1) A sine voltage having maximum value of 283V & frequency of 50Hz is applied to LCR series connection where $R = 3\Omega, L = 25.48mH \& C = 796\mu F$. Then impedence is at resonance condition.

A) 3Ω

B) 5Ω

C) 15Ω

D) 4Ω

2) What is correct for real transformer?

A) $P_i > P_0$ -

B) $P_i < P_o$

C) $P_i = P_o$

D) All are correct

3) The source of displacement current is

A) - Changing Magnetic Field

B) Changing Electric Field

C) Static Electric Field

D) Static Magnetic Field

4) The range of wavelength for Ultraviolet is from to

A) 1mm to 700nm

B) 0.1m to 1mm

C) · 700nm to 400nm

D) 400nm to 1.0nm

5) The earth rotates on its axis takes 24 hours to complete one revolution. How much time it takes at sun from earth to have shift of 1° ?

A) 4sec.

B) 4hrs.

C) 4min.

D) 24hrs.

6) For glass lens $f = +50cm$. Then power of lens is

A) $+2\mathrm{D}$

B) $-2\mathrm{D}$

C) $\cdot +0.02\mathrm{D}$

D) $-0.02\mathrm{D}$

7) A lens ($n = 1.5$) is placed in a liquid. To make it disappear, the value of n of liquid should be

A) $n < 1.5$

B) $n = 1.5$

C) $n > 1.5$

D) any n

8) What is the type of nature of image formed for an object placed an axis of concave mirror between pole & centre?

A) Real, inverted & magnified

B) V Virtual, erect & diminished

C) Real, inverted & diminished

D) Virtual, erect & magnified

9) The distance between two slits is 3mm & screen is placed at 2m distance. When blue-green light of wavelength 500nm is used then distance between two fringes will be?

A) 0.5mm

B) 0.43mm

C) 0.33mm

D) 0.4mm

10) For what distance is ray optics a good approximation when the aperture is 4mm wide & the wavelength is 500nm ?

A) 8m

B) 32m

C) $18 \cdot \mathrm{m}$

D) 6m

11) Resolving power of microscope is

A) $\frac{1.22n\sin\beta}{2n\lambda}$

B) $\frac{2\lambda}{1.22n\sin\beta}$

C) $\frac{1.22n}{2\lambda\sin\beta}$

D) $\frac{1.22\lambda}{2n\sin\beta}$

12) How much is the De-Broglie wavelength for an electron accelerated by an 100V potential difference?

A) 12.3nm

B) 123nm

C) 0.123nm.

D) 0.123cm

13) The threshold frequency of cesium is 5.16×10^{14}Hz. Then its work-function is eV.

A) 1.12

B) 2.14

C) 1.14

D) 4.12

14) The nucleus of gold is about times heavier than an α-particle.

A) 100

B) 50

C) 10

D) 200

15) The ground state energy of hydrogen atom is -13.6eV. What is the kinetic energy of electron in this state?

A) -27.2eV

B) -13.6eV

C) $+13.6$eV

D) $+27.2$eV

16) The minimum wavelength for Balmer series is

A) $-\frac{36}{5R}$

B) $\frac{9}{R}$

C) $\frac{4}{\mathrm{R}}$

D) $\frac{R}{4}$

17) Calculate the energy equivalent of 1g of substance

A) $.6 \times 10^{11}$J

B) 9×10^{13}J

C) 4×10^{12}J

D) 7×10^{12}J

18) In which process neutron is converted into proton?

A) β^{-}decay

B) β^{+}decay

C) α-decay

D) γ decay

19) The Forbidden gap between conduction band & valance band is maximum for

A) Semiconductor

B) Insulator

C) Metal

D) Superconductor

20) The below truth table is for which gate?

Input		Output
A	B	Y
0	0	1
0	1	1
1	0	1
1	1	0

A) NOR

B) AND

C) OR

D) NAND

21) For a pure Si crystal has 5×10^{28} atom m^{-3}. It is doped by 1PPM concentration of pentavalent As. Calculate the number of electron & holes.

