FIITJEE INTERNAL TEST

Batches: Udaya Two Yr CRP(2224)_PT-2

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.

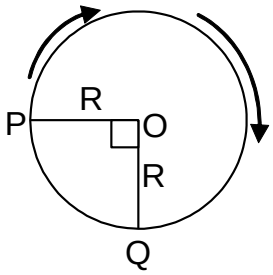
Enrolment No. : | | | | | | | | | | | | | | | | | | | | | | | |

Name : . . . . . .

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

SECTION – I
PHYSICS

1. A body moves along the circumference of circular track of radius R. What is displacement of the body when it covers 3/4th of its circumference?

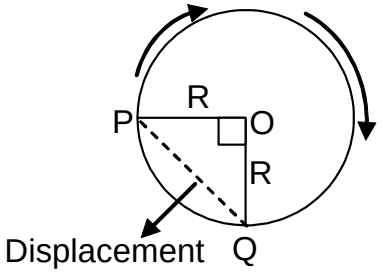


(A) 3R (B) $\frac{3}{4}\pi R$

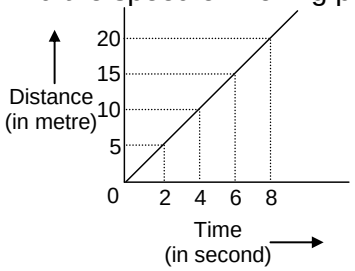
(C) $\frac{3}{2}\pi R$ (D) $\sqrt{2}R$

1. D

Sol. Displacement = $\sqrt{R^2+R^2}=\sqrt{2}R$



2. Find the speed of moving particle from given distance-time graph



(A) 5 m/s (B) 10 m/s

(C) 2.5 m/s (D) 4 m/s

2. C

Sol. From graph, speed $=\frac{5}{2}$ m / s $=$ 2.5 m / s

3. The numerical ratio of displacement to distance covered by an object is

(A) always less than one (B) always equal to one

(C) always more than one (D) equal to or less than one

3. D

Sol. Displacement $\leq$ distance. So, $\frac{\text{Displacement}}{\text{Distance}} \leq 1$.

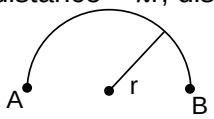
4. A particle covers one half of a circle of radius r. Then the distance and displacement of the particle are:

(A) 2 πr, r (B) πr, 2r

(C) πr, r (D) $\frac{1}{2}\pi$r,r

4. B

Sol. distance = πr, displacement = $2r$



5. A student goes from his house to his school with speed V_1 finding the school closed, return back to his house with speed V_2. Then average speed of the student is,

(A) $\frac{V_1 + V_2}{2}$ (B) $\sqrt{V_1 V_2}$

(C) $\frac{2V_1V_2}{V_1 + V_2}$ (D) $V_1 \cdot V_2$

5. C

Sol. average speed = $\frac{\text{Total distance}}{\text{Total time}}$

$\Rightarrow \frac{2x}{\frac{x}{V_1} + \frac{x}{V_2}} \Rightarrow \frac{2V_1V_2}{V_1 + V_2}$

6. _____ is used to measure distance.

(A) Odometer (B) Lactometer

(C) Barometer (D) All of these

6. A

Sol. Odometer is used to measure distance.

7. Which of the following relations is correct?

(A) Speed = Distance × Time (B) Speed = Distance ÷ Time

(C) Speed = Time ÷ Distance (D) Speed = 1/(Distance × Time)

7. B

Sol. Speed = Distance ÷ Time.

8. S.I. Unit of time is

(A) Second (B) Hour

(C) Day (D) Minute

8. A

Sol. S.I. Unit of time is second.

