CBSE -10th- 2012 Examination

SCIENCE

SET-3 Paper & Solution

Time: 3 Hrs. Max. Marks: 80

General Instructions:

1. The question paper comprises **two** Sections, **A and B**. You are to attempt both the sections.
2. All questions are **compulsory**.
3. There is no overall choice. However, internal choice has been provided in all the three questions of five marks category. Only one option in such question is to be attempted.
4. All questions of **Section A** and all questions of **Section B** are to be attempted separately.
5. Question numbers **1** to **4** in Section A are one-mark questions. These are to be answered in one word or in one sentence.
6. Question numbers **5** to **13** in Section A are two-mark questions. These are to be answered in about 30 words each.
7. Question numbers **14** to **22** in Section A are three-mark questions. These are to be answered in about 50 words each.
8. Question numbers **23** to **25** in Section A are five-mark questions. These are to be answered in about 70 words each.
9. Question numbers **26** to **41** in Section B are multiple choice questions based on practical skills. Each question is a one-mark question. You are to select one most appropriate response out of the four provided to you.

SECTION A

Question 1. Name the functional group present in each of the following organic compounds:

i. CH_3COCH_3

ii. C_2H_5COOH

Solution: i. Ketone

ii. Carboxylic acid

Marks: 1

Question 2. Which phenomenon is responsible for making the path of light visible?

Solution: Tyndall effect is the phenomenon responsible for making the path of light visible.

Marks: 1

Question 3. Which class of carbon compounds are responsible for the depletion of ozone layer at the higher level of the atmosphere?

Solution: Chlorofluorocarbons (CFCs) are responsible for the depletion of the ozone layer.

Marks: 1

Question 4. Select two non-biodegradable substances from the following waste generated in a kitchen: Spoilt food, paper bags, milk bags, vegetable peels, tin cans, used tea leaves.

Solution: Milk bags and tin cans.

Marks: 1

Question 5. Define the term puberty. List two changes observed in girls at the time of puberty.

Solution: It is the age at which the reproductive system becomes functional in human beings. The changes observed in girls at the time of puberty are:

i. Breast enlargement.

ii. Fat tissue starts depositing in areas like the breasts, hips, buttocks and thighs.

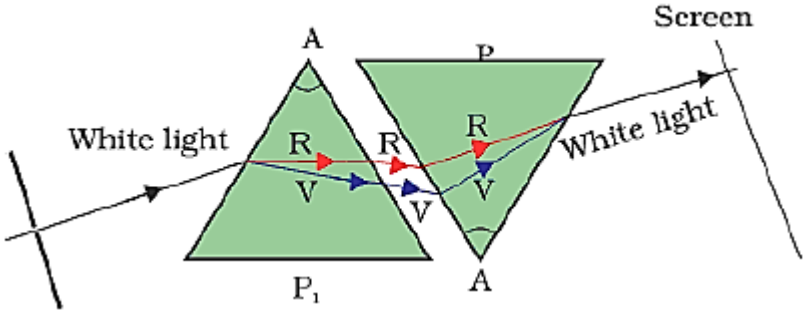
Marks: 2

Question 6. What is meant by asexual reproduction? List any two of its different forms.
Solution: It is a mode of reproduction in which new individuals are produced from a single parent without the involvement of fusion of gametes. The two forms of asexual reproduction are - budding and binary fission.
Marks: 2

Question 7. What are the advantages of water stored in the ground?
Solution: Advantages of water stored in the ground:
i. Stored ground water does not evaporate.
ii. It does not provide breeding grounds for mosquitoes like stagnant water collected in ponds or artificial lakes.
iii. It provides moisture for vegetation over a wide area.
iv. Ground water stored does not get contaminated by human and animal wastes.
Marks: 2

Question 8. "Burning fossil fuels is a cause of global warming." Justify this statement.
Solution: Fossil fuels like coal and petroleum are huge reservoirs of carbon and its compounds. On burning fossil fuels, huge reservoirs of carbon present in fossil fuels get converted to carbon dioxide and go into air. The amount of carbon dioxide thus increases in the atmosphere which leads to an increased green house effect leading to excessive heating of the Earth i.e., global warming.
Marks: 2

Question 9. When we place a glass prism in the path of a narrow beam of white light, a spectrum is obtained. What happens when a second identical prism is placed in an inverted position with respect to the first prism? Draw a labelled ray diagram to illustrate it.
Solution: When a second identical prism is placed in an inverted position with respect to the first prism, recombination of the spectrum occurs and it forms white light again.



