DAV BR PUBLIC SCHOOL, BINA (MP)
CLASS: X-A

TIME: 3Hrs   **SUBJECT: MATHEMATICS**   **MM : 80**

Attempt all the questions

1. If two positive integers p and q can be expressed as $p=ab^2$ and $q=a^3b$, where a, b are prime   1
   numbers then LCM(p, q) is
      a) ab   b) a^2b^2 c) a^3b^2 d) a^3b^3

2. If m is any natural number, then which of the following numbers end with 0   1
      a) $(3 \times 2)^n$ b) $(5 \times 2)^n$ c) $(6 \times 2)^n$ d) $(4 \times 2)^n$

3. If α and $\frac{1}{\alpha}$ are zeroes of the polynomial $6x^2 + 11x - (k-2)$, then the value of k is   1
      a) -4   b) -6   c) 6   d) 4

4. If α and β are the zeroes of the polynomial $2x^2 +7x-5$, then the value of $\alpha^2 +\beta^2$ is   1
      a) $\frac{49}{4}$ b) $\frac{37}{4}$ c) $\frac{61}{4}$ d) $\frac{61}{2}$

5. A quadratic polynomial whose zeroes are -3, 4 is   1
      a) $x^2 -x + 12$ b) $x^2 + x + 12$ c) $\frac{x^2}{2} -\frac{x}{2} - 6$ d) $2x^2 +2x- 24$

6. The value of k for which the system of equations x+y-5=0 and 3x+ky=7 has no solution, is   1
      a) 3   b) 2   c) 1   d) 4

7. The equation $k^2x^2 + kx +1 =o$ has   1
      a) One real root   b) Two real roots   c) no real roots   d) None of these

8. The sum of two natural numbers is 240 and their ratio is 3:5. Then the greater number is   1
      a) 180   b) 160   c) 150   d) 90

9. The value of k for which the equations 3x-y+8=0 and 6x-ky=-16 represent coincident lines is   1
      a) $\frac{1}{2}$ b) $-\frac{1}{2}$ c) 2   d) -2

10. pair of equations x=a and y=b graphically represents lines which are   1
      a) Parallel   b) intersecting (b, a)   c) coincident   d) Intersecting at (b, a)

11. Which of the following is a quadratic equation?   1
      a) $X^2+2x +1 =(4-x)^2 + 3$ b) $-2x^2 = (5-x)(2x-\frac{5}{2})$
      c) $(k +1)x^2 +\frac{3}{2}x = 7$ where k = -1   d) $x^3 - x^2 = (x-1)^3$

12. IN an AP , if a= 3.5, d=0, n=101, then a_n will be   1
      a) 0   b) 3.5   c) 103.5   d) 104.5

13. The sum of first five multiples of 3 is   1
      a) 45   b) 55   c) 65   d) 75

14. In an AP , if $a_{18} -a_{14} = 32$ then the common difference is   1
      a) 8   b) -8   c) -4   d) 4

15. If in triangles ABC and DEF, $\frac{AB}{DE} = \frac{BC}{FD}$ then they will be similar when   1

    a) $\angle B = \angle E$ b) $\angle A = \angle D$ c) $\angle B = \angle D$ d) $\angle A = \angle F$

16. If one end of a diameter of a circle is (2, 3) and the centre is (-2, 5), then the other end is   1

    a) (-6, 7)   b) (6, -7)   c) (0, 8)   d) (0, 4)

17. The fourth vertex D of a parallelogram ABCD whose three vertices are A(-2,3), B(6,7) and C(8, 3) is   1

    a) (0,1)   b) (0, -1)   c) (-1,0)   d) (1,0)

18. The point on the x-axis which is equidistant from the points A(-2, 3) and B(5,4) is   1

    a) (0,2)   b) (2,0)   c) (3,0)   d) (-2,0)

19. Assertion: The graph of the linear equations 3x+2y=12 and 5x-2y=4 gives a pair of intersecting lines.   1

Reason : The graph of the linear equations $a_1x+b_1y+c_1=0$ and $a_2x+b_2y+c_2=0$ gives a pair of intersecting lines if $\frac{a_1}{a_2} \neq \frac{b_1}{b_2}$

    (A) Both A and R are true and reason R is the correct explanation of assertion A
    (B) Both A and R are true but R is not correct explanation of assertion A
    (C) Assertion A is true but reason is false
    (D) Assertion A is false but reason R is true

20. Assertion : If ΔABC and ΔPQR are congruent triangles, then they are also similar triangles   1

Reason : All congruent triangles are similar but similar triangles need not be congruent

    (A) Both A and R are true and reason R is the correct explanation of assertion A
    (B) Both A and R are true but R is not correct explanation of assertion A
    (C) Assertion A is true but reason is false
    (D) Assertion A is false but reason R is true

21. Explain why 7x11x13+13 is a composite number?   2

22. If one of the zeroes of the quadratic polynomial $p(x) = 4x^2 - 8kx-9$ is equal in magnitude but opposite in sign of the other , then find the value of k   2

23. If 47x+31y = 18 and 31x +47y=60, then find the value of x + y.   2

24. Find the roots of the following quadratic equation by factorization: 2

$\sqrt{2} x^2 +7x +5\sqrt{2} =0$

25. Find the 11th term from the last term (towards the first term) of the AP: 10, 7, 4,…-62.   2

26. Check whether 6^n can end with the digit 0 for any natural number.   3

27. The ratio of incomes of the two persons 9:7 and the ratio of their expenditures 4:3. If each of them manages to save Rs.2000 per month. Find their monthly incomes.   3