9. Which one of the following equations is incorrectly written?

(A) $v = u + at$ (B) $s = u + \frac{1}{2}at^2$

(C) $v^2 = u^2 + 2as$ (D) $ut = s - \frac{1}{2}at^2$

9. B

Sol. $s = ut + \frac{1}{2}at^2$

10. A body covers half of the distance with a speed of 4 m/s and the remaining distance at a speed of 6 m/s, then the average speed of the body is
(A) 4.8 m/s (B) 5.1 m/s
(C) 4.2 m/s (D) none of these

10. A

Sol. Average speed = total distance / total time $\Rightarrow \frac{S}{\frac{S}{2\times 4}+\frac{S}{2\times 6}}=\frac{24}{5}=4.8\,\text{m/s}$

11. Land breeze blows during
(A) winter (B) day
(C) night (D) summer

11. C

Sol. Land breeze blows during night.

12. _____ is a device used to measure wind speed?
(A) Ammeter (B) Odometer
(C) Speedometer (D) Anemometer

12. D

Sol. Anemometer is a device used to measure wind speed.

13. Speed with direction is called:
(A) Velocity (B) Movement
(C) Displacement (D) Momentum

13. A

Sol. Speed with direction is called velocity.

14. 1° rise on the Fahrenheit scale is:
(A) Same as 1° rise on celsius scale (B) Greater than 1° rise on celsius scale
(C) Less than 1° rise on celsius scale (D) Is same as 1° rise on Kelvin scale

14. C

Sol. 1°C change in temperature on celsius scale is equivalent to 1.8°F scale.

15. Two bodies are said to be in thermal equilibrium, if they have
(A) Same amount of heat energy (B) Same temperatures
(C) Same amount of total energy (D) None of these

15. B

Sol. Two bodies are said to be in thermal equilibrium, if they have same temperatures.

SECTION – II
CHEMISTRY

1. Rusting of iron
(A) is a chemical process
(B) takes place when it reacts with nitrogen
(C) is a process in which the physical state of iron changes
(D) is a physical change

1. A
Sol. Rusting of iron is a chemical process.

2. In which of the following change, vapors directly converted into solid without passing through the liquid state?
(A) Boiling (B) Melting
(C) Deposition (D) Evaporation

2. C
Sol. In deposition vapors directly converted into solid without passing through the liquid state.

3. Which of the following process is a physical process?
(A) Fractional distillation (B) Reaction of acid and base
(C) Condensation of steam (D) both A & C

3. D
Sol. Fractional distillation & condensation of steam are physical process.

4. Which of the following reaction is called combustion?
(A) Reaction of slaked lime with HCl
(B) Reaction of magnesium and oxygen
(C) Reaction of limewater with carbon dioxide
(D) Reaction of calcium with acids

4. B
Sol. Reaction of magnesium and oxygen is called combustion.

5. Which of the following is a spontaneous process?
(A) Boiling of oil (B) Evaporation of alcohol
(C) Freezing of water vapour (D) burning of camphor

5. B
Sol. Evaporation of alcohol is a spontaneous process.

6. Which of the following is a decomposition reaction?
(A) $CaO + H_2O \rightarrow Ca(OH)_2$ (B) $CaCO_3 \rightarrow CaO + CO_2$
(C) $2Ca + O_2 \rightarrow 2CaO$ (D) $Ca + 2H_2O \rightarrow Ca(OH)_2 + H_2$

6. B
Sol. $CaCO_3 \rightarrow CaO + CO_2$ is a decomposition reaction.

7. Which of the following change takes place if a gas is subjected to high pressure?
(A) Volume increases (B) Contraction takes place
(C) Expansion takes place (D) evaporation takes place

7. B
Sol. Contraction takes place if a gas is subjected to high pressure.

8. Which of the following is a chemical change?
(A) Crystallisation (B) Formation of clouds
(C) Decomposition of a substance (D) None of these

8. C
Sol. Decomposition of a substance is a chemical change.

9. Burning of paper is an example of
(A) physical change (B) chemical change
(C) both (D) none

9. B
Sol. Burning of paper is an example of chemical change .

10. Dissolution of sugar in water is an example of
(A) physical change (B) chemical change
(C) irreversible (D) both A & C

