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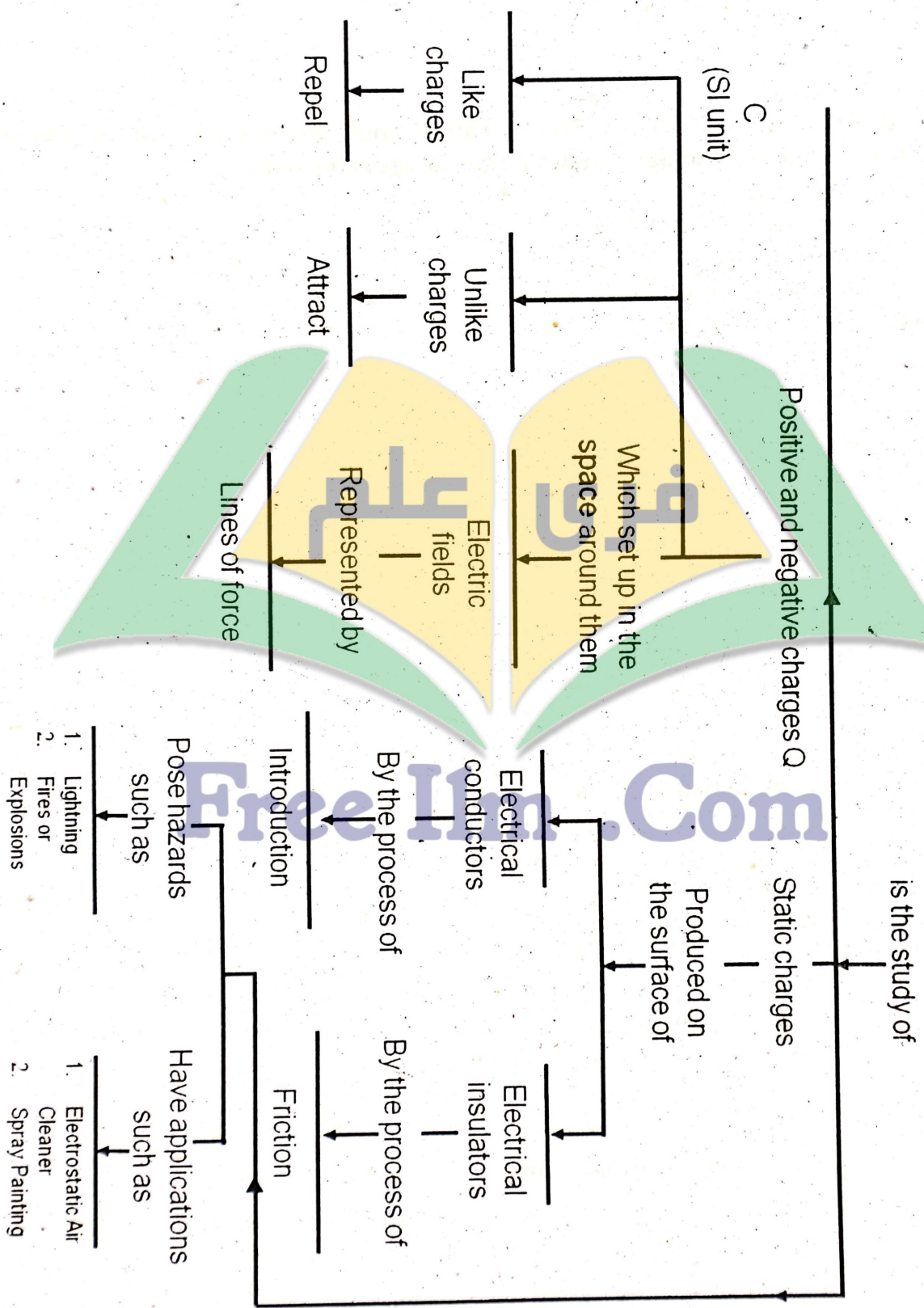
CHAPTER

