

Studymate Practice Boards Paper
Class – X

Code No. 86/1

Reg. No.

--	--	--	--	--

Candidates must write the Code on the title page of the answer-book.

- ▶ Please check that this question paper contains 4 printed pages.
- ▶ Code number given on the right hand side of the question paper should be written on the title page of the answer-book by the candidate.
- ▶ Please check that this question paper contains 27 questions.
- ▶ Please write down the Serial Number of the questions before attempting it.
- ▶ 15 minutes time has been allotted to read this question paper. The student will read the question paper only and will not write any answer on the answer script during this period.

General Science

Time allowed : 3 hours

Maximum marks : 80

General Instructions:

- (i) The question paper comprises two sections, A and B. You are to attempt both the sections.
- (ii) All questions are compulsory.
- (iii) All questions of Section-A and B are to be attempted separately.
- (iv) There is an internal choice in two questions of three marks each and two questions of five marks.
- (v) Question numbers 1 and 2 in Section-A are one mark question. They are to be answered in one word or in one sentence.
- (vi) Question numbers 3 to 5 in Section- A are two marks questions. These are to be answered in 30 words each.
- (vii) Question numbers 6 to 15 in Section-A are three marks questions. These are to be answered in about 50 words each.
- (viii) Question numbers 16 to 21 in Section-A are 5 marks questions. These are to be answered in 70 words each.
- (ix) Question numbers 22 to 27 in Section- B are based on practical skills. Each question is a two marks question. These are to be answered in brief.

Section - A

1. Why should the Municipal Cooperation of Delhi make it mandatory to have two dustbins in our houses?
2. Transpiration does not happen in the night, then how is the water pulled up during the night?
3. Account for the following:
 - (a) Elements in a group of the periodic table have similar chemical properties.
 - (b) Elements of group 18 are called zerovalent.
4. An object is placed perpendicular to the principle axis of a convex lens of focal length 10 cm. The distance of the object from the optical centre of the lens is 15 cm. Calculate the position of the image formed. Mention the nature of the image formed.
5. Write the characteristic features of the micro organisms which help in the production of biogas in a biogas plant. Write the composition of biogas.
6.
 - (a) Fuse acts like a watchman in an electric circuit. Justify this statement.
 - (b) Mention the usual current rating of the fuse wire in the line to (i) lights and fans (ii) appliance of 2 kw or more power.

OR

- (a) Two circular coils P and Q are kept close to each other, of which coil P carries a current. If coil P is moved towards Q, will some current be induced in coil Q? Give reason for your answer and name the phenomenon involved.
 - (b) What happens if coil P is moved away from Q?
 - (c) State any two methods of inducing current in a coil.
7. Calculate the resistance of 50 m length of wire of cross sectional area 0.01 square mm and of resistivity $5 \times 10^{-8} \Omega \text{ m}$.
8.
 - (a) Give reason why white coloured silver chloride turns grey when kept in sunlight?
 - (b) Write balanced chemical equation for the reaction taking place when limestone is heated strongly.
9. How would the following properties of the element vary along the period from left to right in the modern periodic Table. Give reasons.
 - (a) Tendency to lose electrons
 - (b) Atomic size
 - (c) Valency
10. In Rahul's class, routine blood test was done to know the blood group of each student so that it could be entered in their Identity cards. Rahul was told that his blood group is O⁺. He already knew the blood group of his father is B type and that of mother of A type. He got confused why his blood group is O.
 - (a) Is it possible that parents having A and B blood group can have children with O type blood group?
 - (b) What could be the possible blood group of Rahul's siblings?
 - (c) Do you see any other symbols along with your blood group test report?
11.
 - (a) Sight and smell of food brings saliva in our mouth. Which part of the brain is responsible for it?
 - (b) Why do multicellular organisms have to depend upon chemical coordination for communication between the cells when they already had the nervous system?
 - (c) How does the tip of the plant bend towards the light?
12. Draw a ray diagram in each of the following cases to show the position and nature of the image formed when the object is placed:
 - (i) between optical centre and principal focus (F) of a convex lens.

- (ii) between F and 2F of a convex lens.
(iii) as 2F of a convex lens.
13. (a) Three solutions A, B and C have pH values 5, 8 and 10 respectively. Amongst the three which solution has maximum hydrogen ion concentration? Classify the nature of the three solutions as acidic or basic.
(b) "Sodium hydrogen carbonate is a basic salt". Justify the statement. How is it converted into washing soda? Explain with reaction.
14. (a) Give an example where people participation has helped in recovering dwindling forests?
(b) Many states of India have underground rain water storage tanks. What are the advantages of such tanks?
15. Explain dihybrid cross with the help of Round Yellow and Wrinkled Green seeds of garden Pea.

