



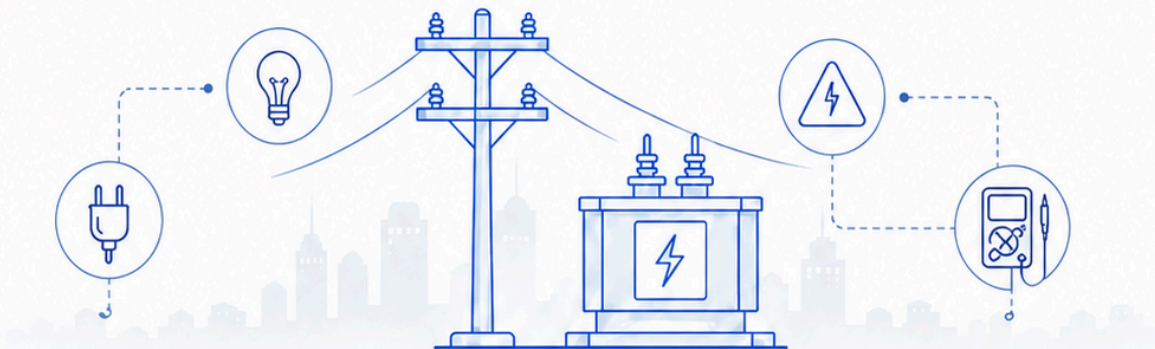
Lineman / Electrician Answer Key



Category No : 464/2025, 465/2025,
556/2025, 634/2025, 776/2025



Exam Date : 10 June 2026



Question Booklet Alpha CODE:B

1. The electron configuration of a copper atom is:

(A) 2, 8, 3

(B) 2, 8, 18, 1

(C) 2, 8, 1

(D) 2, 8, 2

2. Which of the following material is an insulator?

(A) Eureka

(B) Nichrome

(C) Lead

(D) Mica

3. Which of the following statement is true?

1. On molten solder due to repeated melting lead content is reduced.

2. On molten solder due to repeated melting tin content is reduced.

3. Dip soldering is used for quantity production and for tinning work.

4. Soldering of copper conductors is more difficult than soldering of aluminium conductor.

(A) 1, 2, 3

(B) 1, 2, 4

(C) 2, 3

(D) 2, 3, 4

4. Normal current carrying capacity of 1.5 sq mm copper cable = 16 amps (normal rating). Current carrying capacity of the same cable when protected by coarse excess current protection is:

(A) 12.96 amps

(B) 19.44 amps

(C) 18 amps

(D) 20 amps

5. The number of valence electrons in Si and Ge are _____ respectively.

(A) 3 and 4

(B) 5 and 4

(C) 4 and 4

(D) 4 and 5

6. For a semiconductor:

- | | |
|---|---|
| (A) Resistance decreases with decrease in temperature | (B) Resistance increases with increase in temperature |
| (C) Resistance decreases with increase in temperature | (D) Both (A) and (B) |

7. Two wires of equal length and equal resistance, the ratio of their cross sectional area is 3:5. Then the ratio of their specific resistances will be:

- | | |
|-----------|-----------|
| (A) 1 : 1 | (B) 3 : 8 |
| (C) 5 : 3 | (D) 3 : 5 |

8. Which is provided above the metallic sheath in UG Cable?

- | | |
|---------------|----------------------|
| (A) Armouring | (B) Bedding |
| (C) Serving | (D) Paper insulation |

9. Which of the following statement is false?

1. Metals are good electric conductors.
2. Electrons flow from negative terminal to positive terminal.
3. Conventional current flow is assumed as negative to positive.
4. Copper is more conductive than silver.

- | | |
|------------------|------------------|
| (A) Only 2 and 3 | (B) Only 3 and 4 |
| (C) Only 3 | (D) Only 4 |

10. If _____ electrons per second pass through a conductor having one ohm resistance with a potential difference of one volt causes one ampere current.

- | | |
|----------------------------|----------------------------|
| (A) 6.24×10^{18} | (B) 6.24×10^{23} |
| (C) 1.602×10^{18} | (D) 1.602×10^{19} |

11. With rise in temperature the resistance of pure metals:

- | | |
|--|---------------------|
| (A) Increases | (B) Decreases |
| (C) First increases and then decreases | (D) Remain constant |

12. A lead acid cell is rechargeable because:

- | | |
|---------------------------------------|---|
| (A) Its electrolyte is sulphuric acid | (B) It is a wet cell |
| (C) Its chemical action is reversible | (D) Its electrolyte has high specific gravity |

