

**WRITTEN TEST FOR THE POST OF TECHNICAL ASSISTANT (ELECTRICAL) - 2019*****Total Questions: 90 Nos.***

1. According to Kirchhoff's voltage law, the algebraic sum of all IR drops and EMFs in any closed loop of a network is always
  - (a) Negative
  - (b) Positive
  - (c) Zero
  - (d) Determined by EMFs of the batteries
  
2. Lower the self-inductance of a coil
  - (a) More will be the weber-turns
  - (b) More will be the emf induced
  - (c) Smaller the delay in establishing steady current through it.
  - (d) None of the above
  
3. Unit of Magnetic Motive Force (MMF) is?
  - (a) AT
  - (b) Weber/ampere
  - (c) Henry
  - (d) AT/m
  
4. In a centre tap full wave rectifier, 100 V is the peak voltage between the centre tap and one end of the secondary. What is the maximum voltage across the reverse biased diode?
  - (a) 200 V
  - (b) 141 V
  - (c) 100 V
  - (d) 86 V
  
5. A wattmeter is marked 30A/ 60A, 300 V/ 600V and its scale is marked up to 4500 Watts. When the meter is connected for 60A, 600 V, the point indicated is 2000 Watts. The actual power in the circuit is?
  - (a) 4000 Watts
  - (b) 8000 Watts
  - (c) 12000 Watts
  - (d) 16000 Watts
  
6. A geyser is operated from 230 V, 50 Hz mains. The frequency of instantaneous power consumed by the geyser is?
  - (a) 25 Hz
  - (b) 50 Hz
  - (c) 100 Hz
  - (d) 150 Hz

7. The energy stored in the magnetic field of a solenoid 100cm long and 10 cm diameter with 2000 turns of wire carrying current of 20A is ? Let relative permeability of core  $\mu_r = 1$ .
- (a) 0.0789 J
  - (b) 0.789 J
  - (c) 7.890 J
  - (d) 78.90 J
8. The mutual inductance between two unity coupled coils 16H and 4H will be?
- (a) 20 H
  - (b) 64 H
  - (c) 8 H
  - (d) 12 H
9. Four resistances  $2\Omega$ ,  $4\Omega$ ,  $5\Omega$ ,  $20\Omega$  are connected in parallel. Their combined resistances is?
- (a)  $1\Omega$
  - (b)  $2\Omega$
  - (c)  $4\Omega$
  - (d)  $5\Omega$
10. Energy stored in an inductor is given by
- (a)  $\frac{1}{\sqrt{2}}(LI)^2$
  - (b)  $\frac{1}{2}L^2I$
  - (c)  $\frac{1}{\sqrt{LI}}$
  - (d)  $\frac{1}{2}LI^2$
11. If the load on a DC Shunt motor is increased, decrease in back EMF is primarily due to
- (a) Increase in its flux
  - (b) Decrease in speed
  - (c) Increase in armature current
  - (d) Decrease in drop across brush
12. A transformer provides a path for magnetic flux of
- (a) High Conductivity
  - (b) High Reluctance
  - (c) Low Reluctance
  - (d) Low Conductivity

13. In power transformer, breather is used to
- (a) Extract moisture from air
  - (b) Take insulating oil from the conservator
  - (c) Provide cooling to the windings
  - (d) Provide insulation to the windings
14. If a 500kVA, 200Hz transformer is operated at 50Hz, its KVA rating will be?
- (a) 2000kVA
  - (b) 125kVA
  - (c) 250KVA
  - (d) 1000kVA
15. In a double cage induction motor, the inner cage has?
- (a) Low R and Low X
  - (b) Low R and High X
  - (c) High R and High X
  - (d) High R and Low X
16. The starting torque of a 3-phase induction motor varies as?
- (a)  $V^2$
  - (b)  $V$
  - (c)  $\sqrt{V}$
  - (d)  $\frac{1}{V}$
17. The armature reaction of an alternator will be cross-magnetising if the power factor of the load is?
- (a) Leading
  - (b) Lagging
  - (c) Unity
  - (d) More than unity
18. A 8 pole, 30 Hz alternator is directly coupled to and is driven by 60Hz synchronous motor then the number of poles in a synchronous motor is?
- (a) 16 poles
  - (b) 24 poles
  - (c) 8 poles
  - (d) None of the above
19. Equal area criterion is used to find?
- (a) Solution of swing equation
  - (b) Critical reclosure time
  - (c) Change in frequency errors
  - (d) Change in velocity errors.

