

## For 2025 Exam



### **Best Seller**

## For 2025 Exam



# **Solution of the set o**



## MATHEMATICS STANDARD

Strictly as per the Latest CBSE Circular & Syllabus released on 22nd Mar 2024 & 3rd Apr 2024(CBSE Cir. No. Acad-29/2024,30/2024)

## Your #UltimateStudyCompanion

NCERT Textbook & Exemplar for Concepts Recall

Previous Years Questions for Exam Trends Insights Competency Based Questions for Holistic

for Holistic Skill Development





## NEP Compliance

with Artificial Intelligence & Art Integration

## 4<sup>th</sup> EDITION

## YEAR 2024-25



## "9789359583358"



## CENTRAL BOARD OF SECONDARY EDUCATION DELHI



All rights reserved. No part of this book may be reproduced, stored in a retrieval system, or transmitted, in any form or by any means, without written permission from the publishers. The author and publisher will gladly receive information enabling them to rectify any error or omission in subsequent editions.



## **PUBLISHED BY**



1/11, Sahitya Kunj, M.G. Road, Agra - 282002, (UP) India



1010, Cambourne Business Centre Cambridge, Cambridgeshire CB 236DP, United kingdom





contact@oswaalbooks.com



www.OswaalBooks.com

## DISCLAIMER

This book is published by Oswaal Books and Learning Pvt Ltd ("Publisher") and is intended solely for educational use, to enable students to practice for examinations/tests and reference. The contents of this book primarily comprise a collection of questions that have been sourced from previous examination papers. Any practice questions and/or notes included by the Publisher are formulated by placing reliance on previous question papers and are in keeping with the format/pattern/ guidelines applicable to such papers.

The Publisher expressly disclaims any liability for the use of, or references to, any terms or terminology in the book, which may not be considered appropriate or may be considered offensive, in light of societal changes. Further, the contents of this book, including references to any persons, corporations, brands, political parties, incidents, historical events and/or terminology within the book, if any, are not intended to be offensive, and/or to hurt, insult or defame any person (whether living or dead), entity, gender, caste, religion, race, etc. and any interpretation to this effect is unintended and purely incidental. While we try to keep our publications as updated and accurate as possible, human error may creep in. We expressly disclaim liability for errors and/or omissions in the content, if any, and further disclaim any liability for any loss or damages in connection with the use of the book and reference to its contents".

Kindle Edition

## Contents

- Latest CBSE Circular & Syllabus released on 22nd March & 3rd April 2024 for Academic Year 2024-25 (CBSE Cir. No. Acad 29/2024; 30/2024)
- CBSE Solved Board Paper 2024 (Delhi & Outside Delhi Sets)

7 - 13 17 - 48



Abbreviations used - [AI] Academic Intelligence, [OEB] Oswaal Editorial Board



## Why **ONE FOR ALL** is your One Stop Resource to Excel in Exams?

"One For All" truly lives up to its name as the ultimate exam companion, encompassing everything you need for academic success. Every page is a springboard to your academic success. Seamlessly merging theory with real-world relevance, it empowers you to not just study for exams, but to conquer them with a blend of insight, confidence, and practical skill.

"One For All" ensures that every student can excel, regardless of their learning style or academic background. Say goodbye to exam stress and embrace a brighter academic future with One for All guiding your path.



## Preface

Welcome to the vibrant world of CBSE One For All Class 10 – a meticulously crafted book tailored to match the pulse of the latest CBSE syllabus. Just as education constantly evolves, our commitment remains unwavering in furnishing students with the latest and most pertinent resources to thrive in their academic journey. In this edition, we present a plethora of benefits designed to empower you in your quest for academic excellence:

- 1. Extensive Theory Coverage: Comprehensive Chapterwise Theory, Mind Maps and Mnemonics simplify even the most complex concepts.
- **2. Exam Readiness:** Preparedness ensured with Previous Years' Questions, Board Marking Scheme and latest Typologies of Questions specified by the Board.
- **3. Valuable Exam Insights:** Fully solved NCERT Textbook and Exemplar Questions offer insights beyond memorization.
- 4. NEP Compliance: Foster holistic development with Competency-Focused Practice Questions (CFPQ), Artificial Intelligence & Art Integration
- 5. On-Point Practice: Enhance skills with Self-Assessment Questions and Practice Papers for confidence building.

As you embark on this educational journey with us, you'll find yourself armed with all the tools necessary to not just excel in your exams but also foster a deeper understanding and appreciation for the subjects you study.

So, dear students, buckle up and get ready for an exhilarating ride through the world of knowledge and discovery, with CBSE One for All by your side, there's no limit to what you can achieve.

May your academic journey be filled with success and discovery!

Team Oswaal Books

## How to use this Book?



## CBSE Circular 2024-25



## केन्द्रीय माध्यमिक शिक्षा बोर्ड





### CENTRAL BOARD OF SECONDARY EDUCATION

(An Autonomous Organisation Under the Ministry of Education, Govt. of India)

#### CBSE/ACADEMIC/JS(SG)/2024/

3<sup>rd</sup> April, 2024 Circular No. Acad-30/2024

#### All the Heads of Schools affiliated to CBSE

#### Subject : Assessment and Evaluation Practices of the Board for the Session 2024-25.

- The Board in accordance with National Education Policy, 2020 has taken multiple steps towards implementation of Competency Based Education in schools, ranging from aligning assessment to competencies, development of exemplar resources for teachers and students as well as continuous capacity building of the teachers etc. The main emphasis of the Board was to create an educational ecosystem that would move away from rote memorization and towards learning that is focused on developing the creative, critical and systems thinking capacities of students to meet the challenges of the 21st century.
- The Board has released guidelines vide Circular No. Acad- 05/2019 dated 18.01.2019; Circular No. Acad-11/2019 dated 06.03.2019; Circular No. Acad-18/2020 dated 16.03.2020; and Circular No. Acad-57/2022 dated 20.05.2022 to progressively align assessment to the vision of the NEP by including more competency-based questions in the Classes X and XII Board examinations.
- Appropriately, the Board is continuing with aligning of the assessments and evaluation practices with NEP- 2020 for the academic session 2024-2025. Consequently, in the forthcoming session, the percentage of Competency Based Questions that assess application of concepts in real-life situations included in the question papers of the Board is given as under:

(Dr. Joseph Emmanuel) Director (Academics)



फोन/Telephone: 011-23212603 वेबसाइट/Website:http://cbseacademic.nic.in मेल/e-mail: directoracad.cbse@nic.in.

## CBSE Circular 2024-25



## केन्द्रीय माध्यमिक शिक्षा बोर्ड



(शिक्षा मंत्रालय भारत सरकार के अधीन एक स्वायत्त संगठन)

### **CENTRAL BOARD OF SECONDARY EDUCATION**

(An Autonomous Organisation Under the Ministry of Education, Govt. of India)

#### The changes for classes IX-XII year-end Board Examinations (2024-25)

(Classes IX-X)				
Particulars	Academic Session 2023-24	Academic Session 2024-25 (No change from previous academic session)		
Composition of question paper for year-end examination/ Board Examination (Theory)	<ul> <li>Competency Focused Questions in the form of MCQs/ Case Based Questions, Source-based Integrated Questions or any other type = 50%</li> <li>Select response type questions (MCQ) = 20%</li> <li>Constructed response questions</li> </ul>	<ul> <li>Competency Focused Questions in the form of MCQs/Case Based Questions, Source-based Integrated Questions or any other type = 50%</li> <li>Select response type questions (MCQ) = 20%</li> <li>Constructed response questions</li> </ul>		
	(Short Answer/Long Answer Type Questions, as per existing pattern) = 30%	(Short Answer/Long Answer Type Questions, as per existing pattern) = 30%		
	(Classes IX-XII)			
Particulars	Academic Session 2023-24	Academic Session 2024-25		
Composition of question paper for year-end examination/	• Competency Focused Questions in the form of MCQs/ Case Based Questions, Source-based Integrated Questions or any other type = 40%	• Competency Focused Questions in the form of MCQs/ Case Based Questions, Source-based Integrated Questions or any other type = 50%		
Board Examination	<ul> <li>Select response type questions (MCQ)</li> <li>= 20%</li> </ul>	<ul> <li>Select response type questions (MCQ)</li> <li>= 20%</li> </ul>		
(Theory)	• Constructed response questions (Short Answer Questions/Long Answer type Questions, as per existing pattern) = 40%	<ul> <li>Constructed response questions (Short Answer Questions/Long Answer type Questions, as per existing pattern) = 30%</li> </ul>		

Curriculum document released by the Board for the Academic Session 2024-25 and the Sample Question Papers may also be referred to for details of the QP design of individual subjects. Learning frameworks for various subjects for classes IX-XII are available at the link https://cbseacademic.nic.in for reference.

(Dr. Joseph Emmanuel) Director (Academics)



फोन/Telephone: 011-23212603 वेबसाइट/Website:http://cbseacademic.nic.in मेल/e-mail: directoracad.cbse@nic.in.

## **CBSE Circular 2024-25**



## केन्द्रीय माध्यमिक शिक्षा बोर्ड

(शिक्षा मंत्रालय भारत सरकार के अधीन एक स्वायत्त संगठन)



CENTRAL BOARD OF SECONDARY EDUCATION

(An Autonomous Organisation Under the Ministry of Education, Govt. of India)

F.1001/CBSE-Acad/Curriculum/2024

March 22, 2024 Cir No: Acad-29/2024

#### All Heads of Institutions affiliated to CBSE

## Subject: Secondary and Senior School Curriculum for the session 2024-25 and new textbooks to be published by NCERT for classes III and VI.

- 1. CBSE provides the annual curriculum for classes IX to XII containing academic content, syllabus for examinations with learning outcomes, pedagogical practices, and assessment guidelines.
- 2. It is imperative for schools to ensure adherence to the curriculum directives outlined in the initial pages of the curriculum document. Subjects should be taught in accordance with the prescribed curriculum, incorporating methodologies such as Multilingualism, Art-Integrated Education, Experiential Learning, and Pedagogical Plans, wherever feasible.
- 3. With the adoption of the National Curriculum Framework for School Education 2023 by CBSE, schools are advised to align their practices with the recommendations delineated in NCF-SE-2023. This includes adherence to guidelines concerning content, pedagogical strategies, assessment methodologies, and other pertinent areas as communicated by the Board from time to time.
- 4. The National Council of Educational Research and Training (NCERT) has informed CBSE through a letter dated 18.03.2024 that new syllabi and textbooks for Grades 3 and 6 are currently under development and will soon be released. Consequently, Schools are advised to follow these new syllabi and textbooks for classes 3 and 6 in place of textbooks published by NCERT till the year 2023. Additionally, a bridge course for class 6, and concise guidelines for class 3 are being developed by NCERT for facilitating a seamless transition for students to new pedagogical practices and areas of study aligned with NCF-SE 2023. These resources will be disseminated to all the schools online once they are received from NCERT. The Board will also organize capacity building programs for School Heads and Teachers to orient them with the new teaching learning perspectives as envisioned in NEP-2020.
- 5. There will be no change in the Curriculum and textbooks for other classes for the academic year 2024-25 commencing from 1st April 2024.
- 6. Schools are requested to share the Curriculum 2024-25 available on Boards website www. cbseacademic.nic.in with all students and teachers. CBSE Curriculum for classes IX-XII 2024-25 can be accessed at the link-Secondary & Senior Secondary School Curriculum https://cbseacademic.nic.in/curriculum\_2025.html.

(Dr. Joseph Emmanuel) Director (Academics)



'शिक्षा सदन', 17 राऊज़ एवेन्यू, इंस्टीटूशनल एरिया, नई दिल्ली-110002 'Shiksha Sadan', 17, Rouse Avenue, Institutional Area, New Delhi – 110002

फोन/Telephone: 011-23212603 वेबसाइट/Website:http://cbseacademic.nic.in मेल/e-mail: directoracad.cbse@nic.in.

## Latest Syllabus (Issued by CBSE on 22<sup>nd</sup> March 2024)

## MATHEMATICS STANDARD-(Code No. 041)

## Class-X-(Theory)

Unit No.	Unit Name	Marks
I	Number Systems	06
II	Algebra	20
	Coordinate Geometry	06
IV	Geometry	15
V	Trigonometry	12
VI	Mensuration	10
VII	Statistics & Probability	11
	Total	80

### **UNIT I: NUMBER SYSTEMS**

### 1. REAL NUMBERS

Fundamental Theorem of Arithmetic - statements after reviewing work done earlier and after illustrating and motivating through examples, Proofs of irrationality of  $\sqrt{2}$  ,  $\sqrt{3}$  ,  $\sqrt{5}$  .

### **UNIT II: ALGEBRA**

### 1. POLYNOMIALS

Zeros of a polynomial. Relationship between zeros and coefficients of quadratic polynomials.

### 2. PAIR OF LINEAR EQUATIONS IN TWO VARIABLES

Pair of linear equations in two variables and graphical method of their solution, consistency/ inconsistency.

Algebraic conditions for number of solutions. Solution of a pair of linear equations in two variables algebraically - by substitution, by elimination. Simple situational problems.

### 3. QUADRATIC EQUATIONS

Standard form of a quadratic equation  $ax^2 + bx + c = 0$ ,  $(a \neq 0)$ . Solutions of quadratic equations (only real roots) by factorization, and by using quadratic formula. Relationship between discriminant and nature of roots.

Situational problems based on quadratic equations related to day to day activities to be incorporated.

### 4. ARITHMETIC PROGRESSIONS

Motivation for studying Arithmetic Progression. Derivation of the  $n^{th}$  term and sum of the first n terms of A.P. and their application in solving daily life problems.

### (15) Periods

(8) Periods

(15) Periods

### (15) Periods

(10) Periods

## **UNIT III: COORDINATE GEOMETRY**

### 1. COORDINATE GEOMETRY

**Review :** Concepts of coordinate geometry, graphs of linear equations. Distance formula. Section formula (internal division).

## **UNIT IV: GEOMETRY**

### **1. TRIANGLES**

Definitions, examples, counter examples of similar triangles.

- **1.** (**Prove**) If a line is drawn parallel to one side of a triangle to intersect the other two sides in distinct points, the other two sides are divided in the same ratio.
- **2.** (Motivate) If a line divides two sides of a triangle in the same ratio, the line is parallel to the third side.
- **3.** (Motivate) If in two triangles, the corresponding angles are equal, their corresponding sides are proportional and the triangles are similar.
- **4. (Motivate)** If the corresponding sides of two triangles are proportional, their corresponding angles are equal and the two triangles are similar.
- 5. (Motivate) If one angle of a triangle is equal to one angle of another triangle and the sides including these angles are proportional, the two triangles are similar.

### 2. CIRCLES

Tangent to a circle at, point of contact

- **1.** (**Prove**) The tangent at any point of a circle is perpendicular to the radius through the point of contact.
- 2. (Prove) The lengths of tangents drawn from an external point to a circle are equal.

### **UNIT V: TRIGONOMETRY**

### **1. INTRODUCTION TO TRIGONOMETRY**

Trigonometric ratios of an acute angle of a right-angled triangle. Proof of their existence (well defined); motivate the ratios whichever are defined at 0° and 90°. Values of the trigonometric ratios of 30°, 45° and 60°. Relationships between the ratios.

### 2. TRIGONOMETRIC IDENTITIES

Proof and applications of the identity  $\sin^2 A + \cos^2 A = 1$ . Only simple identities to be given.

### 3. HEIGHTS AND DISTANCES:

### Angle of Elevation, Angle of Depression.

Simple problems on heights and distances. Problems should not involve more than two right triangles. Angles of elevation / depression should be only 30°, 45°, and 60°.

## **UNIT VI : MENSURATION**

### **1. AREAS RELATED TO CIRCLES**

Area of sectors and segments of a circle. Problems based on areas and perimeter / circumference of the above said plane figures. (In calculating area of segment of a circle, problems should be restricted to central angle of 60°, 90° and 120° only.

## (10) Periods

(15) Periods

(10) Periods

## (15) Periods

(15) Periods

## (10) Periods

## (12) Periods

### 2. SURFACE AREAS AND VOLUMES

Surface areas and volumes of combinations of any two of the following: cubes, cuboids, spheres, hemispheres and right circular cylinders/cones.

### **UNIT VII : STATISTICS AND PROBABILITY**

### **1. STATISTICS**

Mean, median and mode of grouped data (bimodal situation to be avoided).

### 2. PROBABILITY

Classical definition of probability. Simple problems on finding the probability of an event.

## (12) Periods

## (18) Periods

(10) Periods

## MATHEMATICS-Standard QUESTION PAPER DESIGN

CLASS – X (2024-25)

#### **Time : 3 Hours**

#### Max. Marks: 80

S. No. 1.	Typology of Questions		% Weightage (approx.)
	<b>Remembering :</b> Exhibit memory of previously learned material by recalling facts, terms, basic concepts, and answers.		
	<b>Understanding :</b> Demonstrate understanding of facts and ideas by organizing, comparing, translating, interpreting, giving descriptions, and stating main ideas.	43	54
2. 3.	<b>Applying:</b> Solve problems to new situations by applying acquired knowledge, facts, techniques and rules in a different way.	19	24
	<b>Analysing :</b> Examine and break information into parts by identifying motives or causes. Make inferences and find evidence to support generalizations.		
	<b>Evaluating :</b> Present and defend opinions by making judgments about information, validity of ideas, or quality of work based on a set of criteria.	18	22
	<b>Creating :</b> Compile information together in a different way by combining elements in a new pattern or proposing alternative solutions.		
	Total	80	100

INTERNAL ASSESSMENT	20 Marks
<ul> <li>Pen Paper Test and Multiple Assessment (5+5)</li> </ul>	10 Marks
• Portfolio	05 Marks
• Lab Practical (Lab activities to be done from the prescribed books)	05 Marks

## NEP Derived Learning Resources Prescribed by CBSE for Year 2024-25



## **Exclusive School Books Suppliers**

1	ANDHRA PRADESH		MAHARASHTRA
VIJAYAWADA	Sri Vikas Book Centre, 9848571114, 9440715700,	JALNA	Anil Paper Mart, 9422722522, (02482) 230733
WEST KAMENG	ASSAM Dutta Book Stall, 8729948473 GUJRAT	PUNE	Madhusheela Books & Stationery, 7875899892 <b>TAMIL NADU</b> Bookmark-IT, 7305151653
RAJKOT	Royal Stationers, 9824207514		TELANGANA
I	KARNATAKA	HYDERABAD	Sri Balaji Book Depot , 9676996199, (040) 27613300
BANGLORE	Satish Agencies, 8861630123		WEST BENGAL
		KOLKATA	United Book House, 9831344622

