

FIITJEE INTERNAL TEST

MOCK TEST - 1

for

NTSE STAGE – I

(All Class X Batches)

Scholastic Aptitude Test (SAT)

QP CODE:

Time: 120 Minutes

Maximum Marks: 100

Please read the instructions carefully.

INSTRUCTIONS

- A: The question paper consists of **100** multiple choice questions divided into five sections.
Section – I contains **40** questions of **SST**.
Section – II contains **20** questions of **Mathematics**.
Section – III contains **13** questions of **Physics**.
Section – IV contains **13** questions of **Chemistry**.
Section – V contains **14** questions of **Biology**.
- For each question you will be **awarded 1 mark** if you darken the bubble corresponding to the correct answer and zero mark if no bubbles is darkened or your response is incorrect.
- Attempt **All** questions.
- Use of Calculator is **NOT PERMITTED**.
- All symbols have their usual meanings, if not mentioned in the question.
- The Question Paper contains blank spaces for your rough work.
No additional sheets will be provided for rough work.
- This booklet also contains **OMR** answer sheet.

Enrollment No. : Batch : _____

Name : _____

Candidate's Signature _____ Invigilator's Signature: _____

Section – I
Social Science
(1 – 40)

1. Kal Baisakhi is associated with
(A) Punjab (B) Kashmir
(C) Karnataka (D) Bengal
1. D
2. Mango showers occur in which one of the following group of two states?
(A) Bihar and West Bengal (B) Tamilnadu and Kerala
(C) Karnataka and Kerala (D) Maharashtra and Andhra Pradesh
2. C
3. How much desired area is required for forest in our country?
(A) 16% (B) 20%
(C) 23.2% (D) 33%
3. D
4. Which type of soil develops due to high temperature and evaporation
(A) Forest soil (B) Arid Soil
(C) Black soil (D) Red soil
4. B
5. Which of the following crop is not a millet?
(A) Jowar (B) Maize
(C) Ragi (D) Bajra
5. B
6. Which one of the following is a leguminous crop?
(A) Pulses (B) Millets
(C) Maize (D) Cotton
6. A
7. Select the most important factor for the site selection of a Thermal Power Plant ?
(A) Availability of Water (B) Cost of Plant
(C) Availability of Fuel (D) Distance from the populated area
7. A
8. What are the Khetri mines famous for
(A) Coal (B) Copper
(C) Iron (D) Gold
8. B
9. Which one of the following is a mineral based industry?
(A) Sugar (B) Tea
(C) Coffee (D) Iron and Steel industry
9. D
10. Which one of the following Industry uses limestone as a raw material?
(A) Aluminium (B) Sugar
(C) Cement (D) Jute
10. C

11. Which is the only industry in India which is self – reliant?
 (A) Textile industry (B) Iron and steel
 (C) Electrical (D) Sugar
11. A
12. Nomadic Tribes need to move from one place to another because of
 (A) Seasonal changes (B) In search of pastures
 (C) To maintain ecological balance (D) All of these
12. B
13. The word Maasai means
 (A) My people (B) Pasture land
 (C) Shifting cultivation (D) Wasteland
13. A
14. Under Corn laws British government restricted the imports of
 (A) Wheat (B) Rice
 (C) Corn (D) Barley
14. C
15. A major supplier of wheat in world market was
 (A) Africa (B) South East Asia
 (C) Asia (D) North America
15. D
16. 19th century 'Indenture' has often been described as
 (A) Forced conscription (B) A new system of slavery
 (C) Doing administrating job (D) Serfdom
16. B
17. What was Spinning Jenny?
 (A) A machine (B) A car
 (C) A tractor (D) A bus
17. A
18. The earliest kind of print technology was 1st developed in
 (A) India (B) China
 (C) Britain (D) France
18. B
19. Protestant Reformation movement is related to religion;
 (A) Buddhism (B) Hinduism
 (C) Christianity (D) Jainism
19. C
20. Name the Act which resulted in formation of 'United Kingdom of Great Britain'.
 (A) The Act of Union 1707 (B) Tax Reform Act 1620
 (C) Communication Act 1784 (D) Unity Act 1884
20. A

