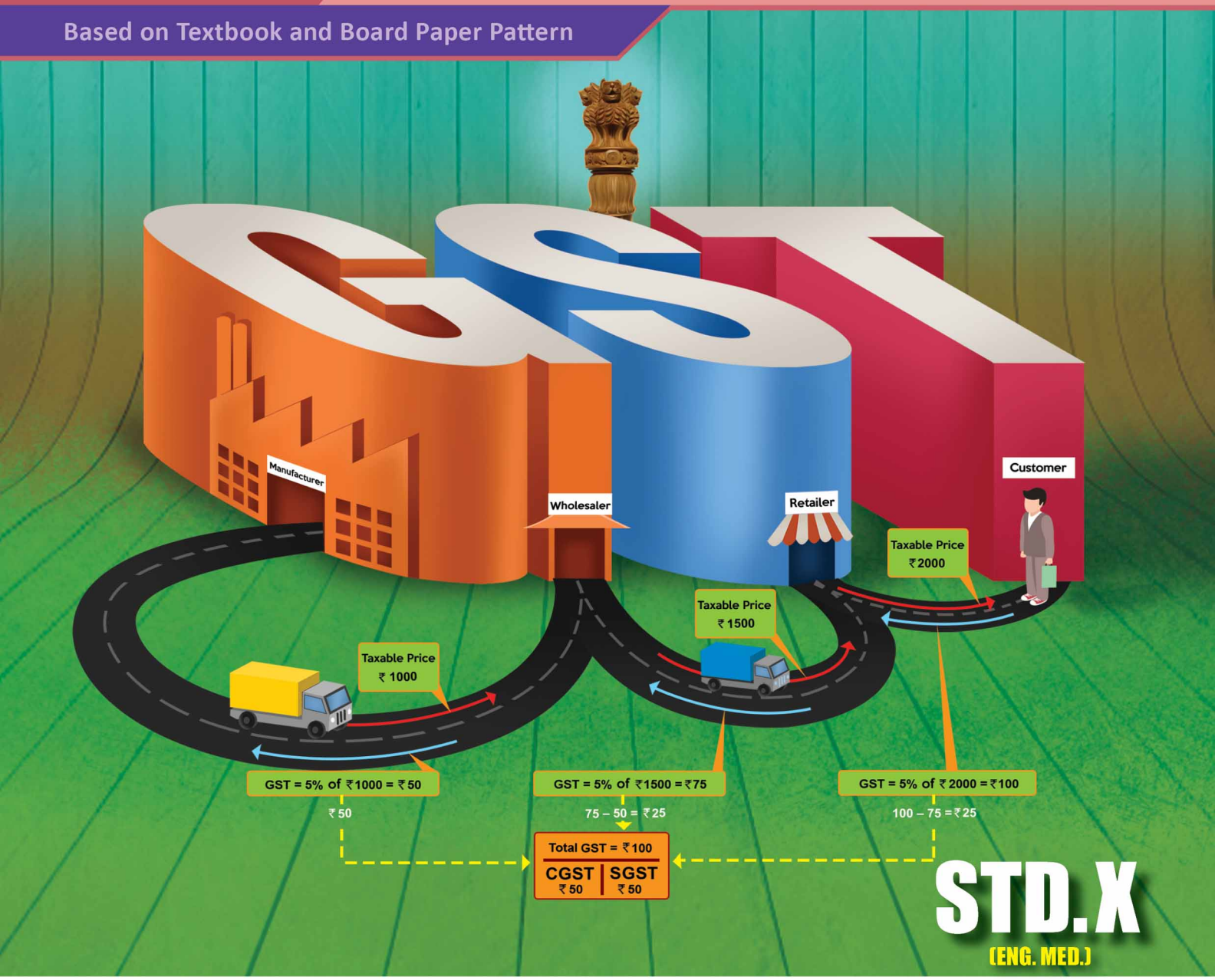
SAMPLE CONTENT

MATHEMATICS PART - I

WORKBOOK

Based on Textbook and Board Paper Pattern



STD. X

(ENG. MED.)

Target Publications® Pvt. Ltd.

