

QUESTION PAPER

Subject: **Electrical**

Code: **3.13 / 041**

Sr. No.:

Roll No.:

Signature of the Invigilator

Date: 13.04.2005

Duration: 2 Hours

Time: 09:00 Hrs. to 11:00 Hrs.

Max. Marks: 120

Instructions: Please read the following instructions carefully before writing your answers:

- 1) All Questions are compulsory.
- 2) Each Questions carries 1 mark.
- 3) There are four alternatives - (A), (B), (C), (D) given against each question out of which only one is the most appropriate answer. **If (A) is correct, round on the correct alternative like (A) .**
- 4) If a question is answered wrongly or more than one answers are marked, 0.25 marks will be deducted for each such question.
- 4) No sheet from the Question Paper / Answer Book should be detached.
- 5) **Please DO NOT repeat DO NOT write your name anywhere on the Question Paper.**

1.The number of micro amperes in 2 milli amperes is?

- A.2 μ A
- B.20 μ A
- C.200 μ A
- D.2,000 μ A

Ans: D

2.If the diameter of a conductor of 10 ohms is doubled, its new resistance would be?

- A.20 ohms
- B.5 ohms
- C.40 ohms
- D.2.5 ohms

Ans: D

3.What amount of current will flow through resistance of 10 ohms when it is connected across a potential difference of 20 volts?

- A.30 amperes
- B.5 amperes
- C.10 amperes
- D.2 amperes

Ans: D

4.Resistance is measured in?

- A.henries
- B.ohms
- C.hertz
- D.watts

Ans: B

5.Eighteen thousand watts is the same as?

- A.18 mW
- B.18 MW

C.18 kW

D.18 μ W

Ans: C

6.An electric heater draws 3.5 A from a 110 V source. The resistance of the heating element is approximately?

A.385 ohms

B.38.5ohms

C.3.1 ohms

D.31 ohms

Ans: D

7.If an incandescent lamp of 80 ohms resistance takes a current of 0.75 ampere, what voltage is required to light it?

A.45 volts

B.60 volts

c.23 volts

D.None of these

Ans: B

8.The current through a flashlight bulb is 40 mA and the total battery voltage is 4.5 V. The resistance of the bulb is approximately?

A.112 ohms

B.11.2 ohms

C.1.2 ohms

D.18 ohms

Ans: A

9.Materials with lots of free electrons are called?

A.conductors

B.insulators

C.semiconductors

D.filters

Ans: A

10.A thermistor is a type of?

A.switch

B.resistor

C.battery

D.power supply

Ans: B

11.If three wires of 3 ohms, 9 ohms and 5 ohms respectively are connected in series, what their resultant resistance?

A.10 ohms

B.12 ohms

C.17 ohms

D.5 ohms

Ans: C

12.If you used 600 W of power for 60 h, you have used?

A.36 kWh

B.3.6 kWh

C.10 kWh

D.1 kWh

Ans: A

13.The turns ratio of a transformer having 200 primary turns and 1,200 secondary turns is?

A.6

B.24

C.1.66

D.66

Ans: A

14.A constant load power means a uniform conversion of?

A.mechanical to electrical energy

B.electrical to mechanical energy

C.current to voltage

D.voltage to current

Ans: B

15.If the peak value of a sine wave is 30 V, the rms value is?

A.19.08 V

B.7.07 V

C.0.707 V

D.23.10 V

Ans: D

16.When converting 7,000 nA to microamperes, the result is?

A.0.007 μ A

B.0.7 μ A

C.700 μ A

D.7 μ A

Ans: D

17.Approximately how many milliamperes of current flow through a circuit with a 40 V source and 6.8 k ohms of resistance?

A.27.2 mA

B.59 mA

C.5.9 mA

D.590 mA

Ans: C

18.Twelve volts are applied across a resistor. A current of 3 mA is measured. What is the value of the resistor?

A.4 ohms

B.400 ohms

C.4 kohms

D.4.4 ohms

Ans: C

19.The minimum resistance value for a blue, gray, red, silver resistor is?