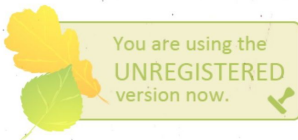
13

ELECTROSTATICS

CONCEPT MAP

STATIC ELECTRICITY

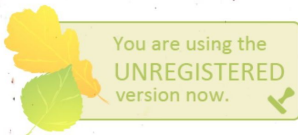




TOPICAL MULTIPLE CHOICE QUESTIONS

13.1 and 13.2 Production of Electric Charges and Electrostatic Induction

1. Study of charges at rest is called _____
 (a) Electrostatics (b) Magnetism (c) Electrochemistry (d) Electric Current
2. An insulating rod is charged positively by rubbing. This is due to
 (a) Deficiency of protons (b) Excess of protons
 (c) Deficiency of electrons (d) Excess of electrons
3. When an insulating rod is charged negatively, this is due to
 (a) Deficiency of protons (b) Excess of protons
 (c) Deficiency of electrons (d) Excess of electrons
4. If we run a plastic comb through hair and then bring it near shell pieces of paper. The comb _____
 (a) Attract them (b) repel them (c) Both a and b (d) None of these
5. Electric charges can be produced by rubbing a neutral body with
 (a) Charged body (b) Another neutral body (c) Both a and b (d) None of these
6. SI unit of electric charge is _____
 (a) Coulomb (b) Ampere (c) Volt (d) Watt
7. A positive charge
 (a) Attract other positive (b) Repel other positive charge
 (c) Attract the natural charge (d) Repels a neutral charge
8. An object gain excess negative charge after being rubbed against another object
 (a) Neutral (b) Negative charged (c) positively charge (d) Object
9. A body can be charged by
 (a) Rubbing with another body (b) Conduction
 (c) Electrostatic induction (d) All of these
10. Only _____ type charges exist
 (a) One (b) Two (c) Three (d) Four
11. When a glass rod is rubbed with a silk cloth, then
 (a) Glass rod acquires negative charge while silk acquires positive charge
 (b) Glass rod acquires positive charge while silk acquires negative charge
 (c) Both glass rod and silk acquire negative charge
 (d) Both glass rod and silk acquire positive charge
12. If a glass rod is rubbed with a silk cloth, it receives charge by the process of:
 (a) Heating (b) Separation of charge
 (c) Rubbing (d) electric force
13. Which one of the following statements is correct?
 (a) Similar charges attract each other
 (b) Similar charges repel each other
 (c) Similar charges attract and repel each other
 (d) Similar charges hither attract nor repel each other
14. Which one of the following statements is correct?
 (a) Opposite charges attract each other
 (b) Opposite charges repel each other
 (c) Opposite charges attract and repel each other
 (d) Opposite charges neither attract nor repel each other.



15. Metals are good conductors of electricity, because they have
 (a) Large number of bounded electrons (b) Small number of bounded electrons
 (c) Large number of free electrons (d) Small number of free electrons
16. Free electrons are
 (a) Tightly bound (b) Fixed
 (c) Loosely bound (d) strongly fixed
17. The number of electrons in one coulomb charge is equal to
 (a) 6.25×10^{19} (b) 1.6×10^{-19}
 (c) Zero (d) 6.2×10^{21}
18. Like charges always _____ each other
 (a) Attract (b) Repel (c) Attract and repel (d) None of these
19. In the presence of a charged body an insulated inductor develops positive charge at one end and negative charges at other end, this process is called the _____
 (a) Electrostatic induction (b) Conduction (c) Friction (d) All of these

