

NEET PHYSICS

Topic: X-Ray

- Q.1** X-rays are also called -
- (1) Becquere rays (2) Rontgen rays
(3) neutron rays (4) cathode rays
- Q.2** The nature of the target used for the production of X-rays should be -
- (1) solid of high atomic number
(2) solid of low atomic number
(3) solid of high melting point
(4) solid of high atomic number and high melting point
- Q.3** Which of the following are used for the study of structure of crystals ?
- (1) infrared rays (2) visible light rays
(3) ultraviolet rays (4) X-rays
- Q.4** Bragg's law of X-ray is correct for -
- (1) refraction (2) reflection
(3) diffraction (4) polarisation
- Q.5** X-rays are not used in radar because -
- (1) they damage the target
(2) they are electromagnetic waves
(3) they are not reflected by the target
(4) they are completely absorbed by air

- Q.6** X-rays were discovered by -
- (1) Rontgen (2) Becquerel
(3) De-Broglie (4) Rutherford
- Q.7** In a Coolidge tube X-rays are produced by
- (1) positive rays (2) cathode rays
(3) electromagnetic rays (4) a proton beam
- Q.8** X-ray is an electromagnetic radiation, so X-ray photons carry -
- (1) an electric charge
(2) a magnetic moment
(3) both the electric charge and magnetic moment
(4) neither electric charge nor magnetic torque
- Q.9** X-rays and γ -rays both are electromagnetic waves. Which of the following statements is correct ?
- (1) the wavelength of X-rays is greater than that of γ -rays
(2) the wavelength of X-rays is less than that of γ -rays
(3) the frequency of γ -rays is less than that of X-rays
(4) the frequency and wavelength of X-rays are more than those of γ -rays
- Q.10** The nature X-rays is similar to -
- (1) cathode rays (2) neutron beam
(3) α -rays (4) γ -rays
- Q.11** Which of the following characteristics of X-rays increases on increasing the number of electrons striking the anticathode ?
- (1) Hardness (2) Wavelength
(3) Penetrating power (4) Intensity

- Q.12** The velocity of X-rays is equal to the velocity of -
- (1) sound waves (2) elastic waves
(3) ultrasonic waves (4) light waves
- Q.13** The wavelength of the most energetic X-ray emitted when a metal target is bombarded by 40 keV electron is approximately -
- (1) 300 Å (2) 10 Å
(3) 4 Å (4) 0.31 Å
- Q.14** X-rays are diffracted by -
- (1) a single slit (2) a double slit
(3) a diffraction grating (4) a crystal
- Q.15** If X-rays are deflected from their path then its cause may be -
- (1) electric field
(2) magnetic field
(3) electric and magnetic field both
(4) none of the above
- Q.16** X-rays travel a long distance in a material if their -
- (1) wavelength is low
(2) wavelength is high
(3) frequency is low
(4) not depend on wavelength and frequency
- Q.17** In majority of crystals the value of lattice constant is of the order of 3Å. The proper X-rays with which the crystal structure can be studied are -
- (1) 50Å to 100 Å (2) 10Å to 50 Å
(3) 5Å to 10 Å (4) 0.1Å to 2.7 Å

- Q.18** The distance between two successive atomic planes of a calcite crystal is 0.3 \AA . The minimum angle for Bragg scattering of 0.3 \AA X-rays will be -
- (1) 1.5° (2) 30°
(3) 2.86° (4) 60°
- Q.19** X-rays of frequency ν are used to irradiate sodium and copper surface in two separate experiments and the stopping potential determined. Then :
- (1) the stopping potential is more for copper than for sodium
(2) the stopping potential is more for sodium than for copper
(3) the stopping potential is same for copper and for sodium
(4) none of the above
- Q.20** The lattice spacing in a crystal is 0.5 \AA . The maximum wavelength of X-rays for which diffraction can be observed will be
- (1) 0.5 \AA (2) 1.0 \AA
(3) 2.0 \AA (4) 5.0 \AA
- Q.21** X-rays do not penetrate -
- (1) wood (2) meat
(3) Al (4) BaSO_4
- Q.22** If X-rays are passing through different material of same thickness then its absorption is minimum in -
- (1) copper (2) gold
(3) air (4) lead
- Q.23** In X-ray tube, the percentage of energy of electron converted into X-rays is -
- (1) nearly 50%
(2) nearly 10%
(3) less than 1%
(4) almost 100%

- Q.24** An X-ray tube operates at 30 kV. Then the speed of the electrons when they hit the target is about -
- (1) 10^8 m/s (2) 10^7 m/s
(3) 10^6 m/s (4) 10^9 m/s
- Q.25** A metal block is exposed to beam of X-rays of different wavelengths. X-rays of which wavelength penetrates most.
- (1) 2 Å (2) 4 Å
(3) 6 Å (4) 8 Å
- Q.26** Difference between soft and hard X-rays is -
- (1) of frequency
(2) of velocity
(3) of penetration power and frequency
(4) of intensity and velocity
- Q.27** Which of the following statements is correct for hard X-rays ?
- (1) Penetrating power is more and wavelength is less than that of soft X-rays
(2) Penetrating power is more and wavelength is more than that of soft X-rays
(3) Penetrating power is equal to that of soft X-rays and wavelength is less than that of soft X-rays
(4) Penetrating power is equal to that of soft X-rays and wavelength is more than that of soft X-rays
- Q.28** The cause of characteristic X-rays is -
- (1) transition of valence electrons from higher to lower orbits
(2) transition of inner shell electrons from higher to lower orbits
(3) transition of atomic nuclei electrons from higher to lower energy states
(4) none of these

Q.29 The energy of a continuous X-ray photon comes from -

- (1) the kinetic energy of the free electrons of target
- (2) the atomic transition in the target
- (3) the kinetic energy of the striking electron
- (4) none of these

Q.30 The energy of a characteristic X-ray photon comes from -

- (1) the kinetic energy of the free electrons of target
- (2) the atomic transition in the target
- (3) the kinetic energy of the striking electron
- (4) none of these

ANSWER KEY

Que.	1	2	3	4	5	6	7	8	9	10
Ans.	2	4	4	3	3	1	2	4	1	4
Que.	11	12	13	14	15	16	17	18	19	20
Ans.	4	4	4	4	4	1	4	2	2	2
Que.	21	22	23	24	25	26	27	28	29	30
Ans.	4	3	3	1	1	3	1	2	3	2