QB365 Student Learing Managemnet System
Exam Name: Pre Quarterly - Practice 1
Std: 10th Standard - Maths
Chapter: Quadratic Equations, Probability, Arithmetic Progressions, Polynomials, Statistics, Real Numbers, Pair of Linear Equation in Two Variables

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Questions:

Case Study Questions

1. In a classroom activity on real numbers, the students have to pick a number card from a pile and frame question on it if it is not a rational number for the rest of the class. The number cards picked up by first 5 students and their questions on the numbers for the rest of the class are as shown below. Answer them.

(i) Suraj picked up $\sqrt{8}$ and his question was - Which of the following is true about $\sqrt{8}$?

(a) It is a natural number	(b) It is an irrational number
(c) It is a rational number	(d) None of these

(ii) Shreya picked up 'BONUS' and her question was - Which of the following is not irrational?

(a) $3-4\sqrt{5}$	(b) $\sqrt{7}-6$	(c) $2+2\sqrt{9}$	(d) $4\sqrt{11}-6$

(iii) Ananya picked up $\sqrt{5}$ -.$\sqrt{10}$ and her question was - $\sqrt{5}$ -.$\sqrt{10}$ _____is number.

(a) a natural	(b) an irrational	(c) a whole	(d) a rational

(iv) Suman picked up $\frac{1}{\sqrt{5}}$ and her question was - $\frac{1}{\sqrt{5}}$ is _____ number.

(a) a whole	(b) a rational	(c) an irrational	(d) anatural

(v) Preethi picked up $\sqrt{6}$ and her question was - Which of the following is not irrational?

(a) $15+3\sqrt{6}$	(b) $\sqrt{24}-9$	(c) $5.\sqrt{150}$	(d) None of these

2. A part of monthly hostel charges in a college is fixed and the remaining depends on the number of days one has taken food in the mess. When a student Anu takes food for 25 days, she has to pay Rs 4500 as hostel charges, whereas another student Bindu who takes food for 30 days, has to pay Rs 5200 as hostel charges.



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Considering the fixed charges per month by Rs x and the cost of food per day by Rs y, then answer the following questions.

(i) Represent algebraically the situation faced by both Anu and Bindu.

(a) x + 25y = 4500, x + 30y = 5200	(b) 25x + y = 4500, 30x + Y = 5200
(c) x - 25y = 4500, x - 30y = 5200	(d) 25x - y = 4500, 30x - Y = 5200

(ii) The system of linear equations, represented by above situations has

(a) No solution	(b) Unique solution
(c) Infinitely many solutions	(d) None of these

(iii) The cost of food per day is

(a) Rs 120	(b) Rs 130	(c) Rs 140	(d) Rs 1300

(iv) The fixed charges per month for the hostel is

(a) Rs 1500	(b) Rs 1200	(c) Rs 1000	(d) Rs 1300

(v) If Bindu takes food for 20 days, then what amount she has to pay?

(a) Rs 4000	(b) Rs 3500	(c) Rs 3600	(d) Rs 3800

3. Electricity energy consumption is the form of energy consumption that uses electric energy. Global electricity consumption continues to increase faster than world population, leading to an increase in the average amount of electricity consumed per person (per capita electricity consumption).

Tariff : LT-Residential	Bill Number : 384756
Type of supply : Single Phase	Connected Load : 3kW
Meter Reading Date: 31-11-13	Meter Reading : 65789
Previous Reading date : 31-10-13	Previous Meter Reading : 65500
	Units Consumed : 289

A survey is conducted for 56 families of a Colony A. The following tables gives the weekly consumption of electricity of these families.

