CBSE Sample Question Paper Term 1

Class – VIII (Session : 2021 - 22)

SUBJECT- MATHEMATICS 041 - TEST - 02

Class 08 - Mathematics

Time Allowed: 1 hour and 30 minutes **Maximum Marks: 50**

General Instructions:

1. The question paper contains 50 questions.
2. Attempt any 40 questions.
3. There is no negative marking.

1. $\frac{18}{23} + \left(-\frac{18}{23}\right)$ = _____. **[1]**

   a) 0 b) 18

   c) 23 d) $\frac{18}{23}$

2. If x + 0 = 0 + x = x, which is rational number, then 0 is called **[1]**

   a) multiplicative inverse of x b) additive inverse of x

   c) reciprocal of x d) identity for addition of rational numbers

3. The reciprocal of $\frac{-3}{8} \times \left(\frac{-7}{13}\right)$ is: **[1]**

   a) $\frac{21}{104}$ b) $\frac{104}{21}$

   c) $\frac{-21}{104}$ d) $\frac{-104}{21}$

4. If r is a rational number and s is an irrational number, then r + s and r - s are _____. **[1]**

   a) none of these b) irrationals

   c) rationals d) natural number

5. Find the multiplicative inverse of $\frac{-1}{21}$. **[1]**

   a) $\frac{1}{21}$ b) -21

   c) -22 d) 21

6. Find $\frac{7}{8} + \left(-\frac{5}{16}\right) + \left(-\frac{9}{16}\right) + \frac{5}{8}$ **[1]**

   a) $\frac{5}{8}$ b) -8

   c) 8 d) -5

7. Which of the following statements is always true? **[1]**

   a) $\frac{x \div y}{2}$ is a rational number between x and y b) $\frac{x \times y}{2}$ is a rational number between x and y

   c) $\frac{x+y}{2}$ is a rational number between x and y d) $\frac{x-y}{2}$ is a rational number between x and y

8. Find $\frac{3}{4} + \left(-\frac{5}{2}\right) + \left(-\frac{8}{3}\right) + \frac{5}{5}$ **[1]**

   a) -41 b) -1

   c) $-\frac{41}{12}$ d) 12

9. Three consecutive integers add upto 51. What are these integers? **[1]**

   a) None of these b) 16, 17 and 18

   c) 16, 16 and 17 d) 18, 19 and 20

10. Arvind is twice as old as Shafali. Five years ago his age was three times Shafali's age. Find their present ages. **[1]**

    a) None of these b) 10 years, 20 years

    c) 15 years, 30 years d) 15years, 20 years

11. A linear equation in one variable has **[1]**

    a) More than two solutions b) No solution

    c) Two solutions d) Only one solution

12. Solve: 8x + 4 = 3(x - 1) + 7 **[1]**

    a) 1 b) 2

    c) 0 d) 9

13. Solve: $\frac{3x-2}{4} - \frac{2x+3}{3} = \frac{2}{3} - x$ **[1]**

    a) 2 b) 3

    c) 4 d) None of these

14. Solve: 5x + 9 = 5 + 3x **[1]**

    a) -1 b) 2

    c) -2 d) 1

15. Solve 0.25(4m - 3) = 0.05(10 - 9) **[1]**

    a) 0.6 b) 0.1

    c) 0.12 d) 0.8

16. Solve: 15(y - 4) - 2(y - 9) + 5(y + 6) = 0 **[1]**

    a) 3 b) 2

    c) $\frac{2}{3}$ d) $\frac{3}{2}$

17. Two adjacent angles of a parallelogram have equal measure. Find the measure of each of the angles of the parallelogram. **[1]**

    a) acute angle b) none of these

    c) right angle d) obtuse angle

18. How many vertices in a pentagon? **[1]**

    a) 7 b) 5

c) 6 d) 8

19. The paper is a model for a _____. **[1]**

a) Point b) Circle

c) Border d) Plane surface

20. Which of the following quadrilaterals has two pairs of adjacent sides equal and diagonals intersecting at right angles? **[1]**

