UKPSC
JE
Previous Year Paper
(Electrical) Paper-II 27
Dec, 2023

1. Which of the following is not used in automatic control system ?
(a) Sensor (b) Oscillator (c) Error detector (d) Control element

2. The function of "input module" in PLC is to
(a) store program.
(b) provide interface between sensor and CPU.
(c) provide interface between CPU and actuator.
(d) provide power to PLC.

3. Memory section of a PLC has
(a) CMOS RAM only (b) EPROM only
(c) EEPROM only (d) All of these

4. To measure temperature in the range of 3000 °C, the sensor used is
(a) RTD (b) Thermistor (c) Thermocouple (d) Pyrometer

5. A platinum resistance thermometer has a resistance of 100 Ω at 25 °C. The resistance temperature co-efficient of platinum is 0.00392 Ω/°C. At 50 °C, its resistance is
(a) 91.2 Ω (b) 109.8 Ω (c) 119.6 Ω (d) 81.4 Ω

6. A Linear Variable Differential Transformer (LVDT) is
(a) a displacement transducer. (b) an impedance matching transformer
(c) a differential temperature sensor. (d) an auto transformer

7. Liquid flow rate is measured using
(a) A Pirani gauge (b) A pyrometer (c) An orifice plate (d) A Bourdon tube

8. Semiconductor strain gauge has the property of
(a) excellent hysteresis characteristics (b) high gauge factor
(c) piezo-resistivity (d) All of these

9. A null type recorder uses
(a) Potentiometer (b) Ammeter (c) Amplifier (d) Capacitor

10. A Megger is used for the measurement of
(a) Low resistance (b) Medium resistance
(c) Insulation resistance (d) All of these

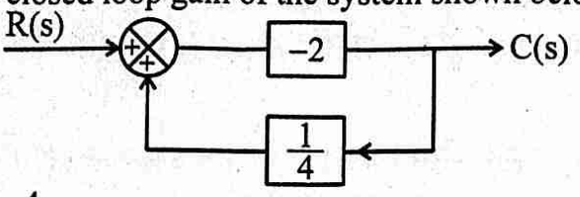
11. The controlling torque in a Megger is provided by
(a) Spring (b) Weight (Gravity)
(c) Liquid friction (d) Combined action of two voltage coils

12. A dual trace CRO has
(a) one electron gun
(b) two electron gun
(c) one electron gun and one two-pole switch
(d) two electron gun and two pole switch

13. The highly sensitive controller to noise is
(a) PI (b) PD (c) PI and PD both (d) PID

14. Which of the following is higher in a closed loop system compared to open loop system ?
(a) Speed (b) Frequency (c) Bandwidth (d) Gain

15. The closed loop gain of the system shown below is



(a) $-\frac{4}{3}$ (b) -4 (c) 4 (d) $-\frac{3}{4}$

16. Energy consumed by a heater of rating 1000 watts by operating it for a period of 2 hours will be
(a) 1 unit (b) 2 units (c) 2000 units (d) 4 units

17. The type-2 control system has
(a) no poles at the origin (b) one pole at the origin
(c) two poles at the origin (d) three poles at the origin

18. Which of the following is not an active transducer ?
(a) LVDT (b) Thermocouple (c) Piezo-electric (d) Photovoltaic cell

19. The resistance of 125 Ω strain gauge changes 1 Ω for 4000 micro-strain. The gauge factor for strain gauge is
(a) 1.5 (b) 2.0 (c) 2.5 (d) 3.0

20. Tachometers are used for
(a) angular speed measurement only.
(b) linear speed measurement only.
(c) both angular and linear speed measurement.
(d) None of these

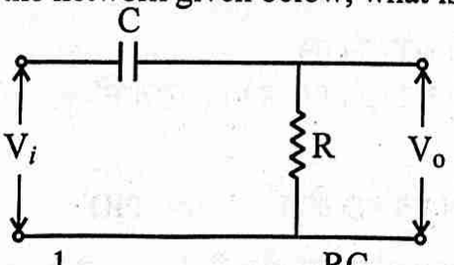
21. The dynamic characteristics of capacitive transducers are similar to those of
(a) High pass filter (b) Low pass filter (c) Band stop filter (d) Notch filter

22. Dummy strain gauge are used for
(a) calibration of strain gauge. (b) compensation for temperature changes.
(c) compensation for expansion. (d) increasing the sensitivity of the bridge.