Marks: 2

Question 10. List four properties of the image formed by a concave mirror when an object is placed between the focus and pole of the mirror.
Solution: When an object is placed between the focus and the pole of a concave mirror, the image formed is:
i. Virtual
ii. Enlarged
iii. Behind the mirror
iv. Erect
Marks: 2

Question 11. An element 'M' has atomic number 12.
(a) Write its electronic configuration.
(b) State the group to which 'M' belongs.
(c) Is 'M' a metal or a non-metal?
(d) Write the formula of its oxide.
Solution: (a) The electronic configuration of M is 2, 8, 2
(b) M belongs to the 2^{nd} group
(c) M is a metal
(d) MO
Marks: 2

Question 12. How can the valency of an element be determined if its electronic configuration is known? What will be the valency of an element of atomic number 9?
Solution: An element's valency is determined by the number of electrons in its outer shell. Hence the number of valence electrons obtained from the electronic configuration of the element gives the valency i.e., the number of electrons lost, gained or shared by the element to attain a noble gas configuration.
The valency of an element of atomic number 9 would be 1 since the number of valence electrons in its outer shell is 7 so it needs only one electron to attain the noble gas configuration.
Marks: 2

Question 13. A star at times appears bright and at times fainter. What is this effect called? State the reason for this effect.
Solution: This effect is called twinkling effect. Atmospheric refraction is the reason behind this effect. Since the stars are very far, they can be taken as point sized objects. As the path of rays coming from the stars keep varying due to atmospheric refraction, the apparent position of the stars fluctuates and the amount of light entering our eyes also varies resulting in a twinkling effect.
Marks: 2

Question 14. F, Cl and Br are elements each having seven valence electrons. Which of these:
i. has the largest atomic radius
ii. is most reactive?
Justify your answer stating reason for each.
Solution: i. F, Cl and Br all are in the same group and thus have the same effective nuclear charge. Br has the largest atomic radius among all because it uses the largest number of electron energy levels since the valence electrons are placed in larger orbitals i.e. the principal quantum number increases on going down the group.
ii. Fluorine is the most reactive since it has the greatest tendency to gain electrons because it has a higher effective nuclear charge and uses fewer energy levels than Br and Cl.
Marks: 3

Question 15. Explain the meaning of sexually transmitted diseases (STD's). Give two examples of STD's each, caused due to
i. bacterial infection
ii. viral infection.

State in brief how the spread of such diseases may be prevented.
Solution: Sexually transmitted diseases (STD's) are diseases which are usually passed through sexual contact with an infected partner.
i. Sexually transmitted diseases caused due to bacterial infection: Gonorrhea and Syphilis.
ii. Sexually transmitted diseases caused due to viral infection: AIDS and Herpes.
A key strategy in the prevention of STD's involves screening, diagnosis and treatment of patients as well as their sexual partners to interrupt transmission.
Prevention of transmission of STD's:
(a) Having sex with an infected or any unknown person should be avoided.
(b) Sharing of needles, syringes etc. must be prohibited.
(c) Surgical and dental instruments should be sterilised properly before use.
(d) Avoid blood transfusion from an infected person. Blood should be tested before transfusion.
(e) Adequate medical treatment should be provided to the pregnant woman to protect the child from getting infected.
Marks: 3

Question 16. Distinguish between homologous organs and analogous organs. In which category would you place wings of a bird and wings of bat? Justify your answer giving a suitable reason.
Solution:

Homologous Organs	Analogous Organs
Homologous organs are organs which are dissimilar in shape, size and function but their origin, basic plan and development are similar.	Analogous organs are organs which are similar in shape and function but their origin, basic plan and development are dissimilar.

Wings of a bird and bat should be placed in the category of analogous organs as they are similar in function but are different in their structure and development.
Marks: 3

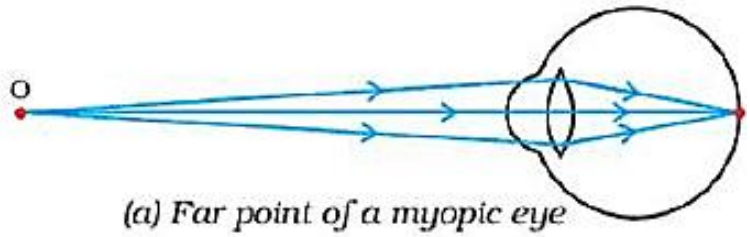
Question 17. Define the term 'evolution'. 'Evolution cannot be equated with progress'. Justify this statement.
Solution: Evolution is a gradual change in the characteristics of a population of animals or plants over successive generations.
Evolution cannot be equated with progress. There is no real 'progress' in the idea of evolution. Evolution is simply the generation of diversity and the shaping of the diversity by environmental selection. The only progressive trend in evolution seems to be that more and more complex body designs have emerged over time. However again, it is not as if the older designs are inefficient! One of the simplest life forms, bacteria inhabits the most inhospitable habitats like hot springs, deep-sea thermal vents and the ice in Antarctica.
Marks: 3