10. A
Sol. Dissolution of sugar in water is an example of physical change.

11. Which of the following is a property of physical change?
(A) formation of new substance takes place
(B) A lot of heat or light energy is absorbed or given out.
(C) Mass of a substance will not alter in a physical change
(D) It is a permanent change

11. C
Sol. Mass of a substance will not alter in a physical change.

12. The state of water which has definite shape & volume is
(A) ice (B) water
(C) steam (D) all

12. A
Sol. The state of water which has definite shape & volume is ice.

13. Which of the following is a compound?
(A) Na (B) O_2
(C) He (D) NO

13. D
Sol. NO is a compound.

14. $Mg + O_2 \rightarrow MgO$ is an example of
(A) displacement reaction (B) combination reaction
(C) decomposition reaction (D) neutralisation reaction

14. B

Sol. $Mg + O_2 \rightarrow MgO$ is an example of combination reaction.

15. Which of the following physical processes is exothermic in nature?

(A) Condensation (B) Vapourisation

(C) Melting (D) None of these

15. A

Sol. Condensation processes is exothermic in nature.

SECTION – III
MATHEMATICS

1. The sum of two angles of a triangle is equal to its third angle. Then the measure of the third angle is
(A) 80° (B) 90°
(C) 60° (D) None of these

1. B

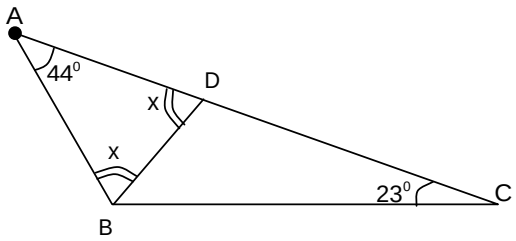
Sol. $\angle A + \angle B + \angle C = 180^o$ (Angle sum property)

$\angle A + \angle B = \angle C$

$\therefore 2\angle C = 180^o$

$\Rightarrow \angle C = 90^o$

2. In the adjoining diagram, AB = AD. $\angle DCB = 23^o$. The measure of $\angle DBC$ is
(A) 55°
(B) 58°
(C) 56°
(D) 45°



2. D

Sol.

In Δ ABD,

$2x + 44° = 180°$

$\Rightarrow x = 68°$

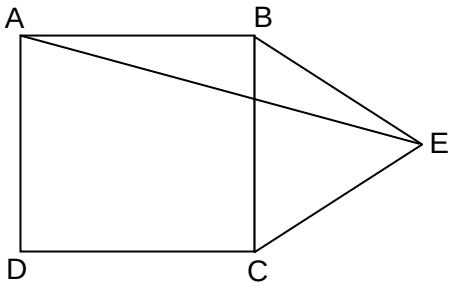
$\angle BDC = 180° - 68° = 112°$ (linear pair)

In Δ BDC,

$23° + 112° + \angle DBC = 180°$

$\Rightarrow \angle DBC = 45°$

3. ABCD is a square. BCE is an equilateral triangle. The measure of $\angle BEA$ is
(A) 15°
(B) 20°
(C) 18°
(D) 16°



3. A

Sol.

In Δ ABE, $\angle ABE = 90° + 60° = 150°$

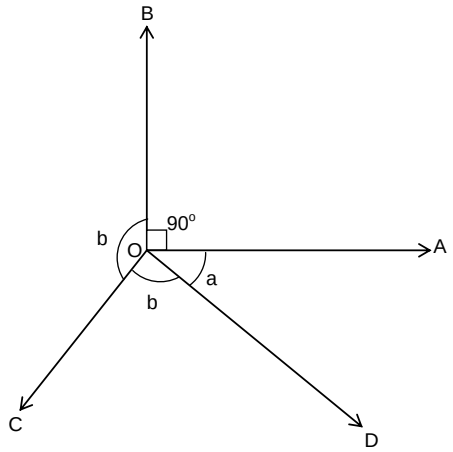
Also, $\angle ABE + \angle BAE + \angle BEA = 180°$

$2\angle BEA = 180° - 150°$ ($\angle BAE = \angle BEA$)

