4. *There is no overall choice.*

SECTION A

(Each question carries 1 Mark)

Q1. What is the degree of a biquadratic polynomial? 1

Q2. Find value of $467^2 - 33^2$ using identity. 1

Q3. What name is given to a quadrilateral whose two pairs of adjacent sides are equal? 1

Q4. What is the number of diagonals in a polygon of n sides? 1

Q5. In word "CHOICE" which letter has rotational symmetry of order more than 2. 1

Q6. What is the angle of rotation of a regular hexagon? 1

SECTION B

(Each question carries 2 Marks)

Q7. Factorise $q^2 - 10q + 21$ 2

Q8. Evaluate : $\left(\frac{2}{11}\right)^4 \cdot \left(\frac{11}{3}\right)^2 \cdot \left(\frac{3}{2}\right)^3$ 2

Q9. At what rate per cent per annum, ₹ 10000 will amount to ₹ 13310 in 3 years compounded annually? 2

Q10. Solve the equation : $\frac{x^2 - 9}{5 + x^2} = \frac{5}{9}$ 2

Q11. One side of a parallelogram is $\frac{3}{4}$ th of its adjacent side. If the perimeter of the parallelogram is 140 cm, find the lengths of sides of the parallelogram. 2

Q12. A box contains 24 marbles of different colours. The following table shows the number of marbles of these different colours. Make the table showing fractions and angles in degrees 2

Colour of marble	Red	Green	Yellow	Blue
No. of marbles	10	6	5	3

SECTION C

(Each question carries 3 Marks)

Q13. Find square root of $367\frac{2}{3}$ correct to 3 decimal places. 3

Q14. Express $81x^2 + 16y^2 - 72xy$ as a square of binomial and evaluate for $x = \frac{2}{3}$ and $y = \frac{3}{4}$ 3

Q15. A man had ₹ 75000. He invested ₹ 35000 in a company which pays him 9% interest per annum and he invested rest of the money in another company which pays him 9.5% interest per annum. Find the total compound interest received by him after 2 years. 3

OR

Madhu bought a house for ₹ 1,31,25,000. If its value depreciates at the rate of 10% p.a. what will be its sale value after 3 years? 3

Q16. Find the compound interest on ₹ 9000 at 6% per annum for 3 years using the formula of simple interest. 3

Q17. (*a*) Divide the polynomial $49p^3 + \sqrt{7}p^2$ by $7\sqrt{7}p$ 3

(*b*) Find $(x^2 - 4x - 45) \div (x - 9)$ using factorisation method. 3

Q18. The numerator of a rational number is less than its denominator by 3. If the numerator becomes three times and the denominator is increased by 20, the rational number becomes $\frac{1}{8}$. Find the rational number. 3

OR

Find three consecutive positive integers whose sum is 2001.

Q19. Solve for x : $\frac{(1-2x)+(1+2x)}{(4x+1)+(x-3)} = \frac{1}{2}$ 3

Q20. Construct quad. ABCD in which AB = BC = 4 cm, AD = CD = 5 cm and diagonal AC = 5.5 cm. Measure diagonal BD. 3

Alternate question for visually challenged students in lieu of Q. 20.

OR

ABCD is a parallelogram whose diagonals bisect each other at right angles. Show that it is a rhombus. 3

Q21. The area of a trapezium is 248 sq. m and its height is 8 m. If one of the parallel side is smaller than the other by 4 m, find two parallel sides. 3

OR

The length of a roller is 40 cm and its diameter is 21 cm. It takes 300 complete revolutions to move once over to level the floor of a room. Find the area of room in m^2. 3

OR

Q22. List all the possible outcomes when three coins are tossed together. What is the probability of getting (*i*) 2 heads (*ii*) no tail. 3

OR

From a well shuffled pack of 52 playing cards, a card is drawn at random. Find the probability that the card drawn is 3

(*i*) a non face card, (*ii*) a red and a king, (*iii*) 10 of black suit

SECTION D

(Each question carries 4 Marks)

Q23. An officer wants to arrange 202500 cadets in the form of a square. How many cadets were there in each row? 4

Q24. Find the continued product of $\left(x+\frac{1}{x}\right)\left(x-\frac{1}{x}\right)\left(x^2+\frac{1}{x^2}\right)\left(x^4+\frac{1}{x^4}\right)$ 4

Q25. The difference between the compound interest and simple interest on a certain sum for 2 years at 7.5% p.a is ₹ 360. Find the sum. 4

Q26. Divide $6x^5 + 4x^4 - 27x^3 - 7x^2 + 27x + \frac{3}{2}$ by $2x^2 - 3$ by long division method. 4

Is $2x^2 - 3$ a factor of given polynomial? What is the degree of quotient?

OR

Divide $34x - 22x^3 - 12x^4 - 10x^2 - 75$ by $3x + 7$ and check your answer. 4

Q27. The diagonals of a rectangle ABCD intersect each other at O. If $\angle COD = 110°$ find $\angle OBA$ and $\angle OBC$. 4

OR

ABCD is a quadrilateral in which AB = CD and AD = BC. Show that it is a parallelogram. What would we call this parallelogram if AB = BC? Also write property of diagonals of this special parallelogram. 4

Q28. Construct quadrilateral ABCD using compass and ruler in which AB = 5 cm, CD = 5.5 cm, BC = 4.5 cm, $\angle B = 45°$, $\angle C = 135°$. 4

Alternate question for visually challenged students in lieu of Q: 28.

Simplify and express the result with positive indices $\left[\sqrt[3]{x^4y} \times \frac{1}{\sqrt[3]{xy^4}}\right]^{-4}$ 4

Q29. (*a*) Find the volume of a cube, one face of which has an area of 81 m^2.

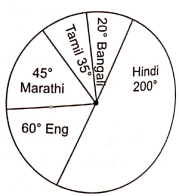
(*b*) Verify Euler's formula for cuboid. 4

Q30. Draw the histogram from the given table which shows marks obtained by 43 students of a class. 4

Class Interval	10–20	20–30	30–40	40–50	50–60	60–70	70–80	80–90
No. of Students	3	1	4	9	5	10	6	5

OR

The following pie-chart represents the no. of students speaking different languages. Answer the questions from the pie-chart.



(*i*) How many students speak Marathi if there are 72 students in the hostel?

(*ii*) What fraction of students speak English?

(*iii*) What is the difference between no. of students speaking Marathi and Tamil?

(iv) Find the no. of students whose angle is one-third of English.

Alternate question for visually challenged students in lieu of Q. 30.

The heights (in cm) of 32 males appearing in a physical test are given below

162, 160, 167, 173, 170, 170, 162, 152, 159, 160, 157, 159, 151, 159, 164, 165, 166, 165, 164, 169, 172, 150, 159, 165, 165, 166, 170, 179, 165, 167, 165, 165

(i) Prepare a frequency distribution table with the class interval of size 5 and the lower limit of first class interval as 150. Using tally marks.

(ii) What is the range of the data?

(iii) What is the class mark of the last class interval?