

1. Two blocks each have lost 3.125×10^{18} electrons are placed 50cm apart. The electrostatic force between them is _____
(a) $9 \times 10^9 \text{N}$ (b) $9 \times 10^{12} \text{N}$ (c) $3 \times 10^{12} \text{N}$ (d) $9 \times 10^5 \text{N}$
2. In hydrogen atom ratio of gravitational force between electron and proton to that of electrostatics force between them is _____
(a) 10^{-39} (b) 10^{-11} (c) 10^{-18} (d) 10^{39}
3. Tick the correct:
I. Positive charge always repel point charge.
II. Positive charge shows repulsive effect per unit point charge.
III. Electrostatic repulsion is the sure test of electrification.
(a) I, II only (b) II, III only (c) I, III only (d) I, II, III only
4. The force between two charges at distance of 4cm is 10N. The force between them at separation of 8cm will be _____
(a) 10N (b) 5N (c) **2.5N** (d) 40N
5. Two oppositely charged plates each has charge density of $0.885 \times 10^{-9} \text{C/m}^2$ are separated by 2cm. A unit coulomb charge is placed between them at the centre. The force on charge is
(a) 10N (b) **100N** (c) 1N (d) 50N
6. Tick the correct for unit of electric flux.
(a) Nm^2/c (b) Jm/c (c) Volt. Meter (d) **all of these**
7. Tick the correct for cooling process of heat engine
(a) $\Delta Q = \Delta U + \Delta W$ (b) **$\Delta W = -\Delta U$** (c) $\Delta Q = \Delta W$ (d) $-\Delta W = \Delta U$
8. A heat engine is working for conversion of heat into mechanical energy so that 60% of its heat is sinked to the cold body. The produces output of 80J. The heat sink is
(a) 200J (b) 80J (c) 280J (d) **120J**
9. A heat engine produces mechanical energy of 200J isothermally. The internal energy of an ideal gas molecules used is 300J then heat energy absorbed by engine is

- (a) 100J (b) 200J (c) 500J (d) 300J

10. A capacitor having spherical surface of diameter 18mm store charge when it is connected across battery of 100 volts then charge stored in capacitor is ____

- (a) $1 \times 10^{-10} \text{C}$ (b) $1 \times 10^{-12} \text{C}$ (c) $1 \times 10^{10} \text{C}$ (d) $1 \times 10^{-9} \text{C}$

11. Two capacitors each of capacitance "c" are charged by 3volts and 4volts respectively. The ratio of their energy stored is ____

- (a) 3:4 (b) 16:9 (c) 1:1 (d) 9:16

12. An electron 'e' moves between two points having P.d of 10 volts. If "m" is the mass of electron then velocity acquired by electron is ____

- (a) $\frac{10eV}{m}$ (b) $\frac{m}{10eV}$ (c) $\sqrt{\frac{10e}{m}}$ (d) $\sqrt{\frac{20e}{m}}$

13. Two capacitors each of capacitance "C" are connected in series so that their equivalent capacitance is C_1 , while equivalent capacitance of their parallel combination is C_2 . The ratio of C_1 to C_2 is

- (a) 1:1 (b) 1:4 (c) 2:1 (d) 4:1

14. A $1\mu\text{F}$ capacitor is charged to P.d of 4volts. Its plates are then connected in parallel to other capacitor then its potential decreases to 3V. the capacitance of unknown capacitor is ____

- (a) $1/3 \mu\text{F}$ (b) $3\mu\text{F}$ (c) $1\mu\text{F}$ (d) $9\mu\text{F}$

15. A capacitor is charged to a battery then is disconnected, now dielectric slab is inserted between its plates then;

I. P.d between plates decreases

II. charge increases

III. Capacitance increases

- (a) I, II, III only (b) II & III (c) I & III (d) III only

16. The heat required for 1kg of water to raise its temperature from 14.5°C to 15.5°C is _____ if $c = 4200 \text{ J/kg K}$.

