

FIITJEE

IOQJS MOCK TEST – II PART – I

Time: 1:00 Hour

Max Marks: 120

Instructions:

Section A) 24 multiple choice questions with one alternative correct.

- +3 marks credit for correct choice.
- - 1 mark penalty for incorrect choice.

Section B) 08 multiple choice questions with one or more than one correct alternatives.

- +6 marks credit for correct choice. To get credit, all the correct option(s) and no incorrect option(s) should be marked. No Negative Marking.

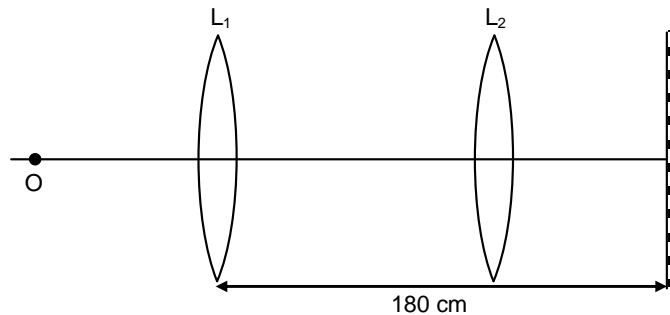
Name of the Candidate :

Enroll Number :

Date of Examination :

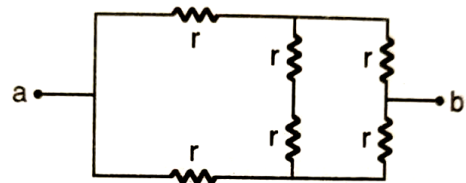
SECTION – A PHYSICS

- A body of mass 1 kg crosses a point O with a velocity of 60m/s. A force of 10N directed towards O begins to act on it. Body will cross point O again in
 (A) 24 sec (B) 12 sec
 (C) 6 sec (D) will never return to O
- Two thin convex lenses L_1 and L_2 having focal lengths $f_1 = 30$ cm & $f_2 = 60$ cm respectively are placed coaxially as shown in figure. A plane mirror is placed normally to the axis and a point object O on the axis as shown in figure. If object is at a distance of 60 cm from L_1 , then what should be the separation between L_1 & L_2 such that final image coincide with object:



- (A) 90cm (B) 120 cm
 (C) 60cm (D) 150 cm
- A stream of electrons is projected horizontally to the right. A straight conductor carrying a current is supported parallel to the electron stream and above it. If the current in the conductor is from left to right, what will be the effect on the electron stream?
 (A) The electron stream will be pulled upwards
 (B) The electron stream will be pulled downwards
 (C) The electron stream will be retarded
 (D) The electron beam will be speeded up towards the right.

- The equivalent resistance between the point a and b of the electrical network shown in the figure is:
 (A) $6r$ (B) $4r$
 (C) $2r$ (D) r



- A man standing between two parallel hills, claps his hand and hears successive echoes at regular intervals of 1s. If velocity of sound is 340 ms^{-1} , then the distance between the hills is
 (A) 100 m (B) 170 m
 (C) 510 m (D) 340 m
- A body weighs m_1 in a fluid of density d_1 and m_2 in a fluid of density d_2 . What would be the weight in a fluid of density d_3 ?
 (A) $\frac{m_1(d_3 - d_1) - m_2(d_2 - d_3)}{(d_2 - d_1)}$ (B) $\frac{m_1(d_2 - d_3) - m_1(d_1 - d_3)}{(d_2 - d_1)}$
 (C) $\frac{m_2(d_3 - d_1) - m_1(d_3 - d_2)}{(d_2 - d_1)}$ (D) $\frac{m_1(d_2 - d_3) - m_2(d_3 - d_1)}{(d_2 + d_1)}$

