

# Dual Nature of Radiation and Matter

1. Who established that electric charge is quantised?

- (a) J.J. Thomson
- (b) William Crookes
- (c) R.A. Millikan
- (d) Wilhelm Rontgen

▼ **Answer**

Answer: c

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2. Cathode rays were discovered by

- (a) Maxwell Clerk James
- (b) Heinrich Hertz
- (c) William Crookes
- (d) J.J. Thomson

▼ **Answer**

Answer: c

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3. The minimum energy required for the electron emission from the metal surface can be supplied to the free electrons by which of the following physical processes?

- (a) Thermionic emission
- (b) Field emission
- (c) Photoelectric emission
- (d) All of these

▼ **Answer**

Answer: d

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4. The phenomenon of photoelectric emission was discovered in 1887 by

- (a) Albert Einstein
- (b) Heinrich Hertz
- (c) Wilhelm Hallwachs
- (d) Philipp Lenard

▼ **Answer**

Answer: b

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5. A metal surface ejects electrons when hit by green light but nothing when hit by yellow light. The electrons will be ejected when the surface is hit by

- (a) blue light
- (b) heat rays
- (c) infrared light
- (d) red light

▼ **Answer**

Answer: a

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6. Which of the following statements is correct regarding the photoelectric experiment?

- (a) The photocurrent increases with intensity of light.
- (b) Stopping potential increases with increase in intensity of incident light.
- (c) The photocurrent increases with increase in frequency.
- (d) All of these

▼ **Answer**

Answer: a



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7. In photoelectric effect, the photocurrent

- (a) depends both on intensity and frequency of the incident light.
- (b) does not depend on the frequency of incident light but depends on the intensity of the incident light.
- (c) decreases with increase in frequency of incident light.
- (d) increases with increase in frequency of incident light.

▼ **Answer**

Answer: b

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8. The maximum value of photoelectric current is called

- (a) base current
- (b) saturation current
- (c) collector current
- (d) emitter current

▼ **Answer**

Answer: b

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9. In photoelectric effect, the photoelectric current is independent of

- (a) intensity of incident light
- (b) potential difference applied between the two electrodes
- (c) the nature of emitter material
- (d) frequency of incident light

▼ **Answer**

Answer: d

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10. In photoelectric effect, stopping potential depends on

- (a) frequency of incident light
- (b) nature of the emitter material
- (c) intensity of incident light
- (d) both (a) and (b)

▼ **Answer**

Answer: d

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11. According to Einstein's photoelectric equation, the graph of kinetic energy of the photoelectron emitted from the metal versus the frequency of the incident radiation gives a straight line graph,



whose slope

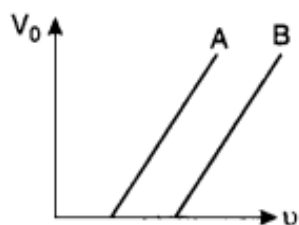
- (a) depends on the intensity of the incident radiation.
- (b) depends on the nature of the metal and also on the intensity of incident radiation.
- (c) is same for all metals and independent of the intensity of the incident radiation.
- (d) depends on the nature of the metal.

▼ **Answer**

Answer: c

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12. The figure shows stopping potential  $V_0$  and frequency  $\nu$  for two different metallic surfaces A and B. The work function of A, as compared to that of B is



- (a) less
- (b) more
- (c) equal
- (d) nothing can be said

▼ **Answer**

Answer: a

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13. Which phenomenon best supports the theory that matter has a wave nature?

- (a) Electron momentum
- (b) Electron diffraction
- (c) Photon momentum
- (d) Photon diffraction

▼ **Answer**

Answer: b

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