SUMMATIVE ASSESSMENT-II
SCIENCE

[Time allowed: 3 hours] [*Maximum marks:80]*

General Instructions:

(i) *The question paper comprises of two sections, A and B. You are to attempt both the sections.*

(ii) *All questions are compulsory.*

(iii) *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 questions is to be attempted.*

(iv) *All question of Section A and all questions of Section B are to be attempted separately.*

(v) *Question numbers **1** to **6** in Section A and **19** to **21** in Section B are short answer type question. These questions carry one mark each.*

(vi) *Question numbers **7** to **12** in Section A and **22** to **24** in Section B are short answer type questions and carry two marks each.*

(vii) *Question numbers **13** to **16** in Section A and **25** and **26** in Section B are also short answer type questions and carry three marks each.*

(viii) *Question numbers **17** and **18** in Section A and question number **27** in Section B are long type questions and carry five marks each.*

SECTION B

26. After observing the prepared slides of binary fission in amoeba and budding in yeast following observations were reported: **(1)**

(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.

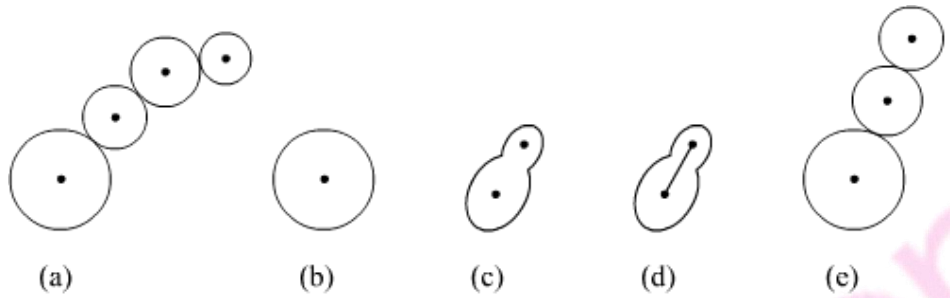
The correct observation(s) is/are:

(A) a and c
(B) b only
(C) c and d
(D) d, a and c

Ans. **(A)**

Both amoeba and yeast are unicellular organisms. In amoeba, a single cell divides to give rise to two identical daughter cells by the process of binary fission. In yeast, the cells reproduce by the process of budding.

27. A student after viewing a prepared slide illustrates the budding in yeast in the following order which is not correct: **(1)**



The correct order should be:
(A) b, c, d, e, a
(B) b, e, d, c, a
(C) b, d, e, c, a
(D) b, d, c, e, a

Ans. **(D)**
During budding in yeast, a single cell develops a protrusion wherein the nucleus divides to give rise to two daughter nuclei. One of the daughter nuclei migrates into the protrusion to form a bud. This bud then enlarges in size and may undergo budding while attached to the parent cell. Hence, budding results in a chain of cells.

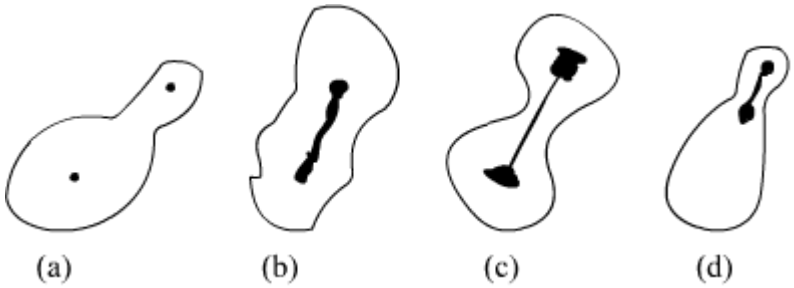
28. A student has to observe a permanent slide of binary fission in amoeba. Find the correct sequence of steps given below for focussing the object under a microscope. **(1)**

(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 focussed.
(d) Look through the eye-piece and move the slide till the object is visible.

(A) d, c, b, a
(B) a, b, d, c
(C) a, d, c, b
(D) a, c, d, b

Ans. **(C)**
The correct order of steps is a, d, c, b.

29. After viewing different slides, a student draws following diagrams. Select the one which depicts binary fission in amoeba: **(1)**



(A) a
(B) b
(C) c
(D) d

Ans. **(C)**
During binary fission, a single cell gets divided into two equal and identical daughter cells.

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: **(1)**

(A) gently rubbing with cotton cloth
(B) hot air blower
(C) dry cotton wool
(D) filter paper

Ans. **(D)**
The raisins after being soaked in water were dried on a piece of filter paper in order to remove the excess water present on their surface.

