

+2 Physics - Important Five Marks Questions English Medium – Volume : 2

Unit: 6 ATOMIC PHYSICS

1. Explain the spectral series of hydrogen.(Diagram not needed) (M-06,M-10,J-10,M-12,M-13)
2. Describe Laue experiment. What are the facts established by it? (O-06)
3. Mention any five properties of X-rays. (J-06,M-11)
4. Derive the expression for energy of the electron in the n^{th} orbit of hydrogen atom. (O-07)
5. Derive the expression for radius of the electron in the n^{th} orbit of hydrogen atom. (J-13)
6. State and obtain Bragg's law. (J-08,O-09,O-11)
7. Give any five properties of cathode rays. (O-08,J-09)
8. Explain the origin of characteristic X-rays. (M-09,J-11,J-12,O-12)
9. The wavelength of Balmer second line is 4861\AA . Calculate the wavelength of the first line of Balmer series. (M-07)

10.

In Bragg's spectrometer, the glancing angle for first order spectrum was observed to be 8° . Calculate the wavelength of X-ray, if $d = 2.82 \times 10^{-10}$ m. At what angle will the second maximum occur? (J-07)

11.

An α - particle is projected with an energy of 4 MeV directly towards a gold nucleus. Calculate the distance of its closest approach. Given : atomic number of gold = 79 and atomic number of α particle = 2. (M-08)

12.

An electron beam passes through a transverse magnetic field of 2×10^{-3} tesla and an electric field E of 3.4×10^4 V/m acting simultaneously. If the path of the electrons remain undeviated, calculate the speed of electrons. If the electric field is removed, what will be the radius of the electron path? (O-10)

***** Best wishes *****

+2 Physics - Unit: 7 Dual Nature of Radiation and Matter and Relativity

1. What is work function? State the laws of photoelectric emission. (M-07,M-09)
2. What is photoelectric effect? State the laws of photoelectric emission. (M-11)
3. Derive Einstein's photoelectric equation. (M-06,J-06,O-09,M-10,J-10,O-11)
4. State any five applications of photoelectric cells. (O-06,J-07,M-08,J-08,J-09,M-12,J-13)
5. Derive an expression for de Broglie wavelength of matter waves. (O-06,M-07,M-09,J-10,O-10,J-11,J-12,M-13)
6. Explain length contraction. (M-06,M-08,M-10,O-10,O-11,J-13)
7. Explain time dilation. (J-06,J-08)
8. Explain wave mechanical concept of atom. (O-07)
9. Explain the photo emissive cell. (O-08)
10. Derive Einstein's mass energy equivalence. (J-07,O-12)
11. (O-09,J-12,M-13)

A metallic surface when illuminated with light of wavelength 3333 Å emits electrons with energies upto 0.6 eV. Calculate the work function of the metal.

12. (O-08)

At what speed is a particle moving if the mass is equal to three times its rest mass.

13. (J-07,J-11,M-12)

How fast would a rocket have to go relative to an observer for its length to be corrected to 99% of its length at rest.

14. (J-09C,M-12C)

The work function of Iron is 4.7 eV. Calculate the cut off frequency and the corresponding cut off wave length for this metal.

15. (J-09C)

The time interval measured by an observer at rest is 2.5×10^{-8} s. What is the time interval as measured by an observer moving with a velocity $v = 0.73 c$.

16. (M-11)

A proton is moving at a speed of 0.900 times the velocity of light. Find its kinetic energy in joules and MeV.

17. (O-12)

What is the de Broglie wave length of an electron of kinetic energy 120 eV?

+2 Physics Unit: 8 NUCLEAR PHYSICS

1. Give the explanation for binding energy curve(Graph not necessary) (J-10)
2. Explain the Soddy- Fajan's radioactive displacement laws. (M-11)
3. Write a note on biological hazards of nuclear radiations. (O-08)
4. Write the properties α - rays. (O-10)
5. Explain the latitude effect of cosmic rays. (O-07,J-09)
6. Explain how cosmic ray shower is formed. (M-07,J-12)
7. If the mass defect of the ${}^6\text{C}^{12}$ nucleus is 0.098amu, calculate the binding energy per nucleon. (J-07)
8. State the properties of neutrons. (J-13)

9. (M-09)

The binding energy per nucleon for ${}^6\text{C}^{12}$ nucleus is 7.68 MeV and that for ${}^6\text{C}^{13}$ is 7.47 MeV. Calculate the energy required to remove a neutron from ${}^6\text{C}^{13}$ nucleus.

