Vacancy Connect
Subject : Maths

Class : VII **Section : .....**
Duration : 3 Hrs. **Max. Marks 80**

General Instructions:
This question paper contains two Parts A and B. Both Part A and B have internal choices.

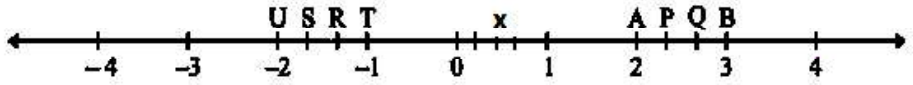
Part - A :
1. It consists two sections-I & II
2. Section-I has 6 questions on Case Study. Each case study has four sub - parts.
3. Section-II has 16 questions (Question No. 7 to 22) of 1 mark each. Internal choice is provided in 5 questions.

Part - B :
1. Question No. 23 to 28 are Short Answer Questions (Type-I) of 2 marks each.
2. Question No. 29 to 34 are Short Answer Questions (Type-II) of 3 marks each.
3. Question No. 35 to 36 are Long Answer Type Questions of 5 marks each.
4. Internal choice is provided in 2 questions of 2 marks, 2 questions of 3 marks and 1 question of 5 marks.

Part - A (Section - I)

Case study based questions are compulsory. Each case study has four case based sub parts. Each sub part carries 1 mark. ***(4×6=24)***

Q1. A rational number is defined as a number that can be expressed in the form $\frac{p}{q}$, where p and q are integers and $q \neq 0$. For example 2, $\frac{3}{1}, \frac{1}{2}, \frac{-1}{2}$, 0, etc. By multiplying the numerator and denominator of a rational number by the same non zero integer, we obtain another rational number equivalent to the given rational number. Observe the number line and give the answer of following questions:



i) Which rational number is represented by R?
(a) negative (c) positive
(b) zero (d) none of these

iv) Which rational number is represented by S?
(a) $\frac{-4}{3}$ (b) $\frac{-5}{3}$ (c) $\frac{5}{3}$ (d) None of these

Q2. Take a stone, tie it at one end of the string and swing it in air holding the other end of the string. The stone will move in a circle. Thus, a circle is the path of a point which moves in such a way that its distance from a fixed point in the given plane, remains constant. This fixed point is called the centre of the circle and the constant distance is called the radius. The perimeter of a circle i.e. the length of the boundary of a circle is called the circumference of the circle.

i) Diameter of a circle of radius 5.6 cm is_____.
(a) 5.6 cm (b) 10.12 cm (c) 11.2 cm (d) none of these

ii) The circumference of a circle of diameter 7 cm is _____.
(a) 44 cm (b) 22 cm (c) 38.5 cm (d) 77 cm

iii) The area of a circle of radius 4.9 cm is _____.
(a) 7546 cm^2 (b) 754.6 cm^2 (c) 75.46 cm^2 (d) 7.546 cm^2

iv) There are _____ number of centre/centres in a circle.
(a) 4 (b) 0 (c) 1 (d) uncountable

Q3. If interest is calculated uniformly on the original principal throughout the loan period, it is called Simple interest (SI). A borrower should return the principal amount (he/she has borrowed) and the interest to the lender. This money is called amount.

(i) Find the simple interest to be paid at the end of 3 years if principal Rs. 200 at the rate of 12% per annum.
(a) Rs. 24 (b) Rs. 48 (c) Rs. 72 (d) None of these

(ii) Find the simple interest to be paid at the end of 3 years if principal Rs. 500 at the rate of 5% per annum.
(a) Rs. 25 (b) Rs. 32 (c) Rs. 75 (d) None of these

(iii) Amount = _____ + _____ .
(a) Principal + S.I. (b) Principal – S.I.
(c) Can't say (d) None of these

(iv) Choose the correct formula to find out time (T) in years.

