Atomic Energy Central Schoool No.4 Rawatbhata

Multiple Choice Questions Test (November-December 2018-19)

M:M: 60 Time Class XII, Physics, Chemistry, Biology 1 Hour

1 . A particle is dropped from a height *H*. The de Broglie wavelength of the particle as a function of height is proportional to

A) H B) $H^{1/2}$ C) H^{0} D) $H^{-1/2}$

2 The wavelength of a photon needed to remove a proton from a nucleus which is bound to the nucleus with 1 MeV energy is nearly

A) 1.2 nm B) 1.2 × 10–3 nm C) 1.2 × 10–6 nm D) 1.2×10^{1} nm

3 Consider a beam of electrons (each electron with energy *E0*) incident on a metal surface kept in an evacuated chamber. Then A)no electrons will be emitted as only photons can emit electrons.

B) electrons can be emitted but all with an energy, E0

C) electrons can be emitted with any energy, with a maximum of *E0* –θ, where θ is the work function).

D) electrons can be emitted with any energy, with a maximum of *E0*.

4 An electron is moving with an initial velocity $\mathbf{v} = v_0 \hat{\mathbf{i}}$ and is in a magnetic field $\mathbf{B} = B_0 \hat{\mathbf{j}}$. Then it's de Broglie wavelength

A) remains constant. B) increases with time. C) decreases with time. D) increases and decreases periodically.

5 Taking the Bohr radius as $a0$ = 53pm, the radius of Li++ ion in its ground state, on the basis of Bohr's model, will be about

A) 53 pm B) 27 pm C) 18 pm D) 13 pm

6 The simple Bohr model cannot be directly applied to calculate the energy levels of an atom with many electrons. This is because

A) of the electrons not being subject to a central force. B) of the electrons colliding with each other C) of screening effects D) the force between the nucleus and an electron will no longer

7 For the ground state, the electron in the H-atom has an angular momentum = h , according to the simple Bohr model. Angular momentum is a vector and hence there will be infinitely many orbits with the vector pointing in all possible directions. In actuality, this is not true,

A) because Bohr model gives incorrect values of angular momentum. B) because only one of these would have a minimum energy C) angular momentum must be in the direction of spin of electron. D) because electrons go around only in horizontal orbits.

8 O_2 molecule consists of two oxygen atoms. In the molecule, nuclear force between the nuclei of the two atoms

A) is not important because nuclear forces are short-ranged.

B) is as important as electrostatic force for binding the two atoms.

C) cancels the repulsive electrostatic force between the nuclei.

D) is not important because oxygen nucleus have equal number of neutrons and protons.

9 Two H atoms in the ground state collide inelastically. The maximum amount by which their combined kinetic energy is reduced is

A) 10.20 eV B) 20.40 eV C) 13.6 eV D) 27.2 eV

10 A set of atoms in an excited state decays.

A) in general to any of the states with lower energy. B) into a lower state only when excited by an external electric field. C) all together simultaneously into a lower state. D) to emit photons only when they collide.

11 Suppose we consider a large number of containers each containing initially 10000 atoms of a radioactive material with a half life of 1 year. After 1 year,

A) all the containers will have 5000 atoms of the material.

B) all the containers will contain the same number of atoms of the material but that number will only be approximately 5000.

C) the containers will in general have different numbers of the atoms of the material but their average will be close to 5000.

D) none of the containers can have more than 5000 atoms.

12 When a nucleus in an atom undergoes a radioactive decay, the electronic energy levels of the atom

A) do not change B) change for α & β C) change for α D) change for β

for any type of radioactivity .

radioactivity but not for γ radioactivity.

radioactivity but not for others

radioactivity but not for others.

13 Heavy stable nucle have more neutrons than protons. This is because of the fact that
(a) neutrons are heavier than protons.

A) neutrons are heavier than protons.

B) electrostatic force between protons are repulsive.

C) neutrons decay into protons through beta decay.

D) nuclear forces between neutrons are weaker than that between protons.

14 In a nuclear reactor, moderators slow down the neutrons which come out in a fission process. The moderator used have light nuclei. Heavy nuclei will not serve the purpose because

A) they will break up.

B) elastic collision of neutrons with heavy nuclei will not slow them down.