### **Our Distributors**

	ANDHRA PRADESH	INDORE	Bhaiya Industries, 9893326853, Sushil Prakashan,(0731) 2503333, 2535892,
TIRUPATI	Shree Aditya Book Centre, 7013300914, 8332972720		9425322330, Bhaiya Store, 9425318103, Arun Prakashan, 9424890785,
VISAKHAPATHAM	JBD Educational, 9246632691, 9246633693, Sri Rajeshwari Book Link, 9848036014		Bhaiya Book Centre, 9424081874, Seva Suppliers, 9826451052
VIJAYAWADA	Akshaya Books Corner, 9666155555	JABALPUR	Vinay Pustak Sadan, 8962362667, Anand Books and Stationers, 9425323508
	ANDAMAN & NICOBAR ISLAND	SAGAR	Princi Book Depot, Sagar, 9977277011
PORTBLAIR	Krishna Book Centre, 9474205570, Kumar Book Depot, 9932082455	KATNI	Shri Mahavir Agency, 9425363412
	ARUNACHAL PRADESH	UJJAIN	Shreenath Book Depot, 9827544045
NAHARLAGUN	New Pothi Ghar. 8731832947	BHOPAL	Gupta Brother. 9644482444
	ASSAM	2	ΜΑΗΑΡΑΣΗΤΡΑ
GUWAHATI	Book Emporium 9675972993 6000763186	PLINE	Natrai Book Depot (020) 24/85054 9890054092 Vikas Book House 9921331187
GUWAHAII	Book Emploration, 7896141127, Ashok Publication, 7896141127, Kayaan Enterprises, (0361) 2630443, Orchid Book house, 9864624209, Newco, 9864178188	PONE	Nata Jobic Cepty (Cost) 244059, 35050-9504, Visas Boto Nobel 522 (Nisas Boto Kepty) Pravin Sales, 9890683475, New Saraswati Granth Bhandar, 9422323859, Akshar Books & Stationary, 7385089789, Vardhaman Educational, 9860574354, Vash Book Centre, 9890156763, Pragati Book Centre, (ISC), 9850039311, Praveen Sales, Pragati Book Centre, Pune (E & C.), 9850039311
DATNIA	BIHAR	AURANGABAD	Shree Sainath Agencies, 7350294089, Maya Book Centre, (ISC), 9372360150
PAINA	Sharda Pustak Bhandar, 9334259293, Vikas Book Depot, 9504780402, Alka Book Agency,	BECD	Adarsh Book Depot, 9860374645
	9835655005, Metro Book(E&C), Ishu Pustak Bhandar, 8294576789, Gyan Ganga Limited,	MUMBAI	Vidyarthi Sales Agencies, 9819776110, New Student Agencies, 7045065799, Shivam
MUZAFFARPUR	9304826651, Pustak Bhandar, 7870834225	IALGAON	Books & Stationery, 86 19805332 Sharma Book Depot & Stat. (ISC). 9421393040
MOLATIAN OK	CHATTISCARH	LATUR	Vach Book Lloure 0627026000 Shri Capach Ductakalay 0720172199
	Saini Brothers 9/25582561 M.P. Department Stores 9/2525/26/	KOLHAPUR	Granth the Book World 992229522
ROKARO	Bokaro Student Friends Dut 11d Bokaro 7277021295	NAGPUR	Lavmi Bustakalay and Stationers (0712) 2727254 Vijay Book Depot 0960122004
	Anil Book Depot 9425224260	NAGPOK	Papuka Book distributor 0765406122 Novalty Book Depot 0657600220 Karamyoor
DHILAI	Alli book Depot, 5423234200		Book Depot, 9923966466, Arun Book & Stationers, 9423110953,
DURG	Bhagwati Bhawani Book Depot, 0788-2327620, 9827473100		Shree Mahalaxmi Pustakalaya, 7507099360
KORBA	Kitab Ghar, Korba ( E & C ), 9425226528	NANDED	Abhang Pustakalaya, 9823470756/9175940756
RAIPUR	Shri Ramdev Traders, 9981761797, Gupta Pustak Mandir, 7974220323,	NASHIK	Rahul Book Centre, 9970849681, New India Book House, 9623123458
	Anil Publication, 9691618258/7999078802	DHULE	Navjeevan Book Stall, 7020525561
RAIGARH	Sindhu Book Deopt, 9981935763	YAVATMAL	Shri Ganesh Pustkalaya, 9423131275
	DELHI	VASAI	Prime Book Centre, Vasai, 9890293662
DELHI	Mittal Books, (011) 23288887, 9899037390, Singhania Book & Stationer, 9212028238,		ODISHA
	Aone Books, New Delhi, 8800497047, Radhey Book Depot, 9818314141, Batheja Super Store, 9871833924, Lov Dev & Sons, Delhi (E&C), 9811182352, Zombozone	CUTTACK	A K Mishra Agencies 9/37025991 9/37081319
	9871274082, LDS Marketing, 9811182352/9999353491	COTTACK	A. R. Misina Ageneics, 5457625551, 5457661515
	GUJARAT	BHUBANESHWAR	M/s Pragnya, 8847888616, 9437943777, Padmalaya, 9437026922, Bidyashree,
AHMEDABAD	Patel Book Agencies, 9898184248, 9824386112, 9825900335, Zaveri Agency,	BARIPADA	Trimurti Book World, 9437034735
BHAVNAGAR	Samir Book Stall Bhavnagar (ISC) 9586305305 7825658466	KEONIHAR	Students corper 7008/35/18
DAHOD	Collegian Book Corper 9925501981	REONDHAR	DINIAB
VAPI	Goutam Book Sellers, 9081790813	AMRALA	Bharat Book Depot 7988455354
VALCAD	Mahavin Stationers, 0420474177	DATIALA	Conf Cone 0402010070 Adamb Enternations 0014247012
NAVSAD	College Store (ISC) NO CALL 02627-259642 0925000121 9141912750		Guer Sons, 9405019976, Audish Enterprises, 9614547615
	COILEGE STOLE, USCI NO CALL 02037-230042, 3023033121,0141313730		Chase Rook Store 0872222458 0878258502 City Rook Shop 0417440752
CUDAT	Changing Daint 0024108662	JALANDHAK	Cheap Book Store, 9872223458, 9878258592, City Book Shop, 9417440753,
SURAT	Shopping Point, 9824108663	JALANDHAK	Cheap Book Store, 9872223458, 9878258592, City Book Shop, 9417440753, Subhash Book Depot, 9876453625, Paramvir Enterprises, 9878626248, Gaurav Book world, 9478821183
SURAT	Shopping Point, 9824108663 Umakant Book Sellers & Stationer, 6359396370	FEROZPUR	Cheap Book Store, 9872223458, 9878258592, City Book Shop, 9417440753, Subhash Book Depot, 9876453625, Paramvir Enterprises, 9878626248, Gaurav Book word, 9478821183 Sita Ram book Depot, 9463039199, 7696141911
SURAT	Shopping Point, 9824108663 Umakant Book Sellers & Stationer, 6359396370 HARYANA	FEROZPUR	Cheap Book Store, 9872223458, 9878258592, City Book Shop, 9417440753, Subhash Book Depot, 9876453625, Paramvir Enterprises, 9878626248, Gaurav Book word, 9478821183 Sita Ram book Depot, 9463039199, 7696141911 Amit Book, 9815807871, Gupta Brothers, 9888200206, Bhatia Book Centre,
SURAT VADODARA	Shopping Point, 9824108663 Umakant Book Sellers & Stationer, 6359396370 HARYANA Marich Treder: 9812556687, Swami Kitab Ghar, 9355611088	FEROZPUR LUDHIANA	Cheap Book Store, 9872223458, 9878258592, City Book Shop, 9417440753, Subhash Book Depot, 9876453625, Paramvir Enterprises, 9878626248, Gaurav Book world, 9478821183 Sita Ram book Depot, 9463039199, 7696141911 Amit Book, 9815807871, Gupta Brothers, 9888200206, Bhatia Book Centre, 9815277131 Mobindra Book Depot, 9814920226
SURAT VADODARA ROHTAK	Shopping Point, 9824108663 Umakant Book Sellers & Stationer, 6359396370 HARYANA Manish Traders, 9812556687, Swami Kitab Ghar, 9355611088, Babu Ram Pradeep Kumar, 9813214692	FEROZPUR LUDHIANA CHANDIGARH	Cheap Book Store, 9872223458, 9878258592, City Book Shop, 9417440753, Subhash Book Depot, 9876453625, Paramvir Enterprises, 9878626248, Gaurav Book world, 9478621183 Sita Ram book Depot, 9463039199, 7696141911 Amit Book, 9815807871, Gupta Brothers, 9888200206, Bhatia Book Centre, 9815277131 Mohindra Book Depot, 9814920226
SURAT VADODARA ROHTAK REWARI	Shopping Point, 9824108663 Umakant Book Sellers & Stationer, 6359396370 HARYANA Manish Traders, 9812556687, Swami Kitab Ghar, 9355611088, Babu Ram Pradeep Kumar, 9813214692 Sajay book depot, 9255447231	FEROZPUR LUDHIANA CHANDIGARH	Cheap Book Store, 9872223458, 9878258592, City Book Shop, 9417440753, Subhash Book Depot, 9876453625, Paramvir Enterprises, 9878626248, Gaurav Book world, 9478821183 Sita Ram book Depot, 9463039199, 7696141911 Amit Book, 9815807871, Gupta Brothers, 9888200206, Bhatia Book Centre, 9815277131 Mohindra Book Depot, 9814920226 RAJASTHAN
SURAT VADODARA ROHTAK REWARI BALLABGARH	Shopping Point, 9824108663 Umakant Book Sellers & Stationer, 6359396370 HARYANA Manish Tradeers, 9812556687, Swami Kitab Ghar, 9355611088, Babu Ram Pradeep Kumar, 9813214692 Sanjay book depot, 9255447231 Kashi Ram Kishan Ial, 9289504004, 8920567245	FEROZPUR LUDHIANA CHANDIGARH AJMER	Cheap Book Store, 9872223458, 9878258592, City Book Shop, 9417440753, Subhash Book Depot, 9876453625, Paramvir Enterprises, 9878626248, Gaurav Book world, 9478821183 Sita Ram book Depot, 9463039199, 7696141911 Amit Book, 9815807871, Gupta Brothers, 9888200206, Bhatia Book Centre, 9815277131 Mohindra Book Depot, 9814920226 <b>RAJASTHAN</b> Laxmi General Store, Ajmer, 0145- 2428942 9460652197
SURAT VADODARA ROHTAK REWARI BALLABGARH HISAR	Shopping Point, 9824108663 Umakant Book Sellers & Stationer, 6359396370 HARYANA Manish Traders, 9812556687, Swami Kitab Ghar, 9355611088, Babu Ram Pradeep Kumar, 9813214692 Sanjay book depot, 9255447231 Kashi Ram Kishan Lai, 9289504004, 8920567245 Natraj Book Distributors, 7988917452	FEROZPUR LUDHIANA CHANDIGARH AJMER KOTA	Cheap Book Store, 9872223458, 9878258592, City Book Shop, 9417440753, Subhash Book Depot, 9976453625, Paramvir Enterprises, 9878626248, Gaurav Book world, 9478821183 Sita Ram book Depot, 9463039199, 7696141911 Amit Book, 9815807871, Gupta Brothers, 9888200206, Bhatia Book Centre, 9815277131 Mohindra Book Depot, 9814920226 <b>RAJASTHAN</b> Laxmi General Store, Ajmer, 0145- 2428942 9460652197 Vardhman Book Depot, 9571365020, 8003221190 Raj Traders, 9309232829
SURAT SURAT VADODARA ROHTAK REWARI BALLABGARH HISAR BHUNA	Shopping Point, 9824108663 Umakant Book Sellers & Stationer, 6359396370 <b>HARYANA</b> Manish Traders, 9812556687, Swami Kitab Ghar, 9355611088, Babu Ram Pradeep Kumar, 9813214692 Sanjay book depot, 9255447231 Kashi Ram Kishan lal, 9289504004, 8920567245 Natraj Book Distributors, 7988917452 Khurana Book Store, 9896572520	FEROZPUR LUDHIANA CHANDIGARH AJMER KOTA BHILWARA	Cheap Book Store, 9872223458, 9878258592, City Book Shop, 9417440753, Subhash Book Depot, 9876453625, Paramvir Enterprises, 9878626248, Gaurav Book world, 9478621183 Sita Ram book Depot, 9463039199, 7696141911 Amit Book, 9815807871, Gupta Brothers, 9888200206, Bhatia Book Centre, 9915277131 Mohindra Book Depot, 9814920226 <b>RAJASTHAN</b> Laxmi General Store, Ajmer, 0145- 2428942 9460652197 Vardhman Book Depot, 9571365020, 8003221190 Raj Traders, 9309232829 Nakoda Book Depot, (01482) 243653, 9214983594,
SURAT VADODARA ROHTAK REWARI BALLABGARH HISAR BHUNA	Shopping Point, 9824108663 Umakant Book Sellers & Stationer, 6359396370 HARYANA Manish Traders, 9812556687, Swami Kitab Ghar, 9355611088, Babu Ram Pradeep Kumar, 9813214692 Sanjay book depot, 9255447231 Kashi Ram Kishan Ial, 9289504004, 8920567245 Natraj Book Distributors, 7988017452 Khurana Book Store, 9896572520 JAMMU	FEROZPUR LUDHIANA CHANDIGARH AJMER KOTA BHILWARA BHILWARA	Cheap Book Store, 9872223458, 9878258592, City Book Shop, 9417440753, Subhash Book Depot, 9876453625, Paramvir Enterprises, 9878626248, Gaurav Book world, 9478621183 Sita Ram book Depot, 9463039199, 7696141911 Amit Book, 9815807871, Gupta Brothers, 9888200206, Bhatia Book Centre, 9815277131 Mohindra Book Depot, 9814920226 <b>RAJASTHAN</b> Laxmi General Store, Ajmer, 0145- 2428942 9460652197 Vardhman Book Depot, 901450, 8003221190 Raj Traders, 9309232829 Nakoda Book Depot, 01482) 243653, 9214983594, Alankar Book Depot, 9414707462
SURAT VADODARA ROHTAK REWARI BALLABGARH HISAR BHUNA	Shopping Point, 9824108663 Umakant Book Sellers & Stationer, 6359396370 HARYANA Manish Tradeers, 9812556687, Swami Kitab Ghar, 9355611088, Babu Ram Pradeep Kumar, 9813214692 Sanjay book depot, 9255447231 Kashi Ram Kishan Ial, 9289504004, 8920567245 Natraj Book Distributors, 7988917452 Khurana Book Store, 9896572520 JAMMU Sahitya Sangam, 9419190177	FEROZPUR LUDHIANA CHANDIGARH AJMER KOTA BHILWARA BHILWARJ JAIPUR	Cheap Book Store, 9872223458, 9878258592, City Book Shop, 9417440753, Subhash Book Depot, 9876453625, Paramvir Enterprises, 9878626248, Gaurav Book world, 9478821183 Sita Ram book Depot, 9463039199, 7696141911 Amit Book, 9815807871, Gupta Brothers, 9888200206, Bhatia Book Centre, 981527713 Mohindra Book Depot, 9814920226 <b>RAJASTHAN</b> Laxmi General Store, Ajmer, 0145-2428942 9460652197 Vardhman Book Depot, 9571365020, 8003221190 Raj Traders, 9309232829 Nakoda Book Depot, 9014707462 Ravi Enterprises, 9829060694, Saraswati Book House, (0141) 2610823, 9829811155,
SURAT VADODARA ROHTAK REWARI BALLABGARH HISAR BHUNA	Shopping Point, 9824108663 Umakant Book Sellers & Stationer, 6359396370 HARYANA Manish Traders, 9812556687, Swami Kitab Ghar, 9355611088, Babu Ram Pradeep Kumar, 9813214692 Sanjay book depot, 9255447231 Kashi Ram Kishan Laj, 9289504004, 8920567245 Natraj Book Distributors, 7988917452 Khurana Book Store, 9896572520 JAMMU Sahitya Sangam, 9419190177	FEROZPUR LUDHIANA CHANDIGARH AJMER KOTA BHILWARA BHILWARA BHILWADI JAIPUR	Cheap Book Store, 9872223458, 9878258592, City Book Shop, 9417440753, Subhash Book Depot, 9976453625, Paramvir Enterprises, 9878626248, Gaurav Book world, 9478821183 Sita Ram book Depot, 9463039199, 7696141911 Amit Book, 9815807871, Gupta Brothers, 9888200206, Bhatia Book Centre, 9815277131 Mohindra Book Depot, 9814920226 <b>RAJASTHAN</b> Laxmi General Store, Ajmer, 0145- 2428942 9460652197 Vardhman Book Depot, 0571365020, 8003221190 Raj Traders, 9309232829 Nakoda Book Depot, (01482) 243653, 9214983594, Alankar Book Depot, (01482) 243653, 9214983594, Alankar Book Depot, 9414707462 Rawi Enterprises, 9829060694, Saraswait Book House, (0141) 2610823, 9829811155, Goyal Book Distt, 946098339, 9414782130
SURAT VADODARA ROHTAK REWARI BALLABGARH HISAR BHUNA BOKARO	Shopping Point, 9824108663 Umakant Book Sellers & Stationer, 6359396370 HARYANA Manish Traders, 9812556687, Swami Kitab Ghar, 9355611088, Babu Ram Pradeep Kumar, 9813214692 Sanjay book depot, 9255447231 Kashi Ram Kishan Ial, 9289504004, 8920567245 Natraj Book Distributors, 7988917452 Khurana Book Store, 9896572520 JAMMU Sahitya Sangam, 9419190177 JHARKHAND Bokaro Student Friends Pvt. Ltd. (0654) 2233094, 7360021503, Bharati Bhawan	FEROZPUR LUDHIANA CHANDIGARH AJMER KOTA BHILWARA BHILWARA BHIWADI JAIPUR UDAIPUR JODHPUR	Cheap Book Store, 9872223458, 9878258592, City Book Shop, 9417440753, Subhash Book Depot, 9876453625, Paramvir Enterprises, 9878626248, Gaurav Book world, 9478821183 Sita Ram book Depot, 9463039199, 7696141911 Amit Book, 9815807871, Gupta Brothers, 9888200206, Bhatia Book Centre, 9815277131 Mohindra Book Depot, 9814920226 <b>RAJASTHAN</b> Laxmi General Store, Ajmer, 0145- 2428942 9460652197 Vardhman Book Depot, 914707462 Ravi Enterprises, 9829060694, Saraswati Book House, (0141) 2610823, 9829811155, Goyal Book Distt, 9460983939, 9414782130 Sunil Book Stall, 9460004745
SURAT VADODARA ROHTAK REWARI BALLABGARH HISAR BHUNA BOKARO	Shopping Point, 9824108663 Umakant Book Sellers & Stationer, 6359396370 HARYANA Manish Traders, 9812556687, Swami Kitab Ghar, 9355611088, Babu Ram Pradeep Kumar, 9813214692 Sanjay book depot, 925547231 Kashi Ram Kishan La, 928564004, 8920567245 Natraj Book Distributors, 7988917452 Khurana Book Store, 9896572520 JAMMU Sahitya Sangam, 9419190177 JHARKHAND Bokaro Student Friends Pvt. Ltd. (0654) 2233094, 7360021503, Bharati Bhawan Agencies, 06542-265302, 9431740797	FEROZPUR LUDHIANA CHANDIGARH AJMER KOTA BHILWARA BHILWARA BHILWARA BHILWARJ JAIPUR UDAIPUR JODHPUR	Cheap Book Store, 9872223458, 9878258592, City Book Shop, 9417440753, Subhash Book Depot, 9872633625, Paramvir Enterprises, 9878626248, Gaurav Book world, 9478621183 Sita Ram book Depot, 9463039199, 7696141911 Amit Book, 9815807871, Gupta Brothers, 9888200206, Bhatia Book Centre, 9815277131 Mohindra Book Depot, 9814920226 <b>RAJASTHAN</b> Laxmi General Store, Ajmer, 0145-2428942 9460652197 Vardhman Book Depot, 9571365020, 8003221190 Raj Traders, 9309232829 Nakoda Book Depot, 01482) 243653, 9214983594, Alankar Book Depot, 01482) 243653, 9214983594, Alankar Book Depot, 9414707462 Ravi Enterprises, 982906694, Saraswati Book House, (0141) 2610823, 9829811155, Goyal Book Distt, 9460983339, 9414782130 Sunil Book Store, 9828682260 Second Hand Book Stall, 9460004745
SURAT SURAT VADODARA ROHTAK REWARI BALLABGARH HISAR BHUNA BOKARO RANCHI	Shopping Point, 9824108663 Umakant Book Sellers & Stationer, 6359396370 HARYANA Manish Traders, 9812556687, Swami Kitab Ghar, 9355611088, Babu Ram Pradeep Kumar, 9813214692 Sanjay book depot, 9255447231 Kashi Ram Kishan lal, 9289504004, 8920567245 Natraj Book Distributors, 7988917452 Khurana Book Store, 9896572520 JAMMU Sahitya Sangam, 9419190177 JHARKHAND Bokaro Student Friends Pvt. Ltd. (0654) 2233094, 7360021503, Bharati Bhawan Agencies, 05542-265302, 9431740797 Crown Book Distributor & Publishers, (0651) 2213735, 9431173904, Pustak Mandri y 943111518	FEROZPUR LUDHIANA CHANDIGARH AJMER KOTA BHILWARA BHILWARA BHIWADI JAIPUR UDAIPUR JODHPUR	Cheap Book Store, 9872223458, 9878258592, City Book Shop, 9417440753, Subhash Book Depot, 9876453625, Paramvir Enterprises, 9878626248, Gaurav Book world, 9478021183 Sita Ram book Depot, 9463039199, 7696141911 Amit Book, 9815807871, Gupta Brothers, 9888200206, Bhatia Book Centre, 9915277131 Mohindra Book Depot, 9814920226 <b>RAJASTHAN</b> Laxmi General Store, Ajmer, 0145- 2428942 9460652197 Vardhman Book Depot, 9571365020, 8003221190 Raj Traders, 9309232829 Nakoda Book Depot, 01482) 243653, 9214983594, Alankar Book Depot, 9114707462 Ravi Enterprises, 9829060694, Saraswati Book House, (0141) 2610823, 9829811155, Goyal Book Distt, 946093393, 9414782130 Sunil Book Store, 9828682260 Second Hand Book Stall, 9460004745 <b>TRIPURA</b>
SURAT SURAT VADODARA ROHTAK REWARI BALLABGARH HISAR BHUNA BOKARO RANCHI DUMKA	Shopping Point, 9824108663 Umakant Book Sellers & Stationer, 6359396370 HARYANA Manish Traders, 9812556687, Swami Kitab Ghar, 9355611088, Babu Ram Pradeep Kumar, 9813214692 Sanjay book depot, 9255447231 Kashi Ram Kishan lal, 9289504004, 8920567245 Natraj Book Distributors, 7988917452 Khurana Book Store, 9896572520 JAMMU Sahitya Sangam, 9419190177 JHARKHAND Bokaro Student Friends Pvt. Ltd. (0654) 2233094, 7360021503, Bharati Bhawan Agencies, 06542-265302, 9431740797 Crown Book Distributor & Publishers, (0651) 2213735, 9431173904, Pustak Mandir, 943111518, Vidyarthi Pustak Bhandar, 9431310228	FEROZPUR LUDHIANA CHANDIGARH AJMER KOTA BHILWARA BHILWARA BHIWADI JAIPUR UDAIPUR JODHPUR AGARTALA	Cheap Book Store, 9872223458, 9878258592, City Book Shop, 9417440753, Subhash Book Depot, 9876453625, Paramvir Enterprises, 9878626248, Gaurav Book world, 9478621183 Sita Ram book Depot, 9463039199, 7696141911 Amit Book, 9815807871, Gupta Brothers, 9888200206, Bhatia Book Centre, 9815277131 Mohindra Book Depot, 9814920226 <b>RAJASTHAN</b> Laxmi General Store, Ajmer, 0145- 2428942 9460652197 Vardhman Book Depot, 9571365020, 8003221190 Raj Traders, 9309232829 Nakoda Book Depot, 01482) 243653, 9214983594, Alankar Book Depot, 9414707462 Ravi Enterprises, 9829060694, Saraswati Book House, (0141) 2610823, 9829811155, Goyal Book Distt, 946093393, 9414782130 Sunil Book Store, 9828682260 Second Hand Book Stall, 9460004745 <b>TRIPURA</b> BookS Corner, 8794894165, 8984657146, Book Emporium, 9089230412
SURAT SURAT VADODARA ROHTAK REWARI BALLABGARH HISAR BHUNA BOKARO RANCHI DUMKA	Shopping Point, 9824108663 Umakant Book Sellers & Stationer, 6359396370 HARYANA Manish Tradeers, 9812556687, Swami Kitab Ghar, 9355611088, Babu Ram Pradeep Kumar, 9813214692 Sanjay book depot, 9255447231 Kashi Ram Kishan Ial, 9289504004, 8920567245 Natraj Book Distributors, 7988917452 Khurana Book Store, 9896572520 JAMMU Sahitya Sangam, 9419190177 JHARKHAND Bokaro Student Friends Pvt. Ltd. (0654) 2233094, 7360021503, Bharati Bhawan Agencies, 06542-265302, 9431740797 Crown Book Distributor & Publishers, (0651) 2213735, 9431173904, Pustak Mandir, 9431115138, Vidyarthi Pustak Bhandar, 9431310228 KARNATAKA	FEROZPUR LUDHIANA CHANDIGARH AJMER KOTA BHILWARA BHILWARA BHIWADI JAIPUR UDAIPUR JODHPUR AGARTALA	Cheap Book Store, 9872223458, 9878258592, City Book Shop, 9417440753, Subhash Book Depot, 9876453625, Paramvir Enterprises, 9878626248, Gaurav Book world, 9478621183 Sita Ram book Depot, 9463039199, 7696141911 Amit Book, 9815807871, Gupta Brothers, 9888200206, Bhatia Book Centre, 9815277131 Mohindra Book Depot, 9814920226 <b>RAJASTHAN</b> Laxmi General Store, Ajmer, 0145- 2428942 9460652197 Vardhman Book Depot, 9571365020, 8003221190 Raj Traders, 9309232829 Nakoda Book Depot, 9571365020, 8003221190 Raj Traders, 9309232829 Nakoda Book Depot, 9414707462 Ravi Enterprises, 9829060694, Saraswati Book House, (0141) 2610823, 9829811155, Goyal Book Store, 9828682260 Second Hand Book Stall, 9460004745 <b>TRIPURA</b> BookS Comer, 8794894165, 8984657146, Book Emporium, 9089230412 <b>TAMIL NADU</b>
SURAT VADODARA ROHTAK REWARI BALLABGARH HISAR BHUNA BOKARO RANCHI DUMKA HUBLI	Shopping Point, 9824108663 Umakant Book Sellers & Stationer, 6359396370 HARYANA Manish Traders, 9812556687, Swami Kitab Ghar, 9355611088, Babu Ram Pradeep Kumar, 9813214692 Sanjay book depot, 9255447231 Kashi Ram Kishan Ial, 9289504004, 8920567245 Natraj Book Distributors, 7988917452 Khurana Book Store, 9896572520 JAMMU Sahitya Sangam, 9419190177 JHARKHAND Bokaro Student Friends Pvt. Ltd. (0654) 2233094, 7360021503, Bharati Bhawan Agencies, 06542-265302, 9431740797 Crowm Book Distributor & Publishers, (0651) 2213735, 9431173904, Pustak Mandir, 9431115138, Vidyarthi Pustak Bhandar, 9431310228 KARNATAKA Renuka Book Distributor, (0836) 2244124, Vidyamandir Book Distributors, 9980773976	FEROZPUR LUDHIANA CHANDIGARH AJMER KOTA BHILWARA BHILWARA BHILWARA BHILWARA UDAIPUR JODHPUR AGARTALA COIMBATORE	Cheap Book Store, 9872223458, 9878258592, City Book Shop, 9417440753, Subhash Book Depot, 9976453625, Paramvir Enterprises, 9878626248, Gaurav Book world, 9478821183 Sita Ram book Depot, 9463039199, 7696141911 Amit Book, 9815807871, Gupta Brothers, 9888200206, Bhatia Book Centre, 9815277131 Mohindra Book Depot, 9814920226 <b>RAJASTHAN</b> Laxmi General Store, Ajmer, 0145- 2428942 9460652197 Vardhman Book Depot, 9571365020, 8003221190 Raj Traders, 9309232829 Nakoda Book Depot, 01482) 243653, 9214983594, Alankar Book Depot, 01482) 243653, 9214983594, Alankar Book Depot, 01482) 243653, 9214983594, Alankar Book Depot, 9414707462 Ravi Enterprises, 9829066064, Saraswati Book House, (0141) 2610823, 9829811155, Goyal Book Distt., 9460983939, 9414782130 Sumil Book Store, 9828682260 Second Hand Book Stall, 9460004745 <b>TRIPURA</b> BookS Cormer, 8794894165, 8984657146, Book Emporium, 9089230412 <b>TAMIL NADU</b> Majestic Book House, (0422) 2384333, CBSC Book Shop, 9585979752
SURAT VADODARA ROHTAK REWARI BALLABGARH HISAR BHUNA BOKARO RANCHI DUMKA HUBLI BANGLORE	Shopping Point, 9824108663 Umakant Book Sellers & Stationer, 6359396370 HARYANA Manish Traders, 9812556687, Swami Kitab Ghar, 9355611088, Babu Ram Pradeep Kumar, 9813214692 Sanjay book depot, 9255447231 Kashi Ram Kishan La, 292654004, 8920567245 Natraj Book Distributors, 7988917452 Khurana Book Store, 9896572520 JAMMU Sahitya Sangam, 9419190177 JHARKHAND Bokaro Student Friends Pvt. Ltd. (0654) 2233094, 7360021503, Bharati Bhawan Agencies, 06542-265302, 9431740797 Crown Book Distributor & Publishers, (0651) 2213735, 9431173904, Pustak Mandir, 943111518, Vidyarthi Pustak Bhandar, 9431310228 KARNATAKA Kenuka Book Distributor, (0836) 2244124, Vidyamandir Book Distributors, 9980773976 Krishna book house, 9739847334, Hema Book Stores, 9986767000,	FEROZPUR LUDHIANA CHANDIGARH AJMER KOTA BHILWARA BHILWARA BHILWARA BHILWARA UDAIPUR JODHPUR JODHPUR AGARTALA COIMBATORE CHENNAI	Cheap Book Store, 9872223458, 9878258592, City Book Shop, 9417440753, Subhash Book Depot, 9876453625, Paramvir Enterprises, 9878626248, Gaurav Book world, 9478621183 Sita Ram book Depot, 9463039199, 7696141911 Amit Book, 9815807871, Gupta Brothers, 9888200206, Bhatia Book Centre, 9815277131 Mohindra Book Depot, 9814920226 <b>RAJASTHAN</b> Laxmi General Store, Ajmer, 0145- 2428942, 9460652197 Vardhman Book Depot, 01482, 243653, 9214983594, Alankar Book Depot, 01482) 243653, 9214983594, Alankar Book Depot, 01482) 243653, 9214983594, Alankar Book Depot, 9414707462 Ravi Enterprises, 9829060694, Saraswati Book House, (0141) 2610823, 9829811155, Goyal Book Distt., 9460983939, 9414782130 Sunil Book Store, 9828682260 Second Hand Book Stall, 9460004745 <b>TRIPURA</b> BookS Cormer, 8794894165, 8984657146, Book Emporium, 9089230412 <b>TAMIL NADU</b> Majestic Book House, (042) 2384333, CBSC Book Shop, 9585979752 Arraba Book Traders, (044) 25387686, 9841459105, M.R. Book Storer (044) 253845456, Polinimedi Storer (047) 78940414 Utimer Chercer 039107417 Par-linet
SURAT SURAT VADODARA ROHTAK REWARI BALLABGARH HISAR BHUNA BOKARO RANCHI DUMKA HUBLI BANGLORE BELLERI	Shopping Point, 9824108663 Umakant Book Sellers & Stationer, 6359396370 HARYANA Manish Traders, 9812556687, Swami Kitab Ghar, 9355611088, Babu Ram Pradeep Kumar, 9813214692 Sanjay book depot, 9255447231 Kashi Ram Kishan La, 9289504004, 8920567245 Natraj Book Distributors, 7988917452 Khurana Book Store, 9896572520 JAMMU Sahitya Sangam, 9419190177 JHARKHAND Bokaro Student Friends Pvt. Ltd. (0654) 2233094, 7360021503, Bharati Bhawan Agencies, 06542-265302, 9431740797 Crown Book Distributor & Publishers, (0651) 2213735, 9431173904, Pustak Mandir, 943111518, Vidyarthi Pustak Bhandar, 9431310228 KARNATAKA Renuka Book Distributor, (0836) 2244124, Vidyamandir Book Distributors, 9980773976 Krishna book house, 973947334, Hema Book Stores, 9986767000, Sapna Book House, 973947334, Hema Book Store, 9886767000,	FEROZPUR LUDHIANA CHANDIGARH AJMER KOTA BHILWARA BHILWARA BHIWADI JAIPUR UDAIPUR JODHPUR AGARTALA COIMBATORE CHENNAI	Cheap Book Store, 9872223458, 9878258592, City Book Shop, 9417440753, Subhash Book Depot, 9876453625, Paramvir Enterprises, 9878626248, Gaurav Book world, 9478021183 Sita Ram book Depot, 9463039199, 7696141911 Amit Book, 9815807871, Gupta Brothers, 9888200206, Bhatia Book Centre, 9815277131 Mohindra Book Depot, 9814920226 <b>RAJASTHAN</b> Laxmi General Store, Ajmer, 0145- 2428942 9460652197 Vardhman Book Depot, 9571365020, 8003221190 Raj Traders, 9309232829 Nakoda Book Depot, 9571365020, 8003221190 Raj Traders, 9309232829 Nakoda Book Depot, 9144707462 Ravi Enterprises, 9829060694, Saraswati Book House, (0141) 2610823, 9829811155, Goyal Book Distt, 946093393, 9414782130 Sunil Book Store, 9828682260 Second Hand Book Stall, 9460004745 <b>TRIPURA</b> BookS Cormer, 8794894165, 8984657146, Book Emporium, 9089230412 <b>TAMIL NADU</b> Majestic Book House, (0422) 2384333, CBSC Book Shop, 9585979752 Arraba Book Traders, (044) 25387868, 9841459105, M.R. Book Store (044) 25364596, Kalaimagal Store, (044) 5544072, 940619404, Vijaya Stores, 9381037417, Bookmark H-Books & Stat, Store, 730511563, M.K. Stores, 984003099, Ticar Books PM LIN
