CREST Science Olympiad (CSO)

Previous Year Paper (2022-23)

Class 10 (Set - A)

Time Allowed: 1 hour **Maximum Marks: 60**

- Additional **10 minutes** will be allotted to fill up information on the OMR Sheet, before the start of the exam.
- Fill in all the mandatory fields clearly on the OMR Sheet.
- There are a total of **50 questions** in this booklet comprising **2 sections** namely the **Practical Science & Achievers' Section** consisting of **40 questions (1 mark each) & 10 questions (2 marks each)** respectively.
- There is no negative marking. The use of a calculator is not permitted.
- There is **only ONE correct option** to a given question.
- Use **HB Pencil / Ball point pen (Blue / Black) only** for marking the correct choice of answers on the OMR Sheet.
- Rough work is to be done in the space provided in the test booklet. Extra plain sheet may be provided by the school for the rough work.
- The OMR Sheet is to be handed over to the invigilator at the end of the exam.
- No candidate is allowed to carry any textual material, printed or written, bits of paper, any electronic device, digital watches, etc. inside the examination hall.
- The use of unfair means may result in the cancellation of the exam. Any such instances must be reported at **+91-98182-94134** or **info@crestolympiads.com**

DO NOT OPEN THIS BOOKLET UNTIL ASKED TO DO SO

FILL IN THE DETAILS

Candidate Name: _____

Class: _____ Section: _____

CREST ID: _____

Practical Science (Each Question is 1 Mark)

1. Which of the following is the correct order of the metals Na, Si, Cl, Mg and Al in the order of decreasing metallic character?

   a. Cl > Si > Al > Mg > Na
   b. Na > Mg > Al > Si > Cl
   c. Na > Al > Mg > Cl > Si
   d. Al > Na > Si > Ca > Mg

2. Robert was conducting an experiment to demonstrate the occurrence of respiration in germinating seeds. He placed some KOH in a small test tube in the flask with germinating seeds. Why did he do so?

   a. To provide oxygen required by the seeds for respiration.
   b. To absorb carbon dioxide and create partial vacuum in the flask.
   c. To absorb water from the seeds to make them dry.
   d. To make the pair of seeds present in the flask alkaline.

3. What shape are eye lenses when one looks at their hand and when one looks at a distant tree?

   a. Thin, thick
   b. Thin, thin
   c. Thick, thick
   d. Thick, thin

4. A student wishes to become an Optometrist yet cannot figure out which statement of the following is correct. Choose the correct statement for him.

   a. A person with myopia can see distant objects clearly.
   b. A person with hypermetropia can see nearby objects clearly.
   c. A person with myopia can see nearby objects clearly.
   d. A person with hypermetropia cannot see distant objects clearly.

5. If A is the angle of prism, D is the angle of deviation, i is the angle of incidence and e is the angle of emergence through a prism, then the correct relation between them is:

   a. A + i = D + e
   b. A + D = i + e
   c. A + e = D + i
   d. A + i + e = D

6. Fill in the blank:

   Two wires have their lengths, diameters and resistivity all in the ratio of 1 : 2. If the resistance of the one wire is 10 Ω, the resistance of the another wire is _____.

   a. 5 Ω
   b. 10 Ω
   c. 20 Ω
   d. 40 Ω

7. Fill in the blank:

   The screening effect of inner electrons of the nucleus causes _____.

   a. decrease in the ionisation energy
   b. increase in the ionisation energy
   c. no effect on the ionisation energy
   d. increase in the attraction of the nucleus to the electrons

8. Which of the following is the process involved in photosynthesis?

   a. Potential energy is released to form free energy
   b. Free energy is converted into potential energy and stored
   c. Food is oxidised to release carbon dioxide and water
   d. Oxygen is taken and carbon dioxide and water vapour are given out

9. Fill in the blank:

The rate of breathing is primarily controlled by the _____.

a. demand for carbon dioxide by the tissues
b. concentration of carbon dioxide in the blood
c. demand for oxygen by the tissues
d. concentration of oxygen in the blood

10. A body is located on a wall. Its image of equal size is to be obtained on a parallel wall with the help of a convex lens. If the lens is placed at a distance of 20 cm ahead of second wall, then what will be the required focal length?

a. 10 cm
b. 20 cm
c. 40 cm
d. More than 5 cm and less than 10 cm

11. In the following question, an assertion and a reason are given. Choose the correct option:

Assertion: The left atrium and the left ventricle are completely separated from the right atrium and the right ventricle.
Reason: Oxygenated and deoxygenated blood never mix with each other inside the heart.

a. Both assertion and reason are true and reason is the correct explanation of assertion.
b. Both assertion and reason are true and reason is not the correct explanation of assertion.
c. Assertion is true, but reason is false.
d. Assertion is false, but reason is true.