Given that ni $= 1.5 \times 10^{16} m^{-3}$

A) $-4.5 \times 10^{-9} m^{-3}$

B) $5.4 \times 10^{9} m^{-3}$

C) $4.5 \times 10^{9} m^{-3}$

D) $5.4 \times 10^{-9} m^{-3}$

22) In diode, Increasing the Forward voltage, the thickness of depletion layer

A) : Decreases

B) Does not change

C) Increases

D) Cannot be decided

23) If charge q is placed on one of the vertex of a cube. Then flux passing through any one surface of cube is

A) $\frac{q}{\varepsilon_0}$

B) $\frac{q}{6\varepsilon_0}$

C) $\frac{q}{24\varepsilon_0}$

D) None of these

24) Two point electric charges $+10^{-8}$C and -10^{-8}C are placed 0.1m apart. Find the magnitude of Total Electric Field at the center of the line joining the two charges.

A) . Zero

B) $3.6 \times 10^{4} NC^{-1}$

C) $7.2 \times 10^{4} NC^{-1}$

D) $12.96 \times 10^{4} NC^{-1}$

25) The charge density of uniformly charged infinite plane is σ. A simple pendulum is suspended vertically downward near it. Charge q_0 is placed on metallic bob. If the angle made by the string is θ with vertical direction then

A) $\sigma \propto \tan\theta$

B) $\sigma \propto \frac{\tan\theta}{q_0}$

C) $\sigma \propto \frac{\cot\theta}{q_0}$

D) $\sigma \propto \frac{q_0}{\tan\theta}$

26) The dimensional formula of Polarization P is

A) $L^2A^{-1}T^{-1}$

B) $M^1L^{-2}A^1T^1$ 。

C) $L^{-2}A^{-1}T^{-1}$

D) $L^{-2}A^1T^1$

27) If relative permittivity for any substance is 80 then its electric susceptibility is

A) 79

B) 7×10^{-10}

C) 7×10^{-9}.

D) 81×10^{-10}

(28) 2μF capacitor is connected with 50V supply & 3μF capacitor is connected with 100V supply. Now after removing battery if two plates of same type of charges are placed to form new capacitor then potential difference is V.

A) 200

B) 333

C) 80

D) 75

29) The emf of a car battery is 12V of internal resistance of battery is 0.4Ω then maximum power drawn from battery is W.

A) +4.8

B) 360

C) 30

D) Zero

30) The resistance of the platinum wire of a platinum resistance thermometer at a ice point is 5Ω& at steam point is 5.23Ω. When the thermometer is inserted in a hot bath, the resistance of a platinum wire is 5.795Ω. Calculate the temperature of the bath.

A) 345.65°C

B) 365.65°C

C) · 354.56°C

D) 245.65°C

31) One electric cell (having emf of 2V & internal resistance of 0.1Ω) and other electric cell (having emf of 4V& internal resistance of 0.2Ω) are connected in parallel to each other. Then its equivalent emf will be V.

A) 1.33

B) 2.57

C) 2.67

D) 0.38

32) The source of magnetic field is & source of electric field is

A) scalar, vector

B) scalar, scalar

C) vector, vector

D) vector, scalar

33) A coil having $10Am^2$ magnetic moment is placed in a vertical plane & is free to rotate about its horizontal axis coincides with its diameter. A uniform magnetic field of 2T in the horizontal direction exists such that initially the axis of the coil is in the direction of the field. The coil rotates through an angle of 90° under the influence of magnetic field. The moment of Inertia of coil is $0.1kgm^2$. What will be its angular speed?

A) 20rad/s

B) 10rad/s

C) , 5rad/s

D) 40rad/s

34) 10A current is passing through a very long wire of radius 5cm. Then magnetic field at a distance of 2cm inside from its curved surface is $\times 10^{-5}$T.

A) 2.4×10^5

B) 6.7×10^{-5}

C) 2.4×10^{-5}

D) 2.4

35). In India Declination at Delhi is

A) $0°58'E$

B) $0°41'W$

C) $0°41'E$

D) $0°58'W$

36) The relative permeability in a core of a solenoid is 400 . The windings of a solenoid are insulated from the core and carry a current of 2A. If the number of turns is 1000 per meter. Then magnetic Intensity inside the core of solenoid is A/m.

A) 2.5×10^3

B) 2×10^3

C) 2.5×10^{-3}

D) 2×10^{-3}

37) The coil having 1000 turns & Area of $0.10m^2$ rotates at half a revolution per second & it is placed in a uniform magnetic field of 0.01T perpendicular to the axis of rotation of coil. Then max emf voltage generated in coil is V.

