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UNIVERSAL EDUCATION CENTRE

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SUMMATIVE ASSESSMENT – I (2015 – 2016)
MATHEMATICS
Class – IX

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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 $\frac{p}{q}$ form of the number $0.\overline{3}$ is :

(A) $\frac{3}{10}$ (B) $\frac{3}{100}$ (C) $\frac{1}{3}$ (D) $\frac{1}{2}$

Q.2 Which of the following is a cubic polynomial ?

(A) $x^3 + 3x^2 - 4x + 3$ (B) $x^2 + 4x - 7$ (C) $3x^2 + 4$ (D) $3(x^2 + x + 1)$

Q.3 If a polynomial $f(x)$ is divided by x - a, then remainder is

(A) $f(0)$ (B) $f(a)$ (C) $f(-a)$ (D) $f(a) - f(0)$

Q.4 If ΔABC is congruent to ΔDEF by SSS congruence rule, then :

(A) ∠C < ∠F (B) ∠B < ∠E (C) ∠A < ∠D (D) ∠A = ∠D, ∠B = ∠E, ∠C = ∠F

Section B

Q.5 Find the remainder when $x^3 - 2x^2 + x + 1$ is divided by $(x - 1)$.

Q.6 In the figure below if AB = AC, find the value of x .
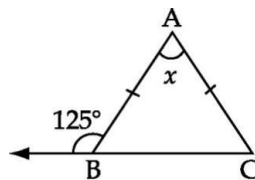
Q.7 The area of an equilateral triangle is $16\sqrt{3}$ m². Find Its perimeter (in metres) .
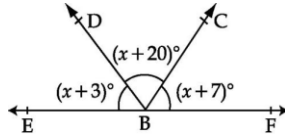
Q.8 The base of a right triangle is 15 cm and its hypotenuse is 25 cm. Then find its area.

Q.9 Simplify $\left(\frac{64}{125}\right)^{-2/3}$
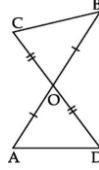
Q.10 Simplify : $(\sqrt{3} + 2)(\sqrt{3} - 2)$

Section C

Q.11 In the given figure, find the value of x.

Q.12 In the figure, OA = OB and OD = OC. Show that

(i) ΔAOD ≅ ΔBOC (ii) AD ∥ BC

OR

An exterior angle of a triangle is 120° and one of the interior opposite angles is 40°. Find the other two angles of a triangle.

Q.13 If $(x - 1)$ is a factor of the polynomial p(x) = $3x^4 - 4x^3 - ax + 2$ then find the value of 'a' ?

Q.14 A point lies on x–axis at a distance of 9 units from y–axis. What are its coordinates ?

What will be the coordinates of a point if it lies on y axis at a distance of - 9 units from x–axis ?

Q.15 Find the value of $\left(\dfrac{64}{125}\right)^{-2/3} + \dfrac{1}{\left(\frac{256}{625}\right)^{\frac{1}{4}}} + \dfrac{\sqrt{25}}{\sqrt[3]{64}}$ **OR**   Represent $\sqrt{3}$ on number line.

Q.16 Prove that $\dfrac{1}{2+\sqrt{3}} + \dfrac{2}{\sqrt{5}-\sqrt{3}} + \dfrac{1}{2-\sqrt{5}} = 0$

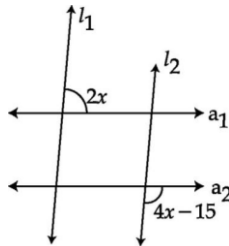**Q.17** Factorise : $x^2 + \dfrac{x}{4} - \dfrac{1}{8}$.   **OR**

What are the possible expressions for the dimensions of a cuboid whose volume is given below ? Volume = $12ky^2 + 8ky - 20k$.

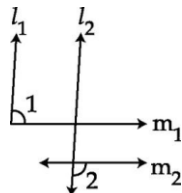**Q.18** If $x = 2y + 6$ then find the value of $x^3 - 8y^3 - 36xy - 216$.

Q.19 In ΔABC, ∠B = 45°, ∠C = 55° and bisector of ∠A meets BC at a point D. Find ∠ADB and ∠ADC.   **OR**

In the figure below, $l_1 ∥ l_2$ and $a_1 ∥ a_2$. Find the value of x.

Q.20 In the figure below, $l_1∥l_2$ and $m_1∥m_2$. Prove that ∠1 + ∠2 = 180°.

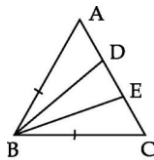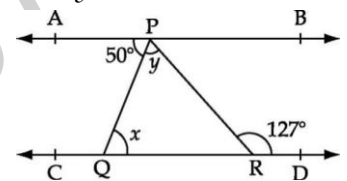**Section D**

Q.21 In the given figure, AB = AC, D is the point in the interior of ΔABC such that ∠DBC = ∠DCB. Prove that AD bisects ∠BAC of ΔABC.
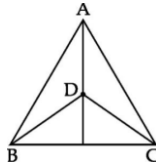
Q.22 In the given figure, AB = BC and AD = EC. Prove that . ΔABE ≅ ΔCBD

Q.23 In the given figure, if AB∥CD, ∠APQ = 50º and ∠PRD = 127º, find x and y.

Q.24 The perimeter of a triangular field is 300 cm and its sides are in the ratio 5 : 12 : 13. Find the length of the perpendicular from the opposite vertex to the side whose length is 130 cm.

Q.25 Find the values of a and b if $\frac{7+3\sqrt{5}}{3+\sqrt{5}} - \frac{7-3\sqrt{5}}{3-\sqrt{5}} = a + \sqrt{5}b$

OR

Evaluate after rationalizing the denominator of $\frac{25}{\sqrt{40}-\sqrt{80}}$. It is being given that $\sqrt{5} = 2.236$ and $\sqrt{10} = 3.162$

Q.26 Simplify $\frac{1}{2+\sqrt{5}} + \frac{1}{\sqrt{5}+\sqrt{6}} + \frac{1}{\sqrt{6}+\sqrt{7}} + \frac{1}{\sqrt{7}+\sqrt{8}}$.

Q.27 Prove that : $(a^2 - b^2)^3 + (b^2 - c^2)^3 + (c^2 - a^2)^3 = 3 (a + b) (b + c) (c + a) (a - b) (b - c) (c - a)$

Q.28 If remainder is same when polynomial p(x) = x^3 + $8x^2$ + $17x$ + ax is divided by (x + 2) and (x + 1), find the value of a.

Q.29 Find α and β, if (x + 1) and (x + 2) are factors of x^3 + $3x^2$ - $2\alpha x$ + β.

OR

Factorize : x^3 - $3x^2$ - 9x - 5.

Q.30 Plot the points A (4, 0) and B (0, 4). Join AB to the origin O. Find the area of ΔAOB.

Q.31 In the given figure, the side QR of ΔPQR is produced to a point S. If the bisectors of ∠PQR and ∠PRS meet at point T, then prove that ∠QTR = $\frac{1}{2}$ ∠QPR.

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