

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 system of equations : $3(2u + v) = 7uv$, $3(u + 3v) = 11uv$.

OR

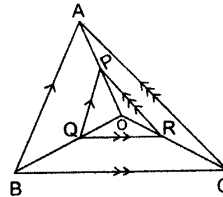
Solve for x and y : $(a + c)x - (a - c)y = 2ab$; $(a + b)x - (a - b)y = 2ab$.

Q.2 Simplify : $\left(\frac{x+1}{x-1} - \frac{x-1}{x+1} - \frac{4x}{x^2+1}\right) \div \frac{4x}{x^4-1}$

Q.3 Solve by factorization method : $\frac{1}{a+b+x} = \frac{1}{a} + \frac{1}{b} + \frac{1}{x}$, $x \neq 0$, $x \neq -(a+b)$

Q.4 The first term of an AP is 5 and its 100th term is -292. Find the 50th term of this AP.

Q.5 In fig. $PQ \parallel AB$ and $PR \parallel AC$.
Prove that $QR \parallel BC$.



Q.6 In what ratio does the point R (2, -5) divide the line segment joining the points A (-3, 5) and B (4, -9)?

Q.7 A bag contains 5 red balls and some blue balls. If the probability of drawing a blue ball is double that of a red ball, find the number of blue balls in the bag.

OR

A bag contains 5 white, 4 red and 3 black balls. A ball is drawn from the bag. Find the probability that it is not black.

Q.8 Out of a number of Saras birds, one fourth the number are moving about in lotus plants; $\frac{1}{9}$ th coupled

(along) with $\frac{1}{4}$ th as well as 7 times the square root of the number move on a hill; 56 birds remain in vakula trees. What is the total number of birds?

- Q.9** Which term of the AP : 3, 15, 27, 39,... will be 132 more than its 54th term?
- Q.10** Find the co-ordinates of the points of trisection of the line segment joining the points A (-4, 3) and B (2, -1)
- Q.11** Percentage of the different products of a village in a particular district are given below. Draw a pie chart representing this information.

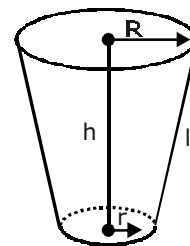
Items	%
Wheat	$\frac{125}{3}$
Pulses	$\frac{125}{6}$
Jwar	$\frac{25}{2}$
Groundnuts	$\frac{50}{3}$
Vegetables	$\frac{25}{3}$
Total	100

- Q.12** The mean of the following frequency table is 54. But the frequency f_1 and f_2 in classes 20–40 and 80–100 are missing. Find the missing frequencies.

Classes	Frequency
0–20	7
20–40	f_1
40–60	10
60–80	9
80–100	f_2
Total	50

- Q.13** If the radii of the circular ends of a conical bucket, which is 45 cm high, are 28 cm and 7 cm, find the capacity of the bucket

$\left(\text{use } \pi = \frac{22}{7} \right)$



- Q.14** The angles of elevation of the top of a tower from two point P and Q at distances of a and b, respectively, from the base and in the same straight line with it are complementary. Prove that the height of the tower is \sqrt{ab} .

Q.15 Evaluate : $\frac{\cos 58^\circ}{\sin 32^\circ} + \frac{\sin 22^\circ}{\cos 68^\circ} - \frac{\cos 38^\circ \operatorname{cosec} 52^\circ}{\tan 18^\circ \tan 35^\circ \tan 60^\circ \tan 72^\circ \tan 55^\circ}$

OR

$$2 (\sin^6 A + \cos^6 A) - 3 (\sin^4 A + \cos^4 A) + 1 = 0$$

Q.16 Construct a ΔABC in which $BC = 4$ cm, $AB = 6$ cm and $AC = 5$ cm. Construct a triangle similar to ΔABC such that each of the sides of the new triangle is two-thirds of the corresponding sides of the given triangle.

Q.17 Solve the following system of linear equations graphically :

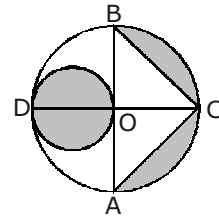
$$3x + 2y + 4 = 0$$

$$3x - 2y + 8 = 0$$

Also find the co-ordinates of the vertices of the triangle formed by the lines representing the above equations and the y-axis.

