PHYSICS

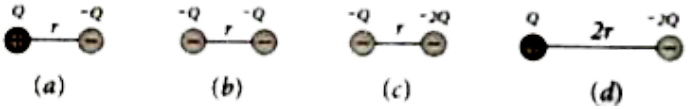
BOOKS - FULL MARKS PHYSICS (TAMIL ENGLISH)

SAMPLE PAPER -13

Part I

1. Rank the electrostatic potential energies for the given system of charges in increasing

order ..... .



A. $1 = 4 < 2 < 3$

B. $2 = 4 < 3 < 1$

C. $2 = 3 < 1 < 4$

D. $3 < 1 < 2 < 4$

Answer: A

Watch Video Solution

2. The energy stored in a capacitor is given by

A. qV

B. $\frac{1}{2}qV$

C. $\frac{1}{2}CV$

D. $\frac{q}{2C}$

Answer: B

Watch Video Solution

3. In a large building, there are 15 bulbs of 40W, 5 bulbs of 100W, 5 fans of 80W and 1 heater of 1 kW are connected. The voltage of electric mains is 220V. The minimum capacity of the main fuse of the building will be ..... .

A. 14A

B. 8A

C. $10A$

D. $12A$

Answer: D

Watch Video Solution

4. A simple pendulum with charged bob is oscillating with time period T and let θ be the angular displacement. If the uniform magnetic field is switched ON in a direction perpendicular to the plane of oscillation then

A. time period will decrease but θ will remain constant

B. time period remain constant but θ will decrease

C. both T and θ will remain the same

D. both T and θ will decrease

Answer: C

Watch Video Solution

5. In a transformer, the number of turns in the primary and the secondary are 410 and 1230

respectively. If the current in primary is 6A, then that in the secondary coil is

A. 2A

B. 18A

C. 12A

D. 1A

Answer: A

Watch Video Solution

6. How is Eddy current produced? How do they flow in a conductor ?

A. heated

B. placed in a time varying magnetic field

C. placed in an electric field

D. placed a unifrom magnetic field

Answer: B

 Watch Video Solution

7. Which one of them is used to produce a propagating electromanetic wave?

A. an accelearating charge

B. a charge moving at constant velocity

C. a stationary charge

D. an uncharged particle

Answer: A

Watch Video Solution

8. Ozone layer absorbs.....

A. Infrared radiaiton

B. Microwaves

C. Radio waves

D. UV radiation

Answer: D

 Watch Video Solution

9. If the velocity and wavelength of light in air is V_a and λ_a and that in water is V_w and λ_w then the refractive index of water is,

A. $\frac{V_w}{v_a}$

B. $\frac{V_a}{V_w}$

C. $\frac{\lambda_w}{\lambda_a}$

D. $\frac{V_a\lambda(a)}{V_w\lambda_w}$

Answer: B

Watch Video Solution

10. A light source of wavelength 520nm emits 1.04×10^{15} photons per second while the second source of 460nm produces 1.38×10^{15} photons per second. Then the ratio of power of second source to that of first source is

A. 1.00

B. 1.02

C. 1.5

D. 0.98

Answer: C

Watch Video Solution

11. If the K.E. of free electron doubles, its de-Broglie wavelength changes by the factor

A. $\frac{1}{2}$

B. 2

C. $\frac{1}{\sqrt{2}}$

D. $\sqrt{2}$

Answer: C

Watch Video Solution

12. The electric potential between a proton and an electron is given by $V = V_0 In\left(\frac{r}{r_0}\right)$ where r_0 is a constant. Assume that Bohr atom model is applicable to potential, then variation of radius of n^{th} orbit r_n with the principal quantum number n is

A. $r_n \propto \frac{1}{n}$

B. $r_n \propto n$

C. $r_n \propto \frac{1}{n^2}$

D. $r_n \propto n^2$

Answer: B

Watch Video Solution

13. If the input to the NOT gate is A = 1011, its output is

A. 0100

B. 1000

C. 1100

D. 0011

Answer: A

Watch Video Solution

14. The variation of frequency of carrier wave with respect to the amplitude of the modulating signal is called_____

A. Amplitude modulaiton

B. Frequency modulation

C. Phase modulation

D. Pulse width modulation

Answer: B

Watch Video Solution

15. The method of making nanomaterial by assembling the atoms is called

A. Top down approach

B. Bottom up approach

C. Cross down approach

D. Diagonal approach

Answer: B

Watch Video Solution

Part Ii

1. What is meant by electrostatic energy density ?

Watch Video Solution

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

Watch Video Solution

3. State Ampere's circuital law.

Watch Video Solution

4. The equation for an alternating current is given by $i = 77$ sin 314t. Find the peak value .

Watch Video Solution

5. What is angle of deviation due to refraction?

Watch Video Solution

6. At the given point of time, the earth receives energy from sun at $4calcm^{-2}min^{-1}$ .Determine the number of photons received on the surface of the Earth per cm^2 per minute. (Given : Mean wavelength of sun light $= 5500Å$)

Watch Video Solution

7. What is isobar? Give an example.

Watch Video Solution

8. Given circuit symbol , logical operation , truth table , and Boolean expression of AND , OR , NOT , NAND , NOR , and EX - OR gates

Watch Video Solution

9. Why steel is preferred in making Robot?

Watch Video Solution

Part Iii

1. What are the properties of an equipotential surface?

Watch Video Solution

2. In a potentiometer arrangement a cell of emf 1.25 V givesn a balance point at 35 cm length of the wire. If the cell is replaced by another cell and the balance point shift to 63 cm, what is the emf of the second cell ?

Watch Video Solution

3. State Biot-Savart's law.

Watch Video Solution

4. List out the advantages of stationary armature - rotating field system of AC generator .

Watch Video Solution

5. State Maxwell's right hand cork screw rule ?

Watch Video Solution

6. Differentiate between Fresnedl and Fraunhofer diffraction.

Watch Video Solution

7. Calculate the time required for 60% of a sample of radon undergo decay. Given $T_{1/2}$ of

radon = 3.8 days.

Watch Video Solution

8. What is the phase relationship between the AC input and output voltages in a common emitter amplifier ? What is the reason for the phase reversal ?

Watch Video Solution

9. Give any two examples for “Nano" in nature.

Watch Video Solution

Part Iv

1. Obtain the expression for electric field due to an charged infinite plane sheet .

Watch Video Solution

2. State and explain Kirchhoff's rules.

Watch Video Solution

3. Assuming that the length the of the solenoid is large when compared to its diameter, find the edquation for its inductance.

Watch Video Solution

4. How can you convert a galvanometer into an voltmeter?

Watch Video Solution

5. Obtain the equation for bandwidth in Young's double slit experimeet.

Conditon for bright fringe (or) maxima

Watch Video Solution

6. Explain how frequency of incident light varies with stopping potential.

Watch Video Solution

7. Obtain the law of radioactivity. Law of radioactive decay

Watch Video Solution

8. Explain zener diode as votltage regulator .

Watch Video Solution

9. What is modulation? Explain the types of modulation with necessary diagrams.

Watch Video Solution

10. Elaborate any two types of Robots with relevant examples.

Watch Video Solution