

Mathematics

Sample Question Paper - 5

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) Which number follows 49 in the square-number sequence?

- | | |
|--------|--------|
| (a) 50 | (b) 56 |
| (c) 64 | (d) 81 |

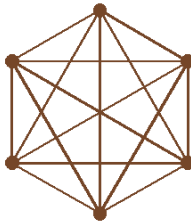
(ii) Which sequence is formed by the sums $1, 1 + 7, 1 + 7 + 19, \dots$?

- | | |
|-----------------|------------------|
| (a) Cubes | (b) Even numbers |
| (c) Powers of 2 | (d) All 1s |

(iii) How many leap years are there from 2024 through 2099, including 2024?

- | | |
|--------|--------|
| (a) 18 | (b) 19 |
| (c) 20 | (d) 25 |

(iv) In the diagram every pair of vertices is joined once. How many connecting segments are there?



- | | |
|--------|--------|
| (a) 6 | (b) 10 |
| (c) 12 | (d) 15 |

(v) What is the digit sum of 678?

- | | |
|--------|--------|
| (a) 18 | (b) 19 |
| (c) 20 | (d) 21 |

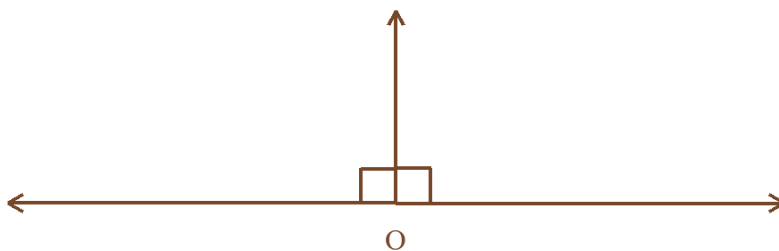
(vi) Which statement is false?

- | | |
|------------------------------------|-------------------------------------|
| (a) No prime number ends in 4 | (b) 2 is an even prime |
| (c) Every even number is composite | (d) A prime has exactly two factors |

(vii) The worked example gives $56 = 2 \times 2 \times 2 \times 7$. What factor remains after one factor 2 is removed?

- | | |
|--------|--------|
| (a) 7 | (b) 14 |
| (c) 28 | (d) 54 |

(viii) Two equal right angles fill the straight opening shown. What is the measure of the whole opening?



(a) 45°

(b) 90°

(c) 180°

(d) 360°

(ix) In the mental-maths example, which expression equals 38800?

(a) $25000 + 400 + 13000$

(b) $25000 + 400 \times 2 + 13000$

(c) $25000 + 1500 + 13000$

(d) $25000 + 400 \times 3 + 13000$

(x) In the textbook example, Smriti scores 100 runs in Match 4. With 1 unit = 10 runs, the bar height is:

(a) 5 units

(b) 8 units

(c) 10 units

(d) 100 units

(xi) The difference between the largest three-digit number and the smallest three-digit number is:

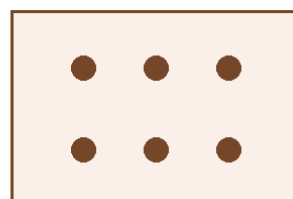
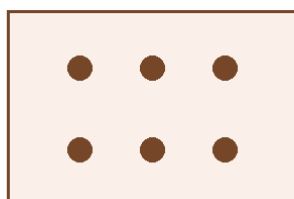
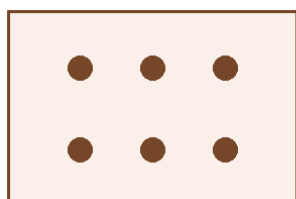
(a) 899

(b) 900

(c) 989

(d) 999

(xii) The equal groups of counters are shown below. How many counters are there altogether?



