COMPULSORY SCIENCE

PHYSICS

FORCE

1. $F=G\frac{m_1 m_2}{d^2}$

Where, F= (Gravitational force)
G = (Gravitational constant)
m_1=(Mass of one object)
m_2 = (Mass of another object)
d=(Distance between two objects from their centers)

2. $g=\frac{GM}{R^2}$ $g=\frac{GM}{(R+h)^2}$

Where, g = (Acceleration due to gravity)
G = (Gravitational constant)
M (Mass of a planet or satellite)
R (Radius of the planet or satellite)
h = (Height from the surface of the earth/planet)

3. $I=\frac{GM}{R^2}$ $I=\frac{GM}{(R+h)^2}$

Where, I= (Gravitational field intensity)
h = (Height from the surface of the earth/planet)

4 $W=m\times g$

Where, W = (Weight of an object)
m = (Mass of an object)
g = (Acceleration)

5 $W=mass \times gravitational\ field\ intensity$

6 $g'=(\frac{R}{R+h})^2$

Where, g'= (Value of acceleration due to gravity at a certain height (h)(from the earth's surface)
g=(Value of 'g' on the surface of the earth/planet)

R=(Radius of the earth/planet)
h = (Height of the earth/planet)

7. $h = ut + \frac{1}{2} gt^2$

Where, h = (Height from the earth's surface)
u= (Initial velocity)
t = (Time taken)
g = (Acceleration due to gravity)

S.I. UNITS

1. (Force) = N (Newton)
2. (Gravitational Force) = N
3. (Acceleration due to gravity) = m/s^2 OR m/s.s OR ms^{-2}
4. (Gravitational Constant) = Nm^2/kg^2 OR Nm^2/kg^{-2}
5. (Gravitational field intensity) =N/kg OR Nkg^{-1}
6. (Mass) = kg
7. (Weight)= N

PRESSURE

$P = \frac{F}{A}$ Pressure $= \frac{Thrust}{Area}$

P= hdg

Where, P=Pressure
h=(Height of the liquid column)
d= (Density of the liquid)
g=(Acceleration due to gravity)

3) $\frac{F_2}{F_1} = \frac{A_2}{A_1}$

Where, F_1 = (Force applied on, small piston)
F_2 = (Force exerted on large piston)
A_1 = (Cross-sectional area of small piston
A_2 = (Cross-sectional area of large piston)

4) U = Adg($h_2 - h_1$)
Upthrust = Adg($h_2 - h_1$)

Where, A= (Cross-sectional area of the immersed body)
d = (Density of the liquid)

g = (Acceleration due to gravity)
h_1 = (Height of the liquid column above the upper surface of the immersed body)
h_2 = (Height of the liquid column above the lower surface of the immersed body)

5) Upthrust = Vdg
Were,
V= Volume of the immersed body or volume of the liquid displaced.

6) Upthrust = Weight of the liquid displaced(mg)

7) Density = $\frac{Mass\ (m)}{Volome(v)}$

8) R. D of substance = $\frac{\text{Mass of any volume of the substance}}{\text{Mass of an equal volme of water at 4° C}}$

S.I Units

Pressure = N/m^2 or Nm^{-2} or Pa
Upthrust: N
Volume: m^3 (cubic metre)
Density: kg/m^3 or kgm^{-3}
Area: m^2 (square metre)

HEAT

1)Q = m.s. dt
Were, Q (Amount of heat)
m = (Mass of an object)
s= (Specific heat capacity)
d=(Change in temperature)
2.$m_1 s_1 t_1 = m_2 s_2 t_2$ OR $m_1 s_1 (t_1 - t) = m_2 s_2 (t - t_2)$

Where, m_1 = (Mass of hot body)
s_1 = (Specific heat capacity of hot body)
t_1 = (Temperature of hot body)
m_2 = (Mass of cold body)
s_2 = (Specific heat capacity of cold body)
t_2 = (Temperature of cold body)
t = (Final temperature of the mixture)

S.I. UNITS

1)Heat : Joule(J)
2)Temperature: (K)
3)Specific heat capacity: (J/kg°C ORJ (kg°C)-l)
4)Heat capacity: J/°C OR $J°C^{-1}$
5)Mass: (kg)

