

Mega Test - 3 (SA-2)

Time: 3 h

10th CBSE Science

Max Marks: 80

General Instructions :

- The question paper comprises of two sections, **A** and **B**, you are to attempt both the sections.
- All questions are **compulsory**.
- There is no overall choice. However, internal choice has been provided in all the three questions of five mark category. Only one option in such question is to be attempted.
- All questions of section A and all questions of section B are to be attempted separately.
- Question numbers 1 to 4 in section A are one mark questions. These are to be answered in **one word or one sentence**.
- Question numbers 5 to 13 are two mark questions, to be answered in about **30 words**.
- Question numbers 14 to 22 are three mark questions, to be answered in about **50 words**.
- Question numbers 23 to 25 are five mark questions, to be answered in about **70 words**.
- 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 choose one most appropriate response out of the four provided to you.
- An additional **15** minutes time has been allotted to read this question paper only. Candidates will not write any answer on the answer sheet during this time interval.

Section A

- Name the type of spherical mirror which
 - has +ve focal length.
 - always forms a virtual image.
 1
- In which group of the periodic table would you place lithium having atomic number 3 ? 1
- "Reuse" of materials is considered better than "recycling". Why ? 1
- "Save the Tiger" campaign is being over emphasised these days by our Government. What may be the possible reason ? 1
- What causes atmospheric refraction of light ? Mention its two effects. 2
- A small object is so placed in front of a convex lens of 5 cm focal length that its virtual image is formed at a distance of 25 cm from the lens. Find where is the object placed with respect to the lens. 2

7. Refractive indices of media A, B, C and D are given below : 2
- | Medium | Refractive Index |
|--------|------------------|
| A | 1.33 |
| B | 1.44 |
| C | 1.52 |
| D | 1.65 |
- In which of these four is the speed of light maximum ? Support your answer with reason. Find the refractive index of medium D with respect to medium A.
8. What is meant by saponification ? Give an example. 2
9. State any two changes in the properties of I group elements of modern periodic table, if we move downwards. 2
10. In the food chain- 2
Grass → deer → lion,
operating in a forest, what will happen if all the
(a) lions are removed ?
(b) deers are removed ?
11. "Testes perform dual function." Justify this statement. 2
12. What is the information source of making proteins in a cell nucleus? State the basic event in reproduction. 2
13. (a) State the range of vision of a normal human eye. 2
(b) Ciliary muscles of a human eye can be stretched or relaxed. How does it help in the normal functioning of the eye ?
14. (a) What is meant by fossil fuel ? 3
(b) Which fossil fuel is usually conserved when we save on electricity ?
(c) At the present rate of consumption how long will the known reserves of coal and petroleum last ?
15. (a) Two thin lenses of power +3.5 D and -2.5 D are placed in contact with each other. Find the power and focal length of the lens combination . 3
(b) A convex mirror used as a rear- view mirror in a car has a radius of curvature of 3 m . If an approaching bus is located at a distance of 5 m from this mirror, how far its image appears in the mirror ?
16. (a) An object is placed at the following distances from a convex lens of focal length 15 cm 3
(i) 35 cm (ii) 30 cm (iii) 20 cm (iv) 10 cm
Which position of the object will produce an image of the same size as the object ?
(b) Draw ray diagrams to show the image formation -
(i) by a concave mirror for an object placed between its focus and centre of curvature.
(ii) by a convex lens for an object placed beyond 2F