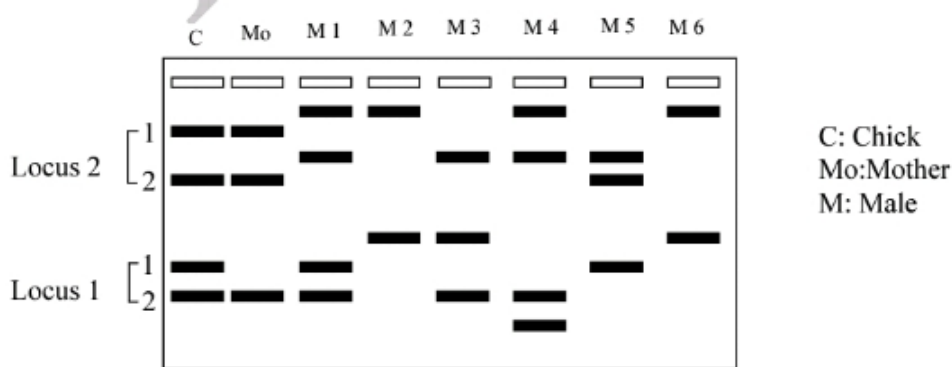
CHEMISTRY

7. Arrange the following processes/reactions involved in the extraction of copper from copper pyrite in proper order
- (a) concentration of ore by froth flotation
(b) electrolytic refining
(c) crushing and grinding
(d) $\text{FeO} + \text{SiO}_2 \longrightarrow \text{FeSiO}_3, \text{Cu}_2\text{O} + \text{FeS} \longrightarrow \text{Cu}_2\text{S} + \text{FeO}$
(e) $2\text{Cu}_2\text{S} + \text{Cu}_2\text{S} \longrightarrow 6\text{Cu} + \text{SO}_2$
(f) $2\text{CuFeS}_2 + \text{O}_2 \longrightarrow \text{Cu}_2\text{S} + 2\text{FeS} + \text{SO}_2$
- (A) cafedb (B) cadefb
(C) cafdeb (D) cdaefb
8. Assertion: The energy of 3d orbital is more than 4s orbital.
Reason: Nitrogen is stable because of its completely filled s-orbital.
- (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 and reason is true
9. Two moles of a hydrocarbon for complete combustion consume 13 moles of oxygen. When 1 mole of its is subjected to complete combustion, the number of moles of water vapour formed is one mole more than the number of moles of CO_2 formed. Identify the formula of hydrocarbon.
- (A) C_4H_{10} (B) C_5H_{12}
(C) C_5H_{10} (D) C_4H_8
10. x grams of a diatomic gas occupies 5.6 L volume at STP. Identify the incorrect statement regarding the gas.
- (A) the sample of gas contains 1.5×10^{23} molecules.
(B) the total number of atoms will be 3×10^{23} .
(C) If the gas is oxygen, then x is equal to 8 g
(D) the vapour density of the gas would be 4x
11. A spherical balloon of volume 253 mL is to be filled with helium gas at STP from a cylinder containing gas at 20 atm and 127°C . If the cylinder can hold 2 L of water, then calculate the number of balloons that can be filled up.
- (A) 150 (B) 100
(C) 50 (D) 160
12. 'A', 'B', 'C' and 'D' are four metals belonging to group 2 (IIA) and 3rd, 4th, 5th and 6th periods, respectively. Arrange their chlorides in the increasing order of covalent character.
- (A) $\text{ACl}_2 < \text{BCl}_2 < \text{CCl}_2 < \text{DCl}_2$ (B) $\text{ACl}_2 < \text{DCl}_2 < \text{CCl}_2 < \text{BCl}_2$
(C) $\text{ACl}_2 < \text{DCl}_2 < \text{BCl}_2 < \text{CCl}_2$ (D) $\text{DCl}_2 < \text{CCl}_2 < \text{BCl}_2 < \text{ACl}_2$

BIOLOGY

13. What is the name given to the specifically shaped region of the enzyme where the reaction occurs?
 (A) Substrate (B) Product
 (C) Active site (D) Reactant
14. Offspring formed by sexual reproduction exhibit more variation than those formed by Asexual Reproduction because—
 (A) sexual reproduction is a lengthy process
 (B) gametes of parents have qualitatively different genetic composition
 (C) genetic material comes from parents of two different species
 (D) greater amount of DNA is involved in sexual reproduction.