23. A DC voltage of 1.0 V is applied to the X-plate of CRO and an AC voltage of 2 sin 100 t is applied to Y-plate. The display on CRO screen will be
(a) Vertical straight line (b) Horizontal straight line
(c) Slanted line (d) Sine wave form

24. The Laplace transform of a unit ramp function is
(a) S (b) $\frac{1}{S}$ (c) $\frac{1}{S^2}$ (d) $\frac{1}{S^3}$

25. For the network given below, what is transfer function ?



(a) $\frac{1}{1+RCs}$ (b) $\frac{RC}{1+RCs}$ (c) $RCs + 1$ (d) $\frac{sRC}{1+RCs}$

26. The mean daily solar radiation at many places in India is about
(a) 100 kWh/m^2 (b) 5 kWh/m^2 (c) 20 kWh/m^2 (d) 1.0 kWh/m^2

27. The function of control rods in a nuclear reactor is
(a) control of nuclear fission rate (b) control of radiation hazards
(c) control of moderator material (d) All of these

28. Graphite is used in nuclear power plant as
(a) Fuel (b) Coolant (c) Moderator (d) Electrode

29. Which of the following is not a transducer ?
(a) Strain gauge (b) Autotransformer (c) Potentiometer (d) Thermocouple

30. The cooling of large electrical machines is done by
(a) flowing water through hollow tubes.
(b) flowing hydrogen through hollow tubes.
(c) (a) and (b) both
(d) flowing nitrogen through hollow tubes.

31. Armature winding is one in which working
(a) flux is produced by field current.
(b) flux is produced by the working e.m.f.
(c) e.m.f. is produced by the working flux.
(d) e.m.f. is produced by the leakage flux.

32. Which of the following test is performed on insulation ?
(a) Design test (b) Performance test (c) Routine test (d) All of these

33. Material used for making insulator is
(a) only porcelain (b) only glass (c) only cement (d) (a) and (b)

34. Which of the following equipment is used for testing of electrical machines and equipments ?
(a) only Megger (b) only Earth tester (c) only CT (d) (a) and (b)

35. The slots of squirrel cage induction motor are skewed to
(a) minimize cogging (b) reduce humming sound
(c) (a) and (b) (d) None of these

36. The tower footing resistance of a transmission tower should be
(a) as high as possible (b) as low as possible
(c) moderately high (d) moderately low

37. An isolator is used for
(a) breaking abnormal current
(b) making under fault current
(c) breaking the circuit under no load condition
(d) None of these

38. The diesel and gas turbine units are more suitable for
(a) Peak load (b) Base load
(c) Intermediate load (d) Both peak and base load

39. Earthing brings the potential of the body of an equipment to
(a) zero
(b) equal to phase voltage
(c) equal to line voltage
(d) equal to equipment rated voltage

40. Which of the following is not the type of earthing ?
(a) Pipe earthing
(b) Plane earthing
(c) Rod earthing
(d) Strip (wire) earthing

41. Which part of the National Electrical Code SP(30) : 1986 has the information about electrical installation in industrial building ?
(a) Part-1 (b) Part-2 (c) Part-3 (d) Part-4

42. An SCR has _____ junctions.
(a) 2 (b) 3 (c) 4 (d) 5

43. For an SCR, in forward conduction mode, anode terminal is connected to _____ terminal of voltage source.
(a) Positive (b) Negative (c) Ground (d) Neutral

44. A small leakage current in SCR forward conduction mode flows from
(a) Anode to cathode
(b) Cathode to anode
(c) Cathode to ground
(d) Anode to ground

45. The minimum current in forward conduction mode required to maintain ON state of SCR is called
(a) Switching current
(b) Latching current
(c) Holding current
(d) No-load current

46. The energy gap between valence and conduction band in insulator is
(a) 0.5 eV (b) 5.0 eV (c) ≥ 10 eV (d) ∞

47. For n-type semiconductors, the doping material is
(a) Tetravalent (b) Pentavalent (c) Trivalent (d) Bivalent

48. The temperature co-efficient of intrinsic semiconductor is
(a) zero (b) positive (c) negative (d) None of these

49. Intrinsic semiconductors have _____ conduction band and _____ valence band.
(a) a lightly filled, moderately filled
(b) almost filled, moderately filled
(c) almost empty, almost filled
(d) almost filled, almost empty

50. In a type-A chopper, the average output voltage is
(a) always less than the input dc voltage.
(b) always equal to input dc voltage.
(c) always greater than input dc voltage.
(d) None of these

51. For low voltage high current d.c. motor, the suitable winding is
(a) wave winding
(b) lap winding
(c) short pitch winding
(d) None of these

52. If phase sequence of a stator connection of a three phase induction motor is reversed then
(a) no effect on induction motor
(b) motor stops
(c) motor gets hot
(d) motor rotates in reverse direction

