control
    (b) Planning of power system
    (c) Fault calculations
    (d) Study of stability
    (e) None of the above
22. Load flow studies involve solving simultaneous
    (a) Linear algebraic equations
    (b) Non Linear algebraic equations
    (c) Linear differential equations
    (d) Non-Linear differential equations
23. For a load flow solutions the quantities normally specified at a voltage controlled bus are
    (a) P and Q
    (b) P and |V|
    (c) Q and |V|
    (d) P and δ
24. Slack bus is a ……. bus
    (a) Load
    (b) Generator
    (c) Feeder
    (d) Measurement
25. In a power system ,the maximum number of buses are
    (a) Generator buses
    (b) Load buses
    (c) Slack buses
    (d) P-V buses
26. In load flow analysis , the load connected at a bus is represented as
    (a) Constant current drawn from the bus
    (b) Constant impedance connected at the bus
    (c) Voltage and frequency dependent source at the bus
    (d) Constant real and reactive power drawn from the bus

27. Gauss-seidel interactive method can be used for solving a set of
    (a) Linear differential equations only
    (b) Linear algebraic equations
    (c) Both Linear and non-linear differential equations
    (d) Both Linear and non- Linear algebraic equations
28. Compared to GS method , NR method takes
    (a) Less number of iterations and more time per iteration
    (b) Less number of iterations and less time per iteration
    (c) More number of iterations and more time per iteration
    (d) More number of iterations and less time per iteration
29. For accurate load flow calculations on large power systems…….. Method is the best one
    (a) G-S
    (b) NR
    (c) De-coupled
    (d) None
30. For fast load flow calculations, the best method is
    (a) G-S
    (b) NR
    (c) De-coupled
    (d) None
31. An acceleration factor is used in …….. Method of load flow studies
    (a) G-S
    (b) NR
    (c) De-coupled
    (d) All the above
32. Regulating transformers are used in power systems for control of
    (a) Voltage
    (b) Power factor
    (c) Power flow
    (d) All of the above
33. In a load flow study a PV bus is treated as a PQ bus when
    (a) Voltage limit is violated
    (b) Active power limit is violated
    (c) Phase angle is high
    (d) Reactive power limit is violated
34. A suitable value of acceleration factor for load flow studies is
    (a) 2.2
    (b) 1.6
    (c) 1.1
    (d) 3.1
35. A single line to ground fault means
    (a) A fault between phase R and ground
    (b) A fault between phase Y and ground
    (c) A fault between phase B and ground
    (d) A fault between any one phase and ground
36. The symmetrical components are used in the fault analysis because

(a) The number of equations becomes smaller
(b) The sequence networks do not have mutual coupling
(c) The results are required in terms of symmetrical components
(d) All the above

37. Fault level means
(a) Fault current
(b) Voltage at the point of fault
(c) Fault MVA
(d) Fault power factor

38. Fault calculations using computer are usually done by
(a) Y_{bus} method
(b) Z_{bus} method
(c) None of the above
(d) Any of the above

39. Ybus as used in the load flow studies and Zbus as used for the short circuit studies
(a) Are the same
(b) Are inverse of each other
(c) Are not related
(d) Any of the above

40. The addition of synchronous compensator in the system
(a) Improves system stability
(b) Has no effect on stability
(c) Decreases system stability
(d) (a) or (b)

41. A bus bar is rated by
(a) Current only
(b) Current and voltage
(c) Current ,voltage and frequency
(d) None of the above

42. Current rating is not necessary in case of
(a) Isolators
(b) Circuit breakers
(c) Load break switch
(d) Both (b) and (c)

43. A small increment in prime mover power of a synchronous generator connected to an infinite bus
(a) Increase reactive power generation
(b) Decrease reactive power generation
(c) Decrease real power generation
(d) Increases the bus voltage phase angle

44. The real power transfer over a line mainly depends on
(a) Power angle
(b) |Vs|-|Vr|
(c) Vs
(d) Vr

45. A balanced 3-phase system consists of
(a) Zero sequence currents only

(b) Positive- sequence currents only
(c) Negative and zero-sequence currents
(d) Zero , negative and positive sequence currents

46. An unbalance 3-phase system having RYB sequence consists of
(a) A positive-sequence component
(b) A negative-sequence component
(c) A zero sequence component
(d) All the above

47. Which is the most severe fault
(a) Single line to ground fault
(b) Double line to ground fault
(c) Line to line fault
(d) Symmetrical faults

48. Which among the following methods are generally used for the calculation of symmetrical faults
(a) Norton theorem
(b) Thevnin theorem
(c) Kirchhoffs laws
(d) Both (b) and (c)
(e) All of the above