C) net weight of the reactor would be unbearably high.

D) substances with heavy nuclei do not occur in liquid or gaseous state at room temperature.

15 . In Bohr model the hydogen atom, the lowest orbil corresponds to

A) Infinite energy B) zero energy C) The minimum energy D) The maximum energy

16 . The control rod in a nuclear reactor is made of

A) uranium B) Cadmium C) plutomium D) graphite

17 If 13.6 eV energy is required to ionige the hydrogen atom the energy required to remove the electron form n=2 state is

A) Zero B) 10.2 eV C) 6.8 eV D) 3.4 eV

18 which of the following can not be emitted in radioactive decay of the substance?

A) Helium-nucleus B) Electrons C) Neutrions D) Proton

19 The ionigation Potential of hydrogen atom is 13.6 eV. An electron in the ground state absords Photon of energy 12.75 eV. How many dirrerent spectral lines can one expect when electron make a down ward transition

A) 1 B) 2 C) 6 D) 4

20 The half life time of a radidactive elements of x is the same as the mean life of another radioactive element Y. Initially they have same number of atoms, then

A) y will decay faster thean x

B) x will decay faster then y

C) x and y will decay at the same rate at all time

D) x and y will decay at the same rate intially.

21 The electronic structure of chromium is

A) $3d^6 4s^0$ B) $3d^5 4s^1$ C) $3d^4 4s^2$ D) $3d^3 4s^2 4p^1$

22 One of the characteristics of transition metals to from the complex ion is

A) Having unpaired electrons in d-subshell

B) Having paired electrons in d-subshell

C) Providing empty d-orbitals

D) Having small charge/size ratio

23 Which of the ions will give colourless aqueous solution?

A) Ni^{2+} B) Fe^{2+} C) Cu^{2+} D) Cu^{+}

24 Which of the following has more unpaired electrons?

A) Zn^{+} B) Fe^{2+} C) Ni^{3+} D) Cu^{+}

25 Which of the following belongs to the actinide series of elements?

A) Y B) Ta C) U D) Ac

26 Manganese exhibits maximum oxidation state in

A) K_2MnO_4 B) $KMnO_4$ C) MnO_2 D) Mn_3O_4

27 Which forms the interstitial compounds?

A) Fe B) Co C) Ni D) All

28 Which lanthanide is most commonly used?

A) Lanthanum B) Nobelium C) Thorium D) Cerium

29 The valancy of Cr in the complex $[Cr(H_2O)_4Cl_2]^+$ is

A) 1 B) 3 C) 5 D) 6

30 Which of the following ions has zero magnetic movement?

A) Cu^+ B) Co^{2+} C) Ni^{2+} D) Fe^{3+}

31 The number of moles of $KMnO_4$ that will be needed to react with one mole of sulphite in an acidic solution is

A) 2/5 B) 3/5 C) 4/5 D) 1

32 Potassium ferrocyanide is a

A) Normal salt B) Mixed salt C) Double salt D) Complex salt

33 In the formation of $K_4[Fe(CN)_6]$, the hybridisation involved is

A) sp^2 B) d^2sp^3 C) d^3sp^2 D) dsp^2

34 $[Co(NH_3)_5Br]SO_4$ and $[Co(NH_3)_5SO_4]$ Br are related to each other as

A) Ionization isomers B) Linkage isomers C) Coordination isomers D) Optical isomers

35 How many ions are produced from $[Co(NH_3)_6]CI_2$ in solution?

A) 6 B) 4 C) 3 D) 2

36 Which one of the following cation doesnot form an ammine complex with excess of ammonia?

A) Ag^+ B) Cu^{2+} C) Cd^{2+} D) Na^+

37 The oxidation number of cobalt in $K[Co(CO)_4]$ is

A) +1 B) +3 C) -1 D) -3

38 Which of the following is *π-acid ligand?*

A) NH_3 B) CO C) F^- D) Ethylene diamine

39 Which of the following has square planar structure?

A) $[NiCl_4]^{2-}$ B) $[Ni(CO)_4]$ C) $[Ni(CN)_4]^2$ D) None of these

40 Which of the following shall form an octahedral complex?

A) d^4 (low spin) B) d^8 (high spin) C) d^6 (low spin) D) All of these

41 When one population is harmed and the other remains unaffected the relationship is called as:

A) Amensalism B) Predation C) Protocooperation D) Parasitism

42 Study of trends of human population is:

A) Biography B) Psychology C) Demography D) Kalography

43 The population explosion has occurred in the last:

A) 500 years B) 300 years C) 100 years D) 250 years

44 Two opposite forces operate in growth and development of a population. One of them relates to ability to reproduce at a rate. The force opposite to it, is called:

A) Fecundity B) Biotic potential C) Environmental resistance D) Morbidity

45 July 11 is observed as:

A) World population Day B) No Tobacco Day C) World Environment Day D) World Health Day

46 Halophytes are grown in:

A) Salty soil or saline soil B) Near the river C) Rainy water D) Desert

47 Consider the following four conditions (1—4) and select the correct pair of them as adaptation to environment in desert lizards. the conditions:
1. Burrowing in soil to escape high temperature 2. Losing heat rapidly from the body during high temperature
3.Bask in sun when temperature is low 4.Insulating body due to thick fatty dermis
A) 3 and 4 B) 1 and 3 C) 2 and 4 D) 1 and 2

48 A few normal seedlings of tomato were kept in a dark room. After a few days they were found to have become white coloured like albinos. Which of the following terms will you use to describe them?
A) Mutated B) Defoliated C) Embolised D) Etiolated

49 In an ecosystem:

A) Movement of energy is unidirectional B) Energy cycling is an independent process C) Energy cycling & nutrient cycling a coupled process D) Micro & macronutrients cycle at same pace

50 Which of the pairs is mismatched?

A) Biomass burning – Release of CO_2 B) Fossil fuel burning – Release of CO_2 C) Nuclear power – Radioactive wastes D) Solar energy – Greenhouse effect

51 Which one of the following is not used for construction of ecological pyramids?

A) Number of individuals B) Rate of energy flow C) Dry weight D) Fresh weight

52 Which one of the following types of organisms occupies more than one trophic level in a pond ecosystem?

A) Phytoplankton B) Fish C) Zooplanktons D) Frogs

53 Which one of the following is most appropriately defined?
A) Host is an organism that which provides food to another organism
B) Amensalism is a relationship in which one species is benefitted while the other is unaffected
C) Predator is an organism that catches and kills other organism for food
D) Parasite is an organism which always lives inside the body of other organism and kill it.

54 Which one of the following statements is correct for secondary succession:

A) It occurs on a deforested site B) It begins on a bare rock C) It follows primary succession D) It is similar to primary succession except that it has relatively fast pace.

55 The first stable product of fixation of atmospheric nitrogen in leguminous plants is:

A) NO_2^- B) Ammonia C) Glutamate D) NO_3^-

56 What is common to following plants: *Nepenthes, Psilotum, Rauwolfia, Aconitum ?*

A) All are ornamental plants B) All are phylogenic link species C) All are prone to over - exploitation D) All are exclusively present in the Eastern Himalayas

57 Which one of the following fish is introduced in India by foreigners?

A) *Labeo rohita* B) *Mystus singhala* C) *Clarius betrachus* D) *Pomphret*

58 Which one of the hotspot of bio-diversity?

A) Eastern Ghats B) Western Ghats C) Aravalli Hills D) Indogangatic plain

59 Just as a person moving from Delhi to Shimla to escape the heat for the duration of hot summer, thousands of migratory birds from Siberia and other extremely cold northern regions move to :
A) Western Ghat B) Meghalaya C) Corbett National Park D) Keolado National Park

60 The Periyar sanctuary is located in:

A) Tamil Nadu B) Karnataka C) Kerala D) Ehrenberg

1	2	3	4	5	6	7	8	9	10
D	B	D	A	C	A	A	A	A	A
11	12	13	14	15	16	17	18	19	20
C	B	B	B	C	B	D	D	C	A
21	22	23	24	25	26	27	28	29	30
B	C	D	B	C	B	D	D	B	A
31	32	33	34	35	36	37	38	39	40
A	D	B	A	C	D	C	B	C	D
41	42	43	44	45	46	47	48	49	50
a	c	d	c	a	a	b	d	a	d
51	52	53	54	55	56	57	58	59	60
c	b	c	a	b	c	d	b	d	c