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NATIONAL LEVEL SCIENCE TALENT SEARCH EXAMINATION

Solutions for sample questions

Class : 7

Mathematics

1. (C) The triangle cannot be constructed as it does not satisfy the angle sum property.

2. (A)
$$\text{Average} = \frac{3+4+2+5+4+3}{6}$$
$$= \frac{21}{6} = 3.5 \text{ hours}$$

3. (D) $b < c + a$, since the sum of any two sides is greater than the third side.

4. (B) $I = \frac{PTR}{100}$

$$\frac{1P}{9} = \frac{P \times R \times R}{100} \quad [\text{Since } T = R]$$

$$\Rightarrow R^2 = \frac{100}{9}$$

$$R = \frac{10}{3} = 3\frac{1}{3}\%$$

5. (A) The average yield per tree per year

$$= \frac{(x+2) \times 60 + x \times 120 + (x-2) \times 180}{(x+2 + x + x-2)} = 100$$

$$\Rightarrow \frac{60x + 120 + 120x + 180x - 360}{3x} = 100$$

$$\Rightarrow 360x - 240 = 300x$$

$$\Rightarrow 60x = 240$$

$$\Rightarrow x = 4$$

Physics

6. (D) A faster moving object covers more distance in less time.

7. (D) If the pendulum is set into motion from

point P, it moves through Q and R. It does not remain at the extreme position R but comes back to Q and P. This movement of pendulum from $P \rightarrow Q \rightarrow R$ and $R \rightarrow Q \rightarrow P$ completes one oscillation.

8. (D) By pouring hot water on glass Y, it expands and glass Y gets separated from glass X.

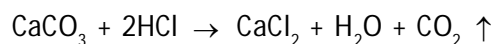
9. (A) When light is incident on a rough surface, irregular reflection takes place. Hence, the image formed is not clear.

10. (C) An electric current can produce three effects heating, lighting and magnetic.

Chemistry

11. (D) pH is a measure of the concentration of hydrogen ions in a solution. The lower the pH, the higher the concentration of the hydrogen ions. Conversely, the higher the pH, the higher the concentration of hydroxide ions in the solution.

12. (B) Calcium carbonate in the test tube reacts with hydrochloric acid and released carbon dioxide which extinguished the burning candle flame.



13. (A) In a chemical change, two substances react chemically to form a new substance with different chemical properties.

14. (C) Lightning hits tall structures, water and metallic bodies easily. So, avoiding them will be safer.

15. (C) The equator gets more heat than the poles. The warm air near the equator rises while the cool air from the poles blows towards the equator. This essentially causes wind currents.

Biology

16. **(D)** In the given figure arrow labelled 'S' is drawn wrongly.
17. **(C)** The transpiration in plants take place through stomata. Most of the most of the stomata are present at the lower part of the leaf labelled as Q.
18. **(B)** The correct sequence is T → P → R → Q → S
19. **(C)** The given description is related to amphibian. Amphibians live both on land and in water. In water they breathe through skin and on land with lungs they have webbed toes to hop and swim.
20. **(C)** The lungs are the both excreting and respiratory in function.