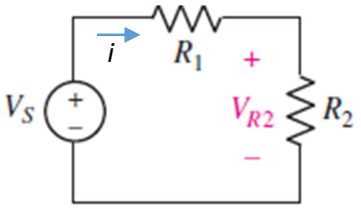
1. A new type of device appears to accumulate charge according to the expression $q(t)=(15t^2-12t)$ mC (t in s) in the interval of $0 \leq t < 5$ s, at what time does the current flowing into the device equal zero?
   A. 0.8s
   B. 0.4s
   C. 0.475s
   D. 0.2ms

Answer: B

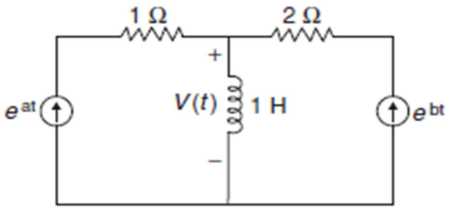
2. Which of the following is not true regarding to the following circuit shown below.



   A. $V_s = i(R_1 + R_2)$
   B. $V_{R2} = V_s(\frac{R2}{R1+R2})$
   C. $V_{R2} = V_s(\frac{R1}{R1+R2})$
   D. $i = (\frac{Vs}{R1+R2})$

Answer: C

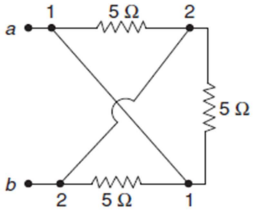
3. In the circuit given below, the voltage V(t) is given by



   A. $e^{at} - e^{bt}$
   B. $e^{at} + e^{bt}$
   C. $a.e^{at} - b.\ e^{bt}$
   D. $a.e^{at} + b.\ e^{bt}$

Answer: D

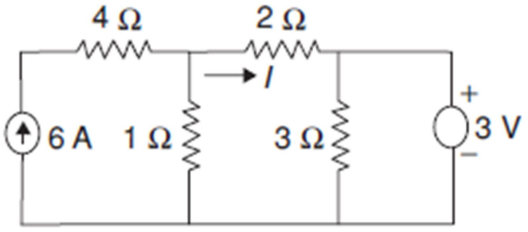
4. Consider the circuit shown in figure below and determine R_{ab},



   A. 2.5 Ω
   B. 7.5 Ω
   C. 25 Ω
   D. 1.66 Ω

Answer: D

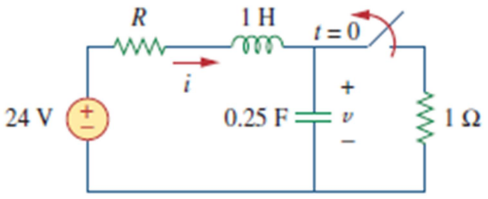
5. For the circuit shown in the figure the current 'I' is given by



A. 2 A
B. 3 A
C. 1 A
D. zero

Answer: C

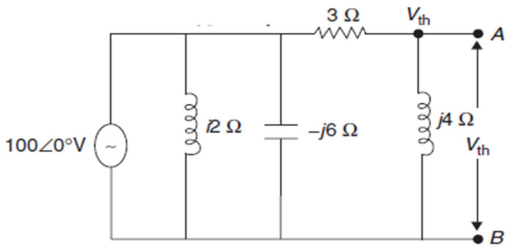
6. The switch is the circuit below is closed for long time and opened at t = 0. What is the value of v (capacitor voltage) at steady state?



A. 1V
B. 24V
C. 0V
D. 6V

Answer: B

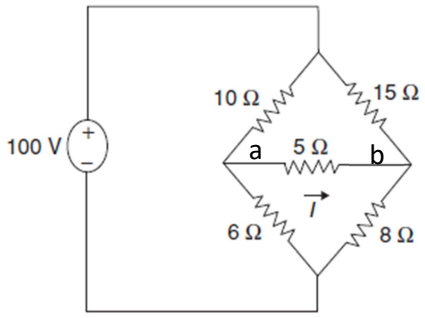
7. The Thevenin's equivalent voltage Vth across the terminal A and B of the network shown in the figure is given by



