

Govt. Higher Primary School, _____, Tq: _____,
Dist: _____

Subject Teacher: _____

Question Paper Design & Weightage Breakdown

Class: 6th Standard

Subject: Mathematics

Total Marks: 40

Total Questions: 24

A) Weightage to Objectives

Objectives	Questions	Marks	Percentage (%)
Knowledge	7	10	25%
Understanding	12	16	40%
Application	3	6	15%
Skill	2	8	20%
Total	24	40	100%

C) Form of Questions

Question Type	Questions	Marks	Percentage (%)
Objective (1 Mark)	12	12	30%
Very Short Answer (2 Marks)	10	20	50%
Long Answer (4 Marks)	2	8	20%
Total	24	40	100%

B) Weightage to Units (Semester 1)

Sl. No.	Unit Name	Questions	Marks	Percentage (%)
1	1. Patterns in Mathematics	4	6	15%
2	2. Lines and Angles	5	8	20%
3	3. Number Play	5	10	25%
4	4. Data Handling and Presentation	6	10	25%
5	5. Prime Time	4	6	15%
Total		24	40	100%

D) Difficulty Level

Difficulty Level	Questions	Marks	Percentage (%)
Easy	10	12	30%
Average	10	16	40%
Difficult	4	12	30%
Total	24	40	100%

Govt. Higher Primary School, _____, Tq: _____, Dist: _____

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BLUEPRINT - 6th Mathematics (SA-1)

Subject: Mathematics (English Medium)				Class: 6th Standard				Total Marks: 40				Number of Questions: 24			
Sl. No.	Unit / Chapter Name	Knowledge			Understanding			Application			Skill			Total	
		Obj(1)	VSA(2)	LA(4)	Obj(1)	VSA(2)	LA(4)	Obj(1)	VSA(2)	LA(4)	Obj(1)	VSA(2)	LA(4)		Questions Marks
1	1. Patterns in Mathematics	1(1)	1(2)	-	1(1)	1(2)	-	-	-	-	-	-	-	4	6
2	2. Lines and Angles	1(1)	1(2)	-	1(1)	1(2)	-	-	1(2)	-	-	-	-	5	8
3	3. Number Play	1(1)	-	-	1(1)	1(2)	-	-	1(2)	-	-	-	1(4)	5	10
4	4. Data Handling and Presentation	-	-	-	4(4)	-	-	-	1(2)	-	-	-	1(4)	6	10
5	5. Prime Time	1(1)	1(2)	-	1(1)	1(2)	-	-	-	-	-	-	-	4	6
Objective-wise Total Marks		10 (25%)			16 (40%)			6 (15%)			8 (20%)			24	40

Note: Numbers inside parentheses denote allotted marks, and numbers outside denote question count. (Obj = 1 Mark, VSA = 2 Marks, LA = 4 Marks)

Govt. Higher Primary School, _____, Tq:

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Subject Teacher: _____

Question-wise Analysis Sheet

Class: 6th Standard

Subject: Mathematics

Total Questions: 24

Total Marks: 40

Q. No.	Unit Name	Objective	Specification	Marks	Type of Question	Difficulty	Time (Min)
1	1. Patterns in Mathematics	Knowledge	Defines	1	Objective	Average	2
2	3. Number Play	Knowledge	Recalls	1	Objective	Easy	2
3	5. Prime Time	Knowledge	Defines	1	Objective	Easy	2
4	2. Lines and Angles	Knowledge	Defines	1	Objective	Easy	2
5	1. Patterns in Mathematics	Understanding	Identifies	1	Objective	Easy	2
6	2. Lines and Angles	Understanding	Identifies	1	Objective	Easy	2
7	3. Number Play	Understanding	Constructs	1	Objective	Easy	2
8	5. Prime Time	Understanding	Identifies	1	Objective	Average	2
9	4. Data Handling and Presentation	Understanding	Matches	1	Objective	Easy	1
10	4. Data Handling and Presentation	Understanding	Matches	1	Objective	Easy	1
11	4. Data Handling and Presentation	Understanding	Matches	1	Objective	Easy	1
12	4. Data Handling and Presentation	Understanding	Matches	1	Objective	Easy	1
13	5. Prime Time	Understanding	Expresses	2	Very Short Answer	Average	5
14	2. Lines and Angles	Knowledge	Differentiates	2	Very Short Answer	Average	5
15	2. Lines and Angles	Understanding	Classifies	2	Very Short Answer	Easy	5
16	5. Prime Time	Understanding	Finds Factors	2	Very Short Answer	Average	5
17	1. Patterns in Mathematics	Knowledge	States Rule	2	Very Short Answer	Average	5
18	1. Patterns in Mathematics	Understanding	Gives Reason	2	Very Short Answer	Average	5
19	2. Lines and Angles	Application	Calculates	2	Very Short Answer	Average	5
20	3. Number Play	Application	Calculates	2	Very Short Answer	Average	5
21	3. Number Play	Application	Solves	2	Very Short Answer	Easy	5
22	4. Data Handling and Presentation	Application	Explains	2	Very Short Answer	Easy	5
23	4. Data Handling and Presentation	Skill	Draws and Interprets Bar Graph	4	Long Answer	Difficult	10
24	3. Number Play	Skill	Verifies Conjecture	4	Long Answer	Difficult	10
Total				40 Marks	24 Questions	-	90 Minutes

