1. Fire can be extinguished by eliminating
   a. Flashing point
   b. Ignition temperature
   c. Explosive range
   d. All of the above
   e. Engulfing away from oxygen

2. Employee shall report any dangerous conditions of the undertaking’s properties, equipment or personnel to their
   a. Co-worker
   b. Superior officer
   c. Both (a) and (b)
   d. None

3. The greatest composition of Dry chemical powder in Fire extinguisher are composed of
   a. Sodium Bicarbonate and other additives
   b. Methane
   c. Both (a) and (b)
   d. None

4. Mouth to mouth procedure of artificial respiration should be repeated about
   a. 10 to 12 times in a min
   b. 30 to 32 times in a min
   c. 50 to 52 times in a min
   d. 1 to 2 times in a min

5. Which type of tower is NOT called as Tension tower/section tower?
   a. Type A
   b. Type B
   c. Type C
   d. Type D

6. Tower footing resistance in EHV should not exceed ______ ohms.
   a. 0.5
   b. 1
   c. 5
   d. 10

7. Which one of these is an environmental factor which causes accident at site?
   a. Lack of vision
   b. Insufficient light
   c. Improper temporary structure arrangements
8. All the accident cases to be informed by Section In charge/Engineer to Project safety head within _________ of accident.
   a. 15 min
   b. 30 min
   c. 45 min
   d. 60 min

9. For extinguishing flammable gas and live Electrical equipment, the class of fire extinguisher used is ________
   a. Class A
   b. Class B
   c. Class C
   d. Class D

10. Which type of tower is suitable for a deviation of 0 degree to 2 degree?
    a. A type
    b. B type
    c. C type
    d. D type

11. Transmission Company must carry out periodical review of
    a. Line Losses
    b. Overloaded Transformer
    c. Revenue collection
    d. All of the above

12. A 3-phase 4-wire system is commonly used for ____________
    a. Primary Transmission
    b. Secondary Transmission
    c. Primary Distribution
    d. Secondary Distribution

13. A 3-phase 3 wire system is commonly used for ____________
    a. Primary Transmission
    b. Secondary Transmission
    c. Primary Distribution
    d. Secondary Distribution

14. What is the minimum distance to construct a house etc., from the EHV Line?
    a. 5 metres from EHV
    b. 6 metres from EHV
    c. 7 metres from EHV
    d. 8 metres from EHV

15. A DD type 765 kV single circuit Quad tower weight is app. ____________
    a. 37 MT
    b. 23 MT
    c. 21 MT
    d. 17 MT

16. A DA type 400kV Double circuit Quad tower weight is ____________
    a. 22 MT
    b. 43 MT
    c. 32 MT
d. 19 MT

17. Basic Wind speed in wind zone IV is _____________
   a. 45 m/sec
   b. 47 m/sec
   c. 49 m/sec
   d. 53 m/sec

18. 55 m/sec wind speed can be observed in wind zone ________________
   a. III
   b. IV
   c. V
   d. VI

19. Which tower has broader footprint than any other tower?
   a. Transposition Tower
   b. Tension Tower
   c. Highway Crossing Tower
   d. Guyed Tower

20. Guys shall be at a slope of _______________
   a. 0 to 30 degrees
   b. 15 to 45 degrees
   c. 30 to 60 degrees
   d. 45 to 75 degrees

21. Very purpose of transposition tower is
   a. reduce voltage level
   b. balance voltage level
   c. reduce mutual coupling
   d. a & c above
   e. b & c above

22. Primary Transmission of Power is
   a. 66/132 kV
   b. 11/22 kV
   c. 132/220/400/765 kV
   d. 11/0.415 V

23. What does severity of shock depends upon?
   a. Path of current through the body
   b. Amount of current flowing through the body
   c. Duration of the shocking current through the body
   d. b & c above
   e. All of the above

24. Which zone is the hottest part of a tower structure/ flame?
   a. Outer Zone
   b. Innermost Zone
   c. Middle Zone
   d. All of the above
   e. None of the above

25. What is the responsibility of a transmission tower?
   a. support the heavy conductor
b. provide electrical isolations among the equipment  
c. provide sufficient ground clearance  
d. all of the above  

26. CEA Gazette Notification includes  
   a. Handling of electric supply lines and apparatus  
   b. Provision applicable to protective equipment  
   c. Clearances between ground and overhead line  
   d. All of the above  

27. The safety gloves can be made up of  
   a. Neoprene rubber  
   b. Plastic  
   c. lather  
   d. All of the above  

28. Why do people behave unsafe?  
   a. Overconfidence  
   b. Personal Problem  
   c. Lack of Knowledge  
   d. All of the above  
   e. A ^ c above  

