

111/2016

Maximum : 100 marks

Time : 1 hour and 15 minutes

1. Which of the following is used in ceiling fan?
(A) Universal motor (B) Synchronous motor
(C) Series motor (D) Induction motor
2. Active power in 3 phase circuit is :
(A) $\sqrt{3} V_L I_L \cos \phi$ (B) $3 V_L I_L \cos \phi$
(C) $\sqrt{3} V_{ph} I_{ph} \cos \phi$ (D) $\sqrt{3} V_{ph} I_{ph} \sin \phi$
3. Unit of luminous intensity :
(A) Lumen (B) Lux
(C) Lumen/m² (D) Candela
4. The power factor of pure resistive circuit is :
(A) Zero (B) Leading
(C) Lagging (D) Unity
5. Illumination of a surface is inversely proportional to :
(A) Luminous intensity (B) Distance from the source
(C) Square of the distance from the source (D) Total Lumen
6. The pitch of wave winding is :
(A) $Y_B - Y_F$ (B) Y_B
(C) $Y_B + Y_F$ (D) Y_F
7. Generator efficiency is maximum when :
(A) Variable loss is minimum
(B) Constant loss = Variable loss
(C) Constant loss is minimum
(D) Constant loss is half of the variable loss

8. Form factor =
- (A) rms value/avg value (B) avg. value/rms value
(C) rms value/peak value (D) peak value/rms value
9. Resultant flux of 3 phase induction motor is :
- (A) $\frac{\sqrt{3}}{2} \phi_m$ (B) $\frac{3}{2} \phi_m$
(C) $3 \phi_m$ (D) $2 \phi_m$
10. Maximum number of electrons in valence shell of an atom is :
- (A) 3 (B) 6
(C) 8 (D) 16
11. Resonant frequency of an ac series circuit is :
- (A) $1/2\pi\sqrt{LC}$ (B) $1/4\pi\sqrt{LC}$
(C) $1/4\pi LC$ (D) $1/2\pi LC$
12. Insulation resistance can be measured using :
- (A) Ohm-meter (B) Multimeter
(C) Clampmeter (D) Megger
13. Absolute permeability $\mu_0 =$
- (A) $4\pi \times 10^{-7} \text{ H/m}$ (B) $2\pi \times 10^{-7} \text{ H/m}$
(C) $4\pi \times 10^{-14} \text{ H/m}$ (D) $2\pi \times 10^{-14} \text{ H/m}$
14. Two wattmeter method of power measurement is suitable for :
- (A) balanced load only (B) unbalanced load
(C) both balanced and unbalanced load (D) delta connected load
15. Ward-Leonard system is used for :
- (A) Voltage regulation of transformer (B) Speed control of dc motor
(C) Excitation of alternator (D) Voltage regulation of alternator

16. Base of BJT is :
- (A) Lightly doped (B) Heavily doped
(C) Moderately doped (D) Not doped
17. Dielectric strength of air is _____ kv/mm.
- (A) 2.5 (B) 25
(C) 3.2 (D) 16
18. Relative permeability of material =
- (A) Flux density produced in vacuum (B) Flux density produced in material
(C) $\frac{\text{Flux density produced in vacuum}}{\text{Flux density produced in material}}$ (D) $\frac{\text{Flux density produced in material}}{\text{Flux density produced in vacuum}}$
19. The tube of fluorescent lamp is filled with :
- (A) Mercury and Nitrogen (B) Mercury and Argon
(C) Nitrogen and Argon (D) Oxygen and Argon
20. Armature torque of a DC motor =
- (A) $\frac{E_b I_a}{N} N - m$ (B) $9.55 \frac{E_b I_a}{N} N - m$
(C) $9.55 \frac{E_b I_a}{N} N$ (D) $\frac{E_b I_a}{N} N$
21. Transformers are rated in :
- (A) KW (B) MW
(C) KVA (D) KVAR
22. Frequency of rotor current of 3 phase induction motor is :
- (A) Slip \times Frequency of stator current (B) Frequency of rotor current
(C) Slip / Frequency of stator current (D) Frequency of stator current / slip
23. _____ is known as universal gate.
- (A) AND gate (B) NAND gate
(C) OR gate (D) NOT gate