(a) $T = \frac{S.I \times 100}{R \times P}$ (b) $T = \frac{S.I \times R \times P}{100}$

(c) $T = \frac{S.I \times P}{R \times 100}$ (d) None of these

Q4. Expressions are defined as numbers, symbols and mathematical operations (such as +, - , × and ÷) grouped together that show the value of something.In algebra a term is either a single number or variable, or numbers and variables multiplied together. Terms are separated by + or - signs or sometimes by division. A coefficient is a number used to multiply a variable (2x means 2 times x, so 2 is a coefficient). Variables on their own (without a number next to them) actually have a coefficient of 1 (x is really 1x).

i) Identify the numerical coefficient of term (other than constants) in the expression: $5 - 3t^2$

(a) 2 (b) –3 (c) 5 (d) –5

ii) Identify the term/terms which contains x in the expression $13y^2 - 8yx$.

(a) $13y^2$ (b) –8yx

(c) Both (a) and (b) (d) None of these

iii) Identify the coefficient of y^2 in the expression $8 - xy^2$.

(a) 8 (b) –x (c) x (d) None of these

iv) Which of the following is the pair of like terms?

(a) –29x, –29y (b) 14xy, 42yx

(c) $4m^2p$, $4mp^2$ (d) None of these

Q5. The heights of 10 girls were measured in cm and the results are as follows: 135, 150, 139, 128, 151, 132, 146, 149, 143, 141.

i) What is the height of the tallest girl?

(a) 151cm (b) 152 cm (c) 150 cm (d) None of these

ii) What is the range of the data?

(a) 15 cm (b) 23 cm (c) 50 cm (d) None of these

iii) What is the mean height of the girls?

(a) 151cm (b) 141.4 cm (c) 155.5 cm (d) None of these

iv) How many girls have heights more than the mean height?

(a) 11 (b) 5 (c) 10 (d) None of these

Q6. Standard Form of any number can be expressed as a decimal number between 1.0 and 10.0 including 1.0 multiplied by a power of 10. Such a form of a number is called its standard form. The exponential form is a shortcut way of writing repeated multiplication involving base and exponents. In this form, the power represents the number of times we are multiplying the base by itself.

i) The exponential form of b × b × b × b is _____.

(a) b^4 (b) 4^b (c) 4b (d) none of these

ii) The standard form of the 5,00,00,000 is _____.

(a) 0.05×10^7 (b) 5×10^{10} (c) 5×10^7 (d) none of these

iii) The exponential form of $6^{15} \div 6^{10}$ after simplification is _____.

(a) 6^4 (b) 6^5 (c) 6^{15} (d) none of these

iv) The exponential form of $2° + 3° + 4°$ after simplification is _____ .

(a) 1 (b) 9° (c) 3 (d) none of these

(Section - II)

Fill ups / True-False / MCQ : (1×16=16)

Q7. The ratio of 15 kg to 210 g is ..... .

OR

The ratio of 30 days to 36 hours is..... .

Q8. The rational number whose numerator is the smallest three digit number and denominator is the largest four digit number is…… .

OR

The lowest form of $\left(\frac{65}{84}\right)$ is …… .

Q9. The product of two negative rational numbers is _____ .

Q10. The area, in square metres, of a rectangle whose length = 5.5 m and breadth = 2.4 m is…… .

OR

The area, in square centimetres, of a square whose side 1.2 cm is…… .

Q11. The mode of scores 19, 25, 23, 20, 9, 20, 15, 10, 5, 16, 25, 20, 24, 12, 20 in mathematics test (out of 25) of 15 students is ……. .

Q12. The range of the data 130, 132, 135, 137, 139, 140, 142, 143, 145, 148 is…… .

OR

The mean of the first five whole numbers is……. .

Q13. What is the coefficient of x in the expression 4x + 3y?

(a) 1 (b) 2 (c) 3 (d) 4

Q14. Which of the following pair of terms is a pair of like terms?

(a) 3x, 2xy (b) $-xy^2$, $-2xy^2$

(c) $-6x^2$, $20x^2y$ (d) $8x^2$, 7y.