A.612 ohms

B.6,120 ohms

C.6,800 ohms

D.6,460 ohms

Ans: B

20. A two-terminal variable resistor is known as a?

- A. potentiometer
- B. thermistor
- C. rheostat
- D. wiper

Ans: C

21. In 0.025 W, there are?

- A. 25 kW
- B. 0.00025 mW
- C. 2,500 μ W
- D. 25 mW

Ans: D

22. How many watt-hours represent 65 W used for 18 h?

- A. 11.7 Wh
- B. 1,170 Wh
- C. 11,700 Wh
- D. 117,000 Wh

Ans: B

23. If a transformer has 50 turns in the primary winding and 10 turns in the secondary winding, what is the reflective resistance if the secondary load resistance is 250 ohms?

- A. 250 ohms
- B. 25 ohms
- C. 6,250 ohms
- D. 62,500 ohms

Ans: C

24. Referring to Problem 18, if all phase currents are 3 A, the line current magnitudes are?

- A. 3 A
- B. 1 A
- C. 9 A
- D. 18 A

Ans: A

25. A sine wave of 15 kHz is changing at a faster rate than a sine wave with a frequency of?

- B. 12 kHz
- C. 18 kHz
- D. 1.3 MHz

Ans: B

26. The number of millivolts in 0.06 kilovolts is?

- A. 600 V
- B. 6,000 mV
- C. 60,000 mV
- D. 600,000 mV

Ans: C

27. How much resistance is required to limit the current from a 12 V battery to 3.6 mA?

- A. 3.3 k ohms

- B.33 k ohms
- C.2.2 k ohms
- D.22 k ohms

Ans: A

28.You are measuring the current in a circuit that is operated on an 18 V battery. The ammeter reads 40 mA. Later you notice the current has dropped to 20 mA. How much has the voltage changed?

- A.9 V
- B.900 mV
- C.0 V
- D.18 V

Ans: A

29.Four amperes of current are measured through a 24 ohms resistor connected across a voltage source. How much voltage does the source produce?

- A.960 V
- B.9.6 V
- C.96 V
- D.8 V

Ans: C

30.Current flows in a circuit when?

- A.a switch is opened
- B.a switch is closed
- C.the switch is either open or closed
- D.there is no voltage

Ans: B

31.Electrons in the outer orbit are called?

- A.nuclei
- B.valences
- C.waves
- D.shells

Ans: B

32.A material that does not allow current under normal conditions is a(n)?

- A.insulator
- B.conductor
- C.semiconductor
- D.valence

Ans: A

33.If it takes 400 ms to use 12,000 J of energy, the power is?

- A.30 kW
- B.30 W
- C.3 W
- D.300 kW

Ans: A

34.A certain transformer has 400 turns in the primary winding and 2,000 turns in the secondary winding. The turns ratio is?

- A.0.2
- B.0.4

C.5

D.25

Ans: C

35. Referring to Problem 3, power consumption is?

A.16 W

B.160 mW

C.160 W

D.3,459 W

Ans: C

36. Two series resistors are connected to an ac source. If there are 7.5 V rms across one resistor and 4.2 V rms across the other, the peak source voltage is?

A.16.54 V

B.1.65 V

C.10.60 V

D.5.93 V

Ans: A

37. The average value of a 12 V peak sine wave over one complete cycle is?

A.0 V

B.1.27 V

C.7.64 V

D.6.37 V

Ans: A

38. When converting 0.16 mA to microamperes, the result is?

A.16 μ A

B.160 μ A

C.1,600 μ A

D.0.0016 μ A

Ans: B

39. The formula to find I when the values of V and R are known is?

A. $I = VR$

B. $I = R/V$

C. $V = IR$

D. $I = V/R$

Ans: D

40. A resistance of 3.3 M ohms is connected across a 500 V source. The resulting current is approximately?

A.15.1 μ A

B.151 μ A

C.66 mA

D.660 mA

Ans: B

Mark following statements as True or False:-

41. A sawtooth wave has a period of 10 ms. Its frequency is 100 Hz.

Ans: True

42. When converting 1,600 kilohms to megohms, the result is 160 megohms.

Ans: False

43.A current of 200 μA through a 6.8 k ohms resistor produces a voltage drop of 1.36 V.

Ans: True

44.A power supply produces a 0.6 W output with an input of 0.7 W. Its percentage of efficiency is 85.7%.

Ans: True

45.15.Seven thousand volts can be expressed as 7 MV.