$\angle BEA = 15°$

4. In the figure below, if $b-a=45^0$, then $\angle COD =$ _____

(A) 45°
(B) 65°
(C) 105°
(D) 115°



4. C

Sol. From the diagram,

$b+b+a+90^0=360^0$

$\Rightarrow 2b+a=270^0 \quad .....(1)$

also $b-a=45^0 \quad .....(2)$

Solving $(1)\&(2)$, $a=60^0, b=105^0$

5. In ΔABC, $AB=4cm, BC=7cm$, then third side can be

(A) 13 cm (B) 1 cm
(C) 3 cm (D) 6 cm

5. D

Sol. Triangle inequality

6. In ΔABC, $\angle A=(2x-3)^0$, $\angle B=(4x+5)^0$, $\angle C=(3x-2)^0$ then difference between the greatest and smallest angle is

(A) 37^o (B) 48^o
(C) 85^o (D) 73^o

6. B

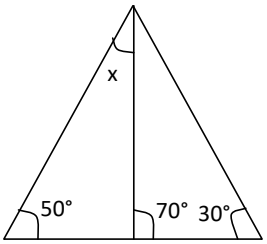
Sol. By angle sum property, x = 20°

$\angle A=37^o, \angle B=85^o, \angle C=58^o$

$\therefore 85^o-37^o=48^o$

7. In given figure, angle x is

(A) 20^0 (B) 10^0
(C) 40^0 (D) 60^0



7. A

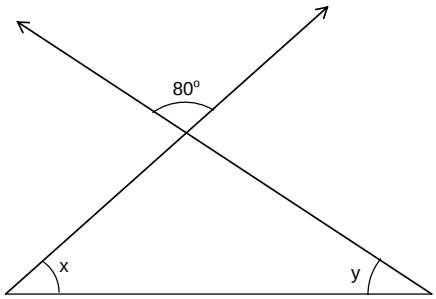
Sol. $x=180^0-(50^0+110^0)$

$=180^0-160^0=20^0$

8. To form a triangle, the length a, b, c of the sides must satisfy
(A) $a+b>c$ only
(B) $a+b>c$ and $b+c>a$ only
(C) $a+b>c, b+c>a, c+a>b$
(D) none of these

8. C
Sol. Triangle inequality

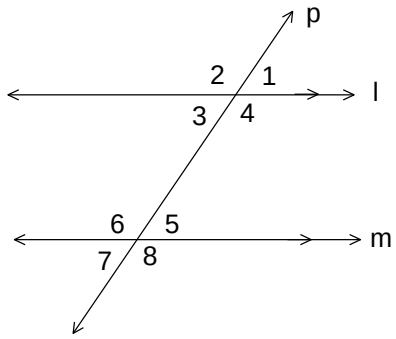
9. From the given figure find the value of x if y = 2x



(A) $\frac{100}{3}$
(B) $\frac{25}{3}$
(C) $\frac{32}{3}$
(D) none of these

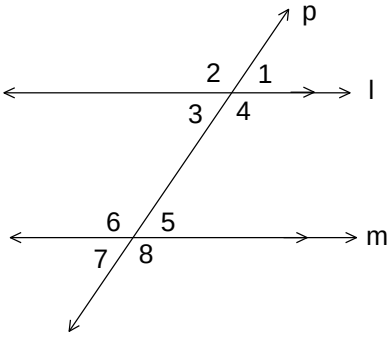
9. A
Sol. Since $x+y+80^o=180^o$ (Angle sum property of triangle)
$\therefore x=\frac{100}{3}$

10. Which of the following is incorrect for the given figure if $l \parallel m$
(A) $\angle 1 + \angle 2 = 180^o$
(B) $\angle 2 + \angle 3 = \angle 1 + \angle 4 = \angle 6 + \angle 7$
(C) $\angle 3 + \angle 8 = 180^o$
(D) $\angle 1 = \angle 8$



