# SCIENCE

## REVISION and MODEL QUESTIONS

**2) What is saponification? Explain the cleansing action of soap.**

**Ans:-** Breaking of an ester molecule by acid or alkali to give alcohol and sodium salt of carboxylic acid is known as saponification

$$\underset{\text{Ester}}{CH_3COOC_2H_5} + \underset{\text{Alkali}}{NaOH} \rightarrow \underset{\text{Sodium acetate}}{CH_3COONa} + \underset{\text{Alcohol}}{C_2H_5OH}$$

**Cleansing action of soap**

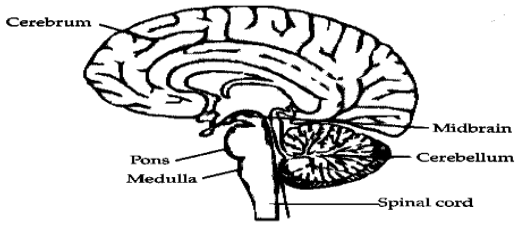
Soap is the sodium or potassium salt of organic acid. Most dirt is oily by nature. Soap molecules form structures called micelles, where one end of the molecule is towards the oil droplet and the ionic end faces outside. This forms an emulsion in water, which helps in pulling out the dirt from the fabric and soap micelle helps in dissolving the dirt in water.

**3) Draw a diagram of vertical section of human brain and label the following parts:**

**(a) Cerebrum** **(b) Cerebellum**

**(c) Medulla oblongata** **(d) Pons**

**Ans:**




**4) Name three parts of a dicot embryo.**

**Ans:** Three parts of dicot embryo are ridicule, plumule and cotyledons.

**5) Can an electric heater of 2kW be connected to a domestic circuit rated 15 A and has a potential difference of 220V? Support your answer.**

***Ans.* :** Can be connected. Because the rate of electric circuit is less than 15 A.

**6) Define the following related to the lens :**

**i) Optic centre**

**ii) Aperture**

**OR**

**What is refraction of light ? Write the Snell's law of refraction of light**.

*Ans.* :

i) The central point of the lens is its optic centre.

ii) The effective diameter of the circular outline of a spherical lens is called its aperature.

**OR**

**Refraction of light i**s the bending of a light ray as it passes obliquely from one transparent medium to another of different optical density, caused by a change in its speed. It bends towards the normal when entering a denser medium (e.g., air to glass) and away from the normal when entering a rarer medium.

* The ratio of sine of angle of incidence to the sine of angle of refraction is a constant, for the light of a given colour and for the given pair of media

$$\frac{\sin i}{\sin r} = \text{Constant}$$

**7) Which component of white light deviates (a) the least and (b) the most while passing through a glass prism? State the reason of this difference**

**Ans**: (a) Red colour deviates the least.

(b) Violet colour deviates the most.

**Reason:**

(i) Speed of different colours in a refracting medium are different.

(ii) Refractive index is different for different colour as

$$n = \frac{c}{v}.$$

(iii) Refractive index is maximum for violet colur and least for red colour as violet colour has minimum speed while red has maximum speed.

(iv) Deviation varies directly to the refractive index.

Therefore, each colour deviates through different angles on passing through a glass prism.

**8) (a) Explain the following terms related to spherical lenses:**

**(i) Optical center** **(ii) Centres of curvature**

**(iii) Principal axis** **(iv) Aperture**

**(v) Principal focus** **(vi) Focal length**

**(b) a converging lens has focal length of 12 cm. calculate at what distance should the object be placed from the lens so that it forms an image at 48 cm on the other side of the lens.**

**Ans:** (a)(i) **Optical center**: It is a point within the lens that lies on the principal axis through which a ray of light passes undeflected.

**(ii) Centre of curvature**: The centre of curvature of the surface of a lens is the centre of the sphere of which it forms a part. A lens has two centres of curvature because it has two surfaces.

**(iii) Principal axis**: It is a line through the centres of curvature of the lens.

(**iv) Aperture**: The diameter of the circular boundary of the lens is called the aperture of the lens.

**(v) Principal focus**: A beam of light parallel to the principal axis either converges to a point or appears to diverge from a point on the principal axis after refraction through the lens, is called the principal focus. All lenses have two principal focuses.

**(vi) Focal length**: The distance between the optical centre and the principal focus of the lens is called its focal length.

**(b)** A converging lens is a convex lens.

$f$ = +12 cm

$u$ = ?

$v$ = +48 cm (+ve as it is formed on other side of the object)

*According to lens formula,* ***(Contd…….)***