13. What is the output voltage of Lithium cell?

- | | |
|-----------|-----------|
| (A) 1.2 V | (B) 1.5 V |
| (C) 1.8 V | (D) 2.5 V |

14. What is the Electro Chemical Equivalent of copper?

- | | |
|-----------------------|----------------------|
| (A) 0.329 mg/coulomb | (B) 0.329 g/coulomb |
| (C) 1.1182 mg/coulomb | (D) 1.1182 g/coulomb |

15. What is the resistance of Light Dependent Resistor, if the intensity of light is increased?

- | | |
|----------------------|----------------------|
| (A) Increases | (B) Decreases |
| (C) Remains constant | (D) Becomes infinity |

16. Sedimentation in lead acid batteries occurs due to:

- | | |
|---------------------------------------|-----------------------------------|
| (A) Slow charging at low rate | (B) Over charging at high rate |
| (C) Non-utilization for longer period | (D) Over discharging at slow rate |

17. Cells are connected in series in order to:

- | | |
|-----------------------------------|---------------------------------|
| (A) Increase the voltage rating | (B) Increase the current rating |
| (C) Increase the life of the cell | (D) Decrease the voltage rating |

18. Sulphation in Lead acid battery occurs due to:

- | | |
|----------------------|-------------------------|
| (A) Heavy charging | (B) Fast charging |
| (C) Trickle charging | (D) Incomplete charging |

19. The specific resistance of a substance depends on:

- | | |
|--------------------------|----------------------------------|
| (A) Its length | (B) Its cross sectional area |
| (C) Its kind of material | (D) All the above stated factors |

20. Kirchhoff's current law is applicable to only:

- | | |
|----------------------------|-------------------------------|
| (A) Junctions in a network | (B) Closed loops in a network |
| (C) Electric circuit | (D) Electronic circuit |

21. The unit of mmf is:

- | | |
|------------------|-----------|
| (A) Ampere turns | (B) Farad |
| (C) Webers | (D) mho |

22. The total number of lines of force per square metre of the cross sectional area of the magnetic core is called:

- | | |
|------------------|------------------|
| (A) Reluctance | (B) Permeability |
| (C) Flux density | (D) Flux |

23. The substances which are slightly repelled by a magnet of powerful strength only are known as:

- | | |
|------------------------------|----------------------------|
| (A) Para magnetic substance | (B) Dia magnetic substance |
| (C) Ferro magnetic substance | (D) Electro magnet |

24. The unit of magnetic flux is:

- | | |
|------------------|-------------|
| (A) Ampere turns | (B) Coulomb |
| (C) Henry | (D) Weber |

25. The magnetic pressure that drives magnetic flux through a magnetic circuit:

- | | |
|---------------------------|---------------------------|
| (A) Flux density | (B) Electro motive force |
| (C) Magnetic motive force | (D) Magnetic neutral axis |

26. The material strongly attracted to the magnetic field and can become magnetized themselves when placed in a magnetic field?

- | | |
|-----------------------------|---------------------------|
| (A) Ferro magnetic material | (B) Dia magnetic material |
| (C) Para magnetic material | (D) None of the above |

27. The ratio of magnetic flux density to the magnetic field strength is called:

- | | |
|----------------|------------------|
| (A) Reluctance | (B) Permeability |
| (C) Inductance | (D) mmf |

28. The material ability to retain its magnetism even after the external magnetic field is removed:

- | | |
|--------------------|------------------|
| (A) Susceptibility | (B) Permeability |
| (C) Resistivity | (D) Retentivity |

29. The unit of capacitance is:

- | | |
|-------------|------------|
| (A) Coulomb | (B) Farad |
| (C) Ohm | (D) Ampere |

30. The opposition offered to the flow of current by a capacitor is called:

- | | |
|------------------|--------------------------|
| (A) Resistance | (B) Inductive Reactance |
| (C) Power factor | (D) Capacitive Reactance |

31. What is called the maximum value of potential difference between a point on the ground and a live point touched by a person?

- | | |
|--------------------|--------------------------|
| (A) Step potential | (B) Touch potential |
| (C) Skin effect | (D) Potential difference |

32. Which represents the physical position of accessories in the wiring installation?

- | | |
|---------------------|-----------------------|
| (A) Circuit diagram | (B) Layout diagram |
| (C) Wiring diagram | (D) Installation plan |

33. Where do you connect megger terminals while measuring insulation resistance between conductors in a wiring installation?

- | | |
|---|---|
| (A) Outgoing terminals of Phase and Neutral wire in the main switch | (B) Outgoing terminals of Phase and Earth wire in the main switch |
| (C) Incoming terminals of Phase and Neutral wire in the main switch | (D) Incoming terminals of Phase and Earth wire in the main switch |

34. What is the current capacity of the wire, if the normal current carrying capacity is 20 Amps while it is protected by coarse excess current protection?

