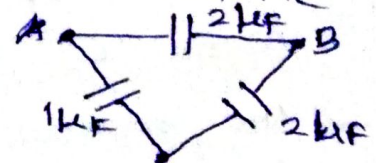


choice questions :-

(25 x 1 = 25)

- 1) Which charge configuration produces a uniform electric field?  
 (a) point charge (b) uniformly charged infinite line  
 (c) uniformly charged infinite plane (d) uniformly charged sphere
- 2) What is the ratio of the charges  $\left| \frac{q_1}{q_2} \right|$  for the following electric field line pattern?  
 (a)  $\frac{1}{5}$  (b)  $\frac{25}{11}$  (c) 5 (d)  $\frac{11}{25}$
- 3) An electric dipole is placed at an alignment angle of  $30^\circ$  with an electric field of  $2 \times 10^5 \text{ N/C}$ . It experiences a torque equal to  $8 \text{ Nm}$ . The charge on the dipole if the dipole length is  $1 \text{ cm}$  is  
 (a)  $4 \text{ mC}$  (b)  $8 \text{ mC}$  (c)  $5 \text{ mC}$  (d)  $7 \text{ mC}$
- 4) The total electric flux for the following closed surface which is kept inside water  
 (a)  $\frac{80q}{\epsilon_0}$  (b)  $\frac{q}{40\epsilon_0}$  (c)  $\frac{q}{80\epsilon_0}$  (d)  $\frac{q}{160\epsilon_0}$
- 5) Two metallic spheres of radii  $1 \text{ cm}$  and  $3 \text{ cm}$  are given charges of  $-1 \times 10^{-2} \text{ C}$  and  $5 \times 10^{-2} \text{ C}$  respectively. If these are connected by a conducting wire, the final charge on the bigger sphere is.  
 (a)  $3 \times 10^{-2} \text{ C}$  (b)  $4 \times 10^{-2} \text{ C}$  (c)  $1 \times 10^{-2} \text{ C}$  (d)  $2 \times 10^{-2} \text{ C}$
- 6) Three capacitors are connected in triangle as shown in the figure. The equivalent capacitance between the points A and C is  
 (a)  $1 \text{ kF}$  (b)  $2 \text{ kF}$  (c)  $3 \text{ kF}$  (d)  $\frac{1}{4} \text{ kF}$
- 7) A parallel plate capacitor stores a charge  $Q$  at a voltage  $V$ . Suppose the area of the parallel plate capacitor and the distance between the plates are each doubled then which is the quantity that will change?  
 (a) Capacitance (b) charge (c) voltage (d) energy density





- 8) An Electric field  $E = 10x\hat{i}$  exists in a certain region of space. then the potential difference  $V = V_0 - V_A$  where  $V_0$  is the potential at the origin and  $V_A$  is the potential at  $x = 2\text{m}$  is  
 (a) 10V (b) -20V (c) +20V (d) -10V
- 9) Two points A and B are maintained a potential of 7V and -4V respectively the work done in moving 50 electron from A to B is  
 (a)  $8.80 \times 10^{-17}\text{J}$  (b)  $-8.80 \times 10^{-17}\text{J}$  (c)  $4.40 \times 10^{-17}\text{J}$  (d)  $5.80 \times 10^{-17}\text{J}$
- 10) A toaster operating at 240V has a resistance of 120 $\Omega$ . Its power is  
 (a) 400W (b) 2W (c) 480W (d) 240W
- 11) What is the value of resistance of the following resistor?  
 (a) 100k $\Omega$  (b) 10k $\Omega$  (c) 1k $\Omega$  (d) 100k $\Omega$
- 12) In india electricity is supplied for domestic use at 220V. It is supplied at 110V in USA. If the resistance of a 60W bulb for use in india is R, the resistance of a 60W bulb for use in USA will be  
 (a) R (b) 2R (c)  $\frac{R}{4}$  (d)  $\frac{R}{2}$
- 13) There is a current of 1.0A in the circuit shown below. What is the resistance of P?  
 (a) 1.5 $\Omega$  (b) 2.5 $\Omega$  (c) 3.5 $\Omega$  (d) 4.5 $\Omega$
- 14) What is the current drawn out from the battery P?  
 (a) 1A (b) 2A (c) 3A (d) 4A
- 15) The temperature coefficient of resistance of a wire is 0.00125 per  $^{\circ}\text{C}$ . At  $20^{\circ}\text{C}$ . its resistance is 1 $\Omega$ . the resistance of the wire will be 2 $\Omega$  at  
 (a)  $800^{\circ}\text{C}$  (b)  $700^{\circ}\text{C}$  (c)  $850^{\circ}\text{C}$  (d)  $820^{\circ}\text{C}$
- 16) The internal resistance of a 2.1V cell which gives a current of 0.2A through a resistance of 10 $\Omega$  is  
 (a) 0.2 $\Omega$  (b) 0.5 $\Omega$  (c) 0.8 $\Omega$  (d) 1.0 $\Omega$
- 17) In Joule's heating law, when R and t are constant. If the H is taken along the y axis and  $I^2$  along the x axis. the graph is  
 (a) straight line (b) parabola (c) circle (d) ellipse