20. If torque angle increases infinitely, the system will show
- (a) Stability
  - (b) Instability
  - (c) Steady state stability
  - (d) None of the above
21. An energy meter having a meter constant of 1200 revolutions per kWh is found to make 5 revolutions in 75 seconds. The load power is?
- (a) 500 W
  - (b) 100 W
  - (c) 200 W
  - (d) 1000 W
22. What is the waveform of current flowing through the diode in a buck-boost converter?
- (a) Square Wave
  - (b) Triangular Wave
  - (c) Trapezoidal Wave
  - (d) Sinusoidal Wave
23. Two single phase AC motors A and B operate from a 1000V supply. A consumes 2kW at a power factor of 0.8 (lag) and B consumes 1kW at a power factor of 0.5 (lag). The total current drawn from the supply is?
- (a) 4.5A
  - (b) 2.1A
  - (c) 4.41A
  - (d) 9A
24. The maximum demand of a consumer is 2 kW and his daily energy consumption is 20 units. The load factor is?
- (a) 21%
  - (b) 1015%
  - (c) 41.6%
  - (d) 50%
25. Critical voltage limit of a transmission line is increased by
- (a) Increasing the radius of the conductors
  - (b) Increasing the spacing between conductors
  - (c) Reducing the spacing between conductors
  - (d) Reducing the radius of the conductors

26. A current  $i = (5 + 16\sin(t))$  ampere is passed through an ideal moving iron type ammeter. Its reading will be?
- (a) Zero
  - (b) 10 A
  - (c)  $\sqrt{153}$  A
  - (d)  $\sqrt{140}$  A
27. Two generators each of capacity 10MVA and reactance 10% are feeding a common bus bar. A transmission line of reactance 5% is connected with the bus bar to transmit power to the consumer end. The contribution of each generator to a three phase fault at the consumer end is ? Let all impedances are calculated on 10MVA base.
- (a) 100MVA
  - (b) 50MVA
  - (c) 300MVA
  - (d) 200MVA
28. The voltage appearing across the contacts after opening of the circuit breaker is called ?
- (a) Surge voltage
  - (b) Recovery Voltage
  - (c) Arc voltage
  - (d) Open voltage
29. Time interval from instant of contact separation to time of arc extinction is called?
- (a) Closing time
  - (b) Opening time
  - (c) Arcing time
  - (d) None of the above
30. A 3-phase breaker is rated at 1000MVA, 11kV, its making current will be?
- (a) 52kA
  - (b) 49kA
  - (c) 70kA
  - (d) 133kA
31. Two wires A and B have the same cross section and are made of same material.  $R_A = 800\Omega$  and  $R_B = 100\Omega$ . The number of times A is longer than B is?
- (a) 5
  - (b) 8
  - (c) 2
  - (d) 4