LIGHT

1)Power of a lens (P) = $\frac{1}{\text{focal length (f) of the lens (in metre)}}$

2)$\frac{1}{f} = \frac{1}{u} + \frac{1}{v}$
Where, f =Focal length of a lens)
u = (Object distance)
v = (Image distance)

3)Magnification (m) = $\frac{height\ of\ image h_2}{\text{height of object } h_1}$

4)Magnification (m)= $\frac{image\ distance}{\text{object distance}}$

S.I UNITS
1)Focal length: m (metre)
Power of a lens: D (dioptre)
Magnification: No unit

CURRENT ELECTRICITY AND MAGNETISM

Current = $\frac{Electric\ power\ (P)}{\text{Potential difference (V)}}$
Electric power Consumption=$P \times N \times t$

Were,
P= Electric power consumed (in kilowatt)
N= Number of appliances used
t = time in hour

$$\frac{V_2}{V_1} = \frac{n_2}{n_1}$$

Were,
V_2 = Secondary Voltage
V_1 = Primary Voltage
n_2 = Number of turns in secondary coil
n_1 == Number of turns in primary coil

S.I. UNITS
Current = ampere (A)
Potential Difference = volt (V)
Resistance = ohm (Ω)
Electric power consumption = kWh (kilowatt hour)

CHEMISTRY

CARBON AND ITS COMPOUNDS

Saturated hydrocarbon:
Alkane (ane' at last and compounds having single bond)

$$C_nH_{2n+2}$$

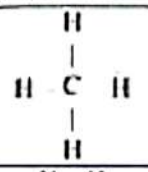
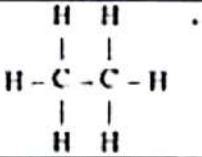
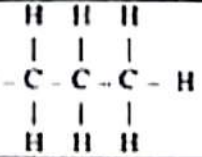
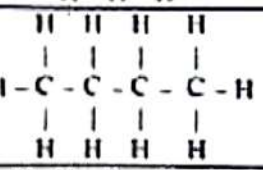
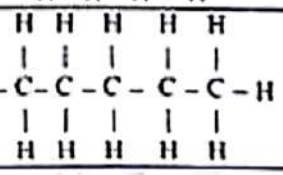
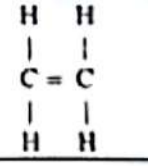
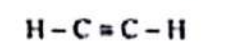
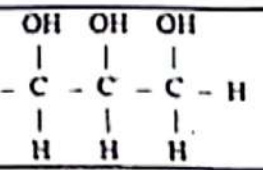
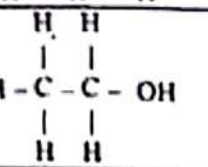
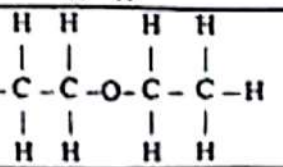
Were,
H= Hydrogen
n= number of carbon atoms
Unsaturated hydrocarbon:
Alkyne ('ene' at last and compounds having double bond)

$$C_nH_{2n}$$

Alkyne ('yne' at last and compounds having triple bond)

$$C_nH_{2n-2}$$

Alcohol: $C_nH_{2n+1} + OH$
Alkyl Ether: $C_nH_{2n+1} + OC_nH_{2n+1}$

यौगिक (Compound)	अणुसूत्र (Molecular Formulae)	संरचनात्मक सूत्र (Structural Formulae)
मिथेन (Methane)	CH_4	
इथेन (Ethane)	C_2H_6	
प्रोपेन (Propane)	C_3H_8	
ब्युटेन (Butane)	C_4H_{10}	
पेन्टेन (Pentane)	C_5H_{12}	
इथाइलिन (इथिन) (Ethylene or Ethene)	C_2H_4	
एसिटाइलिन (Acetylene)	C_2H_2	
ग्लिसेरोल (Glycerol)	$C_3H_5(OH)_3$	
इथाईल अल्कोहल (Ethyl alcohol)	C_2H_5OH	
डाई इथाईल इथर (Diethyl Ether)	$C_2H_5-O-C_2H_5$	

"The meeting of two personalities is like the contact of two chemical substances: if there is any reaction, both are transformed."

~ Carl Jung