13.2, 13.3 and 13.4 Electrostatics, Coulomb's Law and Electric Field

20. Electrostatics is an instrument used for
 (a) Detecting presence of charge (b) To detect the type of charges
 (c) To identify conductor and insulator (d) All of these
21. Force of attraction or repulsion acts between
 (a) Two charged bodies (b) Neutral bodies (c) Non charged bodies (d) All of these
22. Who established fundamental law of electric force between two stationary charged particles?
 (a) Planks (b) Faraday (c) Quantum (d) Coulomb
23. According to Coulomb's law
 (a) $F = K \frac{q_1 r^2}{q_2}$ (b) $F = \frac{kr_1 r_2}{(q)^2}$ (c) $F = \frac{kq_1 q_2}{r^2}$ (d) $F = k \frac{q_1 q_2}{r}$
24. K is constant of proportionality given by
 (a) $K = \frac{1}{4\pi \epsilon_0}$ (b) $K = \frac{\epsilon}{4\pi}$ (c) $K = \frac{4\pi}{\epsilon_0}$ (d) None of these
25. SI unit of K
 (a) Nm^2C (b) Nm^2C^{-2} (c) $N^2m^2C^{-1}$ (d)
26. The value of K
 (a) $8.85 \times 10^9 Nm^2C^{-2}$ (b) $9 \times 10^9 Nm^2C^{-2}$ (c) $6.67 \times 10^9 Nm^2C^{-2}$ (d) none of these
27. A region around the charge in which it exerts electrostatic force on another charge is called
 (a) Gravitational field (b) Magnetic field (c) Electric field (d) All of these
28. SI unit of electric intensity is
 (a) Nm^{-1} (b) NC^{-1} (c) Nm^{-2} (d) Nm
29. The spacing between the field lines shows the
 (a) Strength of electric field (b) Direction of electric field
 (c) Both a and b (d) None of these
30. Electrostatics can be charge by the process
 (a) Magnetism (b) Internal reflection
 (c) Electrostatic induction (d) Electromagnetic tension



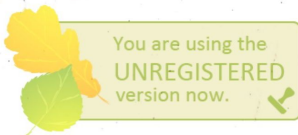
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31. The value of Coulomb's constant K depends upon
 (a) The system of units used
 (b) Medium between the charges
 (c) Quantity of the charges
 (d) The system of units and the medium between the charges
32. If the distance between the two charged bodies is halved, the force between them becomes
 (a) Doubled (b) Half
 (c) Four times (d) One half
33. If the distance between two charges is doubled, the electric force between them will become
 (a) Four times (b) Twice
 (c) Half (d) One fourth
34. Electric charge of $100\mu\text{C}$ is 13 m apart from another charge $16.9\mu\text{C}$. The force between them in Newton is
 (a) 9×10^7 (b) 0.09
 (c) 90 (d) 9×10^5
35. The electric force of repulsion between two electrons at a distance of 1 m is
 (a) 1.8 N (b) $1.5 \times 10^{-9}\text{N}$
 (c) $2.30 \times 10^{-27}\text{N}$ (d) $2.30 \times 10^{-27}\text{N}$
36. The magnitude of the charge on the electron is
 (a) $1.2 \times 10^{-19}\text{C}$ (b) $1.6 \times 10^{-19}\text{C}$
 (c) $2.6 \times 10^{-19}\text{C}$ (d) $1.81 \times 10^{-19}\text{C}$
37. The space around the charge within which other charges are influenced by it is called
 (a) electric intensity (b) Electric field
 (c) Electric flux (d) Electric potential
38. Force experienced by a unit positive charge placed at a point in the electric field is known as
 (a) Electric field intensity (b) Magnetic field intensity
 (c) Electric potential (d) Capacity
39. The force per unit charge is known as
 (a) Electric flux (b) Electric intensity
 (c) Electric potential (d) Electric volt
40. SI unit of electric field intensity is
 (a) Coulomb (b) Volt
 (c) Newton/coulomb (d) Ampere
41. Electric field intensity is a vector quantity and its direction is
 (a) Perpendicular to the direction of field (b) Opposite to the direction of force
 (c) Along the direction of force (d) At a certain angle
42. The electric intensity at infinite distance from the point charge is
 (a) Zero (b) Infinite
 (c) 1 Volt - m^{-1} (d) Positive

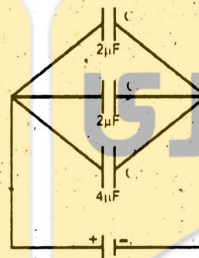


13.6 and 13.7 Electric potential, capacitor and capacitance :

