

1. Magnetic material used in large transformer is _____.
(a) cast steel (b) hot-rolled silicon steel
(b) cold-rolled grain-oriented steel (d) either (b) or (c)
2. _____ type of cylindrical windings using circular conductors are employed in transformers.
(a) Multi-layered (b) double layered (c) triple layered (d) single layered
3. The main disadvantage of cylindrical winding is _____.
(a) high copper loss (b) poor mechanical strength
(c) more eddy current loss (d) none of the above
4. Helical windings are used in _____ transformers.
(a) distribution (b) power (c) shell-type (d) none of these
5. Disc windings are primarily used in _____ capacity transformers.
(a) low (b) medium (c) high (d) any of these

6. Yokes with rectangular cross-section are used for _____ transformers.
(a) small (b) medium (c) large (d) any of these
7. Power transformers have ratings above _____ kVA.
(a) 50 (b) 100 (c) 250 (d) 500
8. Cold-rolled grain-oriented steel has _____ in comparison to hot-rolled silicon steel.
(a) better finish (b) improved space factor
(c) much better magnetic properties (d) all of the above
9. Typical value of window space factor is _____.
(a) 0.5 (b) 0.6 (c) 0.1 (d) 0.3
10. The reason for using multi-step core is used in a transformer is to _____.
(a) increase the efficiency (b) decrease the cost of core material
(c) decrease the cost of copper (d) increase the output
11. Tappings of a transformer are provided _____.
(a) at the middle of *h.v.* side (b) at the neutral end of *h.v.* side
(c) at the phase end of *h.v.* side (d) at the phase end of *l.v.* side
12. For transformer laminations, which type of silicon steel is preferred?
(a) cold rolled (b) hot rolled (c) grain-oriented (d) any of these
13. The primary and secondary windings are interlaced in a transformer for _____.
(a) reduced cost (b) uniform heating
(c) easiness of coil making (d) reduced leakage reactance

14. Helical winding with rectangular strip conductors is generally used for _____.
- (a) *h.v.* coils (b) both *l.v.* and *h.v.* coils
(c) *l.v.* coils (d) none of the above
15. The cross-over coils in transformers are generally used for _____.
- (a) *h.v.* winding (b) *l.v.* winding
(c) both *l.v.* and *h.v.* winding (d) none of the above
16. The cylindrical winding in transformers is generally not used beyond _____.
- (a) 6.6 kV (b) 3.3 kV (c) 66 kV (d) 33 kV
17. The percentage of silicon in the transformer core steel is _____.
- (a) 2 to 3% (b) 3 to 4% (c) 4 to 5% (d) 5 to 6%
18. The transformer core laminations have thickness in the range of _____.
- (a) 3.5 to 5 mm (b) 2 to 3 mm (c) 0.35 to 0.5 mm (d) 0.035 to 0.05 mm
19. The core laminations are prepared using _____ for large capacity power transformers.
- (a) cold-rolled grain-oriented silicon steel (b) cold-rolled silicon steel
(c) hot-rolled silicon steel (d) any one of the above

20. The core section in a large capacity power transformer is _____.
- (a) square (b) rectangular (c) multi-stepped (d) Any of the above
21. Tap changer is normally provided on _____ transformer.
- (a) distribution (b) step up (c) instrument (d) high voltage
22. A three-phase power transformer is generally of _____ type.
- (a) berry (b) core (c) shell (d) toroidal
23. In comparison with power transformer, a distribution transformer has _____.
- (a) low percentage impedance and high copper iron loss ratio
(b) high percentage impedance and high copper iron loss ratio
(c) high percentage impedance and low copper iron loss ratio
(d) low percentage impedance and low copper iron loss ratio
24. What are the effects of making limb section lower than the yoke section?
- (a) economy in copper usage (b) decreased iron losses
(c) decreased magnetizing current (d) all of the above
25. Circular coils are preferred in transformers because of _____.
- (a) of its superior mechanical stability under short circuit conditions
(b) it becomes wasteful to employ rectangular coils
(c) both (a) and (b) above
(d) it is easier to make circular coils.
26. The reason for single-phase shell-type distribution transformer to have sandwich type winding is _____.
- (a) to reduce the leakage reactance (b) to save copper
(c) to improve the voltage regulation (d) both (a) and (c) above.