Weekly consumption (in units)	0-10	10-20	20-30	30-40	40-50	50-60
number of families	16	12	18	6	4	0

The similar survey is conducted for 80 families of colony B and the data is recorded as below:

Weekly consumption (in units)	0-10	10-20	20-30	30-40	40-50	50-60
Number of families	0	5	10	20	40	5

Refer to data received from Colony A

(i) The median weekly consumption is

(a) 12 units (b) 16 units (c) 20 units (d) None of these

(ii) The mean weekly consumption is

(a) 19.64 units (b) 22.5 units (c) 26 units (d) None of these

(iii) The modal class of the above data is

(a) 0-10 (b) 10-20 (c) 20-30 (d) 30-40

Refer to data received from Colony B

(iv) The modal weekly consumption is

(a) 38.2 units

(b) 43.6 units

(c) 26 units

(d) 32 units
(v) The mean weekly consumption is
(a) 15.65 units (b) 32.8 units (c) 38.75 units (d) 48 units

Assertion and reason

4. Assertion: The equation $x^2 + x + 4 = 0$ has equal roots.
Reason: Quadratic equation
Codes:
$ax^2 + bx + c = 0, a \neq 0$ has equal roots if $b^2 - 4ac = 0$.
(a) If both Assertion and Reason are correct and Reason is the correct explanation of Assertion.
(b) If both Assertion and Reason are correct, but Reason is not the correct explanation of Assertion.
(c) If Assertion is correct but Reason is incorrect.
(d) If Assertion is incorrect but Reason is correct.

5. Assertion: The probability of selecting a number from the numbers 1 to 20 is $\frac{1}{20}$.
Reason: For any event E, if P(E) = 1, then E is called an impossible event.
Codes
(a) Both Assertion and Reason are correct and Reason is the correct explanation of Assertion.
(b) Both Assertion and Reason are correct but Reason is not the correct explanation of Assertion.
(c) Assertion is correct but Reason is incorrect.
(d) Assertion is incorrect but Reason is correct.

6. Assertion (A) $\sqrt{2}(5 - \sqrt{2})$ is an irrational number.
Reason (R) Product of two irrational number is always irrational.
(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.

7. Assertion (A) : $-5, \frac{-5}{2}, 0, \frac{5}{2}, \ldots$ is an arithmetic progression.
Reason (R) : The terms of an arithmetic progression cannot have both positive and negative rational numbers.(a) Both Assertion and Reason are correct and Reason is the correct explanation of Assettion.
(b) Both Assertion and Reason are correct but Reason is not the correct explanation of Assertion.
(c) Assertion is correct but Reason is incorrect.
(d) Assertion is incorrect but Reason is correct.

5 Marks

8. In a musical chair game, the person playing the music has been advised to stop playing the music at any time within 2 minutes after she starts playing. What is the probability that the music will stop within the first half-minute after starting?

9. Represent the following situations in the form of quadratic equations :
The area of a rectangular plot is 528 m^2. The length of the plot (in meters) is one more than twice its breadth. We need to find the length and breadth of the plot.

10. Find the zeroes of the following quadratic polynomials and verify the relationship between the zeroe and the coefficients.
$6x^2 - 3 - 7x$

11. In a potato race, a bucket is placed at the starting point, which is 5 m from the first potato, and the other potatoes are placed 3 m apart in a straight line. There are ten potatoes in the line (see Fig)



A competitor starts from the bucket, picks up the nearest potato, runs back with it, drops it in the bucket, runs back to pick up the next potato, runs to the bucket to drop it in, and she continues in the same way until all the potatoes are in the bucket. What is the total distance the competitor has to run?
[To pick up the first potato and the second potato, the total distance (in metres) run by a competitor is 2 x 5 + 2 x (5 + 3)]

3 Marks

12. A man arranges to pay off a debt of Rs 3600 by 40 annual installments which are in AP. When 30 of the installments are paid, he dies leaving one - third of the debt unpaid. Find the value of the 8th installment.

13. A traffic signal displays green light for 3 min to allow passage of traffic on a particular road. If the signal is currently displaying green light, then find the probability that it will turn red within the next half a minute.

14. Find the median of the following data.

Marks obtained	20	29	28	42	19	35	51
Number of students	3	4	5	7	9	2	3

15. If a remainder on division of $x^3 + 2x^2 + kx + 3$ by x - 3 is 21, find the quotient and the value of k. Hence, find the zeroes of the cubic polynomial $x^3 + 2x^2 - kx - 18$.

16. Solve the following pair of linear equation by substitution method.
7x-4y=3,x+2y=3

17. Two students of a class X while solving a quadratic equation, committed the following mistakes:
One of them made a mistakes in the constant term and get the root as 6 and 8.
Another one commmitted an error in the coefficient of x and he got the roots as 3 and 14. But in the mean time, they realised that they are wrorng and they managed to get it right jointly. Find the quadratic equation.

