Model Question of HSC Examination 2020 (All Board)

Physics Second Paper (Creative)

Sub Code : 1 7 5

Time: 2Hrs 35 min **Full marks: 50**

*[Read the following stems and answer **any five** of the following questions:]*

1. ★ Two charges $q_1 = 1.54\times10^{-6}$C and $q_2 = +3\times10^{-6}$C are separated by 10 cm apart.

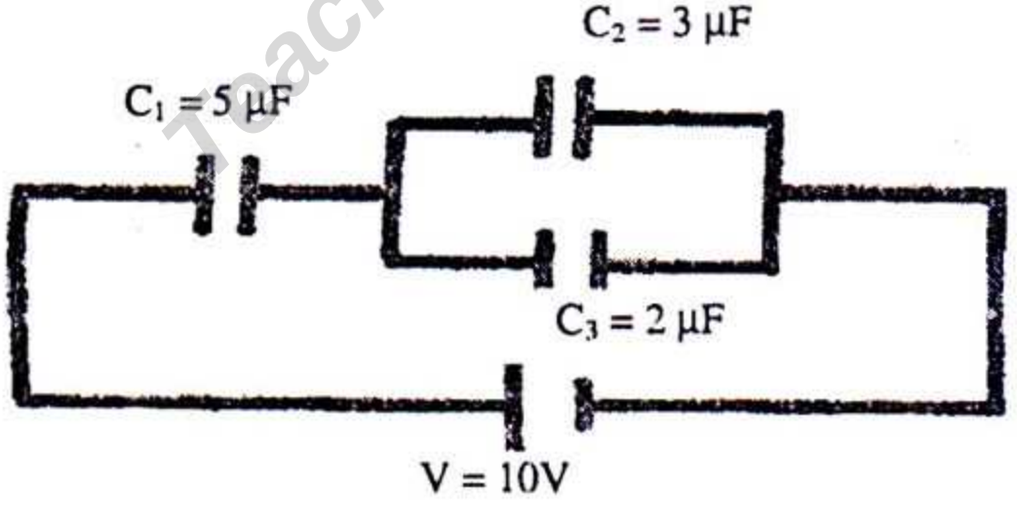
a. What is electric field intensity? 1

b. Why does a moving charge feel force in magnetic field? Explain. 2

c. If a charge $+2\times10^{-6}$C is placed at the centre of the line between the two charge then calculate the resultant force. 3

d. Where the intensity will be the same on the line between the two charges? 4

2. ▶



a. State ampere's law. 1

b. How the nature of the charges can be determined by the Hall effect? 2

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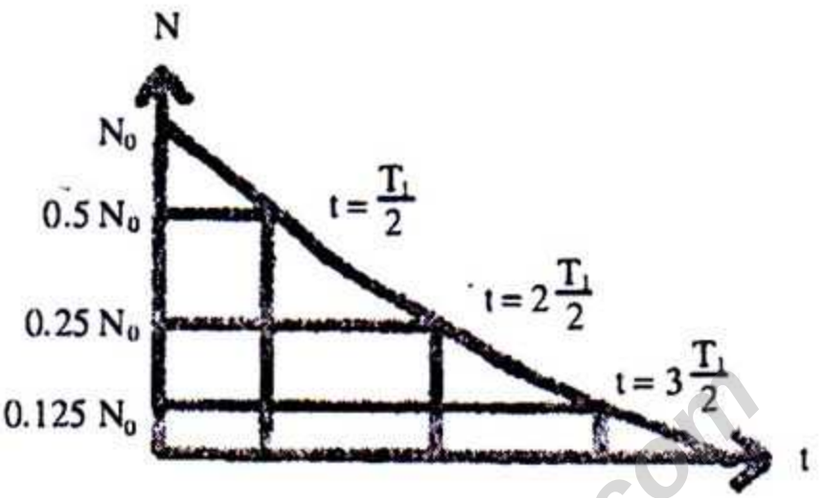
c. Calculate the charge of C_2 capacitor. 3

d. Does the store energy of the combination increase if C_2 and C_3 are connected in series? Analyze mathematically. 4