27. What is the effect of increase in the height of the window in comparison to the width in a transformer?
- (a) cost of copper will be reduced
 - (b) voltage regulation will decrease
 - (c) efficiency will decrease due to increase in copper losses
 - (d) both (a) and (b)
28. _____ causes hum in a transformer.
- (a) Magnetostriction
 - (b) Vibrations developed by laminations depending upon the tightness of clampings
 - (c) Cushions and paddings
 - (d) all of the above
29. Humming noise in a transformer can be decreased by _____.
- (a) using lower flux densities
 - (b) tightening the clampings of laminations
 - (c) using suitable cushions, padding and oil barriers
 - (d) all of the above
30. If all the dimensions of a transformer is doubled, its iron loss will be _____ compared to iron loss with the original dimensions.
- (a) half
 - (b) double
 - (c) four times
 - (d) 8 times
31. Total copper area accommodated in the window of gross area 300 cm^2 of a particular transformer is 0.48 times, the net area of iron in the core of 200 cm^2 . Then, the window space factor is _____.
- (a) 0.72
 - (b) 0.28
 - (c) 0.32
 - (d) 0.48

32. If the net iron area of a three stepped core is 240 cm^2 , then the diameter of the circumscribing circle is _____.
- (a) 25 cm (b) 18 cm (c) 20 cm (d) 15 cm
33. _____ to reduce hysteresis loss in a transformer.
- (a) Core may be laminated
(b) Silicon steel may be used as the core material.
(c) Core may be constructed with any permanent magnet material such as alnico
(d) Core may be impregnated with varnish.
34. Which of the following relation must be satisfied if a transformer having constant flux and constant current density is designed for minimum cost?
- (a) iron loss = copper loss
(b) weight of iron = weight of copper
(c) weight of iron/weight of copper = specific cost of copper/specific cost of iron
(d) weight of iron/weight of copper = specific cost of iron/specific cost of copper
35. The criteria for a transformer to be designed for the minimum volume is _____.
- (a) iron loss = copper loss
(b) volume of iron = volume of copper
(c) weight of iron = weight of copper
(d) the volume of iron is minimum
36. Choice of higher core flux density in a transformer leads to _____.
- (a) increased overall size (b) reduced magnetizing current
(c) reduced iron losses (d) reduction in overall cost

37. With rise in voltage, the window space factor of a transformer _____.
- (a) decreases (b) increases
(c) remains constant
(d) decreases or increases depending upon whether it is a distribution or power transformer
38. If the total area occupied by the insulating material in the window of a transformer is 72%, then the window space factor is _____.
- (a) 0.28 (b) 0.72 (c) 0.32 (d) 0.25
39. If the gross area of window is 750 cm^2 for a particular transformer, then the approximate height of the window is _____.
- (a) 25 cm (b) 75 cm (c) 50 cm (d) 30 cm
40. If for a single phase, 6600/400V, core-type transformer, the e.m.f. per turn is 6 V, then the number of turns in *h.v.* winding is _____.
- (a) 1106 (b) 1122 (c) 1100 (d) 1089
41. If for a single phase, 6600/400V, core-type transformer, the e.m.f. per turn is 6 V, then the number of turns in *l.v.* winding is _____.
- (a) 65 (b) 66 (c) 67 (d) 68
42. If for a single phase, 6600/400V, core-type transformer, the e.m.f. per turn is 6 V, then the number of turns in *h.v.* winding with + 5% tapping is _____.
- (a) 1064 (b) 1178 (c) 1068 (d) 1072
43. If for a three phase, 11000/440V, delta/star, core-type transformer, e.m.f. per turn is 10.8V, then the number of turns per phase in *l.v.* winding is _____.
- (a) 23 (b) 23 (c) 24 (d) 40