12. Consider the following statements and choose the correct option:

Statement 1: Through small intestine maximum nutritional elements in the blood are absorbed.

Statement 2: A single kidney is sufficient to excrete the nitrogenous wastes from our body. A person can survive on a single kidney.

a. Statement 1 is correct but statement 2 is incorrect
b. Statement 1 is incorrect but statement 2 is correct
c. Both the statements are correct
d. Both the statements are incorrect

13. Fill in the blank:

Graphite cannot be used as a lubricant in space because _____.

a. absence of external pressure transforms crystalline graphite to amorphous form
b. there is no atmosphere in space, and hence, graphite sublimes in space
c. there is no atmosphere in space, and hence, there is no absorbed air and water between layers of graphite
d. none of the above

14. A piece of aluminium of finite length is drawn or stretched such that to reduce its diameter to one fourth its original value, its resistance will become:

a. 256 times
b. four times
c. eight times
d. sixteen times

15. In the following question, an assertion and a reason are given. Choose the correct option:

Assertion: When current is represented by a straight line, the magnetic field will be circular.
Reason: According to Fleming's left-hand rule, the direction of force is parallel to the magnetic field.

a. Both assertion and reason are true and reason is the correct explanation of assertion.

b. Both assertion and reason are true and reason is not the correct explanation of assertion.
c. Assertion is true, but reason is false.
d. Assertion is false, but reason is true.

16. Which of the following is not an example of grazing food chain?

a. Seeds → Rodents → Fox → Tiger
b. Green plants → Deer → Tiger
c. Grass → Grasshopper → Lizard → Hawk
d. Shed leaves → Detritus → Shrimps → Small fish

17. The sulphide ores which involve roasting as one of the steps of extraction are concentrated by certain method. Identify the main principle involved:

a. Adsorption of ore particles to pine oil
b. Specific gravity difference between ore and gangue
c. Attraction of ore or gangue particles towards the magnet
d. Coagulation of gangue particles by the addition of pipe oil

18. In the following question, an assertion and a reason are given. Choose the correct option:

Assertion: Nuclear fusion produce more energy than nuclear fission.
Reason: The technical problems of achieving controlled fusion are however very much greater than that with fission.

a. Both assertion and reason are true and reason is the correct explanation of assertion.
b. Both assertion and reason are true and reason is not the correct explanation of assertion.
c. Assertion is true, but reason is false.
d. Assertion is false, but reason is true.

19. A large volume of copper (II) sulphate solution is left in an iron container overnight. Identify the correct statement.

a. The solution evaporates completely and some copper (II) sulphate crystals are left behind.
b. The part of the container in contact with the solution is coated with copper.
c. Some fine iron particles are formed in the solution.
d. Atmospheric oxygen reacts with the copper (II) sulphate to give black copper (II) oxide.

20. 2 mL of ethanoic acid was taken in each of the three test tubes A, B and C. To these test tubes 2 mL, 4 mL and 8 mL of water was added respectively. Which test tube will give a clear solution?

a. Test tube A only
b. Test tube B only
c. Test tube A and B only
d. All the test tubes

21. Which of the following are homologous and analogous organs?

i. Wings of birds and insects
ii. Flippers of whale and fins of fish
iii. Flippers of whale and wings of a bat
iv. Our teeth and elephant's tusks
v. Potato and runners of grass

a. Analogous organs - i, ii, v
Homologous organs - iii, iv
b. Analogous organs - ii, iii, v
Homologous organs - i, iv
c. Analogous organs - i, ii,
Homologous organs - iii, iv, v
d. Analogous organs - iii, ii, iv
Homologous organs - i, v

22. Identify a feature of reproduction that is common to amoeba, spirogyra and yeast:

a. They reproduce asexually.
b. They are all unicellular.
c. They reproduce only sexually.
d. They are all multicellular.

23. Consider the following statements and choose the correct option:

Statement 1: Na, Cu, Mg belong to the same period.
Statement 2: Ni, Cu, Zn belong to the same group.

a. Statement 1 is correct but statement 2 is incorrect.
b. Statement 1 is incorrect but statement 2 is correct.
c. Both the statements are correct.
d. Both the statements are incorrect.

24. Which of the following is incorrect?

a. HCOOH is stronger acid than CH_3COOH.
b. HClO is stronger acid than $HClO_4$.
c. Water is more acidic than methanol.
d. All of the above

25. Angela was in a pet shop. She saw a pair of cats with green eyes and a litter of kittens for sale. She pointed to two kittens and remarked that they were most likely from the same parents. How could she tell?

a. They had green eyes.
b. They were small.
c. They were males.
d. They had a tail.