2 Marks

18. If arithmetic mean of two numbers α and β is A and $\alpha . \beta = G^2$ then write a quadratic equation whose roots are α and β

19. If α and β are zeroes of the quadratic polynomial $p(x)=x^2-(k+6)x+2(2k-1)$, then find the value of k, if $\alpha + \beta = \frac{\alpha\beta}{2}$.

20. Show that 571 is a prime number.

21. A number is selected at random from I to 30. Find the probability that it is a prime number.

22. Find the sum of first 20 terms of an AP in which a = 1 and 20th term = 58.

Multiple Choice Question

23. The following probabilities are given; choose the correct answer for that which is not possible.

(a) 0.15 (b) 2/7 (c) 7/5 (d) none of these

24. An urn contains lottery tickets numbered from 1 to 100. If a ticket is selected at random, then the probability that it is a perfect square is

(a) 0.01 (b) 0.08 (c) 0.09 (d) 0.1

25. If the H. C. F of 210 and 55 is expressible in the form 210×5 + 55y then value of y is

(a) 0 (b) 5 (c) -20 (d) -19

26. If x is a positive real number , then there exists an irrational number y such that

(a) $-\infty. < x < y$ (b) $0 < y < x$ (c) $-\infty. < y < x$ (d) $0 < x < y$

27. If (x + 1) is a factor of $x^2 - 3ax + 3a - 7$, then the value of a is:

(a) -2 (b) 1 (c) -1 (d) 0

28. A fraction becomes when subtracted from the numerator and it becomes . when 8 is added to its denominator. Find the fraction

(a) 4/12 (b) 3/13 (c) 5/12 (d) 11/7

29. For a symmetrical distribution, which is correct

(a) Mean = Median = Mode (b) Mean < Mode < Median (c) Mean > Mode > Median (d) Mode = Mean + Median/2

30. The mean and median of same data are 24 and 26 respectively. The value of mode is :

(a) 23 (b) 25 (c) 30 (d) 26

31. Which term of the following A.P. would be 0? 36,33,30,27....

(a) 9 (b) 12 (c) 13 (d) 10

32. The pair of equations $3^{x+y} = 81$. $81^{x-y} = 3$ has

(a) no solution (b) unique solution (c) infinitelymany solutions (d) $x = 2\frac{1}{8}, y = 1\frac{7}{8}$

33. If $x = \frac{1}{\sqrt{3}}$ IS root of the equation $Px^2 + (\sqrt{3} - \sqrt{2})x - 1 = 0$, then the value of $p^2 + 1$ is

(a) $\sqrt{6}$ (b) 6 (c) 7 (d) 8

34. Take a point A(3, 4) on the graph and draw two lines from it, one is parallel to X-axis and another parallel to Y-axis. Again, take four points on both line on both sides of A, such that their x-coordinates and y-coordinates form an AP with common difference 2. Then, the area of circle, passing through these four points is

(a) 12 sq units (b) 13 sq units (c) 12.56 sq units (d) 13.56 sq units

35. Any line is said to be a tangent to the curve if it intersects the curve at one point. If the line y = kx - 3 is a tangent to the curve $y = 2x^2 + 7$, then the possible values of k is

(a) $4\sqrt{5}$ (b) $-4\sqrt{5}$ (c) Both (a) and (b) (d) None of these

36. n is a natural number such that n > 1 Which of these can definitely be expressed as a product of primes?
(i) √n (ii) n (iii) √n/2

(a) only (ii) (b) only (i) and (ii) (c) all (i), (ii) and (iii) (d) cannot be determined without knowing n

37. The zeroes of the quadratic polynomial $2x^2 - 3x - 9$ are

(a) 3, $\frac{-3}{2}$ (b) -3, $\frac{-3}{2}$ (c) -3, $\frac{3}{2}$ (d) 3, $\frac{3}{2}$

38. A dice is rolled twice. The probability that 5 will not come up either time is

(a) $\frac{11}{36}$ (b) $\frac{1}{3}$ (c) $\frac{13}{36}$ (d) $\frac{25}{36}$

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QUESTION BANK 365