Question 18. A blue colour flower plant denoted by BB is crossbred with a white colour flower plant denoted by bb.
(a) State the colour of flower you expect in their F_1 generation plants.
(b) What must be the percentage of white flower plants in F_2 generation if flowers of F_1 plants are self-pollinated?
(c) State the expected ratio of the genotypes BB and Bb in the F_2 progeny.
Solution: (a) Blue

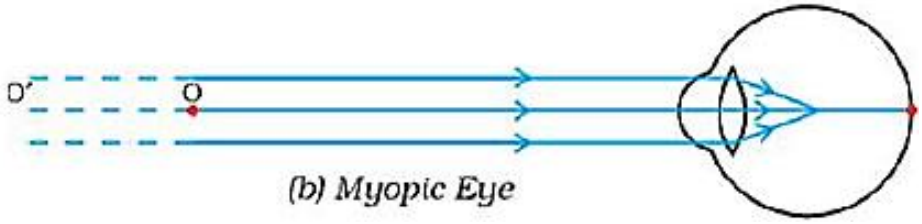
(b) 25%
(c) 1 : 2
Marks: 3

Question 19. Complete the following equations:
(a) $CH_4 + O_2 \rightarrow$
(b) $C_2H_5OH \xrightarrow{\text{Hot conc. } H_2SO_4}$
(c) $CH_3COOH + NaOH \rightarrow$
Solution: (a) $CH_4 + O_2 \rightarrow CO_2 + H_2O$ + Heat and light
(b) $C_2H_5OH \xrightarrow{\text{Hot conc. } H_2SO_4} CH_2 = CH_2 + H_2O$
(c) $NaOH + CH_3COOH \rightarrow CH_3COONa + H_2O$
Marks: 3

Question 20. A student cannot see a chart hanging on a wall placed at a distance of 3 m from him. Name the defect of vision he is suffering from. How can it be corrected? Draw ray diagrams for the:
i. defect of vision
ii. for its correction
Solution: The student is suffering from myopia or short sightedness. It is a defect of vision due to which a person cannot see the distant objects clearly though he can see nearby objects clearly.
It can be corrected by using a concave lens of suitable focal length.
i. Ray diagram for defect myopia:

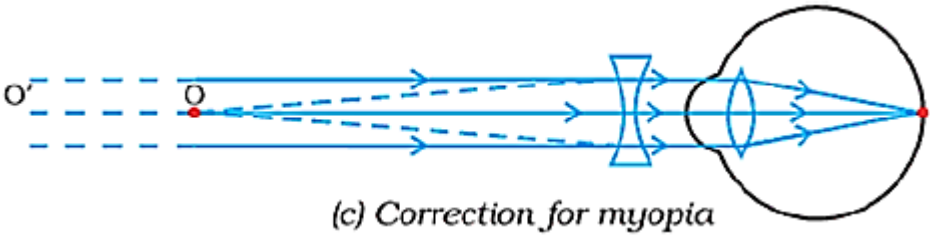


(a) Far point of a myopic eye



(b) Myopic Eye

ii. Ray diagram for the correction of this defect:



(c) Correction for myopia

Marks: 3

Question 21. State the type of mirror preferred as
i. Rear view mirrors in vehicles
ii. Shaving mirrors. Justify your answer giving two reasons in each case

Solution: i. Convex mirror is used as rear view mirror because: (1) It has a large field of view. (2) It produces erect image of the objects behind the vehicle.
ii. Concave mirror is used as shaving mirror, because: (1) It produces enlarged image when object is placed close to it. (2) It produces an erect image.
Marks: 3

Question 22. The image of a candle flame placed at a distance of 36 cm from a spherical lens is formed on a screen placed at a distance of 72 cm from the lens. Identify the type of lens and calculate its focal length. If the height of the flame is 2.5 cm, find the height of the image.
Solution: Given that:
Object distance, u = −36 cm
Image distance, v = 72 cm
As the image is obtained on a screen it is a real image and hence the spherical lens will be a convex lens.
Focal length f = ?
According to lens formula,

$$\frac{1}{v}-\frac{1}{u}=\frac{1}{f}$$

Substituting the values, we get:

$$\frac{1}{72}-\frac{1}{-36}=\frac{1}{f}$$

$$\frac{1}{f}=\frac{1}{72}+\frac{1}{36}$$

$$f=\frac{72}{36}$$

f = 24 cm
Therefore the focal length of the lens = 24 cm
It is given that:
Object height, h_1 = 2.5 cm
Image height, h_2 =?
We know that magnification, m = $\frac{v}{u}=\frac{h_2}{h_1}$

$$\Rightarrow h_2=h_1\times\frac{v}{u}$$

$$h_2=2.5\times\frac{72}{-36}$$

h_2 = -5 cm
The image of the flame formed will be inverted and have a height of 5 cm.
Marks: 3

Question 23. List the sign conventions for reflection of light by spherical mirrors. Draw a diagram and apply these conventions in the determination of focal length of a spherical mirror which forms a three times magnified real image of an object placed 16 cm in front of it.