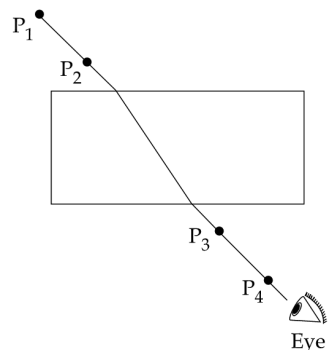
37. A student dips a blue paper in each of the following solutions. The solution which turns blue litmus red is 1
(a) NaHCO_3 (b) $\text{CH}_3\text{CH}_2\text{OH}$
(c) Na_2CO_3 (d) CH_3COOH
38. On adding sodium hydrogen carbonate to acetic acid, we immediately 1
(a) observe strong effervescence
(b) hear hissing sound
(c) observe brown fumes
(d) notice formation of bubbles
39. The salt which gives a light green coloured solution when dissolved in water is 1
(a) CuSO_4 (b) FeSO_4 (c) ZnSO_4 (d) $\text{Al}_2(\text{SO}_4)_3$
40. The zinc and copper metal used in the laboratory for doing experiment is available respectively in the form of 1
(a) Zn filings, Cu turnings (b) Zn strips, Cu pellets
(c) Zn granules, Cu turnings (d) Zn pellets, Cu strips
41. Amita took four different solutions A, B, C and D in four different test tubes. On placing aluminium plates in each of the four solutions she would observe that the gradual change in colour is observed in : 1

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



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33. In the glass slab experiment shown along side, four students, A, B, C and D did the following- 1



- (a) kept the eyes far from the glass slab while placing both the pins P_3 and P_4 .
 (b) kept the eyes close to the slab while placing both the pins P_3 and P_4 .
 (c) kept the eyes close to the glass slab while placing pin P_3 and far from the glass slab while placing pin P_4 .
 (d) kept the eyes far from the glass slab while placing both the pins P_3 and close to the glass slab while placing pin P_4 .
34. A student obtains a blurred image of an object on a screen by using a concave mirror. In order to obtain a sharp image on the screen, he will have to shift the mirror 1
- (a) towards the screen
 (b) away from the screen
 (c) either towards or away from the screen depending upon the position of the object.
 (d) to a position very far away from the screen.
35. A sharp image of a distant object is obtained on a screen using a convex lens. In order to determine the focal length of a lens, a student needs to measure the distance between 1
- (a) lens and the object
 (b) lens and the screen
 (c) object and the screen
 (d) lens and the screen and also object and the screen
36. While doing the experiment of finding the focal length of a given convex lens by obtaining a sharp image of a distant object, a student uses the following steps - 1
- (a) Measure the distance between the lens and the screen
 (b) Adjust the position of the lens to form a sharp image
 (c) Selects a suitable distant object
 (d) Hold the lens between the object and the screen with its face parallel to the screen.
- The proper sequence of steps to be followed by the student should be :
- (a) c, a, d, b (b) c, d, b, a
 (c) c, a, b, d (d) a, b, c, d

17. (i) Write the molecular formulae and name of the following : 3
 (a) simplest aldehyde
 (b) simplest ketone
 (ii) Write any two uses of ethanol.

18. Draw a neat diagram of fertilization of pollen on stigma. Also label on it the following parts - 3
 (i) female germ cell
 (ii) pollen tube
 (iii) pollen grain
 (iv) male germ cell

19. What is meant by pollination ? State its two types. List any two agents which help in pollination ? 3

20. Define isomerism ? Illustrate with one example. 3
 21. (i) Name the scientist who gave the idea of evolution of species by natural selection ? 3
 (ii) What conclusion did Mendel draw from his experiments about traits ?
 (iii) Arrange the following according to evolution.
 Cockroach, Mango tree, gorilla, fish

22. State and explain in brief the 3 factors which would lead to the formation of new species. 3

23. (a) Name the defect of vision in which the eye loses its power of accommodation due to old age. 5
 (b) The near point of a person suffering from hypermetropia is at 50 cm from his eye. What is the power of the lens needed to correct this defect ? (near point of normal eye is 25 cm)
 (c) With the help of ray diagrams, show the formation of image by (i) a hypermetropic eye and (ii) correction of hypermetropia by using an appropriate lens.

OR

- (a) What type of spectacles should be worn by a person having the defect of myopia as well as hypermetropia ? 5
 (b) The far point of a myopic person is 150 cm. What is the nature and power of lens required to correct the defect ?
 (c) With the help of ray diagrams, show the formation of image by (i) a myopic eye and (ii) correction of myopia by using an appropriate lens.