a) square b) rectangle

c) kite d) rhombus

21. The angles of a quadrilateral ABCD taken in an order are in the ratio 3 : 7 : 6 : 4. Then ABCD is a **[1]**

a) rhombus b) kite

c) parallelogram d) trapezium

22. How many diagonals does a convex quadrilateral have? **[1]**

a) 2 b) 4

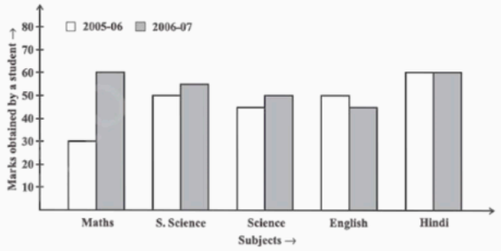
c) 3 d) None of these

23. Find the number of sides of a regular polygon whose each exterior angle has a measure of 20^o. **[1]**

a) 20 b) 22

c) 24 d) 18

24. In which subject has the performance deteriorated? **[1]**



a) English b) Maths

c) Science d) Hindi

25. A display of information using _____ of uniform width, their heights being proportional to the respective values. **[1]**

a) histograms b) None of these

c) angles d) bars

26. The following pie chart shows the times spent by a child during a day. What proportion of the sector for hours is spent in sleeping? **[1]**

a) $\frac{1}{4}$ b) None of these

c) $\frac{1}{2}$ d) $\frac{1}{3}$

27. A geometric representation showing the relationship between a whole and its parts, is a **[1]**

a) histogram b) pictograph

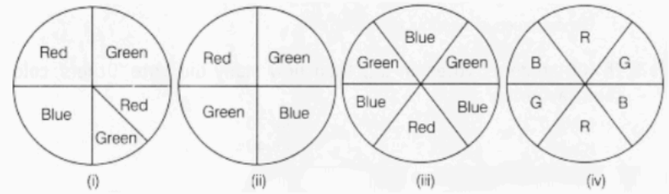
c) pie chart d) bar graph

28. A card is drawn at random from a pack of 52 cards. Find the probability that the card drawn is a black card **[1]**

a) $\frac{1}{2}$ b) $\frac{1}{26}$

c) $\frac{1}{13}$ d) $\frac{1}{52}$

29. Rahul, Varun and Yash are playing a game of spinning a coloured wheel. Rahul wins, if spinner lands on red. Varun wins, if spinner lands on blue. Yash wins, if it lands on green. Which of the following spinners should be used to make the game fair? **[1]**



a) (i) b) (iii)

c) (ii) d) (iv)

