INDIAN SCHOOL MUSCAT
PRACTICE PAPER -1
MATHEMATICS

CLASS: X **Sub. Code: 041** **Time Allotted: 3 Hrs**
Max. Marks: 80

General Instructions:

1. *All questions are* ***compulsory****.*
2. *The question paper consists of* ***30*** *questions divided into* ***four sections A, B, C and D****.* ***Section-A*** *comprises of* ***6*** *questions of* ***1 mark*** *each;* ***Section-B*** *comprises of* ***6*** *questions of* ***2 marks*** *each;* ***Section-C*** *comprises of* ***10*** *questions of* ***3 marks*** *each and* ***Section-D*** *comprises of* ***8*** *questions of* ***4 marks*** *each.*
3. *There is no overall choice in this question paper. However, an internal choice has been provided in* ***two*** *questions of* ***1 mark****,* ***two*** *questions of* ***2 marks****,* ***three*** *questions of* ***3 marks*** *each and* ***three*** *questions of* ***4 marks*** *each. You have to attempt only one of the questions in all such questions.*
4. *Use of calculator is not permitted.*

<u>SECTION A: (1 mark each)</u>

1.	Can two numbers have 18 as their HCF and 380 as their LCM? Give reasons.
2.	If $mx^2 + 2x + m = 0$ has 2 equal roots, then find the value(s) of m. **OR**
	If **1** is a root of the equations $\mathbf{a}y^2 + \mathbf{a}y + 3 = 0$ and $y^2 + y + \mathbf{b} = 0$, then find the value of **ab**.
3.	What is the 27th positive odd number?
4.	How can you show using distance formula three points A, B, C (in order) whose coordinates are given are collinear?
5.	Write the value of $\cot^2 \Theta - \frac{1}{\sin^2\Theta}$. **OR**
	In ΔABC, right angled at B, AB = 5 cm and $\angle ACB = 30^o$. Find length of side BC.
6.	$\Delta ABC \approx \Delta PQR$, if $ar(\Delta ABC) = 2.25m^2$, $ar(\Delta PQR) = 6.25m^2$, $PQ = 0.5m$, then find AB.

<u>SECTION B: (2 marks each)</u>

7.	Determine the values of p and q so that the prime factorization of 2520 is expressible as $2^3 \times 3^p \times q \times 7$. **OR**
	If the HCF of 65 and 117 is of the form (65m – 117), then find the value of m.
8.	Determine the value of k for which the following system of linear equations has no solution : $kx + 3y = 1$, $12x + ky = 2$
9.	Find the middle term of the A.P. 6, 13, 20…, 216. **OR**
	In an A.P. 24th term is twice the 10th term. Prove that 36th term is twice the 16th term.
10.	The centre of a circle is $(2\boldsymbol{\alpha} - 1, 7)$ and it passes through the point (-3, -1). If the diameter of the circle is 20 units, then find the value(s) of $\boldsymbol{\alpha}$.

11. Two different dice are rolled together. Find the probability of getting
(i) the sum of numbers on two dice to be 5,
(ii) even numbers on both dice.

12. A bag contains cards numbered 6 to 50. A card is drawn at random from the bag. Find the probability that a drawn card has a number which is a perfect square.

SECTION C : (3 marks each)

13. Two sets of English and Social Science books containing 336 and 96 books respectively in a library have to stacked in such a way that all the books are stored topicwise and the height of each stack is the same. Assuming that the books are of the same thickness, determine the total number of stacks.

14. If the polynomial $x^4 + 2x^3 + 8x^2 + 12x + 18$ is divided by another polynomial $x^2 + 5$, the remainder comes out to be $px + q$ form. Find the values of p and q.

15. Solve : $\frac{5}{x-1} + \frac{1}{y-2} = 2$; $\frac{6}{x-1} - \frac{3}{y-2} = 1$

16. Find the co-ordinates of a point P on the line segment joining A(1,2) and B (6,7) such that AP= $\frac{2}{5}$ AB .

OR

If (a, b) is the midpoint of the segment joining the points A(10, - 6) and B(k, 4) and a - 2b = 18, find the value of k and the distance AB.

