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CBSE 10th Mathematics 2013 Unsolved Paper All India

TIME - 3HR. | QUESTIONS - 34

THE MARKS ARE MENTIONED ON EACH QUESTION

SECTION - A

Question 1. Which of the following numbers has terminating decimal expansion? *1mark*

$(a) \dfrac{37}{45}$

$(b) \dfrac{21}{2^3 5^6}$

$(c) \dfrac{17}{49}$

$(d) \dfrac{89}{2^2 3^2}$

Question 2:

If one of the zeroes of the quadratic polynomial $(k-1)x^2 + kx + 1 \ is -3$, then the value of k is *1mark*

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

$(b) \ \dfrac{4}{3}$

$(c) \ \dfrac{2}{3}$

$(d) \ -\dfrac{2}{3}$

Question 3:

If a rational number x is expressed as $x = \frac{p}{q}$, where p, q are integer, $q \neq 0$ and p, q have no common factor (except 1), then the decimal expansion of x is terminating if and only if q has a prime factorization of the form: *1mark*

(a) $2^m \cdot 5^n$

(b) $2^m 3^n$

(c) $2^m \cdot 7^n$

(d) $5^m \cdot 3^n$

Where m and n are non-negative integers.

Question 4:

If $0° < x < 90°$ and $2 \sin^2 x = \frac{1}{2}$, then the value of x is *1mark*

(a) $90°$

(b) $30°$

(c) $15°$

(d) $60°$

Question 5:

If $\tan \theta = \frac{1}{\sqrt{7}}$, then the value of $\frac{cosec^2\theta - sec^2\theta}{cosec^2\theta + sec^2\theta}$ is *1mark*

(a) $\frac{1}{5}$

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

(c) $\frac{6}{4}$

(d) $\frac{4}{\sqrt{7}}$

Question 6:

Which of the following numbers has non-terminating repeating decimal expansion? *1mark*

$(a)\ \dfrac{7}{80}$

$(b)\ \dfrac{17}{320}$

$(c)\ \dfrac{20}{100}$

$(d)\ \dfrac{93}{420}$

Question 7:

The value of p for which the polynomial $x^3 + 4x^2 - px + 8$ is exactly divisible by $(x - 2)$is *1mark*

    (a) **1**
    (b) **0**
    (c) **15**
    (d) **16**

Question 8:

$n^2 - 1$**is divisible by 8, if n is** *1mark*

    (a) **an integer**
    (b) **a natural number**
    (c) **an odd integer**
    (d) **an even integer**

Question 9:

If $\cot\theta + \dfrac{1}{\cot\theta} = 2$, then the value of $\cot^2\theta + \dfrac{1}{\cot^2\theta}$ is *1mark*

    (a) **-1**
    (b) **1**
    (c) **2**
    (d) **-2**

Question 10:

The value of $\cosec^2 30° \sin^2 45° - \sec^2 60°$ is *1 mark*

        a. -1
        b.   **1**
        c. -2
        d.   **2**

SECTION - B

Question 11: Use Euclid's division algorithm to find HCF of 870 and 225. *2 marks*

Question 12: Explain $5 \times 4 \times 3 \times 2 \times 1 + 3$ is a composite number. *2 marks*
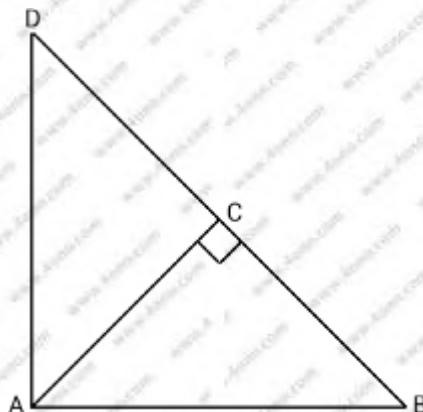
Question 13:

If α and β are the zeroes of the quadratic polynomial $p(x) = x^2 - ax + b$, then find the value of $\alpha^2 + \beta^2$. *2 marks*

Question 14: Solve $37x + 43y = 123, \;\; 43x + 37y = 117$ *2 marks*

OR

Solve $x + \dfrac{6}{y} = 6, \;\; 3x - \dfrac{8}{y} = 5$.