(a) 12

(b) 15

(c) 18

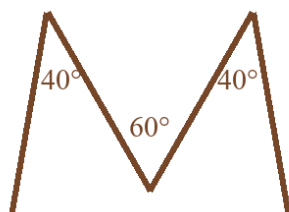
(d) 21

SECTION B

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

2. Find all common factors of 4, 8 and 12. Explain why 8 is not a common factor. [2]

3. Copy the labelled letter M. Use a protractor to construct the two side angles as 40° each and the middle angle as 60° . [2]



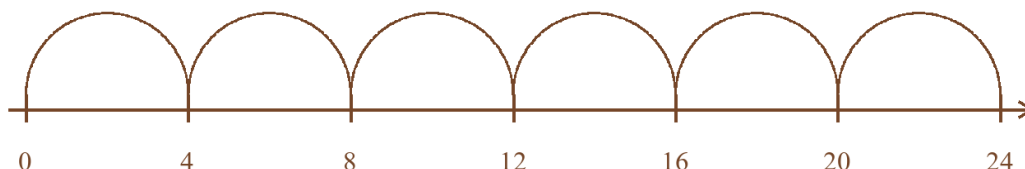
OR

Construct a letter Y in which the three angles around the junction are 150° , 60° and 150° . Label the angles. [2]

4. A number less than 100 has 3 and 5 as factors, and one digit is 1 more than the other. Find every possible number and explain your search. [2]

5. Paromita estimates about 100 children in each of Classes 6–10. How many classes is she counting, and what is her estimated total? [2]

6. The picture shows Jumpy's worked route with jumps of 4. How many jumps take Jumpy from 0 to 24? Explain why 4 is a factor of 24. [2]

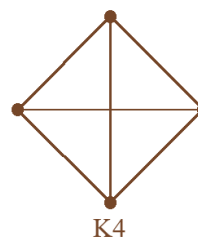
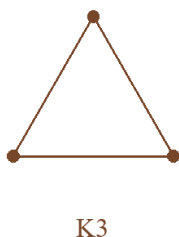


7. Choose a digit to fill both boxes in $4\square2\square$ so the number is divisible by 5 and by 4. Find all possible choices and check them. [2]

SECTION C

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

8. Use the diagram as a starting point for complete graphs.



- Write the number of connecting segments for K2, K3 and K4. [1]
- Explain how many new segments are added when a fifth vertex is added to K4. Hence find the number of segments in K5. [2]

9. In the textbook example, the heights of Mount Everest and Mount Koscuishko are listed as 8848 m and 2228 m. Mount Denali and Mount Kilimanjaro are listed as 6194 m and 5895 m.

- Which of these four mountains has the smallest listed height? [1]
- Using these textbook figures, find the difference between the listed heights of Denali and Kilimanjaro. [2]

10. Use the number pairs in the diagram. A safe treasure pair has no common factor other than 1.



Treasure at 20



Treasure at 55

- Find a jump size greater than 1 that reaches both 20 and 55 from 0. [1]
- List the factors of 20 and 55 and explain why this pair is not safe. [2]

OR

- Find the common factors of 5, 15 and 25. [1]
- Explain why your list for 5, 15 and 25 is complete. [2]

SECTION D

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

11. Test statements about primes and composites. Explain each answer.

- (i) "A product of two prime numbers can be prime." Is this true or false? Give an example and a general reason. [2]
- (ii) "After any prime greater than 2, the next whole number is composite." Explain why this is true. [2]
- (iii) Name the only even prime. [1]

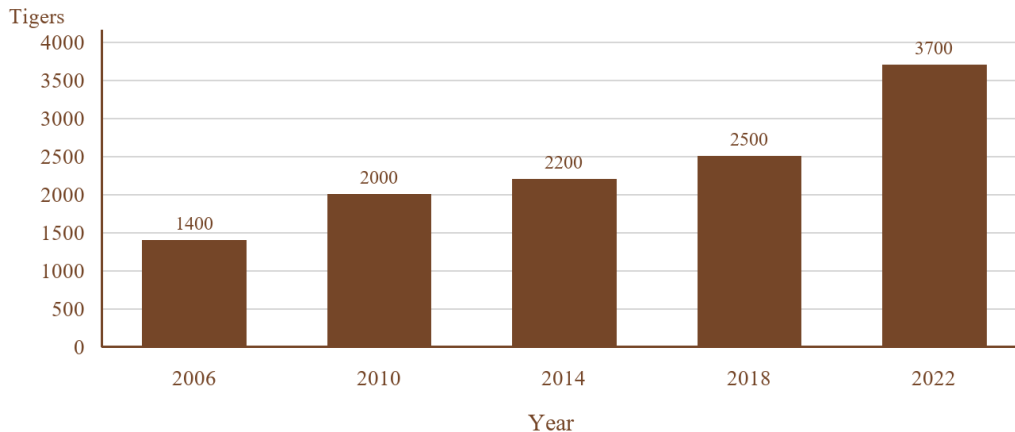
OR

Test this alternative set of statements.