SURAT VADODARA ROHTAK REWARI BALLABGARH HISAR BHUNA BOKARO RANCHI DUMKA HUBLI BANGLORE BELLERI	Shopping Point, 9824108663 Umakant Book Sellers & Stationer, 6359396370 HARYANA Manish Tradeer, 9812556687, Swami Kitab Ghar, 9355611088, Babu Ram Pradeep Kumar, 9813214692 Sanjay book depot, 9255447231 Kashi Ram Kishan Ial, 9289504004, 8920567245 Natraj Book Distributors, 7988917452 Khurana Book Store, 9896572520 JAMMU Sahitya Sangam, 9419190177 JHARKHAND Bokaro Student Friends Pvt. Ltd. (0654) 2233094, 7360021503, Bharati Bhawan Agencies, 06542-265302, 9431740797 Crown Book Distributor & Publishers, (0651) 2213735, 9431173904, Pustak Mandir, 9431115138, Vidyarthi Pustak Bhandar, 9431310228 KARNATKAA Renuka Book Distributor, (0836) 2244124, Vidyamandir Book Distributors, 9980773976 Krishna book house Pvt. Ltd., 1980513242, Hema Book World, (Chamrajpet) (ISC) 080-40905110, 9945731121	FEROZPUR LUDHIANA CHANDIGARH AJMER KOTA BHILWARA BHILWARA BHIWADI JAIPUR UDAIPUR UDAIPUR JODHPUR AGARTALA COIMBATORE CHENNAI	Cheap Book Store, 9872223458, 9878258592, City Book Shop, 9417440753, Subhash Book Depot, 9876453625, Paramvir Enterprises, 9878626248, Gaurav Book world, 9478621183 Sita Ram book Depot, 9463039199, 7696141911 Amit Book, 9815807871, Gupta Brothers, 9888200206, Bhatia Book Centre, 9815277131 Mohindra Book Depot, 9814920226 <b>RAJASTHAN</b> Laxmi General Store, Ajmer, 0145- 2428942 9460652197 Vardhman Book Depot, 971365020, 8003221190 Raj Traders, 9309232829 Nakoda Book Depot, 01482) 243653, 9214983594, Alankar Book Depot, 91414707462 Ravi Enterprises, 9829060694, Saraswati Book House, (0141) 2610823, 9829811155, Goyal Book Distt, 946098393, 9414782130 Sunil Book Store, 9828682260 Second Hand Book Stall, 9460004745 <b>TRIPURA</b> BookS Corner, 8794894165, 8984657146, Book Emporium, 9089230412 <b>TAMIL NADU</b> Majestic Book House, (0422) 2384333, CBSC Book Shop, 9585979752 Arraba Book House, (0424) 25387686, 9841659105, M.R. Book Store, 0494 25364596, Kalaimagal Store, (044) 5544072, 940619404, Vijaya Stores, 9381037417, Bookmark It-Books & Stat Store, 7305115653, M.K. Stores, 9384033099, Tiger Books House, 1126, 1236
SURAT VADODARA ROHTAK REWARI BALLABGARH HISAR BHUNA BOKARO RANCHI DUMKA HUBLI BANGLORE BELLERI	Shopping Point, 9824108663 Umakant Book Sellers & Stationer, 6359396370 HARYANA Manish Tradeep, Vumar, 9813214692 Sanjay book depot, 9255447231 Kashi Ram Kishan Ial, 9289504004, 8920567245 Natraj Book Distributors, 7988917452 Khurana Book Store, 9896572520 JAMMU Sahitya Sangam, 9419190177 JHARKHAND Bokaro Student Friends Pvt. Ltd. (0654) 2233094, 7360021503, Bharati Bhawan Agencies, 06542-265302, 9431740797 Crowm Book Distributor & Publishers, (0651) 2213735, 9431173904, Pustak Mandir, 9431115138, Vidyarthi Pustak Bhandar, 9431310228 KARNATAKA Renuka Book Distributor, (0836) 2244124, Vidyamandir Book Distributors, 9980773976 Krishna book house, P.1390513242, Hema Book World, (Chamrajpet) (ISC) 080-40905110, 9945731121 KERALA	FEROZPUR LUDHIANA CHANDIGARH AJMER KOTA BHILWARA BHILWARA BHILWARA BHILWARA UDAIPUR JODHPUR AGARTALA COIMBATORE CHENNAI	Cheap Book Store, 9872223458, 9878258592, City Book Shop, 9417440753, Subhash Book Depot, 9876453625, Paramvir Enterprises, 9878626248, Gaurav Book world, 9478821183 Sita Ram book Depot, 9463039199, 7696141911 Amit Book, 9815807871, Gupta Brothers, 9888200206, Bhatia Book Centre, 9815277131 Mohindra Book Depot, 9814920226 <b>RAJASTHAN</b> Laxmi General Store, Ajmer, 0145- 2428942 9460652197 Vardhman Book Depot, 9571365020, 8003221190 Raj Traders, 9309232829 Nakoda Book Depot, 01482) 243653, 9214983594, Alankar Book Depot, 01482) 243653, 9214983594, Alankar Book Depot, 9414707462 Ravi Enterprises, 9829066064, Saraswati Book House, (0141) 2610823, 9829811155, Goyal Book Distt., 9460983939, 9414782130 Sumil Book Store, 982682260 Second Hand Book Stall, 9460004745 <b>TRIPURA</b> BookS Corner, 8794894165, 8984657146, Book Emporium, 9089230412 <b>TAMIL NADU</b> Majestic Book House, (042) 2384333, CBSC Book Shop, 9585979752 Arraba Book Traders, (044) 25387868, 9841459105, M.R. Book Store (044) 25384596, Kalaimagal Store, 7305151653, M.K. Stores, 938103717, Bookmark It-Books & Stat. Store, 7305151653, M.K. Stores, 9340030099, Tiger Books Pt. Ltd., 9710447000, New Mylai Stationers, 9841310562, Prince Book House, Chennai, (444-2053926, 923068491, S.K Publishers & Distributors, 9789865544, Dharma Pook Shon & 867272117
SURAT VADODARA ROHTAK REWARI BALLABGARH HISAR BHUNA BOKARO RANCHI DUMKA HUBLI BANGLORE BELLERI ERNAKULAM	Shopping Point, 9824108663 Umakant Book Sellers & Stationer, 6359396370 HARYANA Manish Tradeer, 9812556687, Swami Kitab Ghar, 9355611088, Babu Ram Pradeep Kumar, 9813214692 Sanjay book depot, 925547231 Kashi Ram Kishan Ial, 9289504004, 8920567245 Natraj Book Distributors, 7988917452 Khurana Book Store, 9896572520 JAMMU Sahitya Sangam, 9419190177 JHARKHAND Bokaro Student Friends Pvt. Ltd. (0654) 2233094, 7360021503, Bharati Bhawan Agencies, 06542-265302, 9431740797 Crown Book Distributor & Publishers, (0651) 2213735, 9431173904, Pustak Mandir, 943111518, Vidyarthi Pustak Bhandar, 9431310228 KARNATAKA Kenuka Book Distributor, (0836) 2244124, Vidyamandir Book Distributors, 9980773976 Krishna book house, 9739847334, Hema Book Stores, 9986767000, Sapna Book World, (Chamrajpet) (ISC) 080-40905110, 945731121 KERALA Academic Book House, (0484) 2376613, H & C Store, 9864196344.	FEROZPUR LUDHIANA CHANDIGARH AJMER KOTA BHILWARA BHILWARA BHILWARA BHILWARA JAIPUR UDAIPUR JODHPUR AGARTALA COIMBATORE CHENNAI	Cheap Book Store, 9872223458, 9878258592, City Book Shop, 9417440753, Subhash Book Depot, 9876453625, Paramvir Enterprises, 9878626248, Gaurav Book world, 9478021183 Sita Ram book Depot, 9463039199, 7696141911 Amit Book, 9815807871, Gupta Brothers, 9888200206, Bhatia Book Centre, 9815277131 Mohindra Book Depot, 9814920226 <b>RAASTHAN</b> Laxmi General Store, Ajmer, 0145- 2428942 9460652197 Vardhman Book Depot, 9571365020, 8003221190 Raj Traders, 9309232829 Nakoda Book Depot, 01482) 243653, 9214983594, Alankar Book Depot, 01482) 243653, 9214983594, Alankar Book Depot, 9414707462 Ravi Enterprises, 9829060694, Saraswati Book House, (0141) 2610823, 9829811155, Goyal Book Distt., 9460983939, 9414782130 Sunil Book Store, 9828682260 Second Hand Book Stall, 9460004745 <b>TRIPURA</b> BookS Comer, 8794894165, 8984657146, Book Emporium, 9089230412 <b>TAMIL NADU</b> Majestic Book House, (042) 2387886, 9841459105, M.R. Book Store (044) 25364596, Kalaimagal Store, (044) 5543072, 940619404, Vijaya Stores, 9381037417, Bookmark It-Books K Stat Store, 7305151653, M.K. Stores, 9840030099, Tiger Books Pvt. Ltd., 9710447000, New Mylai Stationers, 9841313062, Prince Book House, Chennai, 0444-203326, 9952068491, S. K Publishers & Distributors, 9789865544, Dharma Book Shop, 866721711
SURAT SURAT VADODARA ROHTAK REWARI BALLABGARH HISAR BHUNA BOKARO RANCHI DUMKA HUBLI BANGLORE BELLERI ERNAKULAM	Shopping Point, 9824108663 Umakant Book Sellers & Stationer, 6359396370 HARYANA Manish Traders, 9812556687, Swami Kitab Ghar, 9355611088, Babu Ram Pradeep Kumar, 9813214692 Sanjay book depot, 9255447231 Kashi Ram Kishan La, 2928504004, 8920567245 Natraj Book Distributors, 7988917452 Khurana Book Store, 9896572520 JAMMU Sahitya Sangam, 9419190177 JHARKHAND Bokaro Student Friends Pvt. Ltd. (0654) 2233094, 7360021503, Bharati Bhawan Agencies, 06542-265302, 9431740797 Crown Book Distributor & Publishers, (0651) 2213735, 9431173904, Pustak Mandir, 943111518, Vidyarthi Pustak Bhandar, 9431310228 KARNATAKA Renuka Book Distributor, (0836) 2244124, Vidyamandir Book Distributors, 9980773976 Krishna book house, 9739847334, Hema Book Stores, 9986767000, Sapna Book House, 941742/17, 9847238314, Asad Book Centere	FEROZPUR LUDHIANA CHANDIGARH AJMER KOTA BHILWARA BHILWARA BHIWADI JAIPUR UDAIPUR JODHPUR AGARTALA COIMBATORE CHENNAI	Cheap Book Store, 9872223458, 9878258592, City Book Shop, 9417440753, Subhash Book Depot, 9876453625, Paramvir Enterprises, 9878626248, Gaurav Book world, 9478021183 Sita Ram book Depot, 9463039199, 7696141911 Amit Book, 9815807871, Gupta Brothers, 9888200206, Bhatia Book Centre, 9815277131 Mohindra Book Depot, 9814920226 <b>RAJASTHAN</b> Laxmi General Store, Ajmer, 0145- 2428942, 9460652197 Vardhman Book Depot, 9571365020, 8003221190 Raj Traders, 9309232829 Nakoda Book Depot, 90145- 2428942, 9460652197 Vardhman Book Depot, 9571365020, 8003221190 Raj Traders, 9309232829 Nakoda Book Depot, 91414707462 Ravi Enterprises, 9829060694, Saraswati Book House, (0141) 2610823, 9829811155, Goyal Book Distt, 946093393, 9414782130 Sunil Book Store, 9828682260 Second Hand Book Stall, 9460004745 <b>TRIPURA</b> BookS Comer, 8794894165, 8984657146, Book Emporium, 9089230412 <b>TAMIL NADU</b> Majestic Book House, (0422) 2384333, CBSC Book Shop, 9585979752 Arraba Book Traders, (044) 25387868, 9841459105, M.R. Book Store (044) 25364596, Kalaimagal Store, (044) 5534072, 9940619404, Vijaya Stores, 9381037417, Bookmark It-Books, 82:45, 059206891, 5 K Publishers & Distributors, 9789865544, Dharma Book Shop, 866722171 Sri Lakshmi Book Stell, 7871555145
SURAT VADODARA ROHTAK REWARI BALLABGARH HISAR BHUNA BOKARO RANCHI DUMKA HUBLI BANGLORE BELLERI ERNAKULAM KOTTAYAM	Shopping Point, 9824108663 Umakant Book Sellers & Stationer, 6359396370 HARYANA Manish Tradeer, 9812556687, Swami Kitab Ghar, 9355611088, Babu Ram Pradeep Kumar, 9813214692 Sanjay book depot, 9255447231 Kashi Ram Kishan Ial, 9289504004, 8920567245 Natraj Book Distributors, 7988917452 Khurana Book Store, 9896572520 JAMMU Sahitya Sangam, 9419190177 JHARKHAND Bokaro Student Friends Pvt. Ltd. (0654) 2233094, 7360021503, Bharati Bhawan Agencies, 06542-265302, 9431740797 Crown Book Distributor & Publishers, (0651) 2213735, 9431173904, Pustak Mandir, 9431115138, Vidyarthi Pustak Bhandar, 9431310228 KaRNATAKA Renuka Book Distributor, (0836) 2244124, Vidyamandir Book Distributors, 9980773976 Krishna book house, 9739847334, Hema Book Stores, 9986767000, Sapna Book House, 9047192471, 9980513242, Hema Book World, (Chamrajpet) (ISC) 080-40905110, 9945731121 KERALA Academic Book House, (0494) 2376613, H & C Store, 9664196344, Suya Book House, 9471427, 984723814, Asad Book Centere Book Centre, (0481) 2566992	FEROZPUR LUDHIANA CHANDIGARH AJMER KOTA BHILWARA BHILWARA BHIWADI JAIPUR UDAIPUR UDAIPUR JODHPUR AGARTALA COIMBATORE CHENNAI	Cheap Book Store, 9872223458, 9878258592, City Book Shop, 9417440753, Subhash Book Depot, 9876453625, Paramvir Enterprises, 9878626248, Gaurav Book world, 9478621183 Sita Ram book Depot, 9463039199, 7696141911 Amit Book, 9815807871, Gupta Brothers, 9888200206, Bhatia Book Centre, 9815277131 Mohindra Book Depot, 9814920226 <b>RAJASTHAN</b> Laxmi General Store, Ajmer, 0145- 2428942 9460652197 Vardhman Book Depot, 9571365020, 8003221190 Raj Traders, 9309232829 Nakoda Book Depot, 9571365020, 8003221190 Raj Traders, 9309232829 Nakoda Book Depot, 9144707462 Ravi Enterprises, 9829060694, Saraswati Book House, (0141) 2610823, 9829811155, Goyal Book Distt, 946093393, 9414782130 Sunil Book Store, 9828682260 Second Hand Book Stall, 9460004745 <b>TRIPURA</b> BookS Corner, 8794894165, 8984657146, Book Emporium, 9089230412 <b>TAMIL NADU</b> Majestic Book House, (0422) 2384333, CBSC Book Shop, 9585979752 Arraba Book Traders, (044) 25387668, 9841459105, M.R. Book Store, 0441 25364596, Kalaimagal Store, 0449 15544072, 9940619404, Vijaya Stores, 9381037417, Bookmark It-Books & Stat. Store, 7305151653, M.K. Stores, 9840030099, Tiger Books Pvt. Ltd., 9710447000, New Mylai Stationers, 9041313062, Prince Book House, Chennai, 0444-2053926, 9925068491, S.K Publishers & Distributors, 9789865544, Dharma Book Shog, 8667227171 Sri Lakshmi Book Steller, 7871555145 Pattu book center, 9894816280, Selem Book House, 9487724584
SURAT VADODARA ROHTAK REWARI BALLABGARH HISAR BHUNA BOKARO RANCHI DUMKA HUBLI BANGLORE BELLERI ERNAKULAM KOTTAYAM TRIVANDRUM CALICUT	Shopping Point, 9824108663 Umakant Book Sellers & Stationer, 6359396370 HARYANA Manish Traders, 9812556687, Swami Kitab Ghar, 9355611088, Babu Ram Pradeep Kumar, 9813214692 Sanjay book depot, 9255447231 Kashi Ram Kishan Ial, 9289504004, 8920567245 Natraj Book Distributors, 7988917452 Khurana Book Store, 9896572520 JAMMU Sahitya Sangam, 9419190177 JHARKHAND Bokaro Student Friends Pvt. Ltd. (0654) 2233094, 7360021503, Bharati Bhawan Agencies, 06542-265302, 9431740797 Crowm Book Distributor & Publishers, (0651) 2213735, 9431173904, Pustak Mandir, 9431115138, Vidyarthi Pustak Bhandar, 9431310228 KARNATAKA Renuka Book Distributor, (0836) 2244124, Vidyamandir Book Distributors, 9980773976 Krishna book house, 9739847334, Hema Book Stores, 9986767000, Sapna Book House Pvt. Ltd., 1990513242, Hema Book World, (Chamrajpet) (ISC) 080-40905110, 9945731121 KERALA Academic Book House, (044) 2376613, H & C Store 9864196344, Surya Book House, (0441) 2376613, H & C Store 9864196344, Surya Book House, (0441) 2376613, H & C Store 9864196344, Surya Book House, (0411) 2566992 Academic Book House, (0411) 233349, 9447063349, Ponni Book Stall, 9037591721 Aman Book Stall. (0491) 2571182	FEROZPUR LUDHIANA CHANDIGARH AJMER KOTA BHILWARA BHILWARA BHILWARA BHILWARA BHILWARA UDAIPUR JODHPUR AGARTALA COIMBATORE CHENNAI PUDUCHERRY SALEM TRICHY THENI	Cheap Book Store, 9872223458, 9878258592, City Book Shop, 9417440753, Subhash Book Depot, 9976453625, Paramvir Enterprises, 9878626248, Gaurav Book world, 94786453625, Paramvir Enterprises, 9878626248, Gaurav Book Depot, 9463039199, 7696141911 Amit Book, 9815807871, Gupta Brothers, 9888200206, Bhatia Book Centre, 9815277131 Mohindra Book Depot, 9814920226 <b>RAJASTHAN</b> Laxmi General Store, Ajmer, 0145- 2428942 9460652197 Vardhman Book Depot, 01482) 243653, 9214983594, Alankar Book Depot, 9414707462 Ravi Enterprises, 9829066064, Saraswati Book House, (0141) 2610823, 9829811155, Goyal Book Distt., 9460983939, 9414782130 Sunil Book Store, 9826862260 Second Hand Book Stall, 9460004745 <b>TRIPURA</b> BookS Cormer, 8794894165, 8984657146, Book Emporium, 9089230412 <b>TAMIL NADU</b> Majestic Book House, (042) 2384333, CBSC Book Shop, 9585979752 Arraba Book Traders, (044) 25387868, 9841459105, M.R. Book Store (044) 25387864, 984030099, Tiger Books Pt. Ltd., 9710447000, New Myiai Stationers, 984131052, Prince Book House, Chennai, 0444-2053926, 9952068491, S K Publishers & Distributors, 9789865544, Dharma Book Shop, 8667227171 Sri Lakshmi Book Seller, 7871555145 Pattu book centre, 9894816280, Selem Book House, 9487724584 P.R.Sons Book Seller, 740370597, Rasi Publication, 9894816280
KATAYAA SURAT VADODARA ROHTAK REWARI BALLABGARH HISAR BHUNA BOKARO RANCHI DUMKA HUBLI BANGLORE BELLERI ERNAKULAM KOTTAYAM TRIVANDRUM CALICUT	Shopping Point, 9824108663 Umakant Book Sellers & Stationer, 6359396370 HARYANA Manish Tradeers, 9812556687, Swami Kitab Ghar, 9355611088, Babu Ram Pradeep Kumar, 9813214692 Sanjay book depot, 9255447231 Kashi Ram Kishan Ial, 9289504004, 8920567245 Natraj Book Distributors, 7988917452 Khurana Book Store, 9896572520 JAMMU Sahitya Sangam, 9419190177 JHARKHAND Bokaro Student Friends Pvr. Ltd. (0654) 2233094, 7360021503, Bharati Bhawan Agencies, 06542-265302, 9431740797 Crown Book Distributor & Publishers, (0651) 2213735, 9431173904, Pustak Mandir, 9431115138, Vidyarthi Pustak Bhandar, 9431310228 KARNATAKA Renuka Book Distributor, (0836) 2244124, Vidyamandir Book Distributors, 9980773976 Krishna book house, 9739847334, Hema Book Stores, 9986767000, Sapna Book House Pvt. Ltd., 198051324 Hema Book World, (Chamrajpet) (ISC) 080-40905110, 9945731121 KERALA Academic Book House, (048) 2376613, H & C Store, 9864196344, Suya Book House, (048) 2376613, H & C Store, 9864196344, Suya Book House, (048) 2376613, H & C Store, 9864196344, Suya Book House, (048) 2376613, H & C Store, 9864196344, Suya Book House, (048) 2376613, H & C Store, 9864196344, Suya Book House, (048) 225692 Academic Book House, (0471) 2333349, 9447063349, Ponni Book Stall, 9037591721 Aman Book Stall, (0495) 2721282,	FEROZPUR LUDHIANA CHANDIGARH AJMER KOTA BHILWARA BHILWARA BHILWARA BHILWARA UDAIPUR UDAIPUR JODHPUR AGARTALA COIMBATORE CHENNAI	Cheap Book Store, 9872223458, 9878258592, City Book Shop, 9417440753, Subhash Book Depot, 9876453625, Paramvir Enterprises, 9878626248, Gaurav Book world, 9478621183 Sita Ram book Depot, 9463039199, 7696141911 Amit Book, 9815807871, Gupta Brothers, 9888200206, Bhatia Book Centre, 9815277131 Mohindra Book Depot, 9814920226 <b>RAJASTHAN</b> Laxmi General Store, Ajmer, 0145- 2428942, 9460652197 Vardhman Book Depot, 01482, 243653, 9214983594, Alankar Book Depot, 01482, 243653, 9214983594, Alankar Book Depot, 01482) 243653, 9214983594, Alankar Book Depot, 9414707462 Ravi Enterprises, 9829060694, Saraswati Book House, (0141) 2610823, 9829811155, Goyal Book Distt., 946098339, 9414782130 Sunil Book Store, 9828682260 Second Hand Book Stall, 9460004745 <b>TRIPURA</b> BookS Cormer, 8794894165, 8984657146, Book Emporium, 9089230412 <b>TAMIL NADU</b> Majestic Book House, (044) 25387868, 9841459105, M.R. Book Store (044) 25364596, Kalaimagal Store, (044) 554072, 9940619404, Vijaya Stores, 983037417, Bookmark It-Books & Stat. Store, 77305151653, M.K. Stores, 9840030099, Tiger Books Pvt. Ltd., 9710447000, New Myial Stationers, 9841313062, Prince Book House, Chennai, 0444-205326, 9952068491, S.K. Polishers & Distributors, 9789865544, Dharma Book Shop, 8667221711 Sri Lakshmi Book Seller, 7871555145 Pattu book centre, 9844816280, Selem Book House, 9487724584 P.R.Sons Book Seller, 9443370597, Rasi Publication, 9894816280 Maya Book Centre, 9443370597, Rasi Publication, 9894816280 Maya Book Centre, 9443929274
SURAT SURAT VADODARA ROHTAK REWARI BALLABGARH HISAR BHUNA BOKARO RANCHI DUMKA HUBLI BANGLORE BELLERI ERNAKULAM KOTTAYAM TRIVANDRUM CALICUT	Shoppin Point, 9824108663 Umakant Book Sellers & Stationer, 6359396370 HARYANA Manish Tradeer, 9812556687, Swami Kitab Ghar, 9355611088, Babu Ram Pradeep Kumar, 9813214692 Sanjay book depot, 9255447231 Kashi Ram Kishan Ial, 9289504004, 8920567245 Natraj Book Distributors, 7988917452 Khurana Book Store, 9896572520 JAMMU Sahitya Sangam, 9419190177 JHARKHAND Bokaro Student Friends Pvt. Ltd. (0654) 2233094, 7360021503, Bharati Bhawan Agencies, 06542-265302, 9431740797 Crown Book Distributor & Publishers, (0651) 2213735, 9431173904, Pustak Mandir, 9431115138, Vidyarthi Pustak Bhandar, 9431310228 KARNATAKA Renuka Book Distributor, (0836) 2244124, Vidyamandir Book Distributors, 9980773976 Krishna book house, 973947334, Hema Book Stores, 9986767000, Sapna Book House, Pvt. Ltd., 9980513242. Hema Book World, (Chamrajpet) (ISC) 080-40905110, 9945731121 KERALA Academic Book House, 0484) 2376613, H & C Store 9861496344, Suya Book House, 9847124217, 9847238314, Asad Book Centere Book Centre, (0481) 2356699 Academic Book House, 1749417, 233349, 9447063349, Ponni Book Stall, 9037591721 Aman Book Stall, (0495) 2721282, MDDHYA PRADESH Pustak Bhawa (F.& C) 8882150100	FEROZPUR LUDHIANA CHANDIGARH AJMER KOTA BHILWARA BHILWARA BHIWADI JAIPUR UDAIPUR JODHPUR AGARTALA COIMBATORE CHENNAI PUDUCHERRY SALEM TRICHY THENI MADURAI	Cheap Book Store, 9872223458, 9878258592, City Book Shop, 9417440753, Subhash Book Depot, 9876453625, Paramvir Enterprises, 9878626248, Gaurav Book world, 9478021183 Sita Ram book Depot, 9463039199, 7696141911 Amit Book, 9815807871, Gupta Brothers, 9888200206, Bhatia Book Centre, 9815277131 Mohindra Book Depot, 9814920226 <b>RAJASTHAN</b> Laxmi General Store, Ajmer, 0145- 2428942, 9460652197 Vardhman Book Depot, 9571365020, 8003221190 Raj Traders, 9309232829 Nakoda Book Depot, 01482) 243653, 9214983594, Alankar Book Depot, 91414707462 Ravi Enterprises, 9829060694, Saraswati Book House, (0141) 2610823, 9829811155, Goyal Book Distt, 946093393, 9414782130 Sunil Book Store, 9828682260 Second Hand Book Stall, 9460004745 <b>TRIPURA</b> BookS Cormer, 8794894165, 8984657146, Book Emporium, 9089230412 <b>TAMIL NADU</b> Majestic Book House, (0422) 2384333, CBSC Book Shop, 9585979752 Arraba Book Traders, (044) 25387868, 9841459105, M.R. Book Store (044) 25364596, Kalaimagal Store, (044) 25387868, 9841459105, M.R. Book Store (044) 25364596, Kalaimagal Store, 0443 5544072, 9940619404, Vijaya Stores, 9381037417, Bookmark 11-Books, Stat. Store, 730511563, M.K. Stores, 984030099, Tiger Book Short, L 9710447000, New Mylai Stationers, 9841313062, Prince Book House, Chennai, 0444-205326, 9952068491, S.K Publishers & Distributors, 9789865544, Dharma Book Shop, 8667221711 Sri Laskmi Book Seller, 787155145 Pattu book centre, 984316280, Selem Book House, 9487724584 PA:Sons Book Seller, 9443370597, Rasi Publication, 9894816280 Maya Book Centre, 943929274 Selvi Book Shoppe, 9843370597, Jayam Book Centre, 9894658036 G & book creater and collections 984517294
SURAT VADODARA ROHTAK REWARI BALLABGARH HISAR BHUNA BOKARO RANCHI DUMKA HUBLI BANGLORE BELLERI ERNAKULAM KOTTAYAM TRIVANDRUM CALICUT CHHINDWARA	Shopping Point, 9824108663 Umakant Book Sellers & Stationer, 6359396370 HARYANA Manish Tradeers, 9812556687, Swami Kitab Ghar, 9355611088, Babu Ram Pradeep Kumar, 9813214692 Sanjay book depot, 9255447231 Kashi Ram Kishan Ial, 9289504004, 8920567245 Natraj Book Distributors, 7988917452 Khurana Book Store, 9896572520 JAMMU Sahitya Sangam, 9419190177 JHARKHAND Bokaro Student Friends Pvt. Ltd. (0654) 2233094, 7360021503, Bharati Bhawan Agencies, 06542-265302, 9431740797 Crown Book Distributor & Publishers, (0651) 2213735, 9431173904, Pustak Mandir, 9431115138, Vidyarthi Pustak Bhandar, 9431310228 KaRNATAKA Renuka Book Distributor, (0836) 2244124, Vidyamandir Book Distributors, 9980773976 Krishna book house, 9739847334, Hema Book Stores, 9986767000, Sapna Book House, 9471247, 9980513242, Hema Book World, (Chamrajpet) (ISC) 080-40905110, 9945731121 KERALA Academic Book House, (0494) 2376613, H & C Store, 9864196344, Suya Book House, 9471247, 984723814, Asad Book Centere Book Centre, (0481) 2566992 Academic Book House, (0471) 233349, 9447063349, Ponni Book Stall, 9037591721 Aman Book Stall, (0495) 2212182, MADHYA PRADESH Pustak Bhawan, (E & C), 8982150100	FEROZPUR LUDHIANA CHANDIGARH AJMER KOTA BHILWARA BHILWARA BHIWADI JAIPUR UDAIPUR JODHPUR AGARTALA COIMBATORE CHENNAI PUDUCHERRY SALEM TRICHY THENI MADURAI VELLORE	Cheap Book Store, 9872223458, 9878258592, City Book Shop, 9417440753, Subhash Book Depot, 9876453625, Paramvir Enterprises, 9878626248, Gaurav Book world, 9478621183 Sita Ram book Depot, 9463039199, 7696141911 Amit Book, 9815807871, Gupta Brothers, 9888200206, Bhatia Book Centre, 9915277131 Mohindra Book Depot, 9814920226 <b>RAJASTHAN</b> Laxmi General Store, Ajmer, 0145- 2428942 9460652197 Vardhman Book Depot, 9571365020, 8003221190 Raj Traders, 9309232829 Nakoda Book Depot, 01482) 243653, 9214983594, Alankar Book Depot, 91414707462 Ravi Enterprises, 9829060694, Saraswati Book House, (0141) 2610823, 9829811155, Goyal Book Distt, 946098399, 9414782130 Sunil Book Store, 9828682260 Second Hand Book Stall, 9460004745 <b>TRIPURA</b> BookS Cormer, 8794894165, 8984657146, Book Emporium, 9089230412 <b>TAMIL NADU</b> Majestic Book House, (0422) 2384333, CBSC Book Shop, 9585979752 Arraba Book Tarders, (044) 25387868, 981459105, M.R. Book Store (044) 25364596, Kalaimagal Store, (044) 5544072, 9940619404, Vijaya Stores, 9381037417, Bookmark Ir-Books, 82: Store, 730511563, M.K. Stores, 984003099, Tiger Books Pvt. Ltd., 9710447000, New Mylai Stationers, 9841359105, M.R. Book Shore (044) 25364596, Kalaimagal Store, (044) 5554072, 9840619404, Vijaya Stores, 9381037417, Bookmark Ir-Books, 82: Store, 730511563, M.K. Stores, 984003099, Tiger Books Pvt. Ltd., 9710447000, New Mylai Stationers, 9841313062, Prince Book House, Chennai, 0444-203926, 9952068491, 5 K Publishers & Distributors, 9789865544, Dharma Book Shop, 8667227171 Sri Lakshmi Book Seller, 7871555145 Pattu book centre, 94433029274 Selvi Book Shoppe, 9843057435, Jayam Book Centre, 9894615800 Maya Book Centre, 94433029274 Selvi Book Shoppe, 9843057435, Jayam Book Centre, 984816280 Maya Book Centre and collections, 9894517994

