

[UPSSSC PRACTICE SET-1 ONLINE SOLUTION BY RAMAN SIR]

1. The efficiency of a power transformer is around:

- a) 50%
- b) 60%
- c) 80%
- d) 95%

2. In a transformer, electrical power is transferred from primary to secondary

- a) Through air
- b) By magnetic flux
- c) Through insulating medium
- d) None of these

3. Transformer action requires a

- a) Constant magnetic flux
- b) Increasing magnetic flux
- c) Alternating magnetic flux
- d) Alternating electric flux

4. The flux created by the current flowing through the primary winding induces emf in.

- a) Primary winding only
- b) Second winding only
- c) Transformer core only
- d) Both primary and secondary windings

5. The primary and secondary windings of a power transformer always have

- a) a common magnetic circuit
- b) Separate magnetic circuits
- c) Wire of same size
- d) Same number of turns

6. If rated dc voltage is applied instead of ac to the primary of a transformer

- a) secondary of transformer will burn
- b) Primary of transformer will burn
- c) Secondary voltage will be excessively high
- d) There will be no secondary voltage

7. For an ideal transformer the windings should have

- a) maximum resistance on primary side and least resistance on secondary side
- b) least resistance on primary side and maximum resistance on secondary side
- c) Equal resistance on primary and secondary sides
- d) No ohmic resistance on either side

8. The core flux in transformer depends mainly on

- a) supply voltage
- b) supply voltage and frequency
- c) supply voltage, frequency and load
- d) Supply voltage and load but independent of frequency

9. In a Hot wire instrument which damping is used

- a) air friction
- b) eddy current
- c) fluid friction
- d) None

10. A single-phase transformer when supplied from 220 V, 50 Hz has eddy current loss of 50 W. If the transformer is connected to a voltage of 330 V, 50 Hz, the eddy current loss will be

- a) 168.75W
- b) 112.5 W
- c) 75 W

- d) 50 W
11. In a silicon the energy gap at 0°K
- 1.11 eV
 - 1.21 eV**
 - 0.782 eV
 - 0.73 eV
12. On no-load phasor diagram of transformer, the core loss component of the current remains in phase with
- no-load current
 - Primary supply voltage**
 - Core flux
 - Primary induced voltage
13. The core flux of a practical transformer with a resistance load
- is strictly constant and load changes**
 - Increases linearly with load
 - Increases as the square root of the load
 - Decreases with increase of load
14. Power transformed from primary to secondary depends upon
- number of primary turns
 - number of secondary turns
 - Current transformation ratio
 - Magnetic coupling between primary and secondary windings**
15. The power factor of a power transformer on no load will be about
- Unity
 - 0.75
 - 0.5
 - 0.35**
16. The power factor of a transformer on no load is poor due to
- magnetizing reactance of the transformer**
 - Open-circuited secondary
 - Low primary winding resistance
 - Low no-load current
17. In a transformer, zero voltage regulation at full load is:
- Not possible
 - Possible at leading power factor load**
 - Possible at lagging power factor load
 - Possible at unity power factor load
18. Positive voltage regulation is an indication of _____ load.
- Inductive
 - Capacitive
 - Either inductive or capacitive**
 - Pure resistive
19. The percentage resistance and reactance of a transformer are 2% and 4% respectively. The approximate regulation on full load at 0.8 pf lag is
- 12%
 - 8%
 - 6%
 - 4%**
20. The voltage regulation of a transformer having 2% resistance and 5% reactance, at full load 0.8 pf lagging is
- 4.6%**
 - 4.6%
 - 1.4%
 - 6.4%
21. The regulation of transformer in which ohmic loss is 1% of the output the reactance drop is 5% of the voltage, when operating at 0.8 power factor lagging is
- 3.8%**
 - 4.8%
 - 5.2%
 - 5.8%
22. In a power transformer iron losses remain practically constant from no load to full load. This is because
- Core flux remains constant**

