PHYSICS

BOOKS - FULL MARKS PHYSICS (TAMIL ENGLISH)

SAMPLE PAPER-6

Part I M C Q

1. If voltage applied on a capacitor is increased from V to 2V:

A. Q remains the same, C is doubled

B. Q is doubled, C doubled

C. Cremains same, Q doubled

D. Both Q and C remain same

Answer: c

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2. The electric field in the region between two concentric charged spherical shells

A. is zero

B. increases with distance from centre

C. is constant

D. decreases with distance from centre

Answer: d

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3. In India electicity is supplied for domestic use at 220V. It is supplied at 110V in USA. If the reistance of a 60W bulb for use in India is R,

the resistance of a 60 W bulb for use in USA will be

A. R

B. 2R

C. $\frac{R}{4}$

D. $\frac{R}{2}$

Answer: c

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4. The vertical component of Earth's magnetic field at a place is equal to the horizontal component. What is the value of angle of dip at this place ?

A. 30°

B. 45°

C. 60°

D. 90°

Answer: b

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5. A step-down transfomer reduces the supply voltage from 220 V to 11 V and increase the current from 6 A to 100 A. Then its efficiency is

A. 1.2

B. 0.83

C. 0.12

D. 0.9

Answer: b

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6. State Faraday's laws of electromagnetic induction.

A. Law of conservation of charge

B. Law of conservation of energy

C. Third law of motion

D. Law of conservation of angular momentum

Answer: b

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7. The dimension of $\frac{1}{\mu_0 \varepsilon_0}$ is

A. $\left[LT^{-1}\right]$

B. $\left[L^2T^{-2}\right]$

C. $\left[L^{-1}T\right]$

D. $\left[L^{-2}T^2\right]$

Answer: b

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8. In a Young's double-slit experiment, the slit separation is doubled. To maintain the same fringe spacing on the screen, the screen-to-slit distance D must be changed to,

A. 2D

B. $\frac{D}{2}$

C. $\sqrt{2}D$

D. $\frac{D}{\sqrt{2}}$

Answer: a

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9. The speed of light in an isotropic medium depends on,

A. its intensity

B. its wavelength

C. the nature of propagation

D. the motion of the source w.r.to medium

Answer: b

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10. The mean wavelength of light from sun is taken to be 550 nm and its mean power is 3.8×10^{26} W. The number of photons received by the human eye per second on the average from sunlight is of the order of.....

A. 10^{45}

B. 10^{42}

C. 10^{54}

D. 10^{53}

Answer: a

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11. As the intensity of incident light increases

A. kinetic energy of emitted photoelectrons increases

B. photoelectric current decreases

C. photoelectric current increase

D. kinetic energy of emitted photoelectrons decreases

Answer: c

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12. In J.J. Thomson e/m experiment, a beam of electron is replaced by that of muons (particle with same charge as that of electrons but mass 208 times that of electrons). No deflection condition is achieved only if

A. B is increased by 208 times

B. B is decreased by 208 times

C. B is increased by 14.4 times

D. B is decreased by 14.4 times

Answer: c

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13. A forward biased diode is treated as

A. An open switch with infinite resistance

B. A closed switch with a voltage drop of OV

C. A closed switch in series with a battery voltage of 0.7V

D. A closed switch in series with a small resistance and a battery.

Answer: d

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

A. Amplitude modulation

B. Frequency modulation

C. Phase modulation

D. Pulse width modulation

Answer: b

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15. Who is the father of the modern robotics industry formed the world's first robotic company in 1956?

A. Joliot

B. Cormark

C. Engelberger

D. Edward purcell

Answer: c

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Part Ii

1. What is the general definition of electric dipole moment?

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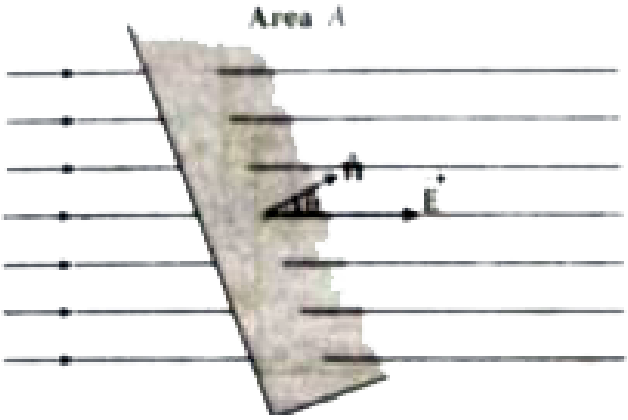
2. Calculate the electric flux through the ractangle of sides 5 cm and 10 cm kept in the rigion of a uniform field 100 NC^{-1} . The angle θ is 60° . Suppose θ becomes zero what is the

electric flux?



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3. What is meant by hysteresis?

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4. What is meant by wattles current ?

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5. What is Snell's window?

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6. Define work function of a metal. Give its unit.

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7. What is meant by radioactivity?

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8. What is the angular momentum of an electron in the third orbit of an atom?

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9. Explain the current flow in a NPN transistor

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Part Iii

1. Define capacitance . Give its unit.

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2. Distinguish between drift velocity and mobility.

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3. A coil of a tangent galvanometer of diametre 0.24 m has 100 turns. If the horizontal component of Earth's magnetic field is 25×10^{-6} T then, calculate the current which gives a deflection of 60° .

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4. Mention the way of producing induced emf.

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5. A 400 mH coil of negligible resistance is connected to an AC circuit in which an effective current of 6 mA is flowing. Find out the voltage across the coil if the frequency is 1000 Hz.

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6. What are the sign conventions followed for lenses?

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7. Write down the draw backs of Bohr atom model.

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8. What do you mean by leakage current in a diode ?

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9. Distinguish between wireline and wireless communication? Specify the range of electromagnetic waves in which it is used.

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10. Explain the equivalent resistance of a series and parallel resistor network.

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11. Obtain a relation for the magnetic induction at a point along the axis of a circular coil carrying current.

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12. Explain the working of a single-phase AC generator with necessary diagram.

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13. What is emission spectra? Give their types

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14. Describe the Fizeau's method to determine speed of light.

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15. List out the laws of photoelectric effect.

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16. Describe the structure of nucleus with a suitable diagram.

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17. Explain the working principle of a solar cell. Mention its applications.

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18. Elaborate on the basic elements of communication system with the necessary block diagram.

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Part Iv

1. Derive an expression for the torque experienced by a dipole due to a uniform electric field.

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