A) 3.14

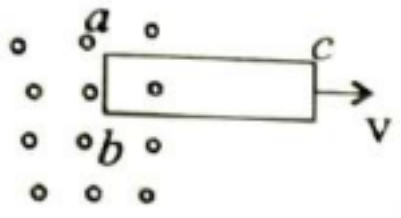
B) 5.0

C) 0.5

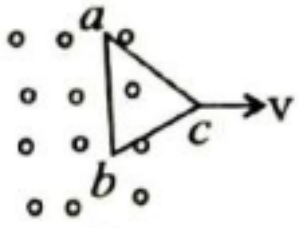
D) 0.314

38) Out of the following given loops in which loop, the direction of induced current is from $a \rightarrow c \rightarrow b$.

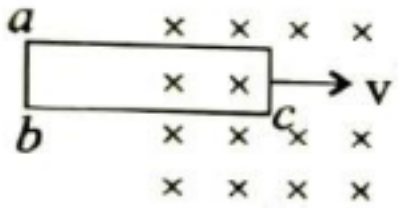
A) (A)



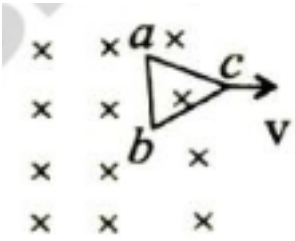
B) (B)



C) (C)



D) (D)



39) Which is not the unit of Inductance?

A) $\cdot$ H

B) V.s. A

C) WbA^{-1}

D) Wb.s. A^{-1}

40) A bulb of 100W rating is connected with 220V supply. The resistance of bulb is

A) 2.2Ω

B) $484\Omega\mathrm{m}^{-1}$

C) 484Ω

D) $2.2 \times 10^{-3}\Omega\mathrm{m}^{-1}$

41) The divalent ion of which of the following element in aqueous solution has magnetic moment 5.92 BM?

A) Fe

B) Cr

C) Co

D) . Mn

42) Although Zirconium belongs to 4d-transition series and Hafnium belongs to 5d transition series, even then they show similar physical and chemical properties because

A) Both have similar atomic radius

B) Both have same number of electrons

C) Both belongs to d-block

D) Both belongs to the same group of the periodic table

43) Which isomerism is possible in hexa ammine cobalt (III) hexa cyanido chromate (III) complex?

A) Ionisation isomerism

B) Co-ordination isomerism

C) Linkage isomerism

D) Solvate isomerism

44) Which of the following complex will absorb maximum wavelength of light?

A) $[Co(NH_3)_6]^{3+}$

B) $\cdot [Co(NH_3)_5(H_2O)]^{3+}$

C) $[CoCl(NH_3)_5]^{2+}$

D) $[Co(CN)_6]^{3-}$

45) The complex having highest electrical conductivity in aqueous solution under similar conditions is

A) ’ Tetra aqua dichlorido cobalt (III) chloride

B) Triaqua trichlorido cobalt (III)

C) Penta aqua chlorido cobalt (III) chloride

D) Hexa aqua cobalt (III) chloride

46) How many optically active isomers are possible in the compound having formula C_4H_9Br ?

A) 1

B) 2

C) 3

D) 4

47) $R' - Cl \xrightarrow{Na/\ ether}$ 2,3 - dimethyl butane. What is R′ in the above reaction?

A) sec-butyl

B) isobutyl

C) isopropyl

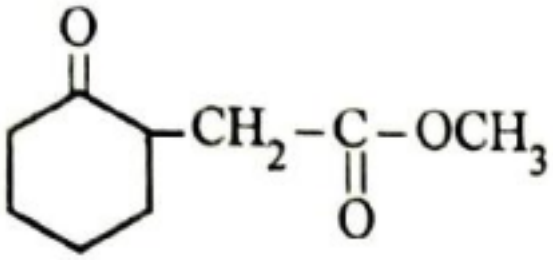
D) n-propyl

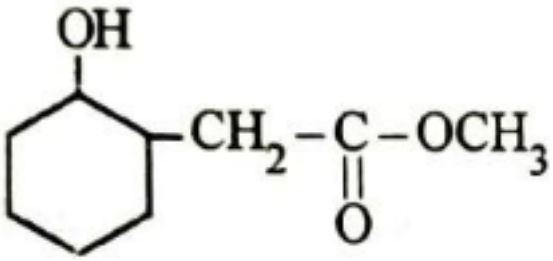
48) 1 mole of metal *' M '* reacts completely with alcohol to give 1.5 moles of H_2. Then what will be the valency of metal *' M '*?