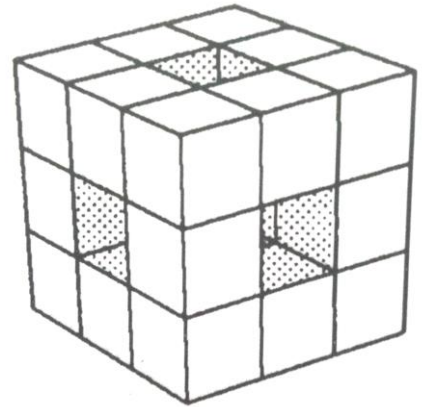
15. Following is the picture of a microsatellite gel of two loci from a chick, its mother and 6 males from a population. Can the biological father of the chick be ascertained from the data?



- (A) Yes, the biological father is male 5.
 (B) Yes, the biological father is male 1.
 (C) Yes, the biological father could either males 2 or 3.
 (D) No, at least three loci need to be shown for the decision.
16. Among the following which is responsible for nerve action potential?
 (A) influx of Na^+ and K^+ ions (B) out flux of Na^+ and K^+ ions
 (C) influx of Na^+ and outflux of K^+ ions (D) outflux of Na^+ and influx of K^+ ions
17. Air inhaled during breathing contains principal gases in order $\text{N}_2 > \text{O}_2 > \text{CO}_2 > \text{H}_2$.
 The gases in exhaled air would be in order
 (A) $\text{N}_2 > \text{O}_2 > \text{CO}_2 > \text{H}_2$ (B) $\text{N}_2 > \text{CO}_2 > \text{O}_2 > \text{H}_2$
 (C) $\text{N}_2 > \text{CO}_2 > \text{H}_2 > \text{O}_2$ (D) $\text{N}_2 > \text{H}_2 > \text{CO}_2 > \text{O}_2$
18. What would be the effect on photosynthesis in C_3 and C_4 plants on elevating the concentration of CO_2 under light saturated condition?
 (A) C_4 plants saturate fast and C_3 plants remain unaffected
 (B) C_3 plant will saturate fast and C_4 plants remain unaffected
 (C) no effect on both types of plants
 (D) both types of plants will saturate fast

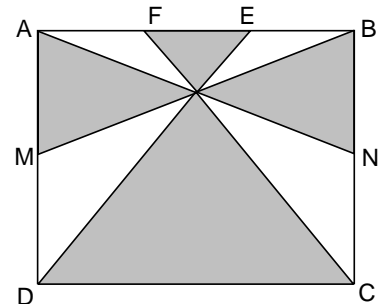
MATHEMATICS

19. A $9 \times 9 \times 9$ cube is composed of twenty – seven $3 \times 3 \times 3$ cubes. The big cube is 'tunneled' as follows: First, the six $3 \times 3 \times 3$ cubes which make up the center of each face as well as the center $3 \times 3 \times 3$ cube are removed as shown. Second, each of the twenty remaining $3 \times 3 \times 3$ cubes is diminished in the same way. That is, the center facial unit cubes as well as each center cube are removed. The surface area of the final figure is
- (A) 384 (B) 729
(C) 864 (D) 1056

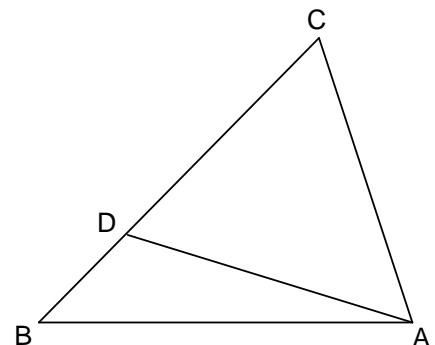


20. How many non – congruent right triangles with positive integer leg lengths have areas that are numerically equal to 3 times their perimeters?
- (A) 6 (B) 7
(C) 8 (D) 10

21. In the given figure the quadrilateral ABCD is a square with a side of length 2 units which M and N are the midpoints of AD and BC, respectively. Determine the area of the shaded area (Given that AN, BM, FC and ED are straight line segments).
- (A) $\frac{8}{3}$ (B) 2
(C) $\frac{7}{4}$ (D) None of these