10. D
Sol. Using properties of transversal and parallel lines.

11. In the given figure if $l \parallel m$ and $\angle 1 : \angle 2 = 4:5$.
Find $[\angle 2+\angle 4+\angle 6+\angle 8]-[\angle 1+\angle 3+\angle 5+\angle 7]$
(A) 40^o
(B) 60^o
(C) 80^o
(D) none of these



11. C
Sol. $4x + 5x = 180$ (Linear pair)
$\Rightarrow 9x = 180$
$\therefore x=\frac{180}{9}=20^o$
Also $\angle 2=\angle 4=\angle 6=\angle 8$ and $\angle 1=\angle 3=\angle 5=\angle 7$
$\therefore (\angle 2+\angle 4+\angle 6+\angle 8)-(\angle 1+\angle 3+\angle 5+\angle 7)=4\times 100^o-4\times 80^o=80^o$

12. In an isosceles triangle ABC, AB = AC and $\angle A = 3\angle B$. Find $\angle C$?
(A) 36^o (B) 32^o
(C) 28^o (D) 40^o

12. A

Sol. Since $\angle A + \angle B + \angle C = 180^o$

$\therefore\ 3\angle B + \angle B + \angle B = 180^o$

$\therefore \angle B = \angle C = 36^o\ (\because\ AB = AC)$

13. A number has two digits. The unit digit is 3 times the tens digit. If the digits are reversed, the new number thus formed is 36 more than the original number. Then, the original number is equal to
(A) 62 (B) 26
(C) 31 (D) 13

13. B

Sol. Let tens digit = x

$\therefore$ unit digit = 3x

$\therefore$ number $= x \times 10 + 3x = 13x$

Now new number $= 3x \times 10 + x = 31x$

$\therefore\ 31x - 13x = 36$

$\Rightarrow x = 2$

$\therefore$ Original number = 26

14. Find the value of $3 - \dfrac{2}{1 + \dfrac{2}{2 - \dfrac{3}{5}}}$

(A) $\dfrac{36}{13}$ (B) $\dfrac{37}{15}$
(C) $\dfrac{36}{17}$ (D) $\dfrac{37}{17}$

14. D

Sol. $3 - \dfrac{2}{1 + \dfrac{2}{2 - \dfrac{3}{5}}}$

$= 3 - \dfrac{2}{1 + \dfrac{2}{\dfrac{10-3}{5}}} = 3 - \dfrac{2}{1 + \dfrac{2}{\dfrac{7}{5}}}$

$\Rightarrow 3 - \dfrac{2}{1 + \dfrac{10}{7}} = 3 - \dfrac{2}{\dfrac{7+10}{7}}$

$\Rightarrow 3 - \dfrac{14}{17} = \dfrac{51-14}{17} = \dfrac{37}{17}$

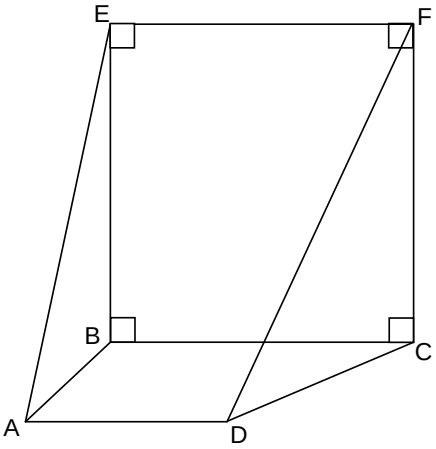
15. In the given figure. ABCD is a parallelogram and BEFC is a square. Which of the following is correct?

(A) $\Delta BAE \cong \Delta FCD$

(B) $\Delta BAE \cong \Delta DCF$

(C) $\Delta ABE \cong \Delta DCF$

(D) $\Delta AEB \cong \Delta DCF$



15. C

Sol. $\because$ ABCD is a parallelogram and BEFC is square.