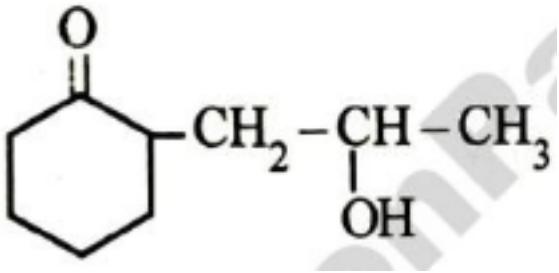
A) 2

B) . 3

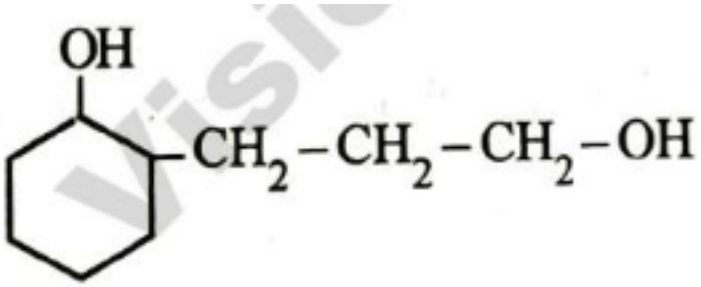
C) 4

D) 1 49)  $\xrightarrow{NaBH_4}$ "X". What is "X" in the reaction?

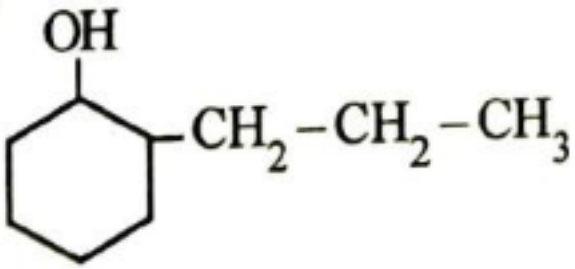
A) (A) 

B) , 

C) (C)



D) (D)



50) Which of the following has highest boiling point?

A) Pentanal

B) Ethoxy ethane

C) n-Butane

D) Pentan - 1-ol

51) Which reagent is required to convert cyclohexanol to cyclohexanone?

A) Anhydrous CrO_3

B) $O_3/H_2O - Zn$ dust

C) PCC

D) DIBAL-H

52) Which of the following acid has highest pKa value?

A) FCH_2COOH

B) O_2NCH_2COOH

C) $NCCH_2COOH$

D) $^{\circ}C_6H_5CH_2COOH$

53) $C_6H_5CH_2 - MgBr \xrightarrow[(2)\ H_3O^+]{(1)\ CO_2/\ ther} 'X' \xrightarrow[\Delta]{NaOH+CaO} 'Y'$? What is the final product in this reaction?

A) C_6H_6

B) $C_6H_5CH_2CH_3$

C) $C_6H_5CH_3$

D) $C_6H_5CH_2OH$

54) Which of the following compound has least Basic strength?

A) $(C_2H_5)_2NH$

B) - $C_6H_5NH_2$

C) NH_3

D) $C_2H_5NH_2$

55) The source of nitrogen in Gabriel synthesis of amines is

A) $C_6H_4(CO)_2NK^+$

B) NaN_3

C) KCN

D) $NaNO_2$

56) The best reagent for converting 2-Phenyl propanamide into 1-Phenyl ethanamine is

A) $LiAlH_4$

B) $NaBH_4$

C) H_2/Pt

D) $'NaOH/Br_2$

57) Giving ' T ' symbol for true statement and ' F ' symbol for false statement, select the correct option

i) Most naturally occuring amino acids have L-configuration

ii) β-D-ribose sugar is present in RNA

iii) Amylose is water insoluble component made up of $\alpha - D - (+)$ glucose units.

iv) All monosaccharides are non-reducing sugars.

A) TTFT

B) TTFF

C) TFTF

D) F T TF

58) Which amino acids are used in the preparation of Nylon - 2 - Nylon 6 ?

A) Amino Caproic acid and glycine

B) Phenol and Formaldehyde

C) Phthalic acid and glycine

D) Ethylene glycol and Phthalic acid

59) Zeiglar Natta catalyst is a mixture of

A) $TiCl_3 \& (C_2H_5)_4Al$

B) $TiCl_4 \& (C_2H_5)_2Al$

C) $TiCl_2 \& (C_2H_5)_3Al$

D) $\cdot (C_2H_5)_3Al \& TiCl_4$

60) Which antihistamine drug is used to prevent acidity?