49. Which among the following reactance have a greater value
(a) Sub transient reactance
(b) Transient reactance
(c) Synchronous reactance
(d) All of these
(e) None of these

50. Symmetrical component method for load flow analysis is useful for
(a) System has unsymmetrical fault and network is otherwise balanced
(b) System has symmetrical fault and network is otherwise unbalanced
(c) System has unsymmetrical fault and network is unbalanced

51. The load currents in short circuit calculations are neglected because
(i) Short circuit currents are much larger than load currents
(ii) Short circuit currents are out of phase with load currents
The correct alternative is
(a) Both (i) and (ii) are wrong
(b) Both (i) and (ii) are correct
(c) (i) is correct and (ii) is wrong

52. Which among the following assumptions are made in the reactance diagram
(a) Neutral reactance are neglected
(b) Static loads are neglected
(c) The capacitance of transmission lines are neglected
(d) Only (a) and (c)
(e) All of these

53. At what value of delta maximum power transfer takes place
(a) 45
(b) 90
(c) 120
(d) 180

54. Which among the following phenomenon is generally associated with voltage stability?
(a) Temporary load reduction
(b) Voltage is reduced
(c) Voltage collapses
(d) All of these
(e) None of these

55. What is the main cause of voltage instability
(a) Generators
(b) Loads
(c) Transformers
(d) Line losses

56. What is voltage stability?
(a) To maintain the steady voltage at all the buses after the occurrence of fault
(b) To maintain the steady voltage at all the buses before the occurrence of fault
(c) To maintain the system frequency after the occurrence of severe disturbaces

57. What is / are the cause(s) for transient disturbance?
(a) Sudden load changes
(b) Faults in the power system
(c) Switching operations
(d) All of these
(e) None of these

58. The per unit impedance of a circuit element is 0.30.if the base kV and MVA is halved , then the new value of per unit impedance of the circuit element will be
(a) 30
(b) 0.30
© 0.003
(d)0.006

59. the per unit value of a 2 ohm resistor at 100MVA and 10 kV base voltage is
(a) 4 pu
(b) 2 pu
© 0.5 pu
(d) 0.2 pu

60. which among the following matrix is sparse ?
(a) jacobian matrix
(b) ybus
© zbus
(e) Both (a) and (b)

61. Initially what will be the voltage at all the PQ buses for solving the load flow problem
(a) 1 angle 90
(b) 1 angle 45
© 1 angle 180
(e) 1 angle 0

62. What is the size of the sub matrix “H “of the jacobian, if n_1 is the number of PV buses and n_2 the number of PQ buses?

(a)$(n_1 + n_2)^2$

(b) $n_1 * n_2$

(c)$(n_1 + n_2)\ n_1$

(d) $(n_1 + n_2)\ n_2$

63. What is the main drawback in NR method?

(a) Slow to converge

(b)A large memory allocation is required to store the jacobian matrix

(c) The number of iterations is more

(d) All of these

(e) None of these

65. Which types of equations are solved using Newton Raphson method?

(a)Non linear differential equations

(b)Linear differential equations

(c) Non linear algebraic equations

(d) Both (a) and (b)

(e) All of these

66. What is the relation between percentage value and per unit value?

(a) 100 times

(b) 10 times

(c) 1000 times

(d) 500 times

67. Ibus =

(a)[Ybus]Vbus

(b)Vbus/Ybus

(c)Zbus/Ybus

(d)Zbus.Vbus

68. The most common buses in a power system are

(a)slack bus

(b)generator bus

(c)load bus

(d)A&B

69. The total number of sequence voltage components in a three phase system is

(a)10

(b)9

(c)5

(d)6

70. Which bus is a swing bus

(a)slack bus

(b)PV bus

(c)PQ bus

(d)load bus

71. NR method requires number of iteration as

(a)greater

(b)lesser

(c)equal
(d)none
72. The angle δat a slack bus is
(a)0
(b)1
(c) 2
(d)3
73. A generator bus is a
(a)slack bus
(b)load bus
(c)PVbus
(d)VI bus
74. Which method used for a quick prediction of stability
(a)Graphical
(b)equal area criterion
(c)NR method
(d)gauss seidal method
75. The number of elements added at one time in formulating Zbus is
(a)0
(b)1
(c)2
(d)3
76. Power systems mostly operates a voltage of
(a)2 pu
(b)3 pu
(c)1 pu
(d)1.1 pu
77. The stability problems involves the study of
(a) electromechanical oscillation
(b) electrochemical
(c) dynamic
(d) rotory
78. What is the simplified diagram called, after omitting all resistances, static loads, capacitance of the transmission lines and magnetising circuit of the transformer?
(a) Single line diagram
(b) Resistance diagram
(c) Reactance diagram
(d) Both (a) and (b)
(e) None of these
79. What is the per unit system (PU)?
(a) A ratio of actual value in any units to the base or reference value in the same units
(b) A ratio of the base or reference value in any units to the actual value in the same units.
(c) Ratio of the square of the actual value in any units to the square of base or the reference value in the same units
(d) All of these
80. In what direction does the phasor get rotated if it is multiplied by the operator ‘a’?

