MCQs Related to the Article "20.1ATOMIC SPECTRA"

1. The radiations emitted from hydrogen filled discharge tube show _____
(a) Bound spectrum (b) Line spectrum
(c) Continuous spectrum (d) Absorption spectrum

2. A spectrum of radiation in which the quantity being studied, such as frequency or energy, takes discrete values is called:
(a) Continuous spectra (b) Band spectra
(c) Line spectra (d) None of these

3. Which of the following is an example of line spectra?
(a) Black body radiation spectra (b) Molecular spectra
(c) Atomic spectra (d) None of these

4. Sunlight spectrum is
(a) Discrete (b) Line spectrum (c) Continuous spectrum (d) None

5. Which is an example of continuous spectra?
(a) Black Body Radiation Spectrum (c) Molecular Spectra
(c) Atomic Spectra (d) None of these

6. Hydrogen atom spectrum does not lie in:
(a) Visible region (b) Ultraviolet region (c) Infrared region (d) X-ray region

7. The value of Rydberg's constant is:
(a) $1.0974 \times 10^{7}\ m^{-1}$ (b) $1.6 \times 10^{-19}\ C$ (c) 1.05×10^{-34} Js (d) $9.1 \times 10^{-34}\ kg$

8. The unit of Rydberg's constant R_H is:
(a) m^{-2} (b) m^{-1} (c) m (d) m^{2}

9. Which of the following series of H-spectrum lies in ultraviolet region:
(a) Pfund Series (b) Balmer Series (c) Paschen Series (d) Lyman Series

10. Lyman series contains the wavelength given by formula:
(a) $\frac{1}{\lambda} = E_o\left(\frac{1}{1^2} - \frac{1}{n^2}\right)$ (b) $\frac{1}{\lambda} = E_o\left(\frac{1}{2^2} - \frac{1}{n^2}\right)$ (c) $\frac{1}{\lambda} = E_o\left(\frac{1}{3^2} - \frac{1}{n^2}\right)$ (d) $\frac{1}{\lambda} = E_o\left(\frac{1}{4^2} - \frac{1}{n^2}\right)$

11. In the spectrum of which of the following, will you find Balmer Series:
(a) Oxygen (b) Nitrogen (c) Hydrogen (d) All a, b & c

12. Balmer series is obtained when all the transitions of electron terminate on:
(a) 2nd orbit (b) 3rd orbit (c) 4th orbit (d) 5th orbit

13. Balmer series in mathematical form can be expressed as:
(a) $\frac{1}{\lambda} = R_H\left(\frac{1}{1^2} - \frac{1}{n^2}\right)$ (b) $\frac{1}{\lambda} = R_H\left(\frac{1}{2^2} - \frac{1}{n^2}\right)$ (c) $\frac{1}{\lambda} = R_H\left(\frac{1}{3^2} - \frac{1}{n^2}\right)$ (d) $\frac{1}{\lambda} = R_H\left(\frac{1}{4^2} - \frac{1}{n^2}\right)$

14. Balmer empirical formula explains the electromagnetic radiation of any excited atom in terms of their:
(a) Energy (b) Mass (c) Wavelength (d) Momentum

15. Balmer series lies in
(a) Visible region (b) Ultraviolet region (c) Infrared region (d) X-ray region

16. First spectral series of hydrogen atom was discovered by:
(a) Balmer (b) Lyman (c) Paschen (d) Rydberg

17. Paschen series is obtained when all the transitions of electron terminate on:
(a) 2nd orbit (b) 3rd orbit (c) 4th orbit (d) 5th orbit

18. The relation for paschen series is given by:
(a) $\frac{1}{\lambda} = R_H\left(\frac{1}{2^2} - \frac{1}{n^2}\right)$ (b) $\frac{1}{\lambda} = R_H\left(\frac{1}{3^2} - \frac{1}{n^2}\right)$ (c) $\frac{1}{\lambda} = R_H\left(\frac{1}{4^2} - \frac{1}{n^2}\right)$ (d) $\frac{1}{\lambda} = R_H\left(\frac{1}{5^2} - \frac{1}{n^2}\right)$

19. For paschen series, value of n starts from:
(a) 2 (b) 4 (c) 6 (d) 8

20. Brackett series can be expressed as:
(a) $\frac{1}{\lambda} = R_H\left(\frac{1}{2^2} - \frac{1}{n^2}\right)$ (b) $\frac{1}{\lambda} = R_H\left(\frac{1}{3^2} - \frac{1}{n^2}\right)$ (c) $\frac{1}{\lambda} = R_H\left(\frac{1}{4^2} - \frac{1}{n^2}\right)$ (d) $\frac{1}{\lambda} = R_H\left(\frac{1}{5^2} - \frac{1}{n^2}\right)$