Based on the latest syllabus prescribed by the Maharashtra State Board of Secondary and Higher Secondary Education, Pune - 04

Mathematics Part – I

WORKBOOK

STD. X (English Medium)

Salient Features

- ⇨ Includes all textual Problem Sets
- ⇨ All Intext and Activity/Project based questions from the textbook are included
- ⇨ Adequate space is provided to write the answers
- ⇨ Tentative marks allocation for all problems
- ⇨ Includes Important Formulae at the end of the book
- ⇨ Relevant questions from previous years' board exams till March 2022 are mentioned

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Standard: _____ ***Division:*** _____ ***Roll No.:*** _____

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Balbharati Registration No.: 2018MH0022 **TEID: 2550** P.O. No. 6941

PREFACE

Taget's **"Mathematics Part - I Workbook, Std. X"** is a perfect practice aid for the preparation of X board examination.

Our basic premise for this book is to retain the outline of the content as texbook to facilitate students to keep their practice material together and have a single point of reference for revision.

The book includes formula section at the end as quick revision tool for the solving problems.

Tentative marks have also been allocated to the questions. However, marks mentioned are indicative and are subject to change as per Maharashtra state board's discretion .

Relevant questions from previous years' board papers have been mentioned in the book for students to have an understanding about the questions that are asked in board exams.

A book affects eternity; one can never tell where its influence stops.

Best of luck to all the aspirants!

Publisher

Edition: First

The journey to create a complete book is strewn with triumphs, failures and near misses. If you think we've nearly missed something or want to applaud us for our triumphs, we'd love to hear from you.

Please write to us on : mail@targetpublications.org

Evaluation Scheme

Academic year 2019 - 2020 and onwards

Mathematics - Part I	40 Marks	Written Examination	Time: 2 hours
Mathematics - Part II	40 Marks	Written Examination	Time: 2 hours
Internal Evaluation	20 Marks		
Total	**100 Marks**		

The scheme of internal evaluation will be as follows:

- 2 Homework assignments [one based on Mathematics Part – I and one based on Mathematics Part – II (5 Marks each) – 10 Marks]
- Practical Exam / MCQ Test (Part I – 10 Marks and Part II – 10 Marks) - These 20 marks are to be converted into 10 Marks.

PAPER PATTERN

Question No.	Type of Questions	Total Marks	Marks with option
1.	(A) Solve 4 out of 4 MCQ (1 mark each)	04	04
	(B) Solve 4 out of 4 subquestions (1 mark each)	04	04
2.	(A) Solve 2 activity based subquestions out of 3 (2 marks each)	04	06
	(B) Solve any 4 out of 5 subquestions (2 marks each)	08	10
3.	(A) Solve 1 activity based subquestion out of 2 (3 marks each)	03	06
	(B) Solve any 2 out of 4 subquestions (3 marks each)	06	12
4.	Solve any 2 out of 3 subquestions (4 marks each) [Out of textbook]	08	12
5.	Solve any 1 out of 2 subquestions (3 marks each)	03	06
	Total Marks	**40**	**60**

The division of marks in question papers as per objectives will be as follows:

Distribution of Marks	
Easy Questions	40%
Medium Questions	40%
Difficult Questions	20%

Objectives	Maths – I
Knowledge	20%
Understanding	30%
Application	40%
Skill	10%

[Maharashtra State Board of Secondary and Higher Secondary Education, Pune - 04]

Topic-wise weightage of marks

S. No.	Topic Name	Marks with option
1	Linear Equations in Two Variables	12
2	Quadratic Equations	12
3	Arithmetic Progression	08
4	Financial Planning	08
5	Probability	08
6	Statistics	12
	Total	**60**

Note: In the topic-wise weightage of marks given in the above table, flexibility of maximum 2 marks is permissible.

CONTENTS

No.	Topic Name	Page No.
1	Linear Equations in Two Variables	1
2	Quadratic Equations	56
3	Arithmetic Progression	95
4	Financial Planning	119
5	Probability	146
6	Statistics	164
7	Important Formulae	211

5 Probability

Practice Set 5.1

1. How many possibilities are there in each of the following? **[1 Mark each]**

i. Vanita knows the following sites in Maharashtra. She is planning to visit one of them in her summer vacation.
Ajintha, Mahabaleshwar, Lonar Sarovar, Tadoba wild life sanctuary, Amboli, Raigad, Matheran, Anandavan.