32. If gain of the critically damped system is increased, the system will behave as?
- (a) Under damped
  - (b) Over damped
  - (c) Critically damped
  - (d) Oscillatory
33. Regarding power transfer capacity of bundled conductor system and parallel circuit system, which among the following statement is correct, considering all other parameter of conductor as same.
- (a) Power transfer capacity of bundled conductor system is more than parallel circuit system
  - (b) Power transfer capacity of bundled conductor system is less than parallel circuit system
  - (c) Power transfer capacity of bundled conductor system is equal to parallel circuit system
  - (d) Insufficient information
34. If sending and receiving end voltages of a transmission line are 220kV and reactance of transmission line is  $20\Omega$  and power angle is  $45^\circ$ . Then the active power flowing through the transmission line is :
- (a) 1711 MW
  - (b) 171 MW
  - (c) 78 MW
  - (d) 8 MW
35. A series circuit includes  $R=9\Omega$ ,  $X_L= 8 \Omega$ ,  $X_c= 8 \Omega$ . The total impedance is?
- (a)  $8 \Omega$
  - (b)  $9 \Omega$
  - (c)  $25 \Omega$
  - (d)  $5 \Omega$
36. An Alternator is delivering rated current at rated voltage and 0.8 power factor lagging. If it is required to deliver rated current at rated voltage and 0.8 power factor leading with the same load, the required excitation will be?
- (a) Less
  - (b) More
  - (c) The same
  - (d) None of the above
37. During light loads, the transformer efficiency is low because?
- (a) Secondary output is low
  - (b) Copper losses are high
  - (c) Fixed loss is high in proportion to the output
  - (d) Copper loss is small

38. If number of turns in the primary winding of transformer increases, what will be the effect in secondary emf?
- (a) Secondary induced emf will be increased
  - (b) Secondary induced emf will remain unchanged
  - (c) Secondary induced emf will be reduced
  - (d) None of the above
39. The synchronous speed of a four pole alternator at power frequency of 50Hz will be?
- (a) 3600 rpm
  - (b) 3300 rpm
  - (c) 3000 rpm
  - (d) 1500 rpm
40. Three capacitors of values  $6\mu\text{F}$ ,  $12\mu\text{F}$  and  $24\mu\text{F}$  are connected in series, the total capacitance will be?
- (a)  $24/7 \mu\text{F}$
  - (b)  $7/24 \mu\text{F}$
  - (c)  $24 \mu\text{F}$
  - (d)  $42 \mu\text{F}$
41. Which method can be used for absolute measurement of resistance?
- (a) Lorentz Method
  - (b) Kelvin's Double Bridge Method
  - (c) Substitution Method
  - (d) Wheatstone Bridge Method
42. One Newton-metre is same as
- (a) One Watt
  - (b) One Joule
  - (c) Five Joules
  - (d) One Joule-second
43. The EMF generated by a shunt-wound DC generator is E. If the pole flux is kept constant and the speed of generator is doubled, the EMF generated will be?
- (a)  $E/2$
  - (b)  $2E$
  - (c) Less than E
  - (d) E

44. Power-angle equation of synchronous machine is the equation between :
- (a) Electrical power generated to the angular displacement of the rotor
  - (b) Mechanical power generated to angular displacement of rotor
  - (c) Electrical power generated to the angular displacement of stator windings
  - (d) Mechanical power generated to angular displacement of stator windings
45. When does maximum power transfer happen from source to load?
- (a) When there is negligible source resistance
  - (b) When source resistance is less than load resistance
  - (c) When source resistance is greater than load resistance
  - (d) When source resistance is equal to load resistance
46. The condition of fluid electrolyte in a battery is measured in terms of?
- (a) Current value
  - (b) Specific gravity
  - (c) Acid contents
  - (d) Voltage output
47. Total flux density of magnetic core is?
- (a)  $\frac{Flux}{Area}$
  - (b)  $\frac{Volume}{Flux}$
  - (c)  $\frac{Flux}{Volume}$
  - (d)  $\frac{Flux}{Length}$
48. In three-phase induction motors sometimes copper bars are placed deep inside the rotor to?
- (a) Improve starting torque
  - (b) Reduce copper losses
  - (c) Improve efficiency
  - (d) Improve power factor
49. The output voltage of an operational amplifier is?
- (a)  $90^\circ$  out of phase from the input
  - (b)  $180^\circ$  out of phase from the input
  - (c)  $45^\circ$  out of phase from the input
  - (d)  $-90^\circ$  out of phase from the input