OR

- (a) How Homologous and Analogous organs are an evidence in favour of evolution?
(b) What is the evidence suggesting that birds have a reptilian origin?
(c) With the help of suitable examples, explain why certain traits cannot be passed on to the next generation. What are such traits called?
16. (a) What is electromagnetic induction? Also state the rule which is closely related to this.
(b) With the help of a labelled diagram, explain the distribution of magnetic field due to a current through a circular loop.
(c) You have a metal, insulator and an alloy. Write these substances in the ascending order of their electrical resistivity.
17. An organic compound A is widely used as a preservative in pickles and has a molecular formula $C_2H_4O_2$. This compound react with ethanol to form a sweet smelling compound B.
(a) Identify the compound A.
(b) Write the chemical equation for its reaction with ethanol.
(c) Name the products formed.
(d) Name the process involved in the reaction.
(e) How can we get back the compound A from B?

OR

- (a) Write chemical equation of the reaction of ethanoic acid with the following:
(i) Sodium hydroxide (ii) Sodium
(iii) Ethanol.
Write the name of one main product of each reaction.
- (b) Draw the electron dot structure of propanone and methanoic acid. Also write their common names.
18. (a) What can be the advantage of biochemical process not being reliable?
(b) (i) Out of the two types of fertilization which one is advantageous over the other and Why?
(ii) Describe, in brief, the changes the uterus undergoes
(I) If egg is fertilized (II) If egg is not fertilized
(c) Mention two advantages of using barriers during sexual act.
19. (a) A person with myopic eye cannot see objects beyond 1.2 metre distinctly. What should be the nature of corrective lenses to restore proper vision?
(b) Explain the cause of the red colour of the Sun at Sunrise and Sunset.
20. (a) What is Thermit reaction? Mention its application.
(b) (i) How do we find whether a given element is a non metal, if we know its electronic configuration?

- (ii) With the help of a reaction show that zinc is more reactive than iron.
 (iii) Why should we not throw small pieces of sodium into a sink in the laboratory?
21. (a) It was found that the leaves of the plant started wilting. Name the tissue which might have got blocked. State the role of this tissue.
 (b) What are the factors on which the amount of water selectively reabsorbed in the tubular part depends?
 (c) What is the internal energy reserve in plants? Do animals have the same energy reserve? Justify your answer.
 (d) Draw a neat labelled diagram of the excretory system in humans.

OR

- (a) What is the use of residual volume of air in lungs?
 (b) What is the fate of intermediate product of respiration in *Yeast*?
 (c) Draw a neat labelled diagram of heart showing the flow of blood and label the following parts.
 (i) Any one of the upper chambers of the heart.
 (ii) Largest Artery of the body.
 (iii) Blood vessel carrying deoxygenated blood away from the heart to lungs.
 (iv) Blood vessel carrying oxygenated blood from the lungs to heart.

Section - B

22. Describe a chemical test to distinguish between ethanol and ethanoic acid.
 23. Name the compound formed on oxidation of ethanol with an oxidizing agent. Write reaction.
 24. A student observed two slides A and B under a microscope. In slide A he saw a unicellular organism dividing into two daughter individuals while in slide B he saw a unicellular organism showing outgrowth in the form of bud from the body.
 (a) Which organisms are being referred to in slide A and B?
 (b) Name the process observed by the student in slide A and B.
 25. A gas is liberated when germinating seeds are kept in a flask. The flask consists of a test tube filled with Potassium Hydroxide solution. A delivery tube from the flask is bent into a beaker consisting of water.
 (a) What is the aim of the above given experiment?
 (b) Which gas is liberated when the seeds germinate?
 (c) What would happen if we take boiled seeds?
 26. Refractive indices of media A, B, C and D are given below:

<i>Medium</i>	<i>Refractive Index</i>
A	1.33
B	1.44
C	1.52
D	1.65

In which of these four is the speed of light maximum? Support your answer with reason. Find the refractive index of medium D with respect to medium A.

27. A bulb cannot be used in place of a resistor to verify Ohm's law. Justify this statement with reason.



Studymate Practice Boards Paper
Class – X

Code No. 45/1

Reg. No.

--	--	--	--	--	--

Candidates must write the Code on the title page of the answer-book.

- ▶ Please check that this question paper contains 4 printed pages.
- ▶ Code number given on the right hand side of the question paper should be written on the title page of the answer-book by the candidate.
- ▶ Please check that this question paper contains 30 questions.
- ▶ Please write down the Serial Number of the questions before attempting it.
- ▶ 15 minutes time has been allotted to read this question paper. The student will read the question paper only and will not write any answer on the answer script during this period.