- (a) 1KJ (b) 1 Cal **(c) 1 K Cal** (d) 4.2J

17. In an adiabatic process, the entropy _____

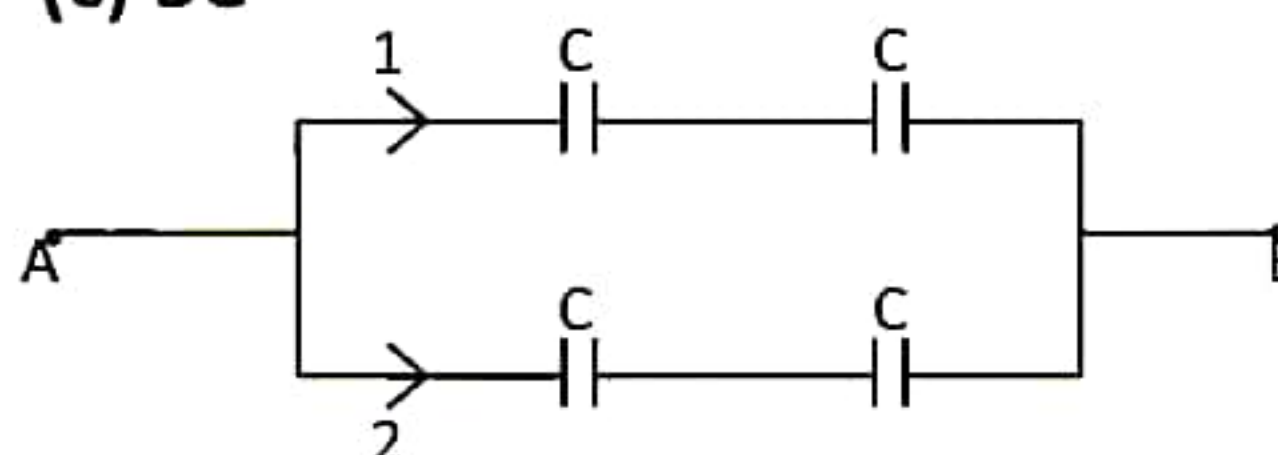
- (a) increases (b) decreases
(c) becomes zero **(d) is constant**

18. The ratio of V_{rms} of oxygen gas molecule to the helium gas at same temperature is

- (a) $\sqrt{2}:1$ (b) $8:1$ **(c) $1:\sqrt{8}$** (d) $\sqrt{8}:1$

19. Four capacitors are connected as shown the P.d between AB is 10V the charge flows through each branch of combination will be;

- (a) 10C (b) 2C **(c) 5C**
(d) 20C (e) C



20. Each dimension of a cube is L. When it is heated from T_1 to T_2 then each dimension changes to 2L. The expansion in its each face is ____

- (a) $8L^3$ (b) $7L^3$ (c) L **(d) $3L^2$** (e) $7L^3$

21. Tick the correct for isothermal compression

- (a) $-\Delta Q = -\Delta U$ (b) $\Delta Q = \Delta U$ (c) $\Delta Q = \Delta W$ **(d) $-\Delta Q = -\Delta W$**

22. Which of the following temperatures of cold reservoir (T_2) and hot reservoir (T_1) for Carnot engine cause 100% efficiency?

- (a) $T_1 = 0^{\circ}\text{C}$; $T_2 = 0^{\circ}\text{C}$ (b) $T_1 = 0\text{K}$; $T_2 = 0^{\circ}\text{C}$
(c) $T_1 = 0^{\circ}\text{C}$; $T_2 = 0\text{K}$ (d) $T_1 = 100^{\circ}\text{C}$; $T_2 = 0^{\circ}\text{C}$