Solution:

ii. Any day of a week is to be selected randomly.

Solution:

iii. Select one card from the pack of 52 cards.

Solution:

iv. One number from 10 to 20 is written on each card. Select one card randomly.

Solution:

Let's Think

 # In which of the following experiments possibility of expected outcome is more? (Textbook pg. no. 116)

i. Getting 1 on the upper face when a die is thrown.

Solution:

ii. Getting head by tossing a coin.

Solution:

Let's Learn

 # Some examples of finite sample space. (Textbook pg. no. 117)

Sr. No.	Random experiment	Sample space	Number of sample points in S
1.	One coin is tossed.	S = {H,T}	n(S) = 2
2.	Two coins are tossed.	S = {HH, HT, TH, TT}	n(S) = ☐
3.	Three coins are tossed.	S = {HHH, HHT, HTH, THH, HTT, THT, TTH, TTT}	n(S) = 8
4.	A die is thrown.	S = {1, 2, 3, 4, 5, 6}	n(S) = ☐
5.	Two dice are thrown.	S = {(1, 1), (1, 2), (1, 3), (1, 4), (1, 5), (1, 6), (2, 1), (2, 2), (2, 3), (2, 4), (2, 5), (2, 6), (3, 1), (3, 2), (3, 3), (3, 4), (3, 5), (3, 6), (4, 1), (4, 2), (4, 3), (4, 4), (4, 5), (4, 6), (5, 1), (5, 2), (5, 3), (5, 4), (5, 5), (5, 6), (6, 1), (6, 2), (6, 3), (6, 4), (6, 5), (6, 6)}	n(S) = 36
6.	A card is drawn from a pack bearing numbers from 1 to 25.	S = {1, 2, 3, 4, ……,25}	n(S) = ☐
7.	A card is drawn from a well shuffled pack of 52 playing cards.	**Diamond:** Ace, 2, 3, 4, 5, 6, 7, 8, 9, 10, Jack, Queen, King **Spade:** Ace, 2, 3, 4, 5, 6, 7, 8, 9, 10, Jack, Queen, King **Heart:** Ace, 2, 3, 4, 5, 6, 7, 8, 9, 10, Jack, Queen, King **Club:** Ace, 2, 3, 4, 5, 6, 7, 8, 9, 10, Jack, Queen, King	n(S) = 52

Practice Set 5.2

1. For each of the following experiments write sample space 'S' and number of sample points n(S). **[2 Marks each]**

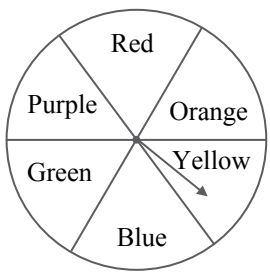
i. One coin and one die are thrown simultaneously.

Solution:

ii. Two digit numbers are formed using digits 2, 3 and 5 without repeating a digit. **[Dec 20]**

Solution:

2. The arrow is rotated and it stops randomly on the disc. Find out on which colour it may stop. [1 Mark]



Solution:

3. In the month of March 2019, find the days on which the date is a multiple of 5. (see the given page of the calendar). [1 Mark]

MARCH - 2019						
M	T	W	T	F	S	S
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	31

Solution:

4. Form a 'Road safety committee' of two, from 2 boys (B_1, B_2) and 2 girls (G_1, G_2). Complete the following activity to write the sample space. [2 Marks]

Solution:

i. Committee of 2 boys = ☐

ii. Committee of 2 girls = ☐

iii. Committee of one boy and one girl = B_1G_1 ☐ ☐ ☐

∴ Sample space = ☐

Practice Set 5.3

1. Write sample space 'S' and number of sample points n(S) for each of the following experiments. Also write events A, B, C in the set form and write n(A), n(B), n(C). [3 Marks each]

i. One die is rolled,
Event A: Even number on the upper face.
Event B: Odd number on the upper face.
Event C: Prime number on the upper face.