53. Ground wire is coloured as
(a) Green (b) Red (c) Black (d) Brown

54. In a 3-ϕ controlled bridge rectifier, the maximum conduction of each thyristor is
(a) 60° (b) 90° (c) 120° (d) 150°

55. A four quadrant chopper cannot be operated as
(a) one quadrant chopper (b) cycloconverter
(c) inverter (d) bidirectional rectifier

56. A step down chopper is operated in the continuous conduction mode with a constant duty ratio D. The ratio of output voltage (V_o) to input voltage (V_i) is given by
(a) D (b) (1 – D) (c) $\frac{1}{(1-D)}$ (d) $\frac{D}{(1-D)}$

57. The frequency of ripple in the output voltage of a three phase controlled bridge rectifier depends upon
(a) firing angle (b) load inductance (c) load resistance (d) supply frequency

58. A cycloconverter is a
(a) frequency converter which has no intermediate dc state.
(b) device which converts ac to dc.
(c) device which converts dc to ac.
(d) None of these

59. In forward conduction mode, an SCR has _____ forward biased junction.
(a) 2 (b) 1 (c) 3 (d) 0

60. A linear displacement transducer (digital) normally uses
(a) Straight binary code (b) BCD code
(c) Gray code (d) Hexadecimal code

61. A CRO uses
(a) Electromagnetic focussing
(b) Electrostatic focussing
(c) Both Electromagnetic and electrostatic focussing
(d) None of these

62. The commutation overlap in phase controlled ac to dc converter is due to
(a) Load inductance (b) Harmonics in load current
(c) Switching of converter (d) Source inductance

63. A free-wheeling diode in a phase controlled converter
(a) decreases the possibility of discontinued conduction in load.
(b) increases the possibility of discontinued conduction in load.
(c) reduces the power factor.
(d) improves the power factor.

64. In a dual converter, the circulating current
(a) allows smooth reversal of current but increases response time.
(b) allows smooth reversal of current with improved speed of response.
(c) does not allow smooth reversal of current.
(d) None of these

65. Spot welding is
(a) Arc welding (b) Gas welding (c) Resistance welding (d) None of these

66. Which of the following DC motor is used in electric traction ?
(a) DC shunt motor (b) DC series motor
(c) DC compound motor (d) All of these

67. The transfer function of a system is $G(s) = \frac{K}{s^3(1+s)}$. The type and order of the system are respectively
(a) 2, 3 (b) 3, 3 (c) 3, 4 (d) 3, 2

68. Which of the following cannot be measured with multimeter ?
(a) Capacitance (b) Resistance (c) Current (d) Voltage

69. The maximum demand of a consumer is 2 kW and his daily consumption is 20 units. The load factor of the consumer is
(a) 10% (b) 41.6% (c) 51.5% (d) 60%

70. Which of the following is a disadvantage of solar and wind energy sources ?
(a) Highly polluting (b) High waste disposal cost
(c) High running cost (d) Unreliable source

71. The present estimated wind energy potential of India is
(a) 2 lakh MW (b) 1 lakh MW (c) 3 lakh MW (d) 5 lakh MW

72. Candela is the unit of
(a) Flux (b) Luminous intensity
(c) Illumination (d) Luminance

73. The dielectric loss depends upon
(a) only voltage (b) only frequency
(c) voltage and frequency (d) material of electrode

74. On main line railways more importance is given to
(a) Acceleration (b) Braking (c) Free running (d) Retardation

75. The copper metal obtained by electrolytic extraction is normally
(a) 98% to 99% pure (b) 100% pure
(c) 96% to 97% pure (d) 94% to 95% pure

76. Which of the following device is not used for pressure measurement ?
(a) Diaphragm gauge (b) Pressure bellows
(c) Strain gauge (d) Dynamometer

77. Light is produced in a fluorescent tube by
(a) Electrical conduction (b) Electrical discharge
(c) Electrical convection (d) None of these

78. Which of the following has least lumen efficiency ?
(a) Fluorescent tube (b) LED lamp
(c) Mercury arc lamp (d) Incandescent lamp

79. A biogas consists of
(a) only methane gas
(b) methane gas, carbon dioxide and some impurities
(c) only ethane
(d) a special organic gas

80. Which of the following area is preferred for solar plant ?
(a) Coastal areas (b) Hot and arid zone (c) Mountain tops (d) High rainfall zones

81. The maximum wind energy available is proportional to
(a) Air density (b) $(\text{Wind velocity})^3$
(c) $(\text{Rotor diameter})^2$ (d) All of these

82. Which one of these resources does not produce CO_2 during electricity generation ?
(a) Coal (b) Petroleum (c) Uranium (d) Biogas

83. Two unequal ideal current sources cannot be connected in
(a) Series (b) Parallel
(c) (a) and (b) are correct (d) None of these