(a) Anti clockwise
(b) Clockwise
(c)Gets rotated by 90° in the clockwise direction
(d) Gets rotated by 90° in the anticlockwise direction

81. Which of the following is not a Primary Energy Source?

a) Oil b) Natural Gas c) Electricity d) Wood

82. Which of the following is a renewable energy source?

a) Bitumen b) Solar Energy c) Coal d) Natural Gas

83. Greenhouse effect refers to increase in

a) Global temperature.
b) b) Carbon monoxide
c) c) atmospheric pressure
d) Greenery

84. The nodal agency for coordinating the energy conservation activities under EC act in India is

a) Bureau of Indian Standards b) Bureau of Energy Efficiency
c) Bureau of Energy Education d) Bureau of Energy and Environment

85. Ratio of maximum demand to connected load is termed as:
a. Load factor
b. Power factor
c. Demand factor
d. Form factor

86. Energy available in fuels is stored as
a) Heat Energy b) Chemical Energy c) Atomic Energy d) Explosive Energy

87. Reactive Power is required for
a. Inductive load
b. Resistive load
c. Capacitive load
d. All of the above

88. In a purely resistive circuit the reactive kVAR will be
a) less than 1 b) more than 1 c) zero d) one

89. Which one is the key element for successful Energy Management?

a) Top management support b) Planning c) Monitoring d) Training

90. What is the NPV of a project , (life 2 year) which requires an investment of Rs.50000 & yield Rs.30000 in the 1st year and Rs.40000/- in the next year, if the interest rate is 10%
a) 10330

b) (10330)
c) 20660
d) (30660)

91. Which is not a general practice of financing in-house energy management
a) From a central budget
b) Bank loan
c) Money from stock market
d) Hire purchase

92. The first step in a project development cycle is
a) Identify components of the project b) Implement the project c) arrange finance d) Training

93. What is the future value of Rs.1000/- after 3 years if the interest rate is 10%?
a) 1610
b) 3221
c) 1331
d) 2420
94. If asset depreciation is considered, then tax cash flow would be
a) Higher
b) Lower
c) No effect
d) None of these

95. Event in a project network diagram represents
a) Task
b) Milestone
c) a & b
d) none of the above

96. The essential elements of monitoring and targeting system is
a) Recording b) Reporting c) Controlling d) All the above

97. If LPG has GCV of 12000 Kcal / kg, then 12 KWh is equivalent to --------kg LPG
a) 0.96 b) 0.86 c) 8.6 d) 86

98. Percentage share of different energy consumption in an industry can be best shown by a
a) Pie Chart b) Bar Chart c) Line Diagram

99. A mass balance for energy conservation does not consider which of the following
a) steam b) water c) raw materials d) lubricating oil

100. In the equation, Energy consumed = C + (M x Production) , where 'C' is
a) Variable energy consumption b) Fixed energy consumption
c) Specific energy Consumption d) None of the above

101. Based on the following Net present values, which of the projects is attractive for investment
a) −2199 b) + 23 c) 0 d) +13

102. While plotting a 'CUSUM Chart', it is observed that "CUSUM' during previous month was 8, the same during this month will be
a) AA 8 b) ■ 8 c) = 8 d) Can't be said

103. Specific energy Consumption can be expressed in which of the following units.
a) Tone / Kwh b) KCal / Kg c) Kcal / Kwh d) None of the above

104. The Ozone layer in the atmosphere acts as an efficient filter for
a) X-Rays b) UV-A Rays c) UV-B Rays d) Intra red Rays

105. Which of the following does not damage ozone layer?
a) CFC b) CCl_3 c) HCFC d) HFC

106. Which gas causes global warming among the following?
a) CFC b) SO_2 c) O_2 d) Argon

107. Ozone has
a) Three oxygen atoms b) Two oxygen atoms c) Two chlorine atoms d) Two bromine atoms

108. GHG emissions are presented in ---------- Units
a) MMTOE b) MMTCE c) MMTME d) MMT

109. The major source of electrical power generation in India is
a) thermal b) Hydel c) Nuclear d) Wind

110. The quantity of heat required to raise 1 kg of a substance by 1°C is known as
a) sensible heat b) specific heat c) latent heat d) calorie