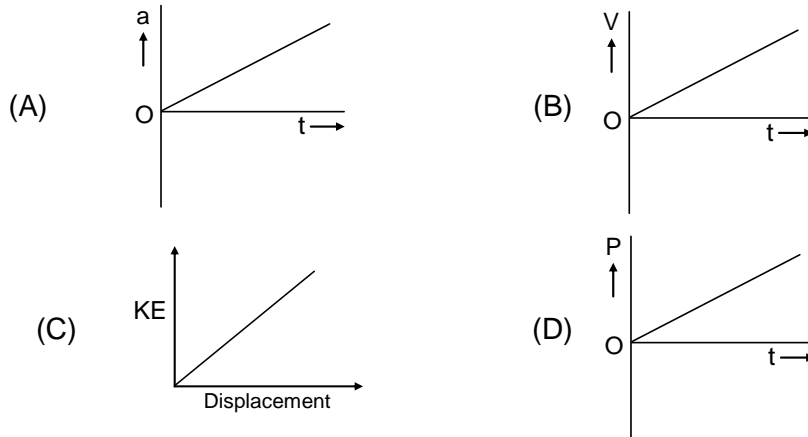
22. If α, β, γ and δ are roots of the equation $x^4 - 3x^3 + x^2 - 2x + 1 = 0$, then the value of $\frac{1}{3} \sum \alpha^3$ is
- (A) 6 (B) 7
(C) 8 (D) 10
23. If area and circumradius of a triangle ABC are 8 and 2 respectively, then the maximum value of in – radius of $\triangle ABC$ is
- (A) $\frac{2}{3}$ (B) $\frac{3}{4}$
(C) $\frac{4}{3}$ (D) $\frac{3}{2}$
24. In triangle ABC, $\angle ABC = 45^\circ$. Point D is on \overline{BC} so that $2 \times BD = CD$ and $\angle DAB = 15^\circ$. Find $\angle ACB$?
- (A) 54° (B) 60°
(C) 72° (D) 75°



SECTION – B

PHYSICS

1. A block is resting over a smooth horizontal plane. A constant horizontal force starts acting on it at $t = 0$. Which of the following graphs is/are correct?



2. Due to refraction of light in atmosphere
- (A) Stars appear to twinkle.
 - (B) the sun appears to be oval in morning and evening.
 - (C) the period of visibility of sun increases.
 - (D) the phenomenon of mirage and looming takes place.

CHEMISTRY

3. Two liquids 'X' and 'Y' can be separated by a separating funnel. Y and water can also be separated by the same method. Which of the following conclusions can be inferred on the basis of above information?
- (A) X and Y are miscible liquids
 - (B) A mixture of X and water can be separated by fractional distillation
 - (C) X and Y are immiscible liquids
 - (D) A mixture of Y and water can also be separated by fractional distillation
4. Which among the following compounds have the same empirical formula?
- (A) Glucose
 - (B) Ethyl alcohol
 - (C) Acetic acid
 - (D) Sucrose

BIOLOGY

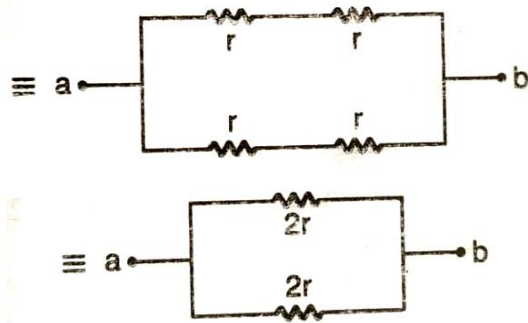
5. Examination of the blood of a person suspected of having Anaemia shows large, immature and nucleated erythrocytes without hemoglobin. Supplementing his diet with which of the following, is likely to alleviate his symptoms?
- (A) Cyanocobalamin
 - (B) Folic acid
 - (C) Riboflavin
 - (D) Ascorbic acid

6. Which of the following statement is/are incorrect regarding the transport of O_2 and CO_2 in the body?
- (A) Haemoglobin carries about 20% -25% of CO_2
 - (B) Haemoglobin transport 97% O_2
 - (C) CO_2 is completely transported through plasma
 - (D) CO_2 is completely transported by Haemoglobin

