FIITJEE INTERNAL TEST

Batches: Udaya One Yr CRP(2223) & Udaya Two Yr CRP(2123) _PT-2&6

N S E J S

Paper Code

Time: 1.30 Hours ***Maximum Marks: 180***

A. Question Paper Format

1. The question paper consists of 4 **parts** (Physics -**Section-I**, Chemistry - **Section-II**, Mathematics- **Section-III** and Biology- **Section IV**) and each part consists of **four sections**.

2. **Each Section** contains **15** multiple choice questions. Each question has 4 choices (A), (B), (C) and (D) for its answer, out of which **only one is correct.**

B. Marking scheme:

1. For each question in **Section I, II, III** & **IV** you will be awarded **3 marks** if you darken only the bubble corresponding to the correct answer and **zero mark** if no bubbles are darkened. In all other cases, **minus one (-1) mark** will be awarded.

Enrolment No. :

Name : . . . . . .

Batch : . . . . . **Date:**. . . . . .

SECTION – I
PHYSICS

1. A source produces 48 waves in 12 seconds. The distance between a crest and the consecutive trough is 5 m, the frequency and the wavelength is:
(A) 4 Hz, 10 m (B) 4 Hz, 5 m
(C) 0.25 Hz, 5 m (D) 0.25 Hz, 10 m

1. A

Sol. Frequency $= \frac{\text{Number of wave}}{\text{Total time taken}}$

2. Large amplitude of vibrations will produce:
(A) Loud sound (B) Meak sound
(C) Slow sound (D) Shreak sound

2. A

Sol. Loudness depends on energy of sound wave and energy depends on square of amplitude of wave.

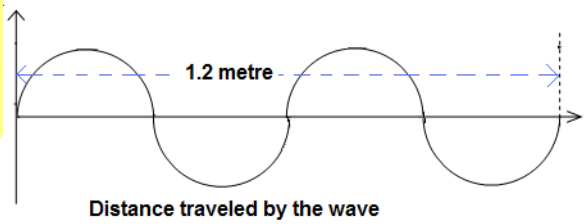
3. A mountain climber experiences nose bleeding when he reaches the top. What could be the cause of his bleeding?

(A) increase in atmospheric pressure (B) decrease in atmospheric pressure
(C) increase in gravitational pull (D) decrease in gravitational pull

3. B

Sol. Atmospheric pressure decreases with increase in altitude from sea level.

4. The wave is travelling with the speed of 1500 m/s in water as shown in diagram. Find its frequency



(A) 25 KHz (B) 25.5 KHz
(C) 2.5 KHz (D) 0.5 KHz

4. C

Sol. $f = \frac{v}{\lambda} = \frac{1500}{1.2} \times 2\,\text{Hz}$

5. The frequency of sound waves in water is :
(A) Same as that of frequency of source (B) Less than frequency of source
(C) More than frequency of source (D) None

5. A
Sol. Same as that of frequency of source.

6. Time period of a pendulum is found to depend upon L (length) as
(A) $T \propto L$ (B) $T \propto L^2$
(C) $T^2 \propto L$ (D) $T \propto \sqrt{\frac{1}{L}}$

6. C
Sol. Time period of a pendulum (T) = $2\pi\sqrt{\frac{L}{g}}$

7. A boy hears an echo of his own voice from a distant hill after one seconds, the speed of sound in air is 340 m/s. What is the distance of hill from the boy?
(A) 165 m (B) 320 m
(C) 340 m (D) 170 m

7. D
Sol. Using, $2d = v \times t \Rightarrow d = \frac{340 \times 1}{2} = 170$ m

8. Which of the following can be a unit of wavelength?
(A) dyne (B) erg
(C) Angstrom (D) Kilowatt

8. C
Sol. Angstrom is used to measure very small distance.

9. A sound signal of 20 vibrations per second has a wavelength 7 m. What is the speed with which the wave travels?
(A) 40 m/s (B) 140 m/s
(C) 490 m/s (D) 25 m/s

9. B
Sol. As $v = f\ \lambda \Rightarrow v = 20 \times 7 = 140$ m/s

10. We cannot hear the sound of explosion which takes place on the moon, why?
(A) Sound waves are absorbed in earth's atmosphere.
(B) Sound waves are absorbed in moon's atmosphere.
(C) Sound waves require medium for propagation.
(D) The explosion produces high frequency sound waves which are inaudible.