Solution:

ii. Two dice are rolled simultaneously,
Event A: The sum of the digits on upper faces is a multiple of 6.
Event B: The sum of the digits on the upper faces is minimum 10.
Event C: The same digit on both the upper faces.

Solution:

iii. Three coins are tossed simultaneously.
Condition for event A: To get at least two heads.
Condition for event B: To get no head.
Condition for event C: To get head on the second coin.

Solution:

iv. Two digit numbers are formed using digits 0, 1, 2, 3, 4, 5 without repetition of the digits.
Condition for event A: The number formed is even.
Condition for event B: The number is divisible by 3.
Condition for event C: The number formed is greater than 50.

Solution:

v. From three men and two women, environment committee of two persons is to be formed.
Condition for event A: There must be at least one woman member.
Condition for event B: One man, one woman committee to be formed.
Condition for event C: There should not be a woman member.

Solution:

vi. One coin and one die are thrown simultaneously.
Condition for event A: To get head and an odd number.
Condition for event B: To get a head or tail and an even number.
Condition for event C: Number on the upper face is greater than 7 and tail on the coin.

Solution:

Practice Set 5.4

1. If two coins are tossed, find the probability of the following events. **[3 Marks]**

i. Getting at least one head.

Solution:

ii. Getting no head. **[July 17]**

Solution:

2. If two dice are rolled simultaneously, find the probability of the following events. **[3 Marks]**

i. The sum of the digits on the upper faces is at least 10. **[Oct 14]**

Solution:

ii. The sum of the digits on the upper faces is 33.

Solution:

iii. The digit on the first die is greater than the digit on second die. **[Oct 14]**

Solution:

3. There are 15 tickets in a box, each bearing one of the numbers from 1 to 15. One ticket is drawn at random from the box. Find the probability of event that the ticket drawn: [2 Marks]

i. shows an even number.

Solution:

ii. shows a number which is a multiple of 5.

Solution:

4. A two digit number is formed with digits 2, 3, 5, 7, 9 without repetition. What is the probability that the number formed is

i. an odd number? **[Mar 20] [2 Marks]**

Solution:

ii. a multiple of 5? **[2 Marks]**

Solution:

5. A card is drawn at random from a pack of well shuffled 52 playing cards. Find the probability that the card drawn is **[3 Marks]**

i. an ace.

Solution:

ii. a spade.

Solution:

Problem Set – 5

1. Choose the correct alternative answer for each of the following questions. [1 Mark each]

i. Which number cannot represent a probability? **[Mar 22]**

(A) $\frac{2}{3}$ (B) 1.5 (C) 15% (D) 0.7

Ans: ☐

ii. A die is rolled. What is the probability that the number appearing on upper face is less than 3?

(A) $\frac{1}{6}$ (B) $\frac{1}{3}$ (C) $\frac{1}{2}$ (D) 0

Ans: ☐

iii. What is the probability of the event that a number chosen from 1 to 100 is a prime number?

(A) $\frac{1}{5}$ (B) $\frac{6}{25}$ (C) $\frac{1}{4}$ (D) $\frac{13}{50}$

Ans: ☐

iv. There are 40 cards in a bag. Each bears a number from 1 to 40. One card is drawn at random. What is the probability that the card bears a number which is a multiple of 5?

(A) $\frac{1}{5}$ (B) $\frac{3}{5}$ (C) $\frac{4}{5}$ (D) $\frac{1}{3}$

Ans: ☐

v. If n(A) = 2, P(A) = $\frac{1}{5}$, then n(S) = ? **[July 19, Mar 20]**

(A) 10 (B) $\frac{5}{2}$ (C) $\frac{2}{5}$ (D) $\frac{1}{3}$

Ans: ☐

2. Basketball players John, Vasim, Akash were practising the ball drop in the basket. The probabilities of success for John, Vasim and Akash are $\frac{4}{5}$, 0.83 and 58% respectively. Who had the greatest probability of success ? [2 Marks]

Solution:

3. In a hockey team there are 6 defenders, 4 offenders and 1 goalie. Out of these, one player is to be selected randomly as a captain. Find the probability of the selection that: [3 Marks]

i. The goalie will be selected.

Solution:

ii. A defender will be selected.

