VENUS WORLD SCHOOLS

Academic Session-2021-22

Half Yearly Test

Grade -X **Time -90 Minutes**

Sub – Mathematics **Max Marks- 40**

General Instructions:-

1. *The question paper contains 3 Sections A, B, C.*
2. *Section A consists of 20 questions of 1 mark each. Any 16 questions are to be attempted.*
3. *Section B consists of 20 questions of 1 mark each. Any 16 questions are to be attempted.*
4. *Section C Consists of 10 questions based on 2 case studies. Attempt any 4 questions from each case study i.e. 8 questions from 2 case studies.*
5. *There will be no negative marking*

SECTION A

Q1. If two positive integers a and b are written as a = x^3y^2 and b = xy^3; x, y are prime numbers, then HCF (a, b) is

(a) xy (b) xy^2 (c) x^3y^3 (d) x^2y^2

Q2. . A card is drawn from a well shuffled deck of 52 cards. Find the probability of getting a king of red suit.

(a) 1/26 (b) 3/26 (c) 7/52 (d) 1/13

Q3. If HCF (16, y) = 8 and LCM (16, y) = 48, then the value of y is

(a) 24 (b) 16 (c) 8 (d) 48

Q4. The radius of a circle whose circumference is equal to the sum of the circumferences of the two circles of diameters 36 cm and 20 cm is

(a) 56 cm (b) 42 cm (c) 28 cm (d) 16 cm

Q5. The number of polynomials having zeroes as -2 and 5 is:

(a) 1 (b) 2 (c) 3 (d) More than 3

Q6. If the circumference of a circle and the perimeter of a square are equal, then

(a) Area of the circle = Area of the square

(b) Area of the circle > Area of the square

(c) Area of the circle < Area of the square

(d) Nothing definite can be said about the relation between the areas of the circle and square.

Q7. One equation of a pair of dependent linear equations is 2x + 5y = 3. The second equation will be

(a) 2x + 5y = 6 (b) 3x + 5y = 3

(c) -10x – 25y + 15 = 0 (d) 10x + 25y = 15

Q8. . If cos 9A = sin A and 9A < 90°, then the value of tan 5A is

(a) 0 (b) 1 (c) $1/\sqrt{3}$ (d) $\sqrt{3}$

Q9. . ΔPQR is an equilateral triangle with each side of length 2p. If PS ⊥ QR, then PS is equal to

(a) √3/2p (b) 2p (c) √3p (d) p

Q10. The points (1,1), (-2, 7) and (3, -3) are

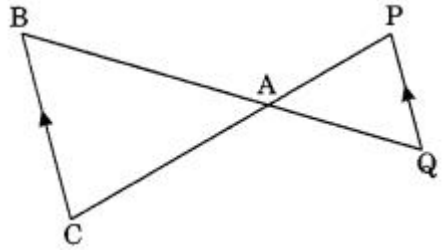
(a) vertices of an equilateral triangle (b) collinear

(c) vertices of an isosceles triangle (d) none of these

Q11. The perimeters of two similar triangles ABC and PQR are 60 cm and 36 cm

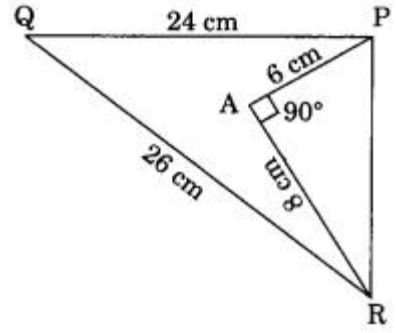
(a) 6 cm (b) 10 cm (c) 15 cm (d) 24 cm

Q12. In the given figure, ΔACB ~ ΔAPQ. If AB = 6 cm, BC = 8 cm, and PQ = 4 cm then AQ is equal to



(a) 2 cm (b) 2.5 cm (c) 3 cm (d) 3.5 cm

Q13. In the given figure, PQ = 24 cm, QR = 26 cm ∠PAR = 90°, PA = 6 cm, and AR = 8 cm, the degree measure of ∠QPR is