## **Exclusive School Books Suppliers**

	TELANGANA	NAJIBABAD	Gupta News Agency, 8868932500, Gupta News Agency, ( E & C ), 8868932500
HYDERABAD	Sri Balaji Book Depot, (040) 27613300, 9866355473, Shah Book House, 9849564564	DHAMPUR	Ramkumar Mahaveer Prasad, 9411942550
	Vishal Book Distributors, 9246333166, Himalaya Book World, 7032578527	GORAKHPUR	Central Book House, 9935454590, Friends & Co., 9450277154, Dinesh book depot, 9125818274, Friends & Co., 9450277154, Dwivedi Brothers, 8299684731
	UTTARAKHAND	JHANSI	Bhanu Book Depot, 9415031340
DEHRADUN	Inder Book Agencies, 9634045280, Amar Book Depot, 8130491477, Goyal Book Store, 9897318047, New National Book House, 9897830283/9720590054	KANPUR	Radha News Agency, 8957247427, Raj Book Dist., 9235616506, H K Book Distributors, 9506033137/9935146730
MUSSORIE	Ram Saran Dass Chanda kiran, 0135-2632785, 9761344588	LUCKNOW	Vyapar Sadan, 7607102462, Om Book Depot, 7705871398, Azad Book Depot Pvt. Ltd., 7317000250, Book Sadan, 9839487327, Rama Book Depot(Retail), 7355078254,
	UTTAR PRADESH		Ashirwad Book Depot, 9235501197, Book.com, 7458922755, Universal Books, 9450302161, Sheetla Book Agency, 9235832418, Vidyarthi Kendra Publisher &
AGRA	Sparsh Book Agency, 9412257817, Om Pustak Mandir, (0562) 2464014, 9319117771,		Distributor Pvt Ltd, (Gold), 9554967415, Tripathi Book House, 9415425943, Navyoug
	Sanjay Publication, 8126699922 Arti book centre, 8630128856, Panchsheel Books, 9412257962, Bhagwati Book Store, (E & C), 9149081912	MEERUT	Ideal Book Depot, (0121) 4059252, 9837066307
ALLAHABAD	Mehrotra Book Agency, (0532) 2266865, 9415636890	NOIDA	Prozo (Global Edu4 Share Pvt. Ltd), 9318395520, Goyal Books Overseas Pvt.Ltd., 1204655555 9873387003
AZAMGARH	Sasta Sahitya Bhandar, 9450029674	PRAYAGRAJ	Kanhaiya Pustak Bhawan, 9415317109
ALIGARH	K.B.C.L. Agarwal, 9897124960, Shaligram Agencies, 9412317800,	MAWANA	Subhash Book Depot, 9760262264
	New Vimal Books, 9997398868, T.I.C Book centre, 9808039570	RENUKOOT	Om Stationers, 7007326732
BULANDSHAHAR	Rastogi Book Depot, 9837053462/9368978202	SHAHJAHANPUR	New Rastogi Book Seller, 9935395062
BALRAMPUR	Universal Book Center, 8933826726		WEST BENGAL
BAREILLY	Siksha Prakashan, 9837829284, Deepak Book Depot 9837027416	KOLKATA	Oriental Publishers & Distributor (033) 40628367, Katha 'O' Kahini, (033) 22196313, 22419071, Saha Book House, (033), 22193671, 9333416484,
HARDOI	Mittal Pustak Kendra, 9838201466		United Book House, 9831344622, Bijay Pustak Bhandar, 8961260603, Shawan Books Distributors, 8336820363, Krishna Book House, 9123083874
DEORIA	Kanodia Book Depot, 9415277835	COOCH BEHAR	S.B. Book Distributor, Cooch behar, 9002670771
VARANASI	Gupta Books, 8707225564, Bookman & Company, 9935194495/7668899901	KHARAGPUR	Subhani Book Store, 9046891334
MATHURA	Sapra Traders, 9410076716, Vijay Book House , 9897254292	SILIGURI	Agarwal Book House, 9832038727, Modern Book Agency, 8145578772
FARRUKHABAD	Anurag Book Agencies, 8844007575	DINAJPUR	Krishna Book House, 9434394212
		MURSHIDABAD	New Book House, 8944876176, 9434013126

### **Entrance & Competition Distributors**

	BIHAR	СИТТАК	A.K.Mishra Agencies, 9437025991
PATNA	Metro Books Corner, 9431647013, Alka Book Agency, 9835655005, Vikas Book Depot, 9504780402, Ishu Pustak Bhandar, 9334186300, 8294576789	BHUBANESH- WAR	M/s Pragnya, 9437943777
	CHATTISGARH		PUNJAB
KORBA	Kitab Ghar, 9425226528,	JALANDHAR	Cheap Book Store, 9872223458, 9878258592
RAIPUR	Shri Ramdev Traders, 9981761797		RAJASTHAN
	DELHI	КОТА	Vardhman Book Depot, 9571365020, Raj Traders, 9309232829
DELHI	Singhania Book & Stationer, 9212028238, Radhey Book depot, 9818314141, The Book Shop, 9310262701, Mittal Books, 9899037390, Lov Dev & Sons, 9999353491	JAIPUR	Goyal Book Distributors, 9414782130
NEW DELHI	Anupam Sales, 9560504617, A ONE BOOKS, 8800497047		UTTAR PRADESH
	HARYANA	AGRA	BHAGWATI BOOK STORE, 9149081912, Sparsh Book Agency, 9412257817, Sanjay Publication, 8126699922
AMBALA	Bharat Book Depot, 7988455354	ALIGARH	New Vimal Books, 9997398868
	JHARKHAND	ALLAHABAD	Mehrotra Book Agency, (532) 2266865, 9415636890
BOKARO	Bokaro Student Friends Pvt. Ltd, 7360021503	GORAKHPUR	Central Book House, 9935454590
	MADHYA PRADESH	KANPUR	Raj Book Dist, 9235616506
INDORE	Bhaiya Industries, 9109120101	LUCKNOW	H K Book Distributors (E & C) Azad Book Depot PVT LTD, 7317000250, Rama Book Depot(Retail), 7355078254 Ashirwad Book Depot , 9235501197, Book Sadan, 8318643277,
CHHINDWARA	Pustak Bhawan, 9827255997		Book.com , 7458922755, Sheetla Book Agency, 9235832418
	MAHARASHTRA	NAJIBABAD	Gupta News Agency, ( E & C ), 8868932500
NAGPUR	Laxmi Pustakalay and Stationers, (0712) 2727354	PRAYAGRAJ	Format Center, 9335115561, Garg Brothers Trading & Services Pvt. Ltd., 7388100499
PUNE	Pragati Book Centre, 9850039311		UTTARAKHAND
MUMBAI	New Student Agencies LLP, 7045065799	DEHRADUN	Inder Book Agancies, 9634045280
	ODISHA		WEST BENGAL
BARIPADA	Trimurti Book World, 9437034735	KOLKATA	Bijay Pustak Bhandar Pvt. Ltd., 8961260603, Saha Book House, 9674827254 United Book House, 9831344622, Techno World, 9830168159

## CBSE EXAMINATION PAPER-2024 Mathematics (Standard) Class-10<sup>th</sup> (Solved) (Delhi & Outside Delhi Sets)

#### Time : 3 Hours

#### Max. Marks: 80

#### **General Instructions:**

Read the following instructions carefully and follow them:

- (i) This question paper contains 38 questions. All questions are compulsory.
- (ii) This question paper is divided into FIVE sections A, B, C, D and E.
- (iii) In Section A, Question numbers 1 to 18 are multiple choice questions (MCQs) and question numbers 19 and 20 are Assertion Reason based questions of 1 mark each.
- (iv) In Section B, Question numbers 21 to 25 are very short answer (VSA) type questions, carrying 2 marks each.
- (v) In Section C, Question numbers 26 to 31 are short answer (SA) type questions, carrying 3 marks each.
- (vi) In Section D, Question numbers 32 to 35 are long answer (LA) type questions, carrying 5 marks each.
- (vii) In Section E, Question numbers 36 to 38 are case-study based integrated questions carrying 4 marks each. Internal choice is provided in 2 marks question in each case-study.
- (viii) There is no overall choice. However, an internal choice has been provided in 2 questions in Section *B*, 2 questions in Section *C*, 2 questions in Section *D* and 3 questions of 2 marks in Section *E*.
- (ix) Draw neat diagrams wherever required. Take  $\pi = \frac{22}{7}$  wherever required, if not stated.