21. Where did Napoleon spend his last years ?
 (A) Isle of Man (B) Malta
 (C) Bermuda (D) St. Helena
21. D
22. Where was Gandhi's ashram located?
 (A) Dhandi (B) Sabarmati
 (C) Allahabad (D) Nagpur
22. B
23. Political parties do not perform the following function
 (A) To form public opinion
 (B) To give political education to the people
 (C) To contest election
 (D) To have faith in violent methods
23. D
24. India has
 (A) One -party system (B) Two party system
 (C) Multi-Party system (D) None of these
24. C
25. Which of the following system of power sharing is called "checks and balances" ?
 (A) Federal division of powers (B) Both a and b
 (C) Vertical division of powers (D) Horizontal distribution of powers
25. D
26. Which two language are generally spoken in Belgium?
 (A) French and English (B) Dutch and English
 (C) French and Dutch (D) Dutch and Sinhala
26. C
27. Select two bases on which new states of India have been created
 (A) Religion and geography (B) Language and regional
 (C) Culture and religion (D) Geography and language
27. B
28. Select the countries that follow 'coming together' federal system
 (A) India, Spain, Canada (B) USA, China, Australia
 (C) USA, Switzerland, Australia (D) China & India only
28. C
29. Select the laws enacted by Parliament for the welfare of women
 (A) Special marriage act of 1955 (B) Dowry prohibition act of 1961
 (C) Equal remuneration act of 1976 (D) All of these
29. D
30. According to "Census of India 2011," which one of the following states has the lowest female literacy ?
 (A) Kerala (B) Orissa
 (C) Bihar (D) Madhya Pradesh
30. C

31. On what ideologies does Indian National Congress rest?
 (A) Communalism (B) Secularism
 (C) Socialism (D) Federalism
31. B
32. What is an "Alliance"?
 (A) One party contest elections
 (B) Several parties join hands for contesting elections
 (C) Two parties contest elections
 (D) None of these
32. B
33. What is regarded as a 'definite plus point' of democratic regimes?
 (A) rule of minority
 (B) participative decision making
 (C) ability to handle social differences, division and conflicts
 (D) none of these
33. C
34. Bufferstock is the stock of food grains produced by the government
 (A) IFCI (B) FCI
 (C) IDBI (D) FICCI
34. B
35. Sustainable development focus on more use of
 (A) Renewable resources (B) Abiotic resources
 (C) Agricultural resources (D) Natural resources
35. A
36. Which of the following do we get when we divide National Income of a country by its Total Population?
 (A) Per capital income (B) Gross development product
 (C) Human development index (D) None of the above
36. A
37. Which sector has gained more importance in last thirty years in India?
 (A) Primary (B) Secondary
 (C) Tertiary (D) All the above
37. C
38. Sectors are compared on the basis of
 (A) Income earned (B) GDP rate
 (C) Employment offered (D) All of the above
38. D
39. After a year or two, if the SHG is regular in saving, it becomes eligible for availing loan from
 (A) Cooperative societies (B) Money lenders
 (C) Bank (D) Traders
39. C
40. "National consumer's day" in India is observed on
 (A) December 24 (B) December 14
 (C) January 14 (D) December 31
40. A

Section – II
Mathematics
(1 – 20)

1. A parallelogram has 3 of its vertices at (1, 2), (3, 8) and (4, 1). Compute the sum of all possible x coordinates of the 4th vertex.

- (A) 8 (B) 6
(C) 2 (D) 11

1. A

Sol. There are three possibilities; the 4th vertex must be opposite one of the three given vertices. These three possibilities have $x = 6$ or $x = 2$ or $x = 0 \Rightarrow$ sum = 8

2. Evaluate the sum $1 - 2 + 3 - 4 + \dots + 2007 - 2008$

- (A) -1004 (B) -502
(C) -1008 (D) None of these

2. A

Sol. Every odd integer term can be paired with the next even integer, and this pair sums to -1. There are 1004 such pairs, so the total sum is -1004

3. Three real numbers x, y and z are such that $\frac{(x+4)}{2} = \frac{(y+9)}{(z-3)} = \frac{(x+5)}{(z-5)}$. Determine the value

of $\frac{x}{y}$.

- (A) $\frac{2}{3}$ (B) $\frac{1}{2}$
(C) $\frac{3}{4}$ (D) $\frac{1}{3}$

3. B

Sol. Because the first and third fractions are equal, adding their numerators and denominators

produces another fraction equal to the others: $\frac{((x+4)+(x+5))}{(2+(z-5))} = \frac{(2x+9)}{(z-3)}$. Then

$$y + 9 = 2x + 9.$$

$$\Rightarrow \frac{x}{y} = \frac{1}{2}$$

4. In any quadrilateral ABCD, the value of $\sin(A+B) + \sin(C+D)$ is equal to

- (A) 1 (B) π
(C) 0 (D) -1

4. C

Sol. $A + B + C + D = 360^\circ$

$$A + B = 360 - (C + D)$$

$$\sin(A + B) = \sin(360 - (C + D))$$

$$\sin(A + B) = -\sin(C + D)$$

$$-\sin(C + D) + \sin(C + D) = 0$$

5. A polynomial f has the property that $f(3x - 1) = x^2 + x + 1$. What is $f(5)$?

- (A) 7 (B) 13
(C) 31 (D) 111

5. A

Sol. The value of $3x - 1$ is 5 when $x = 2$. Thus

$$f(5) = f(3 \cdot 2 - 1) = 2^2 + 2 + 1 = 7$$

6. Tom's age is T years, which is also the sum of the ages of his three children. His age N years ago was twice the sum of their ages then. What is $\frac{T}{N}$?