23. The entropy of system is dimensionally equal to _____

- (a) J/Kg K (b) K/J (c) J/Kg **(d) J/K**

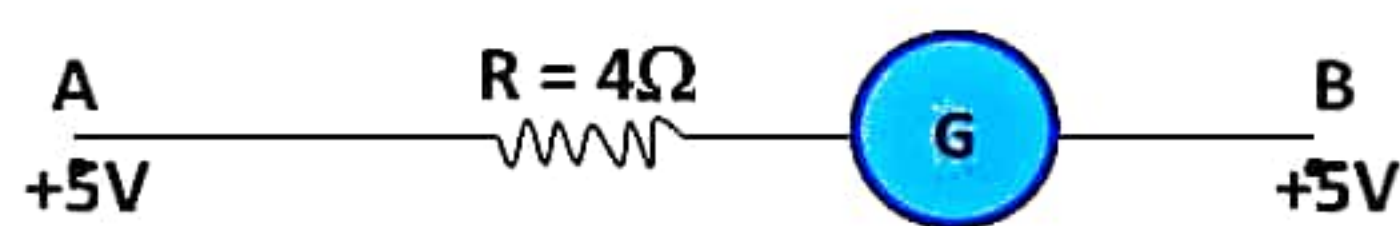
24. If 3.125×10^{18} electrons flows in conductor for 2 seconds then electric current in milli-amperes is

- (a) 4 **(b) 250** (c) 500 (d) 0.25

25. Which of the process occurs during a cloud formation?

- (a) condensation (b) Adiabatic expansion
(c) electrostatic induction **(d) except 'c'**

26. A resistor "R" and Galvanometer are connected in series as shown:



The galvanometer shows current of _____

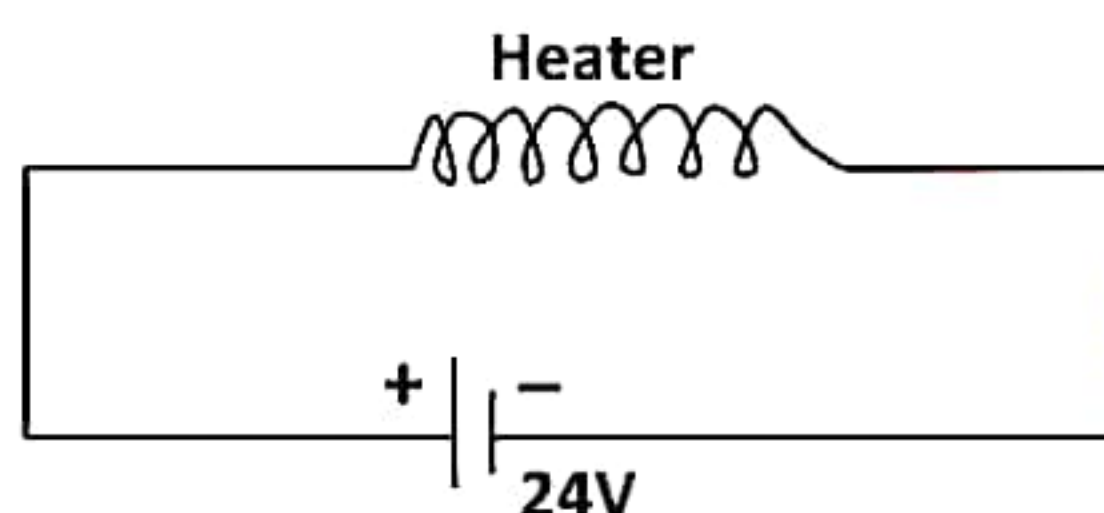
- (a) 5A (b) 2.5A (c) 40A **(d) Zero**

27. Tick the correct for resistance;

- (I) It is the measure of heat produced in conductor.
(II) It is same as resistivity for unit cube volume of conductor.
(III) It is reciprocal of conductance

- (a) I & III (b) II & III (c) III only **(d) I, II & III**

28. An electric heater rated 10Ω is connected to battery as shown;



The internal resistance of battery is 2Ω then rate of heat energy produced by heater is _____.

- (a) 8 watt (b) 48 watt (c) 24 watt **(d) 40 watt**

29. Two wires made of same material and identical in length such that the ratio of their diameter is 2:3 then ratio of their resistances is _____ respectively.