26. A pregnant woman sets off to sail alone on a voyage which she expects to last between two to three months. There is no likelihood of her being able to obtain any food except fish. She takes adequate supplies of carbohydrate, fat and protein foods.
Which part of the fish that she catches will be of most value to her?

a. The brain
b. The muscle tissues
c. The liver
d. The heart

27. A dry battery can deliver 3000 J of energy to a small 2 W electric motor before the battery is exhausted. For how many minutes does the motor run?

a. 1500 min b. 100 min
c. 50 min d. 25 min

28. A sample of soil is mixed with water and allowed to settle. The clear supernatant solution turns the pH paper yellowish-orange. Which of the following would change the colour of this pH paper to greenish-blue?

a. Lemon juice
b. Vinegar
c. Common salt
d. An antacid

29. A compound X on heating with excess concentrated sulphuric acid at 443 K gives an unsaturated compound Y. X also reacts with sodium metal to give a colourless gas Z. Identify X.

a. Hydrogen
b. Ethene
c. Ethanol
d. Sodium hydroxide

30. A Mendelian experiment consisted of breeding pea plants bearing violet flowers with those bearing white flowers. What will be the result in F1 progeny?

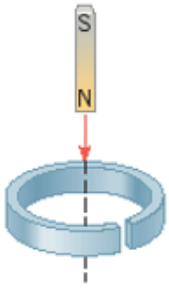
a. All plants bear violet flowers.
b. All plants bear white flowers.

c. All plants bear green flowers.
d. All plants bear blue flowers.

31. When you add a few drops of acetic acid to a test tube containing sodium bicarbonate powder, which one of the following is your observation?

a. No reaction takes place.
b. A colourless gas with a pungent smell is released with a brisk effervescence.
c. A brown coloured gas is released with a brisk effervescence.
d. Formation of bubbles of a colourless and odourless gas.

32. A copper ring having a cut so as not to form a complete loop, is held horizontally and a bar magnet is dropped through the ring with its length along the axis of the ring. The acceleration of the falling magnet is _____.



a. g
b. less than g
c. 0
d. more than g

33. An element A is soft and can be cut with a knife. It is very reactive to air and cannot be kept open in air. It reacts vigorously with water. Identify the element from the following.

a. Mg
b. Na
c. P
d. Ca

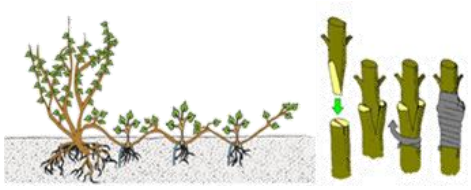
34. Substances like coal, charcoal, etc when burnt, do not produce a flame. They just glow red and give out heat. Which of the following is the reason for the above statement?

a. These substances do not have stored energy.
b. They do not vaporise on heating.
c. They are not so reactive.
d. They have very low stored energy.

35. Three elements X, Y and Z have consecutive, increasing proton numbers. If element X is a noble gas, what will be the symbol for the ions of element Z in its compounds?

a. Z^{2-}
b. Z^{2+}
c. Z^{+}
d. Z^{3+}

36. Both the given figures A and B are of vegetative propagation (artificial technique of asexual reproduction). Select the correct option, regarding the method of vegetative propagation.



A **B**

a. A is grafting and B is layering
b. A and B both are grafting
c. A and B both are layering
d. A is layering and B is grafting

37. In endoscopy, a doctor inserts a very thin and flexible optical fibre into a patient's throat to inspect the interior of the stomach. How does this instrument work?

a. Light is reflected internally and an image is produced.
b. Light is reflected and the diffused reflection is measured.
c. Light is refracted through the stomach and an image is produced.
d. Light is refracted through the stomach and bounces off the stomach wall.

38. An object is placed 15 cm from the optical centre of a converging lens. The focal length of the converging lens is

10 cm. Which of the following describes the image that will be formed?

a. Real, upright, diminished
b. Real, inverted, magnified
c. Virtual, upright, diminished
d. Virtual, inverted, magnified

39. In which of the following is a kilowatt-hour of electrical energy is expended?

a. A 50 W lamp is used for 2 hours.
b. A current of 0.1 A is maintained in a resistance of 100 Ω for 10 hours.
c. A 3000 W heater is used for 20 minutes.
d. Two 50 W lamps in parallel operated on a 200 V supply for 30 minutes.

40. What is the possible result of replacing the fuse in an electrical appliances with one of a lower rating?

a. The fuse will melt more easily.
b. Lesser current will flow through the appliance and will not cause overheating.
c. More current will flow through the appliance and cause overheating.
d. Provide more protection against a short circuit from occurring.

