AMRITA VIDYALAYAM

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PUSHP VIHAR, NEW DELHI
SESSION 2024-25
HALF-YEARLY EXAMINATION

CLASS : VIII

TIME ALLOWED : 3 HOURS

SUBJECT: MATHEMATICS

MAX. MARKS : 80

GENERAL INSTRUCTIONS: -
1. All questions are compulsory. There are 38 questions in all.
2. The question paper has 5 sections A, B, C, D and E.
3. Section A has 20 Multiple Choice Questions (MCQ) carrying 1 mark each.
4. Section B has 5 Short Answer -I type questions carrying 2 marks each.
5. Section C has 6 Short Answer -II type questions carrying 3 marks each.
6. Section D has 4 Long Answer type questions carrying 5 marks each.
7. Section E has 3 Case Based questions carrying 4 marks each.

SECTION-A

1. The square of which of the following numbers would be an even number?
   (a) 223   (b) 141312   (c) 114871   (d) 7657   1

2. Sum of a rational number and its additive inverse is _____ .
   (a) 1   (b) 0   (c) −1   (d) None of these   1

3. Probability of getting a red ball from a bag containing 20 red balls is _____ .
   (a) 1   (b) 0   (c) $\frac{1}{20}$ (d) $\frac{1}{2}$ 1

4. $2^0 + 4^0 + \left(\frac{1}{4}\right)^0$ is equal to _____ .
   (a) 1   (b) 0   (c) 3   (d) 5   1

5. The total cost of articles varies _____ to the number of articles purchased.
   (a) directly   (b) indirectly   (c) can't say   (d) None of these   1

6. What % of 150 is 30?
   (a) 50%   (b) 10%   (c) 15%   (d) None of these   1

7. An equation of the type ax + b = 0 where a≠ 0 is called a _____ in variable x.
   (a) linear   (b) quadratic   (c) cubic   (d) bi − quadratic   1

8. What will be the unit digit of the squares of 68327?
   (a) 9   (b) 1   (c) 3   (d) 4   1

9. The volume of rectangular boxes whose adjacent sides are $5ab, 3a^2b$ and $7a^4b^2$ is ____ .
   (a) $105a^7b^4$ (b) $75a^5b^4$ (c) $21a^6b^3$ (d) $21a^5b^4$ 1

10. The solution of equation $4(x + 5) = 24$ is $x =$ _____ .

(a) 9   (b) 1   (c) 3   (d) 0

11. Two quantities x and y are said to be in inverse variation if _____ .

(a) $\frac{x}{y} = k$ (b) $xy = k$ (c) $\frac{k}{y} = x$ (d) All of these

12. Probability of an impossible event is _____ .

(a) 1   (b) 0   (c) -1 (d) 0.5

13. Multiplicative inverse of $\frac{-23}{7}$ is _____ .

(a) $\frac{-7}{23}$ (b) $\frac{7}{23}$ (c) $\frac{23}{7}$ (d) 1

14. $(102)^2 - (98)^2$ is equal to _____ .

(a) 200   (b) 400   (c) 600   (d) 800

15. $\left(\frac{1}{2}\right)^5$ is equal to _____ .

(a) $\frac{-1}{23}$ (b) $\frac{1}{32}$ (c) 32   (d) -32

16. The speed of a moving object varies inversely to the _____ to cover a certain distance.

(a) time taken   (b) distance covered   (c) can't say   (d) speed of object

17. The smallest number by which 75 should be divided to make it a perfect square is ___ .

(a) 5   (b) 25   (c) 3   (d) 4

18. $\frac{2}{3} \div 0$ is equal to _____ .

(a) $\frac{2}{3}$ (b) $\frac{3}{2}$ (c) 0   (d) Not defined

19. $21 : 42$ is equivalent to _____ .

(a) 26%   (b) 50%   (c) 33.33%   (d) 72%

20. Degree of the polynomial $7x^2yz^2 + 6x^3y^2z - 5z + 8y^8$ is _____ .

(a) 2   (b) 8   (c) 3   (d) 7

SECTION-B

21. How many natural numbers lie between square of 12 and 13?

22. A fort is provided with food for 80 soldiers to last for 60 days. Find how long would the food last if 20 additional soldiers join after 15 days.

23. What should be subtracted from $\frac{-5}{3}$ to get $\frac{-2}{7}$?

24. From the following table, determine p and q if x and y vary directly: **2**

x	6	p	15	20	25
y	18	27	q	60	75

25. List the possible outcomes when two coins are tossed simultaneously.   **2**

SECTION-C

26. Solve for t : $\dfrac{3t-2}{3} + \dfrac{2t+3}{2} = t + \dfrac{7}{6}$ **3**

27. Find the probability in following cases: **3**

    (i) A card is drawn from a well-shuffled pack of 52 cards. Find the probability that the card drawn is a black ace.   **(1)**

    (ii) Ankita and Nagma are friends. They were both born in 1992. What is the probability that they have same birthday?   **(1)**

