BSNL TTA Exam

Paper - II (Basic Engineering) BSNL TTA Exam

1. $X^2 - 4X - 2Y + Y^2 = 4$ represents a circle with

(a) radius = 3

(b) radius = 4

(c) radius = 2

(d) radius = 5

2. Which of these represent two parallel lines:

(a) Y - 4X - 4 = 0

(b) Y + AX - 4 = 0

(c) Y - 4X - 1 =0

(a) (i) and (ii)

(b) (i) and (iii)

(c) (ii) and (iii)

(d) None of these.

3. The conjugate of complex numbers 3 + 2j is

(a) 3 - 2j

(b) 2 + 3j

(c) 2 - 3j

(d) 3 + 4j

4. A Square matrix each of whose diagonal element is 1 and each of the non-diagonal element is zero is called

(a) Null matrix

(b) Unit matrix

(c) Diagonal matrix

(d) Orthogonal matrix

5. The determinant of matrix <image> is

(a) 1

(b) 9

(c) 15

(d) 21

6. The charge of an electron is equal to

(a) 1.6×10^{-16} C

(b) -1.6×10^{-16} C

(c) 1.6×10^{19} C

(d) -1.6 x 1019 C

7. The potential energy of a charged conductor is

(a) $1/2\ CV^2$

(b) 1/2 QV

(c) Both (a) and (b)

(d) None of these

8. Capacitors are mainly used in

(a) Electrical instruments

(b) Storage of electrical energy

(c) Overcoming voltage fluctuations

(d) All the above

9. Two capacities of 4 μF and 12 μF are joined in parallel. The total capacitance is

(a) 8 µF

(b) 16 µF

(c) 3 µF

(f) 2 µF

10. What is the total resistance between points 'A' and 'B' in the given circuit

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(a) 12/7 O

(b) 15 O

(c) 7 O

(d) 7/12 O

11. A current of 12 A is passing through a pure resistive circuit when the potential difference of 60 volts is applied across it, if the potential difference applied is reduced to 12 V, the current would be

(a) 12/5 A

(b) 60 A

(c) 12 A

(d) 2 A

12. Which of these normally used household electrical bulbs will be having maximum resistance.

(a) 100 Watt bulb

(b) 50 Watt bulb

(c) 200 Watt bulb

(d) 25 Watt bulb

13.The distance of point P (4, 3) from the origin will be

(a) 7

(b) 1

(c) 5

(d) 9

14. The slope of the line passing from points (7, 3) and (5, 1) is

(a) 1

(b) 2

(c) 3

(d) 4

15. A line perpendicular to line $3x + 4y + 5 = 0$ can be

(a) $4x + 3y + 4 = 0$

(b) $4x - 3y + 3 = 0$

(c) $3x - 4y + 5 = 0$

(d) $3x - 4y + 2 = 0$.

16. The centre of the circle $x^2 + 6x - 4y + y^2 + 12 = 0$ will be at

(a) (-3, 2)

(b) (3, -2)

(c) (-2, 3)

(d) (2, -3)

17. The product of $(3 + 4j)$ and its conjugate is

(a) 7

(b) 25

(c) 12

(d) 21

18. During charging of a lead acid cell, the specific gravity of electrolyte will

(a) Increase

(b) Decrease

(c) Remain constant

(d) Increase then Decrease

19. The decimal number '12' is represented in binary system as

(a) 1100

(b) 0110

(c) 1010

(d) 1110

20. What is the value of current that will flow when a p. d. 200 V is applied across a circuit of 50 O resistance?

(a) 4 A

(b) 0.4 A

(c) 10 A

(d) 1 A

21. If both the inputs to a Nand Gate are '1', the output would be

(a) 1

(b) 0

22. If input 'A' is 1 and input 'B' is 0, then output X will be

<image>

(a) 0

(b) 1

23. The truth-table of a Nand Gate is

(a)

A	B	X
0	0	1
0	1	1
1	0	1
1	1	0

(b)

A	B	X
0	0	0
0	1	0
1	0	0
1	1	1

(c)

A	B	X
0	0	0
0	1	1
1	0	0
1	1	1

(d) None of these

24. IC chip is usually made of

(a) Lead

(b) Silicon

(c) Chromium.

(d) None of these.

25. Below given network is connected to a 16 V battery with internal resistance of 1 O. What will be current drawn from the battery?

<image>

(a) 2 A

(b) 3 A

(c) 12/7 A

(d) 7/12 A

26.Determine the equivalent resistance of the following network:

<image>

(a) 6 O

(b) 12 O

(c) 3 O

(d) 9 O.

