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XI/SCIENCE/2017-18
OLYMPIAD PRACTICE WORKSHEET

(1) The alkali metals are low melting. Which of the following alkali metal is expected to melt if the room temperature rises to 300 c ?

- (a) Na (b) K (c) Rb (d) Cs

(2) The reducing power of a metal depends on various factors. Suggest the factor which makes Li, the strongest reducing agent in aqueous solution.

- (a) Sublimation enthalpy
(b) Ionisation enthalpy
(c) Hydration enthalpy
(d) Electron - gain enthalpy

(3) Metal carbonates decompose on heating to give metal oxide and carbondioxide. Which of the metal carbonates is most stable thermally ?

- (a) $MgCO_3$
(b) $CaCO_3$
(c) $SrCO_3$
(d) $BaCO_3$

(4) Which of the following metal hydroxide is the least basic ?

- (a) $Mg(OH)_2$
(b) $Ca(OH)_2$
(c) $Sr(OH)_2$
(d) $Ba(OH)_2$

(5) Some of the group - 2 metal halides are covalent and soluble in organic solvents. Among the following metal halides, the one which is soluble in ethanol is

- (a) $BeCl_2$
(b) $MgCl_2$
(c) $CaCl_2$
(d) $SrCl_2$

(6) Dead burnt plaster is ...

- (a) CaSO_4
- (b) CaSO_3
- (c) MgCO_3
- (d) Na_2CO_3

(7) A substance which gives crimson red flame and breaks on heating to give oxygen and a brown gas is ..

- (a) Magnesium nitrate
- (b) Calcium nitrate
- (c) Barium nitrate
- (d) Strontium nitrate

(8) The formula of sodash is ...

- (a) NaHCO_3
- (b) Na_2SO_3
- (c) Na_2CO_3
- (d) Na_3PO_4

(9) Which of the following compounds are readily soluble in water ?

- (a) BeSO_4
- (b) MgSO_4
- (c) BaSO_4
- (d) both (a) and (b)

(10) Identify the correct formula of halides of alkaline earth metals from the following.

- (a) $\text{BaCl}_2 \cdot 2\text{H}_2\text{O}$
- (b) BaCl_2
- (c) MgCO_3
- (d) SrCO_3

(11) The velocity of sound is maximum in

- (a) Water
- (b) Air
- (c) Vacuum
- (d) Metal

(12) When a sound wave of frequency 300 Hz passes through a medium, the maximum displacement of a particle of the medium is 0.1 cm. the maximum velocity of the particle is equal to

- (a) $60\sqrt{2}$ cm/s
- (b) $30\sqrt{2}$ cm/s
- (c) 30 cm/s
- (d) 60 cm/s

(13) Which of the following statements is wrong

- (a) Sound travels in a straight line
- (b) Sound travels as waves
- (c) Sound is a form of energy
- (d) Sound travels faster in vacuum than in air

(14) When a compression is incident on rigid wall it is reflected as

- (a) Compression with a phase change of π
- (b) Compression with no phase change
- (c) Rarefaction with a phase change of π
- (d) Rarefaction with no phase change

(15) The wavelength of sound in air is 10 cm. its frequency is, (Given velocity of sound $\sqrt{2}$ 330 m/s)

- (a) 330 cycles per second
- (b) 3.3 kilo cycles per second
- (c) 30 mega-cycles per second
- (d) 3×10^5 cycles per second

(16) Sound waves having the following frequencies are audible to human beings

- (a) 5 c/s
- (b) 27000 c/s
- (c) 5000 c/s
- (d) 50,000 c/s

(17) A siren emitting a note of frequency n is fitted on a police van, traveling towards a stationary listener. What is the velocity of the van, if the frequency of the note heard by the listener is double the original frequency?

(a) $v_s = v$

(b) $v_s = \frac{v}{2}$

(c) $v_s = 2v$

(d) $v_s = \frac{v}{3}$

(18) With the propagation of a longitudinal wave through a material medium the quantities transmitted in the propagation direction are

- (a) Energy, momentum and mass
- (b) Energy
- (c) Energy and mass
- (d) Energy and linear momentum

(19) What is phase difference between two successive troughs in the transverse wave?

(a) $\frac{\pi}{2}$

(b) π

(c) $\frac{3\pi}{2}$

(d) 2π

(20) Two tuning forks of frequencies 256 and 258 vibrations/second are sounded together. Then the time interval between two consecutive maxima heard by an observer is

- (a) 2 sec
- (b) 0.5 sec
- (c) 250 sec
- (d) 252 sec