OR

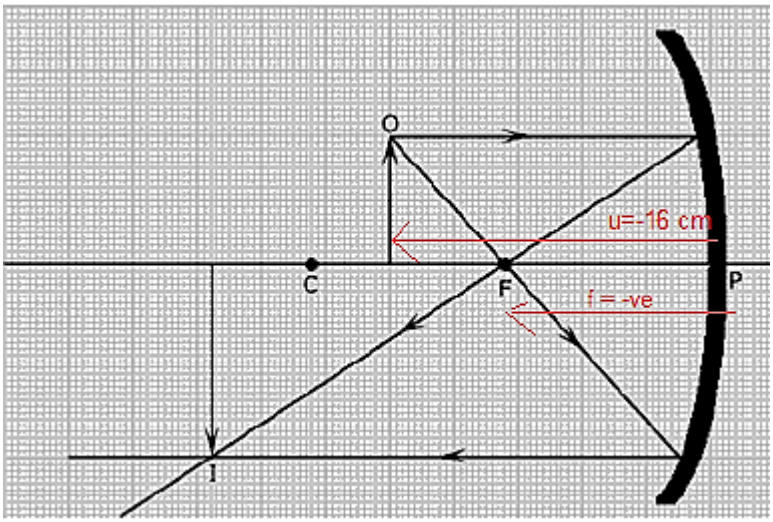
State the law of refraction of light which defines the refractive index of a medium with respect to the other. Express it mathematically. How is refractive index of any medium 'A' with respect to a medium 'B' related to the speed of propagation of light in two media A and B? State the name of this constant when one medium is vacuum or air. The refractive indices of glass and water with respect to vacuum are 3/2 and 4/3 respectively. If the speed of light in glass is 2×10^8 m/s, find the speed of light in

i. vacuum

ii. water

Solution: Sign conventions of spherical mirror:

1. Object is always placed to the left of mirror.
2. All distances are measured from the pole of the mirror.
3. Distances measured in the direction of the incident ray are positive and the distances measured in the direction opposite to that of the incident ray are negative.
4. Distances measured along the y-axis (upwards) above the principal axis are positive and that measured along the y-axis (downwards) below the principal axis are negative.



Given that:

Object distance, u = −16 cm

Magnification, m = 3

We know that magnification for a spherical mirror, $m = -\frac{v}{u} = \frac{h_2}{h_1}$

i.e., $-\frac{v}{u} = 3$

$\Rightarrow v = -3u$

Using mirror formula:

$\frac{1}{f} = \frac{1}{u} + \frac{1}{v}$

$\frac{1}{f} = \frac{1}{-16} + \frac{1}{-3 \times -16}$

$\frac{1}{f} = \frac{48}{-4}$

u = −12 cm

Negative sign of focal length implies that the focal length is being measured against the direction of incident light and it is a concave mirror.

OR

Snell's law of refraction states that the ratio of sine of angle of incidence in the first medium to the sine of angle of refraction in the second medium is a constant and is termed as the refractive index of the second medium with respect to the first medium,

$$\frac{\sin i}{\sin r} = {}^{1}n_{2}$$

where i and r are the angle which the incident and refracted rays respectively make with the normal.

The constant ${}^{1}n_{2}$ is called the refractive index of the second medium (2) relative to the first medium (1).

Relation between refractive index of any medium 'A' with respect to a medium 'B' and the speed of propagation of light in two media A and B:

$${}^{B}n_{A} = \frac{\text{Speed of light in medium B}}{\text{Speed of light in medium A}}$$

When one medium is vacuum or air, this constant is called absolute refractive index.

Given:

Refractive index of glass, $n_g = \frac{3}{2}$

Refractive index of water, $n_w = \frac{4}{3}$

Speed of light in glass, $v_g = 2 \times 10^8$ m/s

Let speed of light in vacuum be c,

We know that, $n_g = \frac{c}{v_g}$

$$c = n_g \times v_g = \frac{3}{2} \times 2 \times 10^8 = 3 \times 10^8 \text{ m/s}$$

Let v_w be the speed of light in water.

$$\therefore n_w = \frac{c}{v_w}$$

$$v_w = \frac{c}{n_w} = \frac{3 \times 10^8}{\frac{4}{3}} = 2.25\ 10^8 \text{ m/s}$$

Speed of light in vacuum = 3×10^8 m/s

Speed of light in water = $2.25 \times 10s^8$ m/s

Marks: 5

Question 24. What is the difference between the chemical composition of soaps and detergents? State in brief the soaps in removing an oily spot from a shirt. Why soaps are not considered suitable for washing when water is hard?