21. Bracket series is obtained when all transition of electron terminate on ____
(a) 4th orbit (b) 5th orbit (c) 3rd orbit (d) 2nd orbit

22. The shortest wavelength in Bracket series has wavelength:
(a) $\frac{16}{R_H}$ (b) $\frac{R_H}{16}$ (c) $16\ R_H$ (d) $4\ R_H$

23. The relation for pfund series is given by:
(a) $\frac{1}{\lambda} = R_H\left(\frac{1}{2^2} - \frac{1}{n^2}\right)$ (b) $\frac{1}{\lambda} = R_H\left(\frac{1}{3^2} - \frac{1}{n^2}\right)$ (c) $\frac{1}{\lambda} = R_H\left(\frac{1}{4^2} - \frac{1}{n^2}\right)$ (d) $\frac{1}{\lambda} = R_H\left(\frac{1}{5^2} - \frac{1}{n^2}\right)$

24. The number of lines in the complete spectrum of hydrogen atom is:
(a) 1 (b) 2 (c) 4 (d) Infinite

25. Radiation with wavelength longer than red light_____
(a) Ultraviolet rays (b) X-rays (c) Infrared radiation (d) Visible radiations

MCQ # 1: (b)	MCQ # 2: (c)	MCQ # 3: (c)	MCQ # 4: (c)	MCQ # 5: (a)	MCQ # 6: (d)	MCQ # 7: (a)
MCQ # 8: (b)	MCQ # 9: (d)	MCQ # 10: (a)	MCQ # 11: (c)	MCQ # 12: (a)	MCQ # 13: (b)	MCQ # 14: (c)
MCQ # 15: (a)	MCQ # 16: (a)	MCQ # 17: (b)	MCQ # 18: (b)	MCQ # 19: (b)	MCQ # 20: (c)	MCQ # 21: (a)
MCQ # 22: (b)	MCQ # 23: (d)	MCQ # 24: (d)	MCQ # 25: (c)			

MCQs Related to the Article "20.2 BOHR'S MODEL TO HYDROGEN ATOM"

1. Bohr second postulate $\left(mvr = n\frac{h}{2\pi}\right)$ was justified by:
(a) Bohr (b) DeBroglie (c) Heisenberg (d) Davisson and Germer

2. If an electron jumps from nth orbit of energy E_n to pth (lower) orbit of energy E_p, a photon of frequency f and wavelength λ obeys the relation:
(a) $E_n - E_p = f\lambda$ (b) $E_n - E_p = hf$ (c) $E_n - E_p = h\lambda$ (d) $E_n - E_p = \frac{f\lambda}{h}$

3. According to Bohr's theory the outer orbit Electron has _____ energy than inner orbits.
(a) Greater (b) Smaller (c) Equal (d) None of these

4. When an electron absorbs energy, it jumps to:
(a) Lower energy state (b) Higher energy state
(c) Ground energy state (d) Remains in the same state

5. If one or more electrons are completely removed from an atom, then atom is said to be:
(a) Excited (b) Polarized (c) Stabilized (d) Ionized

6. The orbital angular momentum in the allowed stationary orbits of Hygdrogen atom is given by:
(a) $\frac{2\pi}{nh}$ (b) $\frac{nh}{2\pi}$ (c) $\frac{2h}{n\pi}$ (d) $\frac{h}{\pi}$

7. The relation between Rydberg's constant R_H and ground state energy E_o is:
(a) $R_H = \frac{E_o}{hc}$ (b) $R_H = \frac{hc}{E_o}$ (c) $E_o = \frac{R_H}{hc}$ (d) $E_o = \frac{hc}{R_H}$

8. Bohr's theory is failed to explain
(a) H – spectrum (b) He – spectrum (c) Complex atoms spectrum

9. The potential required to remove an electron from atom is called:
(a) Critical Potential (b) Excitation Potential
(c) Absolute Potential (d) Ionization Potential

10. The quantized energy of first Bohr orbit of hydrogen atom is
(a) 13.04 eV (b) 3.7 eV (c) 13 eV (d) 13.6 eV

11. The quantized radius of first Bohr orbit of a hydrogen atom is:
(a) 0.053 nm (b) 0.0053 nm (c) 0.00053 nm (d) 0.53 nm