- (a) 9:4** (b) 3:2 (c) 2 : 3 (d) 4:9 (e) 1:1

30. The Ohm's law is valid for

(a) conductors (b) insulators (c) semiconductor (d) All of these

31. The resistance of a wire increases if:

(I) Length of wire decreases (II) Diameter of wire decreases

(III) Temperature of wire decreases

(a) I & II (b) III only (c) II only (d) I, II & III

32. The fractional change of resistivity is dimensionally equal to _____

(a) ohm (b) ohm. meter (c) Siemens (d) No dimension

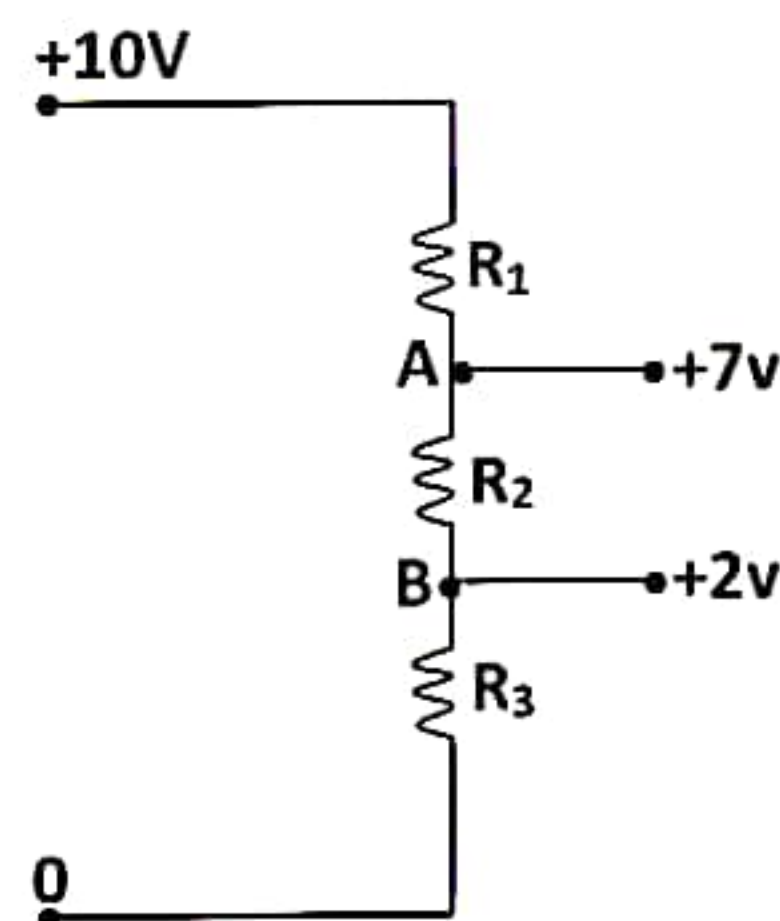
33. A battery of Emf 18volts is to be charged at the rate of 0.3A. Its internal resistance is 20Ω then voltage needed to charge the battery is _____

(a) 12 volt (b) 18 volts (c) **24 volts** (d) 6 volts

34. Three resistors R_1 , R_2 and R_3 are connected as shown:

Tick the correct for voltage drop across each resistor.

Option	R_1	R_2	R_3
A	7V	4V	1V
B	2V	6V	2V
C	3V	5V	2V
D	7V	2V	1V



35. In series combination of resistors, the equivalent resistance is always _____ than _____ resistor been connected in electric circuit