10. C
Sol. Sound needs material medium for propagation.

11. The frequency of a source of sound is 100 Hz. How many times does it vibrate in a minute?

(A) 200 times (B) $\frac{1}{100}$ times (C) 6000 times (D) 1200 times

11. C

Sol. Number of vibrations = $60 \times 100 = 6000$

12. In a transverse wave, the time interval between 1st crest and 11th crest is 50 s, then the time period of wave is _____.

(A) 5 s (B) 10 s (C) 20 s (D) 2 s

12. A

Sol. As, $10T = 50 \Rightarrow T = 5$ second.

13. Ball bearings are used to

(A) Increase friction (B) Decrease friction (C) Optimize friction (D) None of these

13. B

Sol. Ball bearings help to reduce friction.

14. A truck is of mass 50,000 kg. It's tyres exert a pressure of 2,500,000 Pa. The surface area of tyres in contact with ground is $\left(g = 10\,m/s^2\right)$

(A) 2 m^2 (B) 0.2 m^2 (C) 4 m^2 (D) 2.75 m^2

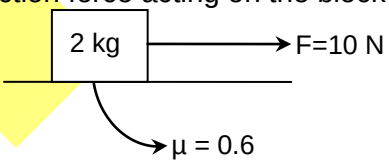
14. B

Sol. Pressure = $\frac{\text{Force}}{\text{Area}} = \frac{50000 \times 10}{\text{Area}}$

$\Rightarrow \quad \frac{2500000}{1} = \frac{500000}{\text{Area}}$

$\Rightarrow \quad \text{Area} = \frac{5}{25} = 0.2\,m^2$

15. A block of mass 2 kg is placed on a rough surface, a force F = 10 N is applied on the block as shown, then friction force acting on the block is



(A) 10 N (B) 12 N (C) 3 N (D) 6 N

15. A

Sol. Limiting friction = $\mu mg = 0.6 \times 2 \times 10 = 12$ N > 10 N

$\therefore$ Friction acting on block = 10 N

SECTION – II
CHEMISTRY

1. What is the underlining principle bases on which fractional distillation is carried out?
(A) Different density of each fraction
(B) Different molecular weight of each fraction
(C) Different boiling point of each fraction
(D) Different melting point each fraction

1. C
Sol. Fractional distillation is carried out on different boiling point of each fraction.

2. Anti knocking agent is
(A) $(C_2H_5)_4Pb$ (B) $(C_2H_5)_4Sn$
(C) $(C_2H_5)_4Pt$ (D) $(C_2H_5)_4Ge$

2. A
Sol. Anti knocking agent is $(C_2H_5)_4Pb$

3. Which substance is also known as Marsh gas?
(A) Methane (B) Solid carbon dioxide
(C) Carbon monoxide (D) Ammonia

3. A
Sol. Methane is also known as marsh gas.

4. Which of the following compounds has a double bond?
(A) $C_{14}H_{28}$ (B) $C_{15}H_{32}$
(C) $C_{12}H_{22}$ (D) $C_{16}H_{34}$

4. A
Sol. General formula of alkene is C_nH_{2n}

5. Conditions necessary for formation of coal from wood inside the earth are:
(A) low temperature and high pressure (B) high temperature and high pressure
(C) high temperature and low pressure (D) low temperature and low pressure

5. B
Sol. High temperature and high pressure is necessary for formation of coal from wood inside the earth.

6. Which of these are correctly matched?
(a) Rayon → bed sheets, carpets
(b) Nylon → parachutes, ropes for climbing
(c) Acrylic → plastic bags, toys
(d) Melamine → floor tiles, kitchens ware

(A) a, b & c (B) b, c & d
(C) a, c & d (D) a, b & d

6. D

Sol. The correctly match are

(i) Rayon → bed sheets, carpets

(ii) Nylon → parachutes, ropes for climbing

(iii) Melamine → floor tiles, kitchens ware

7 Which of the following statements is/are incorrect?

(i) Clothes we wear are made up of thin strands called fibre

(ii) Thermoplastic when molded once cannot be softened on heating.

(iii) It has no risk to wear synthetic clothes while working in the kitchen.

(iv) Plastic is reactive material.

(A) (i), (ii) and (iv) (B) only (i) and (ii)

(C) (i), (ii) and (iii) (D) (ii), (iii) and (iv)

7. D

Sol. Plastic is non-reactive material. Thermoplastic when mould once can be softened on heating. It has very high risk to wear synthetic clothes while working in the kitchen.

8. Consider the following statements given below and choose the correct one:

(i) Coal gas is gaseous fuel, obtained by the heating of coal in the presence of air during the process of coal to get coke.

(ii) Coal tar is thick, black liquid having an unpleasant smell.

(iii) Coke is a tough and porous black solid substance.

