

1. The reciprocal of resistance is
 - A) Susceptance
 - B) Conductance
 - C) Impedance
 - D) Reactance
2. Two waves of the same frequency have opposite phase when the phase angle between them is
 - A) 180°
 - B) 360°
 - C) 90°
 - D) 0°
3. The best place to install a capacitor is
 - A) Very near to inductive load
 - B) Across the terminals of the inductive load
 - C) Far away from the inductive load
 - D) Any where
4. The time constant of a series R-C circuit is given by
 - A) R/C
 - B) RC^2
 - C) RC
 - D) R^2C
5. The material which has a negative temperature coefficient of resistance is
 - A) Aluminium
 - B) Copper
 - C) Brass
 - D) Carbon
6. A dependent source
 - A) May be a current source or voltage source
 - B) Is always a voltage source
 - C) Is always a current source
 - D) Neither a current source nor a voltage source
7. Capacity of a dry cell is
 - A) Not affected by the type of discharge
 - B) More when it supplies current continuously
 - C) More when it supplies current intermittently
 - D) None of the above
8. In a lead acid cell, on discharging, both the plates change and become
 - A) Lead hydroxide
 - B) Lead peroxide
 - C) Lead oxide
 - D) Lead sulphate
9. High current of the order of 100 A can be measured by an ammeter of 0 – 1 A rating by using
 - A) Shunt
 - B) Capacitor
 - C) R-C network
 - D) Current transformer

10. Electrical devices and appliances are not connected in series because
- A) More power losses occur in series
 - B) Series circuit is complex to design -
 - C) Devices have different current rating
 - D) All of these
11. The force of attraction or repulsion between two magnetic poles is inversely proportional to the square of the distance between them. This is known as
- A) Newton's first law
 - B) Faraday's first law of electromagnetic induction
 - C) Coulomb's first law
 - D) Coulomb's second law
12. Who discovered the relationship between magnetism and electricity that serves as the foundation for the theory of electromagnetism ?
- A) Luigi Galvani
 - B) Hans Christian Oersted
 - C) Andre Ampere
 - D) Charles Coulomb
13. A permanent magnet will not attract
- A) Copper
 - B) Steel
 - C) Nickel
 - D) Aluminium
14. The unit of magnetomotive force is
- A) Weber/metre
 - B) Ampere turns/metre
 - C) Ampere turns
 - D) Weber
15. Which of the following is a vector quantity ?
- A) Flux density
 - B) Magnetic field intensity
 - C) Magnetic potential
 - D) Relative permeability
16. The polarity of induced voltage while a field is collapsing is
- A) Independent of the force creating the field
 - B) Opposite to the force creating the field
 - C) Identical to the force creating the field
 - D) Present only if the force is stationary
17. Comparing superparamagnetic and ferromagnetic materials, which statement is false ?
- A) Ferromagnetism is usually more powerful than superparamagnetism
 - B) Ferromagnetism persists when the magnetizing field is removed
 - C) Superparamagnetism persists once the external field is removed
 - D) Superparamagnetism can be thought of as a single-domain particle

18. Lower the self inductance of a coil
 A) More will be the weber turns
 B) More will be the emf induced
 C) Lesser the flux produced by it
 D) Smaller the delay in establishing steady current through it
19. It is difficult to magnetise steel because of its
 A) High density
 B) High retentivity
 C) Low permeability
 D) High permeability
20. The value of dielectric constant for vacuum is taken as
 A) 1
 B) 0
 C) 4
 D) 10
21. To reduce the error in voltmeter and ammeter due to friction torque
 A) The torque weight ratio must be small
 B) The weight of moving system must be made as large as possible
 C) The torque weight ratio must be large
 D) The torque of moving system must be small
22. The controlling torque T_C of a Moving Iron instrument is
 A) K/θ
 B) $K\theta$
 C) $K^2\theta$
 D) K^2/θ
23. Correction factor of wattmeter for lagging load is
 A) $\frac{\cos \phi}{\cos \beta \cos(\phi - \beta)}$
 B) $\frac{\cos \beta}{\cos \phi \cos(\beta - \phi)}$
 C) $\frac{\cos \phi}{\cos \beta \cos(\phi + \beta)}$
 D) $\frac{\cos \beta}{\cos \phi \cos(\beta + \phi)}$
24. When 3 phase power is measured by 2 wattmeter method one of the wattmeter will read zero power
 A) If the load power factor is unity
 B) If the load power factor is zero
 C) If the load power factor is less than 0.5
 D) If the load power factor is 0.5
25. Light load compensation of integrated type energy meter is done by
 A) Shading band
 B) Breaking magnet
 C) Shading loop
 D) Lag plate

