

2019 IV 08

0930

Seat No.

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Time : 3 Hours

MATHEMATICS (E)

(For Children with Special Needs)

Subject Code

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Total No. of Questions : 7

(Printed Pages : 11)

Maximum Marks : 65

INSTRUCTIONS :

- (i) Answer each main question on a new page.
- (ii) All questions are compulsory.
- (iii) The question paper consists of *seven* questions.
- (iv) There is no overall choice. However, internal choice has been provided in two questions of *three* marks each and one question of *four* marks.
- (v) In questions on construction, the drawing should be neat and exactly as per the given measurement. The construction lines and arcs should also be maintained.
- (vi) Chart of tables 2 to 9 will be supplied on request.
- (vii) Use of Calculator and Mathematical tables is not permitted.
- (viii) The numbers on the right side indicate full marks.

1. (A) Select and write the most appropriate alternative from those provided below : 1

If $x + y = 14$ and $x - y = 6$, then the value of x is

- (a) 6
- (b) 8
- (c) 10
- (d) 12

- (B) A pair of linear equations in two variables is given below : 2

$$4x + 6y = 3$$

$$6x + 9y = 5$$

Answer the following questions :

- (i) Write the condition for no solution.
- (ii) Verify whether the equations have no solution.

- (C) By elimination method, find the solution of any *one* of the following equations : 3

(i) $3x + y = 11$

$$4x + 2y = 18$$

(ii) $x + 2y = 17$

$$3x - y = 2$$

(D) Attempt any *one* of the following : 4

(i) The sum of two natural numbers is 11 and their difference is 5. Find the two natural numbers.

(ii) The cost of 1 note-book and 1 ruler is Rs. 25, while the cost of 1 note-book and 2 rulers together is Rs. 30. Find the cost of each note-book and each ruler.

2. (A) Select and write the most appropriate alternative from those provided below : 1

If one of the zeroes of the quadratic polynomial $(x + 5)(3x - 4)$ is -5 then its other zero is

(a) $\frac{-3}{4}$

(b) $\frac{-4}{3}$

(c) $\frac{3}{4}$

(d) $\frac{4}{3}$

(B) Attempt the following : 2

(i) Find the sum of the zeroes of the polynomial $x^2 - 7x - 18$.

(ii) Find the product of the zeroes of the polynomial $3x^2 + 8x + 5$.

(C) Divide $x^3 + 2x^2 - 5x + 8$ by $x - 1$ and write the quotient and the remainder. 3

(D) A child has a box which contains cards with the letters as shown below : 3

□ D □ E □ F □ E □ N □ D

If one card is picked up at random from the box, then find the probability of getting the letter :

(i) E

(ii) N

(iii) Z

3. (A) Select and write the most appropriate alternative from those provided below : 1

The value of $b^2 - 4ac$ in the quadratic equation $x^2 - 3x + 2 = 0$ is

(a) -1

(b) 0

(c) 1

(d) 2

(B) Attempt the following : 2

(i) Write the quadratic equation $2x^2 + 10 = -9x$ in the form $ax^2 + bx + c = 0$.

(ii) Find the roots of the quadratic equation $y^2 - 4 = 0$.

(C) Find the roots of any *one* of the following : 3

(i) $x^2 + 12x + 35 = 0$ (by factorisation method)

(ii) $x^2 - 9x + 14 = 0$ (by using the quadratic formula)

(D) The following frequency distribution table shows the points obtained by a group of students in a fancy dress competition. 4

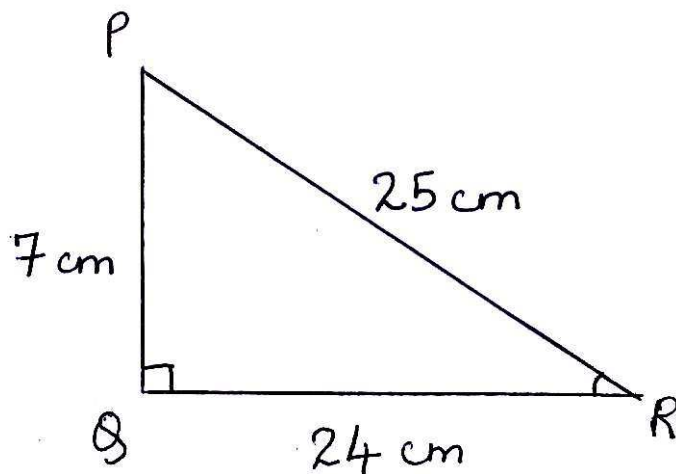
Points Obtained C.I.	No. of Students (f_i)	Class Marks (x_i)	$f_i x_i$
0—10	3	—	—
10—20	2	—	—
20—30	4	—	—
30—40	5	—	—
40—50	4	—	—
50—60	2	—	—
	$\Sigma f_i = \dots$		$\Sigma f_i x_i = \dots$

Rewrite and complete the table. Also find the mean of the points scored by the direct method.