(iv) Coke is used in the manufacture of steel.

(A) only (i) (B) (ii), (iii) and (iv)

(C) only (i) and (iii) (D) only (i) and (ii)

8. B

Sol. Coal gas, coal tar and coke are called products of coal. These products are obtained when coal is heated in the absence of air. This is because if coal is heated in the presence of air, then coal burns to produce mainly carbon dioxide gas and no other useful products obtained.

9. Identify the fuel that leaves more smoke and ash or burning

(A) solid fuel (B) liquid fuel

(C) gaseous fuel (D) any of the above

9. A

Sol. Solid fuel leaves more smoke and ash or burning

10. Match the list

List – I		**List – II**	
(P)	Metallic oxide	(1)	Turns blue litmus red
(Q)	Phosphorus	(2)	Kept in kerosene
(R)	Non-metallic oxide	(3)	Basic in nature
(S)	Sodium	(4)	Kept in water

Code:

	P	Q	R	S
(A)	2	3	4	1
(B)	4	3	2	1
(C)	3	4	2	1
(D)	3	4	1	2

10. D

Sol. Metallic oxide → Basic in nature
Phosphorus → Kept in water
Non-metallic oxide → Turns blue litmus red
Sodium → Kept in kerosene

11. Match the list

List – I		List – II	
(P)	Iron oxide	(1)	Liquid metal
(Q)	Noble metal	(2)	Acidic oxide
(R)	Sulphur dioxide	(3)	Gold
(S)	Mercury	(4)	Basic oxide

Code:

	P	Q	R	S
(A)	3	2	4	1
(B)	4	3	2	1
(C)	4	2	1	3
(D)	2	4	3	1

11. B

Sol. Iron oxide → Basic oxide
Noble metal → Gold
Sulphur dioxide → Acidic oxide
Mercury → Liquid metal

12. Mark the correct statement.
(A) Fossil fuels can be made in laboratory
(B) CNG is more polluting than petrol
(C) Petroleum is a mixture of various oxides of carbon
(D) Coal tar is a mixture of various substances

12. D

Sol. The correct statement is
Coal tar is a mixture of various substances

13. Coke burns without smoke and does not cause air pollution because
(A) products other than carbon are removed from it
(B) it is porous and solid
(C) it is light and black in colour
(D) it has lot of impurities in it

13. A

Sol. Coke is the purest form of carbon.

14. Mark the incorrect statement.
(i) Coal gas can be condensed back to give coal
(ii) Coal gas can be obtained as a gaseous product during destructive distillation of coal
(iii) Coal tar and ammonical liquor are useless products
(iv) Coke starts burning when exposed to air

(A) (i), (ii) and (iii)
(B) (i), (iii) and (iv)
(C) (i) and (iv)
(D) (ii), (iii) and (iv)

14. B

Sol. Coal gas cannot be condensed back to give coal. Coal tar & ammonical liquor are useful products.

15. Which of the following is not true about Biogas?
(A) It contains methane
(B) Burns without smoke
(C) Leaves ash behind
(D) Produced by anaerobic decomposition of animal & plant waste

15. C

Sol. Biogas does not leave ash behind.

SECTION – III
MATHEMATICS

1. Find the mean of following frequency distribution

x	4	9	5	6	8	10	7
f	2	3	1	4	5	3	2

(A) 7.4
(B) 6.5
(C) 7.8
(D) 6.1

1. A

Sol. Mean $= \dfrac{\sum fx}{\sum f} = \dfrac{148}{20} = 7.4$

2. $\sqrt{\dfrac{0.081\times 0.484}{0.0064\times 6.25}}$ is equal to

(A) 0.9
(B) 0.99
(C) 9
(D) 99

2. B

Sol. $\sqrt{\dfrac{0.081\times 0.484}{0.0064\times 6.25}} = \sqrt{\dfrac{81\times 484}{64\times 625}} = \dfrac{9\times 22}{8\times 25} = 0.99$

3. The ratio of greatest four digits perfect cube to greatest three digits perfect cube is

(A) $\dfrac{81}{1000}$
(B) $\dfrac{728}{343}$
(C) $\dfrac{343}{27}$
(D) 343

3. C

Sol. $\dfrac{\text{Greatest 4 digit perfect cube}}{\text{Greatest 3 digit perfect cube}} = \dfrac{9261}{729} = \dfrac{343}{27}$

4. In a quadrilateral ABCD, if AO and BO are the bisectors of internal $\angle A$ and $\angle B$ respectively, $\angle C = 70^o$ and $\angle D = 30^o$. Then, $\angle AOB$ =