29. Assistant Technician – Erection power Transmission reports to  
   a. Engineer  
   b. Assistant Manager  
   c. Site Engineer  
   d. Supervisor  

30. Bulk power Transmission lines connects ___________  
   a. Generating station to a switching station / step down transformer station.  
   b. Step down transformer station to service transformer banks  
   c. Distribution transformer to consumer premises  
   d. Service points to consumer premises  

31. Configuration of transmission tower depends on  
   a. The length of the insulator assembly  
   b. The minimum clearances to be maintained between conductors and between conductor and tower  
   c. The location of ground wire or wires with respect to the outermost conductor  
   d. All of the above  

32. Tower erection work shall be taken up only after concreting is cured and set for minimum_________  
   a. 7 days  
   b. 14 days  
   c. 21 days  
   d. 30 days  

33. Which one of these is a transient load?  
   a. Wind loads on structure and lines  
   b. Stringing loads caused by ice shedding  
   c. Earthquakes  
   d. Horizontal loads because of all line angle
34. A ________ is a tool consisting of a metal bar with a single curved end and flattened points.
   a. Pulley
   b. Crowbar
   c. Spanner
   d. Derrick Pole

35. Which one of these equipment is NOT used for lifting and pulling equipment?
   a. Tirfor
   b. Engine Wrench
   c. Pulley
   d. Gin Pole

36. Authorised person to issue permit in a substation is
   a. Shift engineer or operation in-charge
   b. All employees working in substation
   c. Both (a) and (b)
   d. None of the above

37. Threaded position of bolt projected outside of nut shall not be less than __________.
   a. 2 mm
   b. 3 mm
   c. 4 mm
   d. 5 mm

38. Which one of the systems gets eliminated in the DC transmission system?
   a. Inductive Effect
   b. Capacitive Effect
   c. Phase displacement
   d. All of these

39. In guyed type tower, guys shall be at a slope of
   a. 15 to 45 degrees
   b. 30 to 60 degrees
   c. 45 to 75 degrees
   d. 60 to 90 degrees

40. Transmission tower is generally made up of?
   a. Mild steel members
   b. High tensile steel members
   c. A & b above
   d. Tubular pipes
   e. all of the above

41. When Corona occurs, which colour of light is produced around the conductor?
   a. Red
   b. Yellow
   c. Blue
   d. Violet

42. Which type of tower is NOT called as Tension tower/section tower?
   a. Type A
   b. Type B
   c. Type C
   d. Type D
43. A power transmission company in India can work under ____________
   a. Government Sector
   b. Private Sector
   c. Either Govt or Private
   d. Neither Govt nor Private
44. Reviewing application for new connection, additional load/demand, etc. is done by
   a. CERC
   b. SERC
   c. Both (a) and (b)
   d. None of the above
   e. State electricity utility/Discom
45. Theft of Electricity fall under section ______________
   a. Section 50
   b. Section 138
   c. Section 139
   d. Section 140
46. A ____________ is a company that has the license to distribute power to consumers at the
tariff fixed by the Electricity Regulatory Commission (ERC).
   a. DISCOM
   b. SERC
   c. CERC
   d. All of the above
47. For galvanized towers in coastal or highly polluted areas, the joints shall be painted with
   ____________ paint on all contact surfaces during the course of erection.
   a. Copper
   b. Zinc
   c. Silver
   d. Aluminium
48. The number of ____________ used on the line depends on the isokeraunic level of the area.
   a. Ground wires
   b. Tower Members
   c. Gin pole for erecting of tower
   d. None of these
49. It is practically impossible to construct an HVDC transmission system with more than
   ____________ substations.
   a. 3
   b. 4
   c. 5
   d. 6
   e. 2
50. The potential stress on the insulator of DC transmission system is about __________ of same
    voltage in AC transmission system.
   a. 50 %
   b. 60 %
   c. 70 %
51. Above 220 kV, ______________ conductors are normally used to reduce corona discharge.
   a. Single
   b. Twin
   c. Bundled
   d. Transposed

52. Welding is done to reduce risk of loosening of nuts due to
   a. Vibrations developed in tower
   b. High winds
   c. Electro mechanical stress
   d. All of the above

53. Pipe type towers are supplied in a single piece or multiples depending upon
   a. Length
   b. Weight
   c. Transportation limitations
   d. All of the above

54. Tower type C under __________ degree deviation limits and with suitable modification shall
   be used for transposition for line maintaining all the required clearances and shielding.
   a. 0
   b. 15
   c. 30
   d. 60