- (A) 2 (B) 3
(C) 4 (D) 5

6. D

Sol. Tom's age N years ago was $T - N$. The sum of his three children's ages at that time was $T - 3N$. Therefore $T - N = 2(T - 3N)$, so $5N = T$ and $\frac{T}{N} = 5$.

7. If $a^2 + b^2 + c^2 - ab - bc - ca = 0$ find $\frac{2a + 3b}{4c} + \frac{5c + 6b}{7c}$

- (A) $\frac{79}{28}$ (B) 1
(C) $\frac{71}{35}$ (D) $\frac{81}{31}$

7. A

Sol. $a^2 + b^2 + c^2 - ab - bc - ca = 0 \Rightarrow \frac{1}{2}[(a-b)^2 + (b-c)^2 + (c-a)^2] = 0$

$$\Rightarrow a = b = c$$

$$\Rightarrow \frac{2a + 3b}{4c} + \frac{5c + 6b}{7c}$$

$$= \frac{5}{4} + \frac{11}{7} = \frac{35 + 44}{28} = \frac{79}{28}$$

8. Suppose x , y and z are positive real numbers with $xy = 24$, $xz = 48$, and $yz = 72$. What is the value of $x + y + z$?

- (A) 18 (B) 19
(C) 20 (D) 22

8. D

Sol. Since $x = \frac{24}{y} = \frac{48}{z}$, we have $z = 2y$. So $72 = 2y^2$, which implies that $y = 6$, $x = 4$, and $z = 12$.

$$\text{Hence } x + y + z = 22$$

9. Let x be a real number such that $\sec x - \tan x = 2$. Then $\sec x + \tan x =$

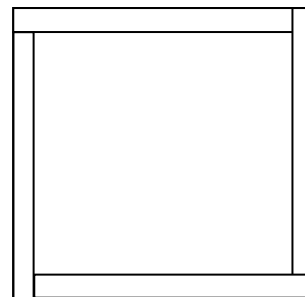
- (A) 0.1 (B) 0.2
(C) 0.3 (D) 0.5

9. D

Sol. From the identity $1 + \tan^2 x = \sec^2 x$ it follows that

$$1 = \sec^2 x - \tan^2 x = (\sec x - \tan x)(\sec x + \tan x) = 2(\sec x + \tan x), \text{ so } \sec x + \tan x = 0.5$$

10. A large square is divided into a small square surrounded by four congruent rectangles as shown. The perimeter of each of the congruent rectangles is 14. What is the area of the large square?
 (A) 49 (B) 64
 (C) 100 (D) 121



10. A
 Sol. Let x and y denote the dimensions of the four congruent rectangles. Then $2x + 2y = 14$, so $x + y = 7$. The area of the large square is $(x + y)^2 = 7^2 = 49$.

11. If $f(x) = ax^4 - bx^2 + x + 5$ and $f(-3) = 2$, then $f(3) =$
 (A) -5 (B) -2
 (C) 1 (D) 8

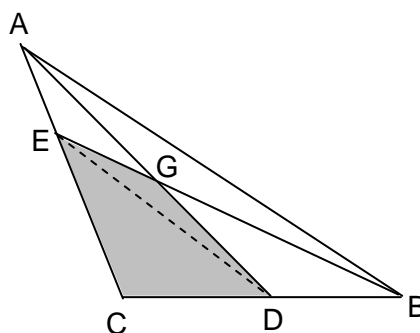
11. D
 Sol. Since $f(3) = a(3)^4 - b(3)^2 + 3 + 5$ and $f(-3) = a(-3)^4 - b(-3)^2 - 3 + 5$, it follows that $f(3) - f(-3) = 6$. Thus, $f(3) = f(-3) + 6 = 2 + 6 = 8$

12. In triangle ABC, the medians AD and BE meet at the centroid G. Determine the ratio of the area of quadrilateral CDGE to the area of triangle ABC.