44. If for a three phase, 11000/440V, delta/star, core-type transformer, e.m.f. is per turn is 10.8V, then the number of turns per phase in *h.v.* winding is _____.
- (a) 1018 (b) 600 (c) 1000 (d) 1038
45. If for a three phase, 11000/440V, delta/star, core-type transformer, e.m.f. is per turn is 10.8V, then the number of turns per phase in *h.v.* winding with – 5% tapping is _____.
- (a) 1050 (b) 1092 (c) 1080 (d) 1070
46. Eddy currents are reduced in high silicon steel as it provides _____.
- (a) increases resistivity (b) reduces resistivity
(c) short circuits (d) none of the above
47. In order to reduce the eddy current losses within the conductor, the thickness of the rectangular conductor selected for *l.v.* and *h.v.* winding should not be greater than _____.
- (a) 2 mm (b) 2.5 mm (c) 3 mm (d) 3.5 mm
48. Stacking factor will be minimum for _____ type of core.
- (a) four-stepped (b) three-stepped (c) square (d) cruciform
49. The usual values of current densities for medium and large power transformers are _____.
- (a) 1.5 to 2.6 A/mm² (b) 2.4 to 3.4 A/mm²
(c) 1.5 to 2 A/mm² (d) 1 to 2.6 A/mm²
50. If a 200/400V transformer has a secondary winding resistance of 0.5Ω, the total resistance referred to primary is _____.
- (a) 0.125Ω (b) 0.5Ω (c) 1Ω (d) 2Ω
51. If the frequency of supply voltage to the primary of a two-winding transformer is doubled, then the induced emf is _____.
- (a) unaltered (b) doubled (c) halved (d) none of these

52. Leakage reactance of a transformer is _____.
- (a) directly proportional to number of turns
 - (b) directly proportional to square of number of turns
 - (c) inversely proportional to number of turns
 - (d) inversely proportional to square of number of turns
53. Large value of flux density can be adopted while designing _____.
- (a) distribution transformer
 - (b) welding transformer
 - (c) large capacity power transformer
 - (d) current transformer.
54. Lower value of window space factor will be adopted in design of _____.
- (a) 400 kVA, 11/0.4 kV, distribution transformer
 - (b) 20,000 kVA, 66/11 kV, power transformer
 - (c) 20,000 kVA, 33/11 kV, power transformer
 - (d) 100 kVA, 11/0.4 kV, distribution transformer
55. Larger value of current density can be adopted for transformer employing _____ cooling.
- (a) oil-forced water forced
 - (b) oil-natural air forced
 - (c) oil-immersed self-cooled
 - (d) any of the above
56. While designing a transformer if increased window height is adopted, it may result into
- (a) poor voltage regulation
 - (b) reduced leakage reactance
 - (c) increased leakage reactance
 - (d) both (a) and (b) above

57. If the thickness of laminations is t , then the eddy current losses are proportional to _____.
- (a) t^4 (b) t^2 (c) t^3 (d) t
58. If wider window is adopted in designing a transformer, it may result in to _____.
- (a) reduced leakage reactance (b) good voltage regulation
(c) increased leakage reactance (d) both (b) and (c) above
59. In the design of a transformer, the usual value of the ratio of window height to window width used is _____.
- (a) 5 (b) 3 (c) 2 (d) 4
60. In a transformer, the emf per turn is determined, in terms of its kVA output rating (Q) from the relation _____.
- (a) $E_t = KQ$ (b) $E_t = k \sqrt{Q}$ (c) $E_t = kQ^{3/2}$ (d) $E_t = k/Q$
61. An iron cored transformer is working at a maximum flux density of 0.8 Wb/m^2 . Its core is replaced by silicon steel core, working at a maximum flux density of 1.2 Wb/m^2 . If the total flux is to remain the same, what is the reduction in volume expressed as of the original volume? The frequency and voltage per turn are the same in both the cases.
- (a) 33% (b) 9% (c) 22% (d) 11%
62. If the total losses of a transformer during its design is 500 W at 50% full load, then the total copper losses of the same transformer at 1.25 times full load will be _____.
- (a) 500 W (b) 625 W (c) 1250 W (d) 3125 W
63. Typical value of no load current expressed as percentage of full load current in transformer is _____.
- (a) 10% (b) 15% (c) 3% (d) 8%

64. In a transformer, iron losses and full load copper losses are 900 and 1600 W, respectively. The ratio of load for maximum efficiency in terms of full load is _____.
- (a) 0.56 (b) 0.85 (c) 0.75 (d) 1.0
65. Magnetic couplings are present closer in a transformer to ensure _____.
- (a) high efficiency
(b) good regulation
(c) good regulation and high efficiency
(d) good regulation and high power factor
66. The useful flux in a transformer links _____.
- (a) only *l.v.* turns (b) only *h.v.* turns
(c) both *l.v.* and *h.v.* turns (d) none of the above
67. Under which of the following conditions, the hysteresis loss in a transformer remains unaffected?
- (a) When both frequency and flux density are increased by 10%
(b) When flux density is increased by 10%
(c) When thickness of lamination is increased by 10%
(d) When frequency is increased by 10%
68. Maintaining the same thickness but selecting a higher silicon content core material for a transformer reduces eddy current loss due to _____.
- (a) decrease in resistivity (b) increase in resistivity
(c) decrease in malleability (d) both (a) and (b) above