55. The design of __________ tower provides the greatest opportunity for the structural engineer
   to minimize the total weight of steel required.
   a. Angle tower
   b. Transposition Tower
   c. Tangent Tower
   d. None of these

56. In 400kv AC transmission system bundled conductors are kept in horizontal configuration
   with a minimum clearance of __________ meters phase to phase.
   a. 9
   b. 10
   c. 11
   d. 12

57. _______ is a short bar used as a lever to provide torque for tightening a box spanner or key.
   a. Tommy Bar
   b. Sling
   c. Spanner
   d. Torque Wrench

58. The tower members are stored in the tower erection sites by which of these ways?
   a. piling them on top of burnt brick/concrete blocks
   b. piling them on top of scrap wood planks
   c. piling them on tarpaulin
d. All of the above

59. Tower shall be stored in tower site above ground level by ________ cms.
   a. 20
   b. 30
   c. 40
   d. 50

60. Which one of the tower erection process does not use heavy machineries?
   a. Build up method
   b. Section method
   c. Ground Assembly method
   d. Helicrane method

61. The zinc rich paint contains minimum ___________ percent of zinc.
   a. 75
   b. 80
   c. 90
   d. 95

62. Which of the below is a not a conventional power plant?
   a. Thermal Power Plant
   b. Hydel Power Plant
   c. Nuclear Power Plant
   d. Solar power Plant

63. Which one of these is NOT considered as fossil fuel?
   a. Coal
   b. Natural Gas
   c. Bio Gas
   d. Petroleum

64. Basic fundamental of safety are
   a. Cooperation of all co-workers is essential to avoid accident
   b. Accident is the result of unsafe working condition and unsafe work
   c. Use of incomplete or little knowledge is dangerous and may invite accident
   d. All of the above

65. The portion above the top cross arm is called __________ of transmission tower.
   a. Leg
   b. Body
   c. Cage
   d. Peak

66. What is ERP?
   a. Emergency Response Plan
   b. Emergency Required Plan
   c. Emergency Response Priority
   d. Emergency Required Priority

67. Which one of these is a portable ladder?
   a. Plain rung ladder
   b. Roof ladder
   c. Step ladder
68. What is fire buckets filled with?
   a. Clean Dry Sand
   b. Wet Sand
   c. Carbon Dioxide
   d. Water

69. Types of power transmission system are
   a. HVDC
   b. HVAC
   c. EHVAC
   d. All above
   e. a&c above

70. All the accident cases to be informed by Section In charge/Engineer to Project safety head within __________ of accident.
   a. 15 min
   b. 30 min
   c. 45 min
   d. 60 min

71. Time duration of ventricular fibrillation is _______________
   a. 15 - 20 mA
   b. 0 - 5 mA
   c. 20 - 30 mA
   d. 5 – 10 mA

72. Inverters convert ____________
   a. AC to DC
   b. AC to AC
   c. DC to DC
   d. DC to AC

73. How many conductors can be used for DC transmission system?
   a. One
   b. Two
   c. Three
   d. Both (a) and (b)

74. Impedance is a combination of
   a. Resistance and reluctance
   b. Reactance and Conductance
   c. Reactance and Resistance
   d. Resistance and Conductance

75. The portion below the top cross arm is called __________ of transmission tower.
   a. Leg
   b. Body
   c. Cage
   d. Peak

76. Tolerance limit for vertical shall be one in ______mm__
   a. 300
   b. 320
77. In which of the following methods, the complete tower is build or assembled on the ground and then erected with the help of cranes?
   a. Build up method
   b. Section Method
   c. Ground Assembly Method
   d. Helicrane Method

78. In case of Railway crossing towers, _______ no. of earthing per tower shall be provided.
   a. One
   b. Two
   c. Three
   d. More than three

79. For reactive power compensation __________________ cannot be is used.
   a. Inductor
   b. Capacitor
   c. Resistor
   d. Combination of capacitor and inductor

80. When Indian Electricity Act was first amended?
   a. 1910
   b. 1920
   c. 1948
   d. 1950
   e. 2003

81. Which body ensures the development of an efficient, coordinated and economical system of inter-state transmission lines and undertakes inter-state transmission?
   a. CTU
   b. PPP
   c. STU
   d. None of these

82. _______ Wire ropes of suitable size attached to deadment are utilized for guying.
   a. Steel
   b. Polypropylene rope
   c. Fibre
   d. Aluminium

83. Angle towers, also called as tension towers, are used where the lines make a diversion angle greater than ________ degrees.
   a. 2
   b. 5
   c. 10
   d. 15

84. Steel Plates are used at junctions where minimum ________ members are jointed.
   a. 2
   b. 3
   c. 4
   d. 5

85. Which one of these cannot be a tower storing area?
a. Close proximity to rail heads, National Highways.
b. Proximity to urbanisation and towns.
c. Communication facilities
d. Marshy land

