

BEST 2024



BOTHRA ENTRANCE AND SCHOLARSHIP TEST

Class IX Studying Moving to Class X

Physics, Chemistry Mathematics & Biology

INSTRUCTIONS FOR CANDIDATE

1. The Answer Sheet is provided to you separately which is a machine readable Optical Mark Recognition (OMR). You have to mark your answers in the OMR by darkening bubble, as per your answer choice, by using black & blue ball point pen.
2. Total Questions to be Attempted 40. (Mathematics-20), (Physics-8), (Chemistry-6), (Biology-6).
3. Marking Scheme:
 - a. If darkened bubble is RIGHT answer: 4 Marks.
 - b. If no bubble is darkened in any question: No Mark.
 - c. If darkened bubble is WRONG answer: -1 Mark (Minus One Mark).
4. Think wisely before darkening bubble as there is negative marking for wrong answer.
5. If you are found involved in cheating or disturbing others then your OMR will be cancelled.
6. Do not put any stain on OMR and hand it over back properly to the invigilator.

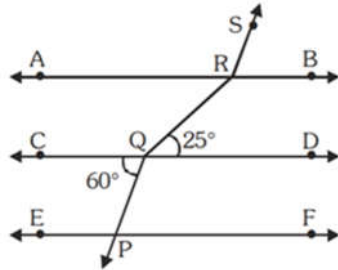


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CLASSES

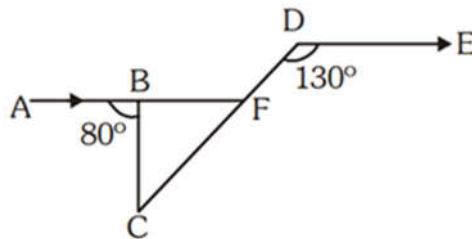
MATHEMATICS**(Single correct option +4, -1)**

1. If $\sqrt{5^n} = 125$, then $5^{\sqrt[4]{64}} =$ _____ .
(a) 25 (b) $\frac{1}{125}$ (c) 625 (d) $\frac{1}{25}$
2. $\sqrt{\frac{81}{64}\sqrt{\frac{81}{64}\sqrt{\frac{81}{64}\sqrt{\frac{81}{64}}\dots\infty}}}$ =
(a) $\frac{81}{64}$ (b) $\frac{9}{8}$ (c) $\frac{3}{2}$ (d) $\frac{3}{2\sqrt{2}}$
3. If $p = 7 - 4\sqrt{3}$, then $\frac{p^2 + 1}{7p} =$ _____ .
(a) 2 (b) 1 (c) 7 (d) $\sqrt{3}$
4. The HCF of the polynomials $12a^3b^4c^2$, $18a^4b^3c^3$ and $24a^6b^2c^4$ is _____ .
(a) $12a^3b^2c^2$ (b) $6a^6b^4c^4$ (c) $6a^3b^2c^2$ (d) $48a^6b^4c^4$
5. If the LCM of the polynomials $(y-3)^a(2y+1)^b(y+13)^7$ and $(y-3)^4(2y+1)^9(y+13)^c$ is $(y-3)^6(2y+1)^{10}(y+13)^7$, then the least value of $a+b+c$ is
(a) 23 (b) 3 (c) 10 (d) 16
6. The remainder when $x^3 - 3x^2 + 5x - 1$ is divided by $x + 1$ is
(a) -10 (b) -12 (c) -8 (d) -9
7. If $(2, 0)$ and $(-2, 0)$ are the two vertices of an equilateral triangle, then the third vertex can be _____ .
(a) $(0, 0)$ (b) $(2, -2)$ (c) $(0, 2\sqrt{3})$ (d) $(\sqrt{3}, \sqrt{3})$
8. Find the area of the triangle formed by the line $3x - 4y + 12 = 0$ with the coordinate axes.
(a) 6 units² (b) 12units² (c) 1 units² (d) 36 units²

9. Find the value of k , if points $(10,14)$, $(-3,3)$ and $(k,-8)$ are collinear.
 (a) 16 (b) 18 (c) - 18 (d) - 16
10. A triangle is formed by points $(6,0)$, $(0,0)$ and $(0,6)$. How many points with the integer coordinates are in the interior of the triangle?
 (a) 7 (b) 6 (c) 8 (d) 10
11. In figure, if $AB \parallel CD \parallel EF$, $PQ \parallel RS$, $\angle RQD = 25^\circ$ and $\angle CQP = 60^\circ$, then $\angle QRS$ is equal to –