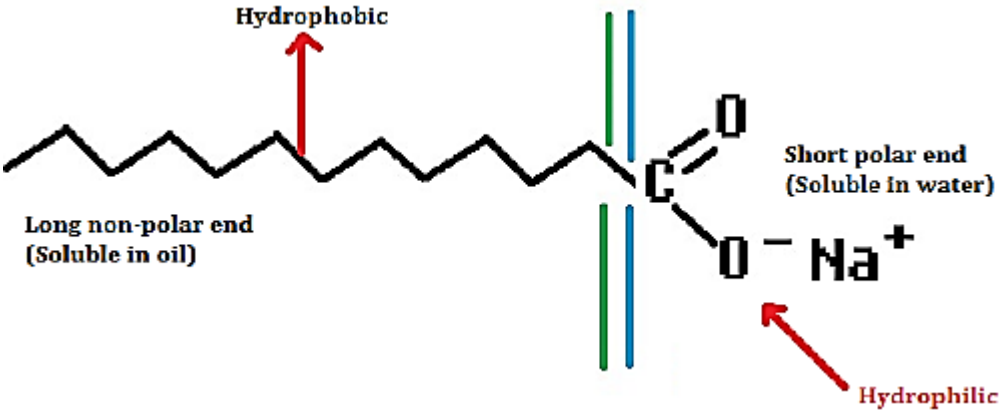
OR

List in tabular form three physical and two chemical properties on the basis of which ethanol and ethanoic acid can be differentiated.

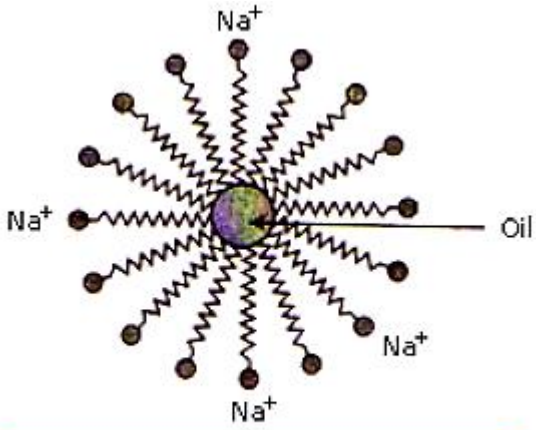
Solution: Detergents are generally ammonium or sulphonate salts of long chain carboxylic acids whereas molecules of soap are sodium or potassium salts of long-chain carboxylic acids.

Action of soap:

1. Soaps are cleansing agents capable of reacting with water and dislodge the unwanted particles from cloth or skin.
2. The molecules of soap are sodium or potassium salts of long chain carboxylic acids.
3. A soap molecule has a tadpole shaped structure.
4. One end (long non polar end) of a soap molecule is a hydrocarbon chain which is insoluble in water but soluble in oil.
5. The other end (short polar end) of a soap molecule is a carboxylate ion which is hydrophilic i.e., water soluble but insoluble in oil.



6. Soap on mixing with water forms a concentrated solution and causes foaming.
7. The long non-polar end of soap gravitates towards and surrounds the dirt and absorbs the dust in it.
8. The short polar end with the carboxylate ion turns the water away from the dirt.
9. A spherical aggregate of soap molecules is formed in the soap solution in water and is called a micelle.
10. The soap molecule thus helps in dissolving the dirt in water and help to wash our clothes clean.



Hard water contains calcium and magnesium salts. When soap is used in hard water it forms an insoluble substance scum which remains even after washing hence soaps are not considered suitable for washing in hard water.

OR

Difference in physical properties:

S. No.	Ethanol	Ethanoic acid
1.	It exists only in liquid form.	It can exist both in liquid as well as solid form.
2.	It belongs to the functional group alcohols.	It belongs to the functional group carboxylic acids.
3.	It has a specific smell but not like vinegar.	It smells like vinegar.

Difference in chemical properties:

S. No.	Ethanol	Ethanoic acid
1.	Reaction with sodium bicarbonate: No salt formation occurs and carbon dioxide gas is also not evolved.	Reaction with sodium bicarbonate: It will react with sodium bicarbonate to form a salt and carbon dioxide gas will be released.
2.	It does not give litmus test i.e., no change in the colour of litmus solution..	It turns blue litmus red.

