

**QUESTION BANK SOFTWARE**  
**QB365 MODEL HALF YEARLY QUESTION 2024**

9th Standard

Reg.No. :

**Science**

Time : 03:00:00 Hrs

Total Marks : 75

**SECTION A**

12 x 1 = 12

1) Choose the correct one

- (a) **mm < cm < m < km**    (b) mm > cm > m > km    (c) km < m < cm < mm  
(d) mm > m > cm > km

2) Which one of the following is most likely not a case of uniform circular motion?

- (a) Motion of the Earth around the Sun    (b) Motion of a toy train on a circular track  
**(c) Motion of a racing car on a circular track.**  
(d) Motion of hours' hand on the dial of the clock

3) The speed of light is maximum in

- (a) **vacuum**    (b) glass    (c) diamond    (d) graphite

4) We can create enlarged, virtual images with

- (a) **concave mirror**    (b) convex mirror    (c) plane mirror    (d) spherical mirror

5) Among the following \_\_\_\_\_ is a mixture

- (a) Common Salt    **(b) Juice**    (c) Carbon dioxide    (d) Pure Silver

6) \_\_\_\_\_ has the same properties throughout the sample

- (a) **Pure substance**    (b) Mixture    (c) Colloid    (d) Suspension

7) The separation of denser particles from lighter particles done by rotation at high speed is called \_\_\_\_\_

- (a) Filtration    (b) sedimentation    (c) decantation    **(d) centrifugation**

8) Companion cells are closely associated with

- (a) **sieve elements**    (b) vessel elements    (c) Trichomes    (d) guard cells

9) To prevent the entry of food into the trachea, the opening is guarded by \_\_\_\_\_

- (a) **epiglottis**    (b) glottis    (c) hard palate    (d) soft palate

10) Which one of the following substance is not a constituent of sweat?

- (a) Urea    **(b) Protein**    (c) Water    (d) Salt

11) Which of the following is not a part of female reproductive system?

- (a) Ovary    (b) Uterus    **(c) Testes**    (d) Fallopian tube

12) Microbes that generally enter the body through nose are likely to affect

- (a) gut    **(b) lungs**    (c) liver    (d) lymph nodes

**SECTION B**

8 x 2 = 16

13) Define measurement

**Answer :** Measurement is defined as the determination of the size or magnitude of something.

14) Why does a ray of light bend when it travels from one medium to another?

**Answer :** Deviation in the path of light is due to change of velocity of light in the different medium

15) Name the components in each of the following mixtures

- i. Ice cream
- ii. Lemonade
- iii. Air
- iv. Soil

**Answer :**

S.No	Mixture	Components
1.	Ice cream	milk, sugar, gelatin, egg and flavour.
2.	Lemonade	Lemon juice, sugar, water.
3.	Air	nitrogen, oxygen, CO <sub>2</sub> , water vapour and other gases.
4.	Soil	clay, sand and various salts.

16) Write the overall equation of photosynthesis.(1 mark)

**Answer :**

17) What is a nematocyst?

**Answer :** In the jelly fish its tentacles bear stinging cells called nematocysts.

18) Differentiate: Macronutrients from micronutrients.

**Answer :**

Macronutrients	Micronutrients
1. Calcium, sodium, potassium are macronutrients.	Iron and iodine are micronutrients.
2. Nutrients required for growth and development of the body in large quantities.	Nutrients required for growth and development of the body in small quantities.

19) How is the small intestine designed to absorb digested food?

**Answer :** Small intestine comprises of three parts.

- i) Duodenum
- ii) Jejunum
- iii) Ileum

Ileum contain minute finger like projection called villi. It is one millimetre in length. Absorption of food takes place here. In this way digested food is absorbed by ileum.

20) Why do we sweat?

**Answer :** The human body functions normally at a temperature of about 37°C. When it gets hot sweat glands start secreting sweat, which contains water with small amounts of other chemicals like ammonia, urea, lactic acid and salts (mainly sodium chloride). The sweat passes through the pores in the skin and gets evaporated which reduces the body temperature.

21) How will you measure the least count of vernier caliper?

**Answer :** The value is one smallest main scale division is divided by total number of vernier scale division is called the least count of vernier caliper.

$$\text{Least count} = \frac{\text{The value of one smallest main scale division}}{\text{Total number of vernier scale division}}$$

$$\text{L.C} = \frac{1 \text{ mm}}{10} = 0.1 \text{ mm} = 0.01 \text{ cm}$$

22) What do you mean by uniform motion?

**Answer :** A body covers equal distances in equal intervals of time is called uniform motion.

23) What is meant by magnification? Write its expression. What is its sign for the image and virtual image?