(a) 90° (b) 100° (c) 50° (d) 45°

Q14 The line segment joining the points (3, -1) and (-6, 5) is trisected. The coordinates of point of trisection are

(a) (3, 3) (b) (- 3, 3) (c) (3, – 3) (d) (-3,-3)

Q15 sin 2B = 2 sin B is true when B is equal to

(a) 90° (b) 60° (c) 30° (d) 0^o

Q16 Asha has only ₹1 and ₹2 coins with her. If the total number of coins that she has is 50 and the amount of money with her is ₹75, then the number of ₹1 and ₹2 coins are, respectively

(a) 35 and 15 (b) 15 and 35 (c) 35 and 20 (d) 25 and 25

Q17. If sin A – cos A = 0, then the value of $\sin^4 A + \cos^4 A$ is

(a) 2 (b) 1 (c) ¾ (d) 1/2

Q18. If one zero of the quadratic polynomial $x^2 + 3x + k$ is 2, then the value of k is

(a) 10 (b) –10 (c) 5 (d) –5

Q19. There are 312, 260 and 156 students in class X, XI and XII respectively. Buses are to be hired to take these students to a picnic. Find the maximum number of students who can sit in a bus if each bus takes equal number of students

(a) 52 (b) 56 (c) 48 (d) 63

Q20 If two positive integers p and q can be expressed as $p = ab^2$, and $q = ab$; a, b being prime numbers, then LCM (p, q) is

(a) ab (b) a^2b^2 (c) a^3b^2 (d) a^3b^3

SECTION B

Directions: In the following questions, a statement of assertion (A) is followed by a statement of reason (R). Mark the correct choice as:
(a) Both assertion (A) and reason (R) are true and reason (R) is the correct explanation of assertion (A).
(b) Both assertion (A) and reason (R) are true but reason (R) is not the correct explanation of assertion (A).
(c) Assertion (A) is true but reason (R) is false.
(d) Assertion (A) is false but reason (R) is true.

Q21. **Assertion (A):** A number N when divided by 15 gives the remainder 2. Then the remainder is same when N is divided by 5.

Reason(R): $\sqrt{3}$ is an irrational number.

(a) ◯ (b) ◯ (c) ◯ (d) ◯

Q22 **Assertion (A):** In the △ABC, AB = 24 cm, BC = 7cm then △ABC is a right angle triangle.

Reason(R): The ratio of the areas of two similar triangles is equal to the square of the ratio of their corresponding sides.

(a) ◯ (b) ◯ (c) ◯ (d) ◯

Q23. **Assertion (A):** 29/625 is a terminating decimal fraction.

Reason(R): If $q = 2^m \times 5^n$ where n, m are non-negative integers, then p/q is a terminating decimal fraction.

(a) ◯ (b) ◯ (c) ◯ (d) ◯

Q24 **Assertion (A):** In a right triangle ABC, right angled at B, if tanA=1, then 2Sin A – Cos A = 1

Reason(R): Cosec A is the abbreviation used for Cosecant of angle A.

(a) ◯ (b) ◯ (c) ◯ (d) ◯

Q25. **Assertion (A):** The value of q = +-2, if x=3, y=1 is the solution of the line $2x + y – q^2 - 3 = 0$.
Reason(R): The solution of the line will satisfy the equation of the line.
(a) ◯ (b) ◯ (c) ◯ (d) ◯

Q26. **Assertion (A):** The value of $2\tan^2 45^o + \text{Cos}^2 30^o – \text{Sin}^2 60^o$ is 2.
Reason(R): Value of $\tan 45^o = 1$, $\text{Cos } 30^o = \frac{\sqrt{3}}{2}$ and $\text{Sin } 60^o = \frac{\sqrt{3}}{2}$.
(a) ◯ (b) ◯ (c) ◯ (d) ◯

Q27. **Assertion (A):** The ordinate of a point A on y-axis is 5 and B has coordinates (-3,1). Then the length of AB is 5 units.
Reason(R): The point A(2, 7) lies on the perpendicular bisector of line segment joining the points P(6, 5) and Q(0, -4).
(a) ◯ (b) ◯ (c) ◯ (d) ◯