84. In a power plant, a reserve generating capacity which is in operation but is not in service is known as –
(a) Hot reserve (b) Spinning reserve
(c) Cold reserve (d) Firm power

85. Diversity factor has direct effect on
(a) Fixed cost of unit generated
(b) Variable cost of unit generated
(c) Both Fixed and Variable cost of unit generated
(d) None of these

86. The suitable turbine used for harvesting tidal power is
(a) Francis turbine (b) Kaplan turbine (c) Pelton turbine (d) None of these

87. The three colours of a single phase three wire system are
(a) Phase-black, Neutral-red, Earth-green (b) Phase-green, Neutral-red, Earth-black
(c) Phase-red, Neutral-black, Earth-green (d) None of these

88. Which of the following distribution system is most economical ?
(a) 3-phase, 3-wire, AC system (b) 3-phase, 4-wire, AC system
(c) 1-phase, 2-wire, AC system (d) DC system

89. The estimated tidal power potential of Indian coast is around
(a) 12000 MW (b) 14000 MW (c) 9000 MW (d) 18000 MW

90. Which parameter is used as an index to measure the standard of living of people of a country ?
(a) Industrial production (b) Number of vehicles per house
(c) Per capita energy consumption (d) Population density

91. The efficiency of a commercial solar cell lies in the range
(a) 2% – 10% (b) 10% – 20% (c) 30% – 40% (d) 40% – 50%

92. In thyristor circuit, a snubber circuit is used for
(a) Triggering
(b) $\frac{dv}{dt}$ protection
(c) $\frac{di}{dt}$ protection
(d) Both (b) & (c) are correct

93. In an L-R circuit, the value of resistance is 3 Ω and the inductance is 1.2 H. The time constant is
(a) 4.8 sec. (b) 48 sec. (c) 0.4 sec. (d) 0.2 sec.

94. For DC applied voltage an inductor under steady state condition behaves as
(a) Voltage source (b) Current source (c) Short circuit (d) Open circuit

95. If the binary number 1110 is converted to hexadecimal number, the hexadecimal number will be
(a) G (b) D (c) E (d) F

96. The torque-speed characteristics of a repulsion motor resembles the characteristics of the following :
(a) Separately excited DC motor (b) DC shunt motor
(c) DC series motor (d) DC compound motor

97. Which material is used for construction of core of electrical machines ?
(a) Copper (b) Copper alloy (c) Silicon steel (d) Mild steel

98. A synchronous motor can operate at
(a) lagging power factor (b) leading power factor
(c) unity power factor (d) All of these are correct.

99. The motor used in household refrigerator is
(a) D.C. series motor (b) D.C. shunt motor
(c) Universal motor (d) Single phase induction motor

100. A domestic installation having fifteen 60 watts lamps is operated as
5 lamps from 6.00 p.m. to 8.00 p.m.
10 lamps from 8.00 p.m. to 10.00 p.m.
6 lamps from 10.00 p.m. to 12.00 midnight.
The daily load factor will be
(a) 15 % (b) 15.5 % (c) 17.5 % (d) 12 %

101. Which of the following is not a type of wiring ?
(a) Conduit (b) Bottom (c) Cleat (d) Casing & capping

102. For regenerative braking, the regenerated power should have
(a) same frequency as that of supply frequency
(b) frequency $\frac{1}{3}$ of the supply frequency
(c) frequency $\frac{2}{3}$ of the supply frequency
(d) any frequency

103. The range of frequency normally used for dielectric heating is
(a) 10 kHz to 100 kHz (b) 100 kHz to 1 MHz
(c) 10 MHz to 40 MHz (d) 1 MHz to 10 MHz

104. A generating station has a maximum demand of 1000 MW. The annual load factor is 75% and plant capacity factor is 60%. The reserve capacity is –

(a) 750 MW (b) 250 MW (c) 1.25 MW (d) 1000 MW

105. A Buffer amplifier has a gain of _____.

(a) infinity (b) zero

(c) unity (d) depends upon circuit parameters

106. Bolometers are used for measuring

(a) Electrical signals (b) Thermal radiations

(c) Optical inputs (d) None of these

107. Transducer for measurement of rotational displacement is

(a) Shaft recorder (b) Differential capacitor

(c) LVDT (d) Strain gauge

108. Which of the following pressure transducer is suitable for measurement of high pressure ?

(a) Alphatron (b) McLeod gauge (c) Pirani gauge (d) Bourdon gauge

109. A variable reluctance type tachometer has 60 rotor teeth. The counter records 3600 counts per sec. The speed in rpm is

(a) 1800 (b) 3600 (c) 60 (d) 180

110. Which temperature transducer is most accurate ?

(a) Thermocouple (b) R.T.D. (c) Thermistor (d) IC sensor

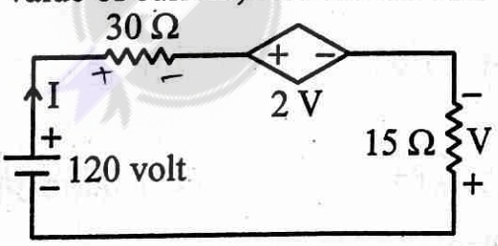
111. The instrument used to measure 100 MΩ resistance is

(a) Ohmmeter (b) Multimeter (c) Megger (d) V.T.V.M.

