

Sample Paper

3 Year (Foundation)

Duration: 2 Hrs

Maximum Marks: 180

For Students Presently in Class 9 (Stream: Foundation)

PAPER SCHEME:

- This paper contains **35 Objective Type Questions** divided into four sections: **Section - I, Section - II, Section - III and Section - IV**
- **Section I** contains **5 Multiple Choice Questions (1-5)** based on **Mental Aptitude**. Each question has 4 choices (A), (B), (C) and (D), out of which **ONLY ONE CHOICE is correct**.
- **Section II** contains **10 Multiple Choice Questions (6-15)** based on **Science**. Each question has 4 choices (A), (B), (C) and (D), out of which **ONLY ONE CHOICE is correct**.
- **Section III** contains **10 Multiple Choice Questions (16-25)** based on **Mathematics**. Each question has 4 choices (A), (B), (C) and (D), out of which **ONLY ONE CHOICE is correct**.
- **Section IV** contains **10 Numerical Value Type Questions (1-10)**. The answer to each of these questions ranges from 0 to 99.

MARKING SCHEME:

- **Section I** : For each question, **4 marks** will be awarded for correct answer and **–1 negative marking** for incorrect answer.
- **Section II & III** : For each question, **5 marks** will be awarded for correct answer and **–1 negative marking** for incorrect answer.
- **Section IV** : For each question, **6 marks** will be awarded for correct answer and **–1 negative marking** for incorrect answer.

SECTION - I [MENTAL APTITUDE]

1. In a certain code language, if the word "ADDRESS" is coded as ZCCQDRR, then how will you code the word "BUILDING" in that language?
(A) ATHKCHMF (B) ATHLCHMF (C) ATHKDHMF (D) ATHLDHNF
2. If "SQUARE" = 87 and "RECTANGLE" = 94, then what is the value of "ROMBUS"?
(A) 96 (B) 94 (C) 89 (D) 97
3. 5 children - P , Q , R , S and T are given ranks based on an essay writing competition. Neither S nor Q got the best rank. P has exactly one person who got a better rank than him. R is two ranks better than T . Who got the third lowest rank?
(A) R (B) S (C) Q (D) T
4.

5	8	10
30	72	?

(A) 110 (B) 90 (C) 120 (D) 130
5. Samir walks 8 km towards North. Then he turns right and walks a further 8 km. How far and in what direction is he from the starting point?
(A) 10 km approx, North (B) 11 km approx, North-east
(C) 16 km approx, North-east (D) 14 km approx, North-east

SECTION - II [SCIENCE]

6. A particle of mass 5 kg is moving with a constant velocity of 10 m/s along positive x -axis. The momentum of particle and the net external force acting upon the particle are respectively:
(A) $49\text{ Ns}, 3\text{ N}$ (B) $50\text{ Ns}, 0\text{ N}$ (C) $59\text{ Ns}, 2\text{ N}$ (D) $47\text{ Ns}, 1\text{ N}$
7. A person pushes a wall with a force of 100 N for 2 minutes, but the wall does not move. The work done by the person is:
(A) 200 J (B) 12000 J (C) 100 J (D) 0 J
8. The rate of change of displacement is called:
(A) Momentum (B) Speed (C) Velocity (D) Acceleration
9. A dipositive ion has 137 nucleons. If it has 50% more neutrons than electrons, then the correct symbol of this ion will be:
(A) ${}_{97}^{247}\text{Bk}^{2+}$ (B) ${}_{56}^{137}\text{Ba}^{2+}$ (C) ${}_{83}^{209}\text{Bi}^{2+}$ (D) ${}_{65}^{137}\text{Tb}^{2+}$
10. Which of the following forms heterogeneous mixture?
(A) Gun powder (B) Cement (C) Blood (D) All of these
11. Which of the following statements is not true about suspension?
(A) The particles of suspension can be separated from solvent by the process of filtration
(B) When the suspension is kept undisturbed, the particles of suspension settle down
(C) A suspension is homogeneous in nature
(D) Scattering of light takes place in suspension
12. Which of the following structures is present in both prokaryotic and eukaryotic cells?
(A) Nucleus (B) Mitochondria
(C) Ribosomes (D) Endoplasmic Reticulum
13. A plant tissue provides mechanical support to young stems while still allowing flexibility. Identify the tissue.
(A) Parenchyma (B) Collenchyma (C) Sclerenchyma (D) Xylem
14. Which animal tissue is specialised for transmitting electrical impulses rapidly from one part of the body to another?
(A) Epithelial tissue (B) Muscular tissue (C) Nervous tissue (D) Connective tissue
15. Which of the following is the main limitation of asexual reproduction?
(A) Offspring are produced slowly (B) It always requires water
(C) It produces little or no genetic variation (D) It cannot occur in unicellular organisms

