NATIONAL LEVEL SCIENCE TALENT SEARCH EXAMINATION

Solutions for Class : 8

MATHEMATICS

1. **(C)** $\angle BDC = \angle AED = 36°$

   (Corresponding $\angle s$, AE $\parallel$ BD.)

   $\angle ABD = \angle BDC = 36°$

   (Alternate $\angle s$, AB $\parallel$ DC)

   $\angle ADB = \angle ABD = 36°$

   (Base angles of isoceles $\triangle$, since AB = DC)

   $\angle BAD = 180° - \angle ABD - \angle ADB$

   (Angle sum of a triangle.)

   $= 180° - 36° - 36°$

   $= 108°$

2. **(B)** Area of shaded region = $15 \times 8cm^2 -$

   $\dfrac{1}{2} \times 12 \times 8cm^2$

   $= 120 \ cm^2 - 48 \ cm^2$

   $= 72 \ cm^2$

3. **(B)** Since x and y are directly proportional, we have

   $\dfrac{3}{30} = \dfrac{x_1}{50} \Rightarrow \dfrac{1}{10} = \dfrac{x_1}{50}$

   $\Rightarrow x_1 = \left(\dfrac{1}{10} \times 50\right) = 5$

   $\dfrac{3}{30} = \dfrac{x_2}{80} \Rightarrow \dfrac{1}{10} = \dfrac{x_2}{80}$

   $\Rightarrow x_2 = \left(\dfrac{1}{10} \times 80\right) = 8$

   $\dfrac{3}{30} = \dfrac{10}{y_1} \Rightarrow \dfrac{1}{10} = \dfrac{10}{y_1}$

   $\Rightarrow (y_1 \times 1) = (10 \times 10) \Rightarrow y_1 = 100$

   $\therefore \quad x_1 = 5, \ x_2 = 8 \ and \ y_1 = 100$

4. **(C)** $\dfrac{a-b}{c} = \dfrac{a}{c} - \dfrac{b}{c}$

5. **(C)** By folding the given net, the cube in option (C) can be formed.

PHYSICS

6. **(D)** As per the laws of reflection of light $\angle i = \angle r$. The angle of reflection is $70°$, as the angle of incidence is $70°$.

7. **(D)** In mercury barometers, the atmosphere (or the air) pushes down on the mercury in the trough. This in turn pushes the mercury in the tube up. The height of mercury in the tube is used as a measure of atmospheric pressure. So, higher the level of mercury in the tube irrespective of the shape of the tube, higher is the atmospheric air pressure. The highest level of the mercury inside the barometer indicates the highest air pressure.

8. **(B)** We know that for a reflected ray, the angle that the incident ray makes with the line perpendicular to the surface is equal to the angle made by the reflected ray with this perpendicular line. N is the correct reflected ray of X.

9. **(D)** The air rushed out of the balloon and pushed the set-up forward in direction Y. Frictional force acts in the opposite direction of motion, i.e., Z.

10. **(A)** First, compare P and Q. The distance moved is the same (130 cm), so the one with the higher magnitude will move faster. It is P. Next, compare R

and S. The distance moved is 90 cm. The one that moved that distance in the shorter amount of time has the larger magnitude. It is R. Finally, compare P and R. They both took 7 seconds to complete. Therefore, if we look at the distance moved, the one that completed the longer distance in 7 seconds has the higher magnitude

CHEMISTRY

11. **(D)** Coal when burnt releases sulphur dioxide and smoke that pollutes the air.

12. **(A)** Metal P reacts both with water and dilute hydrochloric acid. Metal Q does not react with water but reacts with dilute hydrochloric acid. Metal R does not react with water and dilute hydrochloric acid. P, Q, R is the correct reactivity in a decreasing order of given metals.

13. **(D)** For fires involving inflammable materials like petrol and electrical equipment carbon dioxide (CO_2) is the best extinguisher. CO_2, being heavier than oxygen, covers the fire like a blanket. As the contact between the fuel and oxygen is cut off, the fire is controlled. The added advantage of CO_2 is that in most of the cases it does not harm the electrical equipment.

14. **(A)** Copper being more reactive than silver, displaces silver and the solution turns blue due to the formation of copper nitrate.

15. **(D)** The correct matching is :
a – 4, b – 1, c – 2, d – 3
(i) Silk - Saree
(ii) Nylon - Rope
(iii) Acrylic - Sweater
(iv) Plastic - Bottle

BIOLOGY

16. **(B)** Agriculture is the cultivation and breeding of animals, plants and fungi for food, fiber, biofuel and other products used to sustain and enhance human life.

17. **(B)** Echinodermates include starfish, sea urchins and brittle stars. They mostly have fivefold symmetry with spiny outer covering.

18. **(C)** Mucor reproduces by spores.

19. **(B)** 'P' is binary fission and 'Q' is budding. Binary fission and loudding are a sexual repreoduction.

20. **(C)** Organelle chloroplast converts light energy to chemical energy during the process of photosynthesis. It has chlorophyll to trap sunlight during photosynthesis.n

CRITICAL THINKING

21. **(C)**
22. **(B)**
23. **(B)**
24. **(A)**
25. **(D)**