- 18) Fraunhofer lines are an example of — spectrum.  
 (a) Line emission (b) Line Absorption (c) Band Emission (d) Band Absorption
- 19) The dimension of  $\frac{1}{\mu_0 \epsilon_0}$  is  
 (a)  $[L T^{-1}]$  (b)  $[L^2 T^{-2}]$  (c)  $[L^{-1} T]$  (d)  $[L^{-2} T^2]$
- 20) If the Amplitude of the magnetic field is  $3 \times 10^{-6} T$ , then Amplitude of the electric field for a electromagnetic wave is  
 (a)  $100 V m^{-1}$  (b)  $300 V m^{-1}$  (c)  $600 V m^{-1}$  (d)  $900 V m^{-1}$
- 21) Which of the following electromagnetic radiations is used for viewing objects through fog  
 (a) Microwave (b) gamma rays (c) X-rays (d) infrared
- 22) Which of the following is false for electromagnetic wave  
 (a) Transverse (b) non-mechanical wave (c) Longitudinal  
 (d) produced by accelerating charges.
- 23) In an electromagnetic wave travelling in free space the rms value of the electric field is  $3 V m^{-1}$  the peak value of the magnetic field is  
 (a)  $1.414 \times 10^{-8} T$  (b)  $1.0 \times 10^{-8} T$  (c)  $2.828 \times 10^{-8} T$  (d)  $2.0 \times 10^{-8} T$
- 24) Which of the following is an electromagnetic wave?  
 (a)  $\alpha$ -rays (b)  $\beta$ -rays (c)  $\gamma$ -rays (d) All of them
- 25) If  $E = E_0 \sin [10^6 x - \omega t]$  be the electric field of a plane electromagnetic wave the value of  $\omega$  is  
 (a)  $0.3 \times 10^{-14} rad s^{-1}$  (b)  $3 \times 10^{-14} rad s^{-1}$   
 (c)  $0.3 \times 10^{14} rad s^{-1}$  (d)  $3 \times 10^{14} rad s^{-1}$

PART - II

(8 × 2 = 16)

Answer any 8, Q.No. 35 is compulsory

- 26) Define electric flux?
- 27) The Applications of capacitor?
- 28) State quantisation of electric charge?
- 29) State Kirchhoff's laws?
- 30) Define resistivity of the material
- 31) Define temperature co-efficient of resistivity?



32) What are the electromagnetic wave

33) What are Fraunhofer lines?

34) (i) UV radiation (ii) IR radiation

35) A copper wire of cross-sectional Area  $0.5 \text{ mm}^2$  carries of  $0.2 \text{ A}$ . If the free electron density of copper is  $8.4 \times 10^{28} \text{ m}^{-3}$  then compute the drift velocity of free electrons.

### PART - III

Answer any 8. a. No 46 is compulsory ( $8 \times 3 = 24$ )

36) Write short notes on (i) X-ray (ii) Radio wave (iii) microwave (iv) visible light

37) Write down the properties of electromagnetic wave?

38) Displacement current and Maxwell's correction to Ampere's circuital law?

39) Explain the method of measurement of internal resistance of a cell using potentiometer?

40) How the emf of two cells can be compared using potentiometer?

41) Define and the application of Seebeck effect?

42) The properties of electric field line?

43) Different between Coulomb force and gravitational force?

44) Expression for capacitance of parallel plate capacitor?

45) Expression for energy stored in capacitor?

46) Calculate the electric flux through the rectangle of side  $5 \text{ cm}$  and  $10 \text{ cm}$  kept in the region of a uniform electric field  $100 \text{ N/C}$ . The angle  $\theta$  is  $60^\circ$ . If  $\theta$  becomes zero, what is the electric flux?

Answer all the questions ( $7 \times 5 = 35$ )

47) Explain in detail the construction and working of Van de Graaff Generator?

48) Obtain an expression for electric field due to an infinitely long charged wire?

49) Expression for electrostatic potential due to electric dipole

50) Calculate the electric field due to a dipole on its equatorial line



- 51) the microscopic model of current and microscopic form of ohm's law?
- 52) obtain the condition for bridge balance wheatstone bridge?
- 53) How the emf of two cell's care internal resistance of a cell using voltmeter.
- 54) write down maxwell equation in integral form?
- 55) what is emission spectra? Explain their types?
- 56) what is Absorption spectra? Explain their types?
- 57) Explain the resultant resistance (i) series network, (ii) parallel resistor network.



லாபங்கள் சமயத்தில் நீ நடந்தால் - உங்கள்  
 லாபங்கள் 'உட்க' உலகங்கள் - உட்க  
 லாபக் குறைவாகக் கண்டால் குறைவாகக்  
 உபாந்தரம் உட்க உலகங்கள்.  
 - கண்ணாடிகள் (உலகங்கள்)

சிந்தனைகள் சூழல்கள் சந்தர்ப்பங்கள் உலகங்கள்.  
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உன் உலகங்கள் உலகங்கள் உலகங்கள் உலகங்கள், சிந்தனைகள்  
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