MATHEMATICS

7. If $p(x)$ is a cubic polynomial such that $(x-1)^2$ is a factor of $p(x)+2$ and $(x+1)^2$ is a factor of $p(x)-2$ then which of the following is/are True?
- (A) $p(5) = 100$
 - (B) $p(5) = 110$
 - (C) $p(4) = 52$
 - (D) $p(4) = 60$
8. If $\frac{\sin^4 x}{5} + \frac{\cos^4 x}{4} = \frac{1}{9}$, then which of the following is/are TRUE?
- (A) $\cot^2 x = \frac{4}{5}$
 - (B) $\tan^2 x = \frac{4}{5}$
 - (C) $\frac{64}{\cos^6 x} + \frac{125}{\sin^6 x} = 1458$
 - (D) $\frac{125}{\cos^6 x} + \frac{64}{\sin^6 x} = 1458$

Equivalent circuit is given as follows:



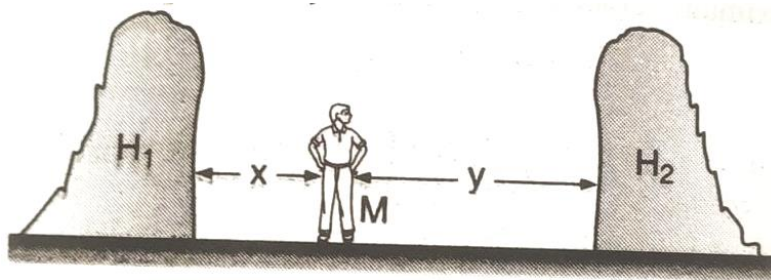
Therefore, resultant resistance between pints a and b

$$\frac{1}{R} = \frac{1}{2r} + \frac{1}{2r} = \frac{1}{r} \quad \text{or} \quad R = r$$

Hence, correct answer is (D)

5. **C**

Sol. Let the man M be at a distance x from hill H_1 and y from hill H_2 as shown in figure. Let $y > x$.



The time interval between the original sound and echoes from H_1 and H_2 will be respectively.

$$t_1 = \frac{2x}{v} \text{ and } t_2 = \frac{2y}{v} \text{ (where } v \text{ is the velocity of sound)}$$

The distance between the hills is,

$$x + y = \frac{v}{2}(t_1 + t_2) = \frac{340}{2}(1 + 2) = 510 \text{ m}$$

6. **C**

Sol. Let m be the mass and ρ the density of solid.

$$\text{Volume} = (m/\rho)$$

$$m_1 g = mg - \frac{m}{\rho} d_1 g \quad \dots \text{(i)}$$

$$m_2 g = mg - \frac{m}{\rho} d_2 g \quad \dots \text{(ii)}$$

$$m_3 g = mg - \frac{m}{\rho} d_3 g \quad \dots \text{(iii)}$$

$$\text{Equation (ii) - equation (i), } \rho = \frac{d_2 - d_1}{(m_1 - m_2)} m$$

$$\text{Equation (ii) - equation (iii), } \rho = \frac{d_3 - d_2}{(m_2 - m_3)} m$$

$$\therefore \frac{d_2 - d_1}{(m_1 - m_2)} m = \frac{d_3 - d_2}{(m_2 - m_3)} m$$

$$\text{or } (d_2 - d_1)m_2 - (d_2 - d_1)m_3 = (m_1 - m_2)(d_3 - d_2)$$

$$m_3 = \frac{(d_2 - d_1)m_2 - (d_3 - d_2)(m_1 - m_2)}{(d_2 - d_1)}$$

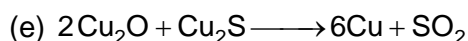
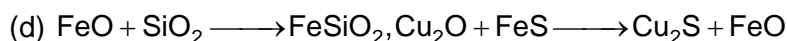
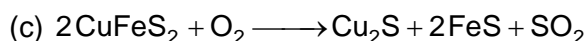
$$= \frac{m_2(d_3 - d_1) - m_1(d_3 - d_2)}{(d_2 - d_1)}$$

CHEMISTRY

7. **C**

Sol. (a) Crushing and grinding

(b) Concentration of ore by froth flotation



(f) Electrolytic refining

Hence, the correct option is (C)

8. C

Sol. Energy 3d orbital is more than 4s because energy of an orbital depends on the sum of principal quantum number and azimuthal quantum number. Nitrogen is stable due to half-filled 2p-orbitals.

