# NEW STANDARD ACADEMY

**Exam : MOCK-** **NEET - JEE** **Marks: 60**
**Date : 04-09-23** **CLASS : 10TH M** **Time: 2 HRS**

## PHYSICS

1. How does the resistivity ofalloys compare with those of pure metals from which they may have been formed?
2. State a difference between the wire used in the element of an electric heater and in a fuse wire.
3. Draw a schematic diagram of a circuit consisting of a cell of 1.5 $V$ , 10Ω resistor and 15 Ω resistor and a plug key all connected in series.
4. Two conducting wires of same material, equal length and equal diameter are connected in series. How does the heat produced by the combination ofresistance change?
5. The values of current (I) flowing through a given resistor of resistance (R), for the corresponding values of potential difference (V) across the resistor are as given below:

| V(Volts) | 0.5 | 1.0 | 1.5 | 2.0 | 2.5 | 3.0 | 4.0 | 5.0 |
|---|---|---|---|---|---|---|---|---|
| I $(Amp$ | 0.1 | 0.2 | 0.3 | 0.4 | 0.5 | 0.6 | 0.8 | 1.0 |

Plot a graph between current (I) and potential difference (V) and determine the resistance (R) of the resistor.

6. (a) Derive the formula for the calculation ofwork done when current flows through a resistor.
(*b*) One electric bulb is rated $40W$ and $240V$ and other $25W$ and 240 V. Which bulb has higher resistance and how many times?
7. When a high resistance voltmeter is connected directly across an electric bulb, its reading is 2 V. An electric cell is sending the current of 0.4 ampere (measured by an ammeter) in the electric circuit.
(a) Draw the circuit.
(*b*) Find the resistance of the electric bulb. (*c*) State the law that is applied for making these calculation. If a graph is plotted between V and I, show the nature of the graph obtaine.

## CHEMISTRY

1. From amongst the metals sodium, calcium, aluminium, copper, and magnesium, name the metal:
(i) which reacts with water only on boiling, and
(ii) another which does not react even with steam.
2. Give the names and formulae of (a) two acidic oxides, and (b) two basic oxides.
3. (a) Name two physical properties each of sodium and carbon in which their behaviour is not as expected from their classification as metal and non-metal respectively.
(b) Name two metals whose melting points are so low that they melt when held in the hand.
4. The atomic number of an element X is 8 and that of element $Y$ is 12. Write down the symbols of the ions you would expect to be formed from their atoms.
5. (a) What is an ion? Explain with examples.
(b) What is the nature of charge on (i) a cation, and (ii) an anion?
(c) Name the cation and anion present in $MgCl_2$. Also write their symbols.
6. State two ways to prevent the rusting of iron.

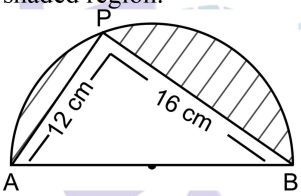
## BIOLOGY

1. (a) What is the genetic constitution of human sperm? (b) Mention the chromosomes pair present in zygote determining the sex of a male child.
2. What are sex chromosomes? Which sex chromosomes are found in male and female human beings? State the chromosome responsible for the development of male child in human beings?
3. A violet pea plant [VV] was crossed with a white one[vv]. F1 generation was allowed to self pollinate and F2 generation was also obtained. Answer the following questions: (a) what would be the phenotype of plants in F1 generation? (b) What would be the percentage of plants with white flowers in F2 generation? (c) What would be the ratio of vv :Vv in F2 generation.

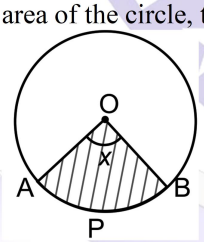
4. An angiosperm plant having red coloured flowers when crossed with the other having the same colour produced 40 progenies, out of which 30 plants were with red coloured flowers, 10 plants were with white coloured flowers. Find out: (a) What is the possible genotype of parent plants? (b) Which trait is dominant and recessive? (c) What is this cross called as and what is its phenotypic ratio?
5. Differentiate between herbivores and consumers.
6. Name two natural ecosystems and two artificial ecosystems.
7. (a) Define decomposers. Name one decomposer. (b) What is the role of decomposers in the ecosystem?

## MATHS

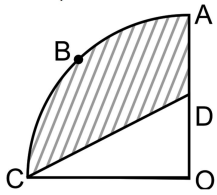
1. In the given figure, AB is the diameter where $AP = 12$ cm and $PB = 16$ cm. Taking the value of $\pi$ as 3, find the perimeter of the shaded region.



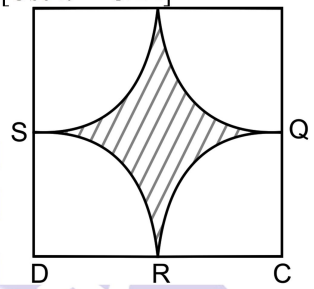

2. In the given figure, $O$ is the centre of a circle? If the area of the sector OAPB is $\frac{5}{36}$ times the area of the circle, then find the value of$x$.



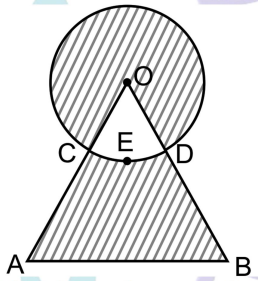

3. The length of the minute hand of a clock is 14 cm. Find the area swept by the minute hand in 5 minutes.
4. In the given figure, OABC is a quadrant of a circle with centre $O$ and radius 3.5 cm. If OD $= 2$ cm, fnd the area of the shaded region.[Use $\pi = \frac{22}{7}$]




5. Find the area of the shaded region in the given figure, where arcs drawn with centres $A, B, C$ and $D$ intersect in pairs at mid points $P, Q, R$ and $S$ of the sides AB, BC, CD and DA respectively of a square ABCD of side 12 cm. [Use $\pi = 3.14$]




6. Find the area of the shaded region shown in the given figure, where a circular arc of radius 6 cm has been drawn with vertex $O$ of an equilateral triangle OAB of side$12cm$ as centre.




7. The circumference of a circle exceeds the diameter by 16.8 cm. Find the radius of the circle. [Use $\pi = \frac{22}{7}$]
8. Without actual division show that $2x^4 - 6x^3 + 3x^2 + 3x - 2$ is exactly divisible by $x^2 - 3x + 2$.
9. If 1 is a zero of polynomial $p(x) = ax^2 - 3(a-1) - 1$, then fnd the value of $a$.
10. If a and $\beta$ are zeroes of the polynomial $f(x) = x^2 - x - k$ such that $\alpha - \beta = 9$, fnd $k$.