112. The resolution of a digital voltmeter with 4 digit display is

(a) $\frac{1}{4}$ (b) $\frac{1}{1000}$ (c) $\frac{1}{10000}$ (d) $\frac{1}{100}$

113. The value of current, I for the circuit shown in the figure :



(a) 2 A (b) 4 A (c) 8 A (d) 6 A

114. Low grade fuels have

(a) low ash content (b) low calorific value

(c) low carbon content (d) low moisture content

115. Which variety of coal has lowest calorific value ?

(a) Lignite (b) Bituminous coal (c) Anthracite (d) Steam coal

116. A 1.8° step, 2-phase bipolar stepper motor has stepping rate of 100 step/sec. The rotational speed of the motor is
(a) 15 rpm (b) 30 rpm (c) 60 rpm (d) 45 rpm

117. In a hysteresis motor the rotor core must have high
(a) Retentivity (b) Resistivity (c) Susceptibility (d) None of these

118. At starting, the per unit slip of three phase induction motor is
(a) zero (b) 0.1 (c) 1.0 (d) infinity

119. If the full load speed of a 6-pole, 50 Hz induction motor is 950 rpm, then motor speed at half full load would be approximately equal to
(a) 475 rpm (b) 950 rpm (c) 500 rpm (d) 975 rpm

120. The main advantage of distributed winding in a rotating machine is
(a) to reduce the size of machine. (b) to enhance generated voltage.
(c) to reduce copper loss. (d) to reduce harmonics in generated emf.

121. In a salient pole synchronous motor, the developed reluctance torque attains maximum value when the load angle in electrical degree is
(a) 0° (b) 45° (c) 60° (d) 90°

122. A 4-pole star connected alternator running at 1500 rpm has 72 slots with 10 conductors per slot. The number of turns per phase and slot angle are respectively.
(a) 120 turns and 20° (b) 100 turns and 10°
(c) 120 turns and 10° (d) 100 turns and 20°

123. To eliminate 5th harmonic voltage from the phase voltage of an alternator, the coil should be short pitched by an electrical angle of
(a) 30° (b) 36° (c) 72° (d) 18°

124. Frequency of current in the rotor of a 3-phase induction is equal to
(a) supply frequency (b) less than supply frequency
(c) slip time supply frequency (d) slip/supply frequency

125. Induction machine with negative slip acts as
(a) an induction motor. (b) a reluctance motor.
(c) an induction generator. (d) a synchronous motor.

126. A 3-phase, 6 pole, 50 Hz induction motor is running at 5% slip. What is the speed of the motor ?
(a) 850 rpm (b) 900 rpm (c) 950 rpm (d) 1000 rpm

127. Under no-load condition, a salient pole synchronous motor is running with normal excitation. If excitation of this motor is reduced to zero
(a) it will work as an induction motor. (b) it will work as a reluctance motor.
(c) it will work as a synchronous motor. (d) the motor will stop.

128. Which of the following motor is most suitable for a computer printer drive ?
(a) Reluctance motor (b) Hysteresis motor
(c) Shaded pole motor (d) Stepper motor

129. The V-curve of a synchronous motor is a plot between
(a) field current and field voltage (b) armature current and armature voltage
(c) field current and armature current (d) field voltage and armature voltage

130. An induction motor operates in braking (plugging) mode when
(a) slip (S) > 1 (b) slip (S) < 0 (c) slip (S) = zero (d) 0 < slip < 1

131. The rotor of a stepper motor has
(a) No windings (b) No commutator (c) No brushes (d) All of these

132. A 3-phase induction motor is operating at a slip, S. If the two supply leads are interchanged, then its slip at that instant will be
(a) 2 – S (b) 2 + S (c) 1 + S (d) 1 – S

133. AC servomotor is basically a
(a) Universal motor (b) Capacitor motor
(c) 2-phase induction motor (d) 3-phase induction motor

134. The per unit value of a 4 Ω resistor at 100 MVA base current and 10 kVA base voltage is
(a) 2.0 p.u. (b) 4.0 p.u. (c) 0.4 p.u. (d) 0.004 p.u.