A) Morphine.

B) Phenelzine

C) Cimetidine

D) Equanil

61) Name the sweetner which is a trichloro derivative of Sucrose?

A) Alitame

B) Sucralose

C) Saccharin

D) Aspartame

62) The deficiency of which vitamin causes scurvy?

A) Ascorbic acid

B) Riboflavin

C) Thiamine

D) Pyridoxine

63) Which of the following statement is correct?

A) In the unit cell of rhombic Sulphur, the axial distances are equal and the value of each axial angle is 90°

B) Amorphous solids are anisotropic in nature

C) Silicon doped with Arsenic impurity is a p-type semiconductor

D) In MnO, all the domains are aligned in the same direction

64) What are the fractions of Fe^{2+} and Fe^{3+} in $Fe_{0.93}O$ respectively?

A) 0.75,0.25

B) 0.85,0.15

C) · 0.93,0.07

D) 0.80,0.20

65) Maximum amount of a solid solute that can be dissolved in a specified amount of a given liquid solvent does not depend upon

i) Temperature

ii) Nature of solute

iii) Pressure

iv) Nature of Solvent

A) (ii) & (iv)

B) (ii)

C) (i) & (iii)

D) (iii)

66) The molality of aqueous solution of any solute having mole fraction 0.25 is

A) 33.33m

B) 16.67m

C) 18.52m

D) 9.26m

67) The osmotic pressure of 0.5M aqueous solution of CH_3COOH having 2pH at temperature T is

A) 0.51RT

B) 1.02RT

C) 0.051RT

D) 0.102RT

68) On the basis of the given following electrode potentials, which one is the strongest reducing agent?

$$E^{o}_{Cr_2O_7{}^{2-}|Cr^{3+}} = 1.33V \quad E^{o}_{MnO_4^-|Mn^{2+}} = 1.51V$$
$$E^{o}_{Br_2|Br^-} = 1.09V \quad E^{\circ}_{Zn^{2+}|Zn} = -0.76V$$

$$E^{\circ}_{Zn^{2+}|Zn} = -0.76V$$

A) Br^-

B) Mn^{2+}

C) Cr^{3+}

D) Zn

69) For which of the following electrolytes the graph of $\wedge_m$ against $\sqrt{C}$ gives a negative slope.

A) Ammonium hydroxide

B) Sodium acetate

C) Acetic acid

D) Water

70) On electrolysis of aqueous solution of a halide of a metal ' M ' by passing 1.5 ampere current for 10 minutes deposits 0.2938g of metal. If the atomic mass of the metal is 63gm/mole, then what will be the formula of the metal halide?

A) MCl

B) MCl_3

C) MCl_2

D) MCl_4

71) In the presence of a catalyst, the heat evolved or absorbed during the reaction

A) May decrease or increase

B) Increases

C) Decreases

D) Remains unchanged

72) Which of the following graph has intercept equal to zero?

A) $\log K \rightarrow \frac{1}{T}$

B) $\log \frac{[R]_0}{[R]} \rightarrow t$

C) $\log[R] \rightarrow t$

D) $[R] \rightarrow t$

73) Time required to decompose SO_2Cl_2 to half of its initial amount is 40 minutes. If the decomposition is a first order reaction, What will be the rate constant of the reaction?

A) $2.88 \times 10^{-4} s^{-1}$

B) $2.88 \times 10^{-2} s^{-1}$

C) $1.73 \times 10^{-2} s^{-1}$

D) $1.73 \times 10^{-4} s^{-1}$

74) Which of the following is a reversible sol?