- (A) $\frac{1}{2}$ (B) $\frac{1}{4}$
 (C) $\frac{1}{3}$ (D) $\frac{2}{3}$

12. C
 Sol. Refer to the figure on the right
 $[CDGE] = [CDE] + [GED]$

$$\begin{aligned} &= \frac{1}{4}[ABC] + \frac{1}{3}[BED] \\ &= \frac{1}{4}[ABC] + \frac{1}{3}\left(\frac{1}{4}[ABC]\right) \\ &= \frac{1}{4}[ABC] + \frac{1}{12}[ABC] \\ &= \frac{1}{3}[ABC] \end{aligned}$$



13. Evaluate : $6 + \frac{16}{6 + \frac{16}{6 + \frac{16}{6 + \dots}}}$

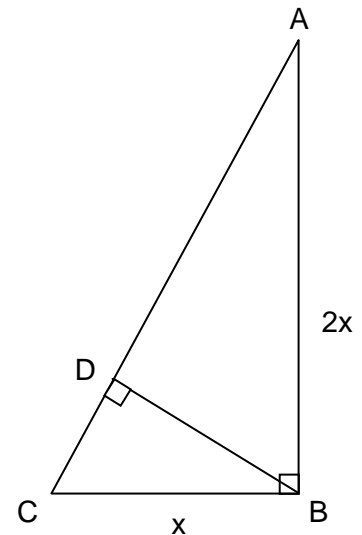
- (A) 2 (B) 4
 (C) -2 (D) 8

13. D
 Sol. Let x be equal to the continued fraction to be evaluated. Assuming the continued fraction converges, we must have $x = 6 + \frac{16}{x}$, which has 8 and -2 as solutions. Since x must be positive, $x = 8$

14. If the ratio of the legs of a right triangle is 1 : 2, then the ratio of the corresponding segments of the hypotenuse made by a perpendicular upon it from the right angled vertex is:
 (A) 1 : 4 (B) $1:\sqrt{2}$
 (C) 1 : 2 (D) $1:\sqrt{5}$

14. A

Sol. From figure $AC = \sqrt{5}x$
 $\Rightarrow CD = \frac{x}{\sqrt{5}}$ and $AD = \frac{4x}{\sqrt{5}}$
 $\Rightarrow \frac{CD}{AD} = \frac{1}{4}$



15. The values of k for which the equation $2x^2 - kx + x + 8 = 0$ will have real and equal roots are:
 (A) 9 and -7 (B) only -7
 (C) 9 and 7 (D) -9 and -7

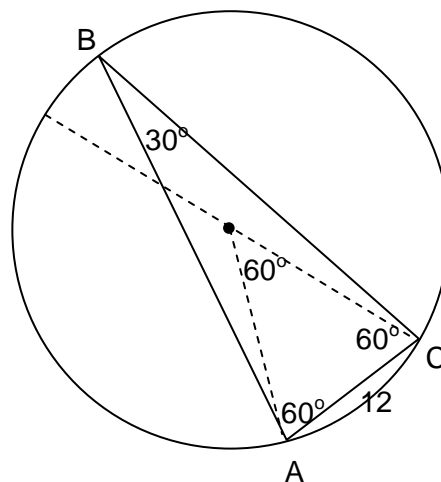
15. A

Sol. $2x^2 - x(k-1) + 8 = 0$. For real, equal roots the discriminant $(k-1)^2 - 64 = 0$ and $k-1 = \pm 8$.
 $\therefore k = 9$ or -7 .

16. If one side of a triangle is 12 inches and the opposite angle is 30 degrees, then the diameter of the circumscribed circle is:
 (A) 18 inches (B) 30 inches
 (C) 24 inches (D) 20 inches

16. C

Sol. Let the 12 inches side be AC.
 Since $\angle B = 30^\circ$, $\angle C = 60^\circ$
 $\therefore \overline{AC} = r$;
 $\therefore 2r = d = 24$ (inches)



17. The medians of a right triangle which are drawn from the vertices of the acute angles are 5 cm and $\sqrt{40}$ cm. The value of the hypotenuse (in cm) is:
 (A) 10 (B) $2\sqrt{40}$
 (C) $\sqrt{13}$ (D) $2\sqrt{13}$