(x) Use of calculators is NOT allowed.

#### Delhi Set-1

#### SECTION - A

This section consists of 20 questions of 1 mark each.

- **1.** If the sum of zeroes of the polynomial  $2x^2 k\sqrt{2x} + 1$  is  $\sqrt{2}$ , then value of *k* is:
  - (A)  $\sqrt{2}$  (B) 2

(C) 
$$2\sqrt{2}$$
 (D)  $\frac{1}{2}$ 

**2.** If the probability of a player winning a game is 0.79, then the probability of his losing the same game is:

(A) 1.79	<b>(B)</b> 0.31
<b>(C)</b> 0.21%	<b>(D)</b> 0.21

**3.** If the roots of equation  $ax^2 + bx + c = 0$ ,  $a \neq 0$  are real and equal, then which of the following relation is true?

(A) 
$$a = \frac{b^2}{c}$$
 (B)  $b^2 = ac$   
(C)  $ac = \frac{b^2}{4}$  (D)  $c = \frac{b^2}{a}$ 

**4.** In an A.P., if the first term a = 7, *n*th term  $a_n = 84$  and the sum of first *n* terms  $S_n = \frac{2093}{2}$ , then *n* is equal

(A) 22	<b>(B)</b> 24
(C) 23	<b>(D)</b> 26

- **5.** If two positive integers *p* and *q* can be expressed as  $p = 18 a^2 b^4$  and  $q = 20 a^3 b^2$ , where *a* and *b* are prime numbers, then LCM(*p*, *q*) is:
  - (A)  $2 a^2 b^2$  (B)  $180 a^2 b^2$ (C)  $12 a^2 b^2$  (D)  $180 a^3 b^4$
- **6.** AD is a median of △ABC with vertices A(5, –6), B(6, 4) and C(0, 0). Length AD is equal to:
  - (A)  $\sqrt{68}$  units (B)  $2\sqrt{15}$  units
  - (C)  $\sqrt{101}$  units (D) 10 units
- 7. If  $\sec \theta \tan \theta = m$ , then the value of  $\sec \theta + \tan \theta$  is:

(A) 
$$1 - \frac{1}{m}$$
 (B)  $m^2 - 1$   
(C)  $\frac{1}{m}$  (D)  $-m$ 

**8.** From the data 1, 4, 7, 9, 16, 21, 25 if all the even numbers are removed, then the probability of getting at random a prime number from the remaining is:

(A)	$\frac{2}{5}$	(B)	$\frac{1}{5}$
-----	---------------	-----	---------------

(C)  $\frac{1}{7}$  (D)  $\frac{2}{7}$ 

30/1/1

**9.** From some data  $x_1, x_2, \dots, x_n$  with respective frequencies  $f_1, f_2, \dots, f_n$  the value of  $\sum_{i=1}^{n} f_i(x_i - \overline{x})$  is

equal to:

(A) $n\overline{x}$	<b>(B)</b> 1
(C) $\Sigma f_i$	<b>(D)</b> 0

**10.** The zeroes of a polynomial  $x^2 + px + q$  are twice the zeroes of the polynomial  $4x^2 - 5x - 6$ . The value of *p* is:

(A) $-\frac{5}{2}$	<b>(B)</b> $\frac{5}{2}$
(C) –5	<b>(D)</b> 10

**11.** If the distance between the points (3, −5) and (*x*, −5) is 15 units, then the values of *x* are:

**12.** If 
$$\cos(\alpha + \beta) = 0$$
, then value of  $\cos\left(\frac{\alpha + \beta}{2}\right)$  is equal

to:

(A) $\frac{1}{\sqrt{2}}$	<b>(B)</b> $\frac{1}{2}$
<b>(C)</b> 0	(D) $\sqrt{2}$

**13.** A solid sphere is cut into two hemispheres. The ratio of the surface areas of sphere to that of two hemispheres taken together, is:

<b>(A)</b> 1 : 1	<b>(B)</b> 1:4
(C) 2:3	<b>(D)</b> 3 : 2

**14.** The middle most observation of every data arranged in order is called:

(A) mode	( <b>B</b> ) median
(C) mean	(D) deviation

**15.** The volume of the largest right circular cone that can be carved out from a solid cube of edge 2 cm is:

(A) 
$$\frac{4\pi}{3}$$
 cu cm  
(B)  $\frac{5\pi}{3}$  cu cm  
(C)  $\frac{8\pi}{3}$  cu cm  
(D)  $\frac{2\pi}{3}$  cu cm

**16.** Two dice are rolled together. The probability of getting sum of numbers on the two dice as 2, 3 or 5, is:

(A)	<del>7</del> 36	<b>(B)</b>	$\frac{11}{36}$
(C)	<u>5</u> 36	(D)	$\frac{4}{9}$

**17.** The centre of a circle is at (2, 0). If one end of a diameter is at (6, 0), then the other end is at:

( <b>A</b> ) (0, 0)	<b>(B)</b> (4, 0)
(C) (-2, 0)	<b>(D)</b> (-6, 0)

**18.** In the given figure, graphs of two linear equations are shown. The pair of these linear equations is:



- (A) consistent with unique solution.
- (B) consistent with infinitely many solutions.
- (C) inconsistent.
- (D) inconsistent but can be made consistent by extending these lines.

Directions:

In Q. No. 19 and 20 a statement of Assertion (A) is followed by a statement of Reason (R). Choose the correct option.

- (A) Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of the Assertion (A).
- (B) Both Assertion (A) and Reason (R) are true, but Reason (R) is not the correct explanation of Assertion (A).

(C) Assertion (A) is true, but Reason (R) is false.

- **(D)** Assertion (A) is false, but Reason (R) is true.
- **19.** Assertion (A): The tangents drawn at the end points of a diameter of a circle, are parallel.**Reason (R):** Diameter of a circle is the longest chord.
- **20. Assertion (A):** If the graph of a polynomial touches *x*-axis at only one point, then the polynomial cannot be a quadratic polynomial.

**Reason (R):** A polynomial of degree n(n > 1) can have at most *n* zeroes.

#### SECTION – B

#### This section consists of 5 questions of 2 marks each.

- **21.** Solve the following system of linear equations 7x 2y = 5 and 8x + 7y = 15 and verify your answer.
- **22.** In a pack of 52 playing cards one card is lost. From the remaining cards, a card is drawn at random. Find the probability that the drawn card is queen of heart, if the lost card is a black card.
- **23.** (a) Evaluate :  $2\sqrt{2} \cos 45^{\circ} \sin 30^{\circ} + 2\sqrt{3} \cos 30^{\circ}$

OR

- (b) If  $A = 60^{\circ}$  and  $B = 30^{\circ}$ , verify that: sin(A + B) = sin A cos B + cos A sin B
- 24. In the given figure, ABCD is a quadrilateral. Diagonal BD bisects ∠B and ∠D both.
   Prove that:



- (i)  $\triangle ABD \sim \triangle CBD$
- (ii) AB = BC
- **25.** (a) Prove that  $5-2\sqrt{3}$  is an irrational number. It is given that  $\sqrt{3}$  is an irrational number.

#### OF

(b) Show that the number  $5 \times 11 \times 17 + 3 \times 11$  is a composite number.

#### SECTION - C

#### This section consists of 6 questions of 3 marks each.

**26.** (a) Find the ratio in which the point 
$$\left(\frac{8}{5}, y\right)$$
 divides

the line segment joining the points (1, 2) and (2, 3). Also, find the value of *y*.

OR

- (b) ABCD is a rectangle formed by the points A(-1, -1) B(-1, 6), C(3, 6) and D(3, -1). P, Q, R and S are mid-points of sides AB, BC, CD and DA respectively. Show that diagonals of the quadrilateral PQRS bisect each other.
- **27.** In a teachers' workshop, the number of teachers teaching French, Hindi and English are 48, 80 and 144 respectively. Find the minimum number of rooms required if in each room the same number of teachers are seated and all of them are of the same subject.
- **28.** Prove that :  $\frac{\tan \theta}{1 \cot \theta} + \frac{\cot \theta}{1 \tan \theta} = 1 + \sec \theta \cdot \csc \theta$
- **29.** Three years ago, Rashmi was thrice as old as Nazma. Ten years later, Rashmi will be twice as old as Nazma. How old are Rashmi and Nazma now?
- **30.** (a) In the given figure, AB is a diameter of the circle with centre O. AQ, BP and PQ are tangents to the circle. Prove that  $\angle POQ = 90^{\circ}$



(b) A circle with centre O and radius 8 cm is inscribed in a quadrilateral ABCD is which P, Q, R, S are the points of contact as shown. If AD is perpendicular to DC, BC = 30 cm and BS = 24 cm, then find the length DC.



**31.** The difference between the outer and inner radii of a hollow right circular cylinder of length 14 cm is 1 cm. If the volume of the metal used in making the cylinder is 176 cm<sup>3</sup>, find the outer and inner radii of the cylinder.

#### SECTION - D

#### This section consists of 4 questions of 5 marks each.

- **32.** An arc of a circle of radius 21 cm subtends an angle of 60° at the centre. Find:
  - (i) the length of the arc.
  - (ii) the area of the minor segment of the circle made by the corresponding chord.
- **33. (a)** The sum of first and eight terms of an A.P. is 32 and their product is 60. Find the first term and common difference of the A.P. Hence, also find the sum of its first 20 terms

#### OR

- (b) In a A.P. of 40 terms, the sum of first 9 terms is 153 and the sum of last 6 terms is 687. Determine the first term and common difference of A.P. Also, find the sum of all the terms of the A.P.
- 34. (a) If a line is drawn parallel to one side of a triangle to intersect the other two sides in distinct points, then prove that the other two sides are divided in the same ratio.
  - OR
  - (b) In the given figure PA, QB and RC are each perpendicular to AC. If AP = x, BQ = y and CR



**35.** A pole 6 m high is fixed on the top of a tower. The angle of elevation of the top of the pole observed from a point P on the ground is 60° and the angle of depression of the point P from the top of the tower is 45°. Find the height of the tower and the distance of point P from the foot of the tower.

19

(use  $\sqrt{3} = 1.73$ )

#### SECTION – E

## This section consists of 3 Case-Study Based Questions of 4 marks each.

**36.** A rectangular floor area can be completely tiled with 200 square tiles. If the side length of each tile is increased by 1 unit, it would take only 128 tiles to cover the floor.



- (i) Assuming the original length of each side of a tile be *x* units, make a quadratic equation from the above information.
- (ii) Write the corresponding quadratic equation in standard form.
- (iii)(a) Find the value of *x*, the length of side of a tile by factorisation. 2

#### OR

- (b) Solve the quadratic equation for *x*, using quadratic formula. 2
- **37.** BINGO is game of chance. The host has 75 balls numbered 1 through 75. Each player has a BINGO card with some numbers written on it. The participant cancels the number on the card when called out a number written on the ball selected at random. Whosoever cancels all the numbers on his/ her card, says BINGO and wins the game.



The table given below, shows the data of one such game where 48 balls were used before Tara said 'BINGO'.

Numbers announced Number of times

#### Delhi Set-2

**Note:** Except these, all other questions have been given in Delhi Set-1

#### SECTION - A

This section consists of 20 question of 1 mark each.

4. If 
$$\sin A = \frac{2}{3}$$
, then value of  $\cot A$  is:

0-15	8
15-30	9
30-45	10
45-60	12
60-75	9

## Based on the above information, answer the following:

) Write the median class.	1
---------------------------	---

(ii) When first ball was picked up, what was the probability of calling out an even number? 1(iii)(a) Find median of the given data. 2

(b) Find mode of the given data.

**38.** A backyard is in the shape of a triangle ABC with right angle at B. AB = 7 m and BC = 15 m. A circular pit was dug inside it such that it touches the walls AC, BC and AB at P, Q and R respectively such that AP = x m.





Based on the above information, answer the following questions:

- (i) Find the length of AR in terms of *x*. 1
- (ii) Write the type of quadrilateral BQOR.

OR

- (iii)(a) Find the length PC in terms of *x* and hence find the value of *x*.
  - (b) Find *x* and hence find the radius *r* of circle.2

30/1/2

1

2



7. Which of the following is not probability of an event?

(A) 0.89 (B) 52%  
(C) 
$$\frac{1}{13}$$
% (D)  $\frac{1}{0.89}$ 

13. If the sum and the product of zeroes of a quadratic polynomial are  $2\sqrt{3}$  and 3 respectively, then a quadratic polynomial is:

(A) 
$$x^2 + 2\sqrt{3}x - 3$$
 (B)  $(x - \sqrt{3})^2$   
(C)  $x^2 - 2\sqrt{3}x - 3$  (D)  $x^2 + 2\sqrt{3}x + 3$ 

**17.** *n*th term of an A.P. is 7n + 4. The common difference is

(A) 7n	<b>(B)</b> 4
(C) 7	<b>(D)</b> 1

#### SECTION - B

#### This section consists of 5 questions of 2 marks each.

21. Diagonals AC and BD of a trapezium ABCD intersect at O, where AB || DC. If  $\frac{DO}{OB} = \frac{1}{2}$ , then show that



#### Delhi Set-3

Note: Except these, all other questions have been given in Delhi Set-1&2

#### SECTION - A

#### This section consists of 20 question of 1 mark each.

**2.** In an A.P., if the first term (a) = -16 and the common difference (d) = -2, then the sum of first 10 terms is:

(A) 
$$-200$$
(B)  $-70$ (C)  $-250$ (D)  $250$ 

7. One card is drawn at random from a well shuffled deck of 52 playing cards. The probability that it is a red ace card, is:

(A) 
$$\frac{1}{13}$$
 (B)  $\frac{1}{26}$   
(C)  $\frac{1}{52}$  (D)  $\frac{1}{2}$ 

**9.** For  $\theta = 30^\circ$ , the value of  $(2 \sin \theta \cos \theta)$  is:

(A) 1  
(B) 
$$\frac{\sqrt{3}}{2}$$
  
(C)  $\frac{\sqrt{3}}{4}$   
(D)  $\frac{3}{2}$ 

**16.** If  $\alpha$ ,  $\beta$  are the zeroes of the polynomial  $6x^2 - 5x - 4$ , ť

then 
$$\frac{1}{\alpha} + \frac{1}{\beta}$$
 is equal to:

**23.** Solve the following system of linear equations: 2p + 3q = 13 and 5p - 4q = -2

#### SECTION - C

#### This section consists of 6 questions of 3 marks each.

- 27. In a chemistry lab, there is some quantity of 50% acid solution and some quantity of 25% acid solution. How much of each should be mixed to make 10 litres of 40% acid solution?
- 29. A wooden toy is made by scooping out a hemisphere of same radius as of cylinder, from each end of a wooden solid cylinder. If the height of the cylinder is 20 cm and its base is of radius 7 cm, find the total surface area of the toy.

#### SECTION - D

#### This section consists of 4 questions of 5 marks each.

- 33. From the top of a building 60 m high, the angles of depression of the top and bottom of the vertical lamp post are observed to be 30° and 60° respectively.
  - (i) Find the horizontal distance between the building and the lamp post.
  - (ii) Find the distance between the tops of the building and the lamp post.
- 35. A vessel is in the form of a hollow hemisphere mounted by a hollow cylinder. The diameter of the hemisphere is 14 cm and the total height of the vessel is 13 cm. Find the inner surface area and the volume of the vessel.

30/1/3

(A) 
$$\frac{5}{4}$$
 (B)  $-\frac{5}{4}$   
(C)  $\frac{4}{5}$  (D)  $\frac{5}{24}$ 

#### SECTION - B

This section consists of 5 questions of 2 marks each.

24. Solve the following system of linear equations algebraically:

$$2x + 5y = -4; 4x - 3y = 5$$

**25.** In  $\triangle ABC$ , altitudes AD and BE are drawn. The AD = 7 cm, BE = 9 cm and EC = 12 cm then, find the length of CD.



SECTION - C

#### This section consists of 6 questions of 3 marks each.

26. The sum of the digits of a 2-digit number is 14. The number obtained by interchanging its digits exceeds the given number by 18. Find the number.

27. The inner and outer radii of a hollow cylinder surmounted on a hollow hemisphere of same radii are 3 cm and 4 cm respectively. If height of the cylinder is 14 cm, then find its total surface area (inner and outer).

#### SECTION - D

#### This section consists of 4 questions of 5 marks each.

- **32.** From the top of a 15 m high building, the angle of elevation of the top of a tower is found to be 30°. From the bottom of the same building, the angle of elevation of the top of the tower is found to be 60°. Find the height of the tower and the distance between tower and the building.
- **35.** In the given figure, diameters AC and BD of the circle intersect at O. If  $\angle AOB = 60^{\circ}$  and OA = 10 cm, then:

#### **Outside Delhi Set-1**

#### SECTION A

#### This section consists of 20 questions of 1 mark each.

- **1.** The value of *k* for which the system of equations 3x y + 8 = 0 and 6x ky + 10 = 0 has infinitely many solutions, is
  - (A) -2 (B) 2 (C)  $\frac{1}{2}$  (D)  $-\frac{1}{2}$
- **2.** Point P divides the line segment joining the points A(4, –5) and B(1, 2) in the ratio 5 : 2. Co-ordinates of point P are

$(\mathbf{A})\left(\frac{5}{2},\frac{-3}{2}\right)$	$\textbf{(B)} \ \left(\frac{11}{7},0\right)$
(C) $\left(\frac{13}{7},0\right)$	(D) $\left(0,\frac{13}{7}\right)$

**3.** The common difference of an A.P. in which  $a_{15} - a_{11} = 48$ , is

<b>(A)</b> 12	<b>(B)</b> 16
(C) –12	<b>(D)</b> –16

**4.** The quadratic equation  $x^2 + x + 1 = 0$  has .....roots.

A) real and equal	(B) irrational
C) real and distinct	(D) not-real

5. If the HCF(2520, 6600) = 40 and LCM(2520, 6600) = 252 × k, then the value of k is
(A) 1650 (B) 1600

(A) 1050	(D)	1000
(C) 165	(D)	1625

6. In the given figure  $\triangle$ ABC is shown. DE is parallel to BC. If AD = 5 cm, DB = 2.5 cm and BC = 12 cm, then DE is equal to





(i) Find the length of the chord AB.

(ii) Find the area of shaded region. (Take  $\pi = 3.14$  and  $\sqrt{3} = 1.73$ )

30/2/1

(A) 10 cm	<b>(B)</b> 6 cm
(C) 8 cm	<b>(D)</b> 7.5 cm

7. If  $\sin \theta = \cos \theta$ ,  $(0^{\circ} < \theta < 90^{\circ})$ , then value of (sec  $\theta$  .  $\sin \theta$ ) is:

(A) $\frac{1}{\sqrt{2}}$	<b>(B)</b> $\sqrt{2}$
(C) 1	<b>(D)</b> 0

**8.** Two dice are rolled together. The probability of getting the sum of the two numbers to be more than 10, is

(A) 
$$\frac{1}{9}$$
 (B)  $\frac{1}{6}$   
(C)  $\frac{7}{12}$  (D)  $\frac{1}{12}$ 

**9.** If α and β are zeroes of the polynomial  $5x^2 + 3x - 7$ , the value of  $\frac{1}{\alpha} + \frac{1}{\beta}$  is

(A) 
$$-\frac{3}{7}$$
 (B)  $\frac{3}{5}$ 

(C) 
$$\frac{3}{7}$$
 (D)  $-\frac{5}{7}$ 

**10.** The perimeters of two similar triangles ABC and PQR are 56 cm and 48 cm respectively.  $\frac{PQ}{AB}$  is equal to

(A) 
$$\frac{7}{8}$$
 (B)  $\frac{6}{7}$   
(C)  $\frac{7}{6}$  (D)  $\frac{8}{7}$ 

**11.** AB and CD are two chords of a circle intersecting at P. Choose the correct statement from the following:





2, then median of the new data		
(A) increases by 2	<b>(B)</b> increases by 2 <i>n</i>	

- (C) remains same (D) decreases by 2
- **13.** A box contains cards numbered 6 to 55. A card is drawn at random from the box. The probability that the drawn card has a number which is a perfect square, is

(A) 
$$\frac{7}{50}$$
 (B)  $\frac{7}{55}$   
(C)  $\frac{1}{10}$  (D)  $\frac{5}{49}$ 

**14.** In the given figure, tangents PA and PB to the circle centred at O, from point P are perpendicular to each other. If PA = 5 cm, then length of AB is equal to





(C)  $2\sqrt{5}$  cm (D) 10 cm

**15.** XOYZ is a rectangle with vertices X(-3, 0), O(0, 0), Y(0, 4) and Z(x, y). The length of its each diagonal is

(A) 5 units	<b>(B)</b> √5	units
-------------	---------------	-------

(C)  $x^2 + y^2$  units (D) 4 units

16. Which term of the A.P. -29, -26, -23, ..., 61 is 16?
(A) 11<sup>th</sup>
(B) 16<sup>th</sup>
(C) 10<sup>th</sup>
(D) 31<sup>st</sup>

(C) 10 <sup>an</sup>	<b>(D)</b> 31
----------------------	---------------

**17.** In the given figure, AT is tangent to a circle centred at O. If  $\angle CAT = 40^\circ$ , then  $\angle CBA$  is equal to



**18.** After an examination, a teacher wants to know the marks obtained by maximum number of the students in her class. She requires to calculate ...... of marks.