17. Prove that : $\frac{\sin\theta - \cos\theta}{\sin\theta + \cos\theta} + \frac{\sin\theta + \cos\theta}{\sin\theta - \cos\theta} = \frac{2}{2\sin^2\theta - 1}$

OR

If $7\sin^2\theta + 3\cos^2\theta = 4$, then show that $\tan\theta = \frac{1}{\sqrt{3}}$.

18. In the figure 1, AB ll PQ ll CD, AB = x units CD = y units and PQ = z units, prove that $\frac{1}{x} + \frac{1}{y} = \frac{1}{z}$

OR

In the figure 2, PQR is a right triangle, right angled at Q. If $QS = SR$, then prove that $PR^2 = 4PS^2 - 3PQ^2$

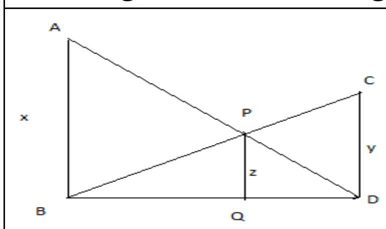

figure 1

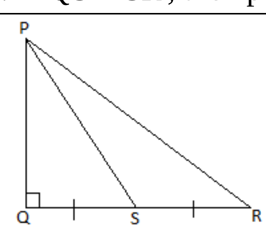

figure 2

19. If d_1, d_2 ($d_2 > d_1$) be the diameter of two concentric circles and c be the length of a chord of a circle which is tangent to the other circle, prove that $d_2^2 = c^2 + d_1^2$.

20. The two sectors of a circle have the central angles as 120^0 and 150^0 respectively. Then the find the ratio between the areas of the two sectors.

21. A hemispherical bowl of internal diameter 36 cm contains liquid. This liquid is to be filled in cylindrical bottles of radius 3 cm and height 6 cm. How many bottles are required to empty the bowl?

OR

	A cone is divided into 2 parts by drawing a plane through the midpoint of its axis, parallel to its base. Compare the volumes of the two parts.
22.	If the median of the following frequency distribution is 24, find the missing frequency x.

Age(in years)	0-10	10-20	20-30	30-40	40-50
Frequency	5	25	x	18	7

SECTION D: (4 marks each)

23. ABCD is a trapezium such that BC II AD and AD = 4 cm. If diagonal AC and BD intersects at E. $\frac{AE}{EC}=\frac{DE}{BE}=\frac{1}{2}$. Find BC.

24. ₹ 6500 were divided equally among a certain number of persons. If there had been 15 more persons each would have got ₹30 less. Find the original number of persons.

OR

Solve for x : $\frac{2x}{x-3}+\frac{1}{2x+3}+\frac{3x+9}{(2x+3)(x-3)}=0$ $(x\neq 3,-\frac{3}{2})$

25. A club consists of members whose ages are in A.P., common difference being 3 months. The youngest member of the club is just 7 years old and the sum of the ages of members is 250 years. Find the number of members in the club.

26. Prove that: $\frac{\tan\theta}{1-\cot\theta}+\frac{\cot\theta}{1-\tan\theta}=1+\tan\theta+\cot\theta$

27. The angle of elevation of a plane from a point on the ground is 60°. After a flight of 20 seconds, the angle of elevation changes to 30°. If the plane is at a height of $2400\sqrt{3}$ m, find the speed of the jet plane.

OR

From a point 100 m above a lake the angle of elevations of a stationary helicopter is 30° and the angle of depression of reflection of the helicopter in the lake is 60°. Find the height of the helicopter.

28. Construct a triangle with sides 4 cm, 5 cm and 6 cm and another triangle whose sides are 7/5 times the corresponding sides of ΔABC.

29. A conical vessel of radius 6 cm and height 8 cm is completely filled with water. A sphere is lowered into the water and its size is such that when it touches the sides, it is just immersed. What fraction of the water overflows?

30. Find the missing frequency in the following frequency distribution table, if mean is 50

C.I	0-20	20-40	40-60	60-80	80-100	Total
frequency	17	f	32	F	19	120

OR

To highlight child labor problem, some students organized a javelin throw competition. 50 students participated in this competition. The distance (in metres) thrown are recorded below:

Distance (in m)	Number of students
0-20	6
20-40	11
40-60	17
60-80	12
80-100	4

(a) Construct a cumulative frequency table.
(b) Draw cumulative frequency curve (less than type) and calculate the median distance thrown.
(c) Calculate the median distance by using the formula for median.

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