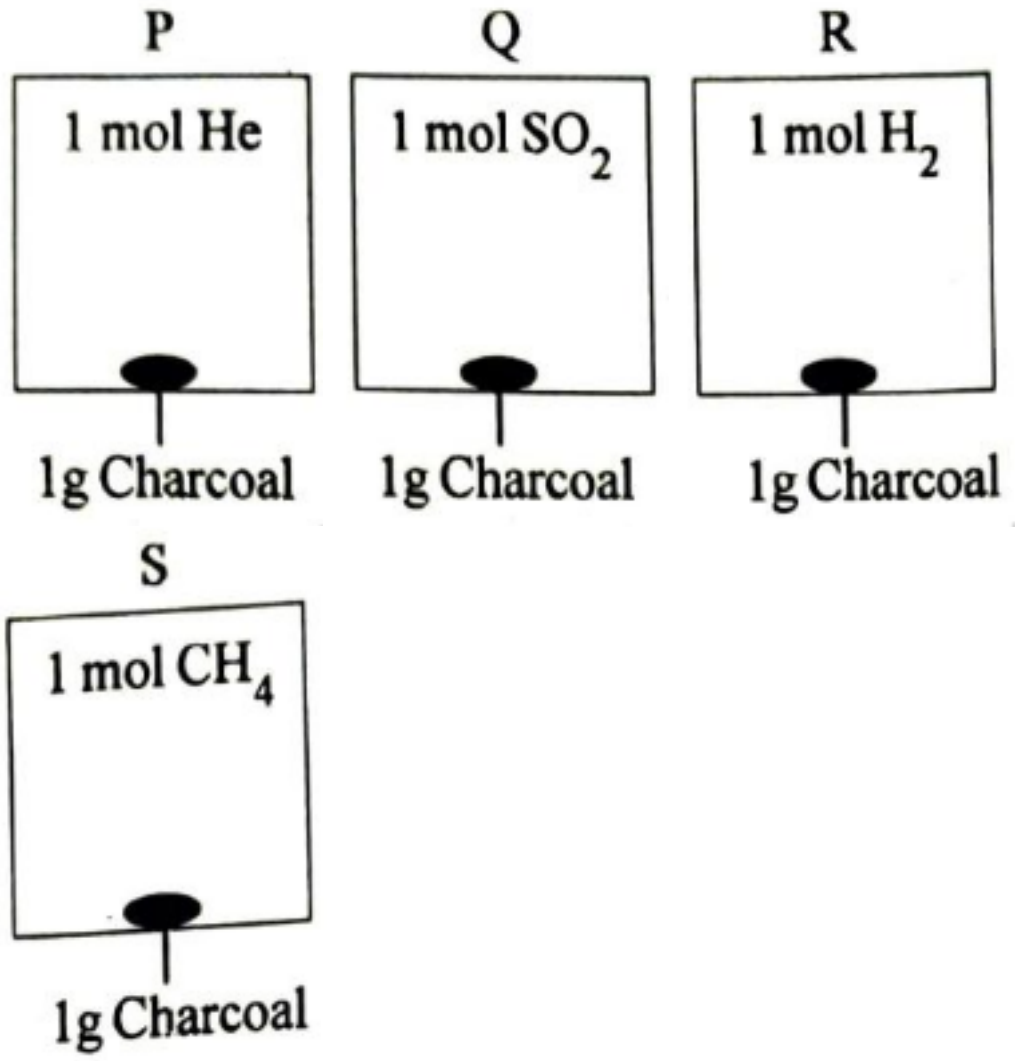
A) $Fe(OH)_3$sol

B) As_2S_3 sol

C) Gelatin sol

D) Gold sol

75) From the figure, in which of the following vessel, the pressure of the gas is the highest. [Temperature and volume of the gases are the same in each vessel].



A) R

B) P

C) Q

D) S

76) Which soluble complex is formed in the leaching process of Gold?

A) $[Au(OH)_4]^{2-}$

B) $[Au(CN)_4]^{2-}$

C) $[Au(OH)_2]^{-}$

D) $[Au(CN)_2]^{-}$

77) Which of the following slag is formed during the extraction of iron in the blast furnace?

A) $CaSiO_3$

B) $FeCO_3$

C) $CaCO_3$

D) $FeSiO_3$

78) Which of the following is the correct order?

A) Ionic character : $MF < MCl < MBr < MI$

B) Stability : $HI < HBr < HCl < HF$

C) Acidic Strength : $HClO_4 < HClO_3 < HClO_2 < HClO$

D) Electron gain enthalpy: $I < Br < Cl < F$

79) In which of the following oxoacid of Sulphur, $S - O - O - S$ bond is present?

A) $H_2S_2O_4$

B) $H_2S_2O_8$

C) $H_2S_2O_7$

D) $H_2S_2O_3$

80) Concentrated HNO_3 oxidise white phosphorus into which substance?

A) H_3PO_4

B) $H_4P_2O_7$

C) H_3PO_2

D) H_3PO_3