43. Work done in bringing a unit positive charge from infinity to that point in an electric field is called
 (a) potential difference (b) Resistance
 (c) Capacitance (d) Electric potential
44. Electric field is strong when lines are
 (a) Separated (b) Closer (c) Smaller (d) Larger
45. _____ at a point in an electric field is equal to amount of work done in bringing unit positive charge from infinity to that point
 (a) Electric intensity (b) Potential difference (c) Electric potential (d) Volt
46. Which statement is true about electrical potential
 (a) Its SI unit is volt (b) It is scalar quantity (c) At any point $v = \frac{w}{q}$ (d) all of these
47. In order to store the charge a device is used which is called
 (a) Potential (b) Capacitor (c) Momentum (d) Voltage
48. SI unit of capacitance
 (a) Farad (F) (b) Coulomb (c) Newton (d) Voltage
49. Parallel plate capacitor consist of two metal plates separated by
 (a) Metal (b) Insulator (c) Conductor (d) all of these
50. Which is incorrect for parallel capacitor?
 (a) $v_1 = v_2 = v_3 = v$ (b) $Q = Q_1 + Q_2 + Q_3$ (c) $C_e = C_1 + C_2 + C_3$ (d) $Q_1 = Q_2 = Q_3 = Q$
51. The work done in moving a unit positive charge from one point to another against the electric field is a measure of
 (a) Intensity of electric field (b) Resistance between two points
 (c) Capacitance (d) Potential difference between two points
52. The potential difference between two points is one volt. The amount of work done in moving a charge of one coulomb from one point to another is
 (a) One erg (b) One Joule
 (c) One electron volt (d) one coulomb
53. Electron volt is the unit of
 (a) Potential difference (b) Electric energy
 (c) Electric current (d) Capacitance
54. The electron energy is one electron – volt when it is accelerated through a potential difference of
 (a) One volt (b) One joule
 (c) One Coulomb (d) One erg
55. Electric potential is a
 (a) Vector quantity (b) Scalar quantity
 (c) Neither scalar nor vector (d) Sometimes scalar and sometimes vector
56. One electron volt is equal to
 (a) $1.6 \times 10^{-19} \text{J}$ (b) $1.6 \times 10^{19} \text{J}$
 (c) $6.25 \times 10^{-18} \text{J}$ (d) $6.25 \times 10^{18} \text{J}$
57. The capacitance C of a capacitor is given by the relation
 (a) $C = QV/2$ (b) $C = QV$
 (c) $C = Q/V$ (d) $C = V/Q$



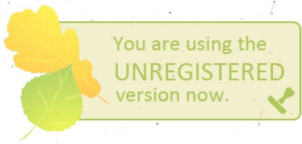
58. A capacitor is a perfect insulator for
 (a) Direct current (b) Alternating current
 (c) Both for the direct and alternating current (d) Electric charge
59. Which one of the following is correct?
 (a) $1 \mu\text{F} = 10^{-6}\text{F}$ (b) $1\text{pF} = 10^{-13}\text{F}$
 (c) $1\text{pF} = 10^{-6}\mu\text{F}$ (d) All of the above
60. When capacitors are connected in parallel, their equivalent capacitance is equal to
 (a) The product of their individual capacitances
 (b) The sum of their individual capacitances
 (c) The product of their individual reciprocal capacitances
 (d) The sum of the reciprocals of the individual capacitances
61. When capacitors are connected in series, their equivalent capacitance is equal to
 (a) The product of their individual capacitances
 (b) The sum of their individual capacitance
 (c) The sum of the reciprocals of the individual capacitances
 (d) The product of their individual reciprocal capacitances
62. Three capacitors C_1 , C_2 and C_3 are connected in parallel as in the Fig. Their equivalent capacitance will be