Ans: False

Fill in the blanks:-

46.The unit of electrical charge is the

Ans: coulomb

47.The of an 8 ohm resistance is 125 mS.

Ans: conductance

48.In kW, there are 40,000 W.

Ans: 40

49.The Norton equivalent current is the current.

Ans: Short circuit

50.The maximum resistance value for a brown, red, yellow, gold resistor is ohms?

Ans: 126,000

51.Which of the following is not an electrical quantity?

- A.voltage
- B.current
- C.distance
- D.power

Ans: C

52.A resistor is connected across a 50 V source. What is the current in the resistor if the color code is red, orange, orange, silver?

- A.2 mA
- B.2.2 mA
- C.214 mA
- D.21.4 mA

Ans: B

53.How much current is produced by a voltage of 18 kV across a 15 k ohms resistance?

- A.1.2 A
- B.12 A
- C.120 mA
- D.12 mA

Ans: A

54.Which of the following is not a type of energy source?

- A.generator

- B.rheostat
- C.solar cell
- D.battery

Ans: B

55.When the pointer of an analog ohmmeter reads close to zero, the resistor being measured is?

- A.overheated
- B.shorted
- C.open
- D.reversed

Ans: B

56.The turns ratio required to match an 80 ohms source to a 320 ohms load is?

- A.80
- B.20
- C.4
- D.2

Ans: C

57.The primary coil of a transformer is connected to a 60 V ac source. The secondary coil is connected to a 330 ohms load. The turns ratio is 3:1. What is the secondary voltage?

- A.2 V
- B.20 V
- C.180 V
- D.18 V

Ans: B

58.In a Y-connected circuit, the magnitude of each line current is?

- A.one-third the phase current
- B.three times the corresponding phase current
- C.equal to the corresponding phase current
- D.zero

Ans: C

59.When a sine wave has a frequency of 100 Hz in 12 s it goes through?

- A.1/100 cycle
- B.12 cycles
- C.120 cycles
- D.1,200 cycles

Ans: D

60.In order to get maximum power transfer from a capacitive source, the load must?

- A.have a capacitive reactance equal to circuit resistance
- B.have an impedance that is the complex conjugate of the source impedance
- C.be as capacitive as it is inductive
- D.none of the above

Ans: B

61.Fourteen milliamperes can be expressed as?

- A.14 MA
- B.14 μ A
- C.14 kA
- D.14 mA

Ans: D

62.If 750 μ A is flowing through 11 k ohms of resistance, what is the voltage drop across the resistor?

- A.8.25 V
- B.82.5 V
- C.14.6 V
- D.146 V

Ans: 2

63.How much voltage is needed to produce 2.5 A of current through a 200 ohms resistor?

- A.50 V
- B.500 V
- C.80 V
- D.8 V

Ans: B

64.When there is 12 mA of current through a 1.2 k ohms resistor, the voltage across the resistor is?

- A.14.4 V
- B.1.4 V
- C.100 V
- D.10 V

Ans: A

65.How much resistance is needed to draw 17.6 mA from a 12 volt source?

- A.212 ohms
- B.6.8 kohms
- C.68 ohms
- D.680 ohms

Ans: D

66.When placed close together, two positively charged materials will?

- A.attract
- B.become neutral
- C.become negative
- D.repel

Ans: D

67.The colored bands for a 4,700 ohm resistor with a ten percent tolerance are?

- A.yellow, violet, red, gold
- B.yellow, violet, orange, gold
- C.yellow, violet, red, silver
- D.orange, violet, red, silver

Ans: C

68.A certain appliance uses 350 W. If it is allowed to run continuously for 24 days, how many kilowatt-hours of energy does it consume?

- A.20.16 kWh
- B.201.6 kWh
- C.2.01 kWh
- D.8.4 kWh

Ans: B

69.When the turns ratio of a transformer is 20 and the primary ac voltage is 12 V, the secondary voltage

is?

- A.12 V
- B.120 V
- C.240 V
- D.2,400 V

Ans: C

70.In a certain loaded transformer, the secondary voltage is one-fourth the primary voltage. The secondary current is?

- A.one-fourth the primary current
- B.four times the primary current
- C.equal to the primary current
- D.one-fourth the primary current and equal to the primary current

Ans: B

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