Solution:

4. Joseph kept 26 cards in a cap, bearing one English alphabet on each card. One card is drawn at random. What is the probability that the card drawn is a vowel card ? [2 Marks]

Solution:

5. A balloon vendor has 2 red, 3 blue and 4 green balloons. He wants to choose one of them at random to give it to Pranali. What is the probability of the event that Pranali gets,

i. a red balloon. **[Mar 20] [2 Marks]**

Solution:

ii. a blue balloon. **[Mar 20] [2 Marks]**

Solution:

iii. a green balloon. **[2 Marks]**

Solution:

6. A box contains 5 red, 8 blue and 3 green pens. Rutuja wants to pick a pen at random. What is the probability that the pen is blue? [Mar 22] [2 Marks]

Solution:

7. Six faces of a die are as shown below.

A	B	C	D	E	A

If the die is rolled once, find the probability of **[3 Marks]**

i. 'A' appears on upper face.

Solution:

ii. 'D' appears on upper face.

Solution:

8. A box contains 30 tickets, bearing only one number from 1 to 30 on each. If one ticket is drawn at random, find the probability of an event that the ticket drawn bears **[3 Marks]**

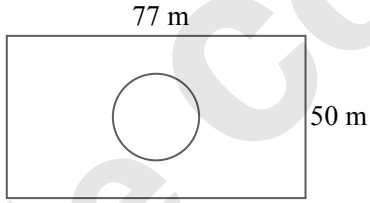
i. an odd number.

Solution:

ii. a complete square number.

Solution:

9. Length and breadth of a rectangular garden are 77 m and 50 m. There is a circular lake in the garden having diameter 14 m. Due to wind, a towel from a terrace on a nearby building fell into the garden. Then find the probability of the event that it fell in the lake. **[3 Marks]**



Solution:

10. In a game of chance, a spinning arrow comes to rest at one of the numbers 1, 2, 3, 4, 5, 6, 7, 8. All these are equally likely outcomes. Find the probability that it will rest at **[1 Mark each]**

i. 8.

Solution:

ii. an odd number.

Solution:

iii. a number greater than 2.

Solution:

iv. a number less than 9.

Solution:

11. There are six cards in a box, each bearing a number from 0 to 5. Find the probability of each of the following events, that a card drawn shows, [1 Mark each]

i. a natural number.

Solution:

ii. a number less than 1.

Solution:

iii. a whole number.

Solution:

iv. a number greater than 5.

Solution:

12. A bag contains 3 red, 3 white and 3 green balls. One ball is taken out of the bag at random. What is the probability that the ball drawn is: [3 Marks]

i. red.

Solution:

ii. not red.

Solution:

iii. either red or white.

Solution:

13. Each card bears one letter from the word 'mathematics'. The cards are placed on a table upside down. Find the probability that a card drawn bears the letter 'm'. [2 Marks]

Solution:

14. Out of 200 students from a school, 135 like Kabaddi and the remaining students do not like the game. If one student is selected at random from all the students, find the probability that the student selected dosen't like Kabaddi. [2 Marks]

Solution:

15. A two digit number is to be formed from the digits 0, 1, 2, 3, 4. Repetition of the digits is allowed. Find the probability that the number so formed is a: [3 Marks]

i. prime number.

Solution:

ii. multiple of 4.

Solution:

iii multiple of 11.

Solution:

16. The faces of a die bear numbers 0, 1, 2, 3, 4, 5. If the die is rolled twice, then find the probability that the product of digits on the upper face is zero. [3 Marks]

Solution:

17. Do the following activities.

i. Total number of students in your class, n(S) = ☐

Number of students from your class, wearing spectacles, n(A) = ☐

Probability of a randomly selected student wearing spectacles, P(A) = ☐

Probability of a randomly selected student not wearing spectacles, P(B) = ☐

(Students should attempt the above activities on their own.)

ii. Decide the sample space yourself and fill in the following boxes.

Sample space

S = { }

n(S) = ☐

The condition for event A is 'getting an even number'.

A = { }

n (A) = ☐

∴ P(A) = ☐/☐ = ☐

Teacher's Remark: ---------- Date: ----------

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(Eng., Mar. & Semi Eng. Medium)

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