17. D

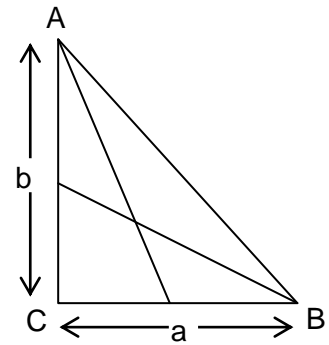
Sol. From the given information it follows that for the right triangle ABC,

$$\left(\frac{a}{2}\right)^2 + b^2 = 25 \text{ and } a^2 + \left(\frac{b}{2}\right)^2 = 40$$

$$\therefore a^2 = 36 \text{ and } b^2 = 16$$

$$\therefore c^2 = a^2 + b^2 = 52;$$

$$\therefore c = 2\sqrt{13}$$



18. If r and s are the roots of the equation $ax^2 + bx + c = 0$, the value of $\frac{1}{r^2} + \frac{1}{s^2}$ is:

- (A) $b^2 - 4ac$ (B) $\frac{b^2 - 4ac}{2a}$
 (C) $\frac{b^2 - 4ac}{c^2}$ (D) $\frac{b^2 - 2ac}{c^2}$

18. D

Sol. Since $\frac{1}{r^2} + \frac{1}{s^2} = \frac{r^2 + s^2}{r^2s^2} = \frac{(r+s)^2 - 2rs}{(rs)^2}$, and since

$$r + s = -\frac{b}{a} \text{ and } rs = \frac{c}{a}, \text{ we have } \frac{1}{r^2} + \frac{1}{s^2} = \frac{b^2 - 2ac}{c^2}$$

19. An equilateral triangle has its side of $3\sqrt{3}$ cm, then radius of its circum-circle is:

- (A) 3 cm (B) 4 cm
 (C) $2\sqrt{3}$ cm (D) 2 cm

19. A

Sol. $R = \frac{2}{3} \times \text{altitude}$

$$= \frac{2}{3} \times \frac{\sqrt{3}}{2} \times 3\sqrt{3}$$

$$= 3 \text{ cm}$$

20. If the height of right circular cylinder is increased by 10% while radius of base is decreased by 10% then curved surface area of cylinder

- (A) Remains same (B) Decreases by 1%
 (C) Increases by 1% (D) Increases by 0.1%

20. B

Sol. Let height = h radius = r
 CSA = $2\pi rh$

$$\text{Increased height} = \frac{11h}{10}$$

$$\text{Decreased radius} = \frac{9}{10}r$$

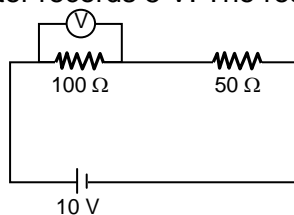
$$\text{New CSA} = 2\pi rh \times \frac{99}{100}$$

$$\text{Decrease in CSA} = \frac{2\pi rh}{100}$$

$$\text{Decrease \%} = \frac{\frac{2\pi rh}{100}}{2\pi rh} \times 100 = 1\%$$

Section – III
Physics
(1 – 13)

1. In the given circuit, the voltmeter records 5 V. The resistance of the voltmeter in ohms is



- (A) 200
 (C) 10
 (B) 100
 (D) 50

1. B

Sol. Voltage across parallel combination of voltmeter V and $100\ \Omega$ resistor.
 = voltage across $50\ \Omega$ resistor
 = 5 V.

\therefore Equivalent resistance of voltmeter and $100\ \Omega$ resistor = $50\ \Omega$

or $\frac{100 \times R_V}{100 + R_V} = 50$

or $2 R_V = 100 + R_V$

or $R_V = 100\ \Omega$.

2. A ball is thrown upwards with speed v from the top of a tower and it reaches the ground with speed $3v$. What is the height of the tower?

- (A) $\frac{v^2}{g}$
 (C) $\frac{4v^2}{g}$
 (B) $\frac{2v^2}{g}$
 (D) $\frac{8v^2}{g}$

2. C

Sol. According to the third equation of motion,
 $v^2 - u^2 = 2as$

Given $v = 3v$, $u = v$ and $a = g$

or $(3v)^2 - v^2 = 2gs$ or $s = \frac{4v^2}{g}$

3. Two masses of 1 g and 4 g have same kinetic energy. What is the ratio of their momentum?

- (A) $\frac{1}{2}$
 (B) $\frac{1}{4}$
 (C) 2
 (D) 4

3. A

Sol. $p = \sqrt{2mK}$

4. Gravitational attraction of Earth on the stone of mass M is F_S . If the force on hydrogen balloon of mass M located at the same space is F_B , then

- (A) $F_S > F_B$
 (C) $F_S = F_B$
 (B) $F_S < F_B$
 (D) $F_S = -F_B$

4. C

Sol. $F_S = Mg$; $F_B = Mg$, Hence, $F_S = F_B$

5. Under which of the following conditions a concave mirror can form a real image larger than the actual object?
 (A) When the object is kept at a distance equal to its radius of curvature
 (B) When object is kept at a distance less than its focal length
 (C) When object is placed between the focus and centre of curvature
 (D) When object is kept at a distance greater than its radius of curvature

5. C

Sol. When object is placed between the focus and centre of curvature.

