

MOCK TEST

SUBJECT : SCIENCE & TECHNOLOGY

CLASS - X

M.M. : 75

TIME : 3 HRS

SECTION A

NOTE :	Q.No. 1 to 5 contain	1 Marks each
	Q.No. 6 to 10 contain	2 Marks each
	Q.No. 11 to 17 contain	3 Marks each
	Q.No. 18 to 20 contain	5 Marks each

- Q.1** Name a metal which is both ductile as well as malleable.
- Q.2** There are two electric bulbs, (i) marked 60 W; 220V and (ii) marked 100 W; 220 V. Which one of the two has a higher resistance ?
- Q.3** Write an example of synthetic rubber.
- Q.4** Give an example of an endothermic reaction.
- Q.5** What kind of lens is used in the spectacles of a person suffering from myopia (near sightedness) ?
- Q.6** With the help of a ray diagram only, show the formation of image by a simple microscope when the object to be seen is placed within the focal length of the objective.
- Q.7** Choose a metal out of the following which reacts with hot water but not with cold water : Sodium, Magnesium, Iron. Mention the products formed during the reaction.
- Q.8** Out of the two, equatorial and polar orbits of man-made satellites, which one is suitable for collection of data for weather prediction ? Why ?
- Q.9** What is efflorescence ? Give an example.
- Q.10** (i) Draw a diagram to show how two resistors R_1 and R_2 are connected in series.
(ii) In a circuit if the two resistors of 5 ohm and 10 ohm are connected in series, how does the current passing through the two resistors compare ?

OR

A bulb is rated at 5.0 volt, 100 mA. Calculate its (i) power, and (ii) resistance.

Q.11 What is meant by the term "magnetic field lines" ? List two properties of magnetic field lines.

OR

With the help of a neat diagram describe how you can generate induced current in a circuit.

Q.12 List the steps involved in the generation of electricity in a nuclear reactor.

OR

Define the terms (i) nuclear fusion and (ii) nuclear fission. Give one example of each.

Q.13 Distinguish between natural and artificial satellites.

Q.14 What is a nuclear reactor ? State one function each of (i) coolant and (ii) moderator in a nuclear reactor.

Q.15 What is an alloy ? Name the constituents of 22 carat gold. Why is 24 carat gold converted to 22 carat gold ?

OR

Draw a labelled diagram to show the extraction of sulphur by Frasch process.

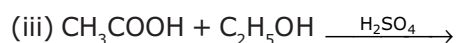
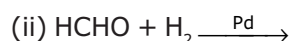
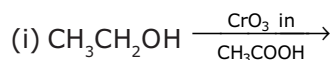
Q.16 (i) How is methanal obtained from methanol ?

(ii) Write the chemical equation of the reaction involved in the preparation of methanol from methanol.

(iii) Mention one use of an aqueous solution of methanal in the biology laboratory.

OR

Complete the following reaction equations :



Q.17 (i) Draw a schematic diagram of a circuit consisting of a battery of five 2V cells, a 5 ohm resistor, a 10 ohm resistor and a 15 ohm resistor, and a plug key, all connected in series.

(ii) Calculate the electric current passing through the above circuit when the key is closed.

Q.18 (i) Explain dynamic equilibrium in chemical reactions, giving a suitable example.

(ii) K_c values of some reversible reactions are large and of some, small. What do these small and large values of K_c suggest about the concentrations of products of these reactions relative to concentrations of reactants in them ?

Q.19 What is an alloy ? How is an alloy made ? List two purposes of making alloys. Mention the constituents and two properties of each of the following alloys :

(i) Stainless steel

(ii) Brass

- Q.20** (a) State the relation between object distance, image distance and focal length of a spherical mirror.
 (b) A concave mirror of focal length 15 cm forms an image of an object kept at a distance of 10 cm from the mirror. Find the position, nature and size of the image formed by it.
 (c) Draw a ray diagram to show the image formed by a concave mirror when an object is placed between pole and focus of the mirror.

OR

- (a) State Ohm's law.
 (b) Describe an activity with the help of a diagram to establish the relationship between current (I) flowing in a conductor and potential difference (V) maintained across its two ends.
 (c) Draw the shape of the curve obtained when a graph is plotted between I and V.