Mathematics

Time allowed : 3 hours

Maximum marks : 80

General Instructions:

- (i) All questions are compulsory.
- (ii) The question paper consists of 30 questions divided into four sections A, B, C and D.
- (iii) Section A contains 6 questions of 1 mark each. Section B contains 6 questions of 2 marks each. Section C contains 10 questions of 3 marks each. Section D contains 8 questions of 4 marks each.
- (iv) There is no overall choice. However, an internal choice has been provided in four questions of 3 marks each and three questions of 4 marks each. You have to attempt only one of the alternatives in all such questions.
- (v) Use of calculators is not permitted.

Section - A

1. A conical tent has 60° angle at the vertex. Find the ratio of its radius and slant height.
2. If the mean and median of a distribution is 26.8 and 27.9 respectively, find its mode.
3. If $a = 2^3 \cdot 3^5$ and $b = 3^2 \cdot 2^5$, then what is the HCF of a and b ?
4. A coin is tossed 20 times. What is the probability of getting at least 1 head?
5. If the product of zeroes of the polynomial $ax^2 - 6x - 6$ is 4. Find the value of a .
6. If $\cos \theta = \tan 40^\circ \tan 50^\circ$, find θ .

Section - B

7. A, B, C are three collinear points and B and C lie on the same side of A, where $A = (3, 4)$ and $B = (7, 7)$. If distance between A and C is 10 units, find the coordinates of C.
8. Find the zeroes of given polynomial and verify the relationship between the zeroes and the coefficients:

$$abx^2 + (b^2 - ac)x - bc$$
9. Draw a line segment of length 7.6 cm and divide it in the ratio 3 : 2.
10. If one root of the equation $x^2 - 2x - k = 0$ is the square of the other, find value(s) of ' k '.
11. Find the number of terms of the AP: $-12, -9, -6 \dots, 21$. If 1 is added to each term of this AP, then find the sum of all terms of the AP thus obtained.
12. The largest possible cube is made from a wooden sphere of radius $6\sqrt{3}$ cm. Find the surface area of the cube.

Section - C

13. Solve for x and y :

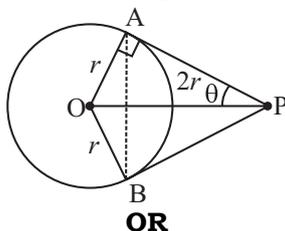
$$99x + 101y = 1499$$

$$101x + 99y = 1501$$
14. If roots of the equation $(c^2 - ab)x^2 - 2(a^2 - bc)x + (b^2 - ac) = 0$ in ' x ' are equal, then show that either $a = 0$ or $a^3 + b^3 + c^3 = 3abc$.
15. Points P, Q, R and S in that order are dividing a line segment joining $A(2, 6)$ and $B(7, -4)$ in five equal parts. Find the coordinates of P and R.
16. If $\cos \theta + \sec \theta = 2$, find the value of $(\cos^5 \theta + \sec^5 \theta)$.

OR

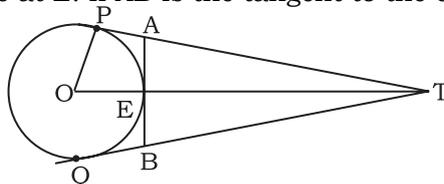
If $\sec \theta - \tan \theta = \sqrt{2} \tan \theta$, then show that $\sec \theta + \tan \theta = \sqrt{2} \sec \theta$.

17. In the figure below, length of OP is equal to diameter of the circle, where O is the centre of the circle. Prove that $\triangle ABP$ is an equilateral triangle.

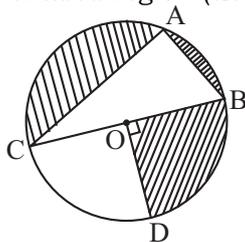


OR

In the figure below, O is the centre of a circle of radius 5cm, T is a point such that $OT = 13$ cm and OT intersects the circle at E. If AB is the tangent to the circle at E, find the length of AB.