A. (64+48j)V
B. (48j – 64)V
C. (48 + 64j)V
D. (48 - 64j)V

Answer: A

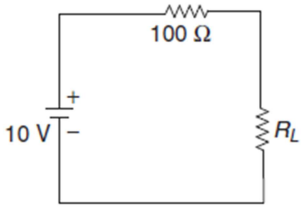
8. What is the Thevenin equivalent resistance at terminal **a** and b on 5Ω indicated on the circuit given below



A. 9.44Ω
B. 39Ω
C. 8.97Ω
D. 9Ω

Answer: C

9. The maximum power that can be transferred to the load resistor RL from the voltage source in the figure is



A. 1 W
B. 10 W
C. 0.25 W
D. 0.5 W

Answer: C

10. What happens if the following program is executed in C and C++?

```
#include<stdio.h>
int main(void)
{
        int new = 5;
        printf("%d", new);
}
```

A. Error in C and successful execution in C++
B. Error in both C and C++
C. Error in C++ and successful execution in C
D. A successful run in both C and C++

Answer C

11. Which of the following is the correct identifier?
A. $var_name
B. VAR_123
C. varname@
D. 2come

Answer B

12. Which of the following statements is correct about the formal parameters in C++?
    A. Parameters with which functions are called
    B. Parameters which are used in the definition of the function
    C. Variables other than passed parameters in a function
    D. Variables that are never used in the function

Answer A

13. What will be the output of the following C++ code?

```
#include <stdio.h>
#include <iostream>
using namespace std;
 int main()
{
        int array[] = {10, 20, 30};
      cout << -2[array];
      return 0;
}
```

    A. -15
    B. -30
    C. compile time error
    D. garbage value

Answer B

14. What will be the output of the following C++ code?

```
#include <iostream>
using namespace std;
 int main()
{
        int a = 3, b =4;
      cout << a | b;
      return 0;
}
```

    A. 3
    B. 4
    C. 7
    D. 8

Answer C

15. For inserting a new line in C++ program, which one of the following statements can be used?
    A. \n
    B. \r
    C. \a
    D. \t

Answer A

16. Which of the following gives the 4th element of the array?

A. Array;
B. array[0];
C. array[3];
D. array[4];

Answer C

17. What is the output of below program?

```
int main()
{
        int a = 10;
        cout<<a++;
        return 0;
}
```

A. 10
B. 11
C. 12
D. 9

Answer A

18. A zener diode is always connected in

A. Reverse bias
B. Forward bias
C. either reverse or forward bias
D. none of the above

Answer: A

19. Which type of rectifier required transformer to operate

A. half-wave rectifier
B. center-tap full-wave rectifier
C. bridge full-wave rectifier
D. none of the above

Answer: B

20. A Bipolar junction transistor is acted as

A. Current controlled device
B. voltage controlled device
C. both voltage and current operated device
D. none of the above

Answer: A

21. A transistor is connected in CB mode. If it is not connected in CE mode with same bias voltages, the values of base, collector and emitter current will
    A. remain the same
    B. increase
    C. decrease
    D. none of the above

Answer: A

22. Main function of common-collector stage is to
    A. provide voltage gain
    B. provide phase inversion
    C. provide a high-frequency path to improve the frequency response
    D. buffer the voltage amplifiers from the low-resistance load and provide impedance matching for maximum power transfer

Answer: D

23. A silicon transistor is biased with base resistor method. If values of β=100, VBE =0.7 V, zero signal collector current IC = 1 mA and VCC = 6V , what is the value of the base resistor ?
    A. 105 kΩ
    B. 530 kΩ
    C. 315 kΩ
    D. None of the above

Answer: B

24. The purpose of capacitors in a transistor amplifier is to
    A. Protect the transistor
    B. Cool the transistor
    C. Couple or bypass a.c. component
    D. Provide biasing

Answer: C

25. The best frequency response of amplifier is achieved using
    A. RC coupling
    B. Transformer coupling
    C. Direct coupling
    D. None of the above