- b) Leakage flux remains constant
c) Both a) and b)
d) Neither a) nor b)
23. In a power transformer, if in place of sinusoidal wave, a peaked wave voltage is fed to the primary
- a) copper losses will be less
b) Noise level will be reduced
c) **Iron losses will be more**
d) Iron losses will be less
24. The full-load copper loss and iron loss of a transformer are 6,400 W and 5,000 W respectively. The copper loss and iron loss at half load will be, respectively.
- a) 3,200 W and 2,500 W
b) 3,200 W and 5,200 W
c) 1,600 W and 1,250 W
d) **1,600 W and 5,000 W**
25. The efficiency of a power transformer can be determined indirectly by
- a) open-circuit test alone
b) short-circuit test alone
c) **open-circuit and short-circuit tests**
d) Back-to-back test
26. The transformer efficiency at relatively light loads is quite low. This is due to
- a) small copper losses
b) small secondary output
c) **high fixed loss in comparison to the output**
d) poor power factor
27. Transformer will operate at maximum efficiency when
- a) hysteresis loss = eddy current loss
b) Eddy current loss = copper loss
c) **Copper loss = iron loss**
d) Hysteresis loss = copper loss
28. The transformer efficiency will be maximum at a power factor of
- a) **0.8 lead, unity**
b) Unity
c) 0.8 lag
d) 0.5 lag or lead
29. In a transformer, if the iron losses and copper losses are 40.5 kW and 50 kW respectively, then at what fraction of load will be efficiency by maximum?
- a) 0.80
b) 0.57
c) 0.70
d) **0.90**
30. A 50 kVA transformer has a core loss of 500W and full load core loss of 900 W. The load at which the efficiency is maximum is
- a) 27.45 kVA
b) **37.75 kVA**
c) 45.5 kVA
d) 47.5 kVA
31. What is load at which maximum efficiency occurs in case of a 100 kVA transformer with iron loss of 1kW and full-load copper loss of 2kW?
- a) 100 kVA
b) **70.7 kVA**
c) 50.5 kVA
d) 25.2 kVA
32. A 500 kVA transformer has constant loss of 500 W and copper losses at full load are 2,000 W. Then at what load, is the efficiency?
- a) **250 kVA**
b) 500 kVA
c) 1000 kVA
d) 125 kVA
33. A 4 kVA transformer has iron-loss of 200 W and full load copper loss of 200 W. The maximum efficiency at unity power factor will be

- a) **90.9%**
b) 85.6%
c) 80.6%
d) 70.9%
34. When a transformer operates under no load conditions, the current
- a) **will lag the applied voltage by 75°**
b) will lag the applied voltage by about 90°
c) will lead the applied voltage by about 90°
d) will be in phase with the applied voltage
35. The regulation of a good transformer should be near
- a) **1%**
b) 10%
c) 50%
d) 100%
36. The efficiency of power transformer is around _____.
- a) 50%
b) 60%
c) 80%
d) **95%**
37. Silicon steel used in transformer core lamination mainly reduces to
- a) Copper loss
b) Eddy current loss
c) **Hysteresis loss**
d) All of them
38. The magnetizing current of a transformer is usually small because it has
- a) **laminated silicon steel core**
b) small airgap
c) Fewer rating parts
d) Large leakage flux
39. The voltage regulation of a transformer, at full load 0.85pF lagging is
- 5%. Its voltage regulation at full load 0.85 pF leading will be
- a) Positive
b) Negative
c) Same
d) **Reduce and may even become negative**
40. Power input to a transformer at no load and rated voltage consists of
- a) Eddy current loss
b) Hysteresis loss
c) Copper loss
d) **Core loss**
41. A 1 mA ammeter has a resistance as 100Ω . It is to be converted to a 1 A ammeter. The value of shunt resistance is
- a) 0.001Ω
b) **0.1001Ω**
c) 100000Ω
d) 100Ω
42. During short circuit test the core losses are negligible. This is because
- a) **The voltage applied across the high voltage side is a fraction of its rated voltage and so is the mutual flux.**
b) The current on the low voltage side is very small
c) The power factor is high
d) Iron becomes fully saturated
43. The efficiency of a power transformer at relatively light loads is quite low. This is due to
- a) Small copper losses
b) Small secondary output
c) **High fixed loss in comparison to the output**
d) Poor power factor