Achievers' Section (Each Question is 2 Marks)

41. The refractive index of the material of a prism is $\sqrt{2}$ and its refracting angle is 30^o. One of the refracting surfaces of the prism is made a mirror inward. A beam of monochromatic light entering the prism from the other face will retrace its path (after reflection from the silvered surface) if its angle of incidence on the prism is _____.

a. 30^o b. 60^o
c. 45^o d. 90^o

42. Which of the following statements are correct?

1. Trypsin converts peptones into amino acids.
2. Maltase converts maltose into glucose.
3. Sucrase converts sucrose into glycerol and galactose.
4. Lactase converts lactose into glucose and fructose.

a. Only 1 b. Only 2
c. 1 and 2 d. 1, 3 and 4

43. Exposure of silver chloride to sunlight for a long duration turns grey due to:

i. the formation of silver by decomposition of silver chloride.
ii. sublimation of silver chloride.
iii. decomposition of chlorine gas from silver chloride.
iv. oxidation of silver chloride.

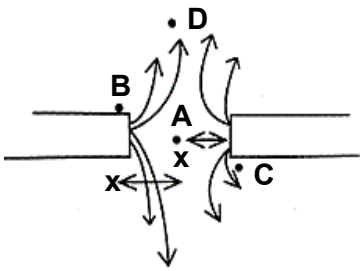
Which among the following statement is(are) false?

a. i only b. ii only
c. i and ii only d. ii, iii and iv

44. The pH of water sample collected from a river was found to be acidic in the range of 3.5-4.5. On the banks of the river were several factories that were discharging effluents into the river. The effluents of which one of the following factories is the most likely cause for lowering the pH of river water?

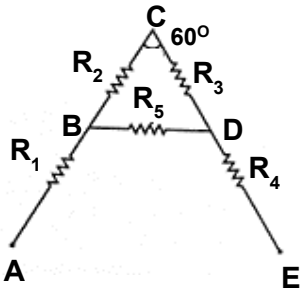
a. Soap and detergent factory
b. Lead battery manufacturing factory
c. Plastic cup manufacturing factory
d. Alcohol distillery

45. From the figure given below, choose the points where the net magnetic field induction is zero.



a. A
b. B
c. C
d. D

46. A letter A consists of a uniform wire of resistance 1 ohm per cm. The sides of the letter are each 20 cm long and the cross-piece in the middle is 10 cm long while the apex angle is 60º. The arrangement is as shown in the figure. The effective resistance between B and D is



a. $\frac{20}{3}\ \Omega$
b. $\frac{3}{20}\ \Omega$
c. 20 Ω
d. 3 Ω

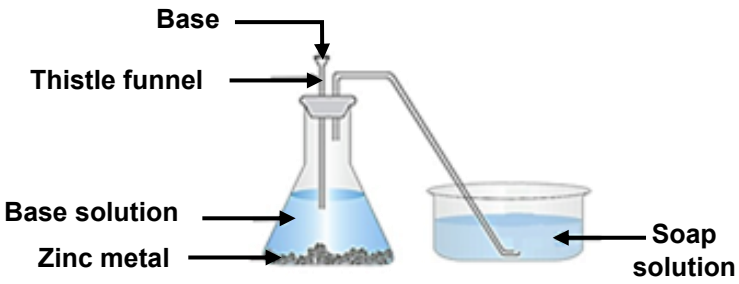
47. On adding water to a sample of a pulse, a student found that the water became yellow in colour. He took a sample of this yellow water and added a few drops of dilute HCl. The sample became pink. This confirms that the adulterant added to the pulse was _____.

a. turmeric
b. metanil yellow
c. potassium dichromate
d. yellow dye

48. A student made the following experimental set up to test the gas evolved when zinc metal is treated with a base.

The different bases used by him are:
1. Sodium hydroxide
2. Zinc hydroxide
3. Potassium hydroxide

In which of the above cases, no gas will be evolved?

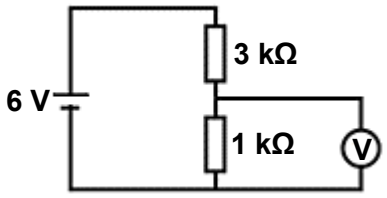


a. Only 1
b. Only 2
c. Only 3
d. 1, 2 and 3

49. An element A burns with golden flame in the air. It reacts with another element B, atomic number 17 to give a product C. An aqueous solution of product C on electrolysis gives a compound D and liberates hydrogen.
Identify compound D:

a. KCl
b. KOH
c. NaCl
d. NaOH

50. The diagram below shows a circuit. What is the reading of the voltmeter?



a. 1 V
b. 1.5 V
c. 2 V
d. 3 V

Answer Key

1. b	2. b	3. d	4. c	5. b	6. b	7. a	8. b	9. b	10. a
11. a	12. c	13. c	14. a	15. c	16. d	17. a	18. b	19. b	20. a
21. c	22. a	23. d	24. b	25. a	26. c	27. d	28. d	29. c	30. a
31. d	32. a	33. b	34. b	35. b	36. d	37. a	38. b	39. c	40. a
41. c	42. c	43. d	44. b	45. a	46. a	47. b	48. b	49. d	50. b