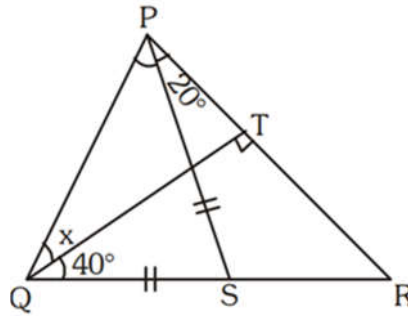


- (a) 85° (b) 135° (c) 145° (d) 110°
12. In the figure, $AB \parallel DE$, the value of $\angle BCD$ is :

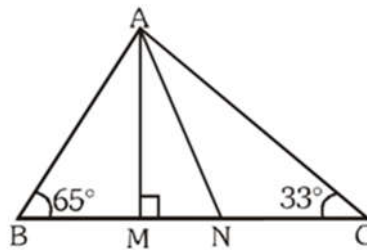


- (a) 80° (b) 130° (c) 50° (d) 30°

13. In the following figure $QT \perp PR$ and $QS = PS$. If $\angle TQR = 40^\circ$ and $\angle RPS = 20^\circ$ then value of x is:



- (a) 80° (b) 25° (c) 15° (d) 35°
14. In $\triangle ABC$, $BC = AB$ and $\angle B = 80^\circ$, Then $\angle A$ is equal to
 (a) 80° (b) 40° (c) 50° (d) 100°
15. In the given figure, $AM \perp BC$ and AN is the bisector of $\angle A$. Then $\angle MAN$ is:



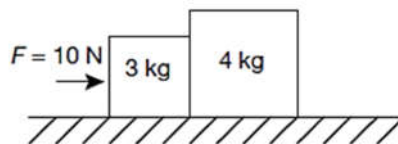
- (a) $32\frac{1}{2}^\circ$ (b) $16\frac{1}{2}^\circ$ (c) 16° (d) 32°
16. The true statement for the perimeter of a triangle is :
 (a) Greater than the sum of its altitudes (b) Less than the sum of its altitudes
 (c) Equal to the sum of its altitudes (d) None of these
17. The base of an isosceles triangle is 12 cm and its perimeter is 32 cm. Then its area is :-
 (a) 48 cm^2 (b) 36 cm^2 (c) 24 cm^2 (d) 12 cm^2

18. The area of right isosceles triangle is 200m^2 . Find its hypotenuse.
 (a) 20 (b) $20\sqrt{2}$ (c) $15\sqrt{2}$ (d) $30\sqrt{2}$
19. The area of a right angled triangle is 30cm^2 and the length of its hypotenuse is 13 cm. The length of the shorter leg is:
 (a) 4 cm (b) 5 cm (c) 6 cm (d) 7 cm
20. Area of a square with side x is equal to the area of a triangle with base x . The altitude of the triangle is :
 (a) $\frac{x}{2}$ (b) x (c) $2x$ (d) $4x$

PHYSICS

(Single correct option +4, -1)

1. For a body that is dropped from a height, the ratio of the distances covered by the body at the end of 1 s, 2 s and 3 s respectively is _____.
 (a) 1:4:9 (b) 1:2:3 (c) 1:3:5 (d) 2:6:5
2. A ball is thrown vertically upwards with a velocity of 30 m s^{-1} . What will be the height reached by the body at the end of 4 s (consider g as 10 s^{-2})?
 (a) 7.5 m (b) 3 m (c) 120 m (d) 40 m
3. A body is projected horizontally with a velocity of 20 m s^{-1} from a height of 10 m. What is the distance at which it hits the ground [take $g = 10\text{ m s}^{-2}$]?
 (a) $20\sqrt{2}\text{ m}$ (b) 28.28 m (c) Both (a) and (b) (d) 20 m
4. A bomb of mass m explodes into two fragments $\frac{2m}{3}$ and $\frac{m}{3}$ which move in opposite directions. What is the ratio of momenta?
 (a) 1:2 (b) 2:1 (c) 4:1 (d) 1:1
5. Two blocks of masses 3 kg and 4 kg are placed on the frictionless surface as shown in the figure. A force of 10 N is applied on the 3 kg block. Find the force of contact between the blocks.