Assertion is correct but Reason is wrong

Hence the correct option is (C)

9. A

Sol. Balanced chemical equation for the complete combustion of one mole of a hydrocarbon is
Given that

$$\frac{y}{2} = x + 1 \text{ [from(1)]}$$

$$y = 2x + 2$$

Given that

$$x + \frac{y}{4} = \frac{13}{2} \text{ [from(2)]}$$

$$x + \frac{2x + 2}{4} = \frac{13}{2} \Rightarrow \frac{6x + 2}{4} = \frac{13}{2}$$

$$12x = 52 - 4 = 48 \Rightarrow x = \frac{48}{12} = 4$$

$$\therefore \frac{y}{2} = x + 1 = 4 + 1 = 5 \Rightarrow \therefore y = 10$$

$$x = 4, y = 10, C_xH_y = C_4H_{10}$$

Hence, the correct option is (A)

10. D

Sol. Mass of 5.6 L of gas at STP = xg

$$\text{Mass of 22.4 L of gas at STP} = \frac{x \times 22.4}{5.6} = 4xg$$

Molecular mass of the gas = $4x$

$$\text{Vapour density of the gas} = \frac{4x}{2} = 2x$$

Hence, the correct option is (D).

11. B

Sol. Volume of each balloon = 253 mL

$$\text{According to ideal gas equation } \frac{P_1V_1}{T_1} = \frac{P_2V_2}{T_2}$$

$$\Rightarrow \frac{20 \times 2}{400} = \frac{1 \times V_2}{273} \Rightarrow V_2 = \frac{273}{10} L = 27.3L$$

$$\therefore \text{Volume of He gas available for filling balloons} = \text{Total volume} - \text{Volume of cylinder} \\ = 27.3 - 2 = 25.3 L$$

$$\therefore \text{Number of balloons} = \frac{25.3L}{0.253L} = 100$$

Hence, the correct option is B

12. D

Sol. The polarising power of the cation is directly proportional to the charge possessed by it and inversely proportional to the radius. The order of covalent character of chlorides of four metals is $D < C < B < A$

Hence the correct option is D

BIOLOGY

13. **C**
Sol. **Active site** is the name given to the specifically shaped region of the enzyme where the reaction occurs.
14. **B**
Sol. Offspring formed by sexual reproduction exhibit more variation than those formed by Asexual Reproduction because gametes of parents have qualitatively different genetic composition
15. **A**
Sol. Yes, the biological father is male 5.
16. **C**
Sol. Influx of Na^+ and outflux of K^+ ions is responsible for nerve action potential.
17. **A**
Sol. The gases in exhaled air would be in order of $\text{N}_2 > \text{O}_2 > \text{CO}_2 > \text{H}_2$
18. **B**
Sol. On elevating the concentration of CO_2 under light saturated condition C_3 plant will saturate fast and C_4 plants remain unaffected

MATHEMATICS

19. **D**
Sol. After step one, twenty $3 \times 3 \times 3$ cubes remain, eight of which are corner cubes and twelve of which are edge cubes. At this stage each $3 \times 3 \times 3$ corner cube contributes 27 units of area and each $3 \times 3 \times 3$ edge cube contributes 36 units of area. The second stage of the tunneling process takes away 3 units of area from each of the eight $3 \times 3 \times 3$ corner cubes (1 for each exposed surface), but adds 24 units to the area (4 units for each of the six 1×1 center facial cubes removed). The twelve $3 \times 3 \times 3$ edge cubes each lose 4 units but gain 24 units. Therefore, the total surface area of the figure is
$$8.(27 - 3 + 24) + 12.(36 - 4 + 24) = 384 + 672 = 1056 .$$
20. **A**
Sol. Let the triangle have leg lengths a and b , with $a \leq b$. The given condition implies that
So $\frac{1}{2}ab = 3(a + b + \sqrt{a^2 + b^2})$, $ab - 6a - 6b = 6\sqrt{a^2 + b^2}$.
Squaring both sides and simplifying yields.
 $ab(ab - 12a - 12b + 72) = 0$ from which $(a - 12)(b - 12) = 72$.
The positive integer solutions of the last equation are $(a, b) = (3, 4), (13, 84), (14, 48), (15, 36), (16, 30), (18, 24)$ and $(20, 21)$. However, the solution $(3, 4)$ is extraneous, and there are six right triangles with the required property.
21. **A**
Sol. The areas of the left and right triangles are both one – fourth the area of the area of the rectangle ABNM which gives an area of $\frac{1}{2}$. The area of the lower triangle is $\frac{1}{2}(2)\left(\frac{3}{2}\right) = \frac{3}{2}$.
The area of the upper triangle is $\frac{1}{9}$ th the lower triangle (compare their altitudes). Hence, the area is $\frac{3}{2}\left(\frac{1}{9}\right)$.