(A) median(B) mode(C) mean(D) range

Directions: In Question 19 and 20, Assertion (A) and Reason (R) are given. Select the correct option from the following:

- (A) Both Assertion (A) and Reason (R) are true. Reason (R) is the correct explanation of the Assertion (A).
- (B) Both Assertion (A) and Reason (R) are true. Reason (R) does not give correct explanation of Assertion (A).
- (C) Assertion (A) is true but Reason (R) is not true.
- (D) Assertion (A) is not true but Reason (R) is true.
- **19. Assertion (A):** If  $\sin A = \frac{1}{3}(0^{\circ} < A < 90^{\circ})$ , then the

value of  $\cos A$  is  $\frac{2\sqrt{2}}{3}$ 

**Reason (R):** For every angle  $\theta$ ,  $\sin^2\theta + \cos^2\theta = 1$ .

**20.** Assertion (A): Two cubes each of edge length 10 cm are joined together. The total surface area of newly formed cuboid is 1200 cm<sup>2</sup>.

**Reason (R):** Area of each surface of a cube of side 10 cm is 100 cm<sup>2</sup>.

#### SECTION – B

#### This section consists of 5 questions of 2 marks each.

- 21. Can the number (15)<sup>n</sup>, n being a natural number, end with the digit 0?Give reasons.
- **22.** Find the type of triangle ABC formed whose vertices are A(1, 0), B(–5, 0) and C(–2, 5).
- **23.** (a) Evaluate :  $2 \sin^2 30^\circ \sec 60^\circ + \tan^2 60^\circ$ .

OR

- (b) If  $2 \sin(A + B) = \sqrt{3}$  and  $\cos(A B) = 1$ , then find the measures of angles A and B.  $0 \le A$ , B,  $(A + B) \le 90^\circ$ .
- **24.** In the given figure, AB and CD are tangents to a circle centred at O. Is  $\angle BAC = \angle DCA$ ? Justify your answer.



**25.** (a) In what ratio is the line segment joining the points (3, -5) and (-1, 6) divided by the line y = x?

#### OR

**(b)** A(3, 0), B(6, 4) and C(-1, 3) are vertices of a triangle ABC. Find length of its median BE.

#### SECTION – C

#### This section consists of 6 questions of 3 marks each.

**26.** (a) If the sum of first *m* terms of an A.P. is same as sum of its first *n* terms  $(m \neq n)$ , then show that the sum of its first (m + n) terms is zero.

#### OR

- (b) In a A.P., the sum of the three consecutive terms is 24 and the sum of their squares is 194. Find the numbers.
- **27.** Prove that  $\sqrt{5}$  is an irrational number.
- **28.** (a) In the given figure, PQ is tangent to a circle at O and  $\angle BAQ = 30^\circ$ , show that BP = BQ.





(b) In the given figure, AB, BC, CD and DA are tangents to the circle with centre O forming a quadrilateral ABCD.



**29.** Prove that  $\frac{1 + \sec \theta - \tan \theta}{1 + \sec \theta + \tan \theta} = \frac{1 - \sin \theta}{\cos \theta}$ .

**30.** In a test, the marks obtained by 100 students (out of 50) are given below:

Marks obtained:	0-10	10-20	20-30	30-40	40-50
Number of students:	12	23	34	25	6

Find the mean marks of the students.

**31.** In a 2-digit number, the digit at the unit's place is 5 less than the digit at the ten's place. The product of the digits is 36. Find the number.

#### SECTION – D

#### This section consists of 4 questions of 5 marks each.

**32. (a)** Using graphical method, solve the following system of equations:

$$3x + y + 4 = 0$$
 and  $3x - y + 2 = 0$   
OR

- (b) Tara scored 40 marks in a test, getting 3 marks for each right answer and losing 1 mark for each wrong answer. Had 4 marks been awarded for each correct answer and 2 marks been deducted for each wrong answer, then Tara would have scored 50 marks. Assuming that Tara attempted all question, find the total number of questions in the test.
- 33. (a) If a line is drawn parallel to one side of a triangle to intersect the other two sides in distinct points, then prove that the other two sides are divided in the same ratio.

OR

- (b) Sides AB and AC and median AD to  $\triangle$ ABC are respectively proportional to sides PQ and PR and median PM of another triangle PQR. Show that  $\triangle$ ABC ~  $\triangle$ PQR.
- **34.** From the top of a 45 m high light house, the angles of depression of two ships, on the opposite side of it, are observed to be 30° and 60°. If the line joining the ships passes through the foot of the light house, find the distance between the ships. (Use  $\sqrt{3} = 1.73$ )
- **35.** The perimeter of a certain sector of a circle of radius 5.6 m is 20.0 m. Find the area of the sector.

#### **SECTION - E**

## This section consists of 3 Case-Study Based Questions of 4 marks each.

**36.** A ball is thrown in the air so that *t* seconds after it is thrown, its height *h* metre above its starting point is given by the polynomial  $h = 25t - 5t^2$ .



Observe the graph of the polynomial and answer the following questions:

1

1

- (i) Write zeroes of the given polynomial.
- (ii) Find the maximum height achieved by ball. 1
- (iii)(a) After throwing upward, how much time did the ball take to reach to the height of 30 m?2 OR
  - (b) Find the two different values of *t* when the height of the ball was 20 m. 2
- **37.** The word 'circus' has the same root as 'circle'. In a closed circular area, various entertainment acts including human skill and animal training are presented before the crowd.

A circus tent is cylindrical upto a height of 8 m and conical above it. The diameter of the base is 28 m and total height of tent is 18.5 m.



#### Based on the above, answer the following questions:

- (i) Find slant height of the conical part.
- (ii) Determine the floor area of the tent. 1
- (iii) (a) Find area of the cloth used for making tent. 2 OR
  - (b) Find total volume of air inside an empty tent. 2

#### **Outside Delhi Set-2**

**Note:** Except these, all other questions have been given in Outside Delhi Set-1

#### SECTION - A

#### This section consists of 20 questions of 1 mark each.

2. In the given figure, PT is tangent to a circle with centre O. Chord PQ subtends an angle of 65° at the centre. The measure of ∠QPT is:



**6.** If α and β are zeroes of the polynomial  $2x^2 - 9x + 5$ , then value of  $\alpha^2 + \beta^2$  is

**38.** In a survey on holidays, 120 people were asked to state which type of transport they used on their last holiday. The following pie chart shows the results of the survey.



Observe the pie chart and answer the following questions:

- (i) If one person is selected at random, find the probability that he/she travelled by bus or ship. 1
- (ii) Which is most favourite mode of transport and how many people used it? 1
- (iii)(a) A person is selected at random. If the probability that he did not use train is  $\frac{4}{5}$ , find the number of people who used train. 2

(b) The probability that randomly selected

person used aeroplane is  $\frac{7}{60}$ . Find the

revenue collected by air company at the rate of ₹ 5,000 per person. 2

(A) 
$$\frac{1}{4}$$
 (B)  $\frac{61}{4}$   
(C) 1 (D)  $\frac{71}{4}$ 

**13.** Value of *k* for which x = 2 is a solution of the equation  $5x^2 - 4x + (2 + k) = 0$ , is

<b>(A)</b> 10	<b>(B)</b> -10
<b>(C)</b> 14	<b>(D)</b> –14

15. The sum of first 200 natural numbers is
(A) 2010
(B) 2000
(C) 20100
(D) 21000

#### SECTION – B

#### This section consists of 5 questions of 2 marks each.

- **23.** Explain why  $7 \times 11 \times 13 + 13$  and  $7 \times 6 \times 5 \times 4 \times 3 \times 2 \times 1 + 5$  are composite numbers.
- **24.** The vertices of a  $\triangle$ ABC are A(-2, 4), B(4, 3) and C(1, -6). Find length of the median BD.

#### SECTION - C

#### This section consists of 6 questions of 3 marks each.

- **28.** Three consecutive integers are such that sum of the square of second and product of other two is 161. Find the three integers.
- **31.** Prove that  $\sin^6\theta + \cos^6\theta = 1 3\sin^2\theta\cos^2\theta$ .

#### SECTION - D

#### This section consists of 4 questions of 5 marks each.

32. The angle of elevation of an aircraft from a point A on the ground is 60°. After a flight of 30 seconds,

#### **Outside Delhi Set-3**

Note: Except these, all other questions have been given in Outside Delhi Set-1&2

#### SECTION - A

#### This section consists of 20 questions of 1 mark each.

**1.** The distance between the points ( $a \cos \theta$ ,  $-a \sin \theta$ ) and  $(a \sin \theta, a \cos \theta)$  is

<b>(A)</b> <i>a</i>	<b>(B)</b> $a\sqrt{2}$
(C) 0	<b>(D)</b> 2 <i>a</i>

- 8. The roots of the quadratic equation  $4x^2 5x + 4 = 0$ are
  - (A) irrational (B) rational and distinct (D) rational and equal
  - (C) not real
- **9.** The common difference of an A.P. in which  $a_{20} a_{15}$ = 20, is

<b>(A)</b> 4	<b>(B)</b> 5
<b>(C)</b> 4d	<b>(D)</b> 5d

**12.** If  $\alpha$  and  $\beta(\alpha > \beta)$  are the zeroes of the polynomial  $-x^2$ + 8x + 9, then  $(\alpha - \beta)$  is equal to

<b>(A)</b> –10	<b>(B)</b> 10
(C) ±10	<b>(D)</b> 8

#### SECTION - B

#### This section consists of 5 questions of 2 marks each.

23. In the given figure, a circle centred at origin O has radius 7 cm, OC is median of  $\triangle OAB$ . Find the length of median OC.



the angle of elevation changes to 30°. The aircraft is flying at a constant height of  $3500\sqrt{3}$  m at a uniform

speed. Find the speed of the aircraft.

33. If the length of a rectangle is reduced by 5 cm and its breath is increased by 2 cm, then the area of the rectangle is reduced by 80 cm<sup>2</sup>. However, if we increase the length by 10 cm and decrease the breadth by 5 cm, its area is increased by 50 cm<sup>2</sup>. Find the length and breadth of the rectangle.

30/2/3

**25.** Can the number  $8^n$ , *n* being a natural number, end with the digit 0? Give reasons.

#### SECTION - C

#### This section consists of 6 questions of 3 marks each.

- **26.** Prove that  $\frac{\csc^2\theta \sec^2\theta}{\csc^2\theta + \sec^2\theta} = \frac{3}{4}$ , if  $\tan \theta = \frac{1}{\sqrt{7}}$
- **30.** A dealer sells an article for ₹ 75 and gains as much percent as the cost price of the article. Find the cost price of the article.

#### SECTION - D

#### This section consists of 4 questions of 5 marks each.

- **32.** A person standing on the bank of a river observes that the angle of elevation of the top of a tower on the opposite bank is 60°. When he moves 30 m away from the bank, he finds the angle of elevation to be 30°. Find the height of the tower and width of the (Take  $\sqrt{3} = 1.732$ ) river.
- 35. (a) Using graphical method, solve the following system of equation:
  - 3x 2y = 10 and 5x + 3y = 4OR
  - (b) If three time the greater of two numbers is divided by the smaller one, we get 4 as the quotient and 3 as the remainder. Also, if seven times the smaller number is divided by greater one, we get 5 as the quotient and 1 as the remainder. Find the numbers.

## **ANSWERS**

#### Delhi Set-1

*.*..

#### SECTION - A

1. Option (B) is correct. Explanation: Given polynomial is  $p(x) = 2x^2 - k\sqrt{2}x + 1$ Sum of zeroes =  $\frac{-(\text{coefficient of } x)}{(x + y)}$ coefficient of  $x^2$  $\sqrt{2} = \frac{-(-k\sqrt{2})}{2}$ [Given, sum of zeroes =  $\sqrt{2}$ ]

k = 2

- 2. Option (D) is correct. Explanation: Probability of loosing the game = 1 – Probability of winning the game = 1 - 0.79 = 0.21
- 3. Option (C) is correct. Explanation: If the discriminant is equal to zero, i.e.,  $b^2 - 4ac = 0$  where *a*, *b*, *c* are real numbers and  $a \neq 0$ , then roots of the quadratic equation  $ax^2 + bx + c =$

0, are real and equal  $b^2 - 4ac = 0 \text{ or } ac = \frac{b^2}{4}$ Thus,

Explanation: Given,

$$a = 7, a_n = 84 \text{ and } S_n = \frac{2093}{2}$$
  

$$\Rightarrow \qquad a_n = a + (n-1)d$$
  

$$\Rightarrow \qquad 84 = 7 + (n-1)d$$
  

$$\Rightarrow \qquad 77 = (n-1)d \qquad \dots(i)$$
  
Also,  

$$S_n = \frac{n}{2}[2a + (n-1)d]$$

$$\Rightarrow \qquad \frac{2093}{2} = \frac{n}{2}[2 \times 7 + (n-1)d]$$
  
$$\Rightarrow \qquad 2093 = n[14 + 77] \quad \text{[from eq (i)]}$$
  
$$\Rightarrow \qquad 2093 = 91n$$
  
$$\Rightarrow \qquad n = 23$$

5. Option (D) is correct. Explanation: Given

$$p = 18 a^{2}b^{4} \text{ and } q = 20 a^{3}b^{2}$$

$$LCM(p, q) = LCM(18 a^{2}b^{4}, 20 a^{3}b^{2})$$

$$= 180a^{3}b^{4}$$

6. Option (A) is correct.

*Explanation*: Coordinates of D(x, y).



Using the mid point formula, the coordinates of mid-point of BC are

Co-ordinates of 
$$D(x, y) = \left(\frac{6+0}{2}, \frac{4+0}{2}\right)$$
  
= (3, 2)  
Now, length of  $AD = \sqrt{(5-3)^2 + (-6-2)^2}$   
=  $\sqrt{4+64} = \sqrt{68}$  units

7. Option (C) is correct.

**Explanation:** Given, 
$$\sec \theta - \tan \theta = m$$
 ...(i)  
We know that,  $\sec^2 \theta - \tan^2 \theta = 1$   
 $\Rightarrow (\sec \theta - \tan \theta)(\sec \theta + \tan \theta) = 1$   
 $\Rightarrow \qquad \sec \theta + \tan \theta = \frac{1}{\sec \theta - \tan \theta}$   
 $\Rightarrow \qquad \sec \theta + \tan \theta = \frac{1}{m}$  [from (i)]

#### 8. Option (B) is correct.

Explanation: Given data : 1, 4, 7, 9, 16, 21, 25 After removing even numbers data is: 1, 7, 9, 21, 25 Prime number: 7

Thus, required probability =  $\frac{1}{5}$ 

#### 9. Option (D) is correct.

10. Option (A) is correct. *Explanation*: Given polynomials :  $x^2 + px + q$ ...(i) and  $4x^2 - 5x - 6$ ...(ii) Zero of polynomial  $4x^2 - 5x - 6$  are:

$$x = 2$$
 and  $x = -\frac{3}{4}$ 

Now, zero of polynomial  $x^2 + px + q$  are 4 and  $-\frac{3}{2}$ 

:. Sum of zeroes 
$$= -\frac{p}{1}$$
 i.e.,  $4 - \frac{3}{2} = -\frac{p}{1}$   
or,  $\frac{5}{2} = -\frac{p}{1}$  or,  $p = -\frac{5}{2}$ 

11. Option (B) is correct.

Explanation: Here,

or,

or,

or,

$$(15)^{2} = (3 - x)^{2} + (-5 + 5)^{2}$$

$$225 = 9 - 6x + x^{2}$$

$$x^{2} - 6x - 216 = 0$$

$$x^{2} - 18x + 12x - 216 = 0$$

$$x(x - 18) + 12(x - 18) = 0$$

$$(x - 18)(x + 12) = 0 \text{ or, } x = -12, 18$$

or, 
$$(x-18)(x+12) = 0$$
 or,  $x = -12$ , 1

Explanation: Given,  

$$\cos(\alpha + \beta) = 0$$
  
 $\Rightarrow \qquad \cos(\alpha + \beta) = \cos\frac{\pi}{2} \Rightarrow \alpha + \beta = \frac{\pi}{2}$   
 $\therefore \qquad \cos\left(\frac{\alpha + \beta}{2}\right) = \cos\left(\frac{\pi}{4}\right) = \frac{1}{\sqrt{2}}$ 

27

30/1/1

#### 13. Option (C) is correct.

*Explanation*: The total surface area of a sphere =  $4\pi r^2$ 

The surface area of one hemi-sphere =  $3\pi r^2$  $\therefore$  The total surface area of two hemi-sphere =  $6\pi r^2$ 

Required Ratio = 
$$\frac{4\pi r^2}{6\pi r^2} = \frac{4}{6} = \frac{2}{3}$$

#### 14. Option (B) is correct.

Explanation: The middle most observation, after arranging all observations in ascending or descending order is called the median.

2

#### 15. Option (D) is correct.

Explanation: Radius of cone 
$$=\frac{2}{2} = 1 \text{ cm}$$
  
Height of cone  $= 2 \text{ cm}$   
Volume of cone  $=\frac{1}{3}\pi r^2 h = \frac{1}{3}\pi .(1)^2 \times 2$   
 $=\frac{2\pi}{3}\text{cu cm}$ 

#### 16. Option (A) is correct.

Explanation: When two dice are tossed together, Total possible outcomes =  $6^2 = 36$ No. of cases getting sum two :  $\{(1, 1)\}$ No. of cases getting sum three :  $\{(1, 2)(2, 1)\}$ No. of cases getting sum five : {(1, 4)(4, 1), (2, 3), (3, 2)} Thus total cases getting sum 2, 3 or 5 = 7

Therefore, required probability =

17. Option (C) is correct. Explanation: Here, centre C is mid-point of AB.



18. Option (D) is correct.

•

 $\Rightarrow$ 

19. Option (B) is correct.

Explanation: Assertion: Two parallel tangents always lie at the end points of the diameter of the circle. Reason: Diameter is the longest chord of a circle which passes through centre joining the two points on the circumference of a circle.

#### 20. Option (D) is correct.

*Explanation*: The polynomials of the form  $(x + a)^2$ and  $(x - a)^2$  has only equal roots and graphs of these polynomials cut x-axis at only one point. These polynomials are quadratic Thus, Assertion is true Reason is true.

#### SECTION - B

21. Given system of linear equations:

$$7x - 2y = 5$$
 ...(i)  
 $8x + 7y = 15$  ...(ii)

Multiplying eq (i) by 7 and eq (ii) by 2, we get 49r - 14u = 35

$$\frac{16x + 14y = 30}{16x + 14y = 30}$$

$$\frac{16x + 14y = 30}{65x = 65}$$

$$\therefore \qquad x = 1$$
Substituting value of x is eq (i) we get
$$7(1) - 2y = 5$$
or,
$$7 - 2y = 5$$
or,
$$-2y = -2 \text{ or, } y = 1$$
Therefore,
$$x = 1 \text{ and } y = 1$$
If one block cardo is last then remaining

**22.** If one black cards is lost, then remaining cards = 51Probability of drawing a queen of heart from remaining  $51 \text{ cards} = \frac{1}{51}$ 

[As there is only one queen of heart card in a pack of 52 cards]

$$2\sqrt{2} \cos 45^{\circ} \sin 30^{\circ} + 2\sqrt{3} \cos 30^{\circ}$$

$$= 2\sqrt{2} \times \frac{1}{\sqrt{2}} \times \frac{1}{2} + 2\sqrt{3} \times \frac{\sqrt{3}}{2}$$
$$= 1 + 3 = 4$$

#### OR

(b) LHS  $\Rightarrow \sin(A + B) = \sin(60^\circ + 30^\circ) = \sin 90^\circ = 1$  $RHS \Rightarrow sin A cos B + cos A sin B$ 

$$= \sin 60^{\circ} \cos 30^{\circ} + \cos 60^{\circ} \sin 30^{\circ}$$
$$= \frac{\sqrt{3}}{2} \times \frac{\sqrt{3}}{2} + \frac{1}{2} \times \frac{1}{2} = \frac{3}{4} + \frac{1}{4} = \frac{4}{4} = 1$$

**24.** (i) Given: diagonal BD bisects  $\angle B$  and  $\angle D$ 



To prove:  $\triangle ABD \sim \triangle CBD$ Proof: In  $\triangle ABD$  and  $\triangle CBD$  $\angle ABD = \angle CBD$ (BD bisects  $\angle B$ )  $\angle ADB = \angle CDB$ Therefore,  $\Delta ABD \sim \Delta CBD$ 

(BD bisects  $\angle D$ ) (by AA rule) Hence Proved

(ii)	Since, $\Delta ABI$	$D \sim \Delta CBD$	
	Therefore,	$\frac{AB}{BD} = \frac{BC}{BD}$	(by cpct)
		AB = BC	Hence Proved

**25.** (a) Let assume that  $5-2\sqrt{3}$  is rational.

Therefore it can be expressed in the form of  $\frac{p}{q}$ 

where *p* and *q* are integers and  $q \neq 0$ 

Therefore, we write 
$$5 - 2\sqrt{3} = \frac{p}{q}$$
  
or,  $2\sqrt{3} = 5 - \frac{p}{q}$  or,  $\sqrt{3} = \frac{5q - p}{2q}$ 

But  $\frac{5q-p}{2q}$  is a rational number as p and q are

integers. This contradicts the fact that  $\sqrt{3}$  is irrational, so our assumption is wrong. Hence  $5-2\sqrt{3}$  is an irrational number.

#### OR

(b) The numbers are prime numbers and composite numbers. Prime numbers can be divided by 1 and itself. A composite number has factors other than 1 and itself.  $(5 \times 11 \times 17) + (3 \times 11)$  $= (85 \times 11) + (3 \times 11)$ 

= 11 × (85 + 3)

- $= 11 \times 88 = 11 \times 11 \times 8$
- $= 2 \times 2 \times 2 \times 11 \times 11$

The given expression has 2 and 11 as its factors. Therefore it is a composite number.

#### SECTION - C

**26.** (a) Let P divides the line segment AB in the ratio k: 1



Then by section formula,  $= \frac{2k+1}{k+1}$  $\frac{8}{5}$ 

...(i)

...(ii)

and

from (i), we get 8k

$$+8 = 10k + 5$$
$$2k = 3 \Rightarrow k = \frac{3}{2}$$

 $y = \frac{3k+2}{k+1}$ 

from (ii), we get

$$y = \frac{3\left(\frac{3}{2}\right) + 2}{\frac{3}{2} + 1} = \frac{9 + 4}{5} = \frac{13}{5}$$

Therefore, required ratio is 3:2

value of 
$$y = \frac{13}{5}$$

#### OR

(b) Given ABCD is a rectangle and P, Q, R and S are mid-points of sides AB, BC, CD and DA.



coordinates of 
$$P = \left(\frac{-1-1}{2}, \frac{-1+6}{2}\right)$$
  
 $= \left(-1, \frac{5}{2}\right)$   
coordinates of  $Q = \left(\frac{-1+3}{2}, \frac{6+6}{2}\right)$   
 $= (1, 6)$   
coordinates of  $R = \left(\frac{3+3}{2}, \frac{6-1}{2}\right)$   
 $= \left(3, \frac{5}{2}\right)$   
coordinates of  $S = \left(\frac{3-1}{2}, \frac{-1-1}{2}\right)$   
 $= (1, -1)$ 

Now, we shall find the mid points of *PR* & *SQ*. Mid points of *P* & *R* which is point *O*,

$$x = \frac{-1+3}{2} = 1$$
$$y = \frac{\frac{5}{2} + \frac{5}{2}}{2} = \frac{5}{2}$$
$$O(x, y) = \left(1, \frac{5}{2}\right)$$

Similarly, the midpoint of *S* and *Q* 

 $\Rightarrow$ 

$$\Rightarrow \qquad x = \frac{1+1}{2} = 1$$
$$y = \frac{6-1}{2} = \frac{5}{2} \Rightarrow O(x, y) = \left(1, \frac{5}{2}\right)$$

Since, the midpoints of PR & QS both have the same coordinate  $\left(1, \frac{5}{2}\right)$ . Hence, diagonals *PR* and *SQ* Hence Proved. bisect to each other.