SECTION B

NOTE :	Q.No. 21 to 23 contain	1 Marks each
	Q.No. 24 to 25 contain	2 Marks each
	Q.No. 26 to 29 contain	3 Marks each
	Q.No. 30 contain	5 Marks each

- Q.21** What is breathing ?
- Q.22** Name the type of blood vessels which carry blood from organs to the heart.
- Q.23** Define the term 'Conservation of environment'.
- Q.24** What is meant by a biodegradable waste ? Which of the following is/are biodegradable ? Agriculture residue, Plastics, Insecticides, Sewage.
- Q.25** Suggest any two ways to strike a balance between environment and development.
- Q.26** Draw the diagram of a palisade cell of a plant leaf and label the following in it :
 (i) Chloroplast (ii) Vacuole (iii) Cytoplasm (iv) Nucleus.
- Q.27** Who proposed the 'Theory of Natural Selection' ? Explain this theory briefly.
- Q.28** (a) Draw a diagram of the human urinary system and label in it :
 (i) Kidney, (ii) Ureter, (iii) Urinary bladder, (iv) Urethra
 (b) Name the two major components of normal human urine.

OR

- (a) Name the blood groups under ABO system.
 (b) Differentiate between universal donor and universal recipient under this system.

- Q.29** (i) What is 'genetics' ?
(ii) Give the common name of the plant on which Mendel performed his experiments.
(iii) What for did Mendel use the term factors and what are these factors called now ?
(iv) What are genes ? Where are the genes located ?

OR

- (i) Who provided the evidence of DNA as a genetic material ?
(ii) Why is DNA called as polynucleotide ?
(iii) List the three important features of double helical model of DNA.

- Q.30** What is vegetative propagation ? Describe three methods of artificial vegetative propagation. List two advantages of vegetative propagation.

MOCK TEST

SUBJECT : MATHS

CLASS - X

M.M. : 80

TIME : 3 HRS

NOTE :	Q.No. 1 to 7 contain	2 Marks each
	Q.No. 8 to 19 contain	3 Marks each
	Q.No. 20 to 25 contain	5 Marks each

Q.1 Solve the following system of equations :

$$\frac{9}{x+1} - \frac{8}{y-1} = 1, \quad \frac{3}{x+1} + \frac{4}{y-1} = 2, \quad x \neq -1, y \neq 1$$

OR

Solve the following system of linear equations for x and y :

$$ax + by = 2ab, \quad bx + ay = a^2 + b^2$$

Q.2 Solve the following quadratic equation for x :

$$x^2 - 2(a+2)x + (a+1)(a+3) = 0$$

Q.3 Determine the A.P. whose 5th term is 15 and the sum of its 3rd and 8th terms is 34.

Q.4 The perimeters of two similar triangles are 36 cm and 48 cm respectively. If one side of the first triangle is 9 cm, what is the corresponding side of the other triangle ?

Q.5 Cards numbered 3, 4, 5, 6, , 17 are put in a box and mixed thoroughly. A card is drawn at random from the box. Find the probability that the card drawn bears :

(i) An even number

(ii) A number divisible by 3 or 5.

Q.6 Without using trigonometric tables, evaluate : $2 \frac{\cos 67^\circ}{\sin 23^\circ} - \frac{\tan 40^\circ}{\cot 50^\circ} - \sin 90^\circ$.

OR

If $\frac{\cos \alpha}{\cos \beta} = m$ and $\frac{\cos \alpha}{\sin \beta} = n$, show that $(m^2 + n^2) \cos^2 \beta = n^2$

Q.7 $\triangle ABC$ is right angled at B. On the side AC, a point D is taken such that $AD = DC$ and $AB = BD$. Find the measure of $\angle CAB$.

Q.8 Reduce the following to a rational expression in lowest terms :

$$\frac{(x+2)}{x^2+2x-15} \times \frac{x^2+4x-5}{2x^2+3x-2} \div \frac{x+1}{2x^2-7x+3}$$

Q.9 Solve the following system of linear equations graphically :

$$3x + y - 12 = 0, x - 3y + 6 = 0.$$

Also find the coordinates of the points where the line meet the x-axis.

Q.10 The sum of the squares of two positive integers is 117. If the square of the smaller number equals four times the larger number find the integers.

Q.11 Prove that : $\frac{\cos A}{1 - \sin A} + \frac{\cos A}{1 + \sin A} = 2 \sec A.$

OR

Without using trigonometrical tables, evaluate : $\frac{\cos^2 25^\circ + \cos^2 65^\circ}{\operatorname{cosec}^2 65^\circ - \tan^2 25^\circ} + \frac{\tan 10^\circ \cot 36^\circ \tan 80^\circ \cot 54^\circ}{\tan^2 30^\circ + \tan^2 45^\circ}$

Q.12 A right circular conical vessel of internal radius 15 cm and height 27 cm is full of water. This water is poured into a right cylindrical vessel with internal radius 5 cm. Find the height to which the water rises in the cylindrical vessel.