6. A boy is moving in a circle of radius 7 m with constant speed 11 m/sec. Magnitude of displacement in 5 sec is

(A) 55 m (B) 11 m (C) 7 m (D) $7\sqrt{2}$ m

6. D

Sol. After 5 seconds boy reaches a point at an angular displacement 90° after completing 1 revolution.

Hence, displacement = $\sqrt{7^2 + 7^2} = 7\sqrt{2}$ m.

7. Two blocks A and B float in water. If A floats with $\frac{1}{4}$ of its volume immersed and B floats with $\frac{3}{5}$ of its volume immersed, then the ratio of their densities is

(A) $\frac{5}{12}$ (B) $\frac{7}{12}$
 (C) $\frac{9}{12}$ (D) $\frac{11}{12}$

7. A

Sol. $M_A g = \frac{V_A}{4} \rho g$

$\Rightarrow V_A \rho_A g = \frac{V_A}{4} \rho g \quad \dots(1)$

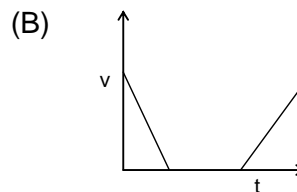
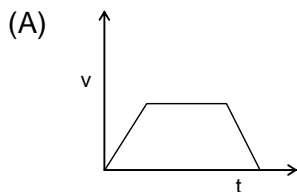
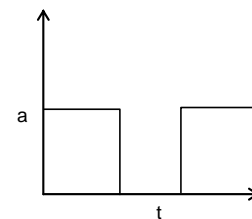
$\rho =$ density of water

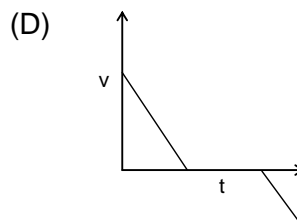
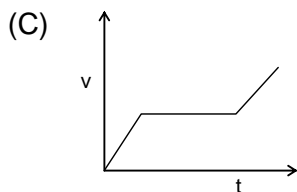
$\Rightarrow V_B \rho_B g = \frac{3}{5} V_B \rho g \quad \dots(2)$

Dividing (1) by (2)

$\frac{\rho_A}{\rho_B} = \frac{5}{12}$

8. Acceleration-time graph of a body is shown in figure. The velocity-time graph of the same body will be





8. C
Sol. When acceleration constant, velocity increases uniformly with time and when $a = 0$, velocity is constant.

9. When objects at different distances are seen by the eye, which of the following remain constant?
(A) Focal length of eye lens (B) Object distance from eye lens
(C) Image distance from eye lens (D) Radii of curvature of eye lens

9. C
Sol. Distance between eye lens and retina does not change.

10. A progressive wave of frequency 500 Hz is travelling with a speed of 350 m/s. A compressional maximum appears at a place at a given instant. The minimum time interval after which a rarefaction maximum occurs at the same point is

- (A) $\frac{1}{250}$ s (B) $\frac{1}{500}$ s
(C) $\frac{1}{1000}$ s (D) $\frac{1}{350}$ s

10. C

Sol. Time interval between compressional maximum and rarefaction maximum = $\frac{T}{2}$

$$\therefore \frac{T}{2} = \frac{1}{2v} = \frac{1}{2 \times 500} = \frac{1}{1000} \text{ s} \quad \left(\because T = \frac{1}{v} \right)$$

11. The magnetic field inside a long straight solenoid-carrying current
(A) is zero (B) decreases as we move towards its end
(C) increase as we move towards its end (D) is the same at all points

11. B

Sol. The magnetic field within the solenoid is uniform except near the ends. It decreases as we move towards its end.

12. To keep the chain reaction under control in a nuclear reactor, one uses

- (A) moderator (B) coolant
(C) control rods (D) reactor core

12. C

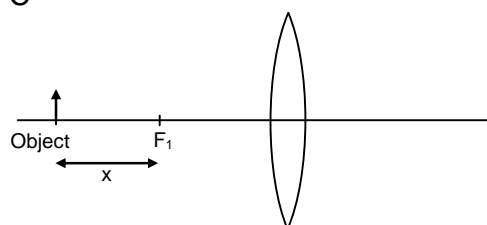
Sol. Factual

13. The focal length of a convex lens is f . An object is placed at a distance x from its first focal point. The ratio of the size of the real image to that of the object is

- (A) $\frac{f}{x^2}$ (B) $\frac{x^2}{f}$ (C) $\frac{f}{x}$ (D) $\frac{x}{f}$

13. C

Sol.