Class: 6th Standard

Time: 90 Minutes

Max. Marks: 40

I. Answer the following questions in one sentence each:

 $4 \times 1 = 4$

1. What is a numerical pattern?
2. What is Kaprekar's magic constant?
3. What is a prime number?
4. What is a point?

II. Choose and write the correct answer from the given alternatives:

 $4 \times 1 = 4$

5. The next number of the sequence 9, 18, 27, 36... is:
(A) 100 (B) 81 (C) 45 (D) 65
6. A geometric figure having a definite length and two end points is a:
(A) Point (B) Line segment (C) Line (D) Ray
7. The greatest 5-digit number using the digits 3, 1, 0 is:
(A) 10003 (B) 33310 (C) 33333 (D) 33301
8. Which of the following is NOT a factor of 66?
(A) 3 (B) 6 (C) 11 (D) 4

III. Match the items in Column 'A' with the appropriate items in Column 'B':

 $4 \times 1 = 4$

Column 'A'	Column 'B'
9. Data	(A) Equal width columns/bars
10. Tally marks	(B) Collection of facts and information
11. Pictograph	(C) Quick counting and recording
12. Bar graph	(D) Representation using pictures

IV. Answer the following questions in 2-3 sentences / solve each:

 $10 \times 2 = 20$

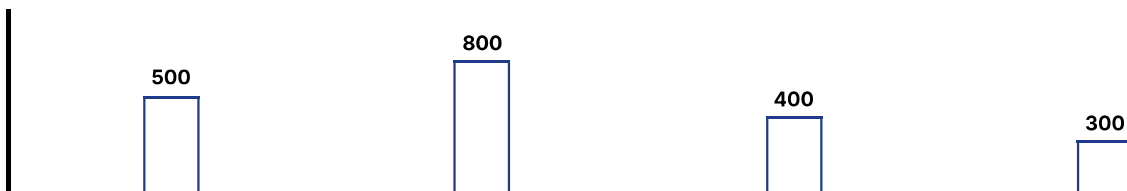
13. Express 200 as a product of prime factors.
14. State the difference between a line and a line segment.
15. Classify the following into acute, obtuse, and reflex angles: 45° , 120° , 210° , 75° .
16. Find the common factors of 12 and 15.
17. Write the next term and the rule of the sequence 3, 6, 12, 24...
18. In 1, 2, 4, 7, 11..., which is the next term and why?
19. Ravi divided a circular wheel into 18 equal parts. What is the degree measure between adjacent lines?
20. Find the difference between the largest and smallest four-digit numbers formed using the digits 4, 6, 8, 1 without repetition.
21. Find the sum and difference of the smallest and largest 5-digit palindrome numbers.
22. State two advantages of representing data using bar graphs.

V. Answer the following questions in detail / solve each:

 $2 \times 4 = 8$

23. The amount spent by four students on buying books is given below. Draw a bar graph using a scale of 1 unit = ₹ 200 and identify who spent the maximum amount.

Manasa: 500	Reeta: 800	Pavan: 400	Dhanush: 300
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24. Verify step-by-step whether the Collatz Conjecture holds true for the starting number 100.

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Model Answers & Scoring Key (Part - 1).