44. A transformer has negative voltage regulation when its load power factor is

- a) Zero
- b) Leading
- c) Unity
- d) Lagging

45. The essential condition for parallel operation of two single phase transformer is that they should have the same

- a) voltage ratio
- b) kVA rating
- c) Polarity
- d) Percentage impedance

46. A 2 KVA transformer has iron loss of 150 W and full load copper loss of 250 W. The maximum efficiency of the transformer would when the total loss is

- a) 500 W
- b) 400 W
- c) 300 W
- d) 100 W

47. In the parallel operation of transformers, which statement is false

- a) Transformers transformation ratios same
- b) Transformers voltage ratings same
- c) Transformers kVA ratings equal
- d) None of the above

48. Two 3- ϕ transformer cannot be operated in parallel if their

- a) reduced to 1/4
- b) reduced to 1/8
- c) % impedance are different
- d) Voltage ratios are different

49. In open circuit test V_1 is applied voltage I_0 is no-load current and $\cos \phi_0$ is no load power factor then iron loss is given by

- a) $V_1 I_0 \cos \phi_0$

- b) $V_0 I_0$
- c) $V_1 I_0 \sin$
- d) None of them

50. When the transformer core is made of copper, which of the following loss will be more?

- a) Copper loss
- b) Hysteresis loss
- c) Thermal loss
- d) Eddy current loss

51. The difference the indicating value and there true value of a quantity is

- a) Gross error
- b) Absolute error
- c) Dynamic error
- d) Relative error

[HPSSC-JE-2015]

52. Which one of the following meters is an integrating type instruments?

- a) Ammeter
- b) Voltmeter
- c) Wattmeter
- d) Energy meter

[HPSSC-JE-2015]

53. Which bridge is used to determine frequency?

- a) Anderson bridge
- b) De-sauty bridge
- c) Wein bridge
- d) Campbell bridge

[HPSSC-JE-2015]

54. In rotating electrical machines, the insulation temperature limit for class B type is

- a) 105°C
- b) 130°C
- c) 150°C
- d) 180°C

[HPSSC-JE-2015]

55. Which of the following need the highest level of illumination?

- a) Living Room
- b) Kitchen
- c) **Proof reading**
- d) Hospital wards

[HPSSC-JE-2015]

56. Long distance railways operated on

- a) 600 V dc
- b) **25 kV single-phase AC**
- c) 25 kV three-phase AC
- d) 15 kV three-phase AC

[HPSSC-JE-2015]

57. The least expensive drive is

- a) **Belt drive**
- b) Rope drive
- c) Chain drive
- d) Gear drive

[HPSSC-JE-2015]

58. Cooling of transformers is necessary to

- a) Increase the efficiency
- b) **Dissipate the heat generated in the windings**
- c) Reduce the losses
- d) Reduce humming

[HPSSC-JE-2015]

59. A 400V, 50-Hz three phase induction motor rotates at 1440 rpm on full-load.

The motor is wound for

- a) 2-poles
- b) **4-poles**
- c) 6-poles
- d) 8-poles

[HPSSC-JE-2015]

60. The relation between synchronous speed, stator supply frequency and stator number of poles of a three phase induction motor is given by

- a) $N_s = P/120f$

b) $f = 120N_s/P$

c) $f = P.N_s/120$

d) $N_s = 120P/f$

[HPSSC-JE-2015]

61. Torque developed by three phase, 400 V induction motor is 100 N-m. If the applied voltage is reduced to 200 V, the developed torque will be

- a) 50 N-m
- b) **25 N-m**
- c) 200 N-m
- d) 62.5 N-m

[HPSSC-JE-2015]

62. For a three phase induction motor having rotor circuit resistance of 6 ohm, maximum torque occurs at a slip of 0.6. The value of standstill rotor circuit reactance is

- a) 4.44 ohm
- b) 0.36 ohm
- c) 1 ohm
- d) **10 ohm**

[HPSSC-JE-2015]