Object distance = $-(x + f)$

Focal length = f

Using lens formula $v = +\frac{f(f - x)}{x}$

$$m = -\frac{f}{x}$$

Section – IV

Chemistry

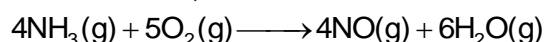
(1 – 13)

1. Alum is added with muddy water to
(A) kill bacteria (B) make filtration of milk
(C) make sedimentation process quick (D) all of the above

1. C

Sol. Alum is added with muddy water to make sedimentation process quick.

2. In the reaction,



When 1 mole of ammonia and 1 mole of O_2 are made to react to completion

- (A) 1 mole of H_2O is produced (B) 1 mole of NO will be produced
(C) all the oxygen will be consumed (D) all the ammonia will be consumed

2. C

Sol. When 1 mole of ammonia and 1 mole of O_2 are made to react to completion, all the oxygen will be consumed.

3. How many oxygen atoms are in 2.71×10^{25} molecules of O_2 ?

- (A) 5.42×10^{25} (B) 4.272×10^{24}
(C) 3.281×10^{26} (D) 5.9×10^{28}

3. A

Sol. No. of oxygen atoms present in 2.71×10^{25} molecules of $\text{O}_2 = 2.71 \times 10^{25} \times 2$
 $= 5.42 \times 10^{25}$ atoms

4. When 20 ml of $\frac{M}{20}$ NaOH are added to 10 ml of $\frac{M}{10}$ HCl, the resulting solution will

- (A) turn red litmus into blue (B) turn phenolphthalein solution pink colour
(C) turn methyl orange red (D) will have no effect on red or blue litmus

4. D

Sol. When 20 ml of $\frac{M}{20}$ NaOH are added to 10 ml of $\frac{M}{10}$ HCl, the resulting solution will have no effect on red or blue litmus.

5. Metal behave as a good reducing agent, because

- (A) they have low ionization energy (B) they can loose electrons easily
(C) both (A) and (B) (D) none of the above

5. C

Sol. Metal behave as a good reducing agent, because they have low ionization energy and they can loose electrons easily.

6. Choose the correct option for calorific value of fuels:

- (A) Biogas < Petrol < Methane < Hydrogen
(B) Biogas < Methane < Petrol < Hydrogen
(C) Biogas < Petrol < Hydrogen < Methane

- (D) Petrol < Biogas < Methane < Hydrogen
6. A
Sol. The correct option for calorific value of fuels: Biogas < Petrol < Methane < Hydrogen.
7. 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 colloid
(D) Sol is a liquid-solid colloid and gel is a solid liquid colloid
7. B
Sol. Sol is a solid-liquid colloid and gel is liquid-solid colloid.
8. Two substances, A and B combine together to form a product A_2B , according to the following $2A + B \rightarrow A_2B$ which of the following statements concerning this reaction are incorrect?
(i) The product A_2B shows the properties of substance A and B
(ii) The product A_2B will always have a fixed composition
(iii) The product A_2B so formed cannot be classified as a compound
(iv) The product so formed is an element
(A) (i), (ii) and (iii) (B) (ii), (iii) and (iv)
(C) (i), (iii) and (iv) (D) All of these
8. C
Sol. Product A_2B will always have a fixed composition. Rest others options are incorrect.
9. Which of the following methods would you use to separate cream from milk?
(A) Fractional distillation (B) Centrifugation
(C) Chromatography (D) Seperating funnel
9. B
Sol. Centrifugation method would be used to separate cream from milk.
10. Which of the following statements about the electron is incorrect?
(A) It is a negatively charged particle.
(B) The mass of electron is equal to the mass of neutron.
(C) It is the basic constituent of all atoms.
(D) It is a constituent of cathode rays.
10. B
Sol. The incorrect statement is: The mass of electron is equal to the mass of neutron.
11. Element 'M' forms a chloride with the formula MCl_2 which is a solid with high melting point. M would most likely be in the same group of the periodic table as
(A) Si (B) Mg
(C) Al (D) Na
11. B
Sol. M would most likely be in the same group of the periodic table as Mg.
12. The number of chain isomers of pentane is
(A) 2 (B) 3
(C) 4 (D) 5
12. B
Sol. The number of chain isomers of pentane is 3.
13. C_3H_8 belongs to the homologous series of
(A) alkynes (B) alkenes
(C) alkanes (D) cycloalkanes
13. C
Sol. C_3H_8 belongs to the homologous series of alkanes.