27. The no. of rooms will be minimum if each room accommodates maximum no. of teachers. Since in each room the same number of teachers are to be seated and all of them must be of the same subject. Therefore no. of teachers in each room must be HCF

of 48, 80 and 144. The prime factorization of 48, 80 and 144 are as  $19 - 2^4 \times 2^1$ under

$$40 = 2 \times 5$$
  
 $80 = 2^4 \times 5^1$   
 $144 = 2^4 \times 3^2$ 

:. HCF of 48, 80 and 144 is 
$$2^4 = 16$$

Therefore in each room 16 teachers can be seated.

$$\therefore \text{ No. of room required} = \frac{\text{Total no. of teachers}}{16}$$
$$= \frac{48 + 80 + 144}{16}$$

$$=\frac{272}{16}=17$$

#### Oswaal CBSE Chapterwise & Topicwise ONE for ALL MATHEMATICS (STANDARD), Class – 10

28. LHS = 
$$\frac{\tan\theta}{1-\cot\theta} + \frac{\cot\theta}{1-\tan\theta}$$
  
=  $\frac{\tan\theta}{1-\frac{1}{\tan\theta}} + \frac{\frac{1}{\tan\theta}}{1-\tan\theta}$   
=  $\frac{\tan^2\theta}{1-\frac{1}{\tan\theta-1}} + \frac{1}{1-\tan\theta}$   
=  $\frac{\tan^2\theta}{\tan\theta-1} + \frac{1}{\tan\theta(1-\tan\theta)}$   
=  $\frac{\tan^2\theta}{\tan\theta-1} - \frac{1}{\tan\theta(\tan\theta-1)}$   
=  $\frac{\tan^3\theta-1}{\tan\theta(\tan\theta-1)}$   
=  $\frac{(\tan\theta-1)(\tan^2\theta+\tan\theta+1)}{(\tan\theta(\tan\theta-1))}$   
[Using  $a^3 - b^3 = (a-b)(a^2 + ab + b^2)$ ]  
=  $\frac{\tan^2\theta + \tan\theta + 1}{\tan\theta}$   
=  $\frac{\sec^2\theta}{\tan\theta} + 1$   
=  $\frac{\sec^2\theta}{\tan\theta} + 1$   
=  $\frac{\csc^2\theta}{\tan\theta} + 1$   
=  $\frac{\cos\theta}{\cos^2\theta\sin\theta} + 1$   
=  $\sec\theta$ .  $\csc\theta + 1$   
=  $1 + \sec\theta$ .  $\csc\theta + 1$   
=  $1 + \sec\theta$ .  $\csc\theta + 1$   
=  $1 + \sec\theta$ .  $\csc\theta = 1$   
29. Let the age of Rashmi = x years  
and the age of Nazma = y years  
Three years ago,  
Rashmi's age =  $(x-3)$  years  
Nazma's age =  $(y-3)$  years  
According to question,  
 $(x-3) = 3(y-3)$   
 $\Rightarrow x-3 = 3y-9$   
 $\Rightarrow x = 3y-6$ ...(i)  
Ten years later,  
Rashmi's age =  $x + 10$   
Nazma's age =  $y + 10$   
According to question,  
 $(x + 10) = 2(y + 10)$   
 $x + 10 = 2y + 20$   
 $x = 2y + 10$ ...(ii)  
From eqs (i) and (ii), we get  
 $3y-6 = 2y + 10$   
 $y = 16$   
Substituting value of y in eq (i), we get  
 $x = 3 \times 16 - 6 = 48 - 6 = 42$   
Thus, the age of Rashmi is 42 years and age of Nazma is 16 years.

30. (a) In the given figure, Join OR.



∴ ∠POQ = 90° *i.e.*, OPDQ is a regular polygon
 Further DP = DQ i.e., OPDQ is a square
 Hence, radius = OP = DQ = 8 cm ...(ii)
 Now, DC = DQ + QC = 8 + 6 = 14 cm [from eqs (i) & (ii)]
 31. Let *r* and R be the radii of inner and outer surface of a cylinder.
 Given, height of cylinder (*h*) = 14 cm

Volume of cylinder 
$$(V) = 176 \text{ cm}^3$$
  
and  $R - r = 1 \text{ cm}$  ...(i)  
 $\because V = 176 \text{ cm}^2$   
 $\pi (R^2 - r^2)h = 176$   
 $\frac{22}{7}(R^2 - r^2) \times 14 = 176$   
 $R^2 - r^2 = \frac{176 \times 7}{22 \times 14} = 4$   
 $\Rightarrow (R - r)(R + r) = 4$   
 $\Rightarrow 1(R + r) = 4$   
 $\Rightarrow R + r = 4$  ...(ii)  
On solving eqs (i) & (ii), we get  
 $2R = 5$   
 $R = \frac{5}{2} \text{ cm} = 2.5 \text{ cm}$   
From (i),  $r = R - 1$   
 $r = \frac{5}{2} - 1 = \frac{3}{2} = 1.5 \text{ cm}$ 

32.  
32.  
(i) Given, 
$$r = 21 \text{ cm}, \theta = 60^{\circ}$$
  
length of the arc  $APB = \frac{\theta}{360^{\circ}} \times 2\pi r$   
 $= \frac{60^{\circ}}{360^{\circ}} \times 2 \times \frac{22}{7} \times 21$   
 $= \frac{1}{6} \times 2 \times 22 \times 3$   
 $= 22 \text{ cm}$ 

(ii) Area of the minor segment = Area of sector OAPB – Area of triangle of OAB

Now, Area of sector 
$$APB = \frac{\theta}{360^{\circ}} \times \pi r^2$$
  
$$= \frac{60^{\circ}}{360^{\circ}} \times \frac{22}{7} \times (21)^2$$
$$= \frac{1}{6} \times \frac{22}{7} \times 21 \times 21$$
$$= 231 \text{ cm}^2$$

and Area of triangle  $OAB = \frac{1}{2} \times base \times height$  $=\frac{1}{2}AB \times OM$ Ο 309  $30^{\circ}$ 2 ch 60 Μ B We draw  $OM \perp AB$  $\angle OMB = \angle OMA = 90^{\circ}$ ... and by symmetry, M is mid-point of AB  $BM = AM = \frac{1}{2}AB$  ...(i) *:*..  $\sin 30^\circ = \frac{AM}{AO}$ In right  $\triangle OMA$ ,  $\frac{1}{2} = \frac{AM}{21}$  $\Rightarrow$  $AM = \frac{21}{2}$  cm ⇒ In right  $\Delta OMA$ ,  $\cos 30^\circ = \frac{OM}{AO}$  $\frac{\sqrt{3}}{2} = \frac{OM}{21}$  $\Rightarrow$  $OM = \frac{\sqrt{3}}{2} \times 21 \text{ cm}$  $\Rightarrow$ : from eq (i)  $AM = \frac{1}{2}AB$  $AB = 2AM = 2 \times \frac{21}{2}$  $\Rightarrow$ = 21 cmArea of  $\triangle OAB = \frac{1}{2} \times 21 \times \frac{\sqrt{3}}{2} \times 21$ Thus,  $=\frac{441\sqrt{3}}{4}$  cm<sup>2</sup> Therefore, area of minor segment  $= \left(231 - \frac{441\sqrt{3}}{4}\right) \mathrm{cm}^2$ **33.** (a) Let *a* and  $a_8$  be first and eight terms of A.P.

Let common difference be d.  

$$\therefore \qquad a + a_8 = 32 \qquad (given)$$

$$\Rightarrow a + [a + (8 - 1)d] = 32 [\because T_n = a + (n - 1)d]$$

$$\Rightarrow \qquad a + (a + 7d) = 32$$

$$\Rightarrow \qquad a + 7d = 32 - a \qquad ...(i)$$
Also,
$$a.a_8 = 60 \qquad (given)$$

$$\Rightarrow \qquad a.[a + (8 - 1)d] = 60$$

$$\Rightarrow \qquad a(a + 7d) = 60$$

$$\Rightarrow \qquad a(32 - a) = 60 \qquad [from eq (i)]$$

$$\begin{array}{l} \Rightarrow \qquad 32a - a^2 = 60 \\ \Rightarrow \qquad a^2 - 32a + 60 = 0 \\ \Rightarrow \qquad a^2 - 30a - 2a + 60 = 0 \\ \Rightarrow \qquad a(a - 30) - 2(a - 30) = 0 \\ \Rightarrow \qquad a = 2, 30 \\ \hline \text{For} \qquad a = 2, from eq (i) \\ 2 + 7d = 32 - 2 \\ 7d = 28 \\ d = 4 \\ \hline \text{For} \qquad a = 30, from eq (i) \\ 30 + 7d = 32 - 30 \\ 7d = -28 \\ d = -4 \\ \hline \text{for} \qquad (a, d) = (2, 4) \\ a_8 = 2 + 7 \times 4 = 30 \\ \therefore \qquad a + a_8 = 32 \text{ and } a.a_8 = 60 \\ \hline \text{for} \qquad (a, d) = (30, -4) \\ a_8 = 30 + 7 (-4) = 2 \\ \therefore \qquad a + a_8 = 32 \text{ and } a.a_8 = 60 \\ \hline \text{Taking} \qquad (a, d) = (2, 4) \\ S_{20} = \frac{20}{2} [2 \times 2 + (20 - 1) \times 4] \\ \left[ \begin{array}{c} \because S_n = \frac{n}{2} [2a + (n - 1)d] \\ = 10[4 + 19 \times 4] \\ = 40 \times 20 = 800 \\ \hline \text{Taking} \qquad (a, d) = (30, -4) \\ S_{20} = \frac{20}{2} [30 \times 2 + (20 - 1)(-4)] \\ \end{array} \right] \\ \left[ \begin{array}{c} \because S_n = \frac{n}{2} [2a + (n - 1)d] \\ = 10[60 + 19(-4)] \\ = 10[60 + 19(-4)] \\ = 10(60 - 76) \\ = 10 \times (-16) = -160 \end{array} \right] \\ \hline \mathbf{OR} \end{array}$$

(b) Let the first term and common difference of A.P. be *a* and *d*.

∴ Sum of *n* terms of A.P., 
$$S_n = \frac{n}{2}[2a + (n-1)d]$$
  

$$S_9 = \frac{9}{2}[2a + (9-1)d]$$

$$= \frac{9}{2}[2a + 8d]$$

$$\Rightarrow 153 = 9(a + 4d)$$

$$\exists \Rightarrow 153 = 9(a + 4d)$$

$$\exists \because \text{Given, } S_9 = 153]$$

$$\Rightarrow 17 = a + 4d$$
or  $a + 4d = 17$  ...(i)  
Similarly, sum of 6 terms,  

$$S_6 = \frac{6}{2}[2a + (6-1)d]$$

$$\Rightarrow 687 = 3(2a + 5d)$$

$$\Rightarrow 229 = 2a + 5d$$
or  $2a + 5d = 229$  ...(ii)  
On solving eqs (i) & (ii), we get  

$$3d = -195$$

$$\Rightarrow d = -65$$
Substituting value of *d* in eq (i), we get  

$$a + 4(-65) = 17$$

$$a = 17 + 260$$

a = 277Thus, first term of given A.P. is 277 and common difference is -65. Now, Sum of all terms i.e.,  $S_{40} = \frac{40}{2} [2 \times 277 + (40 - 1)(-65)]$  $= 20[554 + 39(-65)] \\= 20(554 - 2535)$  $= 20 \times (-1981) = -39,620$ 34. (a) Given,: DE || BC Е D В EС BD To prove: = AE AD Proof: In  $\triangle AED$  and  $\triangle ACB$  $\angle AED = \angle ACB$ (Corresponding angles)  $\angle ADE = \angle ABC$ (Corresponding angles) ∠EAD is common to both triangles  $\Delta AED \sim \Delta ACB$ (by AAA similarity)  $\Rightarrow$  $\frac{AC}{AE} = \frac{AB}{AD}$ *:*..  $\Rightarrow \frac{AE + EC}{AE} = \frac{AD + BD}{AD} \Rightarrow 1 + \frac{EC}{AE} = 1 + \frac{BD}{AD}$  $\frac{EC}{AE} = \frac{BD}{AD}$  $\Rightarrow$ Hence Proved OR (b) In  $\triangle$ CAP and  $\triangle$ CBQ  $\angle CAP = \angle CBQ = 90^{\circ}$  $\angle PCA = \angle QCB$ (common angle) R z  $\cap$ х y В С А So,  $\triangle CAP \sim \triangle CBQ$ (By AA similarly Rule)  $\frac{BQ}{AP} = \frac{BC}{AC}$ Hence,  $\frac{y}{x} = \frac{BC}{AC}$ ...(i)  $\Rightarrow$ 

> Now, in  $\triangle ACR$  and  $\triangle ABQ$   $\angle ACR = \angle ABQ = 90^{\circ}$   $\angle QAB = \angle RAC$  (common angle) So,  $\triangle ACR \sim \triangle ABQ$ (By AA similarity Rule)

Hence, 
$$\frac{BQ}{CR} = \frac{AB}{AC}$$
  
 $\Rightarrow \qquad \frac{y}{z} = \frac{AB}{AC}$ ...(ii)

On adding eqs. (i) and (ii), we get  $\frac{1}{14}$   $\frac{1}{14}$   $\frac{1}{14}$   $\frac{BC}{BC}$   $\frac{AB}{BC}$ 

$$\frac{y}{x} + \frac{y}{z} = \frac{BC}{AC} + \frac{AB}{AC}$$
$$y\left(\frac{1}{x} + \frac{1}{z}\right) = \frac{BC + AB}{AC}$$
$$y\left(\frac{1}{x} + \frac{1}{z}\right) = \frac{AC}{AC} \Rightarrow y\left(\frac{1}{x} + \frac{1}{z}\right) = 1$$
$$\frac{1}{x} + \frac{1}{z} = \frac{1}{y}$$
Hence Proved

**35.** Consider QR as the tower, PQ as the pole on it. Given,  $\angle PAR = 60^{\circ}$  and  $\angle QAR = 45^{\circ}$ 



Since 
$$PQ = 6$$
 m (given)  
 $\therefore PR = 6 + h$  ...(i)

In right ∆QAR,

$$\tan 45^\circ = \frac{QR}{AR}$$
$$1 = \frac{h}{AR}$$

 $\Rightarrow$ 

 $\Rightarrow$ 

 $\Rightarrow$ 

Lat

In right 
$$\triangle PAR$$
,

AR = h m

...(ii)

$$\tan 60^\circ = \frac{1}{AR}$$

$$\sqrt{3} = \frac{6+h}{h} \qquad \text{[From eq.(i) \&(ii)]}$$

$$\Rightarrow \qquad \sqrt{3}h = 6 + h$$
$$\Rightarrow \qquad h = \frac{6}{\sqrt{3}}$$

$$\Rightarrow \qquad h =$$

$$\Rightarrow \qquad h = \frac{6}{(1.732)}$$

 $h = \frac{6}{0.732} = \frac{6000}{732} = 8.196$ 

 $\Rightarrow h = 8.20 \text{ m}$ Height of tower, QR = h = 8.20 mDistance of point P from the foot of the tower = PR = 6 + h = 6 + 8.20 = 14.20 m

 $\overline{(\sqrt{3}-1)}$ 

-1)

#### **SECTION – E**

36. (i) Let the original side length of each tile be x units.  
The area of the rectangular floor using 200 tiles  

$$= 200 x^{2} unit^{2}$$
The area with increased side length (each side  
increased by 1 unit) using 128 tiles  

$$= 128(x + 1)^{2} unit^{2}$$
So, required quadratic equation is:  

$$200x^{2} = 128(x + 1)^{2}$$
(ii) We have,  

$$200x^{2} = 128(x + 1)^{2}$$

$$\Rightarrow 200x^{2} = 128(x + 1)^{2}$$

$$\Rightarrow 200x^{2} = 128(x + 1)^{2}$$

$$\Rightarrow 200x^{2} = 128(x + 1)^{2}$$
(ii) We have,  

$$72x^{2} - 256x - 128 = 0, \text{ which is the quadratic equation is standard form.
(iii) (a) We have,
$$72x^{2} - 256x - 128 = 0, \text{ which is the quadratic equation is standard form.
(iii) (a) We have,
$$72x^{2} - 256x - 128 = 0, \text{ which is the quadratic equation is standard form.
(iii) (a) We have,
$$72x^{2} - 32x - 16 = 0, \text{ or, } 9x^{2} - 32x - 16 = 0, \text{ or, } 9x^{2} - 32x - 16 = 0, \text{ or, } 9x(x - 4) + 4(x - 4) = 0 \text{ or, } (x - 4)(9x + 4) = 0, \text{ or, } x = 4, -\frac{4}{9}$$
Since, side cannot be negative, thus  $x = 4$  units  
**OR**  
(b) We have  $9x^{2} - 32x - 16 = 0$   
On comparing with  $ax^{2} + bx + c = 0$ , we get  
 $a = 9, b = -32 \text{ and } c = -16$   
Using quadratic formula,  

$$x = \frac{-b \pm \sqrt{b^{2} - 4ac}}{2a}$$

$$\therefore \qquad x = \frac{-(-32) \pm \sqrt{(-32)^{2} - 4(9)(-16)}}{2x9}$$

$$= \frac{32 \pm \sqrt{1024 + 576}}{18}$$

$$= \frac{32 \pm \sqrt{1024} + 576}{18}$$

$$= \frac{32 \pm \sqrt{1600}}{18} = \frac{32 \pm 40}{18}$$

$$= \frac{72}{18} \text{ or } \frac{-8}{18} = 4 \text{ or } \frac{-4}{9}$$$$$$$$

37. (i)	Numbers announced	No. of times	c.f.
	0-15	8	8
	15-30	9	17
	30-45	10	27
	45-60	12	39
	60-75	9	48
		N = 48	
	Here, $N = 48$ ,		

then 
$$\frac{N}{2} = \frac{48}{2} = 24$$

 $\therefore$  Median class : 30 – 45

(ii) The number of even numbers between 1 to 75 is 37, [i.e., (75 − 1) ÷ 2 = 37]

Prob.(calling out an even number) =  $\frac{37}{75}$ 

(iii) (a) From part (i), we have median class : 30-45We have, l = 30, c.f. = 17, f = 10, h = 15

Median = 
$$l + \frac{\frac{N}{2} - c.f.}{f} \times h$$
  
=  $30 + \frac{24 - 17}{10} \times 15$   
=  $30 + \frac{7}{10} \times 15 = 30 + \frac{105}{10}$   
=  $30 + 10.5 = 40.5$   
OR

(b) From part (i), we see highest frequency is 12. So, modal class is 45-60.

$$l = 45, f_0 = 10, f_1 = 12, f_2 = 9, h = 15$$
  
Mode =  $l + \left(\frac{f_1 - f_0}{2f_1 - f_0 - f_2}\right) \times h$   
=  $45 + \left(\frac{12 - 10}{2 \times 12 - 10 - 9}\right) \times 15$   
=  $45 + \left(\frac{2}{24 - 19}\right) \times 15 = 45 + \frac{2}{5} \times 15$   
=  $45 + 6 = 51$ 

38. (i) Given,



#### Delhi Set-2

Note: Except these, all other questions have been given in Delhi Set-1

SECTION - A

4. Option (A) is correct.  
Explanation: 
$$\sin A = \frac{2}{3}$$
 (Given)  
 $\frac{BC}{AC} = \frac{2}{3}$  [Since,  $\sin \theta = \frac{P}{H}$ ]  
 $BC = 2x$  and  $AC = 3x$ 

Now, In AABC, By Pythagoras Theroem

AP = ARHence, (Tangent drawn from an external point to the circle are equal in length) AR = x m*.*.. (ii) Since, AR = x m and AB = 7 mRB = (7 - x)m.... RB = BQAlso, (Tangents drawn from an external point to the circle) OR = OQ(radii of circle)  $\angle ORB = \angle OQB = 90^{\circ}$ (Angle between radius and tangent) Also,  $\angle RBQ = 90^{\circ}$ (angle between the walls AB and BC) Thus,  $\angle ROQ = 90^{\circ}$ Thus, □BQOR is square. BC = 15 m(iii) (a) Here, BQ = (7 - x)m $Q\widetilde{C} = 15 - (7 - x)$ *.*.. QC = (8 + x)mor, QC = PCAlso, (Tangents from an external points C to the circle) PC = (8 + x)mi.e., In right ΔABC, using Pythagoras theorem,  $AC^{2} = AB^{2} + BC^{2}$  $AC^{2} = 7^{2} + 15^{2}$ = 49 + 225 = 274AC = 16.55 $\Rightarrow$ AP + PC = 16.55 $\Rightarrow$ x + 8 + x = 16.55 $\Rightarrow$ 2x = 8.55 $\Rightarrow$  $\Rightarrow$  $x = 4.275 \sim 4.28 \text{ m}$ OR **(b)** From part (iii) (a), we get x = 4.28 m From part (ii), we know that BQOR is a square *.*..

From part (ii), we know that BQOR is a sq  $\therefore$  BQ = OQ  $\Rightarrow$  r = 7 - x  $\Rightarrow$  r = 7 - 4.28

 $\Rightarrow$  r = 2.72 m

30/1/2

$$AC^{2} = AB^{2} + BC^{2}$$

$$(3x)^{2} = AB^{2} + (2x)^{2}$$

$$9x^{2} = AB^{2} + 4x^{2}$$

$$AB^{2} = 9x^{2} - 4x^{2}$$

$$AB^{2} = 5x^{2}$$

$$AB = \sqrt{5}x$$

$$\cot A = \frac{AB}{BC}$$

$$\left[ \text{Since, } \cot \theta = \frac{B}{P} \right]$$

$$= \frac{\sqrt{5}x}{2x} = \frac{\sqrt{5}}{2}$$

7. Option (D) is correct.

*Explanation*: From option (D)  
= 
$$\frac{1}{0.89} = \frac{100}{89} = 1.123$$

We know that probability of any event can not be greater than 1.