30. A coin is tossed three times. The number of possible outcomes is: **[1]**

a) 4 b) 8

c) 6 d) 3

31. How many natural numbers lie between 15^2 and 16^2? **[1]**

a) 30 b) 14

c) 60 d) 15

32. Find the perfect square number between 80 and 90. **[1]**

a) 87 b) 82

c) 81 d) 85

33. Which of the following will have 4 at the units place? **[1]**

a) 27^2 b) 35^2

c) 14^2 d) 62^2

34. Find the square of 74. **[1]**

a) 80 b) 5476

c) none of these d) 148

35. Find the cube root of 216000. **[1]**

a) None of these b) 50

c) 40 d) 60

36. Find the prime factorisation of 1728. **[1]**

a) $2^3 \times 2^3 \times 3^3$ b) None of these

c) $2^3 \times 2^3 \times 5^3$ d) $2^3 \times 3^3 \times 3^3$

37. Find the cube root of -132651. **[1]**

a) 51 b) -51

c) 15 d) 41

38. Find the value of the expression x^3 for x = 10. **[1]**

a) 1000 b) 100

c) 10000 d) 10

39. $(-3)^5 \div (-3)^8$ =? **[1]**

a) $\frac{1}{27}$ b) $-\frac{1}{27}$

c) $-\frac{1}{5}$ d) $-\frac{1}{2}$

40. Evaluate: 7^3 **[1]**

a) 343 b) 3

c) 49 d) 7

41. If x be any integer different from zero and m be any positive integer, then x^{-m} is equal to **[1]**

a) $\frac{1}{x^m}$ b) $\frac{-1}{x^m}$

c) x^m d) $-x^m$

42. If y be any non-zero integer, then y^0 is equal to **[1]**

a) 0 b) -1

c) not defined d) 1

43. The multiplicative inverse of $\left(-\frac{5}{9}\right)^{-99}$ is **[1]**

a) $\left(\frac{9}{-5}\right)^{99}$ b) $\left(\frac{9}{5}\right)^{99}$

c) $\left(\frac{5}{9}\right)^{99}$ d) $\left(-\frac{5}{9}\right)^{99}$

44. Find x so that $(-3)^{x+1} \times (-3)^5 = (-3)^7$ **[1]**

a) 1 b) 2

c) 3 d) 4

45. If the division N ÷ 5 leaves a remainder of 4, what might be the one's digit of N? **[1]**

a) 7 b) Either 2 or 7

c) 5 d) Either 4 or 9

46. Find the values of the letters in following :- **[1]**

$$\begin{array}{r} 2\,A\,B \\ +\,A\,B\,1 \\ \hline B\,1\,8 \end{array}$$

a) A = 4, B = 5 b) A = 2, B = 7

c) None of these d) A = 4, B = 7

47. The number 2 8 2 2 1 is divisible by which of the following: **[1]**

a) 6 b) 2

c) 3 d) 9

48. By which of the following number 225 is divisible? 2, 3, 4, and 6 **[1]**

a) 4 b) 3

c) 6 d) 2

49. If 5A + 25 is equal to B2, then the value of A + B is **[1]**

a) 8 b) 15

c) 7 d) 10

50. If A3 + 8B = 150, then the value of A + B is **[1]**

a) 13 b) 17

c) 12 d) 15

Solution

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Class 08 - Mathematics

1. **(a)** 0
   Explanation: $\frac{18}{23} + (\frac{-18}{23})$
   $= \frac{18}{23} - \frac{18}{23}$
   $= 0$

2. **(d)** identity for addition of rational numbers
   Explanation: We know that, the sum of any rational number and zero (0) is the rational number itself.
   Now, x + 0 = 0 + x = x, which is a rational number, then 0 is called identity for addition of rational numbers.

3. **(b)** $\frac{104}{21}$
   Explanation: Given number is $\frac{-3}{8} \times \left(\frac{-7}{13}\right)$
   The product of $\frac{3}{8} \times \left(\frac{7}{13}\right) = \frac{21}{104}$
   Hence, the multiplicative inverse of $\frac{21}{104}$ is $\frac{104}{21}$

4. **(b)** irrationals
   Explanation: r is a rational number and s is an irrational number so, r + s and r - s both will be irrationals, for example let r = 2 and s = $\sqrt{3}$, so r + s = 2 + $\sqrt{3}$ and r - s = 2 - $\sqrt{3}$ which are both irrationals.

5. **(b)** -21
   Explanation: The multiplicative inverse or reciprocal of any rational number is given by $\frac{1}{number}$, here the rational number is $\frac{-1}{21}$, so its multiplicative inverse will be $\frac{1}{\frac{-1}{21}}$ = -21

6. **(a)** $\frac{5}{8}$
   Explanation: $[\frac{7}{8} + (-\frac{5}{16})] + [(-\frac{9}{16}) + \frac{5}{8}]$
   $= [\frac{7\times2+(-5)\times1}{16}] + [\frac{(-9)\times1+5\times2}{16}]$
   $= [\frac{14-5}{16}] + [\frac{-9+10}{16}]$
   $= \frac{9}{16} + \frac{1}{16}$
   $= \frac{10}{16}$
   $= \frac{5}{8}$

7. **(c)** $\frac{x+y}{2}$ is a rational number between x and y
   Explanation: Here, $\frac{x+y}{2}$ is a rational number.
   Then, it always lies in between x and y either x < y or y< x.

8. **(c)** $-\frac{41}{12}$
   Explanation: $[\frac{3}{4} + (\frac{5}{2}) + (\frac{8}{3})] + \frac{5}{5}$
   $= [\frac{3\times3+(-5)\times6+(-8)\times4}{12}] + 1$
   $= [\frac{9 \quad 30 \quad 32}{12}] + 1$
   $= \frac{-53}{12} + 1$
   $= \frac{-53+12}{12}$
   $= \frac{-41}{12}$

9. **(b)** 16, 17 and 18
   Explanation: Let the interest are x, x + 1, x - 1.
   Therefore, x + x + 1 + x - 1 = 51
   or, 3x = 51
   or, x = 17
   One number is 17.
   Other are 16 and 18.

