DAV BORL PUBLIC SCHOOL, BINA
PRACTICE PAPER, HALF YEARLY (2018-19)

Class: X — Subject: Mathematics

Time Allowed: 3 Hours. — Maximum Marks: 80

General instructions:

- (i) **All questions are compulsory.**
- (ii) **Questions 1 to 6 are carrying 1 mark each.**
- (iii) **Questions 7 to 12 are carrying 2 mark each.**
- (iv) **Questions 13 to 22 are carrying 3 mark each.**
- (v) **Questions 23 to 30 are carrying 4 mark each.**

01 Find the number which when divided by 47 gives 23 as quotient and 37 as remainder.

02 Find a relation between a and b such that point (a,b) is equidistant from the points (8,3) and (2,7).

03 A number when divided by 53, gives 33 as quotient and 19 as remainder. Find the number.

04 If $\Delta ABC \sim \Delta PQR, \frac{Ar.\Delta \mathrm{ABC}}{Ar.\Delta PQR} = \frac{16}{9}$ and PQ = 10 cm then find the length of AB.

05 Prove that the distance of the point $(a\cos\alpha, a\sin\alpha)$ from the origin is independent.

06 Prove that $(\tan\theta + 2)(2\tan\theta + 1) = 5\tan\theta + 2\sec^2\theta$.

07 Solve the quadratic equation $2x^2+x-4 = 0$ by the method of completing square. OR

Find the value of $\sqrt{7+\sqrt{7+\sqrt{7+++\cdots\infty}}}$

08 Solve $\frac{x}{x+1} + \frac{x+1}{x} = \frac{34}{15}$,x$\neq 0, -1$

09 Find the area of Δ *whose vertices A, B and C are respectively* $(3,4), (-4,3)$ *and* $(8,6)$

10 Solve the equations graphically 3x+y-5 = 0, 2x-y-5 = 0.

11 Prove that $\frac{1-\cos\theta}{1+\cos\theta} = (\cot\theta - \csc\theta)^2$

12 Without using trigonometric tables find the value of

$$\frac{\sin 50^0}{\cos 40^0} + \frac{\csc 40^0}{\sec 50^0} - 4\cos 50^0 \csc 40^0$$

13 The product of two consecutive odd numbers is 483. Find the number.

14 How many terms are there in an AP whose first term and sixth term are -12 and 8 respectively and sum of all the terms is120.

15 If the area of the triangle formed by points A(x,y), B(1,2), and C(2,1) is 6 sq. units, then show that x+y = 15.

16 Find the value of k for which the roots of the quadratic equation

$$(k-4)x^2 + 2(k-4)x + 2 = 0 \text{ are equal}$$

17 If the points $(p,q), (m,n)$ *and* $(p-m, q-n)$ are collinear, show that pn = qn. OR
Find the area of the triangle formed by joining the mid points of the sides of the Δ *whose vertices are* $(0,-1), (2,1)$ *and* $(0,3)$.

18 Solve the following equation for x:
$\frac{1}{x+1} + \frac{2}{x+2} = \frac{5}{x+4}, x \neq -1, -2, -4.$

19 Prove that $5+\sqrt{3}$ is an irrational number.

20 Show that any positive odd integer is of the form 6q+1or 6q+3 or 6q+5, where q is some integer.

21 Find all zeroes of the polynomial $f(x) = 2x^3+x^2-6x-3$, if two of its zeroes are $-\sqrt{3}, and\ \sqrt{3}$.
OR Obtain all zeroes of $f(x) = x^3-7x+6$, if one of its zeroes is 1.

22 Prove that: $\sqrt{\frac{\sec A-1}{\sec A+1}}+\sqrt{\frac{\sec A+1}{\sec A-1}} = 2\csc A$.

23 Prove that $\frac{\cot A+\csc A-1}{\cot A-\csc A+1} = \frac{1+\cos A}{\sin A}$. Or If $\tan A = \sqrt{2}-1$,Show that$\sin A \cos A = \frac{\sqrt{2}}{4}$.

24 State and prove the Basic proportionality theorem.

25 The sum of five consecutive odd integers is 685. What are the numbers?

26 Determine graphically the vertices of the triangle, the equations of whose sides are y = x , y = 0 and 2x+3y = 10 and also determine its area.

27 If a line is drawn parallel to one side of a triangle to intersect the other two sides in distinct points, prove that the other two sides are divided in the same ratio.

28 If $\tan\theta + \sin\theta = m\ and\ \ \theta - \sin\theta = n, show\ that\ m^2 - n^2 = \sqrt{mn}$.

29 In a triangle PQR, PD ⊥ QR such that D lie on QR. If PQ=a, PR=b, QD=d, and DR=d, show that $(a+b)(a-b) = (c+d)(c-d)$.

30 If the polynomial:
$x^4 - 6x^3 + 16x^2 - 25x + 10\ is\ divided\ by\ another\ polynomial\ x^2 - 2x + k, the\ remainder\ comes\ out\ to\ be\ x + a, find\ k\ and\ a$.