(a) less, larger (b) **more, larger** (c) less, smaller (d) more, smaller

36. If electric current through the resistor increases by 20% then rate of energy dissipated across it is _____.

(a) 20% (b) 22% (c) **44%** (d) 10%

37. An electric bulb rated 100watt is operated for 2 hours. How many commercial units of electric energy are consumed?

(a) 2 (b) **0.2** (c) 20 (d) 200

38. An electric bulb is connected to 5V battery so that 1A current flows through it. Its conductance is _____
(a) 0.1 Siemens **(b) 0.2 Siemens** (c) 5 Siemens (d) 10 Siemens
39. 1kg of mass consists of _____ number of electrons approximately.
(a) 10^{-31} (b) 10^{19} (c) 10^{18} **(d) 10^{30}**
40. An electron volt is equal to:
(a) $0.62 \times 10^{13}\text{J}$ (b) $1.6 \times 10^{-13}\text{J}$ (c) $0.62 \times 10^{19}\text{J}$ **(d) $1.6 \times 10^{-19}\text{J}$**
41. Two point charges -2 coulomb and +6 coulomb attract each other with a force of 12N. If a charge of -2 coulomb is given to each of these charges, the force will now be:
(a) 8 N (attractive) **(b) 16 N (attractive)**
(c) 16N (repulsive) (d) None of these
42. A hollow sphere of copper is positive charged. Then the electric field inside the sphere is:
(a) the same as the field at the surface
(b) greater than the field at the surface
(c) less than the field at the surface, but not zero
(d) zero
43. A and B are two points in an electric field. If 8.0 joule of work is done in taking 2.0 coulomb of electric charge from A and B, then the potential difference between A and B is:
(a) zero (b) 2.0V **(c) 4.0V** (d) 16.0V
44. Two plates are 1cm apart and the potential difference between them is 10V. The electric field between the plates is:
(a) 10N/C (b) 250N/C (c) 500N/C **(d) 1000N/C**
45. If a copper wire of length 10m is bended at a point its resistance;
(a) increases (b) decreases **(c) remains same** (d) becomes zero

46. A battery of 6V is connected to two resistors 3Ω and 2Ω joined together in series. The current delivered by the battery will be _____.
(a) **1.2 A** (b) 2.2 A (c) 3.2 A (d) 6 A
47. Current flows through a wire
(a) Along the axis of wire (b) **within** the volume of wire
(c) At the surface of wire (d) N.O.T
48. P.D. across a resistance of 100Ω is 220 volt, current through it will be
(a) 0.022Amp (b) 0.22Amp (c) **2.2Amp** (d) 22Amp
49. The charge transferred by a current of 3 Amp: in 10 sec
(a) 0.3 Coul: (b) 3 Coul: (c) **30 Coul:** (d) 300 Coul
50. Energy Generated by a resistance of 100Ω when a current of 1Amp: passes through it
(a) 1 Joul (b) 10 Joul (c) **100 Joul** (d) 0.1 Joul
51. Seven resistance each of 7Ω are connected in parallel, The equivalent resistance will be
(a) **1Ω** (b) $1/7\Omega$ (c) 7Ω (d) N.O.T
52. If a copper wire of resistance 10Ω is cut into two equal halves. The resistance of each half becomes _____.
(a) **5Ω** (b) 15Ω (c) 20Ω (d) 10Ω
53. An electric bulb and a motor are connected in parallel with a battery of voltage 100 Volts and 10 A current. If 40% of its power is utilized by the electric bulb then the electric current flows through the motor will be _____.
(a) 10A (b) **6 A** (c) 2.25A (d) 7.75A
54. AT is dimension for
(a) current (b) resistance (c) **charge** (d) conductance
55. The translational KE of an ideal gas molecule is independent of
(a) **pressure** (b) temperature (c) internal energy (d) except 'a'

56. The latent heat of fusion is measured as
(a) J/K **(b) J/Kg** (c) $\text{J mol}^{-1} \text{K}^{-1}$ (d) $\text{J Kg}^{-1} \text{K}^{-1}$
57. When water freezes to ice then entropy
(a) remains same **(b) decreases** (c) increases (d) none of these
58. When a solid body is negatively charged by friction, it means that the body has
(a) acquired excess of electrons
(b) lost some protons
(c) acquired some electrons and lost a lesser number of protons
(d) lost some positive ions
59. The ratio of the force between two charges in air and that in a medium of dielectric constant K is
(a) K : 1 (b) 1 : K (c) $K^2 : 1$ (d) 1 : K^2
60. A positively charged particle of mass 'm' and charge 'q' travels from rest through a potential difference of 'V'. Its kinetic energy is
(a) q V (b) m q V (c) m q/V (d) m/Qv
61. If a charge is moved against the coulomb force of an electric field
(a) work is done by the electric field
(b) energy is used from some outside source
(c) the strength of the field is decreased
(d) the energy of the system is decreased
62. A charge Q is divided into two parts and the two parts are separated by a certain distance. The force between them will be maximum if one of the charge is
(a) Q/2 (b) Q/3 (c) Q/4 (d) Q/8
63. The temperature at which the rms speed of air molecule is double of that at STP is
(a) 819°C (b) 819K (c) 1092°C (d) 1192K
64. In a cyclic process the change in the internal energy of a system is
(a) minimum but not zero **(b) zero**