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26. Single phase electrodynamicometer power factor meter consists of
A) Two identical pressure coils and one current coil which is split up into two parts
B) One pressure coil and two identical current coils
C) One pressure coil and one current coil
D) None of these
27. Ferro dynamic type frequency meter is a
A) Mechanical resonance type frequency meter
B) Electrical resonance type frequency meter
C) Vibrating type frequency meter
D) Western frequency meter
28. The bridge circuit which measures self inductance in terms of standard capacitor is
A) Anderson's bridge
B) Owen's bridge
C) De Sauty's bridge
D) Maxwell bridge
29. In a CRO intensity of electron beam is controlled by
A) Focusing anode
B) Accelerating anode
C) Grid
D) Electron Gun
30. The primary current in the CT is
A) Dependent of the secondary circuit conditions
B) Independent of the secondary circuit conditions
C) Depends upon the secondary burden
D) None of these
31. One complete cycle of alternating quantity is said to be spread over
A) 270°
B) $\pi/2$ radians
C) 180°
D) 2π radians
32. Amplitude factor of sinusoidal alternating voltage is
A) $\frac{E_m}{E_m/2}$
B) $\frac{E_m}{E_m/\sqrt{2}}$
C) $\frac{E_m/\sqrt{2}}{E_m}$
D) $\frac{E_m/2}{E_m}$
33. What will be the reading of hot-wire voltmeter if it is connected across the terminal of a generator whose voltage wave form is represented by
 $V = 100 \sin \omega t + 50 \sin 3\omega t + 25 \sin 2\omega t$?
A) 83
B) 80
C) 81
D) 71

A

34. The instantaneous value of a quantity is $5 \sin (2\pi ft - 1)$. Then the phase in degree with respect to the quantity of reference is
 A) -57.3° B) -90° C) 47° D) -56.3°
35. When pure inductive coil is connected to an AC supply then the average demand of power from power supply is
 A) Zero B) Maximum C) Minimum D) None of these
36. The inductive reactance offered to the third harmonic component of the voltage is
 A) $3\pi fL$ B) $6\pi fL$ C) $12\pi fL$ D) πfL
37. The current in a pure capacitor leads its voltage by
 A) Half cycle B) Full cycle C) Quarter cycle D) None of these
38. When three phase symmetrical balanced load is connected to 3 phase 4 wire star system, the neutral wire will be carrying three currents which are exactly equal in magnitude but
 A) are 240° out of phase with each other
 B) are in phase with each other
 C) are 90° out of phase with each other
 D) are 120° out of phase with each other
39. In a 3 phase star connection system Φ is the
 A) Angle between phase voltage and phase current
 B) Angle between phase voltage and line voltage
 C) Angle between line voltage and line current
 D) Angle between line voltage and phase current
40. For a balanced star connected system, load impedance per phase Z_y is equal to
 A) $Z_\Delta/3$ B) $3Z_\Delta$ C) $\sqrt{3}Z_\Delta$ D) $Z_\Delta/\sqrt{3}$
41. The efficiency of a solar cell is between
 A) 5% to 10% B) 15% to 20% C) 25% to 40% D) 50% to 60%
42. The purpose of earthing the electrical equipment is
 A) To bring it to zero potential B) To avoid shock to the operator
 C) Both A) and B) D) None of these

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43. Fillers in a lead acid battery are provided to
A) Allow flow of gases
B) Recover acid losses through vapour
C) Prevent flow of gases
D) None of the above
44. In which solar energy collector the efficiency is maximum ?
A) Evacuated tube
B) Line focusing
C) Flat plate
D) Paraboloid dish
45. The primary purpose of a grounding system is to provide a _____ path for currents to the earth.
A) High resistance
B) Low impedance
C) High impedance
D) None of the above
46. Two 12 Volt 60 Ah batteries are connected in parallel, we get _____ output.
A) 12 Volt 120 Ah
B) 24 Volt 60 Ah
C) 24 Volt 120 Ah
D) 12 Volt 30 Ah
47. Hydrometer is used to measure the _____ in a lead acid cell.
A) Current rating
B) Specific gravity of electrolyte
C) Power rating
D) Efficiency
48. The capacity of a cell increases with
A) The increase in plate surface area
B) The quantity and specific gravity of the electrolyte
C) The porosity of the separators
D) All of the above
49. For _____ voltages and _____ body resistances will increase the degree of electrical shock to the human body.
A) higher, higher
B) lower, higher
C) higher, lower
D) lower, lower
50. Which of the following device will not operate at fault ?
A) Isolator
B) Circuit breaker
C) Fuse
D) MCB
51. Melting point of Tungsten is
A) 2400°C
B) 2700°C
C) 3000°C
D) 3400°C