- | | |
|---------------|---------------|
| (A) 20 Amps | (B) 24.6 Amps |
| (C) 16.2 Amps | (D) 18.2 Amps |

35. What is the main reason for leakage current flowing in wiring installation?

- | | |
|-------------------------------|--|
| (A) High insulation reactance | (B) Insulation failure |
| (C) Low earth resistance | (D) High insulation resistance of wire |

36. What is the minimum depth at which the top edge of plate electrodes should be buried from the surface of the ground level?

- | | |
|-----------|-----------|
| (A) 1.5 m | (B) 0.5 m |
| (C) 1.0 m | (D) 2.0 m |

37. What is the permissible leakage current in any wiring installation as per IE rule?

- | | |
|--|---|
| (A) Not exceed 1/500th part of full load current | (B) Not exceed 1/50th part of full load current |
| (C) Not exceed 1/50000th part of full load current | (D) Not exceed 1/5000th part of full load current |

38. Which type of wiring system requires special sockets or plug with fuse?

- | | |
|-------------------------------|-----------------------------------|
| (A) Distribution board system | (B) Looping out from junction box |
| (C) Ring main system | (D) Tree system |

39. What is the maximum permissible voltage drop at the point of the commencement of supply at the consumers end for high and extra high voltage as per IE rule?

- | | |
|--------|-----------|
| (A) 6% | (B) 7% |
| (C) 3% | (D) 12.5% |

40. What is the average value for Voltage (V_{av}), if the maximum value is V_m ?

(A) $V_{av} = 1.11 V_m$

(B) $V_{av} = \sqrt{2} V_m$

(C) $V_{av} = 0.637 V_m$

(D) $V_{av} = 0.707 V_m$

41. In a DC generator if the magnetic flux is doubled and the speed of the armature is halved, what happens to the generated EMF?

(A) It is doubled

(B) It remains the same

(C) It increases by 50%

(D) It is halved

42. Which of the following DC generator will have negligible terminal voltage on no load?

(A) Shunt

(B) Series

(C) Compound

(D) None of these

43. A differentially compounded DC motor is running at rated speed. If the series field winding of the motor gets short circuited, what happened to the speed of the motor?

(A) Remains constant

(B) Increase

(C) Decrease

(D) Zero

44. Which speed control method is used for increasing the speed of DC motor above rated speed?

(A) Field control method

(B) Armature control method

(C) Both (A) and (B)

(D) None of these

45. The series field of a short shunt DC generator is excited by _____ current.

(A) Armature current

(B) Shunt field current

(C) Load current

(D) None of these

46. In a DC shunt motor, the 3 point starter:

- | | |
|---------------------------------|----------------------------------|
| (A) Limits the starting current | (B) Provides overload protection |
| (C) Provides no volt protection | (D) All of the above |

47. The speed of DC shunt motor can be increased above its normal speed by:

- | | |
|-------------------------------------|-------------------------------------|
| (A) Increasing the field current | (B) Decreasing the field current |
| (C) Decreasing the terminal voltage | (D) Increasing the terminal voltage |

48. What is the main drawback of 3 point starter?

- | | |
|--|---------------------------|
| (A) No overload protection | (B) Weak starting torque |
| (C) Motor may stop if field current is reduced | (D) High maintenance cost |

49. What is the necessity of residual magnetism in a self excited DC generator?

- | | |
|-----------------------------|--------------------------------------|
| (A) To build up voltage | (B) Reduce the field current |
| (C) Reduce armature current | (D) Maintain constant output voltage |

50. What is the purpose of pole shoe in DC generator?

- | | |
|----------------------------------|--|
| (A) Reduce air gap | (B) Increase the field strength |
| (C) Minimize the magnetic losses | (D) Spread out flux uniformly in the air gap |

51. Which color is typically used for the control circuit wiring?

- | | |
|-----------|-----------|
| (A) Red | (B) Green |
| (C) Black | (D) Blue |

52. An auto-transformer starter is used for:

- | | |
|-----------------------------------|------------------------|
| (A) DC shunt motor | (B) Single-phase motor |
| (C) Squirrel cage induction motor | (D) Universal motor |

53. In a D.O.L. starter, the Normally Open auxiliary contact is used for:

- | | |
|----------------------|---|
| (A) Current limiting | (B) Reducing voltage |
| (C) Speed control | (D) Maintaining self-hold or latching circuit |

54. What type of current is used in phase sequence testing?

- | | |
|--------------------|----------|
| (A) DC | (B) AC |
| (C) Both AC and DC | (D) None |

55. Phase sequence is checked before:

- | | |
|------------------------|-------------------------|
| (A) Installing a motor | (B) Turning off a motor |
| (C) Repairing a motor | (D) All of the above |