- (c) maximum but not infinite (d) infinite
65. In a Carnot cycle the total work done is
(a) zero (b) minimum (c) infinite **(d) maximum but not 100%**
66. When a gas expands adiabatically
(a) no energy is required for expansion.
(b) energy is required and it comes from wall of container of gas.
(c) internal energy of the gas is used in doing work.
(d) law of conservation of energy does not hold.
67. A Carnot engine works with a source at 27°C and a sink at -123°C . Its efficiency is
(a) 0.75 (b) 0.4 **(c) 0.5** (d) 0.25
68. On a thermometer the freezing point of water is marked as 20°C and the boiling point of water is marked at 150°C . A temperature of 60°C will be read on this thermometer as
(a) 40°C (b) 65°C **(c) 98°C** (d) 110°C
69. Four molecules have speed 2km/s , 3km/s , 4km/s and 5km/s . The rms speed of these molecules in km/s is
(a) $\frac{\sqrt{54}}{4}$ **(b) $\frac{\sqrt{54}}{2}$** (c) 3.5 (d) $3\sqrt{3}$
70. A gas at pressure P_0 is contained in a vessel. If the mass of all the molecules are halved and their speed is doubled the resulting pressure will be
(a) $4P_0$ **(b) $2 P_0$** (c) P_0 (d) $P_0/2$
71. A conductor of resistance R is compressed to double of its diameter then its resistance becomes
(a) R (b) $16 R$ (c) $R/4$ **(d) $R/16$**
72. Voltage divider Rule (VDR) is applicable for _____ combination of resistances.
(a) series (b) parallel (c) both (d) none of these
73. When the temperature of conductor is increased then

- I. drift velocity of electrons decreases.
- II. electric potential of electrons decreases
- III. the resistivity increases.

(a) I, II & III (b) III only (c) I & II (d) II & III

74. A closely wound coil of 1000 turns and cross sectional area $2.0 \times 10^{-4} \text{m}^2$ carries a current of 1.0 A is placed in uniform field of 0.2 T with the normal to the coil making an angle of 30° with the direction of field, the torque experienced by the coil will be

(a) **0.02 N-m** (b) 0.03 N-m (c) 0.04 N-m (d) 0.05 N-m

75. Tick the correct relation;

(a) $1 \text{ T} = 10^{-4} \text{G}$ (b) $1 \text{ G} = 10^4 \text{ T}$ (c) **$1 \text{ T} = 10^4 \text{ G}$** (d) $1 \text{ G} = 10^2 \text{ T}$

76. Which of the following does not affect the motion of a moving electron?

(a) electric field applied in the direction of motion
(b) **magnetic field applied in the direction of motion**
(c) electric field applied perpendicular to the direction of motion
(d) magnetic field applied perpendicular to the direction of motion

77. A conductor carrying current along Northward is placed in magnetic field directed from west to east. The force acting on conductor is directed;

(a) upward (b) **downward** (c) along west (d) along south

78. Which of the following particle remains un-deflected in magnetic field?

(a) alpha (b) beta (c) proton (d) **neutron**

79. The direction of the force on a current-carrying wire in a magnetic field can be found by using

(a) left hand grip rule (b) right hand grip rule
(c) **Fleming's left hand rule** (d) Fleming's right hand rule