- (a) $\frac{30}{7}\text{ N}$ (b) $\frac{40}{7}\text{ N}$ (c) $\frac{12}{7}\text{ N}$ (d) 5 N

6. Which among the following is a wrong statement?
(a) Action and reaction act on the same object.
(b) Action and reaction are equal in magnitude.
(c) Action and reaction are opposite in direction.
(d) None of the above
7. What is the ratio of escape velocity of the Earth to orbital velocity on the Earth?
(a) $\sqrt{2}$ (b) 2 (c) $\sqrt{3}$ (d) 3
8. According to Kepler's III law of planetary motion, _____. (T = time period, R = Radius of the orbit)
(a) $T \propto R$ (b) $T^2 \propto R^3$ (c) $T^3 \propto R^2$ (d) $T \propto R^3$

CHEMISTRY

(Single correct option +4, -1)

1. Which of the following phenomena would increase on rising temperature?
(a) Diffusion, evaporation, compression of gases
(b) Evaporation, compression of gases, solubility
(c) Evaporation, diffusion, expansion of gases
(d) Evaporation, solubility, diffusion, compression of gases
2. Which of the following conditions is most favourable for converting gas into liquid?
(a) High pressure, low temperature
(b) Low pressure, low temperature
(c) Low pressure, high temperature
(d) High pressure, high temperature
3. In all the three states of water, (i.e. ice, liquid and vapour) chemical composition of water
(a) is very different
(b) remains same
(c) sometimes same and sometimes different
(d) none of the above
4. What is the statement?
. "10 percent glucose in water by mass" signifies.
(a) 10 gram of glucose dissolved in 100 gram of water.
(b) 10 gram of glucose dissolved in 90 gram of water.
(c) 20 gram of glucose dissolved in 200 gram of water.
(d) 20 gram of glucose dissolved in 90 gram of water.

5. Sol and gel are examples of _____
- (a) Solid-solid colloids
 - (b) Sol is a solid-liquid colloid and gel is liquid-solid colloid
 - (c) Sol is solid- solid colloid and gel is solid-liquid colloid
 - (d) Sol is a liquid-solid colloid and gel is a solid-liquid colloid
6. Which of the statements is incorrect about the physical change?
- (a) There is no gain or loss of energy.
 - (b) It is permanent and Irreversible
 - (c) Composition of the substance remains the same
 - (d) No new substance is formed.

BIOLOGY

(Single correct option +4, -1)

Class: 9 (1) Biology

- 1) Which of the following is incorrect?
- (a) The plasma membrane allows or permits the entry and exit of some materials in and out of the cell. It also prevents movement of some other materials. The cell membrane, therefore, is called a permeable membrane.
 - (b) Some substances like carbon dioxide or oxygen can move across the cell membrane by a process called diffusion.
 - (c) There is spontaneous movement of a substance from a region of high concentration to a region where its concentration is low.
 - (d) Diffusion plays an important role in gaseous exchange between the cells as well as the cell and its external environment
- 2) Diffusion is important in exchange of gases and water in the life of a cell. In additions to this, the cell also obtains nutrition from its environment. Different molecules move in and out of the cell through a type of transport requiring use of energy are called :-
- (a) Simple diffusion (b) Osmosis (c) Active transport (d) None of the above
- 3) The chlorophyll in photosynthetic prokaryotic bacteria is associated with
- (a) membranous vesicles (bag like structures) (b) with plastids
 - (c) A and B both (d) None of these
- 4) Specific cells of reproductive organs or tissues in animals and plants divide to form gametes are called :-
- (a) Mitosis (b) Meiosis (c) Budding (d) Amitosis

- 5) Find out the incorrect statement.
- (a) Varieties or strains of crops can be selected by breeding for various useful characteristics such as disease resistance, response to fertilisers, product quality and high yields.
 - (b) One way of incorporating desirable characters into crop varieties is by hybridisation.
 - (c) Hybridisation refers to crossing between genetically similar plants.
 - (d) This crossing may be intervarietal (between different varieties), interspecific (between two different species of the same genus) or intergeneric (between different genera).
- 6) For variety improvement are focused on to develop new varieties for the following desirable traits—
- (i) number and quality of chicks;
 - (ii) dwarf broiler parent for commercial chick production;
 - (iii) summer adaptation capacity/ tolerance to low temperature;
 - (iv) low maintenance requirements;
 - (v) reduction in the size of the egg-laying bird with ability to utilise more fibrous cheaper diets formulated using agricultural by-products.
- (a) (i), (ii), (iii) are correct
 - (b) All are correct
 - (c) (i), (ii), (iv) and (v) are correct
 - (d) None of these