

Mathematics

Sample Question Paper - 4

Class 6 (Ganita Prakash)

(Chapters 1 to 5)

Time Allowed: 2 Hours 30 Minutes

Maximum Marks: 60

GENERAL INSTRUCTIONS

1. All 16 questions are compulsory, subject to the internal choices given.
2. Section A has 12 multiple-choice parts of 1 mark each. Choose one correct option.
3. Sections B, C and D carry 2, 3 and 5 marks per question respectively.
4. Each case in Section E carries 4 marks, divided as 1 + 1 + 2.
5. Attempt only one alternative wherever OR is given.
6. Show working clearly. Use a ruler and protractor for constructions.
7. Draw graphs and figures neatly in your answer sheet. Calculators are not allowed.

SECTION A

Multiple Choice Questions | $12 \times 1 = 12$ marks

1. (i) What is the next term in 2, 4, 6, 8, 10, 12, 14, ...?

- | | |
|--------|--------|
| (a) 15 | (b) 16 |
| (c) 18 | (d) 28 |

(ii) Which sequence results from adding the all-1s sequence successively?

- | | |
|----------------------|------------------|
| (a) Counting numbers | (b) Even numbers |
| (c) Cubes | (d) Powers of 2 |

(iii) The ticks are equally spaced. What number should replace X?



- | | |
|-----------|-----------|
| (a) 15079 | (b) 15080 |
| (c) 15081 | (d) 15082 |

(iv) A three-digit number is made using 2, 4 and 5 once each. How many such numbers can be prime?

- | | |
|-------|-------|
| (a) 0 | (b) 1 |
| (c) 2 | (d) 6 |

(v) Which pair can have a product of 10000 while neither number ends in 0?

- | | |
|----------------|----------------|
| (a) 20 and 500 | (b) 25 and 400 |
| (c) 16 and 625 | (d) 50 and 200 |

(vi) What is the smallest five-digit number between 35000 and 75000 with all digits odd?

- | | |
|-----------|-----------|
| (a) 35001 | (b) 35111 |
| (c) 35555 | (d) 37111 |

(vii) The drawn figure has one endpoint and extends indefinitely in the arrow direction. What is it?



- | | |
|-------------|---|
| (a) A point | (b) A line segment |
| (c) A ray | (d) A line extending in both directions |

(viii) In the factorisation $30 = 2 \times 3 \times 5$, changing the order of the factors gives:

- (a) A different product every time
(b) The same product
(c) Always 60
(d) A prime product

(ix) Lakhanpal recorded 7 absentees in Class 8. Using one symbol per student, how many symbols does he draw?

- (a) 1
(b) 5
(c) 7
(d) 8

(x) The worked addition is $12350 + 24545 = 36895$. How many digits are in its sum?

- (a) 3
(b) 4
(c) 5
(d) 6

(xi) A spinner makes the two turns shown in the same direction. What total angle does it turn through?



- (a) 90°
(b) 120°
(c) 150°
(d) 180°

(xii) A library packs 96 books equally into 8 boxes. How many books are in each box?

- (a) 8
(b) 10
(c) 12
(d) 16

SECTION B

Very Short Answer Questions | $6 \times 2 = 12$ marks

2. Grumpy puts treasures on 28 and 70. Jumpy starts at 0 and uses one fixed whole-number jump size. List every jump size that lands on both treasures. [2]



Treasure at 28



Treasure at 70

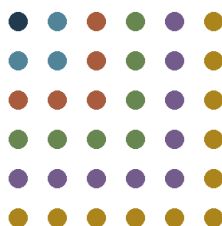
3. Draw an angle of 195° and mark the reflex angle clearly. [2]

OR

Draw an angle of 35° and mark the acute angle clearly. [2]

4. Choose four different non-zero digits for which the difference between the largest and smallest four-digit arrangements is less than 5085. Write both arrangements and subtract. [2]

5. The diagram shows the first six odd numbers arranged in square layers. Find their sum and state the square's side length in dots. [2]



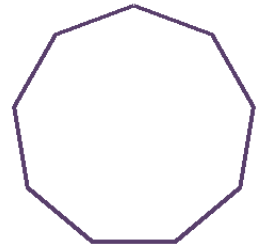
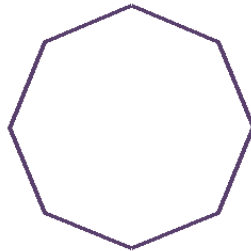
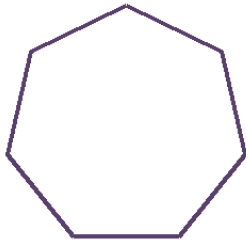
6. In the population example, the scale is 1 unit length = 10 crores. What quantities are represented by bars of 5 units and 8 units? [2]

7. A number has prime factorisation $2 \times 2 \times 5 \times 7$. Find the number and decide whether it is divisible by 20. Show the grouping of factors. [2]