(A) 40^o
(B) 50^o
(C) 80^o
(D) 100^o

4. B

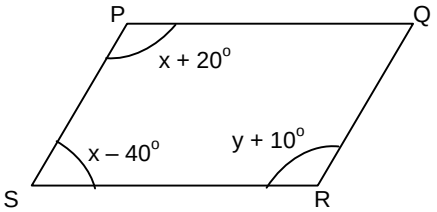
Sol. $\angle A + \angle B = 360^o - (70^o + 30^o) = 260^o$

$\dfrac{1}{2}(\angle A + \angle B) = 130^o$

So, $\angle AOB = 180^o - 130^o = 50^o$

5. In the figure, PQRS is a parallelogram then y =

(A) 80^o
(B) 90^o
(C) 100^o
(D) 110^o



5. D

Sol. $\angle P + \angle S = 180^o \Rightarrow (x + 20^o) + (x - 40^o) = 180^o$

$\Rightarrow x = 100^o$

Now, $\angle S + \angle R = 180^o \Rightarrow 60^o + y + 10^o = 180^o \Rightarrow y = 110^o$

6. A rhombus is divided into two triangles by its longer diagonal with each triangle having a perimeter of 100 cm. If it is divided into four triangles by its diagonals with each triangle having a perimeter of 60 cm then length of shorter diagonal (in cm) is

(A) 10 (B) 15

(C) 20 (D) 12

6. C

Sol. From figure

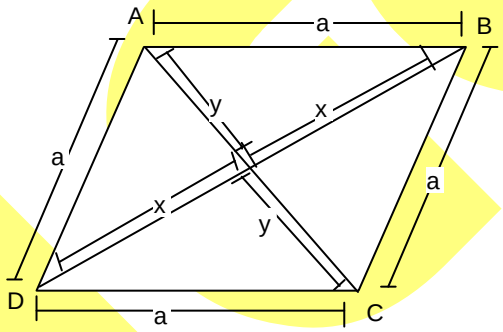
$2x + 2a = 100$

$\Rightarrow x + a = 50\,cm$

Also, $x + y + a = 60\,cm$

So, y = 10 cm

AC = 20 cm



7. In a cyclic quadrilateral ABCD, if $\angle A - \angle C = 60^o$ then $\angle A$ is equal to

(A) 60^o (B) 120^o

(C) 90^o (D) 150^o

7. B

Sol. $\angle A - \angle C = 60^o$ and $\angle A + \angle C = 180^o$

$\Rightarrow \angle A = 120^o$ and $\angle C = 60^o$

8. A dice is rolled twice. The probability that 5 will not come up either time is

(A) $\frac{11}{36}$ (B) $\frac{1}{3}$

(C) $\frac{13}{26}$ (D) $\frac{25}{36}$

8. D

Sol. Total number of outcomes = 36

Favourable number of outcomes = 25

Probability $= \frac{25}{36}$

9. If the sum of one – half and one – fifth of a number exceeds one- third of that number by $7\frac{1}{3}$, then number is

(A) 15 (B) 18

(C) 20 (D) 30

9. C

Sol. Let number = x

$\Rightarrow \left(\frac{x}{2}+\frac{x}{5}\right)-\frac{x}{3}=\frac{22}{3}$

$\Rightarrow x=20$

10. Find the value of x if $\frac{x}{5}-\frac{x}{6}=4$.

(A) 100 (B) 120
(C) 130 (D) 140

10. B

Sol. $\frac{x}{5}-\frac{x}{6}=4 \Rightarrow \frac{x}{30}=4 \Rightarrow x=120$

11. If the mean of x, x + 2, x + 4, x + 6 and x + 8 is 11, then x = ?

(A) 4 (B) 7
(C) 8 (D) 10

11. B

Sol. $\frac{x+(x+2)+(x+4)+(x+6)+(x+8)}{5}=11$

$\Rightarrow 5x+20=55 \quad \Rightarrow x = 7$

12. The range of marks obtained by 20 students in a class is 43. If the highest marks was 94 then what is the lowest marks?