Therefore the area of the shaded region is $\frac{1}{2} + \frac{1}{2} + \frac{3}{2} + \frac{1}{6} = \frac{8}{3}$.

22. C

Sol. $x^4 - 3x^3 + x^2 - 2x + 1 = 0$

$$\therefore \sum \alpha = 3, \sum \alpha\beta = 1, \sum \alpha\beta\gamma = 2, \alpha\beta\gamma\delta = 1$$

$$\Rightarrow x^3 - 3x^2 + x - 2 + \frac{1}{x} = 0$$

$$\Rightarrow x^3 = 3x^2 - x + 2 - \frac{1}{x}$$

$$\Rightarrow \sum \alpha^3 = 3\sum \alpha^2 - \sum \alpha + \sum 2 - \sum \frac{1}{\alpha}$$

$$\Rightarrow \sum \alpha^3 = 3\left((\sum \alpha)^2 - 2\sum \alpha\beta\right) - \sum \alpha + 8 - \frac{\sum \alpha\beta\gamma}{\alpha\beta\gamma\delta} = 24$$

So, $\frac{1}{3} \sum \alpha^3 = 8$

23. C

Sol. $r = \frac{\Delta}{s} = \frac{8}{s} = \frac{16}{2s}$ for maximum value of r , $2s$ must be minimum i.e. $2s = a + b + c$

Now $R = 2$

$$\therefore R = \frac{abc}{4\Delta} \Rightarrow abc = 64$$

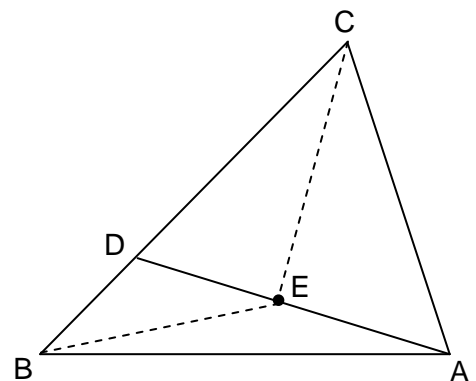
\therefore using A.M. \geq G.M. in a, b, c

$$\frac{a+b+c}{3} \geq (abc)^{1/3} \Rightarrow a+b+c \geq 12$$

Hence $r|_{\max} = \frac{16}{12} = \frac{4}{3}$

24. D

Sol. Let E be a point on \overline{AD} such that \overline{CE} is perpendicular to \overline{AD} , and draw \overline{BE} . Since $\angle ADC$ is an exterior angle of $\triangle ADB$, it follows that $\angle ADC = \angle DAB + \angle ABD = 15^\circ + 45^\circ = 60^\circ$. Thus $\triangle CDE$ is a $30^\circ - 60^\circ - 90^\circ$ triangle and $DE = \frac{1}{2}CD = BD$. Hence $\triangle BDE$ is isosceles and $\angle EBD = \angle BED = 30^\circ$. But $\angle ECB$ is also equal to 30° and therefore $\triangle BEC$ is isosceles with $BE = EC$. On the other hand, $\angle ABE = \angle ABD - \angle EBD = 45^\circ - 30^\circ = 15^\circ = \angle EAB$. Thus $\triangle ABE$ is isosceles with $AE = BE$. Hence $AE = BE = EC$. Right triangle AEC is also isosceles with $\angle EAC = \angle ECA = 45^\circ$. Hence $\angle ACB = \angle ECA + \angle ECD = 45^\circ + 30^\circ = 75^\circ$.

