# Uttar Pradesh Madhyamik Shiksha Parishad Class 10 Model Question Papers for Maths

## High School Model Paper 2021-22

### Mathematics

**Time :Three hours 15 Minutes**          **Class-10**          **Max. Marks: 70**

**Note:-** First 15 minutes time has been allotted for examinees to read this question paper.

**Instructions:-**

(i)     There are seven questions in this question paper.

(ii)    All questions are compulsory.

(iii)   In the beginning of each question it has been mentioned how many parts of it are to be attempted.

(i)     Marks allotted to each question are mentioned against it.

(ii)    Start from the first question and go up to the last question. Do not waste your time over a question which you cannot solve.

(iii)   If you need place for rough work, do it on the left page of your answer book and cross (×) the page. Do not write the solution on that page.

(iv)    Write the solutions on pages of both sides of answer-book. Write the steps of solution of all questions except question no.1.

(v)      Do not rub off the arcs and the lines constructed in a question of construction. Write steps of construction, if asked.

(vi)     Draw the figure in the solution of a question wherever it is necessary, otherwise in its absence the solution will be treated as incomplete and wrong.

1.  **Do all the parts:**

    Four alternatives of the answer of each part are given, out of which only one is correct. Pick out the correct alternative and write it in your answer-book-

    (a) Which one is pair of co-prime numbers-                    1

    (i)     (14, 35)          (ii)   (18, 25)

(iii)   (31, 93)        (iv)  (32, 62)

(b) Product of roots of quadratic equation $3x^2 - 4x = 0$ is-      1

    (i)     0           (ii)     $\dfrac{4}{3}$

    (iii)   $\dfrac{-4}{3}$       (iv)    $\dfrac{3}{4}$

(c) Properties of similar triangles are-      1

    (i)    Its corresponding sides are proportional
    (ii)   Its corresponding angles are equal
    (iii)  Both (i) and (ii)
    (iv)  None of these

(d) The value of $\cos 60^0 \cos 30^0 - \sin 60^0 \sin 30^0$ is-      1

    (i)    0          (ii)    $\dfrac{\sqrt{3}}{2}$

    (iii)  $\dfrac{1}{2}$        (iv)    1

(e) which one is not central tendency -      1

    (i)    Mean          (ii)   Mode

    (iii) Median       (iv)  Standared

(f) The Co-ordinate of two points are (-8,0) and (0,-8). The Co-ordinate of mid point of line-segment joining these points will be-      1

    (i)   (-4,0)       (ii)   (0,-4)

    (iii) (-4,-4)     (iv)  (4,-4)

## 2. Attempt all parts :

(a)   Find the discriminant and nature of the roots of the quadratic equation $2x^2 - 4x + 3 = 0$.      1

(b)   If $15 \cot A = 8$ then find out the value of $\sin A$ and $\sec A$.      1

(c)    If the area of two similar triangles are 121 square cm and 289 square cm respectively. Then find the ratio between its corresponding sides.    1

(d)    In a certain distribution, mean and mode are 16 and 13 respectively. Find the median of the distribution.    1

**3.    Attempt all parts :**

(a)    prove that $\sqrt{3}$ is irrational number.    2

(b)    Find the value of a; for which pair of linear equations $ax + 2y = 2$, $8x + ay = 4$ have an infinite number of solutions.    2

(c)    In the given figure, $\dfrac{PS}{SQ} = \dfrac{PT}{TR}$ and $\angle PST = \angle PRQ$. Prove that $\triangle PQR$ is an isosceles triangle.    2
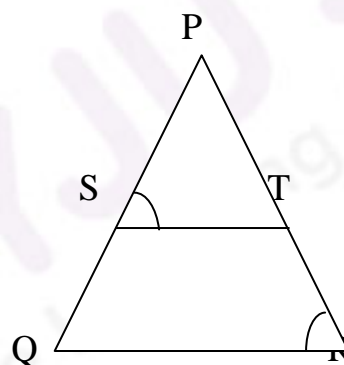


(d)    The radii of circular ends of the fustrum of 40 cm high cone are 38 cm and 8 cm, find the slant height of the fustrum.    2

**4 Attempt all parts :**

(a)    Use Euclid's algorithm to find the H.C.F of 272 and 1032.    2

(b)    D is a point on the side BC of a triangle $\triangle ABC$ such that $\angle ADC = \angle BAC$. Show that $CA^2 = CB.CD$ .    2

(c)    Draw a line segment of 5 cm and divide it in the ratio of 2:3. Measure the length of both the parts.    2

(d)    If $\cot\theta = \dfrac{7}{8}$, then find the value of $\dfrac{(1 + \sin\theta)(1 - \sin\theta)}{(1 + \cos\theta)(1 - \cos\theta)}$ .    2

**5 Attempt all parts :**

(a)     If the sum of the squars of two consecutive positive integers is 365. Find the integers.                                                                                   3

(b)     In which ratio does the point (-4,6) divide the line segment joining the points A(-6, 10) and B (3, -8)?                                                                   3

(c)     A metallic sphere of radius 4.2 cm is melted and recast into the shape of cylinder of radius 6 cm. Find the height of the cylinder.                              3

(d)     The following table shows the Literacy rate (In Percentage) of 35 cities-

| Literacy rate (%) | 45–55 | 55–65 | 65–75 | 75–85 | 85–95 |
|-------------------|-------|-------|-------|-------|-------|
| No. of cities | 3 | 10 | 11 | 8 | 3 |

Find the mean Literacy rate.                                                                              3

**6. Attempt all the parts :**

(a)     The difference between squares of two numbers is 180. The square of the smaller number is 8 times the larger number. Find the two numbers.

4

(b)     In the given figure, ABCD is square of side 14 cm. Find out the area of the shaded region.                                                                                  4
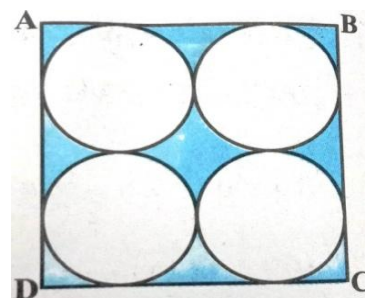


(c)     Construct a tangent to a circle of radius of 4 cm from a point on the concentric circle of radius 6 cm and measure its length.                                4

(d)     A survey was conducted of the heights of 51 girls of class 10 in a school. The following data has been obtained-

| Height (cm) | Less than 140 | Less than 145 | Less than 150 | Less than 155 | Less than 160 | Less than 165 |
|---|---|---|---|---|---|---|
| Number of girls | 4 | 11 | 29 | 40 | 46 | 51 |

Find the median height. 4

## 6. Attempt all the parts :

(a) Solve the following pair of equations by reducing them to a pair of linear equations : 6

$$\frac{10}{x+y} + \frac{2}{x-y} = 4$$

$$\frac{15}{x+y} - \frac{5}{x-y} = -2$$

Or

The sum of the reciprocals of Rehman's ages (in years) 3 years ago and 5 years from now is $\frac{1}{3}$ .Find his present age. 6

(b) The angles of depression of the top and bottom of an 8 m. tall building from the top of a multi-storeyed building are $30^0$ and $45^0$ respectively. Find the height of the multi-storeyed building and the distance between two buildings. 6

Or

From a point P on the ground, the angle of elevation of the top of a 10 m tall building is $30^0$. A flag is hoisted at the top of the building and the angle of elevation of the top of the flagstaff from P is $45^0$. Find the length of the flagstaff and the distance of the building from the point P. (You may take $\sqrt{3} = 1.732$) 6