63. The phenomenon of squirrel cage motors some time showing a tendency to run at a very low speed is known as

- a) Cogging
- b) **Crawling**
- c) Damping
- d) Skewing

[HPSSC-JE-2015]

64. A commercial alternator has

- a) Rotating armature and stationary field
- b) **Stationary armature and rotating field**
- c) Both armature and field rotating
- d) Both armature and field stationary

[HPSSC-JE-2015]

65. In alternator damper windings are used to

- a) Reduce eddy current loss
- b) **Prevent hunting**
- c) Make the rotor dynamically balanced
- d) Reduced armature reaction

[HPSSC-JE-2015]

66. Pitch factor for 5/6 short pitch coil is

- a) **0.966**
- b) 0.833
- c) 1.0
- d) 3.454

[HPSSC-JE-2015]

67. Armature Reaction in a electrical machine is the effect of:

- a) **Armature flux on the main field flux**
- b) Heat produced on the armature windings
- c) Armature current on the output
- d) Armature flux on the output

[HPSSC-JE-2015]

68. The speed regulation of a Synchronous motor is

- a) Unity
- b) **Zero**
- c) Infinity
- d) Always less than one

[HPSSC-JE-2015]

69. The direction of the rotation of an ordinary shaded pole single phase induction motor

- a) Can be reversed by reversing the supply terminal connections to the stator winding
- b) **Cannot be reversed**
- c) Can be reversed by open circuiting the shading rings

d) Can be reversed by short circuiting the shading rings

[HPSSC-JE-2015]

70. A D.C. series motor when connection across an A.C. supply will

- a) **Develop torque in the same direction**
- b) Not develop any torque
- c) Draw dangerously high current
- d) Develop a pulsating torque

[HPSSC-JE-2015]

71. The armature of a D.C. machine is made up of laminated sheets to

- a) Reduce hysteresis loss
- b) **Reduce eddy current loss**
- c) Reduce armature copper loss
- d) Increase dissipation of heat from the armature surface

[HPSSC-JE-2015]

72. The function of a brush and commutator arrangement in a d.c. motor

- a) **To produce unidirectional torque**
- b) To produce unidirectional current armature
- c) To help in changing the direction of rotation of armature
- d) To reduce sparking

[HPSSC-JE-2015]

73. The direction of rotation of a dc motor can be reversed

- a) by reversing the connections of both the armature and the field winding with the supply
- b) **by reversing the connections of either the armature or the field winding connection with the supply**
- c) by reducing the field flux
- d) by introducing an extra resistance in the armature circuit

[HPSSC-JE-2015]

74. In overhead lines, we generally use

- a) copper condenser
- b) ACSR conductor**
- c) Aluminium conductor
- d) None of the above

[HPSSC-JE-2015]

75. Which of the following motor is used in household refrigerators?

- a) A.C. series motor
- b) D.C. shunt motor
- c) Reluctance motor
- d) Single phase induction motor**

[HPSSC-JE-2015]

76. Voltage regulators are used to _____ the voltage.

- a) Increase
- b) Stabilize**
- c) Decrease
- d) None of the above

[HPSSC-JE-2015]

77. The direct current system employed for train ways operates on

- a) 3000 V
- b) 1500 V
- c) 750 V**
- d) 440 V

[HPSSC-JE-2015]

78. The unit of retentivity is

- a) Ampere-turn
- b) Weber
- c) Ampere turns/meter
- d) Weber/meter square**

[HPSSC-JE-2015]

79. Which material has least specific resistance?

- a) Mercury
- b) Zinc
- c) Copper**
- d) Lead

[HPSSC-JE-2015]

80. In an a.c. circuit M.I. meters measure

- a) Mean value
- b) Peak value
- c) r.m.s. value**
- d) average value

[HPSSC-JE-2015]

81. Economizer are used to heat

- a) air
- b) steam
- c) feed water**
- d) none

[HPSSC-JE-2015]

82. Thermocouple works on

- a) Thomson Effect
- b) Seebeck Effect**
- c) Peltier Effect
- d) Joule Effect

[HPSSC-JE-2015]