52. One lumen/ M^2 =
 A) One lux B) Coulomb C) One candela D) One foot candle
53. The fuse in DC circuit is inserted in
 A) Negative line only B) Positive line only
 C) Both negative and positive lines D) Either negative or positive line
54. The unit of solid angle is
 A) Lumen B) Lux C) Degree D) Steradian
55. Carbon arc lamps are commonly used in
 A) Street lighting B) Cinema hall lighting
 C) Cinema projector D) Domestic lighting
56. The HRC fuses are standardized for rated current up to _____ Ampere.
 A) 500 B) 1000 C) 1250 D) 2500
57. Current rating of 1.5 mm^2 single core copper wire is _____ Amps.
 A) 5 B) 10 C) 15 D) 20
58. The earth resistance of a domestic wiring is
 A) Less than 5 ohms B) More than 5 ohms
 C) Zero ohms D) None of the above
59. The action of a fuse is based on the _____ effect of the electric current.
 A) Magnetic B) Heating C) Chemical D) None of the above
60. To improving the efficiency of earthing by
 A) Increase the pipe or plate area B) Increase the depth of the earth pit
 C) Installing parallel electrodes D) All of the above
61. Which of the following statements is/are true regarding the functions of yoke in a dc machine ?
 i. It provides path for the pole flux.
 ii. It provides mechanical support to the machine.
 iii. It helps to convert the AC EMF to DC.
 iv. It helps in reducing the armature reaction effect.
 A) Only i and ii B) Only i, ii and iii
 C) Only i and iv D) Only ii, iii and iv

62. The number of parallel paths in a 4 pole wave wound dc machine is
 A) 4
 B) 2
 C) 8
 D) 1
63. In order to obtain maximum generated EMF in the armature of a dc generator, what should be the shape of field flux waveform?
 A) Flat topped waveform
 B) Sinusoidal waveform
 C) Triangular
 D) Ramp shaped
64. Match the following starters and the motors in which they are employed?
- | I | II |
|--------------------------|--|
| 1. Three pointer starter | i. DC shunt motor with field control |
| 2. Four point starter | ii. DC shunt motor without field control |
| 3. Two point starter | iii. DC series motor |
| A) 1-ii, 2-i, 3-iii | B) 1-i, 2-ii, 3-iii |
| C) 1-iii, 2-ii, 3-i | D) 1-i, 2-iii, 3-ii |
65. In case of compound dc machines, the reason/reasons for keeping the series field wound over the shunt field coil is/are
 A) Convenience in construction
 B) For better cooling
 C) To improve commutation
 D) Both (A) and (B)
66. The main reason for improper commutation in case of dc machine is
 A) Inductance of armature winding
 B) Use of interpoles
 C) Use of compensating winding
 D) Field flux
67. A long shunt dc compound generator delivers 2.2 kW at 220 V. If armature resistance is 0.1 ohms, series field winding resistance is 0.2 ohms and shunt field resistance is 110 ohms, calculate the value of armature current in amperes.
 A) 10 A
 B) 8 A
 C) 12 A
 D) 6 A

- A

74. Which of the following techniques can be used for speed control of three phase squirrel cage induction motor ?
- Rotor resistance control.
 - V/f control.
 - Pole changing method.
- A) Only i and ii B) Only i and iii
C) Only ii D) Only ii and iii
75. Which of the following statements is/are true regarding star delta starter of three phase induction motor ?
- At the time of starting the windings are connected in star and after attaining the steady state speed the windings are connected in delta.
 - At the time of starting the windings are connected in delta and after attaining the steady state speed the windings are connected in star.
 - It reduces the starting torque to one third of that produced by direct switching in delta.
 - It increases the starting torque to three times of that produced by direct switching in delta.
- A) Only i and iii B) Only ii and iii
C) Only i and iv D) Only ii and iv
76. The number of slip rings in a star connected three phase alternator with the field provided on rotor is
- A) 3 B) 4 C) 2 D) 5
77. The armature reaction effect in a three phase alternator operating in isolated condition depends on which of the following ?
- Power factor of the load.
 - Speed of the machine.
 - Load current.
- A) Only i and iii B) Only ii and iii
C) Only i D) Only iii
78. Which of the following statement/statements are true regarding damper winding in a three phase synchronous motor ?
- Damper winding helps to start the motor.
 - Current is present in damper winding when the motor is running at synchronous speed.
 - Current is zero in damper winding when the motor is running at synchronous speed.
- A) Only iii B) Only i and ii C) Only i D) Only i and iii