4. (A) Select and write the most appropriate alternative from those provided below : 1

The decimal form of the rational number $\frac{58}{5}$ is

- (a) 1.06
 - (b) 1.16
 - (c) 10.6
 - (d) 11.6
- (B) If the L.C.M. and H.C.F. of two numbers are 420 and 3 respectively, then find the product of the two numbers. 2
- (C) Using Euclid's division algorithm, find the H.C.F. of 20 and 75. 2
- (D) Find the sum of the first 16 terms of the A.P. 3, 6, 9, 12, 3
5. (A) Select and write the most appropriate alternative from those provided below : 1



If in ΔPQR , $\angle Q = 90^\circ$, $QR = 24$ cm, $PQ = 7$ cm and $PR = 25$ cm,
then $\sin R = \dots\dots\dots$

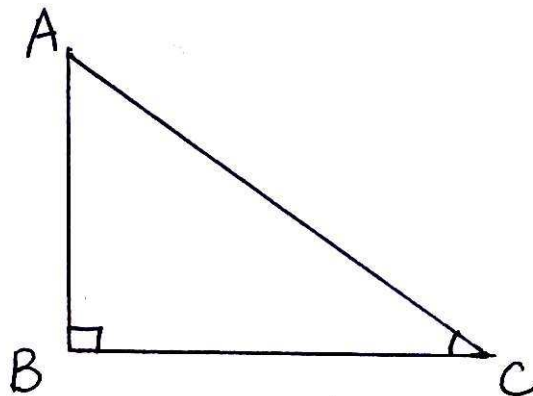
(a) $\frac{7}{25}$

(b) $\frac{7}{24}$

(c) $\frac{24}{25}$

(d) $\frac{25}{24}$

(B) If in ΔABC , $\angle B = 90^\circ$ and $\tan C = \frac{6}{8}$, then find : 2



(i) Length of AC.

(ii) The value of $\cos C$.

(C) Find the distance between the points A(5, 3) and B(7, 6) by using the distance formula. 3

- (D) Substitute the known numerical values of trigonometric ratios and find the value of : 3

$$4 \cos^2 60^\circ + 2 \tan 45^\circ - 2 \sin 30^\circ.$$

6. (A) Select and write the most appropriate alternative from those provided below : 1