Q.18 A bicycle is sold Rs 2700 cash or for Rs 900 cash down payment alongwith two monthly instalments of Rs 915 each. Find the rate of interest charged under the instalment plan.

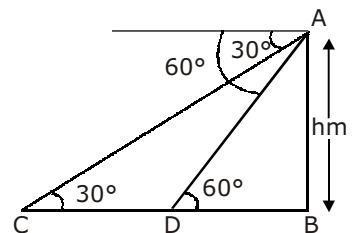
Q.19 In fig. AB and CD are two diameters of a circle (with centre O) perpendicular to each other and OD is the diameter of the smaller circle. If $OA = 7$ cm, find the area of the shaded region.



Q.20 Compute arithmetic mean for the following data :

Marks Obtained	No. of Students
Less than 10	12
Less than 20	19
Less than 30	35
Less than 40	47
Less than 50	58
Less than 60	65
Less than 70	84
Less than 80	100

Q.21 A man on a cliff observes a boat at an angle of depression of 30° which is approaching the shore to the point immediately beneath the observer with a uniform speed. Six minutes later, the angle of depression of the boat is found to be 60° . Find the time taken by the boat to reach the shore.



MOCK PAPER

Q.22 A straight road leads to the foot of a tower 150 meters high. From the top of the tower the angles of depression of two cars standing on the road are observed to be 30° and 60° respectively. Find the distance between the two cars.

OR

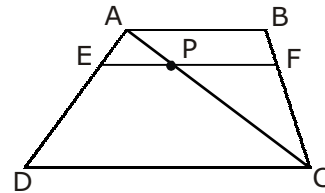
Two poles of equal height stand vertically opposite to each other on either side of a road, which is 100 metres wide. From a point on the road between the poles, the angles of elevation of the tops of the poles are 30° and 60° . Find the height of the poles. Also find the distance of the point from the feet of the poles.

Q.23 The internal radii of the ends of a bucket, full of milk and of internal height 16 cm, are 14 cm and 7 cm. If this milk is poured into a hemispherical vessel, the vessel is completely filled. Find the internal diameter of the hemispherical vessel.

Q.24 If the mean of the following frequency distribution is 188, find the missing frequencies f_1 and f_2 .

Classes	0-80	80-160	160-240	240-320	320-400	Total
Frequency	20	25	f_1	f_2	10	100

Q.25 If a line is drawn parallel to one side of a triangles, intersecting the other two sides, then the other two sides are divided in the same ratio. Prove this theorem. Using the above theorem, prove that in the figure if ABCD is a trapezium in which



AB || DC || EF then $\frac{AE}{ED} = \frac{BF}{FC}$



MOCK TEST

SUBJECT : MATHS
CLASS - X (ANSWER KEY)

1. $u = 0, v = 0$ & $u = 1, v = 3/2$ **OR** $x = b, y = -b$
2. 2 3. $x = -a, -b$ 4. -142
6. 5 : 2 internally 7. 10 **OR** $3/4$ 8. 576 9. 771 is the 65th term
10. $(0, 1/3)$ 12. $f_1 = 11, f_2 = 13$ 13. 48510 cm^3
15. $\frac{6 - \sqrt{3}}{3}$ **OR** 0 17. $x = -2, y = 1, A (-2, 1), B (0, 4), C (0, -2)$
18. 13.41% p.a. 19. 66.5 cm^2
20. 43 21. 9 minutes 22. 173.2 approx. **OR** 43.3 m.
23. 28 cm. 24. $f_1 = 15, f_2 = 30$

