ॐ 🕉 ॐ

UNIVERSAL EDUCATION CENTRE
JAYANT SHARMA (94145-37474 , 98181-63814)
SUMMATIVE ASSESSMENT – I (2015 – 2016)
MATHEMATICS
Class – X

_____

Time allowed: 3 hours   Maximum Marks: 90

General Instructions:
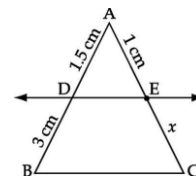
a) All questions are compulsory.
b) The question paper consists of 31 questions divided into four sections – A, B, C and D.
c) Section A contains 4 questions of 1 mark each which are multiple choice questions, Section B contains 6
    questions of 2 marks each, Section C contains 10 questions of 3 marks each and Section D contains 11
    questions of 4 marks each.
d) Use of calculator is not permitted.

Section A

Q.1   H.C.F. of two consecutive even numbers is :
       (A) 0   (B) 1   (C) 4   (D) 2

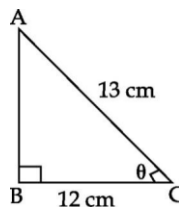Q.2   The graph of y = p(x) is given below. The number of zeroes of p(x) are :
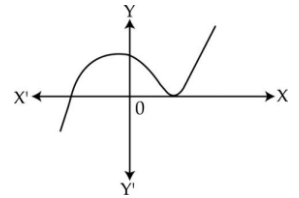
       (A) 0   (B) 3   (C) 2   (D) 4

Q.3   In figure, DE ∥ BC then x equals to :

       (A) 2.5 cm   (B) 2 cm   (C) 1.4 cm   (D) 4 cm

Q.4   If $\sin\theta$ = cos θ, then value of θ is :
       (A) 0⁰   (B) 45⁰   (C) 30⁰   (D) 90⁰

Section B

Q.5   If a cot θ + b cosec θ = p and b cot θ + a cosec θ = q then find the value of $p^2 - q^2$.

Q.6   In figure, AC = 13 cm, BC = 12 cm, then find the value of sec θ .

Q.7 If the HCF of 85 and 153 is expressible in the form 85n − 153 , then find the value of n.

Q.8 One equation of a pair of dependent linear equations is - $5x + 7y$ = 2, then find the second equation.

Q.9 Find The value of tan1°.tan2°.tan3°.......... tan89° .

Q.10 The mean and median of same data are 24 and 26 respectively. Find The value of mode .

Section C

Q.11 Divide ($2x^2 + x - 20$) by ($x + 3$) and verify the result by division algorithm.

Q.12 It being given that 1 is one of the zeros of the polynomial $7x - x^3 - 6$. Find its other zeros.

Q.13 For what value of p will the following system of equations have no solution

(2p - 1) x + (p - 1)y = 2p + 1; $\quad$ y + 3x − 1 = 0.

Q.14 If tan (A + B) = $\sqrt{3}$ and tan (A - B) = $\frac{1}{\sqrt{3}}$, $\quad$ 0° <A + B ≤ 90° ; A > B, find A and B.

OR

If sin (A + B) = cos (A - B) = $\frac{\sqrt{3}}{2}$ and A, B (A > B) are acute angles, find the values of A and B .

Q.15 X and Y are points on the sides PQ and PR respectively of a ΔPQR. If the lengths of PX, QX, PY and YR (in centimeters) are 4, 4.5, 8 and 9 respectively. Then show XY ∥ QR.

Q.16 A pole of length 10 m casts a shadow 2 m long on the ground. At the same time a tower casts a shadow of length 50 m on the ground, then find the height of the tower.

Q.17 The ages of employees in a factory are as follows :

Age in years	$17-23$	$23-29$	$29-35$	$35-41$	$41-47$	$47-53$
No. of employees	2	5	6	4	2	1

Find the median age group of the employees.

Q.18 The following is the daily pocket money spent by students.

Pocket money (₹)	$0-15$	$15-30$	$30-45$	$45-60$	$60-75$
No. of students	8	15	7	4	6

Find the mode of the above data.

Q.19 Prove that $\frac{2\sqrt{3}}{5}$ is irrational.

Q.20 Show that 4^n can never end with the digit zero for any natural number n.

OR

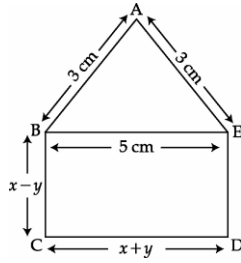If d is the HCF of 45 and 27, find x, y satisfying d = 27x + 45y

Section D

Q.21 Solve the following system of linear equations by cross multiplication method :

2(ax - by) + (a + 4b) = 0 . $\quad$ 2(bx + ay) + (b - 4a) = 0

OR

In the figure below ABCDE is a pentagon with BE ∥ CD and BC ∥ DE. BC is perpendicular to CD. If the perimeter of ABCDE is 21 cm, find the value of x and y.
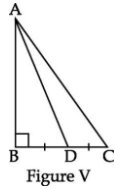
Q.22 On dividing the polynomial p(x) by a polynomial g(x) = $4x^2 + 3x - 2$ the quotient q(x) = $2x^2 + 2x - 1$ and remainder r(x) = $14x - 10$. Find the polynomial p(x).
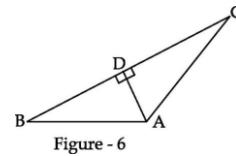
Q.23 Prove that (cosecA – sinA) (secA – cosA) = $\dfrac{1}{\tan A\ +\ \cot A}$

Q.24 If cosec (A - B) = 2,   cot (A + B) = $\dfrac{1}{\sqrt{3}}$, $0°< (A + B) \le 90°$,   A > B, then find A and B.

Q.25 In figure, ∆ABC is right angled at B and D is the mid point of BC. Prove that $AC^2 = 4AD^2 - 3AB^2$.

Figure V

Q.26 In the figure given below, AD ⊥ BC. Prove that $AB^2 + CD^2 = BD^2 + AC^2$:

Figure - 6

Q.27 Find the mean of the following frequency distribution, using step deviation method.

Classes	100 – 150	150 – 200	200 – 250	250 – 300	300 - 250
Frequency	4	5	12	2	2

OR

The mean of the following distribution is 22, find the missing frequency f :

Class	$0-10$	$10-20$	$20-30$	$30-40$	$40-50$
Frequency	12	16	6	f	9

Q.28 Find the missing frequency f if the mode of the given data is 154.

Class :	$120-130$	$130-140$	$140-150$	$150-160$	$160-170$	$170-180$
Frequency :	2	8	12	f	8	7

Q.29 Obtain all the zeroes of the polynomial $f(x) = x^4 - 7x^3 + 10x^2 - 14x - 2$, if two of its zeroes are $+\sqrt{2}$ and $-\sqrt{2}$

Q.30 Prove that in a right triangle the square of the hypotenuse is equal to the sum of the squares of the other two sides :

OR

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

Q.31 Draw the graph of $2x + y = 6$ and $2x – y + 2 = 0$. Shade the region bounded by these lines with x axis. Find the area of the shaded region.

ALL THE BEST