SECTION C

Short Answer Questions | $3 \times 3 = 9$ marks

8. The regular polygons in the display continue the shape sequence.

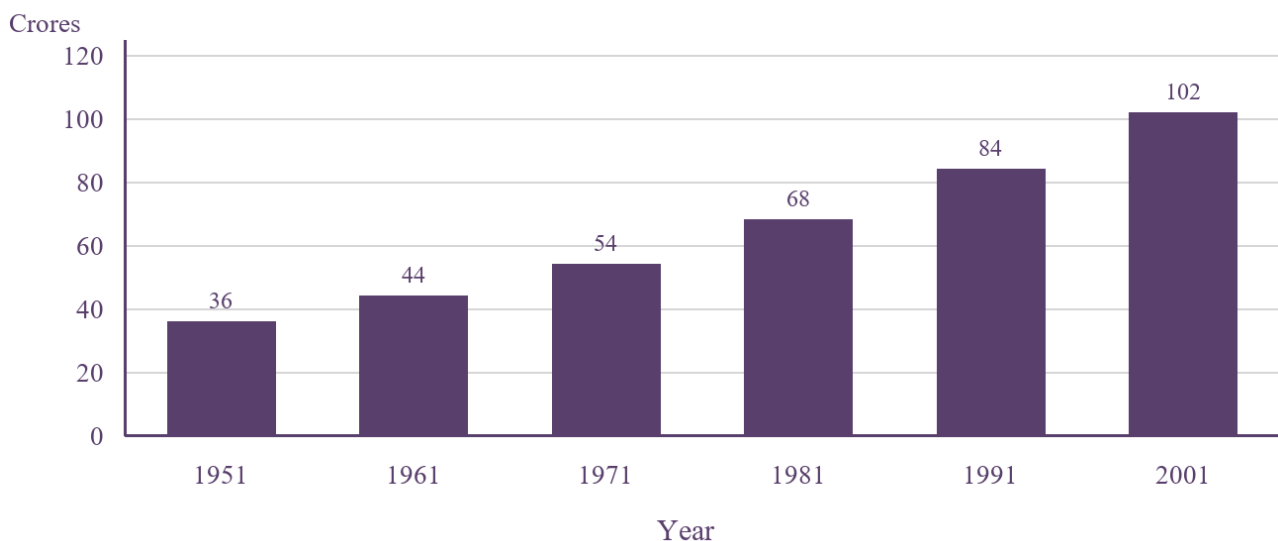


(i) How many corners will the next polygon have? [1]

(ii) Name the next polygon and explain what “regular” says about its sides and angles. [2]

9. The bar graph uses the population figures from the textbook example, in crores.

Textbook population data



(i) Read the population shown for 1981. [1]

(ii) Calculate the increase from 1951 to 2001. [2]

10. Investigate primes and composite numbers.

(i) Write one pair of primes less than 20 whose sum is a multiple of 5. [1]

(ii) Write two more such pairs, different from your first pair, and show their sums. [2]

OR

(i) Write one reversed-digit pair of different two-digit primes other than 13 and 31. [1]

(ii) Write two more reversed-digit pairs of different two-digit primes. Use a different pair each time and check that all entries are prime. [2]

SECTION D

Long Answer Questions | $3 \times 5 = 15$ marks

11. Use the eight-cell row to investigate supercells. A supercell is larger than all its immediate neighbours and end cells have only one neighbour.

1	2	3	4	5	6	7	8
---	---	---	---	---	---	---	---

Cell positions only — replace with your chosen numbers.

- (i) Fill the row with eight different three-digit numbers to make as many supercells as possible. [2]
- (ii) Mark your supercells and explain why two adjacent cells cannot both be supercells. [2]
- (iii) State the maximum number of supercells for your row. [1]

OR

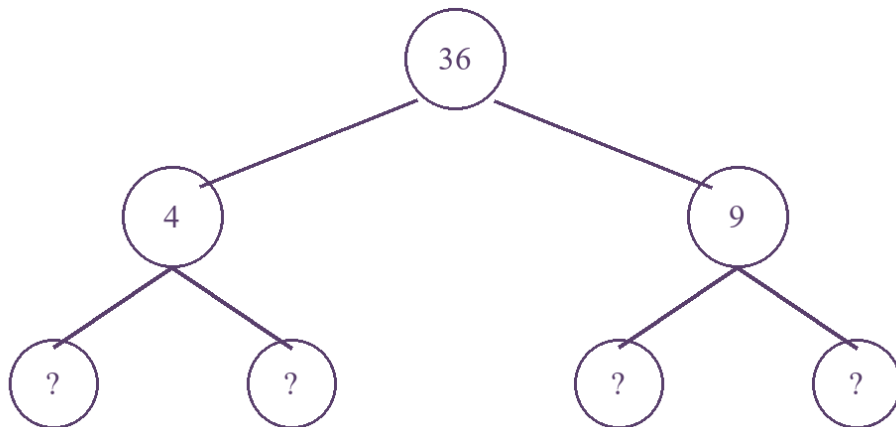
Use a seven-cell row instead.