86. Which one of the points should be ensured in the store?
   a. Complete fencing of the store yard
   b. Proper lighting
   c. Fire protection equipment.
   d. All of the above

87. Towers are required to be painted on body or top by _________ colour for the purpose of awareness.
   a. Red
   b. Blue
   c. Green
   d. Violet

88. Finely broken coke/charcoal having maximum granular size 25 mm and salt shall be filled in the excavated bore hole in ratio ________________.
   a. 5:1
   b. 10:1
   c. 15:1
   d. 20:1

89. Tower shall be checked for verticality with the help of theodolite in _______ and _________ direction.
   a. Transverse
   b. Longitudinal
   c. Both a and b
   d. None of these

90. The step bolts usually adopted are of ______ diameter and ______ length.
   a. 16 mm and 175 mm
   b. 18 mm and 200 mm
   c. 16 mm and 200 mm
   d. 18 mm and 175 mm

91. The number in number plate is enamelled in _________ on white enamelled background.
   a. Black
   b. Red
   c. Blue
   d. Green

92. The bird guard is made of ________ gauge MS sheet.
   a. 15
   b. 16
   c. 18
   d. 20

93. Portable ladders are normally constructed on which of these materials?
   a. Wood
   b. Aluminium
c. Fibreglass  
d. All of the above

94. A ladder is strongest when it is in ______ position relative to the surface.
   a. 45 degrees  
b. 60 degrees  
c. 75 degrees  
d. 90 degrees

95. Ear protection (ear muffs, earplugs etc.) must be used in areas where the noise level is above ________
   a. 65 dB  
b. 75 dB  
c. 85 dB  
d. 90 dB

96. Who must be present in the site for heavy weight tower construction?
   a. Gang Leader  
b. Authorised supervisor  
c. Any one of a and b  
d. Both a and b

97. Ground clearance of 400 kV AC voltage is ________
   a. 6.1 m  
b. 11.8 m  
c. 8.5 m  
d. 9.0 m

98. Time duration of ventricular fibrillation is ________
   a. 15 - 20 mA  
b. 0 - 5 mA  
c. 20 - 30 mA  
d. 5 – 10 mA

99. ____________ are the most effective means of protecting electrical lines against lightning and switching.
   a. Circuit Breaker  
b. Lightning Arrestor  
c. Isolator  
d. HRC Fuse

100. Severity of shocks depends on
    a. Path of current through the body  
b. Amount of current through the body  
c. Duration of the shocking current through the body  
d. b&c of the above

101. During the rain the porcelain insulators may develop ________.
    a. Hairline cracks  
b. Partial discharge  
c. Either a or b  
d. None
VIVA- 15 Ques

1. How are transmission lines installed in hilly areas?
2. What are the parts of Transmission Line?
3. What is the normal height of the tower in 400kv D/C?
4. What is the minimum distance to construct a house etc. from the EHV Line?
5. What are standard right-of-way widths in 220kv line?
6. Explain factors on which configuration of tower depends?
7. State various types of crossing for transmission tower
8. What is isokeraunic level?
9. Classify Tower based on angle of deviation?
10. Identify parts/zones of Transmission tower

11. Explain importance for consideration of various wind zones with respect to power transmission tower?
12. List different activities in construction of transmission line?
13. List tools required for tower erection?
14. List equipment’s required for tower erection?
15. Identify below mentioned tools.
16. Explain process of tower erection by Build-up method?
17. Explain process of tower erection by section method?
18. List transmission tower accessories installed on tower?
19. Describe tightening and punching?
20. What are the differences between pipe type earthing and counterpoise earthing?
21. Why we use safety helmets while working on ground
22. Why red colour painting is done on towers top

**On job training (tower erection)**

1. Assemble the arm of a transmission tower.
2. Assemble the leg of transmission tower and connect it to the stub of the foundation.
3. Demonstrate the connection of conductor in the insulator connected on tower.
4. Verify the size of Danger Board and connect it to the transmission tower.
5. Connect anti climbing device in the transmission tower.
6. Erect a single section of transmission tower by section method.
7. Paint the tower in order to save from corrosion in the tower required for awareness with the paint as per the location required on the tower.
8. Measure the angle and dimension of stub and make a report which shows complete regularity/irregularity as per the result observed.
9. Construct a gin pole.
11. Demonstrate use of safety gadgets while working on transmission tower.
12. Demonstrate safe keeping of tools and tackles.
13. Demonstrate fixation of hardware such as nuts, bolts and weld it in proper way.