27. A Zener diode is

(a) Forward biased heavily doped silicon p-n junction

(b) Reversed biased heavily doped silicon p-n junction

(c) Forward biased diode operating at breakdown point

(d) Is used as rectifying device

28. Crystal oscillator is used when frequency required is

(a) High

(b) Low

(c) Constant

(d) Varying.

29. What is the energy in a quantum of radiation having a wave length of 5000 A?

(a) 3.98×10^{-19} J

(b) 3.98×10^{-9} J

(c) 2.9×10^{-19} J

(d) 7.9×10^{-19} J.

30. Which of these cannot store energy?

(a) Capacitor

(b) Inductor

(c) Resistance

(d) LC circuit.

31. A short bar of magnet placed with its axis at 30^0 with a uniform external magnetic field of 0.16 T experiences a torque of magnitude 0.032 J. What is the magnetic moment of the magnet?

(a) 0.40 JT^{-1}

(b) 4.0 JT^{-1}

(c) 0.04 JT^{-1}

(d) 0.2 JT^{-1}

32. The total force on a charge 'q' with velocity "V" in an electric field 'E' and magnetic field 'B' will be

(a) q (E + V x B)

(b) q(E + V.B)

(c) qE + VxB

(d) q(B + V x E)

33. The magnetic field B at the centre of a circular current loop of radius 'a' is given by

(a) $B = \mu_0 I/2a$

(b) $B = \mu_0 I/a$

(c) $B = 2\mu_0 I/a$

(d) $B = \mu_0 a/2I$

34. If $f = x^2 + 4xy + y^2 + 9$, then which of the following is not true:

(a) $?f/?x = 2x + 4y$

(b) $?f/?y = 4x + 2y$

(c) $?^2f/?x^2 = 2$

(d) $?^2f/?x?y = 4$

35. A hollow metal ball 8 cm in diameter is given a charge of $- 4 \times 10^{-8}$ C. The potential on the surface of the ball is

(a) - 9000 V

(b) - 900 V

(c) - 90 V

(d) Zero.

36. The effective capacitance between X and Y is

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(a) 8/3 µF

(b) 7/6 µF

(c) 5/6 µF

(d) 2 µF.

37. The amount of work done is joules in carrying a charge + Q alongwith path ABCD and back to A between two oppositely charged plates is:

<image>

(a) Q

(b) 4Q

(c)Q/2

(d) Zero.

38. How many electrons are contained in 1C?

(a) 6.25×10^{18}

(b) 6.25×10^{19}

(c) 6.25×10^{20}

(d) 6.25×10^{21}

39. The phase angle between voltage and current in an a. c. circuit through a pure capacitance is

(a) 180°

(b) 90°

(c) 60°

(d) 0°

40. The permeability of a material is 0.998. It is:

(a) Diamagnetic

(b) Paramagnetic

(c) Ferromagnetic

(d) Anti ferromagnetic.

41. The ratio of the specific charge of an electron to that of a positron is

(a) 1:1

(b) 1:2

(c) 2:1

(d) 4:1.

42. With increase in temperature, the electrical conductivity of intrinsic semiconductor

(a) Increases

(b) Decreases

(c) First increases then decreases

(d) First decreases then increases.

43. In a common collector circuit, input resistance is:

(a) Very high

(b) Very low

(c) Zero

(d) Moderate.

44. A electron jumps from the 4th orbit to the 2nd orbit of hydrogen atom. If R = 10^7/m, the frequency of emitted radiations will be

(a) 3/16 x 10^5 Hz

(b) 3/16 x 10^{15} Hz

(c) 9/16 x 10^{15} Hz

(d) 3/4 x 10^{15} Hz.

45. I amu. equals

(a) 1.67 x 10^{-27} g

(b) 1.67 x 10^{-28} g

(c) 1.67 x 10^{-29} g

(d) 1.67 x 10^{-27} kg

46. A tuning fork produces 4 beats/sec both with 50 and 40 cms of a stretched wire of a sonometer. The frequency of the tuning fork is

(a) 36 Hz

(b) 50 Hz

(c) 90Hz

(d) 110 Hz

47. A particle is executing SHM with an amplitude 4 cm. At what displacement its energy is half kinetic and half potential

(a) 2v2cm

(b) v2 cm

(c) 2 cm

(d) 1 cm.

48. An electron moves with a constant velocity V parallel to the direction of uniform magnetic field 'B'. The force experienced by the electron is

(a) BeV

(b) eV/B

(c)B/eV

(d) Zero.

49.A charged particle is moving along the axis of X. If an electric field is applied along the axis of Y, the motion of the particle in Y-Y plane will be

(a) Elliptical

(b) Parabolic

(c) Circular

(d) Linear

50. An electric or magnetic field cannot accelerate

(a) Electrons

(b) Protons

(c) Neutrons

(d) Alpha particles