10. (M-08C, M-13)

Calculate the time required for 60% of a sample of radon to undergo decay. Given $T_{1/2}$ of radon = 3.8 days

11. (M-06C)

Calculate the energy released when 1 kg of ${}_{92}\text{U}^{235}$ undergoes nuclear fission. Assume, energy per fission is 200 MeV. Avagadro number = 6.023×10^{23} . Express your answer in kilowatt hour

12. (O-06C,J-08C)

Calculate the mass of coal required to produce the same energy as that produced by the fission of 1 kg of U^{235} . Given ; heat of combustion of coal = 33.6×10^6 J/kg, 1 ton = 1000 kg. Energy per fission of U^{235} = 200 MeV. $1\text{eV} = 1.6 \times 10^{-19}$ J. Avagadro number $N = 6.023 \times 10^{23}$

13. (M-06C)

A piece of bone from an archaeological site is found to give a count rate of 15 counts per minute. A similar sample of fresh bone gives a count rate of 19 counts per minute. Calculate the age of the specimen. Given : $T_{1/2} = 5570$ years

14.

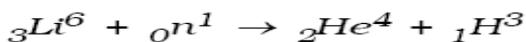
(J-06C)

Find the energy released when two ${}_1\text{H}^2$ nuclei fuse together to form a single ${}_2\text{He}^4$ nucleus. Given, the binding energy per nucleon of ${}_1\text{H}^2$ and ${}_2\text{He}^4$ are 1.1 MeV and 7.0 MeV respectively.

15.

(O-11)

Calculate the energy released in the following reaction.



Given mass of ${}_3\text{Li}^6$ nucleus = 6.015126 amu

Mass of ${}_1\text{H}^3$ nucleus = 3.016049 amu

Mass of ${}_2\text{He}^4$ nucleus = 4.002604 amu

Mass of ${}_0\text{n}^1$ = 1.008665 amu

16.

(O-06C,M-08C,M-12)

Show that the mass of radium (${}_{88}\text{Ra}^{226}$) with an activity of 1 curie is almost a gram. Given $T_{1/2} = 1600$ years;
1 curie = 3.7×10^{10} disintegrations per second.

17.

(M-10)

The disintegration constant λ of a radioactive element is 0.00231 per day. Calculate its half life and mean life.

18.

(J-06C,J-08C,O-09,J-11)

A reactor is developing energy at the rate of 32 MW. Calculate the required number of fissions per second of ${}_{92}\text{U}^{235}$. Assume that energy per fission is 200 MeV.

19.

(O-12)

Calculate the energy released in the reaction



Given : Mass of ${}_{13}\text{Al}^{27}$ = 26.981535 amu

Mass of ${}_1\text{H}^2$ = 2.014102 amu

Mass of ${}_{12}\text{Mg}^{25}$ = 24.98584 amu

Mass of ${}_2\text{He}^4$ = 4.002604 amu

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+2 Physics Unit: 9 Semiconductor Devices and their Applications

1. Explain the working of a half wave diode rectifier. (M-09,J-11,M-12,M-13)
2. Explain the working of bridge rectifier. (J-06,M-10)
3. Deduce the relation between α and β of a transistor. (J-07)
4. Draw the frequency response curve of a single stage CE amplifier and discuss the results. (M-08)
5. With a neat circuit diagram, explain voltage divider biasing of a transistor. (M-07,J-09)
6. Explain the function of a transistor as a switch. (O-07)
7. Explain the function of AND gate using diodes. (J-08)
8. State and prove De Morgan's theorems. (M-06,O-06,O-10,J-13)
9. Explain with the circuit symbol and pin-out configuration of OP-AMP. (O-08)
10. Explain how operational amplifier is used as a summer. (J-12)
11. Explain how multimeter is used as ohm meter. (M-11)
12. Explain the action of Zener diode as a voltage regulator with a necessary circuit. (O-12)
13. (O-11)

The gain of the amplifier is 100. If 5% of the output voltage is fed back into the input through a negative feed back network. Find out the voltage gain after feed back.

14. (J-10)

A transistor is connected in CE configuration. The voltage drop across the load resistance (R_L) $3\text{ k}\Omega$ is 6 V. Find the base current. The current gain α of the transistor is 0.97

15. (O-09)

When the negative feedback is applied to an amplifier of gain 50, the gain after feedback falls to 25. Calculate the feedback ratio.



+2 Physics

Unit: 10 Communication Systems

1. What are the advantages and disadvantages of digital communication. (M-06,J-06,J-08,J-09,J-12)
2. Explain the space wave propagation of radio waves. (O-06)
3. Mention the principle of radar and write its applications. (M-07,M-08,M-10,M-12,M-13)
4. Write a short notes on optical fiber communication and give its uses. (J-07,O-11)
5. Draw the block diagram of AM radio transmitter. (O-07,O-10)
6. Explain with a block diagram of FM radio transmitter. (O-08,O-09,J-10,J-11,O-12)
7. Explain the operation of a FM superheterodyne receiver. (M-09)
8. What are the merits of satellite communication? (J-13)
9. (M-11)

A 10 MHz sinusoidal carrier wave of amplitude 10 mV is modulated by a 5 kHz sinusoidal audio signal wave of amplitude 6 mV. Find the frequency components of the resultant modulated wave and their amplitude.

Best wishes

Hard working never fails

BEST WISHES TO GET CENTUM IN PHYSICS.

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