10. **(b)** 10 years, 20 years
    Explanation: Let Arvind's age be = x
    Shefali's age = 2x
    Five years ago,
    Arvind's age be = x - 5
    Shefali's age = 2x - 5
    According to question,
    2x - 5 = 3(x - 5)
    or, 2x - 5 = 3x - 15
    or, 2x - 3x = -15 + 5
    or, -x = -10
    by cancelling (-) from both sides,
    or, x = 10
    Now,
    Arvind's age be = x = 10 years
    Shefali's age = 2x = 20 years

11. **(d)** Only one solution
    Explanation: Only one solution

12. **(c)** 0
    Explanation: 8x + 4 = 3(x - 1) + 7
    or, 8x + 4 = 3x - 3 + 7 (solve bracket first)
    or, 8x + 4 = 3x + 4
    By transposing both sides
    or, 8x - 3x = 4 - 4
    or, 5x = 0
    or, x = 0

13. **(a)** 2
    Explanation: $\frac{3x-2}{4} - \frac{2x+3}{3} = \frac{2}{3} - x$
    L.C.M on both sides
    or, $\frac{(9x-6-8x-12)}{12} = \frac{(2-3x)}{3}$
    or, $\frac{(x-8)}{12} = \frac{(2-3x)}{3}$
    by cross-multiply
    or, 3x - 54 = 24 - 36x
    or, -54 - 24 = -36x - 3x
    or, -78 = -39x
    or, $\frac{-79}{-39}$ = x
    or, 2 = x

14. **(c)** -2
    Explanation: 5x + 9 = 5 + 3x
    5x - 3x = 5 - 9
    2x = -4
    x = -2

15. **(d)** 0.8
    Explanation: 0.25(4m - 3) = 0.05(10 - 9)
    or, m - 0.75 = 0.05
    or, m = 0.8

16. **(c)** $\frac{2}{3}$
    Explanation: 15(y - 4) -2(y - 9) + 5(y + 6) = 0

15y - 60 - 2y + 18 + 5y + 30 = 0

18y - 12 = 0

18y = 12

$y = \frac{12}{18}$

$y = \frac{2}{3}$

17. **(c)** right angle
Explanation: Let an angle = x

$x + x = 180^o$ (sum of adjecent angle of a parallelogram is 180^o)

$2x = 180^o$

$x = \frac{180^0}{2}$

$x = 90^o$

18. **(b)** 5
Explanation: A pentagon is a polygon with five vertices and fives sides.

19. **(d)** Plane surface
Explanation: A paper is a model of a plane surface with no 3-d (three - dimensional) shape.

20. **(c)** kite
Explanation: kite

21. **(d)** trapezium
Explanation: It is given that the ratio of angles of quadrilateral ABCD is 3 : 7 : 6 : 4
Let the angles of quadrilateral ABCD be 3x, 7x, 6x, 4x respectively.

We know that the sum of all angles is 360^o

$3x + 7x + 6x + 4x = 360^o$

$20x = 360^o$

$x = 18^0$

i.e., $\angle A = 3x = 54^o$

$\angle B = 7x = 126^o$

$\angle C = 6x = 108^o$

$\angle D = 4x = 72^o$

Now, Sum of interior angles

$\Rightarrow \angle A + \angle B = 126^o + 54^o = 180^o$

$\Rightarrow \angle C + \angle D = 108^o + 72^o = 180^o$

$\Rightarrow$BC || AD

$\therefore$ ABCD is a trapezium.

22. **(a)** 2
Explanation: The two diagonals of a convex quadrilateral are the line segments that connect opposite vertices.

23. **(d)** 18
Explanation: Number of sides = $\frac{360^0}{exterior-angle}$

$n = \frac{360^0}{20^0} = 18$

24. **(a)** English
Explanation: In English as the marks are less in 2006-07 from 2005 -06. So in English performance deteriorated

25. **(d)** bars
Explanation: A display of information using bars of uniform width, their heights being proportional to the respective values.

26. **(d)** $\frac{1}{3}$
Explanation: total hours = 24

hours spent in sleeping = 8

proportion of the sector for hours is spent in sleeping = $\frac{8}{24} = \frac{1}{3}$

27. **(c)** pie chart
Explanation: A pie chart (circle graph) shows the relationship between the whole and its parts.

28. **(a)** $\frac{1}{2}$
Explanation: Total number of cards = 52
Black cards = 26
Probability of getting a black card = $\frac{26}{52} = \frac{1}{2}$

29. **(d)** (iv)
Explanation: The figure (iv) should be selected to make the game fair as the area occupied by each colour is equal. Hence, the chance of winning for each person is equal.

30. **(b)** 8
Explanation: Number of possible outcomes is 8, i.e. HHH, HHT, HTH, THH, TTH, THT, HTT, TTT.

31. **(a)** 30
Explanation: Between the squares of any two consecutive numbers there lies 2m natural numbers where 'm' is the smaller of the two consecutive numbers given. Here, m = 15, so $2m = 2 \times 15 = 30$ natural numbers will lie between 15^2 and 16^2.