**Answer :** Magnification is defined as the ratio of the height of the image ( $h_i$ ) to the height of object ( $h_o$ )

$$\text{Magnification} = \frac{h_i}{h_o}$$

1. Real image is negative sign.
2. Virtual image is positive sign

24) Oxygen is very essential for us to live. It forms 21% of air by volume. Is it an element or compound?

**Answer :** It is an element.

### SECTION C

7 x 5 = 35

25) How will you find the thickness of a one rupee coin?

**Answer : The thickness of coin (one rupee) is finding with the help of screw gauge:**

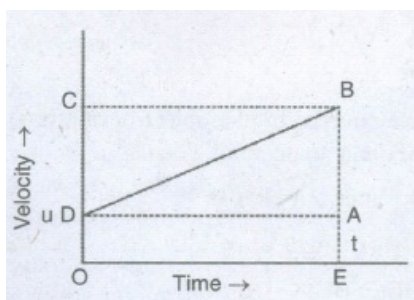
1. Determine the pitch, least count and the zero error of the screw gauge.
2. Place the coin between two studs.
3. Rotate the head until the coin is held firmly but not tightly with the help of the ratchet.
4. Note the reading of a pitch scale crossed by the head scale and the head scale (PSR) division that coincides with the pitch scale axis (HSC).
5. The thickness of the coin is given by  $\text{PSR} + (\text{HSC} + \text{ZC}) \times \text{LC}$ . Repeat the experiment for the different position of the coin.
6. Tabulate the reading.
7. The average of the reading given the thickness of the coin.

S.No	PSR Cmm	HSC	HSC ± ZC	= PSR + (HSC x LC)
1	1	33	33	$1 + (33 \times 0.01) = 1.33$
2	1	32	32	$1 + (32 \times 0.01) = 1.32$
3	1	34	34	$1 + (34 \times 0.01) = 1.34$
				Average = 1.33

The thickness of one rupee coin is = 1.33 mm.

26) Derive equations of motion by graphical method.

**Answer :**



Graph shows the change in velocity with time for an uniformly accelerated object. The object starts from the point 'D' in the graph with velocity 'u'. Its velocity keeps increasing and after time 't' it reaches the point 'B'.on the graph.

The initial velocity of the object =  $u = OD = EA$ .

The final velocity of the object =  $v = OC = EB$

Time =  $t = OE = DA$

Also from the graph we know that,  $AB = DC$

**First equation of motion:**

By definition, acceleration = change in velocity / time

$$= (\text{final velocity} - \text{initial velocity}) / \text{time}$$

$$= (OC - OD) / OE$$

$$= DC / OE$$

$$a = DC / t$$

$$DC = AB = at$$

From the graph  $EB = EA + AB$

$$v = u + at \dots (1)$$

This is first equation of motion.

**Second equation of motion:**

From the graph the distance covered by the object during time t is given by the area of quadrangle DOEB.

$$s = \text{area of the quadrangle DOEB}$$

$$= \text{area of the rectangle DOEA} + \text{area of the triangle DAB}$$

$$= (AE \times OE) + (1/2 \times AB \times DA)$$

$$s = ut + 1/2 at^2 \dots (2)$$

This is second equation of motion.

**Third equation of motion:**

From the graph the distance covered by the object during time t is given by the area of the quadrangle DOEB. Here DOEB is a trapezium. Then

$$S = \text{area of trapezium DOEB}$$

$$= 1/2 \times \text{sum of length of parallel side} \times \text{distance between parallel sides}$$

$$= 1/2 \times (OD + BE) \times OE$$

$$S = 1/2 \times (u + v) \times t$$

$$\text{since } a = (v - u) / t \text{ or } t = (v - u) / a.$$

$$\text{Therefore } s = 1/2 \times (v + u) \times (v - u) / a$$

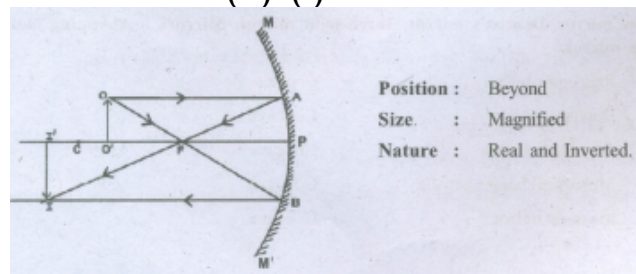
$$2as = v^2 - u^2$$

$$v^2 = u^2 + 2as \dots\dots(3)$$

This is third equation of motion.