79. The direction of rotation of a single phase induction motor can be reversed by
 A) Reversing the leads of the supply
 B) Reversing the leads of main winding
 C) Reversing the leads of starting winding
 D) Either B or C
80. Which of the following can be employed for speed control of universal motors ?
 i. Resistance connected in series to armature.
 ii. Tappings provided on field winding.
 iii. Using centrifugal device.
 A) Only i and iii
 B) Only ii and iii
 C) Only ii
 D) i, ii and iii
81. The power delivered to the load is maximum when the SCR firing angle is
 A) 90°
 B) 180°
 C) Zero
 D) Between 90° and 180°
82. A UJT has $R_{BB} = 15 \text{ K ohms}$, $R_{B_2} = 5 \text{ K ohms}$. Its intrinsic stand off ratio is
 A) 0.67
 B) 0.5
 C) 0.8
 D) 0.33
83. The operation of JFET involves
 A) Recombination
 B) Flow of minority carriers
 C) Negative resistance
 D) Flow of majority carriers
84. For half wave controlled rectifier, if firing angle is θ_1 , then average value of output DC voltage is given by
 A) $V_{dc} = \frac{2V_m}{\pi}(1 + \cos\theta_1)$
 B) $V_{dc} = \frac{V_m}{\pi}(\cos\theta_1 - 1)$
 C) $V_{dc} = \frac{V_m}{2\pi}(\cos\theta_1 + 1)$
 D) $V_{dc} = \frac{V_m}{2\pi}(1 - \cos\theta_1)$
85. A TRIAC is equivalent to two SCRs
 A) In series
 B) In inverse parallel
 C) In parallel
 D) In inverse series
86. Which is an example of DIAC ?
 A) NTE 6408
 B) OptoNCD ILR 1030
 C) EddyNCD 3301
 D) BT 136

87. A latched up IGBT can be turned off by
 A) UJT triggering circuit
 B) Forced commutation of voltage
 C) Snubber circuit
 D) Forced commutation of current
88. A single phase half bridge inverter has input supply voltage of 100 volts. For a load resistance of 5 ohms, the output power is equal to (square wave output)
 A) 2000 watts
 B) 500 watts
 C) 1000 watts
 D) 750 watts
89. The internal resistance of an ideal voltage source is
 A) High
 B) Moderate
 C) Zero
 D) Very high
90. _____ is used in the rotating type UPS system to supply the mains.
 A) Battery bank
 B) DC motor
 C) Self excited DC generator
 D) Alternator
91. The decimal number - 19 is expressed in 2's complement form as
 A) 10010011
 B) 11101101
 C) 11011100
 D) 00110011
92. $A(\overline{AB} + \overline{AB})$ is equivalent to
 A) $\overline{AB}$
 B) $A\overline{B}$
 C) $\overline{AB}$
 D) AB
93. In negative logic, logic state 1 corresponds to
 A) Zero voltage
 B) More negative voltage
 C) Lower voltage level
 D) Negative voltage
94. The most suitable gate for comparing two bits is
 A) NAND
 B) XOR
 C) AND
 D) OR
95. A feature that distinguishes the JK flip flop from the SR flip flop is the
 A) Type of clock
 B) Clear input
 C) Present input
 D) Toggle condition

96. In a 4 bits weighted resistor D/A converter, the resistor value corresponding to LSB is 64 K Ohms. The resistor value corresponding to MSB will be
- A) 4 K Ohms
 - B) 64 K Ohms
 - C) 8 K Ohms
 - D) 16 K Ohms
97. The disadvantage of counter type A/D converter as compared to comparator type A/D converter is that
- A) Longer conversion time is required
 - B) The resolution is low
 - C) Its stability is low
 - D) The circuit is more complex
98. A divide by 54 counter can be realized by
- A) 9 numbers of mod 9 counters
 - B) 6 numbers of mod 9 counters
 - C) 9 numbers of mod 6 counter
 - D) one mod 9 counter followed by one mod 6 counter
99. A stage in a shift register consists of
- A) a latch
 - B) a byte of storage
 - C) a flip flop
 - D) four bits of storage
100. The purpose of using flux in soldering is to
- A) Fill up gaps left in a bad joint
 - B) Prevent oxides forming
 - C) Wash away surplus solder
 - D) Increase fluidity of solder metal