28. If the roots of a quadratic equations $(c^2-ab)x^2 -2(a^2-bc)x+b^2-ac=0$ in x are equal then show that either a=0 or $a^3+ b^3+c^3=3abc$ 3

29. Given a_n =4, d=2, S_n = -14, find n and a.   3

30. A girl of height 90 cm is walking away from the base of a lamp post at a speed of 1.2m/s. If the lamp is 3.6m above the ground, find the length of her shadow after 4 seconds.   3

31. Find the ratio in which the y-axis divides the line segment joining the points (5, -6) and (-1, -4). 3
Also find the point of intersection.

32. The sum of a two- digit number and the number obtained by reversing the digits is 66. If the digits 5
of the number differ by 2, find the number. How many such numbers are there?

33. State and prove Basic Proportionality Theorem. 5

34. Prove that $\sqrt{2}$ is irrational. Show that $5+3\sqrt{2}$ is irrational. 5

35. Sides AB, AC and median AD of a triangle ABC are respectively proportional to sides PQ, PR 5
median PM of another triangle PQR. Show that $\Delta ABC \sim \Delta PQR$.

36. Amanufacturer of TV sets produced 600 sets in the third year and 700 sets in the seventh year. 4
Assuming that the production increases uniformly by a fixed number every year , find :
   (i)   The production in the first year
   (ii)   The production in the 10th year
   (iii)   The total production in first 7 years.

37. To conduct sports day activities, in your rectangular shaped school ground ABCD, lines have been 4
drawn with chalk powder at a distance 1m each. 100 flower pots have been placed at a distance of
1mfrom each other along AD, as shown in figure. Niharika runs $\frac{1}{4}$th the distance AD on the second
line and posts a green flag. Preet runs $\frac{1}{5}$th the distance AD on the eighth line and post a red flag.
   (i)   What is the distance between both the flags?
   (ii)   If Rashmi has to post ablue flag exactly halfway between the line segments joining the
           two flags, where should she post her flag?
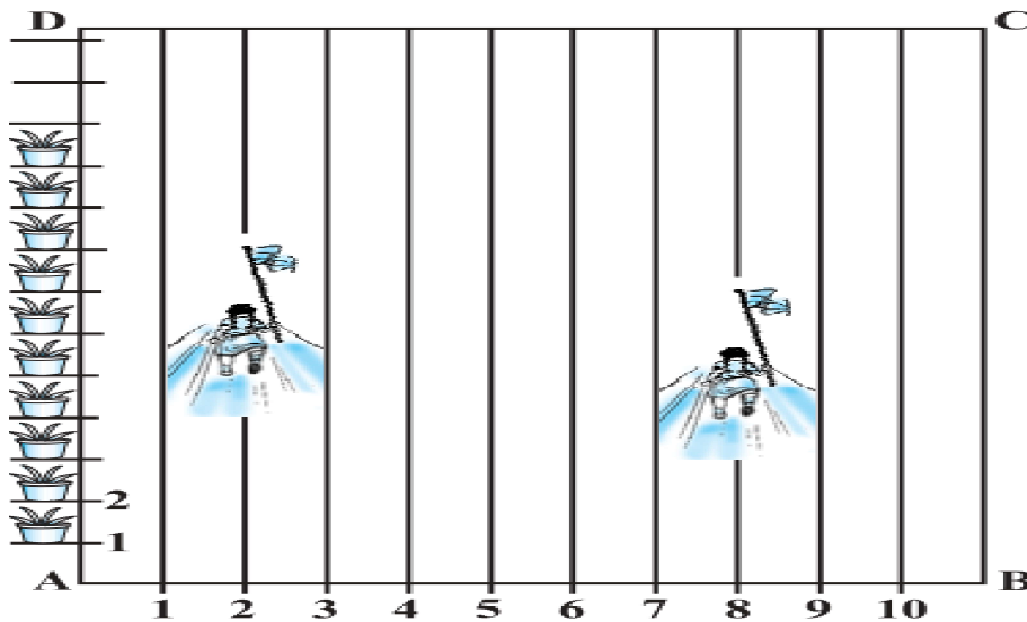
38. The below picture are few natural examples of parabolic shape which is represented by a quadratic 4
polynomial. A parabolic arch is an arch in the shape of a parabola. In structures, their curve
represents an efficient method of load, and so can be found in bridges and in architecture in a
variety of forms.

1. In the standard form of quadratic polynomial, $ax^2 + bx + c$, a, b and c are
   a) All are Polynomials.
   b) All are rational numbers.
   c) 'a' is a non zero real number and b and c are any Polynomials.
   d) All are integers.

2. If the roots of the quadratic polynomial are equal, where the discriminant $D = b^2 - 4ac$, then
   a) $D > 0$
   b) $D < 0$
   c) $D = 0$
   d) $D \geq 0$

3. If α and $1/\alpha$ are the zeroes of the quadratic polynomial $2x2 - x + 8k$, then k is
   a) a) 4
   b) b) 1/4
   c) c) $-1/4$
   d) d) 2