Answer: C

26. Why the number of stages that can be directly coupled is limited

A. Due to changes in temperature cause thermal instability

B. Circuit becomes heavy and costly

C. It becomes difficult to bias the circuit

D. None of the above

Answer : A

27. The period of signal of x(t) = $\sin t + \cos\sqrt{2}t$ is

A. $\pi/\sqrt{2}$

B. 3π

C. 2π

D. The signal is not periodic

Answer: D

28. The even part of a signal $x(n) = u(n) + u(-n)$ is

A. $u(n) - u(-n)$

B. $u(n) + u(-n)$

C. $u(-n) - u(n)$

D. $2u(n)$

Answer: B

29. The Impulse response of a LTI system is given as **h(n)=** $\left(\frac{-1}{4}\right)^n u(n)$ .The step response is

A. $\frac{1}{4}\left[5 + \left(\frac{-1}{4}\right)^n\right]$

B. $\frac{1}{4}\left[5 - \left(\frac{-1}{4}\right)^n\right]$

C. $\frac{1}{4}\left[4 + \left(\frac{-1}{4}\right)^n\right]$

D. $\frac{1}{4}\left[4 - \left(\frac{-1}{4}\right)^n\right]$

Answer: B

30. H(s) the transfer function and H(s)= $\frac{s}{s^2-s-2}$ $(\sigma < -1)$. Then the function is

A. Causal and stable

B. Causal and unstable

C. Non-causal and stable

D. Non-causal and unstable

Answer: D

31. Unit impulse response of a system is $f(t) = e^{-t}$, *for* $t \geq 0$, for this system, the steady state value of the output for unit step input is equal to

A. 1

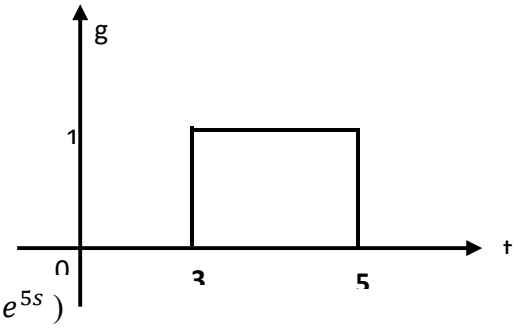
B. –1

C. 0

D. ∞

Answer: A

32. The Laplace transform of the following signal given in the following figure is equal to:



A. $\frac{1}{s}(e^{3s} - e^{5s})$

B. $\frac{1}{s}(e^{-5s} - e^{-3s})$

C. $\frac{1}{s}(e^{3s} - e^{5s})$

D. $\frac{e^{-3s}}{s}(e^{5s} - e^{3s})$

Answer: D

33. $x[n] = a^n u[n]$ where a is real. z-transform of $x[n]$ is

A. $\frac{z}{z-a}$, $|z| < |a|$

B. $\frac{z}{z-a}$, $|z| > |a|$

C. $\frac{z}{z+a}$, $|z| > |a|$

D. $\frac{z}{z+a}$, $|z| < |a|$

Answer: B

34. Which of the following statements is/are true?

1. A Fourier series for an even periodic function will consist entirely of cosine terms.
2. A Fourier series for an odd periodic function will consist entirely of sine terms.
3. A Fourier series for an odd periodic function will consist entirely of cosine terms.
4. A Fourier series for an even periodic function will consist entirely of sine terms.

A. 3, 4

B. 1, 2

C. 1, 3

D. 2, 4

Answer: B

35. If the driving point admittance function of a 1-port network is $Y(s) = \frac{Ks}{s+\alpha}$,it can be realized using
    A. Parallel combination of R, L
    B. Series combination of R, L
    C. Parallel combination of R, C
    D. Series combination of R, C

Answer D

36. For an RC driving point impedance function, the poles and zeros
    A. Should alternate only on the negative real axis
    B. Should alternate on the imaginary axis
    C. Should alternate on real axis
    D. Can lie anywhere on the left half plane

Answer A

37. An ideal filter should have
    A. Zero attenuation in the attenuation band
    B. Zero attenuation in the pass band
    C. Infinite attenuation in the passband
    D. None of the above