69. In order to have minimum copper loss in the transformer windings, _____.
- (a) the primary and secondary currents should be equal
 - (b) the current densities in primary and secondary windings must be the same
 - (c) copper losses should be equal to iron losses
 - (d) none of the above
70. Transformer core is laminated to decrease _____.
- (a) stray loss
 - (b) eddy current loss
 - (c) copper loss
 - (d) hysteresis loss
71. In transformers, with rise in supply frequency, _____.
- (a) copper loss remains unaffected but efficiency increases.
 - (b) copper loss decreases but efficiency increases
 - (c) copper loss increases but efficiency decreases
 - (d) both copper loss and efficiency remain unaffected
72. In transformers, with increase in supply frequency, the iron losses ____
- (a) decreases
 - (b) increases
 - (c) remain unaffected
 - (d) becomes zero
73. Under which situation(s), a transformer can be slightly over loaded?
- (a) if the ambient temperature is much below the designed value
 - (b) if the supply frequency is increased
 - (c) both (a) and (b) above
 - (d) none of the above

74. _____ transformer is designed for good all day efficiency.
- (a) Distribution transformer
 - (b) Current transformer
 - (c) High voltage transformer
 - (d) Power transformer
75. Mechanical forces in a transformer are developed due to _____.
- (a) interaction of current flowing in the winding and leakage flux around it
 - (b) vibrations
 - (c) gap between laminations
 - (d) none of these
76. The overload capacity in a transformer depends on _____.
- (a) supply frequency
 - (b) core size
 - (c) both (a) and (b)
 - (d) none of these
77. In _____ transformer, use of higher leakage reactance is permitted.
- (a) current transformer
 - (b) instrument transformer
 - (c) distribution transformer
 - (d) power transformer
78. In a transformer having a higher leakage reactance leads to an advantage of _____.
- (a) reducing the magnetizing current
 - (b) improving the voltage regulation
 - (c) limiting the inrush current during a short circuit
 - (d) none of the above
79. The leakage reactance of a transformer depends on _____.
- (a) configuration of the winding
 - (b) number of turns
 - (c) frequency
 - (d) all the above

80. The leakage reactance of a transformer is _____.
- (a) proportional to square of number of turns
 - (b) directly proportional to number of turns
 - (c) inversely proportional to number of turns
 - (d) proportional to inverse square of number of turns
81. Addition of cooling tubes to the transformer tank improves heat dissipation capacity because of _____.
- (a) additional dissipation by convection
 - (b) additional dissipation by radiation
 - (c) additional cooling surface
 - (d) all the above
82. A conservator tank along with the main tank of a transformer is mostly adopted _____.
- (a) to prevent formation of sludge in the main tank
 - (b) to improve the cooling
 - (c) to keep the oil in reserve
 - (d) to facilitate the periodical check up of the oil
83. _____ can be adopted for transformer cooling.
- (a) Animal oil
 - (b) Vegetable oil
 - (c) Mineral oil
 - (d) Any oil
84. Heat dissipation by means of radiation in oil immersed transformers with cooling tubes is _____.
- (a) about $6.0 \text{ W/m}^2/\text{°C}$
 - (b) about $2 \text{ W/m}^2/\text{°C}$
 - (c) about $10 \text{ W/m}^2/\text{°C}$
 - (d) about $50 \text{ W/m}^2/\text{°C}$

85. The heat dissipation capacity of transformer exceeding 50 kVA rating is increased by providing _____.
- (a) fins (b) tubes (c) radiator tanks (d) corrugations
(e) all of these
86. Oil used in cooling of transformer should have _____.
- (a) low viscosity (b) low dielectric strength
(c) low flash point (d) none of the above
87. Transformer oil should be devoid of _____.
- (a) sulphur (b) moisture
(c) acids (d) all the above
88. Transformer oil should possess _____.
- (a) high flash point (b) high dielectric strength
(c) high viscosity (d) both (a) and (b) above
89. How much heat can be dissipated by natural means from the plain walled tank of a transformer?
- (a) $8.78 \text{ W/m}^2/\text{°C}$ (b) $3.72 \text{ W/m}^2/\text{°C}$ (c) $6 \text{ W/m}^2/\text{°C}$ (d) $12.5 \text{ W/m}^2/\text{°C}$