83. What is usually more in induction heating process

- a) Frequency**
- b) Voltage
- c) Current
- d) Phase angle

[UPPCL-JE-2015]

84. For what speed of alternators are the cylindrical pole type rotors used?

- a) 150 to 300 rpm
- b) 1500 to 3000 rpm**
- c) 300 to 1000 rpm
- d) 3000 to 6000 rpm

[UPPCL-JE-2015]

85. Which of the following is not a starting method of an induction motor?

- a) Direct online starter
- b) Auto ignition starter**
- c) Auto transformer starter
- d) Rheostatic starter

[UPPCL-JE-2015]

86. On increasing load, the speed of synchronous motor

- a) Becomes infinity
- b) Decreases
- c) **Remains constant**
- d) Increases

[UPPCL-JE-2015]

87. In a circuit two 9 ohms resistance are connected in series to a parallel combination of two 2 ohms resistances. If the supply voltage is 38 V. What will be the value of current in the circuit?

- a) **2 A**
- b) 0.5 A
- c) 38 A
- d) 19 A

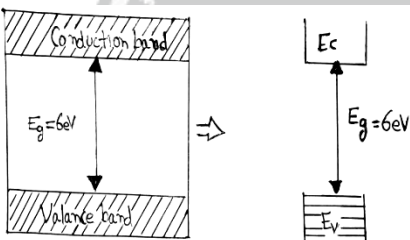
[UPPCL-JE-2015]

88. The efficiency of a DC motor is given by:

- a) $BHP \times 735.5 EI$
- b) $BHP / 735.5$
- c) $735.5 / EI$
- d) **EI / V**

[UPPCL-JE-2015]

89. What does the following picture depict?



- a) Superconductor
- b) Conductor
- c) **Insulator**
- d) Semiconductor

[UPPCL-JE-2015]

90. How can the emf of an alternator be increased?

- a) By reducing voltage

- b) By increasing the quantity of resistance
- c) By introducing capacitor
- d) **By increasing flux**

[UPPCL-JE-2015]

91. In hydel plants, which of the following components removes excess water from the water sources?

- a) Surge tank
- b) **Tail race**
- c) Penstock
- d) Head race

[UPPCL-JE-2015]

92. In a condition of developing arc on carbon brushes

- a) Decreases load
- b) Test the starter
- c) Check the line voltage
- d) **Clean the commutator**

[UPPCL-JE-2015]

93. What is the value of AC supply frequency in India?

- a) **50 Hz**
- b) 40 Hz
- c) 45 Hz
- d) 60 Hz

[UPPCL-JE-2015]

94. In comparison to overhead transmission, in underground systems.

- a) Voltage loss is less
- b) **Value of charged current is less**
- c) Fault correction is easier
- d) Initial cost of the system is low

[UPPCL-JE-2015]

95. Derived armature current from the DC Motor is proportional to

- a) Motor's speed
- b) Planted voltage
- c) **Required torque**
- d) Required mass

[UPPCL-JE-2015]

96. The unit of low pressure (vacuum)

- a) mH
- b) Farad
- c) **Micron**
- d) None of these

[UPPCL-JE-2015]

97. In a Semiconductor the unit of diffusion constant upon mobility is (D/μ).

- a) **volt**
- b) 1/volt
- c) meter²/volt-s
- d) ampere

[UPPCL-JE-2015]

98. Which of the following motors does not have variable speed?

- a) DC compound motor
- b) **DC shunt motor**
- c) DC differential motor
- d) DC series motor

[UPPCL-JE-2015]

99. A shading ring in a shaded pole motor is meant for:

- a) **Producing rotating magnetic field**
- b) Reducing friction losses
- c) Reducing noise in motor
- d) Changing the direction of revolution

[UPPCL-JE-2015]

100. Synchronous speed of a motor is 480 rpm. When the supply frequency is 60 Hz.

What will be the number of poles?

- a) **15**
- b) 18
- c) 10
- d) 12

[UPPCL-JE-2015]