3. ▶



The graph indicates the radioactive decay of a radioactive element X which average life is 2294 years

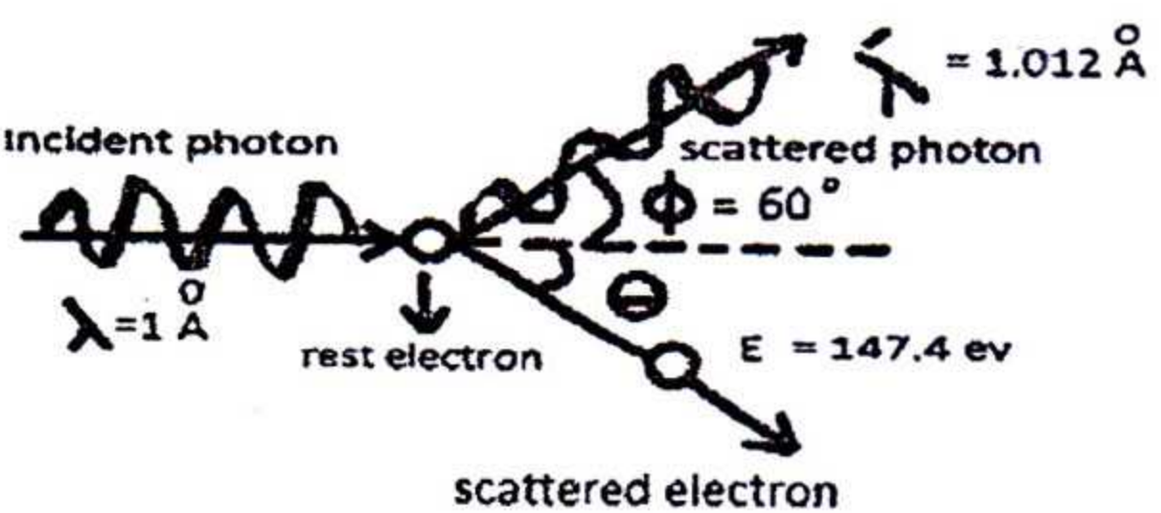
a. What is binding energy? 1

b. Why does light wave get polarized but not sound wave? Explain. 2

c. Calculate the half life of the element X. 3

d. Does the graph of the above stem obey the radioactive decay law? Analyze mathematically from the above data. 4

4. ✪



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a. What is stopping potential? 1

b. Is it possible to consider a rotational object as inertial frame of reference? Explain. 2

c. Calculate the mass of the scattered electron. 3

d. Does the collision of the above stem elastic? Explain mathematically and give opinion. 4

5. ✪ In a optics lab Rakib incident a color of light with 450nm wavelength perpendicularly on a diffraction grating with 6×10^5 number of lines on it.

a. What is coherent source? 1

b. How does a shunt protect a galvanometer? 2

c. Calculate the diffractive angle of first order? 3

d. Is it possible of diffraction of forth order? Analyze. 4

6. ▶ Temperature of heat source and heat sink of a Carnot engine are 1200°C and 600°C respectively. Work done at four steps are 1100J, 1150J, 600J and 300J.

a. What is called pulsar theory? 1

b. Explain black hole. 2

c. Calculate the total amount of work done. 3

d. In order to increase the efficiency of the engine 100% the temperature of the source must be infinity and temperature of the sink must be 0K. Analyze mathematically. 4