56. Which device in the panel controls the speed of an AC motor?

- | | |
|------------------------------------|--------------------|
| (A) Contactor | (B) Overload relay |
| (C) Variable Frequency Drive (VFD) | (D) Timer |

57. Which device is used to isolate the motor control panel from power supply for maintenance?

- | | |
|---------------|---------------------|
| (A) Fuse | (B) Isolator switch |
| (C) Contactor | (D) Overload relay |

58. What does MCCB stand for in motor control panel?

- | | |
|-----------------------------------|------------------------------------|
| (A) Molded Case Circuit Breaker | (B) Manual Circuit Control Breaker |
| (C) Motor Control Circuit Breaker | (D) Main Control Circuit Breaker |

59. What happens to the voltage applied to each winding of the motor during star connection?

- | | |
|-----------------------------|--------------------------|
| (A) Reduced by $1/\sqrt{3}$ | (B) Full line voltage |
| (C) Reduced by $1/3$ | (D) Increased by 3 times |

60. How does increasing rotor resistance affect starting torque?

- | | |
|-------------------------------|-------------------------------|
| (A) Decreases starting torque | (B) Increases starting torque |
| (C) No change | (D) Depends on the load |

61. Which type of winding is used in three phase shell type transformer?

- | | |
|------------------------------|---------------------------|
| (A) Sandwich type winding | (B) Wave type winding |
| (C) Cylindrical type winding | (D) Circular type winding |

62. A transformer is working at its maximum efficiency. As iron loss is 500 W, its copper loss will be:

- | | |
|-----------|-----------|
| (A) 100 W | (B) 300 W |
| (C) 500 W | (D) 250 W |

63. Transformers are rated in:

- | | |
|---------|----------|
| (A) kV | (B) kVAH |
| (C) kVA | (D) kW |

64. Find the total output power of the transformer. Primary voltage is 240 V, secondary voltage is 12 V, and secondary current is 3 A.

(A) 36 VA

(B) 4 VA

(C) 72 VA

(D) 18 VA

65. In a transformer 11kV/440V, 100kVA, is 435V at no load, 421V at 0.54 power factor under full load condition. Calculate the percentage voltage regulation of the transformer.

(A) 332%

(B) 33.2%

(C) 0.332%

(D) 3.32%

66. Which is absolute Instrument?

(A) Voltmeter

(B) Tangent Galvanometer

(C) Multimeter

(D) Energy meter

67. Which type of instrument is used air friction damping?

(A) Moving iron instrument

(B) Dynamometer type instrument

(C) Moving coil instrument

(D) Induction type instrument

68. A 1 milli ampere meter has a coil resistance of 1000 ohms. What value of multiplier resistor is needed to measure 100 V?

(A) 0.99 Ohm

(B) 99 Ohm

(C) 9900 Ohm

(D) 99000 Ohm

69. For power measurement of three phase circuit by two wattmeter method, what happens when the value of power factor is less than 0.5 lagging?

(A) Current coil of the wattmeter will become ineffective

(B) One of the wattmeter connections will have to be reversed

(C) High internal resistance

(D) One of the wattmeters will read zero

70. Deflecting torque of moving iron attraction type instrument is:

- | | |
|--|---|
| (A) Inversely proportional to current | (B) The ability to withstand current |
| (C) Directly proportional to square of current | (D) Inversely proportional to square of current |

71. What is the function of a choke in a fluorescent lamp circuit?

- | | |
|--|---|
| (A) To regulate current through the lamp | (B) To supply high voltage for starting |
| (C) To increase lamp brightness | (D) Both (A) and (B) |

72. Which lamp has the highest luminous efficacy?

- | | |
|-----------------------|-------------------------|
| (A) Incandescent lamp | (B) Fluorescent lamp |
| (C) LED lamp | (D) Mercury vapour lamp |

73. According to the inverse square law, illumination on a surface is inversely proportional to:

- | | |
|--|--|
| (A) Distance from the light source | (B) Square of the distance from the light source |
| (C) Cube of the distance from the light source | (D) Angle of incidence |

74. The emitter base junction of a given transistor is forward biased and collector base junction reverse biased. If the base current is increased then:

- | | |
|-------------------------------------|-----------------------|
| (A) Collector current will increase | (B) VCE will increase |
| (C) Collector current will decrease | (D) VCC will increase |

75. Zener breakdown occurs in junctions which are:

- | | |
|--|--|
| (A) Lightly doped and narrow depletion layer | (B) Heavily doped and wide depletion layer |
| (C) Heavily doped and narrow depletion layer | (D) Lightly doped and wide depletion layer |

76. The ripple frequency of a full-wave bridge rectifier is:

- | | |
|------------------------------|-------------------------------|
| (A) Equal to input frequency | (B) Half of input frequency |
| (C) Zero | (D) Twice the input frequency |