Q28. **Assertion (A):** If circumference of two circles are equal, then their areas will be equal.
Reason(R): If the areas of two circles are equal, then their circumferences are equal.
(a) ◯ (b) ◯ (c) ◯ (d) ◯

Q 29. **Assertion (A):** $\triangle ABC \sim \triangle DEF$ such that $ar(\triangle ABC) = 36\ cm^2$ and $ar(\triangle DEF) = 49\ cm^2$. Then, the ratio of their corresponding sides is 6:7
Reason(R): The ratio of the areas of the areas of two similar triangles is equal to the square of the ratio of their corresponding sides.
(a) ◯ (b) ◯ (c) ◯ (d) ◯

Q30. . **Assertion (A):** The HCF of two numbers is 18 and their product is 3072. Then their LCM is 169.
Reason(R): If a,b are two positive integers, then HCF x LCM = a x b.
(a) ◯ (b) ◯ (c) ◯ (d) ◯

Q31. **Assertion (A):** ABC is an Isosceles triangle right angled at
then $AB^2 = 2AC^2$
Reason(R): If in a triangle, square of one side is equal to the sum of the squares of the other two sides, then the angle opposite the first side is a right angle.
(a) ◯ (b) ◯ (c) ◯ (d) ◯

Q32. . **Assertion (A):** The sum and product of the Zeros of a quadratic polynomial are -1/4 and ¼ respectively. Then the quadratic polynomials is $4x^2 + x + 1$.
Reason(R): The quadratic polynomial whose sum and product of zeros are given is x^2 – (sum of Zeros). X + Product of zeros.
(a) ◯ (b) ◯ (c) ◯ (d) ◯

Q33. **Assertion (A):** If x $\text{Sin}^3\theta$ + y$\text{Cos}^3\ \theta$ = Sin θ Cos θ and X Sin θ = y Cos θ, then $x^2 + y^2 = 1$.

Reason(R): For any value of θ , $\text{Sin}^2\theta + \text{Cos}^2\ \theta = 1$

(a) ◯ (b) ◯ (c) ◯ (d) ◯

Q34. **Assertion (A):** Degree of a Zero polynomial is not defined.

Reason(R): Degree of a non-zero constant polynomial is 0.

(a) ◯ (b) ◯ (c) ◯ (d) ◯

Q35. **Assertion (A):** If the radius of a circle is $7/\sqrt{\pi}$ cm, then the area of circle is 49 cm^2 .

Reason(R): If r is a radius of circle, then the area of circle is $2\pi r$.

(a) ◯ (b) ◯ (c) ◯ (d) ◯

Q36. **Assertion (A):** The radius of a wheel of a bus is 25 cm. If the speed of a bus is 33 Km/h, then the number of revolutions made by wheel in 1 minute is 250.

Reason(R): number of revolutions in 1 minute= $\frac{distance\ covered\ in\ 1\ min}{circumference}$.

(a) ◯ (b) ◯ (c) ◯ (d) ◯

Q37. **Assertion (A):** D and E are points on the sides AB and AC respectively of a △ABC such that DE ∥ BC then the value of x is 4 when AD = X cm, DB = (x-2)cm, AE = (x+2) cm and EC = (x-1) cm.

Reason(R): If a line is parallel to one side of a triangle then it divides the other two sides in the same ratio.

(a) ◯ (b) ◯ (c) ◯ (d) ◯

Q38. **Assertion (A):** 250 lottery tickets were sold and there are 5 prizes on these tickets. Kunal has purchased one lottery ticket, the probability of winning the prize is 1/5.

Reason(R): Probability = $\frac{Number\ of\ Favourable\ outcomes}{Total\ number\ of\ outcomes}$.

(a) ◯ (b) ◯ (c) ◯ (d) ◯

Q39. **Assertion (A):** A number is selected randomly from the numbers 1 to 25. The probability of Prime number is 9/25.