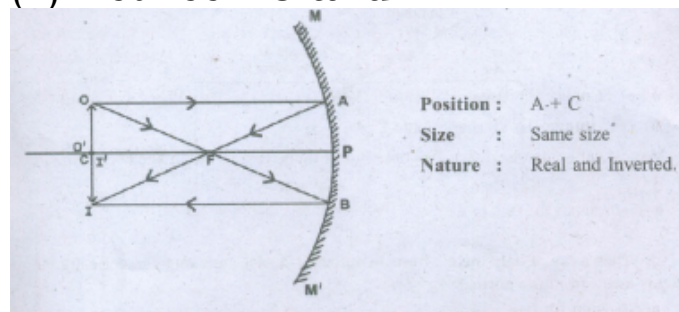
- 27) a) Draw ray diagrams to show how the image is formed using a concave mirror, when the position of object is i) at C ii) between C and F iii) between F and P of the mirror.  
b) Mention in the diagram the position and nature of image in each case.

**Answer :** (a) (i) At the centre of Curvature C



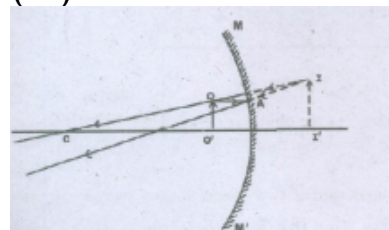
Position : Beyond  
Size : Magnified  
Nature : Real and Inverted.

(ii) Between C and F



Position : A + C  
Size : Same size  
Nature : Real and Inverted.

(iii) Between the focus F and the pole P of the mirror.



Position : Behind the mirror  
Size : Magnified  
Nature : Virtual and Erect.

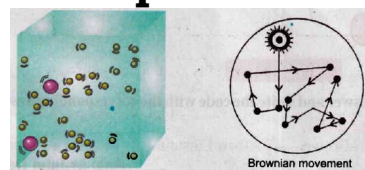
Position of object	Position of image	Name of image
At C	At 'C'	Real and inverted
Between C and F	Beyond C	Real and inverted
Between F and P	Behind the mirror	Virtual and erect

28) Explain Tyndall effect and Brownian movement with suitable diagram.

**Answer : Brownian movement:**

When colloidal solution are viewed under powerful microscope, it can be seen that colloidal particles are moving constantly and rapidly in zig-zag directions. The Brownian movement of colloidal particles is due to the unbalanced bombardment of the particles by the molecules of dispersion medium.

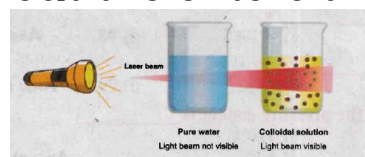
**Example:** Motion of pollen grains in water.



**Tyndall effect:**

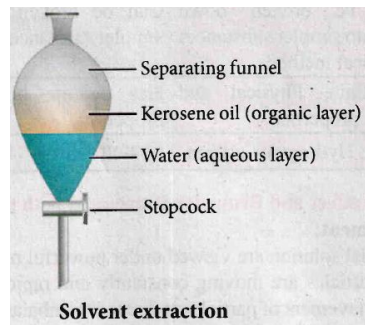
Tyndall (1869) observed that when a strong beam of light is focused on a colloidal solution the path of the beam becomes visible. This phenomenon is known as Tyndall effect and the illuminated path is called Tyndall cone. This phenomenon is not observed in case of true solution.

**Example:** When fine beam of light pass through the true solution, the light is invisible but the enters the colloidal solution the light is visible.



29) How is a mixture of common salt, oil and water separated? You can use a combination of different methods.

- Answer :**
1. The mixture is taken in a separating funnel, whose mouth is kept closed.
  2. Oil and Water are immiscible liquids.
  3. As common salt can dissolve in water it settles as a separate layer at the bottom of oil layer in the separating funnel.
  4. Place a beaker below the funnel to collect salt solution.
  5. Open the tap. Allow the salt solution alone to collection in the beaker.
  6. From the salt solution, the common salt is obtained from evaporation.



30) What conclusions were made from the observations of Gold foil experiment?

- Answer :**
- (i) Atom has a very small nucleus at the centre.
  - (ii) There is large empty space around the nucleus.
  - (iii) Entire mass of an atom is concentrated in a very small positively charged region which is called the nucleus.
  - (iv) Electrons are distributed in the vacant space around the nucleus.
  - (v) The electrons move in circular paths around the nucleus.

31) Differentiate tropic and nastic movements.

**Answer :**

S.No	Tropic movements	Nastic movements
1.	Unidirectional response to the stimulus	Non - directional response to the stimulus
2.	Growth dependent movement	Growth independent movement.
3.	More or less permanent and irreversible.	Temporary and reversible
4.	Found in all plants.	Found only in a few specialized plants
5.	Slow action	Immediate action