77. Compared to a silicon P-N diode, a Schottky diode exhibits:

- | | |
|---|---|
| (A) Higher forward voltage and slower switching | (B) Lower forward voltage and faster switching |
| (C) Lower leakage current | (D) Higher forward voltage and faster switching |

78. The main advantage of the emitter-follower (CC) configuration is:

- | | |
|---|--|
| (A) High voltage gain | (B) High phase shift |
| (C) High input impedance and low current gain | (D) High current gain and low output impedance |

79. The main function of the agitator in a washing machine is:

- | | |
|---------------------------------|--------------------------------------|
| (A) To heat the water | (B) To rotate clothes during washing |
| (C) To drain water from the tub | (D) To control the spin speed |

80. Which component controls the speed of a fan in electronic regulators?

- | | |
|-----------------|--------------|
| (A) Triac | (B) Diode |
| (C) Zener diode | (D) Resistor |

81. Which equipment converts water into steam on steam power station?

- | | |
|------------------|----------------|
| (A) Boiler | (B) Furnace |
| (C) Super heater | (D) Economiser |

82. Which equipment in steam power plant heats the feed water on its way to boiler by deriving heat from flue gases?

- | | |
|-------------------|---------------------|
| (A) Air preheater | (B) Prime mover |
| (C) Economiser | (D) Feed water pump |

83. What is the primary function of condenser in steam power station?

- | | |
|--|---|
| (A) Create a very low pressure at the exhaust of turbine | (B) Create a very high pressure at the exhaust of turbine |
| (C) Pre heat the water to the boiler | (D) Purify the feed water |

84. Which type of turbine is used in high head hydroelectric power stations?

- | | |
|----------------------|--------------------------|
| (A) Francis turbine | (B) Kaplan turbine |
| (C) Reaction turbine | (D) Pelton wheel turbine |

85. What is the function of moderator in nuclear reactor?

- | | |
|--------------------------------|----------------------------------|
| (A) Slows down the neutron | (B) Absorbs neutron |
| (C) Control the heat exchanger | (D) Control the steam production |

86. Which phenomenon is used in solar panels to produce electricity?

- | | |
|---------------------------|----------------------------|
| (A) Piezo electric effect | (B) Photovoltaic effect |
| (C) Electrostatic effect | (D) Electromagnetic effect |

87. The main source of production of biogas is:

- | | |
|---------------------------|-----------------------------|
| (A) Animal excreta | (B) Vegetable waste |
| (C) Food waste | (D) All of the above |

88. What is the function of gear box in wind turbine?

- | | |
|---|---|
| (A) It controls the excitation current | (B) It converts rotor rotation into high speed |
| (C) It controls the amount of wind that hit blades | (D) It controls internal supply unit |

89. What is the main constituent of Bio-gas?

- | | |
|--------------------|---------------------|
| (A) Ethane | (B) Ethanol |
| (C) Methane | (D) Methanol |

90. Which of the power plant use conventional energy source to produce electricity?

- | | |
|--------------------------------|----------------------------------|
| (A) Wind mill | (B) Nuclear power station |
| (C) Tidal power station | (D) Solar power plant |

91. Which insulator is used for holding the line conductors of overhead line on straight running of poles?

- | | |
|---------------------------------|------------------------------|
| (A) Pin insulator | (B) Shackle insulator |
| (C) Suspension insulator | (D) Disc insulator |

92. Which is disadvantage of DC Transmission?

- | | |
|---|--|
| (A) Requires only two conductors | (B) Less corona loss |
| (C) No skin effect | (D) Generation of high voltage is difficult |

93. What is ACSR stands for?

- | | |
|---|--|
| (A) All Conductor Strain Reinforced | (B) Aluminium Covered Steel Reinforced |
| (C) Aluminium Conductor Strain Reinforced | (D) Aluminium Conductor Steel Reinforced |

94. What is the span length of RCC poles used for distribution?

- | | |
|----------------------|-----------------------|
| (A) 40 to 50 metres | (B) 50 to 80 metres |
| (C) 60 to 100 metres | (D) 100 to 300 metres |

95. Which is used for connecting copper wire to aluminium conductor in the case of consumer service?

- | | |
|-------------------------|--------------------------|
| (A) Standard P.G. Clamp | (B) Universal P.G. Clamp |
| (C) B.M.P.G. Clamp | (D) U Bolt Clamp |

96. Which of the following statement is/are correct about AC Electric power Transmission?

- (i) Power can be generated at high voltage.
- (ii) Due to skin effect, less copper is required.
- (iii) Construction of AC transmission lines is more complicated as well as costly.