MOCK TEST

SUBJECT : SCIENCE & TECHNOLOGY
CLASS - X

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** What is the purpose of quenching steel?
- Q.2** How can you show that the magnetic field produced by a given electric current in the wire decreases as the distance from the wire increases?
- Q.3** Write an example of synthetic rubber.
- Q.4** Out of the two, a toaster of 1 kW and an electric heater of 2kW, which has a greater resistance?
- Q.5** Name the process of large energy production in the Sun.
- Q.6** What is efflorescence? Give an example.
- Q.7** An object is placed at a distance of 12 cm in front of a concave mirror. It forms a real image four times larger than the object. Calculate the distance of the image from the mirror.
- Q.8** What is an optical fibre ? State the property on which it works. Write its one use.
- Q.9** What is the difference between direct and alternating currents? Write one important advantage of using alternating current.
- OR**
- Differentiate between short circuiting and overloading of electric circuits. How does a fuse protect an electric circuit?
- Q.10** Why is a satellite lifted to a height of about 200 km from the ground before giving it a horizontal push? What is the minimum velocity required to launch an artificial satellite in an orbit around the earth?
- Q.11** (i) An aqueous solution has a pH value of 7.0. Is this solution acidic, basic or neutral?
(ii) If H^+ concentration of a solution is $1 \times 10^{-2} \text{ mol L}^{-1}$, what is the pH value for it?
(iii) Which has a higher pH value, 1 M HCL or 1 M NaOH solution?

- Q.12** (i) Name the raw materials used in the manufacture of sodium carbonate by Solvay process.
(ii) How is the sodium hydrogen carbonate formed during Solvay process separated from a mixture of NH_4Cl and NaHCO_3 ?

Q.13 What are Jovian planets? Why are they so called? Write any two special features of Jovian planets.

Q.14 What are detergents chemically? Why are they more effective than soaps in cleansing action? How can detergent molecules be altered to make them biodegradable?

OR

Write one example each to illustrate the following :

- (i) Fermentation (ii) Esterification (iii) Fehling's test

- Q.15** (i) Name the organic acid present in vinegar. Write its chemical formula also.
(ii) Name the products formed when (a) ethanol burns in air. (b) Sodium ethanoate is heated with soda lime.

- Q.16** (i) What is meant by pH of solution?
(ii) State one difference between a strong electrolyte and a weak electrolyte. Give one example of each.

Q.17 A metal occurs in nature in its sulphide form. Explain, with a labelled diagram, the process used to enrich this ore. State the principle on which this process works.

Q.18 What is hypermetropia? Write two causes for development of this defect. Describe with a ray diagram how this defect of vision can be corrected by using spectacles.

OR

What is a 'compound microscope'? Draw a labelled ray diagram to show the formation of image of an object by using this microscope.

Q.19 What is a nuclear reactor? Name the main components of a nuclear reactor and describe their functions. Why are safety measures essential in harnessing nuclear energy?

- Q.20** (i) During its passage from one medium to another, when does a light ray change its path?
(ii) Define the term absolute refractive index of a medium.
(iii) With the help of a ray diagram explain the term 'critical angle'.
(iv) For a ray of light going from a denser medium to air, what is the value of refractive index of the medium if the critical angle is equal to 45° ?

OR

- (i) List four common defects of vision that can be corrected with the use of suitable spectacles.
(ii) Draw a labelled ray diagram showing the magnified image of a distant object formed by an astronomical telescope.
(iii) What is the magnification produced by an astronomical telescope formed by two lenses of focal lengths 1 cm and 100 cm?

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 vegetative propagation?
- Q.22** Why is terrace farming practised on sloping fields?
- Q.23** What is a gene?
- Q.24** What is sustainable development? Suggest any one method to achieve it.
- Q.25** How are the following effective in controlling particulate emissions present in air?
(i) Wet scrubbers (ii) Electrostatic precipitators
- Q.26** What is vegetative propagation? When is it used? Name three methods of vegetative propagation.
- Q.27** Define the terms 'excretion' and 'osmoregulation'. Name the excretory unit of the following :
(i) Amoeba (ii) Earthworm
- Q.28** Explain the role of the following in the process of digestion in the human body :
(i) Saliva (ii) Gastric juices (iii) Trypsin
- Q.29** (i) List two important functions of human kidney.
(ii) Write any two causes that may damage the kidney of a person.
(iii) Name the procedure used in the working of an artificial kidney.
- Q.30** (i) What is reflex action? Give its two examples. Illustrate the pathway followed by a message from the receptor in a reflex arc.
(ii) Name the sympathetic and parasympathetic systems of eye.