Answer B

38. If two two-port networks are connected in parallel, and if the port current requirement is satisfied, which one of the following is true
    A. The ABCD-parameter matrices add
    B. The z -parameter matrices add
    C. The y-parameter matrices add
    D. None of the above

Answer C

39. Match the List-I (Forms) with List-II (Networks)

	List I		List II
a	Cauer I	1	L in series arms and C in shunt arms of a ladder
b	Cauer II	2	C in series arms and L in shunt arms of a ladder
c	Foster I	3	series combination of L and C in parallel
d	Foster II	4	Parallel combination of L and C in series

    A. a-1, b-2, c-3, d-4
    B. a-1, b-2, c-4, d-3
    C. a-2, b-1, c-4, d-3
    D. a-2, b-1, c-3, d-4

Answer A

40. A two-port network is described by relations

$$V_1 = 2V_2 + 0.5I_2$$
$$I_1 = 2V_2 + I_2$$

What is the value of the h_{22} parameter of the network

A. 2 Ω
B. 2 mho
C. -2Ω
D. -2 mho

Answer D

41. Ideal response of filter takes place in
A. Pass band and stop band frequency
B. Stop band frequency
C. Pass band frequency
D. None of the mentioned

Answer C

42. A network function can be completely specified by
A. Poles and zeros
B. Real parts of zeros
C. Real parts of poles
D. Poles, zeros, and a scale factor

Answer D

43. A device that is used to switch one of several input lines to a single output line is called a

A. Comparator
B. Multiplexer
C. Decoder
D. Encoder

Answer C

44. If the period of a clock signal is 500 ps, the frequency is_____

A. 20 MHz
B. 2 GHz
C. 200 MHz
D. 20 GHz

Answer B

45. In the binary number 1000, the weight of the column with the 1 is
    A. 8
    B. 10
    C. 6
    D. 4

Answer A

46. 2's complement of binary number 0101 is
    A. 1111
    B. 1011
    C. 1101
    D. 1110

Answer B

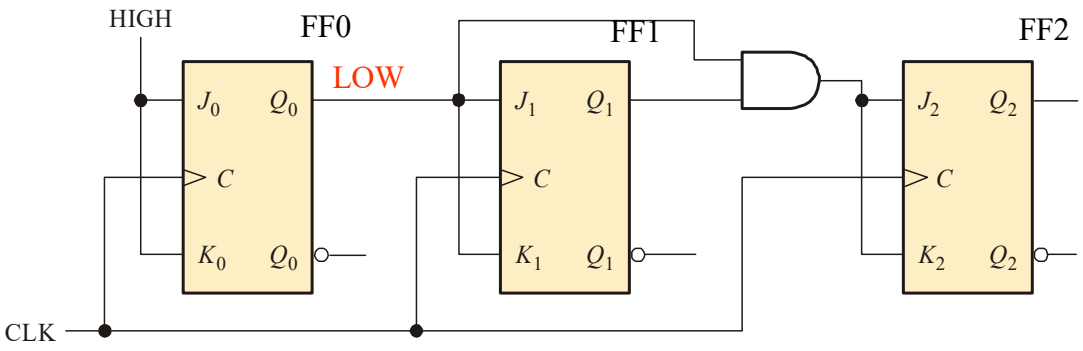
47. _____ is a universal gate
    A. AND
    B. OR
    C. NOT
    D. NAND

Answer D

48. A Boolean expression that is in standard SOP/POS form is
    A. The minimum logic expression
    B. Contains only one product term
    C. Has every variable in the domain in every term
    D. None of the above

Answer C

49. Assume Q_0 is LOW. The next clock pulse will cause
    a. FF1 and FF2 to both toggle
    b. FF1 and FF2 to both latch
    c. FF1 to latch; FF2 to toggle
    d. FF1 to toggle; FF2 to latch



Answer B

50. A 4-bit parallel-in/parallel-out shift register will store data for
    A. 1 clock period
    B. 3 clock periods
    C. 2 clock periods
    D. clock period

Answer A

51. The chemical used in breather for transformer should have the quality of
    A. cooling the transformer oil
    B. cleansing the transformer oil
    C. absorbing moisture
    D. ionizing air