- | | |
|----------------|------------------------|
| (A) Only (i) | (B) Only (i) and (ii) |
| (C) Only (iii) | (D) Only (i) and (iii) |

97. Which of the following statement is/are correct about Properties of a good line insulator?

- (i) High mechanical strength
- (ii) High relative permittivity
- (iii) High ratio of puncture strength to flash over

(A) Only (ii) and (iii)	(B) Only (i) and (ii)
(C) All of the above (i), (ii) and (iii)	(D) Only (i) and (iii)

98. Which of the following statement is/are wrong about Suspension type insulator?

- (i) If any one disc is damaged, the whole string does not become useless.
- (ii) Suspension type insulators are costlier than pin type insulators for voltage beyond 33 kV.
- (iii) Suspension arrangement provides greater flexibility.

(A) Only (i)	(B) Only (ii)
(C) Only (iii)	(D) All of the above (i), (ii) and (iii)

99. Which is the normal cable connected between distributors and consumer load terminal?

(A) Feeders	(B) Distributors
(C) Service lines	(D) None of these

100. What is called the difference in level between points of supports and the lowest point of the conductor in overhead lines?

(A) Corona	(B) Sag
(C) Span	(D) Tension

ANSWER KEY

Question Booklet Alpha CODE:B

Q	Ans	Q	Ans	Q	Ans	Q	Ans
1	B	26	A	51	A	76	D
2	D	27	B	52	C	77	B
3	C	28	D	53	D	78	D
4	A	29	B	54	B	79	B
5	C	30	D	55	A	80	A
6	C	31	B	56	C	81	A
7	D	32	B	57	B	82	C
8	B	33	A	58	A	83	A
9	B	34	C	59	A	84	D
10	A	35	B	60	B	85	A
11	A	36	A	61	A	86	B
12	C	37	D	62	C	87	D
13	D	38	C	63	C	88	B
14	A	39	D	64	A	89	C
15	B	40	C	65	D	90	B
16	B	41	B	66	B	91	A
17	A	42	B	67	A	92	D
18	D	43	C	68	D	93	D
19	C	44	A	69	B	94	B
20	A	45	C	70	C	95	B
21	A	46	D	71	D	96	D
22	C	47	B	72	C	97	C

23	B	48	C	73	B	98	B
24	D	49	A	74	A	99	C
25	C	50	D	75	C	100	B



Detailed Explanation:

1. **B – 2, 8, 18, 1**

Copper atomic number is 29. Its shell-wise electron configuration is **2, 8, 18, 1**.

2. **D – Mica**

Mica is a very good electrical insulator. Eureka, nichrome, and lead are conducting materials.

3. **C – 2 and 3**

In molten solder, repeated heating mainly reduces **tin content**. Dip soldering is used for quantity production and tinning work. Aluminium is harder to solder than copper, so statement 4 is false.

4. **A – 12.96 A**

For coarse excess current protection, permissible current capacity is usually taken as **81% of normal current capacity**.

$$16 \times 0.81 = \mathbf{12.96 \text{ A}}$$

5. **D – 4 and 4**

Silicon and Germanium are group-IV semiconductors. Both have **4 valence electrons**.

6. **C – Resistance decreases with increase in temperature**
Semiconductors have negative temperature coefficients. Their resistance decreases when temperature increases.
7. **D – 3 : 5**
Resistance, length, and area relation: $R = \rho L/A$. Since length and resistance are equal, specific resistance is directly proportional to area. So ratio = **3 : 5**.
8. **B – Bedding**
In underground cable construction, **bedding** is provided above the metallic sheath to protect it before armouring.
9. **B – Only 3 and 4**
Conventional current flows from positive to negative, not negative to positive. Also silver is more conductive than copper. So statements 3 and 4 are false.
10. **A – 6.24×10^{18}**
One ampere means one coulomb of charge per second. Number of electrons in one coulomb = **6.24×10^{18}** .
11. **A – Increases**
Pure metals have positive temperature coefficient. Their resistance increases with rise in temperature.
12. **C – Its chemical action is reversible**
A lead-acid cell is rechargeable because the chemical reaction can be reversed during charging.
13. **D – 2.5 V**
In this ITI-level question, lithium cell output is taken as approximately **2.5 V**.
14. **A – 0.329 mg/coulomb**
Electrochemical equivalent of copper is **0.329 mg per coulomb**.
15. **B – Decreases**
LDR means Light Dependent Resistor. When light intensity increases, its resistance decreases.
16. **B – Overcharging at high rate**
Sedimentation in lead-acid batteries occurs when active material falls from plates, commonly due to overcharging at high rate.
17. **A – Increase the voltage rating**
Cells are connected in series to increase total voltage. Current capacity remains the same.
18. **D – Incomplete charging**
Sulphation in lead-acid batteries occurs when the battery is left undercharged or incompletely charged.
19. **C – Its kind of material**
Specific resistance or resistivity is a property of the material. It does not depend on length or area.