If $\triangle CAR \sim \triangle HUT$, then $\frac{CA}{HU} = \dots\dots\dots$

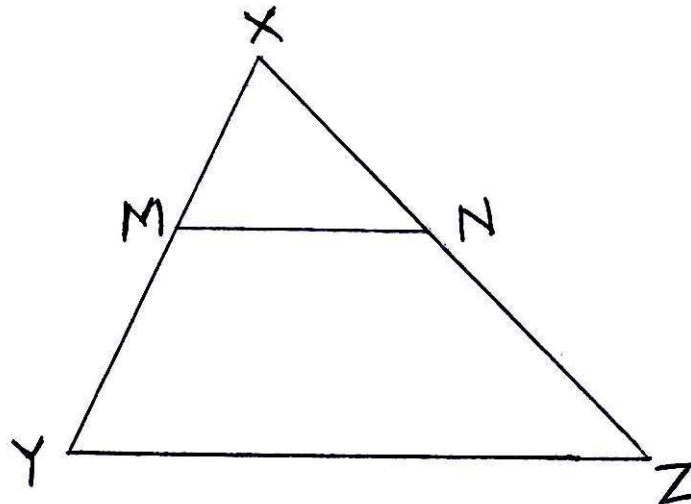
(a) $\frac{HT}{CR}$

(b) $\frac{AR}{HU}$

(c) $\frac{CR}{HT}$

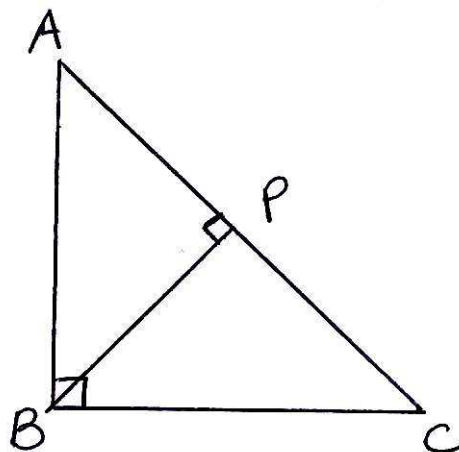
(d) $\frac{RC}{UH}$

- (B) In $\triangle XYZ$, $MN \parallel YZ$. If $XM = 5$ cm, $MY = 15$ cm, $NZ = 21$ cm, then find : 2



- (i) The length of XN .
(ii) The length of XZ .

- (C) In $\triangle ABC$, $\angle B = 90^\circ$ and $BP \perp AC$. With reference to the figure given below, fill in the blanks and complete the proof : 3



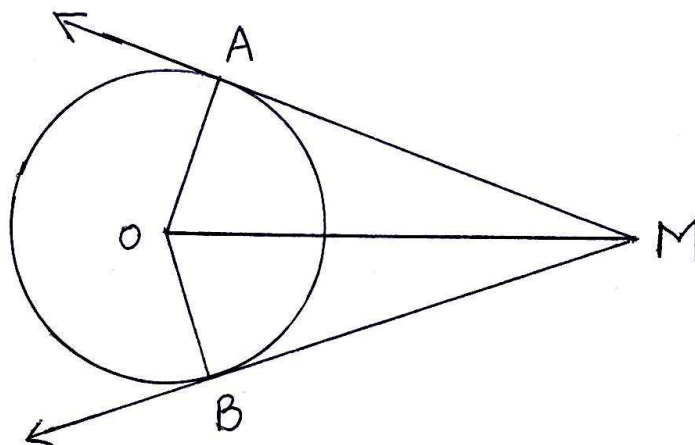
Statement

Reason

In $\triangle ABC$ and $\triangle APB$,

- | | | |
|-------|------------------------------------|-----------------------|
| (i) | $\angle ABC = \dots\dots\dots$ | Each is a right angle |
| (ii) | $\angle A = \angle A$ | $\dots\dots\dots$ |
| (iii) | $\triangle ABC \sim \triangle APB$ | $\dots\dots\dots$ |

- (D) In the figure given below, O is the centre of a circle. MA and MB are two tangent segments drawn from the point M to a circle at A and B respectively. With reference to the figure, answer the following questions to complete the proof : 4



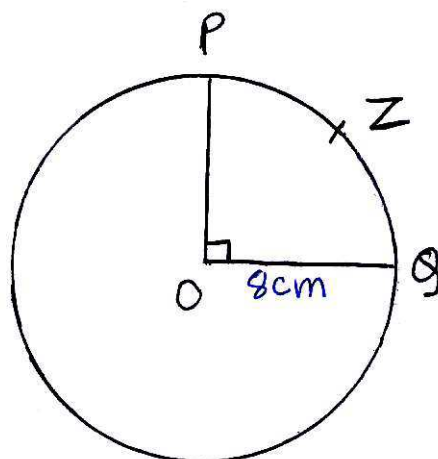
- (i) Name the side equal to OB.
- (ii) Name the common side of ΔOAM and ΔOBM .
- (iii) Name the right angles of ΔOAM and ΔOBM .
- (iv) By which criterion/theorem are ΔOAM and ΔOBM congruent ?

7. (A) Select and write the most appropriate alternative from those provided below : 1

If the diameter of a circle is 15 cm, then its radius is cm.

- (a) 7
- (b) 7.5
- (c) 15
- (d) 30

(B) In the following figure, O is the centre of the circle with radius 8 cm
 O – PZQ is a sector and $\angle POQ = 90^\circ$. 2



Find :

- (i) Area of sector O – PZQ (Do not substitute the value of π)
 - (ii) Length of arc PZQ (Do not substitute the value of π)
- (C) Draw a line segment AB of length 8.5 cm and divide it into 5 equal parts. (Use only a pair of compasses and ruler). 3
- (D) Draw a line segment PQ = 7.5 cm. Taking P as the centre and radius 3 cm, draw a circle. Then using a pair of compasses and ruler, construct two tangents from point Q to the circle. Measure and state the length of each tangent segment. 3