Q.13 The following data shows the expenditure of a family on different items during a month :

Item	Rent	Education	Food	Others
Monthly Expenditure (In Rs)	2400	1200	2700	900

Represent the above data by a Pie-chart.

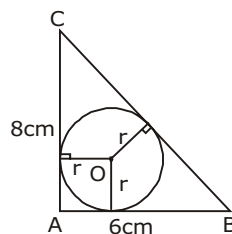
Q.14 Find the ratio in which the line joining the points (2, -6) and (8, 4) is divided by x-axis. Also find the coordinates of the point of division.

OR

Find the value of k for which the points A(-5, 1), B(1, k) and C(4, -2) are collinear. Also find the ratio in which B divides AC.

Q.15 In a ΔABC , P and Q are points on the sides AB and AC respectively such that PQ is parallel to BC. Prove that median AD, drawn from A to BC, bisects PQ.

Q.16 In fig. ABC is a right-angled triangle with AB = 6 cm and AC = 8 cm. A circle with centre O has been inscribed inside the triangle. Calculate the value of r, the radius of the inscribed circle.



Q.17 A dice is tossed once. What is the probability of the dice coming up with a number < 8 ? What is the probability of the dice coming up with the number '8' ?

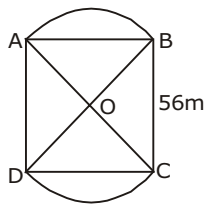
Q.18 Find the mean of the following data :

Class Interval	Frequency
0 - 50	4
50 - 100	10
100 - 150	12
150 - 200	10
200 - 250	8
250 - 300	6
Total	50

Q.19 In an equilateral triangle ABC, a point D is taken on base BC such that $BD : DC = 2 : 1$. AP has been drawn perpendicular from A to BC. Prove that $9AD^2 = 7AB^2$.

Q.20 An aeroplane, when 3000 m high, passes vertically above another aeroplane at an instance when the angles of elevation of the two aeroplanes from the same point on the ground are 60° and 45° respectively. Find the vertical distance between the two aeroplanes.

Q.21 In fig., two circular flower beds have been shown in two sides of a square lawn ABCD of side 56 m. If the centre of each circular flower bed is the point of intersection O of the diagonals of the square lawn, find the sum of the areas of the lawn and the flower beds.

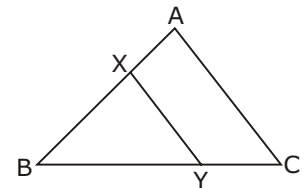


Q.22 A right triangle whose sides are 15 cm and 20 cm, is made to revolve about its hypotenuse. Find the volume and surface area of the double cone so formed. [Use $\pi = 3.14$]

Q.23 Selvi's house has an overhead tank in the shape of a cylinder. This is filled by pumping water from a sump (an underground tank) which is in the shape of a cuboid. The sump has dimensions $1.57 \text{ m} \times 1.44 \text{ m} \times 95 \text{ cm}$. The overhead tank has its radius 60 cm and height 95 cm. Find the height of the water left in the sump after the overhead tank has been completely filled with water from the sump which had been full. Compare the capacity of the tank with that of the sump. (Use $\pi = 3.14$)

Q.24 Construct a triangle similar to a given triangle ABC with its sides equal to $\frac{5}{3}$ of the corresponding sides of the triangle ABC (i.e., of scale factor $\frac{5}{3}$).

Q.25 In fig., the line segment XY is parallel to side AC of $\triangle ABC$ and it divides the triangle into two parts of equal areas. Find the ratio $\frac{AX}{AB}$.



OR

BL and CM are medians of a triangle ABC right angled at A. Prove that $4(BL^2 + CM^2) = 5BC^2$.

MOCK TEST

SUBJECT : MATHS
CLASS - X (ANSWER KEY)

1. $x = 2, y = 5$ OR $x = b, y = a$
2. $x = a + 3, a + 1$ 3. $-1, 3, 7, 11$ 4. 12 cm 5. (i) $7/15$, (ii) $7/15$
6. 0 7. 60° 8. $\frac{x-1}{x+1}$ 9. $x = 3, y = 3, (4, 0), (-6, 0)$
10. 6, 9 11. $7/4$ 12. 81 cm 14. $\left(\frac{28}{5}, 0\right)$ OR 2 : 1
16. 2 cm 17. Sure event, impossible event 18. 151
20. 1268 m 21. 4032 m^2 22. $3768 \text{ cm}^3, 1318.8 \text{ cm}^2$
23. Capacity of the tank is $\frac{1}{2}$ capacity of the sump. 25. $\frac{2-\sqrt{2}}{2}$