135. A 10 kVA, 400 V/200 V single phase transformer with 10% impedance draws a steady short circuit current of
(a) 50 A (b) 150 A (c) 250 A (d) 350 A

136. The positive sequence current of a transmission line is
(a) always zero (b) 1/3 of negative sequence current
(c) equal to negative sequence current (d) 3 times of negative sequence current

137. The percentage bias for generator protection for a differential relay lies between
(a) 5 to 10 (b) 20 to 15 (c) 15 to 20 (d) 20 to 25

138. The capacitor switching is easily done with
(a) Air blast circuit breaker (b) Oil circuit breaker
(c) Air circuit breaker (d) Vacuum circuit breaker

139. For a P-pole electrical machine, the relation between electrical and mechanical degrees is
(a) $\theta_e = \frac{2}{P}\theta_m$ (b) $\theta_e = \frac{4}{P}\theta_m$ (c) $\theta_e = \theta_m$ (d) $\theta_e = \frac{P}{2}\theta_m$

140. In a dc machine, the field flux axis and armature flux axis are respectively along
(a) direct axis and quadrature axis. (b) quadrature axis and direct axis.
(c) Both along direct axis. (d) Both along quadrature axis.

141. In case of an induction motor, which expression is correct ?
(a) $N_r = N_s(1 - S)$ (b) $N_s = N_r(1 - S)$ (c) $N_s = N_r(1 + S)$ (d) $N_r = 2 \cdot N_s$

142. The unit protection scheme provides
(a) Primary protection only
(b) Back-up protection only
(c) Simultaneous protection
(d) Remote protection

143. Infinite bus bar has
(a) constant voltage
(b) constant current
(c) constant frequency
(d) constant voltage and constant frequency both

144. Which of the following equipment is not installed in a sub-station ?
(a) Shunt reactor
(b) Exciter
(c) Voltage transformer
(d) Capacitor

145. A distance relay measures
(a) Difference in voltage
(b) Difference in phase
(c) Difference in impedance
(d) Difference in distance

146. In HRC fuse, the time between cut-off and final current zero is called
(a) Pre-arcing time
(b) Arcing time
(c) Total operating time
(d) None of these

147. According to fuse law, the current carrying capacity of fuse is proportional to
(a) diameter of fuse
(b) $(\text{diameter of fuse})^{3/2}$
(c) $(\text{diameter of fuse})^{1/2}$
(d) $\frac{1}{\text{diameter of fuse}}$

148. The rating of fuse wire is always expressed in
(a) Voltage and current
(b) Amperes
(c) Volt-Ampere
(d) Ampere-hour

149. Earth wires are made of
(a) Copper
(b) Aluminium
(c) Iron
(d) Galvanized stranded steel wire

150. The safety of electrical appliances and wiring is ensured by
(a) Insulation
(b) Earthing
(c) Providing fuse wire in the electrical circuit
(d) All of these

151. MCB stands for
(a) Main Circuit Board
(b) Main Circuit Breaker
(c) Miniature Circuit Breaker
(d) None of these

152. The Rate of Rise of Restriking Voltage (RRRV) depends upon
(a) Type of circuit breaker
(b) Inductance of the system only
(c) Capacitance of the system only
(d) Inductance and capacitance of the system

153. The Buchholz relay protects a transformer from
(a) All types of internal faults
(b) Winding to earth fault only
(c) Inter-turn faults only
(d) External faults

154. The relay, which is most affected by "arc resistance"
(a) Buchholz relay
(b) Impedance relay
(c) Reactance relay
(d) Differential relay

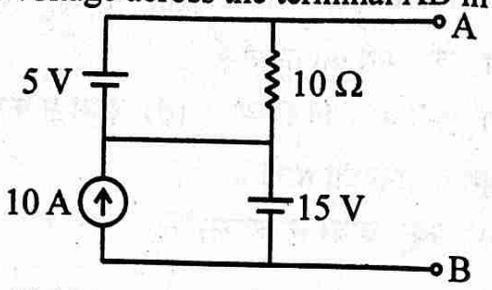
155. In village, most commonly used distribution system is
(a) Parallel system (b) Mesh system (c) Ring system (d) Radial system

156. Reactance relay is normally used for the protection of
(a) Long transmission line (b) Medium transmission line
(c) Short transmission line (d) All types of lines

157. If the fault current is 2000 A, relay setting is 50 % and CT ratio is 400/5 A, then Plug Setting Multiplier (PSM) will be
(a) 25 (b) 10 (c) 15 (d) 50