- (i) "Prime numbers do not have any factors." Is this true or false? Explain with an example. [2]
- (ii) "No prime number has units digit 4." Explain why this is true. [2]
- (iii) Give one example of an even composite number. [1]

12. The bar graph intentionally has errors. The correct approximate tiger counts in the textbook table are 1400, 1700, 2200, 3000 and 3700 for the years shown.

Graph to correct



- (i) Identify the two bars whose lengths disagree with the given counts, and write the correct counts for them. [2]
- (ii) Draw the corrected graph using 1 unit length = 500 tigers. Add a title, labelled axes and a scale starting at zero. [3]

13. Work with two drawings of the same prime product.



- (i) Use the diagram to explain why changing the order or grouping of 2, 3 and 5 does not change their product. Calculate both routes. [2]
- (ii) Find the prime factorisation of 729 by repeated division, and multiply the prime factors to check. [3]

OR

- (i) The worked example of 72 combines the prime factors of 12 and 6. Write both factorisations, combine them and multiply to check. [2]
- (ii) Find the prime factorisation of 64 by repeated division, and multiply the prime factors to check. [3]

SECTION E

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

14. Case Study 1 Sweet preferences

A class records each child's favourite sweet using tally marks. Each group of five has four upright strokes crossed by a fifth stroke.

(i) How many children chose gujiya? [1]

Sweet	Tally marks
Jalebi	
Gulab jamun	
Gujiya	
Barfi	
Rasgulla	

(ii) How many children chose rasgulla? [1]

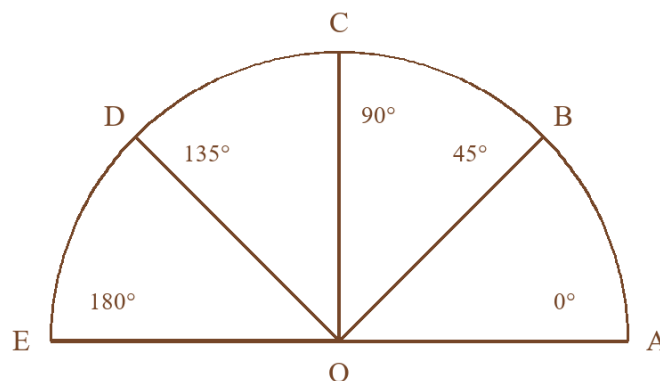
(iii) The teacher buys one sweet of the chosen type for each child. Jalebi costs Rs 5 each. What is the cost of the jalebis needed? [2]

OR

(iii) Two children change their choice from gulab jamun to barfi. Write the new frequencies for both sweets. [2]

15. Case Study 2 Measuring on a paper protractor

A semicircular paper protractor has marks at equal 45° intervals. Use the marked rays from O.



(i) Find angle AOC. [1]

(ii) Find angle BOD. [1]

(iii) In the worked folding method, half a right angle makes a new crease. Find this angle and the angle left over in a straight angle. [2]

OR

(iii) In the worked folding method, half of 45° gives another crease. Find this angle and check by doubling it. [2]

16. Case Study 3 A number-pattern challenge

A child follows this rule: halve an even number; for an odd number, multiply by 3 and add 1. The trail begins at 100.



- (i) Is the step from 50 to 25 valid? State the reason. [1]
- (ii) On another trail, which even number would be halved to give 18? [1]
- (iii) Continue the displayed trail from 25 for two more steps. State the rule used at each step. [2]

OR

- (iii) Start a new trail at 9. Write the next two numbers and state the rule used at each step. [2]