Section – V
Biology
(1 –14)

1. Name an organism which contains single chromosome and cell division occurs through fission or budding?

- (A) Eukaryotes (B) Prokaryotes
(C) protozoa (D) yeast

Ans. **B**

Sol. Prokaryotes contain single chromosome and cell division occurs through fission or budding.

2. Intestine absorbs the digested food materials. What types of epithelial cells are responsible for that?

- (A) Stratified squamous epithelium (B) Columnar epithelium
(C) Spindle fibres (D) Cuboidal epithelium

Ans. **B**

Sol. Columnar epithelium is present in small intestine.

3. A person met with an accident in which two long bones of the hand were dislocated. Which among the following may be the possible reason?

- (A) Tendon breaks (B) Break of skeletal muscle
(C) Ligament breaks (D) Areolar tissue breaks

Ans. **C**

Sol. Ligament establishes connection between bone to bone.

4. In peas, a pure tall plant (TT) is crossed with a short plant (tt). The ratio of pure tall plants to short plants in F₂ is:-

- (A) 1 : 3 (B) 3 : 1
(C) 1 : 1 (D) 2 : 1

Ans. **C**

Sol. When pure bred tall plant with phenotype (TT) crossed with short plant with phenotype (tt), the possible progeny in F₂ generation: TT (1), tt (1) and Tt (2). Thus the ratio of pure tall (TT) to pure short (tt) is 1:1.

5. A basket of vegetables contains carrot, potato, radish and tomato. Which of them represent the correct homologous structures?

- (A) Carrot and potato (B) Carrot and tomato
(C) Radish and carrot (D) Radish and potato

Ans. **C**

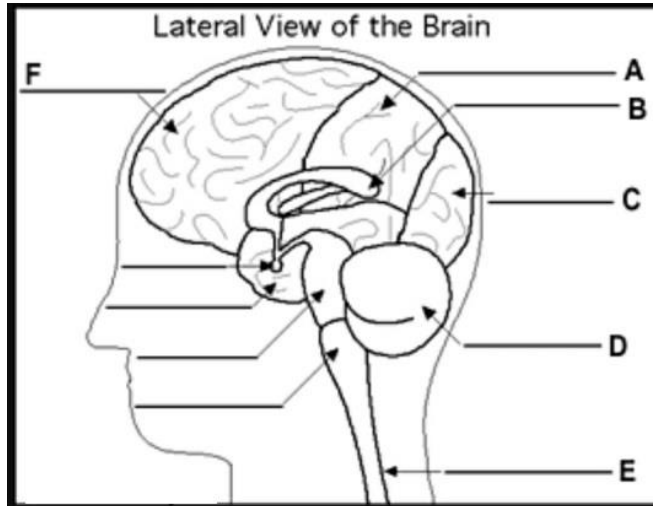
Sol. Radish and carrot represent homologous structures as they have the same structure or basic design through they are different species

11. When raisins are kept in water, the water moves ____i____ the raisins. This makes the raisins to __ii____.
- (A) i- inside, ii- swell (B) i- inside, ii- shrink
(C) i- outside, ii- swell (D) i-outside, ii- shrink

Ans. **A**

Sol. When raisins are kept in water, the water moves **inside** the raisins. This makes the raisins to **swell**.

12. Which letter on the image indicates the cerebellum?



- (A) Letter 'A' (B) Letter 'D'
(C) Letter 'F' (D) Letter 'E'

Ans. **B**

Sol. Letter 'D' indicates the cerebellum.

13. Characteristic of smooth muscle fibres are:–

- (A) Spindle shaped, unbranched, non-striated, uninucleate and involuntary
(B) Spindle shaped, unbranched, non-striated, multinucleate and involuntary
(C) Cylindrical, unbranched, striated, multinucleate and voluntary
(D) Cylindrical, unbranched, striated, uninucleate and voluntary

Ans. **A**

Sol. Characteristic of smooth muscle fibres are spindle shaped, unbranched, non-striated, uninucleate and involuntary.

14. People living at sea level have around 5 million RBC per cubic millimeter of their blood whereas those living at an altitude of 5400 metres have around 8 million. This is because at high altitude:–

- (A) there is more UV radiation which enhances RBC production
(B) people eat more nutritive food, therefore more RBCs are formed
(C) people get pollution-free air to breathe and more oxygen is available

(D) atmospheric O_2 level is less and hence more RBCs are needed to absorb the required amount of O_2 to survive

Ans. **D**

Sol. This is because at high altitude atmospheric O_2 level is less and hence more RBCs are needed to absorb the required amount of O_2 to survive