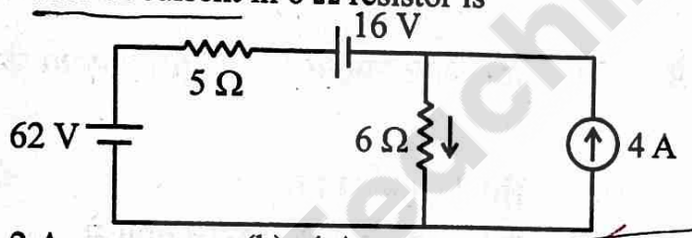
158. The maximum power (watts) that a 12 V DC source with an internal resistance of 3 Ω can supply to an external resistive load
(a) 12 watts (b) 36 watts (c) 48 watts (d) 72 watts

159. The voltage across the terminal AB in the circuit shown is



(a) 10 V (b) 5 V (c) 15 V (d) 20 V

160. The value of current in 6 Ω resistor is



(a) 2 A (b) 4 A (c) 6 A (d) 5.2 A

161. The superposition theorem cannot be applied to a linear circuit to determine
(a) voltage (b) power (c) current (d) Both (a) and (c)

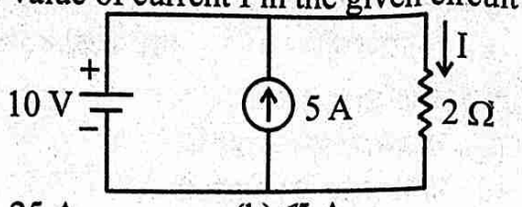
162. Thevenin's theorem can be applied to a circuit having
(i) Independent source (ii) Linear elements
(iii) Unilateral elements (iv) Bilateral elements
(a) (i) and (iii) (b) (i), (ii) and (iii) (c) (i), (ii) and (iv) (d) None of these

163. What should be the value of resistor R in resistance switching for critically damped restriking voltage ?
(a) $R > \frac{1}{2}\sqrt{\frac{L}{C}}$ (b) $R = \frac{1}{2}\sqrt{\frac{L}{C}}$ (c) $R \le \sqrt{LC}$ (d) $R \ge \frac{1}{2}\sqrt{LC}$

164. What is the effect of welding equipments on power factor ?
(a) Power factor increases. (b) Power factor decreases.
(c) Power factor does not change. (d) Both current drawn and power factor increase.

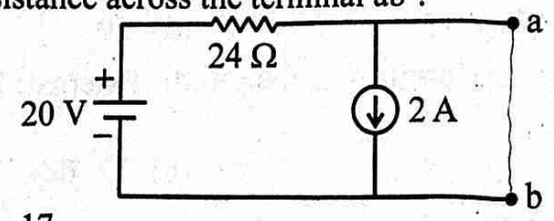
165. In ring main distribution system, a distributor is fed
(a) by one feeder (b) by two feeders
(c) by four feeders (d) at different points of the feeder

166. The value of current I in the given circuit



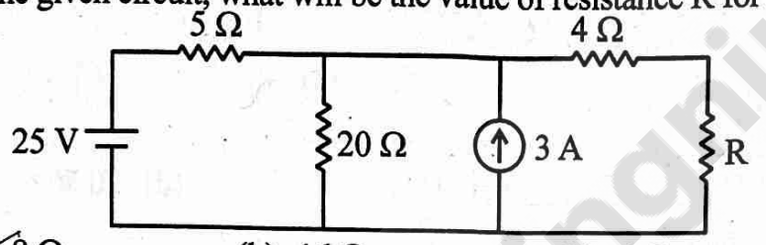
(a) 25 A (b) 5 A (c) 10 A (d) 20 A

167. In the given circuit, what will be Norton's current source value and Norton's equivalent resistance across the terminal ab ?



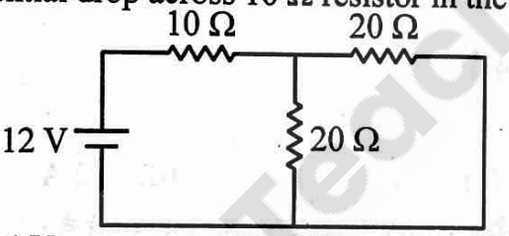
(a) $\frac{17}{6}$ A, 48 Ω (b) 2 A, 24 Ω (c) $-\frac{7}{6}$ A, 24 Ω (d) −2 A, 48 Ω

168. In the given circuit, what will be the value of resistance R for maximum power transfer into it ?



(a) 8 Ω (b) 16 Ω (c) 4 Ω (d) 12 Ω

169. Potential drop across 10 Ω resistor in the given circuit is



(a) 4 V (b) 8 V (c) 6 V (d) 3 V

170. A network consists of only independent current sources and resistors. If the value of all current sources are doubled, then voltage at any node will

(a) remain the same (b) be doubled

(c) be halved (d) be one-fourth

171. In a synchronous motor damper winding is used to

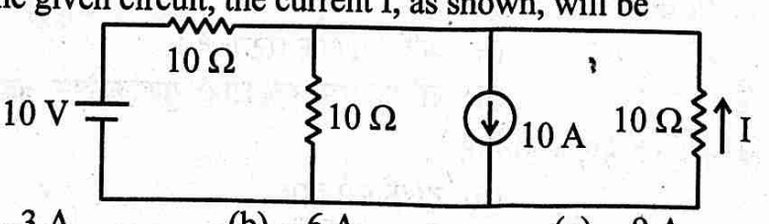
(a) stabilize rotor speed only.