31. While performing the experiment with raisins to determine the percentage of water absorbed by them, a student made following measurements: **(1)**

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 the experiment = 35 g

The percentage of water absorbed by raisins is:

(A) $\frac{40g - 35g}{35g} \times 100$

(B) $\frac{40g - 35g}{40g} \times 100$

(C) $\frac{8g-5g}{8g}\times 100$

(D) $\frac{8g-5g}{5g}\times 100$

Ans. **(D)**

The percentage of water absorbed by raisins is calculated by using the formula

$$\frac{W_2-W_1}{W_1}\times 100$$

where, W_2 is the weight of wet resin and W_1 is the weight of dry resin.

32. Which of the following observations is true about dilute solution of acetic acid? **(1)**

(A) It smells like vinegar and turns red litmus blue
(B) It smells like onion and turns blue litmus red
(C) It smells like orange and turns red litmus blue
(D) It smells like vinegar and turns blue litmus red

Ans. **(D)**

The odour of vinegar is same as that of acetic acid. Also, being an acid (though weak) it turns blue litmus to red.

33. A student takes Na_2CO_3 powder in a test tube and pours some drops of acetic acid over it. He observes: **(1)**

(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

Ans. **(C)**

Acetic acid reacts with Na_2CO_3 to form sodium acetate, carbon dioxide and water. It is this colourless gas carbon dioxide gas which comes out as bubbles.

34. A student adds 4 mL of acetic acid 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: **(1)**

(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

Ans. **(D)**

Acetic acid forms a homogeneous solution with water.

35. The colours of aqueous solutions of $CuSO_4$ and $FeSO_4$ as observed in the laboratory are:**(1)**

(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

Ans. (D)
Cu is present in +2 oxidation state and iron is present in +3 oxidation state.

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 solutions in X and Y respectively appear: **(1)**

(A) blue and green
(B) colourless and pale green
(C) colourless and light blue
(D) greenish and colourless

Ans. (D)
Reaction in beaker X: $Fe + CuSO_4$ (blue) $\rightarrow FeSO_4$ (green) + Cu
Reaction in beaker Y: $Zn + FeSO_4$ (green) $\rightarrow ZnSO_4$ (colourless) +Fe

37. While tracing the path of a ray of light passing through a rectangular glass slab a student tabulated his observations as given below: **(1)**

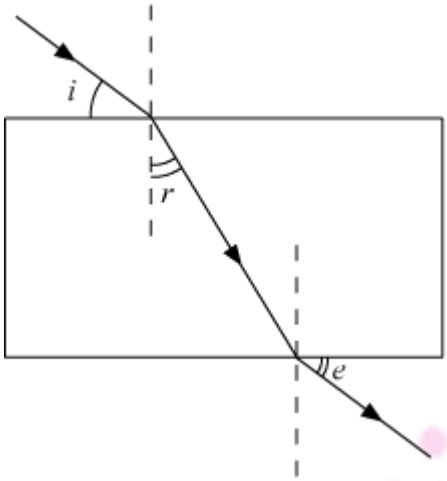
S.No.	∠i	∠r	∠e
I	60°	40°	61°
II	50°	36°	51°
III	40°	28°	39°
IV	30°	20°	31°

The correct observation is:

(A) I
(B) II
(C) III
(D) IV

Ans. (D)
Using Snell's law, $\sin i/\sin r = n_2/n_1$, check the ratio of the sine values of i and r which gives 1.5 (we know, n_2=1.5 and n_1=1) will be the answer.

38. A student traces the path of a ray of white light through a rectangular glass slab and marks, the angles of incidence (∠i) , refraction (∠r) and emergence (∠e) as shown. Which angle or angles has he **not** marked correctly? **(1)**



(A) ∠i only
(B) ∠i and ∠r
(C) ∠i and ∠e
(D) ∠r and ∠e

Ans. (C)
Incident and emergent angles are measured from the normal of the plane.

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. **(1)**

(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

Ans. (B)
Focal length is the distance between the focus and the mirror. The image of the distant object is formed at the focus of the mirror.

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 distant object (preferably the sun) should be focussed on the screen. What should be done for this purpose? **(1)**

(A) Move the screen slightly away from the mirror
(B) Move the mirror slightly towards the screen
(C) Move the screen and the mirror away from the object
(D) Move the screen and the mirror towards the object

Ans. (A)
Screen is moved to get the focused image for a fixed object and mirror position.

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: **(1)**

(A) mirror and the object
(B) mirror and the screen
(C) screen and the object
(D) screen and the object and also mirror and the screen

Ans. (B)
The correct sequence of steps is c, d, a, e, b.