Answer C

52. Power factor of a synchronous motor is unity when
    A. the armature current is maximum
    B. the armature current is zero
    C. the armature current is maximum
    D. none of the above

Answer C

53. A synchronous motor can operation at
    A. lagging, leading and unity power factors
    B. unity power factor only
    C. leading power factor only
    D. lagging power factor only

Answer A

54. No load on a transformer is carried out to determine
    A. efficiency of the transformer
    B. magnetizing current
    C. copper loss
    D. magnetizing current and loss

Answer D

55. In a D.C. shunt motor, under the conditions of maximum power, the current in the armature will be
    A. more than full load current
    B. less than full load current
    C. rated full load current
    D. almost negligible

Answer A

56. A 4pole Lap wound DC shunt generator has an armature winding consists of 220 turns each of 0.004Ω. The armature resistance is..
    A. 0.5Ω
    B. 1Ω
    C. 0.025Ω
    D. 0.055Ω

Answer D

57. Which of the following motors has the poorest speed regulation?

A. cumulative compound motor

B. differential compound motor

C. series motor

D. hunt motor

Answer C

58. In D.C. generator, lap winding is used for

A. low voltage, low current

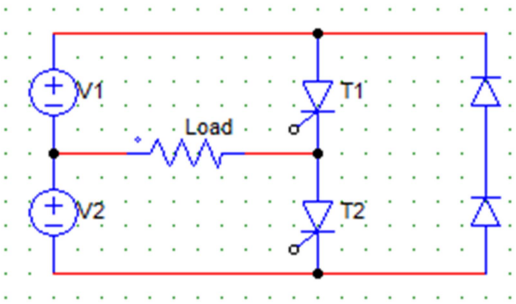
B. high voltage, low current

C. low voltage, high current

D. high voltage, high current

Answer C

59. What is the voltage across the R load when only T2 is conducting?



A. Vs

B. Vs/2

C. 2Vs

D. Zero

Answer B

60. The output current wave of a single-phase full bridge inverter on RL load is

A. a sine wave

B. a square wave

C. a triangular wave

D. constant dc

Answer C

61. In AC voltage controllers the

A. variable ac with fixed frequency is obtained

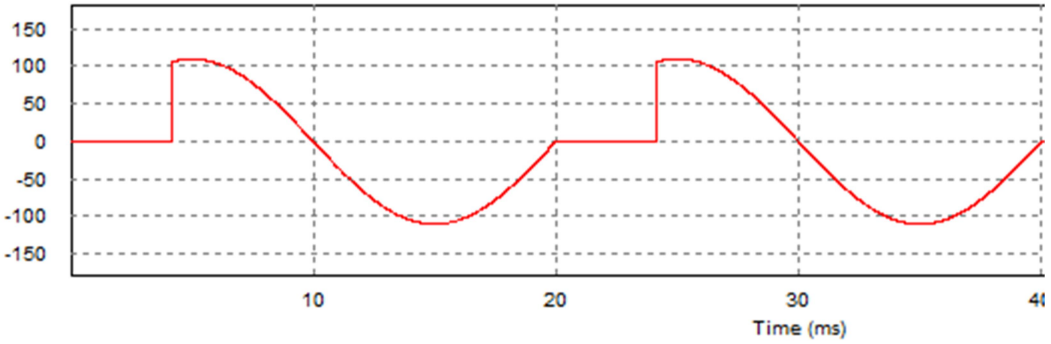
B. variable ac with variable frequency is obtained

C. variable dc with fixed frequency is obtained

D. variable dc with variable frequency is obtained

Answer A

62. The below given output voltage waveform can be obtained by a



A. half wave ac voltage controller
B. full wave ac voltage controller
C. half wave controller with firing angle = 0° for T1
D. full wave controller with firing angle = 0° for both T1 and T2

Answer B

63. A cycloconverter is a _____

A. one stage power converter
B. one stage voltage converter
C. one stage frequency converter
D. none of the mentioned

Answer C

64. Induction heating is a _____ type of heating

A. zero frequency
B. high frequency
C. power frequency
D. none of the mentioned

Answer B

65. Servo motors are an example of which type of load?

A. Pulsating loads
B. Short time loads
C. Impact loads
D. Short time intermittent loads

Answer B

66. The peak inverse voltage in ac to dc converter system is highest in

A. single phase full converter
B. single phase full wave midpoint converter
C. 3 phase half wave converter
D. 3 phase bridge converter