(b) suppress rotor oscillation only.

(c) develop necessary starting torque only.

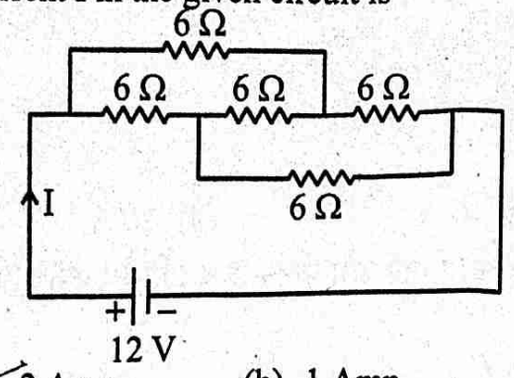
(d) Both (b) and (c) are correct.

172. In the given circuit, the current I, as shown, will be



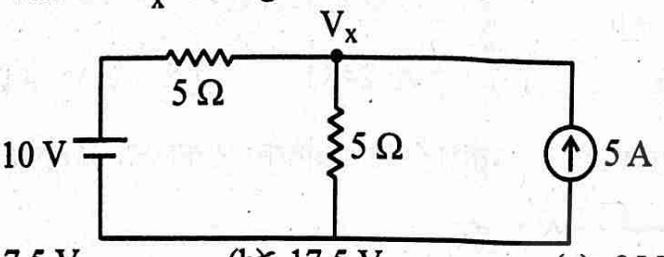
(a) −3 A (b) −6 A (c) −9 A (d) +3.67 A

173. Current I in the given circuit is



(a) 2 Amp (b) 1 Amp (c) 4 Amp (d) 3 Amp

174. The value of V_x in the given circuit is



(a) 7.5 V (b) 17.5 V (c) 35 V (d) 15 V

175. Which law is applied for Nodal analysis ?

(a) Norton's theorem (b) Kirchhoff's current law
(c) Thevenin's theorem (d) None of these

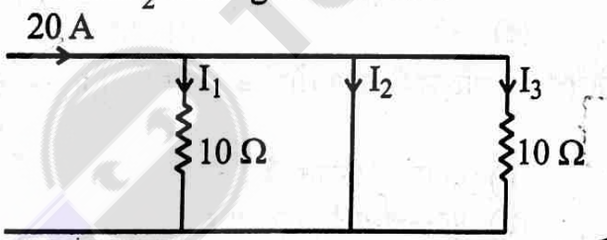
176. In an oscilloscope screen, linear sweep is applied at the

(a) Vertical axis (b) Horizontal axis
(c) Origin (d) Both horizontal and vertical axes

177. Lissajous pattern obtained on the screen of CRO can be used to determine

(a) Phase shift (b) Voltage amplitude (c) Amplitude distortion (d) None of these

178. The value of I_2 in the given circuit is

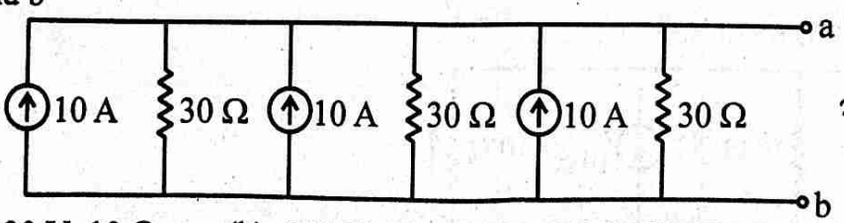


(a) 0 A (b) 10 A (c) 20 A (d) 5 A

179. The condition for maximum power transfer in an AC circuit to a load impedance Z_L is

(a) $Z_L = Z_{th}$ (b) $Z_L = -Z_{th}$ (c) $Z_L = Z_{th}^*$ (d) $R_L = R_{th}$

180. Find Thevenin's voltage V_{th} and equivalent resistance (R_{th}) respectively across the terminal a and b



(a) 90 V, 10 Ω (b) 300 V, 20 Ω (c) 90 V, 90 Ω (d) 300 V, 10 Ω