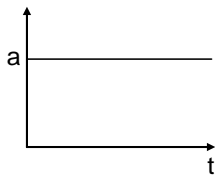


SECTION – B

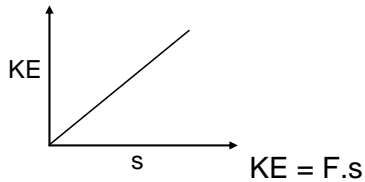
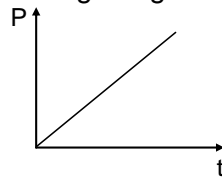
1. **BC**

Sol.

$$a = \frac{F}{m} = \text{Constant}$$



P-t graph should pass through origin.



2. **ABC**

Sol. Mirage & looming take place due to total internal reflection.

CHEMISTRY

3. **BC**

Sol. X and Y are immiscible liquids and X and water can be separated by fractional distillation.

4. **AC**

Sol. Glucose & cetic acid have same empirical formula

BIOLOGY

5. **AB**

Sol. Deficiency of vitamin B₉ and B₁₂ leads **megaloblastic anaemia**.

6. **CD**

Sol. Blood is the medium of transport for O₂ and CO₂. About 97% of O₂ is transported by RBCs in the blood. The remaining 3% of O₂ is carried in a dissolved state through the plasma. Nearly 20-25% of CO₂ is transported by RBCs whereas 70% of it is carried as bicarbonate. About 7% of CO₂ is carried in a dissolved state through plasma.

MATHEMATICS

7. **BC**

Sol. If $(x - a)$ divides a polynomial $q(x)$ then $q(a) = 0$. Let $p(x) = ax^3 + bx^2 + cx + d$. Since

$(x - 1)$ divides $p(x) + 2$, we get

$$a + b + c + d + 2 = 0$$

$$\text{Hence } d = -a - b - c - 2 \text{ and } p(x) + 2 = a(x^3 - 1) + b(x^2 - 1) + c(x - 1)$$

$$= (x - 1)\{a(x^2 + x + 1) + b(x + 1) + c\}$$

Since $(x - 1)^2$ divides $p(x) + 2$, we conclude that $(x - 1)$ divides $a(x^2 + x + 1) + b(x + 1) + c$.

This implies that $3a + 2b + c = 0$. Similarly using the information that $(x + 1)^2$ divides $p(x) - 2$, we get two more relations : $-a + b - c + d - 2 = 0$; $3a - 2b + c = 0$.

Solving we obtain $b = d = 0$, and $a = 1$, $c = -3$. Thus only polynomial satisfying this is $p(x) = x^3 - 3x$. So $p(5) = 110$ and $p(4) = 52$

8. AC

Sol. We have $\frac{9}{5}\sin^4 x + \frac{9}{4}\cos^4 x = 1$

$$\Rightarrow \frac{9}{5}\tan^4 x + \frac{9}{4} = \sec^4 x \text{ (on dividing throughout by } \cos^4 x \text{)}$$

$$\Rightarrow \frac{9}{5}\tan^4 x + \frac{9}{4} = (1 + \tan^2 x)^2$$

$$\Rightarrow 16\tan^4 x - 40\tan^2 x + 25 = 0$$

$$\Rightarrow (4\tan^2 x - 5)^2 = 0$$

$$\therefore \tan^2 x = \frac{5}{4}$$

$$\text{Now, } \sec^2 x = 1 + \tan^2 x = 1 + \frac{5}{4} = \frac{9}{4}$$

$$\text{and } \operatorname{cosec}^2 x = 1 + \cot^2 x = 1 + \frac{4}{5} = \frac{9}{5}$$

Hence $64\sec^6 x + 125\operatorname{cosec}^6 x$

$$= \left(64 \times \frac{729}{64}\right) + \left(125 \times \frac{729}{125}\right) = 1458$$