- (i) Fill a seven-cell row with seven different three-digit numbers to make as many supercells as possible. [2]
- (ii) Mark your supercells and explain why alternating high and low values works. [2]
- (iii) State the maximum number of supercells for your seven-cell row. [1]

12. Chinu counted vehicles for one hour. His recorded totals were: bikes 13, cars 6, buses 4, autos 8, bicycles 8, bullock carts 2 and scooters 9.

- (i) Prepare a tally-frequency table for the seven categories. [2]
- (ii) Draw a bar graph using 1 unit length = 2 vehicles. Include a title and labelled axes; use half a unit where needed. [3]

13. Use factorisation to explain your answers.



- (i) In the worked factorisation of 36, two routes begin with 4×9 and 6×6 . Complete both routes and compare their prime factors. [2]
- (ii) Find the prime factorisation of 1000×81 without first multiplying these two numbers. Show the separate factorisations and combine them. [3]

OR

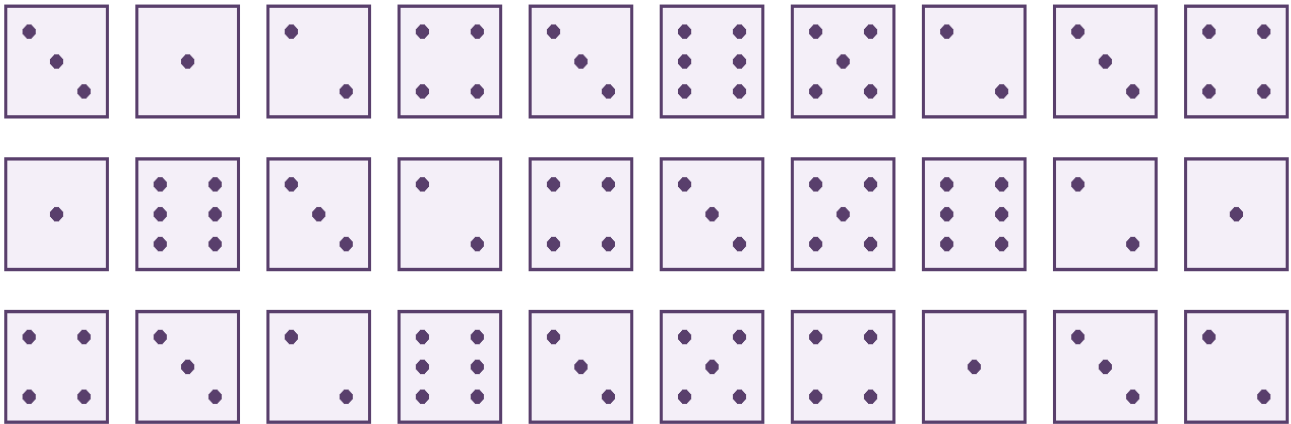
- (i) In the worked example, 63 can start as 3×21 or 7×9 . Complete both routes and compare their prime factors. [2]
- (ii) Find the prime factorisation of 1024 by repeated division. Write all prime factors, counting repetitions. [3]

SECTION E

Case Study Questions | $3 \times 4 = 12$ marks

14. Case Study 1 A dice experiment

A child records the 30 die results shown below. These are observations; answer by counting them.



- (i) Which result occurred the most often? [1]
- (ii) Which two results occurred equally often? [1]
- (iii) The child makes a bar graph with 1 unit length = 2 occurrences. Find the bar heights for results 3 and 5. [2]

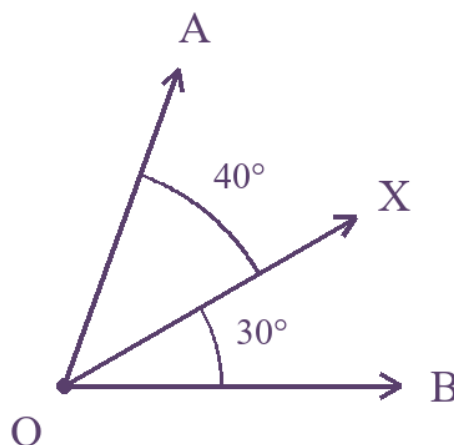
OR

- (iii) The child records 5 on the next two throws. What is the new frequency of 5, and how many observations are there now? [2]

15. Case Study 2 A shared reference arm

Three rays form angles around O. The marked measures let you compare angles without relying on arm lengths.

- (i) Which is greater: angle AOB or angle XOY? [1]
- (ii) By how many degrees is it greater? [1]



- (iii) Extend the drawn arms without turning them. Does either angle change? Explain using the worked idea of superimposition. [2]

OR

- (iii) Rotate the entire diagram on the page without moving the rays relative to each other. Do the angle measures change? Explain. [2]

16. Case Study 3 Kaprekar steps

Use descending digits to make the larger number and ascending digits to make the smaller number, then subtract. Keep four digits, including any leading zero. Start with 5683.

- (i) What is the largest number that can be made from the starting digits? [1]



- (ii) What is the digit sum of the smaller arrangement of the starting digits? [1]

- (iii) Calculate the first subtraction and then find the digit sum of its result. [2]

OR

- (iii) Change the starting digit 8 to 9. Find the new largest and smallest arrangements and their difference. [2]