24. 1 KWh =
- (A) $36 \times 10^2 \text{ J}$ (B) $36 \times 10^3 \text{ J}$
 (C) $36 \times 10^4 \text{ J}$ (D) $36 \times 10^5 \text{ J}$
25. $I_E : I_B : I_C ::$
- (A) $1 : \alpha : (1 + \alpha)$ (B) $1 : (1 - \alpha) : \alpha$
 (C) $1 : (1 + \alpha) : \alpha$ (D) $1 : \alpha : (1 - \alpha)$
26. Number of parallel path in wave winding is :
- (A) 3 (B) 4
 (C) 6 (D) 2
27. Zener diodes are commonly used as :
- (A) Rectifier (B) Amplifier
 (C) Voltage regulator (D) Filter
28. Which is secondary cell?
- (A) Dry cell (B) Leclanche cell
 (C) Voltaic cell (D) Lead acid cell
29. 1 nF =
- (A) 10^{-6} F (B) 10^{-9} F
 (C) 10^9 F (D) 10^6 F
30. The time taken by an alternating quantity to complete one cycle :
- (A) Time period (B) Frequency
 (C) Angular velocity (D) Time constant
31. Speed of dc motor is directly proportional to _____ and inversely proportional to :
- (A) flux, back emf (B) current, back emf
 (C) back emf, flux (D) back emf, voltage

32. If capacitors are connected in series, effective capacitance is :

(A) $C = C_1 + C_2 + C_3 + \dots$

(B) $\frac{1}{C} = \frac{1}{C_1} + \frac{1}{C_2} + \frac{1}{C_3} + \dots$

(C) $C = \frac{1}{C_1} + \frac{1}{C_2} + \frac{1}{C_3} + \dots$

(D) $C = \frac{1}{C_1} - \frac{1}{C_2} + \frac{1}{C_3} - \frac{1}{C_4} + \dots$

33. Watts =

(A) $VA \cos \phi$

(B) $VA \sin \phi$

(C) $VA \tan \phi$

(D) $VA \cot \phi$

34. EMF equation of DC generator is :

(A) $\frac{\phi ZN}{60} \times \frac{P}{A}$ Volt

(B) $\frac{\phi ZN}{60} \times \frac{P}{4}$ Volt

(C) $\frac{\phi ZN}{120} \times \frac{P}{A}$ Volt

(D) $\frac{\phi ZN}{30} \times \frac{P}{A}$ Volt

35. Admittance is the _____ of conductance and susceptance.

(A) Arithmetic sum

(B) Arithmetic difference

(C) Vector sum

(D) Reciprocal

36. Which has negative temperature coefficient of resistance?

(A) Copper

(B) Aluminium

(C) Iron

(D) Carbon

37. Which is class Y insulating material?

(A) Mica

(B) Cotton

(C) Porcelain

(D) Asbestos

38. Charge of an electron is :

(A) 6.242×10^{-18} C

(B) 6.242×10^{18} C

(C) 1.602×10^{-19} C

(D) 1.602×10^{-16} C

39. Atomic number is, the number of :

(A) Neutrons

(B) Protons and neutrons

(C) Valence electrons

(D) Electrons

40. Solder is the mixture of :
- (A) Tin and Lead (B) Copper and Tin
(C) Copper and Lead (D) Iron and Lead
41. 1N 4007 is semi conductor diode. Here 1N represents :
- (A) Forward current (B) Voltage drop
(C) One layer (D) One PN junction
42. Colour code for $47\ \Omega$ resistor with $\pm 5\%$ tolerance :
- (A) Yellow - Violet - Black - Gold
(B) Yellow - Black - Violet - Gold
(C) Yellow - Violet - Brown - Gold
(D) Yellow - Violet - Brown - Silver
43. Two current carrying conductors placed side by side, experience a force of attraction :
- (A) When current direction of both conductors are same
(B) When current direction of both conductors are opposite
(C) Independent of the direction of currents
(D) Only when one conductor is carrying current
44. Fire caused by LPG is _____ Fire.
- (A) Class B (B) Class A
(C) Class D (D) Class C
45. Which motor is used in portable drilling machine?
- (A) Induction motor (B) DC series motor
(C) Universal motor (D) Shaded pole motor
46. Negative plate of lead acid cell :
- (A) Carbon (B) Spongy lead
(C) Lead peroxide (D) Cadmium
47. Ammeter shunt is _____ resistance.
- (A) High (B) Medium
(C) Low (D) Very high

48. Melting point of copper :
(A) 2305 °C (B) 663 °C
(C) 1083 °C (D) 3075 °C
49. 18 SWG = _____ mm.
(A) 1.22 (B) 1.42
(C) 0.91 (D) 0.61
50. Electrolyte used in Edison cell :
(A) H_2SO_4 (B) HCl
(C) KOH (D) MnO_2
51. CT is used for measuring :
(A) Voltage (B) Frequency
(C) Power factor (D) Alternating current
52. Unit of reluctance :
(A) Ampere Turns/Weber (B) Weber Turns
(C) Henry (D) Weber Turns/Ampere
53. Energy stored in inductor is :
(A) $W = \frac{1}{4} LI^2$ (B) $W = \frac{1}{2} LI^2$
(C) $W = \frac{1}{2} L^2 I$ (D) $W = \frac{1}{2} L^2 I^2$
54. What is the capacitance of a capacitor that requires 0.9 C to charge it to 30 V :
(A) 0.003 F (B) 0.3 F
(C) 0.03 F (D) 0.3×10^{-3} F
55. Specific gravity of a fully charged lead acid cell is approximately :
(A) 1.18 (B) 1.21
(C) 1.17 (D) 1.16