32. **(c)** 81
Explanation: The answer is 81 as the next square number is 100 which does not lie between 80 and 90

33. **(d)** 62^2
Explanation: The unit place of the square of $62^2 = 2^2 = 4$ [$\because 2^2 = 4$]
Clearly, 62^2 has 4 at the unit's place.

34. **(b)** 5476
Explanation: $74^2 = 74 \times 74 = 5476$

35. **(d)** 60
Explanation: $216000 = 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 3 \times 3 \times 3 \times 5 \times 5 \times 5$
$\sqrt[3]{216000} = \sqrt[3]{2^3 \times 2^3 \times 3^3 \times 5^3}$
$\sqrt[3]{216000} = 2 \times 2 \times 3 \times 5$
$\sqrt[3]{216000} = 60$

36. **(a)** $2^3 \times 2^3 \times 3^3$
Explanation: $1728 = 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 3 \times 3 \times 3$
$= 2^3 \times 2^3 \times 3^3$

37. **(b)** -51
Explanation: $-132651 = (3) \times (3) \times (3) \times (-17) \times (-17) \times (-17)$
$\sqrt[3]{-132651} = \sqrt[3]{3^3 \times (-17)^3}$
$\sqrt[3]{-132651} = 3 \times (-17)$
$\sqrt[3]{-132651} = -51$

38. **(a)** 1000
Explanation: For x = 10
$x^3 = 10^3$
$10 \times 10 \times 10 = 1000$

39. **(b)** $-\frac{1}{27}$
Explanation: $= (-3)^5 \div (-3)^8$
$= (-3)^5 \times (-3)^8$
$= (-3)^{-3}$
$= -\frac{1}{27}$

40. **(a)** 343

Explanation: 7^3

$7 \times 7 \times 7$

$= 49 \times 7$

$= 343$

41. **(a)** $\frac{1}{x^m}$

Explanation: Using law of exponents, $a^{-m} = \frac{1}{a^m}$

Similarly, $x^{-m} = \frac{1}{x^m}$ [$\because$ a is non-zero integer]

42. **(d)** 1

Explanation: Using law of exponents,

a° = 1 [for every 'a' is non-zero integer]

Similarly, y° = 1

43. **(d)** $\left(-\frac{5}{9}\right)^{99}$

Explanation: For multiplicative inverse, a is called multiplicative inverse of b, if a $\times$ b = 1

Put b = $\left(-\frac{5}{9}\right)^{99} \Rightarrow a \times \left(\frac{-5}{9}\right)^{-99} = 1$

$\Rightarrow a = \frac{1}{\left(\frac{5}{9}\right)^{-99}} \Rightarrow a = \left(-\frac{5}{9}\right)^{99} \left[\because a^{-m} = \frac{1}{a^m}\right]$

44. **(a)** 1

Explanation: $(-3)^{x+1} \times (-3)^5 = (-3)^7$

$(-3)^{x+1} = (-3)^7 \div (-3)^5$

$(-3)^{x+1} = (-3)^{7-5}$

$(-3)^{x+1} = (-3)^2$

Hence, x + 1 = 2

So, x = 1

45. **(d)** Either 4 or 9

Explanation: We know for a number to be divisible by 5 should have 0 or 5 at ones place. If the remainder is 4 than the ones digit of N must be either 0 + 4 = 4 or 5 + 4 = 9. Therefore, the answer is either 4 or 9.

46. **(d)** A = 4, B = 7

Explanation: 1 + B is 8 so B = 7. B + A gives 1 in units digit. Thus A has to be 4.

47. **(c)** 3

Explanation: 3

48. **(b)** 3

Explanation: It's digit sum = 9. So, it is divisible by 3

49. **(b)** 15

Explanation: If 5A + 25 = B2

here A + 5 = 2 i.e. two digit number. so, A = 7 and 1 carrya

57 + 25 = 82 so, B = 8

hence A + B = 7 + 8

= 15

50. **(a)** 13

Explanation: We have, A3 + 8B = 150

Here, 3 + B = 0, so 3 + B is a two-digit number whose unit's digit is zero.

3 + B = 10 $\Rightarrow$ B = 7 and 1 carry

Now, considering ten's column, A + 8 + 1 = 15

$\Rightarrow$ A + 9 = 15

$\Rightarrow$ A = 6

Hence, A + B = 6 + 7

= 13