- (a) $8\mu\text{F}$ (b) $0.8\mu\text{F}$
 (c) $1\mu\text{F}$ (d) $16\mu\text{F}$
63. Tick the correct statement
 (a) Capacitance decreases in parallel combination
 (b) Capacitance decreases in series combination
 (c) Capacitance is the same in both combinations
 (d) All of the above
64. If $4\mu\text{F}$ and $2\mu\text{F}$ capacitors are connected in series, the equivalent capacitance is given by
 (a) $6\mu\text{F}$ (b) $2\mu\text{F}$
 (c) $1.3\mu\text{F}$ (d) $8\text{F}\mu$
65. Two $50\mu\text{F}$ capacitors are connected in parallel. The equivalent capacitance of the combination is
 (a) $1\mu\text{F}$ (b) $100\mu\text{F}$
 (c) $50\mu\text{F}$ (d) $25\mu\text{F}$

13.9 and 13.10 Types of capacitor and some hazards of electricity:

66. In variable capacitors
 (a) Both the sets of plates are fixed
 (b) Both the sets of plates are moveable
 (c) One set of plates is fixed and the other is moveable
 (d) Both the sets of plates are neither fixed not moveable



- 67. Variable capacitors are used in
 - (a) Radio only
 - (b) Television only
 - (c) Radio and television
 - (d) None of the above
- 68. A radio tuning capacitor is a
 - (a) Variable parallel plate capacitor
 - (b) Variable cylindrical capacitor
 - (c) Spherical capacitor
 - (d) Tubular capacitor
- 69. Which of the following is commercial type capacitor
 - (a) Tubular capacitor
 - (b) Electrolytic capacitor
 - (c) Miniature capacitors
 - (d) All of the above
- 70. The equivalent capacitance is greater than individual capacitance in
 - (a) Series combination
 - (b) Parallel combination
 - (c) Series and parallel combination
 - (d) All of them
- 71. Farad is defined as
 - (a) Coulomb/Volt
 - (b) Ampere/Volt
 - (c) Coulomb/Joule
 - (d) Joule/coulomb
- 72. Capacitor have different types depending upon
 - (a) Their construction
 - (b) Nature of dielectric
 - (c) Both A and B
 - (d) None of above
- 73. In variable capacitors, the value of capacitance can be
 - (a) Decrease
 - (b) Increased
 - (c) Both a and B
 - (d) Fixed
- 74. In fixed type of capacitors, the value of capacitance
 - (a) Increase
 - (b) Decrease
 - (c) Can not be changed
 - (d) All given ture
- 75. It is a fixed capacitor
 - (a) Paper capacitor
 - (b) Mica capacitor
 - (c) Both a and b
 - (d) Capacitors in radio sets
- 76. In Mica capacitors the dielectric is
 - (a) Aluminum foils
 - (b) Mica
 - (c) Copper
 - (d) Polythene paper.
- 77. Capacitors are used in
 - (a) Tuning Transmitters
 - (b) Receiver
 - (c) Transistor radio
 - (d) All of these
- 78. Capacitors are used in resonant circuit that tune radios to particular frequency
 - (a) Electrostatic air cleaner
 - (b) Spray painting
 - (c) Car washing
 - (d) None of these
- 79. Application of electrostatic is
 - (a) Photocopying
 - (b) Car painting
 - (c) Extracting Dust
 - (d) All of these

ANSWER KEY

Q.	Ans	Q.	Ans	Q.	Ans	Q.	Ans	Q.	Ans	Q.	Ans	Q.	Ans	Q.	Ans
1	a	11	b	21	a	31	d	41	c	51	d	61	c	71	a
2	c	12	c	22	d	32	c	42	a	52	b	62	a	72	c
3	d	13	b	23	c	33	d	43	d	53	b	63	b	73	c
4	a	14	a	24	a	34	b	44	b	54	a	64	c	74	c
5	b	15	c	25	b	35	c	45	c	55	a	65	b	75	c
6	a	16	c	26	b	36	b	46	d	56	a	66	c	76	b
7	b	17	a	27	c	37	b	47	b	57	c	67	c	77	d
8	b	18	b	28	b	38	a	48	a	58	c	68	a	78	d
9	d	19	a	29	a	39	b	49	b	59	a	69	d	79	d
10	b	20	d	30	c	40	c	50	d	60	b	70	b		