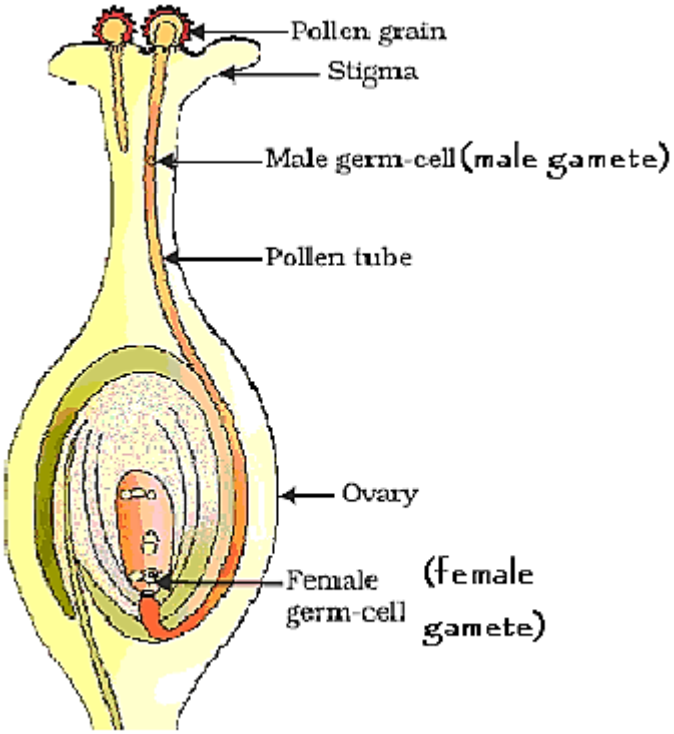
Marks: 5

Question 25. Define the terms pollination and fertilisation. Draw a diagram of a pistil showing pollen tube growth into the ovule and label the following: pollen grain, male gamete, female gamete and ovary.

OR

Describe in brief the role of
i. testis
ii. seminal vesicle
iii. vas deferens
iv. ureter
v. prostate gland in human male reproductive system.

Solution: Pollination- Transfer of pollen grains from the anther to the stigma is called pollination.
Fertilisation - The process of fusion of male and female gametes to form a zygote which eventually develops into an embryo is called fertilisation.



Germination of pollen on stigma

OR

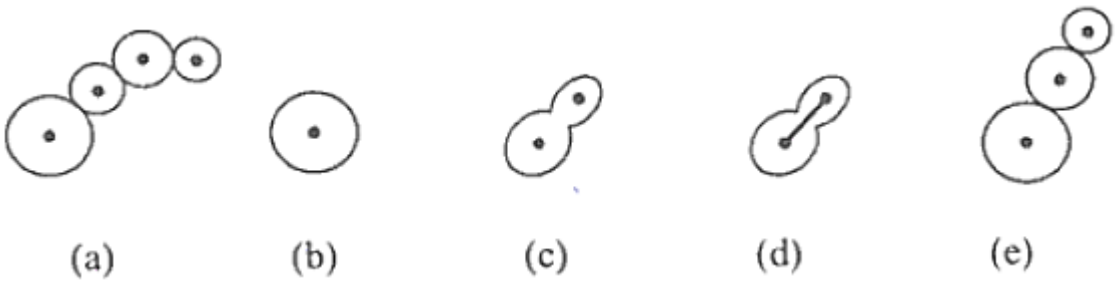
i. Testis: It is the organ which produces sperms and the male sex hormone, testosterone.
ii. Seminal vesicle: It produces fluid which makes up a significant percentage of semen.

iii. Vas deferens: Vas deferens is a tube transporting spermatozoa from the epididymis to the prostate part of the urethra.
iv. Ureter: It carries urine from the kidneys to the urinary bladder.
v. Prostate gland in human male reproductive system: It contributes additional fluid to the ejaculate. Prostate fluids also help to nourish the sperms.
Marks: 5

SECTION B

Question 26. After observing the prepared slides of binary fission in Amoeba and budding in yeast, the following observations were reported:
a. Single cells of Amoeba and Yeast were undergoing binary fission and budding respectively.
b. Cytokinesis was observed in the Yeast cell.
c. Elongated nucleus was dividing to form two daughter nuclei in Amoeba.
d. A chain of buds were observed due to reproduction in Amoeba.
The correct observation(s) is/are:
(a) d, a and c
(b) c and d
(c) b only
(d) a and c
Solution: (d) a and c
The correct observations are:
i. Single cells of Amoeba and Yeast were undergoing binary fission and budding respectively.
ii. Elongated nucleus was dividing to form two daughter nuclei in Amoeba.
Marks: 1

Question 27. A student after viewing a prepared slide illustrates budding in yeast in the following order which is not correct:

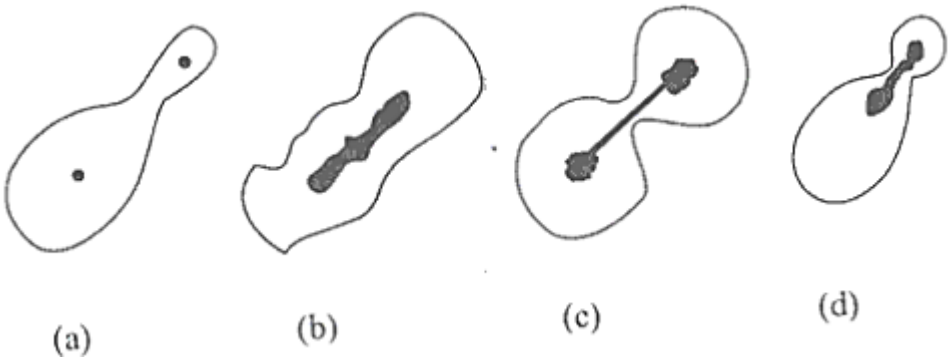


The correct order should be:
(a) b, d, e, c, a
(b) b, e, d, c, a
(c) b, c, d, e, a
(d) b, d, c, e, a
Solution: (d) b, d, c, e, a
The correct sequence is b, d, c, e, a
Marks: 1

Question 28. A student has to observe a permanent slide of binary fission in Amoeba. Find the correct sequence of steps given below for focusing the object under a microscope.

a. Place the slide on the stage, look through the eye-piece and adjust the mirror to get proper illumination.
b. Focus the slide sharp using fine adjustment screw.
c. Look through the eye-piece and raise the objective lens using coarse adjustment screw till the object is focused.
d. Look through the eye-piece and move the slide till the object is visible.
(a) a, c, d, b
(b) d, c, b, a
(c) a, b, d, c
(d) a, d, c, b
Solution: (d) a, d, c, b
The correct sequence is a, d, c, b
Marks: 1

Question 29. After viewing different slides, a student draws the following diagrams. Select the one which depicts binary fission in Amoeba:



(a) d
(b) b
(c) a
(d) c
Solution: (c) a
Figure (a) shows binary fission in Amoeba.
Marks: 1

Question 30. Dry raisins were soaked in water for 2 hours to determine the percentage of water absorbed by raisins. Before final weighing of swollen raisins, the extra water left on the surface of soaked raisins was removed by:
(a) Dry cotton wool
(b) Hot air blower
(c) Gently rubbing with cotton cloth
(d) Filter paper
Solution: (d) Filter paper
Filter paper is used to soak raisins.
Marks: 1

Question 31. While performing the experiment with raisins to determine the percentage of water absorbed by them, a student made the following measurements:
Mass of water in the beaker = 40 g

Mass of raisins before soaking = 5 g
Mass of raisins after soaking for 2 hours = 8 g
Mass of water left in the beaker after three experiments = 35 g
The percentage of water absorbed by raisins is:
(a) $\frac{8\text{g}-5\text{g}}{8\text{g}}\times 100$
(b) $\frac{40\text{g}-35\text{g}}{40\text{g}}\times 100$
(c) $\frac{40\text{g}-35\text{g}}{35\text{g}}\times 100$
(d) $\frac{8\text{g}-5\text{g}}{5\text{g}}\times 100$
Solution: (d) $\frac{8\text{g}-5\text{g}}{5\text{g}}\times 100$
Marks: 1

Question 32. Which of the following observations is true about dilute solution of acetic acid?
(a) It smells like vinegar and turns red litmus blue
(b) It smells like onion and turns blue litmus blue
(c) It smells like orange and turns red litmus blue
(d) It smells like vinegar and turns blue litmus red
Solution: (d) It smells like vinegar and turns blue litmus red
Acetic acid smells like vinegar and turns blue litmus red due to its acidic nature.
Marks: 1

Question 33. A student takes Na_2CO_3 powder in a test tube and pours some drops of acetic acid in it. He observes:
(a) No reaction in the test tube
(b) Colourless gas with pungent smell
(c) Bubbles of a colourless and odourless gas
(d) White fumes with smell of vinegar
Solution: (c) Bubbles of a colourless and odourless gas
Na_2CO_3 reacts with acetic acid to evolve carbon dioxide gas.
Marks: 1

Question 34. A student adds 4 ml of acetic to a test tube containing 4 ml of distilled water. He then shakes the test tube and leaves it to settle. After about 10 minutes he observes:
(a) A layer of water over the layer of acetic acid
(b) A layer of acetic acid over the layer of water
(c) A precipitate settling at the bottom of the test tube
(d) A clear colourless solution
Solution: (d) A clear colorless solution
Acetic acid is completely miscible with water in all proportions.
Marks: 1