Question 15: In figure, $\triangle ABD$ is a right triangle, right-angled at A and AC ⊥ BD. Prove that $AB^2 = BC.BD$ *2 marks*

Question 16:

Without using trigonometric tables, find the value of

$$\frac{\cos 70°}{\sin 20°} + \cos 57° \cosec 33° - 2 \cos 60°$$ *2marks*

OR

If A, B, C are interior angles of ΔABC**, then show that**

$$\cos\left(\frac{B + C}{2}\right) = \sin\frac{A}{2}$$

Question 17:
The following frequency distribution gives the monthly consumption of electricity of 68 consumers of a locality. *2marks*

Monthly Consumption (in units)	65-85	85-105	105-125	125-145	145-165	165-185	185-205
Number of consumers	4	5	13	20	14	8	4

Write the above distribution as less than type cumulative frequency distribution.

Question 18:

Find the mode of the following data: *2marks*

Class	0-20	20-40	40-60	60-80
Frequency	15	6	18	10

SECTION - C

Question 19:

Prove that $3 + \sqrt{2}$ **is an irrational number** *3marks*

Prove that $5\sqrt{2}$ is irrational number.

Question20:

Show that 5^n can't end with the digit 2 for any natural number n.*3marks*

Question 21

A and B are friends and their ages differ by year. A's father D is twice as old as A and B is twice as old as his sister C. The age of D and C differ by 40 years. Find the ages of A and B.

3marks

<div align="center">**OR**</div>

Solve the following pair of equations:

$$\frac{5}{x-1} + \frac{1}{y-2} = 2$$

$$\frac{6}{x-1} - \frac{3}{y-2} = 1$$

Question 22:

Obtain all zeroes of the polynomial $f(x) = x^4 - 3x^2 = x^2 + 9x$ if two of its zeroes are $-\sqrt{3},$ and $\sqrt{3}$.*3marks*

Question 23:

In figure, $\triangle ABC$ is right-angled at B, BC=7cm and AC − AB = 1cm. Find the value of $\cos A - \sin A$. *3marks*

Question 24:

$$\frac{\cos\theta}{\csc\theta + 1} + \frac{\cos\theta}{\csc\theta - 1} = 2\tan\theta \quad \textit{3marks}$$

Question 25:

$$\sqrt{\frac{1 + \sin\theta}{1 - \sin\theta}} + \sqrt{\frac{1 - \sin\theta}{1 + \sin\theta}} = 2\sec\theta \quad \textit{3marks}$$

Question 26:

In the figure, ABC is a triangle with $\angle B = 90°$, Medians AE and CD of respective lengths $\sqrt{40}\ cm\ and\ 5cm$ are drawn. Find the length of the hypotenuse AC.*3marks*

Question 27: Compute the median for the following cumulative frequency distribution
:*3marks*

Weight	Less than 38	Less than 40	Less than 42	Less than 44	Less than 46	Less than 48	Less than 50	Less than 52
Number of students	0	3	5	9	14	28	32	35

OR

Find the missing frequencies in the following frequency distribution table, if N = 100 and median is 32.

Marks obtained	0-10	10-20	20-30	30-40	40-50	50-50	Total
No, of students	10	?	25	30	?	10	100

Question 28: The mean of- the following frequency distribution is 25.2. Find the missing frequency x *3marks*

C.I.	0-10	10-20	20-30	30-40	40-50
Frequency	8	X	10	11	9

SECTION - D

Question29:

Divide $30x^4 + 11x^3 - 82x^2 - 12x + 48$ by $(3x^2 + 2x - 4)$) and verify the result by division algorithm. *4marks*

Question 30:

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. Solution. Given : A triangle ABC in which a line parallel to BC intersects other two sides AB and AC at D and E respectively. *4marks*

OR

Prove that in a triangle, if the square of one side is equal to the sum of the squares of the other two sides, then the angle opposite to the first side is a right angle. Solution. Given :A triangle ABC such that :

Question 31. Without using trigonometric tables, evaluate the following :

$$\frac{\sec 37°}{\csc 53°} + 2\cot 15° \cot 25° \cot 45° \cot 75° \cot 65° - 3(\sin^2 18° + \sin^2 72°)$$

OR

Prove that : $\dfrac{\tan\theta}{1-\cot\theta} + \dfrac{\cot\theta}{1-\tan\theta} = 1 + \sec\theta\,\text{cosec}\theta$

Question 32.

Form the pair of linear equations in the following problem, and find their solutions graphically. 10 students of Class X took part in a Mathematics quiz. If the number of girls is 4 more than the number of boys, find the number of boys and girls who took part in the quiz.

Question 33:

$prove\ that\ \sqrt{\dfrac{1+\sin A}{1-\sin A}} = \sec A + \tan A.$

Question 34:

m3.30. Solve the following system of linear equations graphically : &+y-8 32-2y-12 Also find the coordinates of the points where the lines meet the z-axis.