50. The apparent power drawn by an AC circuit is 10kVA and active power drawn is 8kW. The reactive power in the circuit is?
- (a) 4 kVAR
  - (b) 6 kVAR
  - (c) 8 kVAR
  - (d) 16 kVAR
51. Two DC Generators A and B have 6 poles each. Generator A has wave wound armature while Generator B has lap wound armature. The ratio of the induced emf of Generator A and B will be?
- (a) 2:3
  - (b) 3:2
  - (c) 3:1
  - (d) 1:4
52. Which of the following parameters can be neglected for modelling a short transmission line?
- (a) Inductance
  - (b) Resistance
  - (c) Reactance
  - (d) Capacitance
53. Current flows into a junction along two paths, one path current is 4A and other path current is 3 A. The total current out of the junction is?
- (a) 1A
  - (b) 7A
  - (c) 4A
  - (d) None of the above
54. Five light bulbs are connected in parallel across 110V. Each bulb is rated at 200W. The current through each bulb is approximately?
- (a) 2.2A
  - (b) 13.7mA
  - (c) 1.8A
  - (d) 9.09A
55. The unit of luminous flux is?
- (a) Steradian
  - (b) Candela
  - (c) Lumen
  - (d) Lux

56. The length of wire having resistance of  $1\Omega/m$  in a heater rated at  $1000W$  and  $250V$  will be?
- (a) 250m
  - (b) 125m
  - (c) 62.5m
  - (d) 500m
57. An RLC series circuit has a resistance of  $R$  of  $20\Omega$  and a current which lags behind the applied voltage by  $45^\circ$ . If the voltage across the inductor is twice the voltage across the capacitor, what is the value of inductive reactance?
- (a)  $10\Omega$
  - (b)  $20\Omega$
  - (c)  $40\Omega$
  - (d)  $60\Omega$
58. A  $3\mu F$  capacitor is charged by a constant current of  $2\mu A$  for 6 seconds. The voltage across the capacitor at the end of charging will be?
- (a) 3V
  - (b) 4V
  - (c) 6V
  - (d) 9V
59. A reactive power of 100 VAR is drawn by a  $10\mu F$  capacitor due to a current of 0.87A. Calculate the frequency?
- (a) 50Hz
  - (b) 100Hz
  - (c) 160Hz
  - (d) 120Hz
60. ASCII Code is a
- (a) 5 bit Code
  - (b) 7 bit Code
  - (c) 9 bit Code
  - (d) 11 bit Code
61. Decimal equivalent of Hexa decimal number BF0 is?
- (a) 4028
  - (b) 3116
  - (c) 4258
  - (d) 3056

62. The output of EX-OR gate with A & B as input is?
- $AB + \overline{A}\overline{B}$
  - $(A+B)(\overline{A} + \overline{B})$
  - $(A+B)\overline{A}\overline{B}$
  - $\overline{A} + \overline{B} + AB$
63. The nature of molecular bonding in Germanium is?
- Ionic
  - Covalent
  - Metallic
  - Vander waal type
64. Which one of the following will serve as a donor impurity in silicon?
- Boron
  - Indium
  - Germanium
  - Antimony
65. What is the reverse recovery time of a diode when switched from forward bias  $V_F$  to reverse bias  $V_R$ ?
- Time taken to remove stored minority carriers
  - Time taken by diode voltage to attain zero value
  - Time taken to bring the diode voltage to reverse bias  $V_R$
  - Time taken by the diode current to reverse
66. Schottky diode is used for?
- Display panels
  - Voltage regulators
  - High frequency switching
  - None of the above
67. In an open circuited P-N Junction diode, space charge density at the junction is?
- Maximum
  - Negative
  - Positive
  - Zero
68. The overall bandwidth of two identical voltage amplifiers connected in cascade will?
- Remain the same as single stage
  - Reduces than that of single stage
  - Increases than that of single stage
  - None of the above