Question 35. The colours of aqueous solutions of $CuSO_4$ and $FeSO_4$ as observed in the laboratory are:
(a) Pale green and light blue respectively
(b) Light blue and dark green respectively
(c) Dark blue and dark green respectively
(d) Dark blue and pale green respectively
Solution: (D) Dark blue and pale green respectively
Copper sulphate solution is blue coloured and iron sulphate solution is pale green.
Marks: 1

Question 36. A student prepared an aqueous solution of $CuSO_4$ in beaker X and an aqueous solution of $FeSO_4$ in beaker Y. He then dropped some iron pieces in beaker X and some zinc pieces in beaker Y. After about 10 hours, he observed that the solution in X and Y respectively appears:
(a) Blue and green
(b) Colourless and pale green
(c) Colourless and light blue
(d) Greenish and colourless
Solution: (d) Greenish and colourless

$$\underset{(X)}{Fe + CuSO_{4(aq)}} \rightarrow \underset{\text{Greenish}}{FeSO_{4(aq)}} + Cu$$

$$\underset{(Y)}{Zn + FeSO_{4(aq)}} \rightarrow \underset{\text{Colorless}}{ZnSO_{4(aq)}} + Fe$$

Marks: 1

Question 37. While tracing the path of a ray of light passing through a rectangular glass slab a student tabulated his observations as given below:

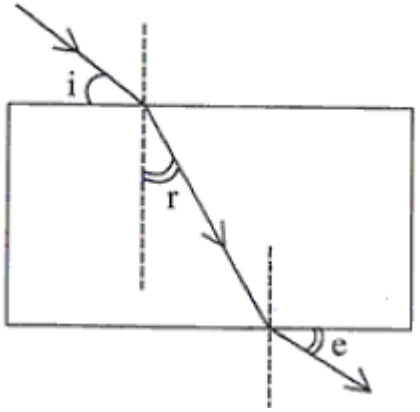
S.No.	∠i	∠r	∠e
I	60°	40°	61°
II	50°	36°	51°
III	40°	28°	39°
IV	30°	20°	31°

The correct observation is:
(a) I
(b) II
(c) III
(d) IV
Solution: (d) IV
The IV observation is the correct one. The ratio of sin i and sin r given by the fourth choice gives 1.5.
We know that

$$\frac{\sin i}{\sin r} = \frac{n_2}{n_1} = \frac{1.5}{1} = 1.5$$

Marks: 1

Question 38. A student traces the path of a ray of white light through a rectangular glass slab and marks the angles of incidence ($\angle$i), refraction ($\angle$r) and emergence ($\angle$e) as shown.



Which angle or angles have not been marked correctly?
(a) $\angle$i only
(b) $\angle$i and $\angle$r
(c) $\angle$r and $\angle$e
(d) $\angle$i and $\angle$e
Solution: (d) $\angle$i and $\angle$e
$\angle$i and $\angle$e are not marked correctly. Each angle is supposed to be marked from the normal.
Marks: 1

Question 39. To determine the focal length of a convex lens by obtaining a sharp image of a distant object we generally follow the following steps which are not in proper sequence.
a. Hold the lens between the object and the screen
b. Measure the distance between the lens and the screen
c. Select a well lit distant object
d. Place a screen opposite to the object on the lab table
e. Adjust the position of the lens to form a sharp image
The correct sequence of these steps is:
(a) c, a, d, e, b
(b) c, d, a, e, b
(c) c, d, e, a, b
(d) c, a, e, d, b
Solution: (b) c, d, a, e, b
The correct sequence will be c, d, a, e, b
Marks: 1

Question 40. A student obtained a sharp image of the grills of a window on a screen using a concave mirror. His teacher remarked that for getting better results a well lit distance object (preferably the Sun) should be focused on the screen. What should be done for this purpose?
(a) Move the screen and the mirror towards the object
(b) Move the screen and the mirror away from the object
(c) Move the screen slightly away from the mirror
(d) Move the mirror slightly towards the screen
Solution: (c) Move the screen slightly away from the mirror

The screen is moved away from the mirror so as to focus the object for a fixed position of the mirror and the object.
Marks: 1

Question 41. To determine focal length of a concave mirror a student obtains the image of a well lit distant object on a screen. To determine the focal length of the given concave mirror he needs to measure the distance between the:
(a) Cannot be determined
(b) Screen and the object
(c) Mirror and the object
(d) Mirror and the screen
Solution: (d) Mirror and the screen
The distance between mirror and the screen will give the focal length of the mirror as the mirror focuses the light on the screen.
Marks: 1