    (iii) Find the probability of getting 53 Sundays in a leap year.   **(1)**

28. Decrease the number 275 by 8%.   **3**

29. Find the value of m for which $(9)^m \div (3)^{-2} = (9)^4$ **3**

30. Express 37^2 as sum of two consecutive integers.   **3**

31. A 23 m 75 cm high water tank casts a shadow 20 m long. Find at the same time: **3**

    (i) The length of the shadow cast by a tree 9 m 50 cm high.   **(1.5)**

    (ii) The height of the building if the length of the shadow is 12 m.   **(1.5)**

SECTION-D

32. Using appropriate properties evaluate the following, also name the property used: **5**

    (i) $\left(\dfrac{-4}{5}\right) \times \dfrac{3}{7} \times \dfrac{15}{16} \times \left(\dfrac{-14}{9}\right)$ **(3)**

    (ii) $\left\{\dfrac{7}{5} \times \left(\dfrac{-3}{12}\right)\right\} + \left\{\dfrac{7}{5} \times \left(\dfrac{5}{12}\right)\right\}$ **(2)**

33. If two adjacent sides of a rectangle are $5x^2 + 4y^2$ and $2x^2 - 3y^2$, find its area and perimeter.   **5**

34. Sanjay wants to purchase a laptop whose marked price is ₹70200 excluding 8% GST. But he has ₹70200 only, so he requests the shopkeeper to reduce the price of laptop in such a way that he has to pay ₹70200 including GST. Find the amount reduced by the shopkeeper.   **5**

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35. Solve the equation

(i) $\dfrac{x+1}{x-1} = \dfrac{2x+3}{2x-5}$ (4)

(ii) $5x - 3 = 3x - 5$ (1)

SECTION-E

36. The Galactic Exploration Agency is preparing a mission to study two planets in our solar   4
system: Mercury and Neptune. To assess the mission's feasibility, they need to consider the
distances of these planets from the Sun. Mercury is situated approximately 5.79×10^7
kilometers from the Sun. In contrast, Neptune is located about 4.5 billion kilometers away
from the Sun. The agency will use these distances to plan the mission's trajectory and
estimate travel time. Based on the distances provided for Mercury and Neptune, answer the
following questions:

(i) Express the distance of Mercury from the Sun in usual form.   (1)

(ii) Find the sum of the distances of Mercury and Neptune from the Sun and express the   (1)
    sum in standard form.

(iii) Express the distance of Neptune from the Sun in standard form.   (1)

(iv) If a spacecraft travels at a speed of 10 million kilometers per year, how many years   (1)
    will it take to travel from Earth to Neptune? (Assume the distance from Earth to
    Neptune is 100 million kilometers.)

37. The Baker's Club at Riverwood School is preparing for their bake sale and needs to   4
calculate various quantities and costs for their ingredients. The amount of flour needed for
one cookie is represented by the expression $4x + 7$ measured in kilograms. The amount of
sugar required for one cookie is given by the expression $2x^2 - 5x + 3$, also in kilograms.
For one cookie, the amount of butter needed is represented by $5x - 2$, measured in
kilograms. Additionally, the total cost for all the ingredients is expressed by the formula
$6x^2 - 4x + 9$, calculated in rupees.

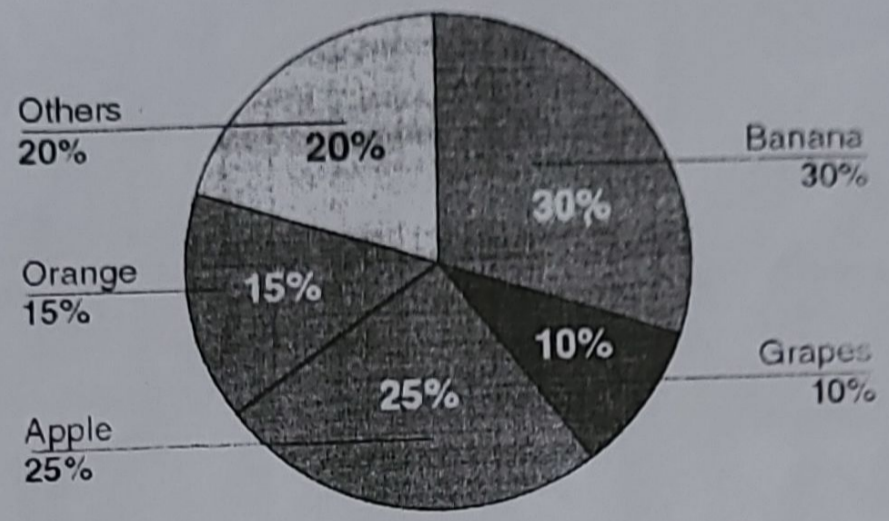(i) Find the total amount of flour and sugar needed.   (1)

(ii) Determine how much more flour is needed compared to butter.   (1)

(iii) If they plan to make $3x + 1$, cookies, calculate the total amount of butter needed.   (2)

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38. The below pie chart shows the sale of different fruits in a day for a shop:

Answer the following questions based on the pie chart:

(i) If a total of 1200 kg of fruits were sold in a day, calculate the amount of bananas sold (in kg). (1)

(ii) Find the difference between sales of grapes and oranges. (2)

(iii) Calculate the central angle for others. (1)