(A) 51 (B) 68.5
(C) 47 (D) 21.5

12. A

Sol. Range = Highest marks – Lowest marks

$\Rightarrow$ 43 = 94 – Lowest Marks

$\Rightarrow$ Lowest marks = 94 – 43 = 51

13. The median of $x,\frac{x}{5},\frac{x}{4},\frac{x}{3},\frac{x}{2.5}$ is 7 then the value of x is

(A) 21 (B) 27
(C) 28 (D) 17.5

13. A

Sol. Arrange in ascending order

$\frac{x}{3}=7$

$x=21$

14. 10 years ago, the ratio of age of A and B was 3 : 2 and after 10 years their ages ratio will become 4 : 3. Find the sum of their present age

(A) 100 (B) 120
(C) 140 (D) 160

14. B

Sol. If present age of A is x and B is y

$\frac{x-10}{y-10}=\frac{3}{2}, \frac{x+10}{y+10}=\frac{4}{3}$

$2x-3y+10=0$ ……(i)

$3x-4y=10$ ……...(ii)

$x=70$ and $y=50$

$x+y=120$

15. In a quadrilateral ABCD , $\angle C=64^0$, $\angle D=\angle C-8^0$, $\angle A=5(a+2)^0$ and $\angle B=2(2a+7)^0$,the value of $\angle A$

(A) 60^o (B) 216^o

(C) 130^o (D) 240^o

15. C

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

$5(a+2)+2(2a+7)+64+64-8^o=360^o$

$9a=216$

a = 24

$\angle A=5(24+2)=130^o$

SECTION – IV
BIOLOGY

1. Kaziranga National Park is located in:
(A) Assam (B) West Bengal
(C) Madhya Pradesh (D) Andman

1. A
Sol. Kaziranga National Park is located in Assam.

2. The plants and animals of a particular area are called respectively:
(A) Fauna and flora (B) Flora and fauna
(C) Flora and producer (D) Species and flora

2. B
Sol. The plants and animals of a particular area are called Flora and fauna.

3. Deforestation increases the level of ……..in the atmosphere.
(A) O_2 (B) CO_2
(C) SO_2 (D) All of the above

3. B
Sol. Deforestation increases the level of CO_2 in the atmosphere.

4. A food chain starts with a:
(A) Producer (B) Consumers
(C) Both (A) and (B) (D) Scavengers

4. A
Sol. A food chain starts with a producer.

5. The microorganism which contains chlorophyll is _____.
(A)Virus (B) Fungus
(C) Algae (D) All of the above

5. C
Sol. The microorganism which contains chlorophyll is algae.

6. The National Park which is located in Rajasthan is:
(A) Corbett National Park (B) Kanha National Park
(C) Sariska National Park (D) Satpura National Park

6. C
Sol. The National Park which is located in Rajasthan is Sariska National Park.

7. During rainy season, moist bread gets spoiled and its surface gets covered with greyish white patches. These patches represents which of the following micro-organism?
(A) Bacteria (B) Protozoa
(C) Algae (D) Fungi

7. D
Sol. During rainy season, moist bread gets spoiled and its surface gets covered with greyish white patches. These patches represents fungi.

8. Rhizobium bacteria are present in the nodules of root of _____ plant.
(A) Rice (B) Maize
(C) Gram (D) Sunflower

8. C
Sol. Rhizobium bacteria are present in the nodules of root of gram plant.

9. Unwanted plants like weeds should be removed as they compete with the main crop for _____, _____ & _____.
(A) Space, water & nutrients (B) Moisture, soil & temperature
(C) Temperature, sowing & nutrients (D) Sunlight, space & temperature

9. A
Sol. Unwanted plants like weeds should be removed as they compete with the main crop for space, water & nutrients.

10. Which of the following is not a consequence of deforestation?
(A) Increase in soil erosion (B) Decrease in rainfall
(C) Increase in earth's temperature (D) Decrease in floods

10. D
Sol. Decrease in floods is not a consequence of deforestation.

11. The species which no longer exist anywhere on the earth are called:
(A) Endemic species (B) Exotic species
(C) Endangered species (D) Extinct species

11. D
Sol. The species which no longer exist anywhere on the earth are called extinct species.

12. Wild buffalo is an endangered species because:
(A) Its population is diminishing
(B) It has become extinct
(C) It is found exclusively in a particular area
(D) Its poaching is strictly prohibited

12. A
Sol. Wild buffalo is an endangered species because its population is diminishing.

13. In-situ conservation includes:
(A) National Park (B) Seed bank
(C) Wild life sanctuary (D) Both (A) and (C)

13. D
Sol. In-situ conservation includes National Park and Wild life sanctuary.

14. ……makes the longest migration.
(A) Antarctica tern B) Artic tern
(C) Siberian crane D) Eels

14. B
Sol. Artic tern makes the longest migration.

15. Restoring of the destroyed forest by planting new trees is known as:
(A) Housekeeping (B) Landscape
(C) Reforestation (D) Deforestation

15. C
Sol. Restoring of the destroyed forest by planting new trees is known as reforestation.