SECTION - III [MATHEMATICS]

16. Let $x = 2 + \sqrt{3}$, then the value of $x^2 + \frac{1}{x^2}$ is:
(A) 12 (B) 14 (C) 16 (D) 10
17. If $p(x) = x^4 - k^2x^2 + 3x - k$, then the value of 'k' for which $x + k$ is a factor of $p(x)$, is:
(A) 1 (B) -1 (C) 0 (D) 2
18. Let a, b, c be real numbers such that $a^3 + b^3 + c^3 - 3abc = 0$ and $a + b + c \neq 0$. Which of the following MUST be true?
(A) $a = b = c$ (B) $a + b = c$
(C) $abc = 0$ (D) $a^2 + b^2 + c^2 = 2(ab + bc + ca)$
19. The point $P(a, 4)$ is equidistant from the points $A(5, -2)$ and $B(-1, 4)$. Find the value of a .
(A) 7 (B) 3 (C) -3 (D) 5
20. A wire is bent to form a square of area 484 cm^2 . If the same wire is straightened and rebent into a circle, find the area enclosed by the circle. (Use $\pi = 22/7$)
(A) 588 cm^2 (B) 616 cm^2 (C) 704 cm^2 (D) 660 cm^2
21. If $\sqrt{13 - a\sqrt{10}} = \sqrt{8} + \sqrt{5}$, then a is one of the zero of the polynomial:
(A) $x^2 - 3x + 2$ (B) $x^2 - 7x + 12$ (C) $x^2 + 7x + 12$ (D) $x^2 + 3x + 2$
22. A person sells a T.V. at Rs. 10000 making a profit of 25% and a fridge at Rs. 20000 making a loss of 20%, then overall:
(A) Profit is Rs. 3000 (B) Loss is Rs. 5000
(C) Loss is Rs. 3000 (D) Profit is Rs. 5000
23. Three numbers are in A.P. Their sum is 24 and their product is 440. Find the largest of the three numbers.
(A) 11 (B) 10 (C) 13 (D) 14
24. While travelling from A to B , wheels of a bus makes 1250 revolutions. Distance between A and B is 2.2 km. Find the radius of wheels.
(A) 30 cm (B) 32 cm (C) 28 cm (D) 26 cm
25. A shopkeeper inflates his price by 10% and uses weight which are 20% less than the actual weight. The total profit earned by him will be:
(A) 30% (B) 88% (C) 37.5% (D) 40%

SECTION - III [NUMERICAL VALUE TYPE QUESTIONS]

This Section contains 10 Integer Type Questions. Each question has an integer answer between 0 and 99. Enter the correct Numerical Value.

1. If $x = \frac{1}{\frac{1}{9^3} - \frac{1}{3^3} + 1}$, then the value of $64x^3 - 48x^2 + 12x$ is _____.
2. If $a - b = 4$ and $b - c = 3$, then the value of $(a^2 + b^2 + c^2) - (ab + bc + ca)$ is _____.
3. Find the number of positive integers $n \leq 100$ that are neither a perfect square nor a perfect cube.
4. A sequence satisfies $a_1 = a_2 = 1$ and $a_n = a_{n-1} + a_{n-2}$ for $n \geq 3$. Find the remainder when a_{20} is divided by 100.
5. For how many positive integers n , is $n^2 - 3n + 2$ a prime number? _____.
6. If $N = \sqrt{97 \times 98 \times 99 \times 100 + 1}$, then the value of $(\sqrt{N - 97} + 23)^{1/2}$ is _____.
7. If a, b, c are positive real numbers such that $a + b + c = 6$, $ab + bc + ca = 11$ and $abc = 6$, then find the value of $a^3 + b^3 + c^3$.
8. In the XY -plane, let A be the point $(5, 0)$ and L be the line $y = \frac{x}{3}$. The number of points P on the line L such that triangle OAP is isosceles is _____. (O being the origin)
9. In $\triangle ABC$, $AB = 13$, $BC = 14$, $CA = 15$. Find the length of the altitude drawn from vertex A to side BC .
10. If a and b are positive integers ($a > b$ and a, b are co-primes) such that $a\sqrt{a} + b\sqrt{b} = 341$ and $a\sqrt{b} + b\sqrt{a} = 330$. If $\frac{a}{b} = \frac{m}{n}$, then the value of $n + m$ is _____.