12. The radius of 3rd Bohr orbit in H-atom is greater than the radius of 1st orbit by the factor
(a) 2 (b) 3 (c) 4 (d) 9

13. The speed of electrons in nth orbit is given as:
(a) $\frac{4\pi^2 ke^2}{nh}$ (b) $\frac{2\pi ke^2}{nh}$ (c) $\frac{2\pi ke}{n^2h^2}$ (d) $\frac{2\pi^2 ke^2}{nh}$

14. Speed of electron in first Bohr's orbit is:
(a) $2.19 \times 10^{-6}\ m/s$ (b) $2.19 \times 10^{6}\ m/s$ (c) $2.19 \times 10^{-6}\ cm/s$ (d) $2.19 \times 10^{6}\ cm/s$

15. The total energy of electron in the state $n = \infty$ of hydrogen atom is:
(a) Zero (b) 3.2 eV (c) 10.2 eV (d) 13.6 eV

16. The total energy of electron in an orbit around the nucleus is
(a) + ive (b) – ive (c) zero (d) None

17. The value of Plank's constant is
(a) 6.63×10^{-34} J.sec (b) 6.63×10^{-34} J/sec (c) 6.63×10^{-34} sec/J (d) None of these

18. Ratio of the weight of H-atom to that of an electron is approximately _____
(a) 183.336 (b) 1836 (c) 18360.00 (d) 183.60

19. Ground state energy of the 4th orbit in a H-atom is _____
(a) 13.60eV (b) 3.40eV (c) 0.85eV (d) 1.51eV

20. If the ionization energy of hydrogen atom is 13.6 eV, its ionization potential will be _____
(a) 13.6 V (b) 136.0 V (c) 3.4 V (d) 0 V

21. Photon of high frequency will be absorbed when transition takes place from _____
(a) 1st to 5th orbit (b) 2nd to 5th orbit (c) 3rd to 5th orbit (d) 4th to 5th orbit

MCQ # 1: (b)	MCQ # 2: (b)	MCQ # 3: (a)	MCQ # 4: (b)	MCQ # 5: (d)	MCQ # 6: (b)	MCQ # 7: (a)
MCQ # 8: (c)	MCQ # 9: (d)	MCQ # 10: (d)	MCQ # 11: (a)	MCQ # 12: (d)	MCQ # 13: (b)	MCQ # 14: (b)
MCQ # 15: (d)	MCQ # 16: (b)	MCQ # 17: (a)	MCQ # 18: (b)	MCQ # 19: (c)	MCQ # 20: (a)	MCQ # 21: (a)

MCQs Related to the Article "20.3 INNER SHELL TRANSITIONS AND CHARACTERISTIC X-RAYS"

1. The reverse process of photo-electric effect is:
(a) Compton Effect (b) X-ray production (c) Pair Production (d) Pair Annihilation

2. When magnetic field is applied in the path X –rays , they will be moving in
(a) Straight line (b) Circular path (c) Parabolic path (d) None

3. X – rays is also known as
(a) Photon (b) γ – rays (c) Breaking radiation

4. X - rays are similar in nature to _____
(a) Cathode rays (b) Positive rays (c) γ - rays (d) α - rays

5. Quality of X-rays depends upon _____
(a) Filament current (b) Accelerating voltage (c) Material of the target (d) b and c

6. In an X - ray tube, electrons each of charge e are accelerated through V potential difference allowed to hit a metal target, the wavelength of the X-rays emitted is ___
(a) hc/eV (b) he/Vc (c) eV/h (d) impossible to predict

7. Emission of electrons by metal on heating is called
(a) Secondary emission (b) Field effect
(c) Photoelectric emission (d) Thermionic emission

8. In electronic transition, an atom cannot emit:
(a) γ −rays (b) Infrared rays (c) UV rays (d) X −rays

9. Photons emitted in inner shell transition are:
(a) Continuous X-rays (b) Discontinuous X-rays
(c) Characteristic X-rays (d) Energetic X-rays

10. X-rays are _____
(a) Unknown nature (b) High energy electrons
(c) High energy photon (d) Radioisotopes

11. Characteristic X – rays are the X – rays which have
(a) High energy photons (b) Specific wavelengths
(c) Specific frequencies (d) All of these

12. X-ray photons moves with a speed of :
(a) Light (b) sound
(c) Less than speed of light (d) Greater than speed of light