Answer B

67. Earthing is necessary to give protection against

A. Electric shock
B. Voltage fluctuation
C. Overloading
D. High temperature of the conductors

Answer A

68. The fuse rating is usually defined in

A. Ampere
B. Kilowatt
C. VA
D. All of the above

Answer A

69. Fuse wire should be connected to

A. Phase wire only
B. Neutral wire only
C. Ground wire only
D. Both B and C

Answer A

70. If 2 switches are connected in series to a lamp/load, then

A. Any one switch needs to be switched ON to energize the load
B. Both the switches need to be switched ON to energize the load
C. Only switch 1 need to be switched ON to energize the load
D. Only switch 2 need to be switched ON to energize the load

Answer B

71. The connection sequence of meter and circuit breaker is

A. circuit breaker must be connected before meter
B. meter must be connected before circuit breaker
C. A and B
D. none

Answer B

72. the rate of circuit breaker for general purpose branch circuit is

A. 16ampere
B. 10ampere
C. 25ampere
D. a and b

Answer D

73. The architect design is approved by

A. Client
B. Tender
C. Contractor
D. all

Answer A

74. The standard distance between two socket is

A. 1.21 meter

B. 0.61 meter

C. 1.83 meter

D. None

Answer C

75. what is the difference between agreement and contract

A. contract is only legally enforceable

B. an agreement must be socially acceptable

C. an agreement doesn't be enforceable by the law

D. all

Answer D

76. Bundled conductors in EHV transmission lines

A. decrease inductance

B. decrease capacitance

C. increase inductance

D. increase capacitance

Answer A

77. Which of the following insulator is practically used for railway crossings?

A. string insulator
B. strain insulator
C. pin insulator
D. all of the above

Answer B

78. Communication lines are treated as

A. medium transmission lines
B. long transmission lines
C. short transmission lines
D. any of the above

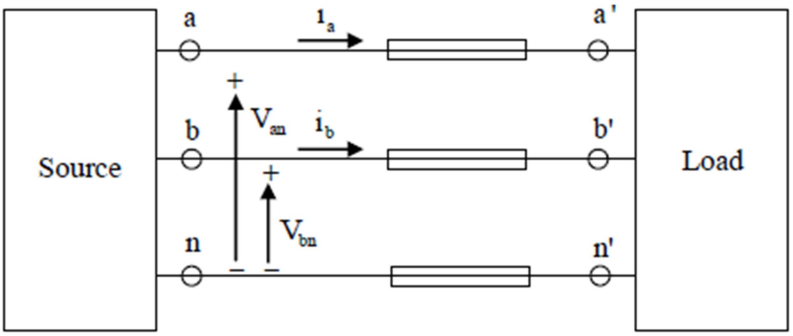
Answer B

79. The horizontally placed conductors of a single-phase line operating at 50 Hz are having outside diameter of 1.6 cm, and the spacing between centers of the conductors is 6 m. The permittivity of free space is 8.854×10^{-12} F/m. The capacitance to ground per kilometer of each line is

A. 4.2 x 10-9F
B. 8.4x10-9F
C. 4.2x10-12F
D. 8.4x10-12F

Answer B

80. A source is supplying a load through a 2-phase, 3-wire transmission system as shown in figure below. The instantaneous voltage and current in phase-a are V_{an} = 220sin(100πt)V and i_a = 10sin(100πt)A, respectively. Similarly for phase-b the instantaneous voltage and current are V_{bn} = 220cos(100πt)V and i_b = 10cos(100πt)A, respectively.