Reason(R): The probability of odd numbers from 1 to 25 is 13/25.

(a) ◯ (b) ◯ (c) ◯ (d) ◯

Q40. **Assertion (A):** If P(E) = 0.20, then the probability of 'not E' is 0.80.

Reason(R): If two dice are thrown together, then the probability of getting a doublet is 5/6.

(a) ◯ (b) ◯ (c) ◯ (d) ◯

SECTION C

Q41. Read the information given below and answer the questions:

Lunch Party

Mr Manoj Jindal arranged a lunch party for some of his friends. The expense of the lunch are partly constant and partly proportional to the number of guests. The expenses amount to ₹ 650 for 7 guests and ₹ 970 for 11 guests.

Denote the constant expense by ₹ x and proportional expense per person by ₹ y and answer the following questions.

(i) Represent both the situations algebraically.

(a) $x + 7y = 650, x + 11y = 970$ (b) $x - 7y = 650, x - 11y = 970$

(c) $x + 11y = 650, x + 7y = 970$ (d) $11x + 7y = 650, 11x - 7y = 970$

(ii) Proportional expense for each person is

(a) ₹ 50 (b) ₹ 80 (c) ₹ 90 (d) ₹ 100

(iii) The fixed (or constant) expense for the party is

(a) ₹ 50 (b) ₹ 80 (c) ₹ 90 (d) ₹ 100

(iv) If there would be 15 guests at the lunch party, then what amount Mr Jindal has to pay?

(a) ₹ 1500 (b) ₹ 1300 (c) ₹ 1200 (d) ₹ 1290

(v) The system of linear equations representing both the situations will have

(a) unique solution (b) no solution

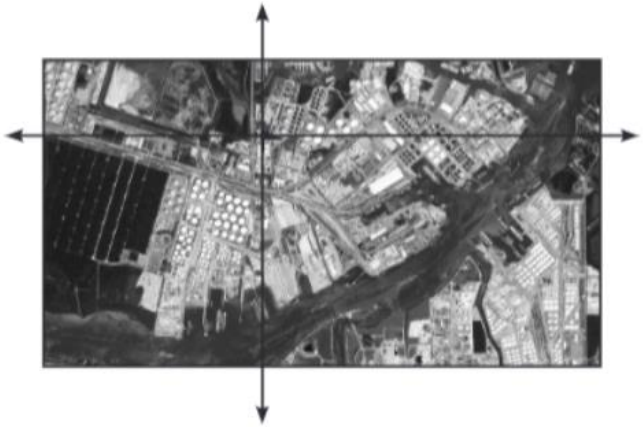
(c) infinitely many solutions (d) none of these

Q42. **Read the information given below and answer the questions:**

Satellite View

Satellite image of a colony is shown below. In this view, a particular house is pointed out by a flag, which is situated at the point of intersection of x and y-axes. If we go 2 cm east and 3 cm north from the house, then we reach to a Grocery store. If we go 4 cm west and 6 cm south from the house, then we reach to a Electrician's shop. If we go 6 cm east and 8 cm south from the house, then we reach to a food cart. If we go 6 cm west and 8 cm north from the house. then we reach to a bus stand.

Scale
x-axis : 1 cm = 1 unit
y-axis : 1 cm = 1 unit



Based on the above information, answer the following questions.

(i) The distance between grocery store and food cart is

(a) 12 cm (b) 15 cm (c) 18 cm (d) none of these

(ii) The distance of the bus stand from the house is

(a) 5 cm (b) 10 cm (c) 12 cm (d) 15 cm

(iii) If the grocery store and electrician's shop lie on a line, the ratio of distance of house from grocery store to that from electrician's shop, is

(a) 3 : 2 (b) 2 : 3 (c) 1 : 2 (d) 2 : 1

(iv) The ratio of distances of house from bus stand to food cart is

(a) 1 : 2 (b) 2 : 1 (c) 1 : 1 (d) none of these

(v) The coordinates of positions of bus stand, grocery store, food cart and electrician's shop form a

(a) rectangle (b) parallelogram (c) square (d) none of these