Class: 6th Standard

Subject: Mathematics

Answers for Questions 1 to 12 (Objective Questions)

Q. No.	Expected Model Answers / Value Points	Marks
1	What is a numerical pattern? Model Answer: An ordered list of numbers that follows a specific rule is called a number pattern.	1 Mark
2	What is Kaprekar's magic constant? Model Answer: 6174.	1 Mark
3	What is a prime number? Model Answer: A number having exactly two factors, 1 and the number itself, is called a prime number.	1 Mark
4	What is a point? Model Answer: A figure that determines a precise location and has no length, breadth, or height.	1 Mark
5	The next number of the sequence 9, 18, 27, 36... is: Model Answer: C) 45	1 Mark
6	A geometric figure having a definite length and two end points is a: Model Answer: B) Line segment	1 Mark
7	The greatest 5-digit number using the digits 3, 1, 0 is: Model Answer: B) 33310	1 Mark
8	Which of the following is NOT a factor of 66? Model Answer: D) 4	1 Mark
9	Data Model Answer: (B) Collection of facts and information	1 Mark
10	Tally marks Model Answer: (C) Quick counting and recording	1 Mark
11	Pictograph Model Answer: (D) Representation using pictures	1 Mark
12	Bar graph Model Answer: (A) Equal width columns/bars	1 Mark

Govt. Higher Primary School, _____, Tq:
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Model Answers & Scoring Key (Part - 2)

Class: 6th Standard

Subject: Mathematics

Detailed Solutions for Questions 13 to 24

Q. No.	Expected Model Answers / Value Points	Marks
13	Express 200 as a product of prime factors. Model Answer / Solution Steps: $200 = 2 \times 2 \times 2 \times 5 \times 5$.	2 Marks
14	State the difference between a line and a line segment. Model Answer / Solution Steps: A line segment has a definite length with two fixed endpoints. A line extends indefinitely in both directions without any endpoints.	2 Marks
15	Classify the following into acute, obtuse, and reflex angles: 45°, 120°, 210°, 75°. Model Answer / Solution Steps: Acute angles: 45° , 75° . Obtuse angle: 120° . Reflex angle: 210° .	2 Marks
16	Find the common factors of 12 and 15. Model Answer / Solution Steps: Factors of 12 = 1, 2, 3, 4, 6, 12. Factors of 15 = 1, 3, 5, 15. Common factors = 1 and 3.	2 Marks
17	Write the next term and the rule of the sequence 3, 6, 12, 24... Model Answer / Solution Steps: Next term: 48. Rule: Multiply the previous term by 2 (or double the previous term) to obtain the next term.	2 Marks
18	In 1, 2, 4, 7, 11..., which is the next term and why? Model Answer / Solution Steps: Next term is 16. Reason: Consecutive natural numbers are successively added to each term (+1, +2, +3, +4, +5).	2 Marks
19	Ravi divided a circular wheel into 18 equal parts. What is the degree measure between adjacent lines? Model Answer / Solution Steps: One complete turn = 360° . Measure of angle = $360^\circ / 18 = 20^\circ$.	2 Marks
20	Find the difference between the largest and smallest four-digit numbers formed using the digits 4, 6, 8, 1 without repetition. Model Answer / Solution Steps: Largest number = 8641. Smallest number = 1468. Difference = $8641 - 1468 = 7173$.	2 Marks
21	Find the sum and difference of the smallest and largest 5-digit palindrome numbers. Model Answer / Solution Steps: Smallest = 10001, Largest = 99999. Sum = $10001 + 99999 = 110000$. Difference = $99999 - 10001 = 89998$.	2 Marks
22	State two advantages of representing data using bar graphs. Model Answer / Solution Steps: 1. Enables quick and clear comparison of different categories. 2. Visual presentation makes interpretation accessible to everyone without complex math.	2 Marks
23	The amount spent by four students on buying books is given below. Draw a bar graph using a scale of 1 unit = ₹ 200 and identify who spent the maximum amount. Model Answer / Solution Steps: 1. X-axis: Names of students; Y-axis: Expenditure in ₹. 2. Scale: 1 unit = ₹ 200. 3. Heights: Manasa = 2.5 units, Reeta = 4 units, Pavan = 2 units, Dhanush = 1.5 units. 4. Maximum expenditure: Reeta (₹ 800).	4 Marks
24	Verify step-by-step whether the Collatz Conjecture holds true for the starting number 100. Model Answer / Solution Steps: Rule: If even, divide by 2; if odd, multiply by 3 and add 1. Sequence:	4 Marks

Q. No.	Expected Model Answers / Value Points	Marks
	100 → 50 → 25 → 76 → 38 → 19 → 58 → 29 → 88 → 44 → 22 → 11 → 34 → 17 → 52 → 26 → 13 → 40 → 20 → 10 → 5 → 16 → 8 → 4 → 2 → 1. Conclusion: The sequence terminates at 1, confirming that the Collatz conjecture holds true for 100.	