80. The relation between the direction of force and the direction of magnetic field is

(a) Same direction (b) Opposite direction
(c) **Perpendicular** (d) Unrelated

81. A moving electric charge contains
(a) **both electric and magnetic field** (b) only electric field
(c) only magnetic field (d) no field
82. The idea of force between two parallel current carrying wires was given by
(a) Faraday (b) H Oersted (c) Henry (d) **Ampere**
83. Two parallel wires carrying current in same direction will
(a) **attract each other** (b) repel each other
(c) experience no force (d) none of these
84. A charge is placed stationary in magnetic field then
(a) it will move at right angle due to magnetic force on it
(b) it will move along the magnetic lines of force
(c) **it will remain in rest**
(d) it will move in parabolic path due to magnetic force
85. A charge enters in electric field at certain angle then;
(a) it will move at right angle due to electrostatic force on it
(b) it will move along the electric lines of force
(c) it will remain un-deflected
(d) **it will move in parabolic path due to electrostatic force**
86. The idea of electromagnetism was given by
(a) Faraday (b) **H Oersted** (c) Henry (d) Ampere
87. The torque acting on current carrying coil placed in magnetic field is expressed as
(a) **$B I A N \sin \theta$** (b) $B I A N \cos \theta$ (c) $B I A N \tan \theta$ (d) $B I A N / t$
88. The magnetic field induction can be expressed as
(a) $\frac{F}{qv}$ (b) $\frac{F}{q}$ (c) $\frac{F}{Il}$ (d) **except 'b'**
89. The force experienced per unit moving charge is the measure of
(a) **magnetic field induction** (b) electric field intensity
(c) electric potential of the charge (d) all of these

90. A 2m length of a wire is carrying a current of 3 amperes at right angles to uniform magnetic field of 0.4 weber/m^2 . The force on this length of wire is:
(a) **2.4 N** (b) 15 N (c) 0.27 N (d) 0.6 N
91. Force on a charged particle having charge 'q' moving with velocity V parallel to magnetic field of intensity B is given as:
(a) $F = q V B$ (b) $F = q V/B$ (c) $F = VB/q$ (d) **$F = 0$**
92. The emf of a source is equal to the potential difference across the terminals of the source when its internal resistance is:
(a) **Zero** (b) Infinite
(c) Zero or infinite (d) None of these
93. Terminal potential difference ' V_t ' of a battery of internal resistance ' r ' and emf ' E ' is:
(a) **$V_t = E - Ir$** (b) $V_t = E + Ir$ (c) $V_t = Elr$ (d) $V_t = \frac{E}{IR}$
94. The electric intensity due to insulating plane sheet of charge is independent of
(a) charge density (b) nature of charge distributed
(c) **distance 'r' from the sheet** (d) all of these
95. The negative space rate of change of potential with respect to displacement is the measure of _____ at that point.
(a) electric flux (b) **electric flux density**
(c) electric potential (d) all of these
96. The drift velocity of electrons due to current in a wire is expressed as
(a) $\frac{I}{n e}$ (b) $\frac{I A}{n e}$ (c) $\frac{I e}{n A}$ (d) **$\frac{I}{n e A}$**
97. A metallic block loses 6.25×10^{18} electrons then electric potential at 1cm from it is
(a) $9 \times 10^9 \text{ volt}$ (b) $9 \times 10^{-11} \text{ volt}$ (c) $9 \times 10^7 \text{ volt}$ (d) **$9 \times 10^{11} \text{ volt}$**
98. Two capacitors are joined in series and with a battery then;
(a) both stores equal amount of energy

- (b) smaller capacitor stores more energy
 - (c) larger capacitor stores more energy
 - (d) their energy depends upon amount of supplied voltage
99. The area under the curve of Ohmic graph shows
(a) **electric power** (b) resistance (c) conductance (d) energy
100. The specific heat capacity of water for unit mass is $4200\text{Jkg}^{-1}\text{K}^{-1}$. If mass is doubled then its specific heat capacity becomes
(a) doubled (b) halved (c) **remains same** (d) four times

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