69. An Amplifier without feedback has a gain of 1000, what is the gain with a negative feedback of 0.009?
- (a) 900
  - (b) 10
  - (c) 100
  - (d) 1000
70. For a common collector amplifier, the voltage gain is?
- (a) Less than 1
  - (b) Constant
  - (c) Varies with input voltage
  - (d) None of the above
71. Generally, the gain of transistor falls at high frequencies due to?
- (a) Internal capacitance
  - (b) Coupling capacitor at input
  - (c) Skin effect
  - (d) Coupling capacitance at output
72. Which of the following power stations is mainly used to supply peak load on the system?
- (a) Coal based thermal power plant
  - (b) Nuclear power plant
  - (c) Gas based thermal power plant
  - (d) Pumped storage hydro power plant
73. Nuclear power plants chain reaction is controlled by?
- (a) Iron rods
  - (b) Cadmium rods
  - (c) Graphite rods
  - (d) Brass rods
74. For harnessing low variable water heads, the suitable hydraulic turbine is?
- (a) Francis
  - (b) Impeller
  - (c) Kaplan
  - (d) Pelton
75. One million Cubic meter of water is stored in a reservoir feeding a water turbine. The density of water is  $1000\text{kg/m}^3$ . If the centre of mass of water is 50m above the turbine and losses are negligible, the energy produced by the volume of water is?
- (a) 130 MWh
  - (b) 143 MWh
  - (c) 136 MWh
  - (d) 144 MWh

76. Most suitable device for high frequency inversion in SMPS is?
- (a) BJT
  - (b) IGBT
  - (c) MOSFET
  - (d) GTO
77. Turn ON and turn OFF time of a transistor depends on?
- (a) Static Characteristics
  - (b) Junction Capacitance
  - (c) Current gain
  - (d) None of the above
78. A semiconductor device which has combined characteristics of BJT & MOSFET is?
- (a) GTO
  - (b) FET
  - (c) IGBT
  - (d) None of the above
79. The insulation level of EHV lines is designed based on?
- (a) Lightning
  - (b) Corona
  - (c) Radio Interference
  - (d) Switching voltage
80. Galloping of transmission line conductors arises generally due to?
- (a) Asymmetrical layers of ice formation
  - (b) Vortex phenomenon in light winds
  - (c) Heavy weight of line conductors
  - (d) Adoption of horizontal conductor configuration
81. Shunt Compensation in EHV line is used to improve?
- (a) Stability & fault level
  - (b) Fault level and voltage profile
  - (c) Voltage profile and stability
  - (d) None of the above
82. Power transmission lines are transposed to reduce?
- (a) Skin effect
  - (b) Ferranti effect
  - (c) Transmission loss
  - (d) Interference with adjacent communication lines

83. The number of disc insulators in string of insulators for 400kV AC overhead transmission lines lies in the range of?
- (a) 32 to 33
  - (b) 22 to 23
  - (c) 15 to 16
  - (d) 9 to 10
84. Which of the following act as a protection against high voltage surges due to lightning and switching?
- (a) Breather
  - (b) Conservator
  - (c) Horn gap
  - (d) Thermal overload relay
85. A transformer with percentage resistance and percentage reactance of 1 % and 4 % respectively, calculate voltage regulation at 0.8 pf. lagging and 0.8 pf. leading
- (a) 2.4% & - 0.8%
  - (b) 3.2% & -1.6%
  - (c) 3.2% & -3.2%
  - (d) 4.8% & -1.6%
86. What is the power transferred conductively from primary to secondary of an autotransformer having transformation ratio of 0.8 and supplying a load of 3kW?
- (a) 0.6kW
  - (b) 2.4kW
  - (c) 1.5kW
  - (d) 0.27kW
87. An induction motor when started on load does not accelerate up to full speed but runs at  $\frac{1}{7}$ <sup>th</sup> the rated speed. The motor is said to be?
- (a) Locking
  - (b) Plugging
  - (c) Crawling
  - (d) Cogging
88. What is the frequency of rotor current of a 50Hz induction motor operating at 2% slip?
- (a) 1 Hz
  - (b) 100 Hz
  - (c) 2 Hz
  - (d) 50 Hz

89. Power factor of synchronous motor?
- (a) Increases with increase in excitation
  - (b) Decreases with increase in excitation
  - (c) Constant
  - (d) None of the above
90. What is the highest voltage level at which electrical power is transmitted in India ?
- (a) 765kV
  - (b) 1200kV
  - (c) 400kV
  - (d) 220kV