20. A – Junctions in a network

Kirchhoff's Current Law is applied at junctions. It states that incoming current equals outgoing current.

21. A – Ampere turns

Unit of magnetomotive force, MMF, is **ampere-turns**.

22. C – Flux density

Magnetic flux per unit area is called **magnetic flux density**.

23. B – Diamagnetic substance

Diamagnetic materials are slightly repelled by a strong magnetic field.

24. D – Weber

SI unit of magnetic flux is **weber**.

25. C – Magnetomotive force

The pressure which drives magnetic flux through a magnetic circuit is called **MMF**.

26. A – Ferromagnetic material

Ferromagnetic materials are strongly attracted by magnets and can become magnetised.

27. B – Permeability

Permeability is the ratio of magnetic flux density B to magnetic field strength H.

28. D – Retentivity

Retentivity is the ability of a material to retain magnetism after removal of the external magnetic field.

29. B – Farad

SI unit of capacitance is **farad**.

30. D – Capacitive reactance

Opposition offered by a capacitor to AC current is called **capacitive reactance**.

31. B – Touch potential

Touch potential is the potential difference between a live part and the ground point touched by a person.

32. B – Layout diagram

A layout diagram shows the physical position of accessories in an electrical wiring installation.

33. A – Outgoing terminals of phase and neutral in the main switch

For measuring insulation resistance between conductors, megger terminals are connected between phase and neutral outgoing terminals.

34. C – 16.2 A

For coarse excess current protection, take 81% of normal capacity.
 $20 \times 0.81 = 16.2 \text{ A}$.

35. D – Low insulation resistance of wire

Leakage current mainly occurs due to weak or damaged insulation, causing low insulation resistance.

36. A – 1.5 m

In plate earthing, the top edge of the plate electrode should be buried at least **1.5 m** below ground level.

37. A – Not exceed 1/5000th part of full load current

Permissible leakage current should not exceed **1/5000 of full load current**.

38. C – Ring main system

Ring main wiring uses special socket outlets or plugs with fuses for protection.

39. D – 12.5%

As per voltage variation limits, for extra-high voltage supply, maximum permissible voltage drop can be **12.5%**.

40. C – $V_{av} = 0.637 V_m$

Average value of a sinusoidal AC voltage over half cycle is **0.637 times maximum value**.

41. B – It remains the same

Generated EMF in DC generator is proportional to flux \times speed. If flux doubles and speed halves, EMF remains unchanged.

42. B – Series generator

A DC series generator has negligible voltage at no load because field current is almost zero at no load.

43. C – Decrease

In a differentially compounded motor, series field opposes shunt field. If series field is shorted, net flux increases and speed decreases.

44. A – Field control method

DC motor speed above rated speed is obtained by weakening the field using field control.

45. C – Load current

In a short-shunt DC generator, the series field winding carries load current.

46. D – All of the above

A 3-point starter limits starting current and provides no-voltage and overload protection.

47. B – Decreasing the field current

In a DC shunt motor, speed is inversely proportional to flux. Reducing field current reduces flux and increases speed.

48. C – Motor may stop if field current is reduced

In a 3-point starter, no-voltage coil is connected in series with shunt field. Reducing field current may release the starter handle.

49. A – To build up voltage

Residual magnetism is necessary in a self-excited DC generator to start voltage build-up.

50. D – Spread out flux uniformly in the air gap

Pole shoes spread magnetic flux uniformly and reduce reluctance in the magnetic path.

51. A – Red

In common motor control panel wiring practice, red is used for control circuit wiring.

52. C – Squirrel cage induction motor

Auto-transformer starters are commonly used for starting squirrel cage induction motors at reduced voltage.

53. D – Maintaining self-hold or latching circuit

In a DOL starter, the normally open auxiliary contact is used for holding the contactor after releasing the start push button.

54. B – AC

Phase sequence testing is done in three-phase AC systems.

55. A – Installing a motor

Phase sequence is checked before installing or running a three-phase motor to ensure correct rotation.

56. C – Variable Frequency Drive

VFD controls AC motor speed by varying supply frequency.

57. B – Isolator switch

An isolator switch disconnects the motor control panel from supply during maintenance.

58. A – Molded Case Circuit Breaker

MCCB stands for **Molded Case Circuit Breaker**.

59. A – Reduced by $1/\sqrt{3}$

In star connection, phase voltage = line voltage / $\sqrt{3}$.

60. B – Increases starting torque

Increasing rotor resistance improves starting torque in slip-ring induction motors.

61. A – Sandwich type winding

Shell-type transformers commonly use sandwich-type winding arrangement.