18. In given figure, O is centre of circle with AC = 24 cm and AB = 7 cm.
If $\angle BOD = 90^\circ$, find the area of the shaded region (use $\pi = 3.14$)

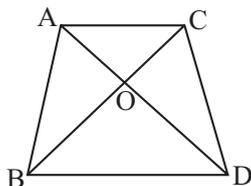


19. A circular field has a circumference of 360 km. Three cyclists start together and can cycle 60 km, 72 km and 90 km a day, around the field. After how many days will they meet again at the starting point?
20. Two customers are visiting a particular shop in the same week (Monday to Saturday). Each is equally likely to visit the shop on any one day as on another. What is the probability that both will visit the shop on:
- (i) the same day? (ii) different days?
- (iii) consecutive days?
21. If S_n denotes the sum of first n terms of an AP, prove that $S_{12} = 3(S_8 - S_4)$.

OR

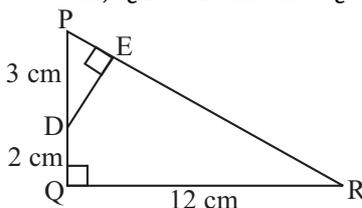
If S_1, S_2 and S_3 represents the sum of first $n, 2n$ and $3n$ terms of an A.P., prove that $S_3 = 3[S_2 - S_1]$.

22. In figure, ABC and DBC are two triangles on the same base BC. If AD intersects BC at O, show that $\frac{\text{ar}(\triangle ABC)}{\text{ar}(\triangle DBC)} = \frac{AO}{DO}$.



OR

In the given figure, $\triangle PQR$ is right angled at Q and $DE \perp PR$. Prove that $\triangle PQR \sim \triangle PED$ and find the length of PE and DE, if PD = 3 cm, QD = 2 cm and QR = 12 cm.



Section - D

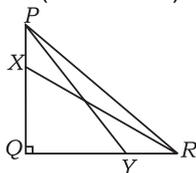
23. Find the area of the triangle formed by the points $[(p + 1), 1], [(2p + 1), 3], [(2p + 2), 2p]$ and show that these points are collinear if $p = 2$ or $-\frac{1}{2}$.

OR

Two vertices of an equilateral triangle are $(0, 0)$ and $(0, 2\sqrt{3})$. Find the third vertex.

24. A pole projected outwards and upwards from a window at height of 8 m above the ground level, makes an angle of 30° with the wall. If angle of elevation of base and top of the pole, from a point on the ground level, is 30° and 60° respectively, find the length of the pole.

25. If $\sin \theta + \sin^2 \theta = 1$, then find the value of $\cos^{12} \theta + 3\cos^{10} \theta + 3\cos^8 \theta + \cos^6 \theta + 2\cos^4 \theta + 2\cos^2 \theta - 2$
26. Prove that the length of tangents drawn from an external point to a circle are equal.
Using the above, find the perimeter of $\triangle ABC$, if a circle touches the side BC of $\triangle ABC$ at R and touches AB and AC produced at Q and P respectively and $AQ = 5$ cm.
27. In figure, PQR is a triangle, right angled at Q. X and Y are the points on PQ and QR such that $PX : XQ = 1 : 2$ and $QY : YR = 2 : 1$. Prove that $9(PY^2 + XR^2) = 13PR^2$.



28. The sum of deviations of a set of values $x_1, x_2, x_3, \dots, x_n$ measured from 50 is -10 and the sum of deviations of the values from 46 is 70. Find the value of 'n' and the mean.

OR

The median and mode of the following distribution are 33.5 and 34 rupees respectively. Find the missing frequencies.

Daily wages (in Rs.)	0 – 10	10 – 20	20 – 30	30 – 40	40 – 50	50 – 60	60 – 70	N
Frequencies	4	16	60	x	y	z	4	230

29. A train covered a certain distance at a uniform speed. If the train would have been 10 km/hr faster, it would have taken 2 hours less than the scheduled time. And, if the train were slower by 10 km/hr; it would have taken 3 hours more than the scheduled time. Find the distance covered by the train. What are the benefits of time management in our daily life?

OR

Rakesh donates the amount to Cancer Aid Society which is a two digit number such that the sum of this two-digit number and the number formed by interchanging its digit is 110. If 10 is subtracted from the original number, the new number is 4 more than 5 times the sum of the digits of the original number. Find the amount. Which value is depicted from this?

30. A farmer connects a pipe of internal diameter 25 cm from a canal into a cylindrical tank in his field, which is 12 m in diameter and 2.5 m deep. If water flows through the pipe at the rate of 3.6 km/h, in how much time will the tank be filled? Also find the cost of water, if the canal department charges at the rate ₹0.07/m³. (Use $\pi = \frac{22}{7}$)

OR

A bucket is in the form of a frustum of a cone with a capacity of 12308.8 cm³ of water. The radii of the top and bottom circular ends are 20 cm and 12 cm respectively. Find the height of the bucket and the area of the metal sheet used in its making. [Use $\pi = 3.14$]