13. X–rays can cause cancer in living cells due to radiation exposure which is
(a) Small (b) Large (c) Excessive (d) None of these

MCQ # 1: (b)	**MCQ # 2: (a)**	**MCQ # 3: (c)**	**MCQ # 4: (c)**	**MCQ # 5: (d)**	**MCQ # 6: (a)**	**MCQ # 7: (d)**
MCQ # 8: (a)	**MCQ # 9: (c)**	**MCQ # 10: (c)**	**MCQ # 11: (d)**	**MCQ # 12: (a)**	**MCQ # 13: (c)**	

MCQs Related to the Article "20.4 UNCERTAINTY WITHIN THE ATOM"

1. According to Heisenberg's uncertainty principle, the quantities which cannot be measured simultaneously with accuracy are:
(a) Energy and Momentum (b) Position and Momentum
(c) Position and Energy (d) Momentum and Time

2. Which is the more careful calculation by Warner Heisenberg:
(a) $\Delta E.\Delta t \approx \hbar$ (b) $\Delta x.\Delta p \approx \hbar$ (c) $\Delta x.\Delta p \geq \hbar$ (d) $\Delta m.\Delta v \approx \hbar$

MCQ # 1: (b)	**MCQ # 2: (c)**

MCQs Related to the Article "20.5 LASER"

1. Laser is a device which can produce
(a) An intense beam of light (b) Coherent light
(c) Monochromatic light (d) All a, b & c

2. Which one of the following is more coherent
(a) X – rays (b) Normal light (c) Laser (d) γ – rays

3. Which is not a characteristics of a LASER:
(a) Monochromatic (b) Coherent (c) Intense (d) Multi-Directional

4. LASER action can be produced if an atom is in its:
(a) Normal State (b) Excited State (c) Ionized State (d) De-Excited State

5. The velocity of laser light is _____
(a) Less than ordinary light (b) More than ordinary light
(c) Equal to ordinary light (d) Different for different colors or frequency

6. In laser production, the state in which more atoms are in the upper state then in the lower one is called _____
(a) Metal stable state (b) Normal state
(c) Population Inversion (d) All the above

7. In population inversion:
(a) All electrons are in excited state (b) Some electrons are in excited state
(c) Majority of electrons are in excited state (d) None of these

8. In Laser a Meta-stable state is
(a) An excite state (b) In which an electron is usually stable
(c) In which an electron reside 10^{-3} sec (d) All a, b & c

9. Excited atoms return to their ground state in _____
(a) 10^{-10}s (b) 10^{-8}s (c) 10^{-6}s (d) 10^{-9}s

10. The residing time of atoms in metastable state is:
(a) $10^{-6}s$ (b) $10^{-5}s$ (c) $10^{-4}s$ (d) $10^{-3}s$

11. The Meta-stable state of Helium and Neon is
(a) Different (b) Identical (c) Nearly identical (d) None of these

12. In He-Ne LASER, the discharged tube is filled with:
(a) 80% He & 20% Ne (b) 83% He & 17% Ne (c) 85% He & 15% Ne (d) 90% He & 10% Ne

13. Helium-Neon Laser beam emitted from a discharge tube has a color:
(a) Blue (b) Green (c) Red (d) White
14. Optical pumping exist in
(a) X – rays (b) Laser (c) Spectrum (d) None
15. Reflecting mirrors in laser is used to _____
(a) Further stimulation (b) Lasing more
(c) For production more energetic laser (d) All the above
16. A finally focused beam of LASER used to destroy:
(a) Cancerous cells (b) Precancerous cells (c) Living cells (d) Both a and b
17. Laser beam can be used to generate
(a) One dimensional images (b) Two dimensional images
(c) Three dimensional images (d) None of these
18. Laser beam can be used for
(a) Wilding of detached retinas (b) Destroy tissues in a localized area
(c) Sealed off capillaries for prevention of disease (d) All of them

MCQ # 1: (d)	**MCQ # 2: (c)**	**MCQ # 3: (d)**	**MCQ # 4: (b)**	**MCQ # 5: (c)**	**MCQ # 6: (c)**	**MCQ # 7: (c)**
MCQ # 8: (d)	**MCQ # 9: (b)**	**MCQ # 10: (d)**	**MCQ # 11: (c)**	**MCQ # 12: (c)**	**MCQ # 13: (c)**	**MCQ # 14: (b)**
MCQ # 15: (d)	**MCQ # 16: (d)**	**MCQ # 17: (c)**	**MCQ # 18: (d)**			