62. C – 500 W

Transformer efficiency is maximum when copper loss equals iron loss. Iron loss = 500 W, so copper loss = **500 W**.

63. C – kVA

Transformers are rated in **kVA** because losses depend on voltage and current, not power factor.

64. **A – 36 VA**

Output power = secondary voltage × secondary current = $12 \times 3 = 36 \text{ VA}$.

65. **D – 3.32%**

Voltage regulation = $[(\text{No-load voltage} - \text{Full-load voltage}) / \text{Full-load voltage}] \times 100$

= $[(435 - 421) / 421] \times 100 = 3.32\%$.

66. **B – Tangent galvanometer**

Tangent galvanometer is an absolute instrument because it can measure current using physical constants.

67. **A – Moving iron instrument**

Moving iron instruments commonly use air-friction damping.

68. **C – 99000 Ω**

Total resistance needed = $V/I = 100 / 0.001 = 100000 \Omega$.

Multiplier resistance = $100000 - 1000 = 99000 \Omega$.

69. **B – One wattmeter connection will have to be reversed**

In two-wattmeter method, when power factor is less than 0.5 lagging, one wattmeter gives negative reading. Its connection is reversed to get upscale reading.

70. **C – Directly proportional to square of current**

In moving iron instruments, deflecting torque is proportional to I^2 .

71. **D – Both A and B**

Choke in fluorescent lamp limits current and also helps produce high voltage for starting.

72. **C – LED lamp**

LED lamps have higher luminous efficacy than incandescent, fluorescent, and mercury vapour lamps.

73. **B – Square of the distance from the light source**

According to inverse square law, illumination is inversely proportional to the square of distance.

74. **A – Collector current will increase**

In a transistor, collector current increases when base current increases.

75. **C – Heavily doped and narrow depletion layer**

Zener breakdown occurs in heavily doped junctions with narrow depletion region.

76. **D – Twice the input frequency**

In a full-wave bridge rectifier, ripple frequency is twice the supply frequency.

77. **D – Lower forward voltage and faster switching**

Schottky diode has low forward voltage drop and very fast switching speed.

78. **D – High current gain and low output impedance**

Emitter follower or common collector circuit gives high input impedance, high current gain, and low output impedance.

79. **B – To rotate clothes during washing**
Agitator in washing machine moves or rotates clothes for washing action.
80. **A – Triac**
Electronic fan regulators use a triac to control AC power and speed.
81. **A – Boiler**
Boiler converts water into steam in a steam power station.
82. **C – Economiser**
Economiser heats feed water using waste heat from flue gases.
83. **A – Create a very low pressure at the exhaust of turbine**
Condenser creates vacuum at turbine exhaust, improving efficiency.
84. **D – Pelton wheel turbine**
Pelton wheel turbine is used for high-head hydroelectric power stations.
85. **A – Slows down the neutron**
Moderator slows fast neutrons into thermal neutrons in a nuclear reactor.
86. **B – Photovoltaic effect**
Solar panels produce electricity by photovoltaic effect.
87. **D – All of the above**
Animal excreta, vegetable waste, and food waste can all be used for biogas production.
88. **B – It converts rotor rotation into high speed**
Gearbox in wind turbine increases low rotor speed to high generator speed.
89. **C – Methane**
Main constituent of biogas is methane.
90. **B – Nuclear power station**
Among the given options, nuclear power is considered a conventional energy source.
91. **A – Pin insulator**
Pin insulators are used on straight running poles for holding overhead line conductors.
92. **D – Generation of high voltage is difficult**
A disadvantage of DC transmission is that high-voltage DC generation and voltage transformation are difficult compared to AC.
93. **D – Aluminium Conductor Steel Reinforced**
ACSR stands for **Aluminium Conductor Steel Reinforced**.
94. **B – 50 to 80 metres**
Usual span length of RCC poles in distribution lines is about **50 to 80 m**.
95. **B-Universal P.G Clamp**
Universal P.G clamp is used for connecting copper wire to aluminium conductor.
96. **D – Only (i) and (iii)**
AC power can be generated/transformed at high voltage. AC transmission line

construction is more complicated than DC. Skin effect does not reduce copper requirement; it increases effective resistance.

97. **C – All of the above**

A good line insulator should have high mechanical strength, suitable dielectric property, and high puncture strength compared with flashover voltage.

98. **B – Only (ii)**

Statement (ii) is wrong because suspension insulators are economical for higher voltages above 33 kV compared to pin type.

99. **C – Service lines**

Service lines connect the distributor to the consumer's load terminals.

100. **B – Sag**

Sag is the difference in level between the support point and the lowest point of an overhead conductor.



entri

Thank you



4.8 ★

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