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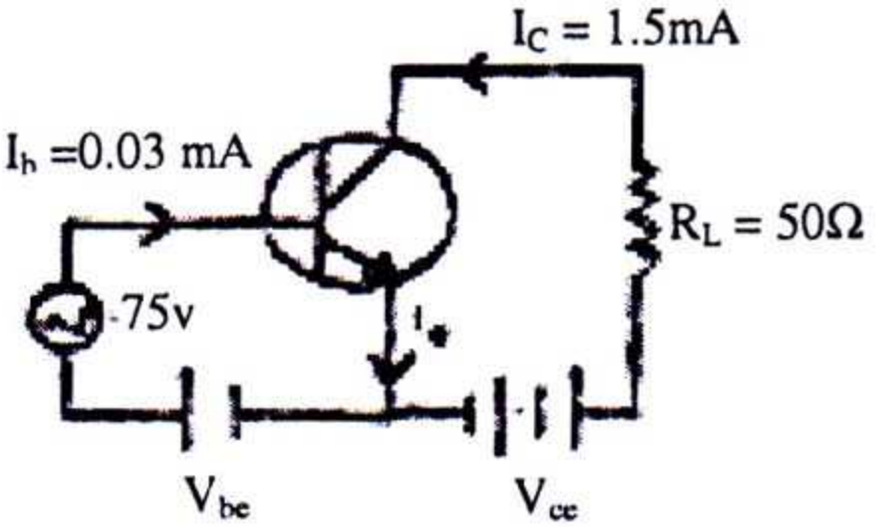
7. ☆



a. What is lenz law? 1

b. Explain the relation of the mass of an object and wavelength. 2

c. From the stem calculate the value of α. 3

d. Is it possible to use the transistor of the stem as electric switch by changing the input voltage? Explain. 4

8. ▶ A current carrying conductor of length 1m and 10 coulomb charge pass through the conductor in 5 sec.

a. What is Lorentz's force? 1

b. Which is more dangerous between 220V DC and 220V AC? Explain. 2

c. On the basis of the stem calculate the magnetic field at a distance 5cm from the wire. 3

d. If the wire is made a circular coil of 20 turns is there any change of magnetic field at the centre of the coil? Analyze mathematically. 4

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Model Question of HSC Examination 2020 (All Board)

Physics Second Paper (MCQ)

Sub Code : 1 7 5

Time : 25 Minutes | Full Marks : 25

[N.B. Fill the circle of the correct answer with a black ball point pen. Each question bears 1 mark.]

1. For two atom gases γ is—
ⓐ 1.33 ⓑ 1.40
ⓒ 1.50 ⓓ 1.67

2. In case of a photon—
i. mass is always zero
ii. energy E = hf
iii. velocity $3 \times 10^8 ms^{-1}$
Which one is correct?
ⓐ i & ii ⓑ i & iii
ⓒ ii & iii ⓓ i, ii & iii

3. Which has negative temperature Co-efficient of heat?
ⓐ Brass ⓑ Copper
ⓒ Zermanium ⓓ Aluminium

4. Which is Lorentz force?
ⓐ $q\vec{E}$ ⓑ $q(\vec{v} \times \vec{B})$
ⓒ $q(\vec{E} + \vec{v} \times \vec{B})$ ⓓ $q(\vec{E} \times \vec{v} \times \vec{B})$

5. ★ If the kinetic energy of a particle is equal to its rest energy then which one is correct?
ⓐ $m_0 = 2m$ ⓑ $m = 2m_0$
ⓒ $m_0 = 2mc^2$ ⓓ $m = 2m_0c^2$

6. This Question is unavailable

7. If the path difference between two waves is $\frac{\lambda}{8}$ then phase difference is?
ⓐ $\frac{\pi}{2}$ ⓑ $\frac{\pi}{4}$
ⓒ $\frac{\pi}{6}$ ⓓ $\frac{\pi}{8}$

8. What is the equivalent energy of 1*amu*?
ⓐ 931*J* ⓑ 931*eV*
ⓒ 931*MeV* ⓓ 931*kJ*

9. The ratio of the second and the third orbits of hydrogen atom—
ⓐ 2:3 ⓑ 1:2
ⓒ 9:4 ⓓ 1:3

10. In case of a ferromagnetic substance—
ⓐ $\mu >> 1, k >> 1$
ⓑ $\mu << 1, k >> 1$
ⓒ $\mu = 1, k < 1$
ⓓ $\mu < 1, k = 1$