24. (a) State the Modern Periodic Law. How have the elements been arranged in the modern periodic table ? Why is it considered that the position of hydrogen in the periodic table is anomalous ? 5
 (b) An element X(2,8,2) combines separately with NO_3^- and $(\text{PO}_4)^{3-}$ radicals. Write the formulae of the compounds so formed. To which group of the periodic table does the element 'X' belong? Will it form covalent or ionic compounds with these radicals ? How ?

OR

The atomic radii of the element of second period are given below :

Second period elements	B	Be	O	N	Li	F	C
Atomic Radii (pm)	88	111	66	74	152	64	77

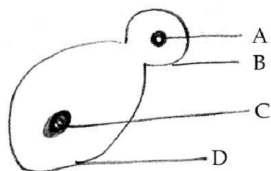
- (i) Arrange these elements in decreasing order of their atomic radii.
 (ii) Are the elements now arranged in the pattern of a period in the periodic table ?
 (iii) Name the element which has the (i) largest and (ii) smallest atomic number .
 (iv) From the above data , infer how the atomic size or atomic radius of the elements changes as we go from left to right in a period.
 (v) Name one metal, one non-metal and a metalloid out of these elements.
 (vi) Why does atomic radius decreases as we move from left to right in a period ?
25. (a) What is geographical isolation ?
 (b) Illustrate formation of a species with the help of an example where individuals are very different from each other and one capable of reproduction among themselves.

OR

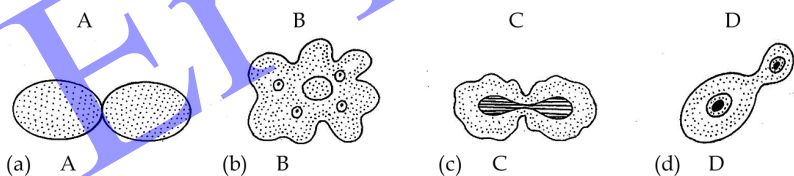
Name any five vegetables generated from a common ancestors through artificial selection rather than natural selection. Also mention the features for which each vegetable is selected.

Section B

26. In the adjoining figure of budding in yeast the structures A, B, C and D should be labelled respectively as : 1



- (a) Nucleus of bud, Bud, Yeast, Nucleus of yeast
 (b) Dividing nucleus of bud, Bud, Yeast, Nucleus of yeast
 (c) Nucleus of bud., Bud, Yeast, Dividing nucleus of yeast
 (d) Dividing nucleus of yeast , Yeast, Bud, Nucleus of bud.
27. The budding in yeast is illustrated by the diagram : 1



28. The process represented in the diagram below is the : 1



- (a) budding in amoeba
 (b) binary fission in amoeba
 (c) spore formation in amoeba
 (d) gamete formation in amoeba
29. The initial mass of raisins given to Yusuf is 6 g. After sometime, when he performed the experiment, he found that the final mass of the soaked raisins is 8g. The percentage of water absorbed by the raisins is : 1

(a) $\frac{(8 - 6) \text{ g}}{6 \text{ g}} \times \frac{1}{100}$ (b) $\frac{(8 - 6) \text{ g}}{8 \text{ g}} \times 100$
 (c) $\frac{(8 - 6) \text{ g}}{6 \text{ g}} \times 100$ (d) $\frac{(8 - 6) \text{ g}}{8 \text{ g}} \times \frac{1}{100}$

30. Binary fission in amoeba is illustrated by the diagrams 1



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

31. Sohan soaked 2 g raisins each of exactly equal mass in three beakers A, B and C each containing same amount of tap water at the room temperature. After 30 minutes he removed raisins from beaker A after 60 minutes from beaker B and after 90 minutes from beaker C. He calculated the percentage absorption of water in each case. If P_A, P_B and P_C denote percentage absorption, then on the basis of observation made by Sohan, the correct representation of the conclusion should be : 1

(a) $P_A > P_B > P_C$ (b) $P_A = P_B = P_C$ (c) $P_A < P_B < P_C$ (d) $P_A < P_C > P_B$

32. While performing the experiment of refraction through a glass slab, the path of a ray of light passing through a glass slab is traced by four students as shown in the figures below. Which of them is correct ? 1