56. Inductive reactance of a coil having inductance 4 H :

(A) $796 \times 10^{-6} \Omega$

(B) 1256 Ω

(C) 314 Ω

(D) 628 Ω

57. Which of the following equation is wrong?

(A) $P = VI$

(B) $P = I^2R$

(C) $P = \frac{V^2}{R}$

(D) $P = \frac{V}{R^2}$

58. Capacitive reactance =

(A) $X_C = 2\pi FC$

(B) $X_C = 2\pi\sqrt{FC}$

(C) $X_C = \frac{1}{4\pi FC}$

(D) $X_C = \frac{1}{2\pi FC}$

59. Admittance, $Y =$

(A) $\frac{1}{Z}$

(B) $\frac{1}{X_L}$

(C) $\frac{1}{X_C}$

(D) $\frac{1}{R}$

60. Susceptance, $b =$

(A) $\frac{R}{Z}$

(B) $\frac{X}{Z^2}$

(C) $\frac{R}{Z^2}$

(D) $\frac{X}{Z}$

61. Two Wattmeters W_1 and W_2 are connected in a 3 phase circuit to measure 1 KW load at 0.5 PF. Which of the following reading will be correct?

(A) W_1 reads 500 W , W_2 reads 500 W

(B) W_1 reads 1200 W , W_2 attempt to read negative value

(C) W_1 reads 1000 W , W_2 reads zero

(D) W_1 reads 750 W , W_2 reads 250 W

62. Polarised electrolytic – Aluminium capacitors are designed to have DC working voltage in the range of _____ V.
- (A) 200-1600 (B) 5-500
(C) 0-200 (D) 3-125
63. Time period of 240 V ac supply in India is :
- (A) 0.02 seconds (B) 50 Hz
(C) 0.002 seconds (D) 55 Hz
64. Internal diameter of pipe earthing electrode should not be less than _____ mm.
- (A) 28 (B) 76
(C) 38 (D) 19
65. In PTC resistor, as the temperature increases, the resistance :
- (A) increases linearly (B) increases nonlinearly
(C) decreases linearly (D) decreases nonlinearly
66. Which is active component?
- (A) Capacitor (B) Diode
(C) Inductor (D) Resistor
67. BY 127 is a:
- (A) PNP transistor (B) NPN transistor
(C) TRIAC (D) Semi conductor diode
68. Colour of silica gel changes to _____ as it absorbs moisture from air.
- (A) White (B) Blue
(C) Pink (D) Yellow
69. Synchronous speed of a 3 phase, 4 pole, 50 Hz induction motor :
- (A) 1500 rpm (B) 1440 rpm
(C) 3000 rpm (D) 2880 rpm
70. Electric charge is equal to :
- (A) $I t$ (B) I / t
(C) $I^2 t$ (D) I^2 / t
71. Limiting temperature of F class insulating material :
- (A) 225 °C (B) 105 °C
(C) 120 °C (D) 155 °C

72. Non uniform distribution of variable currents in solid conductors resulting in an increase in the current density near the surface :
- (A) Corona (B) Skin effect
(C) Joule effect (D) Eddy current
73. Pick the correct one :
- (A) Power = VQ/t (B) Power = VQt
(C) Power = VI (D) Power = VI/t
74. One metric HP = _____ Watts.
- (A) 746 (B) 756
(C) 735.5 (D) 756.5
75. _____ helps to find out the direction of current in the conductor of a generator.
- (A) Cork screw rule (B) Right hand thumb rule
(C) Fleming's left hand rule (D) Fleming's right hand rule
76. When two resistors are connected in series total resistance is 8Ω and when connected in parallel, equivalent resistance is 2Ω . Value of each resistance are :
- (A) 5Ω and 3Ω (B) 6Ω and 2Ω
(C) 4Ω and 4Ω (D) 7Ω and 1Ω
77. An MI volt meter reads _____ value.
- (A) Peak (B) Average
(C) rms (D) Peak to peak
78. Inductance, $L =$
- (A) $L = \frac{X_L}{2\pi F}$ (B) $L = 2\pi FX_L$
(C) $L = \frac{FX_L}{2\pi}$ (D) $L = \frac{F}{2\pi X_L}$
79. One cycle is _____ electrical degrees.
- (A) 180 (B) 270
(C) 90 (D) 360
80. RMS value = _____ \times Maximum value.
- (A) 0.636 (B) 0.85
(C) 0.607 (D) 0.707