A. 2200W
B. 2200sin2(100πt)W
C. 440
D. 2200sin(100πt)cos(100πt)W

Answer A

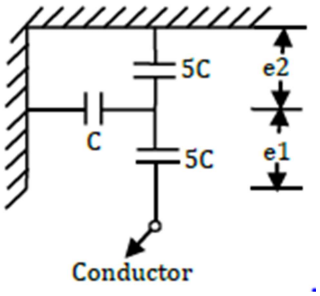
81. Transmission lines are transposed to reduce
A. interference with neighboring communication lines
B. proximity effect
C. skin effect
D. ferranite effect

Answer A

82. Transmission loss is
A. a function of bus voltage magnitude and its angle
B. a function of reactive power generation
C. independent of real power generation
D. a function of real power generation

Answer D

83. Consider a three-phase, 50Hz, 11kV distribution system. Each of the conductors is suspended by an insulator string having two identical porcelain insulators. The self-capacitance of the insulator is 5 times the shunt capacitance between the link and the ground, as shown in the figure. The voltage across the two insulators are



A. e1 = 3.74 kV, e2= 2.61 kV
B. e1 = 3.46 kV, e2= 2.89 kV
C. e1 = 6.0 kV, e2= 4.23 kV
D. e1 = 5.5 kV, e2= 5.5 kV

Answer B

84. The insulation resistance of the 20km long underground cable is 8MΩ. Other things being same, the insulation resistance of 10km long cable will be

A. 8MΩ
B. 4MΩ
C. 16MΩ
D. 32MΩ

Answer C

85. In case of short circuit, _____ current will flow in the circuit

A. Zero
B. Very low
C. Normal
D. Very high current

Answer D

86. The service mains connects

A. Distributor and consumer terminals
B. Distributor and transformer
C. Distributor and relay system
D. Transformer and earth

Answer A

87. A type of relay works on the principle of either electromagnetic induction or electromagnetic attraction is
    A. Electromagnetic relay
    B. Static relay
    C. Numerical relay
    D. None

Answer A

88. Power Frequency Variations are usually caused by rapid changes in
    A. Customer
    B. Load
    C. a and b
    D. all

Answer D

89. Expected failure rate is the inverse of
    A. Expected repair rate
    B. Mean time to failure
    C. Mean time repair
    D. b and c

Answer B

90. _____ is a mechanism for interchange of power between two and more utilities which provide of generate electricity.
    A. Power Pool
    B. Automatic voltage control
    C. Load frequency control
    D. None

Answer A

91. Over current protection is
    A. None directional
    B. No intentional time delay
    C. Relay responds to overcurrent condition in the forward direction only
    D. a and b

Answer D

92. _____ relay is a gas operated relay used for the protection of oil immersed transformers against all the types of internal faults
    A. Static relay
    B. Numerical relay
    C. Buchholz Relay
    D. Electromechanical relay

Answer C

93. Most nuclear reactors are controlled by means of control rods that are made of_____
    A. Boron
    B. Cadmium
    C. Hafnium
    D. All of the above

Answer D

94. Which sentence is not correct
    A. Microgrid can be considered as a small-scale version of the traditional utility grid
    B. Microgrid can coordinate unique community energy needs with generation resources
    C. Microgrid have to operate with utility grid
    D. Microgrid enables 'intelligent sharing' of energy loads and resources

Answer C

95. The main types of sources in Microgrid are
    A. Only renewables
    B. Renewables, diesel generators, microturbine, fuel cell
    C. Only diesel generators
    D. Renewables and diesel generators

Answer B

96. The thermodynamic Isochoric process shows constant_____process
    A. Enthalpy
    B. Pressure
    C. Volume
    D. Temperature

Answer C

97. _____cycle is the example for external combustion thermodynamic power cycle
    A. Ericsson
    B. Otto
    C. Diesel
    D. Brayton

Answer A

98. It is a measure of the ignition quality of diesel engine fuels
    A. Octane number
    B. Cetane number
    C. Pour point
    D. None of the above

Answer B

99. Which of the following are types of systems used in ocean thermal energy conversion?
    A. Horizontal and vertical
    B. Vertical and open cycle
    C. Open cycle and closed cycle
    D. Horizontal and closed cycle

Answer C

100. Open cycle ocean thermal energy conversion systems use _____ as the working fluid.
    A. Vapour from rivers
    B. Water from rivers
    C. Vapour from seawater
    D. Seawater

Answer C