OR

Add: a + b - 1, b - a + 1, 1 - 2b

(a) 1 (b) –1 (c) 2 (d) none of these

Q15. The value of 7^3 is 243. T/F

Q16. The value of $(-2) \times (-3)^3$ is 54. T/ F

Q17. Sum of the numbers p and 5 is 11. The equation is p+ 5 = 11. T/F

Q18. There can be more than one mode for a given data. T/ F

Q19. An equation form for statement: one fourth of n is 3 more than 2 is ___ .

(a) $\frac{n}{4}-2=3$ (b) $\frac{n}{4}+2=3$

(c) $\frac{n}{2}-4=3$ (d) $\frac{n}{2}+4=3$

Q20. The solution of the equation $\frac{m}{3}$ = 3 is _____ .

(a) 3 (b) 6 (c) 9 (d) 12

Q21. Solve for x: 18 – (2x –12) = 8x

(a) 15 (b) 26 (c) 3 (d) $\frac{13}{5}$

Q22. An arithmetic mean of a and b is …… .

(Part - B)

Short Answer Questions (Type-I): (2×6=12)

Q23. In a computer lab, there are 3 computers for every 6 students. How many computers will be needed for 24 students?

OR

Find: 15% of 250.

Q24. Which rational number in each of the following pair of rational number is greater?

(i) $\left(\frac{-3}{8}\right), 0$ (ii) $\left(\frac{4}{-9}\right), \left(\frac{-3}{-7}\right)$

Q25. A marble tile measures 10 cm ×12 cm. How many tiles will be required to cover a wall of size 3m × 4m?

OR

One side of a square field is 179 m. Find the cost of raising a lawn on the field at the rate of Rs 1.50 per square metre.

Q26. Fill in the blanks by the correct symbol out of >, =, or <:

(i) $\left(\frac{-6}{7}\right) \ldots \left(\frac{7}{13}\right)$ (ii) $\left(\frac{-3}{5}\right) \ldots \left(\frac{-5}{6}\right)$

Q27. Solve $\{(2^3)^4 \times 2^8\} \div 2^{12}$ and express it in exponential form.

Q28. Add $(2x^2 - 3x + 1)$ to the sum of $(3x^2 - 2x)$ and $(3x + 7)$.

Short Answer Questions (Type-II): (3×6=18)

Q29. Insert six rational numbers between $\frac{3}{8}$ and $\frac{3}{5}$.

Q30. Express the numbers appearing in the following statements in the standard form:

(i) The distance between the Earth and the Moon is 384,000,000 meters.

(ii) Diameter of the Earth is 1, 27, 56,000 meters.

OR

If $\frac{\left(9^n \times 3^2 \times 3^n - (27)^n\right)}{(3^3)^5 \times 2^3} = \left(\frac{1}{27}\right)$, find the value of n.

Q31. The marks (out of 100) obtained by a group of students in a science test are 85, 76, 90, 85, 39, 48, 56, 95, 81 and 75. Find the :
(i) range of the marks obtained.
(ii) mean marks obtained by the group.

Q32. Subtract $6x^3 - 7x^2 + 5x - 3$ from $4 - 5x + 6x^2 - 8x^3$.

OR

Subtract $x^3 + 2x^2y + 6xy^2 - y^3$ from $y^3 - 3xy^2 - 4x^2y$.

Q33. Construct 3 equations starting with $x = 5$.

Q34. In a test, Abha gets twice the marks as that of Palak. Two times Abha's marks and three times Palak's marks make 280. If Palak gets x marks, find Abha's marks.

Long Answer Type Questions: **(5×2=10)**

Q35. Chalk contains calcium, carbon and oxygen in the ratio 10 : 3 : 12. Find the percentage of carbon in chalk. If in a stick of chalk, carbon is 3g, what is the weight of the chalk stick?

OR

Using the concept of SI, find the amount to be paid at the end of 3 years in each case:
a) Principal = Rs. 1,200 at 12% p.a.
b) Principal = Rs. 7,500 at 5% p.a.

Q36. Each side of a square flower bed is 2 m 80 cm long. It is extended by digging a strip 30 cm wide all around it. Find the area of the enlarged flower bed and also the increase in the area of the flower bed.

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