11. If the tire of a bus brust then—
i. Their will be change in entropy
ii. Work will be done
iii. internal temperature will be decreased
Which one is correct?
ⓐ i & ii ⓑ ii
ⓒ ii & iii ⓓ i, ii & iii

12. In which temperature the Celcius and Farenheit scale has 20° difference?
i. – 15°C and 5°F
ii. –65°C and –85°F
iii. –35°C and –63°F
Which one is correct?
ⓐ i & ii ⓑ ii
ⓒ ii & iii ⓓ i, ii & iii

13. From which gate all gate can be obtained —
ⓐ XOR ⓑ AND
ⓒ NOR ⓓ X-NOR

14. Two charges of magmitide 1×10^{-6}C and 2×10^{-6} are placed at a distance of 10cm. Find the neutral point of field intensity.
ⓐ 0.041m away from 1×10^{-6}C
ⓑ 0.41m away from 1×10^{-6}C
ⓒ 0.041m away from 2×10^{-6}C
ⓓ 0.41m away from 2×10^{-6}C

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15. ★ A light having wavelength 2325Å is entering into water of refractive index $\frac{4}{3}$. What will be it wavelength in water?

ⓐ 1470Å

ⓑ 1740Å

ⓒ 1870Å

ⓓ 1840Å

16. At minium deviatin of prism—

i. $i_1 = r_2$

ii. $ra = \frac{A}{2}$

iii. $I_1 = \frac{\delta m + A}{2}$

Which one is correct?

ⓐ i & ii ⓑ i & iii

ⓒ ii & iii ⓓ i, ii & iii

17. This Question is unavailable

18. What is the de-Broglle wavelength of an electron of kinetic energy 54 *eV*.

ⓐ 1.35Å ⓑ 1.45Å

ⓒ 1.55Å ⓓ 1.65Å

Answer Question no. 19 and 20 in the light of the following stem :

Same amount of two madioactive substance one has half 10days and another has decay constant $0.03465d^{-1}$.

19. ★ What is the mean life of first element?

ⓐ 10d

ⓑ 14.43d

ⓒ 17.63d

ⓓ 20d

20. ★ After 40 days what portion will be remain to the second element with respect to the first element?

ⓐ 2 ⓑ 3

ⓒ 4 ⓓ 5

21. In case of a transistor $\alpha = 0.95$, and $I_E = 1mA$, then what will be β?

ⓐ 19 ⓑ 20

ⓒ 21 ⓓ 22

22. Decimal of $(20D)_{16}$ is

ⓐ $(510)_{10}$

ⓑ $(515)_{10}$

ⓒ $(520)_{10}$

ⓓ $(525)_{10}$

23. What is measured by Post Office Box?

ⓐ Current

ⓑ Resistance

ⓒ Potential difference

ⓓ EMF

24. The magnitude of earths magnetic field is 5 and dip is 60°. What is the magnitude of horizontal component of earths magnet?

ⓐ 25μT

ⓑ 2.5μT

ⓒ 25T

ⓓ 2.5T

25. Root mean square value of alternating current is—

ⓐ $0.707\ i_0$ ⓑ $0.637\ i_0$

ⓒ $\frac{\sqrt{2}}{\pi} i_0$ ⓓ $\frac{\pi}{\sqrt{2}} i_0$

Ans.																													
	1	ⓑ	2	ⓒ	3	ⓒ	4	ⓒ	5	ⓑ	6	*	7	ⓑ	8	ⓒ	9	ⓒ	10	ⓐ	11	ⓓ	12	ⓐ	13	ⓒ
	14	ⓐ	15	ⓑ	16	ⓒ	17	*	18	ⓓ	19	ⓑ	20	ⓒ	21	ⓐ	22	ⓓ	23	ⓑ	24	ⓑ	25	ⓐ		

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