$\therefore$ AB || CD and BE || CF

$\therefore \angle ABE = \angle DCF$ ……(i)

Now, in ΔABE and ΔDCF

AB = DC [$\because$ ABCD is parallelogram]

$\angle ABE = \angle DCF$ [From equation (i)]

BE = CF [$\because$ BEFC is square]

$\therefore$ By S – A – S criterion

$\Delta ABE \cong \Delta DCF$

SECTION – IV
BIOLOGY

1. Fermentation a process used in alcohol generation is example of:
(A) Aerobic respiration
(B) Anaerobic respiration
(C) Aerotolerant yeast respiration
(D) It's not respiration but a simple carboxylation process

1. **B**
Sol. Fermentation a process used in alcohol generation is example of **anaerobic respiration**.

2. The region around the equator, heated by the direct rays of sun is _____.
(A) Frigid (B) Temperature (C) Torrid (D) None of these

2. **C**
Sol. The region around the equator, heated by the direct rays of sun is **Torrid**.

3. A bottle containing germinating seeds is connected to a tube having lime water. After some time, lime water turns:
(A) White (B) Green
(C) Remains the same (D) Reddish-Brown

3 A
Sol. A bottle containing germinating seeds is connected to a tube having lime water. After some time, lime water turns **white**.

4 Which of these animals is not found in cold habitat?
(A) Reindeer (B) Camel (C) Penguin (D) Polar Bear

4 **B**
Sol. Camel is not found in cold habitat

5. The winter sleep of animals is called
(A) Aestivation (B) Hibernation (C) Perspiration (D) None of these

5. B
Sol. The winter sleep of animals is called **hibernation**.

6. Exchange of gases through lungs is called
(A) Cutaneous (B) Pulmonary respiration
(C) Both (A) and (B) (D) None of these

6. **B**
Sol. Exchange of gases through lungs is called **pulmonary respiration**.

7. The amount of rainfall a place gets depends on:
(A) its closeness to the sea (B) winds
(C) the presence of mountains (D) all of these

7. **D**
Sol. The amount of rainfall a place gets depends on its closeness to the sea, winds and the presence of mountains.

8. Consumption of sweet foods for the longer periods of time will destroy _____, the hardest part of the teeth and causes dental caries.
(A) Enamel (B) Dentine (C) Pulp cavity (D) Bone

8. **A**
Sol. Consumption of sweet foods for the longer periods of time will destroy **Enamel**, the hardest part of the teeth and causes dental caries.

9. How can climate of a tropical rainforest be described?
(A) hot and humid (B) cold and humid
(C) hot and dry (D) moderate temperature & heavy rain

9. **A**
Sol. Climate of a tropical rainforest be described as hot and humid.

10. In tropical grasslands, animals cope up with the competition for food by:
(A) Grazing at different times (B) Fighting for territory
(C) Having different food preference (D) Living in different areas

10. **C**
Sol. In tropical grasslands, animals cope up with the competition for food by **having different food preference**.

11. At compensation point, photosynthesis is:
(A) less than respiration (B) equal to respiration
(C) more than respiration (D) not affected by respiration

11. **B**
Sol. At compensation point, photosynthesis is **equal to respiration**.

12. The hump of camel is a reservoir of:
(A) fatty tissue (B) water (C) milk (D) all of these

12. **A**
Sol. The hump of camel is a reservoir of **fatty tissue**.

13. Which feature is adopted by polar bear to live in extremely cold climate?
(A) A white fur, fat below skin, keen sense of smell
(B) Thin skin, large eyes, a white fur
(C) A long tail, strong claws, white large panes
(D) White body panes for swimming, gills for respiration

13. **A**
Sol. A white fur, fat below skin, keen sense of smell feature is adopted by polar bear to live in extremely cold climate.

14. Dough kept overnight at a warm place become soft and spongy due to:
(A) Absorption of CO_2 from atmosphere (B) Osmosis
(C) Fermentation (D) Diffusion of air into dough

14. **C**
Sol. Dough kept overnight at a warm place become soft and spongy due to **Fermentation**.

15. Which of the following is a migratory bird?
(A) Crow (B) Peacock
(C) Siberian Crane (D) Penguin

15. **C**
Sol. **Siberian Crane** is a migratory bird.