Conductor and conductance

1. Which one of the following statements is *correct*
   (a) The oxidation number of oxygen in KO_2 is zero
   (b) The specific conductance of an electrolyte solution decreases with increase in dilution
   (c) Sn^{2+} oxidises Fe^{3+}
   (d) $Zn/ZnSO_4$ is a reference electrode

2. In infinite dilutions, the equivalent conductances of Ba^{2+} and Cl^- are 127 and 76 $ohm^{-1}cm^{-1}\,eqvt^{-1}$. The equivalent conductivity of $BaCl_2$ at indefinite dilution is
   (a) 101.5   (b) 139.5
   (c) 203.5   (d) 279.5

3. The factor which is not affecting the conductivity of any solution is
   (a) Dilution
   (b) Nature of electrolyte
   (c) Temperature
   (d) None of these

4. Specific conductance of 0.1 m nitric acid is $6.3 \times 10^{-2} ohm^{-1}cm^{-1}$. The molar conductance of solution is
   (a) 630 $ohm^{-1}cm^2mole^{-1}$
   (b) 315 $ohm^{-1}cm^2mole^{-1}$
   (c) 100 $ohm^{-1}cm^2mole^{-1}$
   (d) 6300 $ohm^{-1}cm^2mole^{-1}$
   (e) 63.0 $ohm^{-1}cm^2mole^{-1}$

5. The conductivity of strong electrolyte is
   (a) Increase on dilution slightly
   (b) Decrease on dilution
   (c) Does not change with dilution
   (d) Depend upon density of electrolytes itself

6. If X is the specific resistance of the solution and M is the molarity of the solution, the molar conductivity of the solution is given by
   (a) $\frac{1000X}{M}$ (b) $\frac{1000}{MX}$
   (c) $\frac{1000M}{X}$ (d) $\frac{MX}{1000}$

7. Conductivity (unit Siemen's) is directly proportional to area of the vessel and the concentration of the solution in it and is inversely proportional to the length of the vessel then the unit of the constant of proportionality is
   (a) $S\,mmol^{-1}$ (b) Sm^2mol^{-1}
   (c) $S^{-2}m^2mol$ (d) $S^2m^2mol^{-2}$

8. If one end of a piece of a metal is heated, the other end becomes hot after some time. This is due to

(a) Energised electrons moving to the other part of the metal

(b) Resistance of the metal

(c) Mobility of atoms in the metal

(d) Minor perturbation in the energy of atoms

9. Conductivity of a solution is directly proportional to

(a) Dilution

(b) Number of ions

(c) Current density

(d) Volume of the solution

10. The increase in equivalent conductance of an electrolyte solution with dilution is due to the increase in

(a) Ionic attraction

(b) Molecular attraction

(c) Degree of association of the electrolyte

(d) Degree of ionisation of the electrolyte

11. Which of the following conducts electricity

(a) Fused $NaCl$ (b) CO_2

(c) Br_2 (d) Si

12. Which of the following shows electrical conduction

(a) Potassium   (b) Graphite

(c) Diamond   (d) Sodium

13. The unit of equivalent conductivity is

(a) $ohm\ cm$

(b) $ohm^{-1}cm^2(gm\ equivalent)^{-1}$

(c) $ohm\ cm^2(gmequivalent)$

(d) Scm^{-2}

14. It has been observed that gaseous hydrogen chloride is a very poor conductor of electricity but a solution of hydrogen chloride gas in water is a good conductor of electricity. This is due to the fact that

(a) Water is good conductor of electricity

(b) Hydrogen chloride gas in water solution ionizes

(c) A gas is non-conductor but a liquid conducts electricity

(d) Gas does not obey Ohm's law whereas solution does

15. Electrolytic conduction differs from metallic conduction in that in the case of electrolytic conduction

(a) The resistance increases with increasing temperature

(b) The resistance decreases with increasing temperature

(c) The flow of current does not generate heat

(d) The resistance is independent of the length of the conductor

16. The electrolytic conductance is a direct measure of
    (a) Resistance
    (b) Potential
    (c) Concentration
    (d) Dissociation

17. Conductivity of a strong electrolyte
    (a) Increases on dilution
    (b) Does not change considerably on dilution
    (c) Decreases on dilution
    (d) Depends on density

18. Which of the following statements is not applicable to electrolytic conductors
    (a) New products show up at the electrodes
    (b) Ions are responsible for carrying the current
    (c) Show a positive temperature coefficient for conductance
    (d) A single stream of electrons flows from cathode to anode

19. Which one is not a conductor of electricity
    (a) $NaCl$ (aqueous)
    (b) $NaCl$ (solid)
    (c) $NaCl$ (molten)
    (d) Ag metal

20. Solid sodium chloride is bad conductor of electricity because
    (a) It contains only molecules
    (b) It does not possess ions
    (c) The ions present in it are not free to move
    (d) It does not contain free molecules

21. Which of the following is a poor conductor of electricity
    (a) CH_3COONa
    (b) C_2H_5OH
    (c) $NaCl$
    (d) KOH

22. The molar conductivity is maximum for the solution of concentration
    (a) 0.001 M
    (b) 0.005 M
    (c) 0.002 M
    (d) 0.004 M

23. The unit of molar conductivity is
    (a) $\Omega^{-1}cm^{-2}mol^{-1}$
    (b) $\Omega\ cm^{-2}mol^{-1}$
    (c) $\Omega^{-1}cm^2mol^{-1}$
    (d) $\Omega\ cm^2mol$

24. The highest electrical conductivity of the following aqueous solutions is of
    (a) 0.1 M acetic acid
    (b) 0.1 M chloroacetic acid
    (c) 0.1 M fluoroacetic acid
    (d) 0.1 M difluoroacetic acid

25. Given $l/a = 0.5cm^{-1}, R = 50ohm, N = 1.0$. The equivalent conductance of the electrolytic cell is
    (a) $10ohm^{-1}cm^2gmeq^{-1}$
    (b) $20ohm^{-1}cm^2gmeq^{-1}$
    (c) $300ohm^{-1}cm^2gmeq^{-1}$
    (d) $100ohm^{-1}cm^2gmeq^{-1}$

26. If equivalent conductance of $1M$ benzoic acid is $12.8\,ohm^{-1}cm^2$ and if the conductance of benzoate ion and H^+ ion are 42 and $288.42\,ohm^{-1}cm^2$ respectively. its degree of dissociation is

(a) 39% (b) 3.9%

(c) 0.35% (d) 0.039%

27. The unit ohm^{-1} is used for

(a) Molar conductivity

(b) Equivalent conductivity

(c) Specific conductivity

(d) Conductivity