13. Option (B) is correct. *Explanation*: If  $\alpha$  and  $\beta$  are the zeroes of a quadratic

polynomial then Given, 3

$$\alpha + \beta = 2\sqrt{3}$$
 and  $\alpha\beta = 2$ 

$$p(x) = x^2 - (\alpha + \beta)x + \alpha\beta$$
  
=  $x^2 - (2\sqrt{3})x + (3)$ 

$$= x^2 - 2\sqrt{3}x + 3 = (x - \sqrt{3})^2$$

#### 17. Option (C) is correct.

Explanation: Given,

 $T_n = 7n + 4$  (*n*<sup>th</sup> term at an A.P.)  $T_1 = 7(1) + 4$ Put n = 1, = 7 + 4 = 11 $\begin{array}{l} T_2 = 7(2) + 4 \\ = 14 + 4 = 18 \end{array}$ Put n = 2, Now, common difference

$$= T_2 - T_1 = 18 - 11 = 7$$



Given: (i) In trapezium ABCD Diagonals AC and BD intersect at O (ii) AB || DC DO 1

(iii) 
$$\frac{DO}{OB} = \frac{1}{2}$$

To prove: AB = 2CDProof: In  $\triangle OAB$  and  $\triangle OCD$  $\angle AOB = \angle COD$ (vertically opposite angle)  $\angle OAB = \angle OCD$ (Alternate interior angle as given, AB || DC)  $\Delta OAB \sim \Delta OCD$ (by AA similarity Rule)  $\frac{OC}{OA} = \frac{CD}{AB} = \frac{DO}{BO} \Rightarrow \frac{CD}{AB} = \frac{DO}{BO}$ Now,  $\frac{CD}{AB} = \frac{1}{2}$ (given) AB = 2CDHence, Proved 2p + 3q = 1323. ...(i) 5p - 4q = -2and ...(ii) On multiplying eq (i) by 4 and eq (ii) by 3  $(2p + 3q = 13) \times 4$  $(5p - 4q = -2) \times 3$ On adding both equations 8p + 12q = 5215p - 12q = -623p = 46 $p = \frac{46}{23}$ p = 2Put p = 2 in eq (i) 2(2) + 3q = 134 + 3q = 13

$$3q = 9 \Rightarrow q = \frac{9}{3}$$
$$q = 3 \Rightarrow p = 2 \text{ and } q = 3$$
SECTION - C

27. Let, taking x litres quantity of 50% acid solution and y litres quantity of 25% acid solution. Given, After mixed both type of acid. Solution, Total quantity is 10 litres. Therefore, x + y = 10...(i) According to the question,  $\frac{50}{100}x + \frac{25}{100}y = \frac{40}{100} \times 10 \implies \frac{x}{2} + \frac{y}{4} = 4$ 2x + y = 16...(ii) On subtracting eq (i) from eq (ii)

x = 6 litres Put x = 6 in eq (i) to get y6 + y = 10

29

$$y = 10 - 6 \Rightarrow y = 4$$
 litres

Hence, we should take 6 litres from 50% Acid solution and 4 litres from 25% Acid solution.



Given, r = 7 cm and h = 20 cm Total surface Area of Toy = CSA fo cylinder + (inner CSA of Hemi-sphere)  $\times 2$  $= 2\pi rh + (2\pi r^{2}) \times 2^{1}$ =  $2\pi rh + 4\pi r^{2} = 2\pi r(h + 2r)$  $= 2 \times \frac{22}{7} \times 7(20 + 2 \times 7)$ 

$$= 44(34) = 1496 \text{ cm}^2$$

#### SECTION - D

33. Let the horizontal distance between the building and lamp post is BC



В

Η

(ii) Here, 
$$ED = BC = 20\sqrt{3}$$
 m  
(Distance between two parallel lines)  
In  $\triangle AED$ ,  $\angle AED = 90^{\circ}$   
 $\cos D = \frac{ED}{AD}$   $\left[\because \cos \theta = \frac{B}{H}\right]$ 

 $\cos 30^\circ = \frac{20\sqrt{3}}{AD}$  $\frac{\sqrt{3}}{2} = \frac{20\sqrt{3}}{AD}$ AD = 40 m

 $\Rightarrow$ 

**35.** Given, diameter hemisphere 
$$d = 14$$
 cm



#### Delhi Set-3

Note: Except these, all other questions have been given in Delhi Set-1 & 2.

#### SECTION - A

n = 10

2. Option (C) is correct. Explanation: Given,  $1^{\text{st}} \text{ term } = a = -16$ common difference = d = -2then, we know that sum of *n* terms =  $S_n$  $S_n = \frac{n}{2} [2a + (n-1).d]$ 

Here So

$$S_{10} = \frac{10}{2} [2 \times -16 + (10 - 1).(-2)]$$
  
= 5[-32 - 18] = 5[-50]  
= -250

7. Option (B) is correct. *Explanation*: Let E = event of getting a red card which is an ace card. S = Total elements in sample space  $\Rightarrow$ n(S) = 52& n(E) = 2We know that, Probability of any event (E) Number of favourable outcomes = Total number of outcomes n(E)1 2 =

$$\Rightarrow P(E) = \frac{1}{n(S)} = \frac{1}{52} = \frac{1}{26}$$

9. Option (B) is correct. Explanation: Given,  $\theta = 30^{\circ}$ then,  $2\sin 30^{\circ} \cdot \cos 30^{\circ} = 2 \times \frac{1}{2} \times \frac{\sqrt{3}}{2} = \frac{\sqrt{3}}{2}$ 

 $r = \frac{d}{2} = \frac{14}{2}$ r = 7 cmHeight of cylinder h = 6 cm Total inner surface Area of vessel = CSA of cylinder + CSA of hemi-sphere  $= 2\pi rh + 2\pi r^2$  $= 2\pi r(h+r)$  $= 2 \times \frac{22}{7} \times 7(6+7)$  $= 44 \times 13$  $= 572 \text{ cm}^2$ 

Now, Volume of vessel

$$= \pi r^{2}h + \frac{2}{3}\pi r^{3}$$

$$= \pi r^{2}\left(h + \frac{2}{3}r\right)$$

$$= \frac{22}{7} \times (7)^{2}\left(6 + \frac{2}{3} \times 7\right)$$

$$= 154 \times \frac{32}{3}$$

$$= 1642.67 \text{ cm}^{3}$$

30/1/3

16. Option (B) is correct.

*Explanation*: Given,  $\alpha$ ,  $\beta$  are the zeroes of the polynomial 2

$$P(x) = 6x^{2} - 5x - 4$$

$$\Rightarrow \qquad \alpha + \beta = \text{sum of zeroes} = \frac{-(-5)}{6} = \frac{5}{6}$$

$$\& \qquad \alpha \beta = \frac{-4}{6} = \frac{-2}{3}$$
So,
$$\frac{1}{\alpha} + \frac{1}{\beta} = \frac{\alpha + \beta}{\alpha \beta} = \frac{\frac{5}{6}}{\frac{-2}{3}}$$

$$= \frac{5}{6} \times \frac{3}{-2} = \frac{-5}{4}$$
**SECTION - B**
24. Let,
$$2x + 5y = -4 \qquad \dots(i)$$

$$\& \qquad 4x - 3y = 5 \qquad \dots(ii)$$
from equation (i) × 2 - equation (ii), we get
$$4x + 10y = -8$$

$$4x - 3y = 5 \text{ (by method of elimination)}$$

$$\frac{- + -}{13y = -8 - 5}$$

$$y = \frac{-13}{13} = -1$$
Putting the value of  $y = -1$  in (i) we get
$$2x + 5 \times (-1) = -4$$

$$\Rightarrow \qquad 2x = +5 - 4$$

$$x = \frac{1}{2}$$
So,  $x = \frac{1}{2}$ 

y = -1

#### SOLVED PAPER - 2024

25. Given, AD = 7 cmBE = 9 cmEC = 12 cmCD = ?then, E D Let  $CD = x \,\mathrm{cm}$ In  $\triangle BEC$ ,  $\angle BEC = 90^{\circ}$ (As  $BE \perp AC$  given)  $\Rightarrow$  from pythagoras theorem,  $BC = \sqrt{BE^2 + EC^2}$  $=\sqrt{9^2+12^2}$  cm  $=\sqrt{81+144}$  cm  $=\sqrt{225}$  cm BC = 15 cmBD = (15 - x) cm $\Rightarrow$ Area  $\triangle ABC = \frac{1}{2} \times BC \times AD = \frac{1}{2} \times AC \times BE$ Now, {As area of  $\triangle ABC = \frac{1}{2} \text{base} \times \text{height}$  }  $\frac{1}{2} \times 15 \times 7 = \frac{1}{2} AC \times 9$ ⇒  $AC = \frac{15 \times 7}{9} = \frac{35}{2}$  cm  $\Rightarrow$ Now, In  $\triangle ADC$ ,  $\angle ADC = 90^{\circ}$ So, Again from pythagoras theorem,  $DC^2 = AC^2 - AD^2$  $DC = \sqrt{\left(\frac{35}{3}\right)^2 - 7^2}$  cm =  $7 \cdot \sqrt{\frac{5^2}{3^2} - 1^2}$  cm  $= 7.\sqrt{\frac{25-9}{9}}$  cm  $= 7.\frac{4}{3}$  cm  $= \frac{28}{3}$  cm  $DC = \frac{28}{3}$  cm  $\Rightarrow$ SECTION - C 26. Let, unit digit = xtens digit = y& number = 10y + xthen, Also number obtained after interchanging its digit = 10x + yAccording to question, ...(i) x + y = 1410x + y - (10y + x) = 18 $\Rightarrow \qquad 9x - 9y = 18$ x - y = 2...(ii) From eqn (i) + (ii), we have x + y = 14x - y = 22x = 16

So, y = 14 - 8 = 6[from (i)] thus,

x = 8

Required number =  $10y + x = 10 \times 6 + 8 = 68$ 



#### Oswaal CBSE Chapterwise & Topicwise ONE for ALL MATHEMATICS (STANDARD), Class – 10



Given, OA = 10 cmAC & BD are diameters intersect at O hence O is centre OA = OB = OC = 10 cm $\Rightarrow$  $\angle AOB = 60^{\circ}$ &  $\angle ABO = \angle BAO = \frac{120^{\circ}}{2} = 60^{\circ}$  $\Rightarrow$ 

#### Outside Delhi Set-1

### SECTION - A

1. Option (B) is correct.  
Explanation: Given equation are  

$$3x - y + 8 = 0$$
  
 $6x - ky + 16 = 0$   
 $a_1 = 3, b_1 = -1, c_1 = 8$   
 $a_2 = 6, b_2 = -k, c_2 = 16$   
For Infinite many solution  
 $\frac{a_1}{a_2} = \frac{b_1}{b_2} = \frac{c_1}{c_2}$   
 $\Rightarrow \qquad \frac{3}{6} = \frac{-1}{-k} \Rightarrow \frac{1}{2} = \frac{1}{k}$   
 $\Rightarrow \qquad K = 2$ 

2. Option (C) is correct. *Explanation*: Let P(x, y) be the point We know that

$$x = \frac{m_1 x_2 + m_2 x_1}{m_1 + m_2}$$

$$5 : 2$$

$$A (4, -5) P(x, y) B(1, 2)$$

$$x = \frac{5 \times 1 + 2 \times 4}{5 + 2} \Rightarrow x = \frac{5 + 8}{7} = \frac{13}{7}$$

$$y = \frac{m_1 y_2 + m_2 y_1}{m_1 + m_2}$$

$$y = \frac{5 \times 2 + 2 \times (-5)}{5 + 2} = \frac{10 - 10}{7}$$

$$y = 0$$
(17)

Therefore, Coordinates of point  $P = \left(\frac{13}{7}, 0\right)$ 

#### 3. Option (A) is correct.

Explanation: Given  

$$a_{15} - a_{11} = 48$$
  
 $\Rightarrow a + 14d - a - 10d = 48$   
 $\Rightarrow 4d = 48 \Rightarrow d = 12$ 

4. Option (D) is correct. Explanation: Given equation is  $x^2 + x + 1 = 0$ 

 $[:: OA = OB \Rightarrow \angle OAB = \angle OBA]$ Hence,  $\Delta OAB$  = equilateral triangle AB = OA = OB = 10 cm(i) So (Sides of equilateral triangle) (ii) Area of shaded region = Sector area (OBPC) + [Sector area OAQB area of  $\triangle OAB$ ]  $= \left[\frac{120^{\circ}}{360^{\circ}} \times \pi \times 10^{2} + \frac{60^{\circ}}{360^{\circ}} \times \pi \times 10^{2} - \frac{\sqrt{3}}{4} \times 10^{2}\right] \text{cm}^{2}$  $= \left(\frac{180^{\circ}}{360^{\circ}} \times \pi \times 100 - \frac{\sqrt{3}}{4} \times 100\right) \mathrm{cm}^2$  $= \left(50\pi - \frac{\sqrt{3}}{4} \times 100\right) \mathrm{cm}^2$ =  $(50 \times 3.14 - 1.73 \times 25)$ cm<sup>2</sup> = 157 cm<sup>2</sup> - 43.25 cm<sup>2</sup> = 113.75 cm<sup>2</sup>

Hence, Required shaded area = 
$$113.75 \text{ cm}^2$$

30/2/1

Where 
$$a = 1, b = 1, c = 1$$
  
 $D = b^2 - 4ac$   
 $(1)^2 - 4 \times 1 \times 1$   
 $D = -3$   
Where  $D < 0$   
When  $D < 0$  roots are not-real.  
5. Option (A) is correct.  
Explanation: Given  
HCF = 40  
LCM = 252 \times k  
We know that  
LCM × HCF = Product of two number  
 $\Rightarrow 40 \times 252 \times k = 2520 \times 6600$   
 $\Rightarrow \qquad k = \frac{2520 \times 6600}{40 \times 252} \therefore k = 1650$ 

6. Option (C) is correct. Explanation: Given

=

$$AD = 5 \text{ cm}$$

$$B = 2.5 \text{ cm}$$

$$DB = 2.5 \text{ cm}$$

$$DB = 2.5 \text{ cm}$$

$$BC = 12 \text{ cm}$$

$$DE || BC$$

$$\Delta ABC \sim \Delta ADE$$

$$\frac{AD}{AB} = \frac{DE}{BC} \Rightarrow \frac{5}{7.5} = \frac{DE}{12}$$

$$\Rightarrow \frac{50}{75} = \frac{DE}{12} \Rightarrow \frac{2}{3} = \frac{DE}{12}$$

$$\therefore DE = 8 \text{ cm}$$
7. Option (C) is correct.  
Explanation: Given  

$$\sin \theta = \cos \theta$$

$$\Rightarrow \frac{\sin \theta}{\cos \theta} = 1$$

$$\Rightarrow \tan \theta = 1$$
  

$$\theta = \frac{\pi}{4}$$
  
then (sec  $\theta$  . sin  $\theta$ )  
Put  $\theta = \frac{\pi}{4}$   

$$\Rightarrow \sec \frac{\pi}{4} . \sin \frac{\pi}{4}$$
  

$$\Rightarrow \sqrt{2} . \frac{1}{\sqrt{2}} = 1$$

#### 8. Option (D) is correct.

Explanation: When two dice are rolled together then sample space

$$S = \{(1, 1) (1, 2) (1, 3)....(6, 6)\}$$
  

$$n(S) = 36$$
  
Sum of two numbers to be more than 10  

$$A = \{(6, 5) (5, 6) (6, 6)\}$$
  

$$n(A) = 3$$
  

$$\therefore P(A) = \frac{3}{36} = \frac{1}{12}$$

9. Option (C) is correct.

Explanation: Given equation is  $5x^2 + 3x - 7$ Here a = 5, b = 3, c = -7 $\alpha$ ,  $\beta$  are zero's of the polynomial. So, Sum of zero's  $= -\frac{b}{a}$  $\alpha + \beta = \frac{-b}{a}$ , Product of zero's =  $\frac{c}{a}$  $\alpha\beta = \frac{c}{a}$  $\alpha + \beta = \frac{-3}{5}, \alpha\beta = \frac{-7}{5}$  $\frac{1}{\alpha} + \frac{1}{\beta} = \frac{\alpha + \beta}{\alpha\beta} \Rightarrow \frac{\frac{-3}{5}}{\frac{-7}{5}} = \frac{3}{7}$ Find

#### 10. Option (B) is correct.

Explanation: The ratio of the corresponding sides of similar triangles is same as the ratio of their perimeter

$$\therefore \quad \Delta ABC \sim \Delta PQR \text{ or } \Delta PQR \sim \Delta ABC$$
  
$$\Rightarrow \quad \frac{PQ}{PQ} = \frac{QR}{PQ} = \frac{PR}{PQ} = \frac{48}{PQ} \Rightarrow \frac{PQ}{PQ} = -$$

$$\rightarrow$$
  $\overline{AB}$   $\overline{BC}$   $\overline{AC}$   $\overline{56}$   $\rightarrow$   $\overline{AB}$   $=$  7

#### 11. Option (D) is correct.

**Explanation**:

 $\angle APD = \angle CPB$ [vertically opposite angle]  $\angle ADP = \angle CBP$ 

[Angle subtends on the same segment] : AA similarity

6

 $\Delta ADP \sim \Delta CBP$ 

#### 12. Option (A) is correct.

Explanation: When value of each observation in data is increased by 2.

So, median of data is increases by 2



Explanation: Given, A box contains card numbered 6 to 55. Perfect square number are = 9, 16, 25, 36, 49  $S = \{6, 7, 8.....55\},\$ n(S) = 50 $\hat{A} = \{9, 16, 25, 36, 49\}$ n(A) = 5 $P(A) = \frac{5}{50} = \frac{1}{10}$  $\Rightarrow$ 14. Option (B) is correct. Explanation: Given PA = 5 cm $PA \perp PB$ ∠OAP [90°, AP is a tangent]  $\angle OBP [90^\circ, BP \text{ is a tangent}]$ So, APBO is square or  $\Delta$ APB is a Right angle Triangle AB<sup>2</sup> = AP<sup>2</sup> + PB<sup>2</sup>AB<sup>2</sup> = 2AP<sup>2</sup> $AB<sup>2</sup> = 2 \times 5<sup>2</sup>$ [AP = PB] $AB = 5\sqrt{2}$  cm ⇒

#### 15. Option (A) is correct.

13. Option (C) is correct.



We know that, Length of Diagonals are equal In Rectangle

$$\frac{ZO = YX}{\Rightarrow \sqrt{(x-0)^2 + (y-0)^2}} = \sqrt{(0+3)^2 + (4-0)^2}$$

$$\Rightarrow \sqrt{x^2 + y^2} = \sqrt{25}$$

$$\Rightarrow x^2 + y^2 = 5$$
Both Diagonal are 5 units
OR
$$(ZO)^2 = (ZX)^2 + (XO)^2$$

$$(ZO)^2 = 4^2 + 3^2$$

$$(ZO)^2 = 25$$

$$ZO = 5$$
Again  $(YX)^2 = (YO)^2 + (XO)^2$ 

in 
$$(YX)^2 = (YO)^2 + (YX)^2 = 4^2 + 3^2$$
  
 $(YX)^2 = 25$   
 $YX = 5$ 

16. Option (B) is correct. Explanation: Given a = -29

$$d = -26 - (-29) = -26 + 29 = 3 d = 3$$

$$a_n = 16$$

Here we know

40

$$a_n = a + (n-1)d$$

$$\Rightarrow 16 = -29 + (n-1)3$$

$$\Rightarrow \frac{16+29}{3} = n-1$$

$$\Rightarrow 15 = n-1$$

$$\therefore n = 16$$
**17. Option (D) is correct.**  
*Explanation:* Given  

$$\angle CAT = 40^{\circ}$$
Find  $\angle CBA$   

$$\angle BAT = 90^{\circ}$$

$$\Rightarrow \angle BAC + \angle CAT = 90^{\circ}$$

$$\Rightarrow \angle ACB = 90^{\circ}$$
[Angle in semi-circle]  
In  $\triangle ABC$   

$$\angle A + \angle B + \angle C = 180^{\circ}$$

$$50^{\circ} + \angle B + 90^{\circ} = 180^{\circ}$$

$$\angle B = 180^{\circ} - 140^{\circ}$$

$$\angle B = 40^{\circ}$$

18. Option (B) is correct. *Explanation*: Mode = The Most Common or (Maximum). Number that appears in your set of data.

#### 19. Option (A) is correct.

*Explanation*: Given,  $\sin A = \frac{1}{3}$ 

Here,

$$\sin A = \frac{\text{Perpendicular}}{\text{Hypotenuse}}$$

We know that 
$$H^2 = P^2 + B^2$$
  
 $\Rightarrow \qquad (3)^2 = (1)^2 + B^2$   
 $\Rightarrow \qquad 9 - 1 = B^2$   
 $B = 2\sqrt{2}$   
 $\cos A = \frac{Base}{Hypotenuse}$   
 $\cos A = \frac{2\sqrt{2}}{3} \rightarrow True$ 

#### Reason

When  $\theta$  is equal then  $\sin^2\theta + \cos^2\theta = 1$  $H^2 = P^2 + B^2$  $\Rightarrow$  $\frac{H^2}{H^2} = \frac{P^2}{H^2} + \frac{B^2}{H^2}$  $\Rightarrow$  $[1 = \sin^2 \theta + \cos^2 \theta] \rightarrow \text{True}$  $\Rightarrow$ 20. (D) Explanation: Given Edge of cube = 10 cmIn cube length = Breadth = Height When join two cube New length is = 20 cmheight = 10 cmwidth = 10 cmIt convert in cuboid Total surface Area of cuboid = 2(lb + bh + hl) $= 2[20 \times 10 + 10 \times 10 + 10 \times 20]$ = 2[200 + 100 + 200] $= 2[500] = 1000 \text{ cm}^2$ 

Assertion is wrong. Reason Area of each surface =  $10 \times 10 \text{ cm}^2$  $= 100 \text{ cm}^2$ Reason is true. **SECTION - B 21.** If  $15^{15}$  ends with 0 or 5, then it must have 5 as a factor. But only prime factors of 15 are 3 and 5.  $\therefore 15^n = (5 \times 3)n = 3^n \times 5^n$ From the fundamental theorem of arithmetic, the prime factorization of every composite number is

unique.  $\therefore 15^n$  can never end with 0 or 5.

#### **22.** Given

Vertices of a triangle



Distance of

 $\Rightarrow$ 

 $\Rightarrow$  $\Rightarrow$ 

 $\Rightarrow$ 

$$AB = \sqrt{(1+5)^2 + (0-0)^2}$$

$$\Rightarrow AB = 6$$
  
Distance of  
$$AC = \sqrt{(1+2)^2 + (0-5)^2}$$
$$\Rightarrow AC = \sqrt{9+25}$$
$$\Rightarrow AC = \sqrt{34}$$

$$\Rightarrow \text{Distance of BC}$$

$$BC = \sqrt{(-2+5)^2 + (5-0)^2}$$

$$= \sqrt{9+25}$$

$$\Rightarrow BC = \sqrt{34}$$

When two sides are equal, isosceles triangle is form. **23.** (a)  $2 \sin^2 30^\circ \sec 60^\circ + \tan^2 60^\circ$ 

$$= 2\left(\frac{1}{2}\right)^{2} \times 2 + \left(\sqrt{3}\right)^{2}$$

$$= 2 \times \frac{1}{4} \times 2 + 3$$

$$= 1 + 3 = 4$$
OR
(b)  $2 \sin (A + B) = \sqrt{3}$ 

$$\Rightarrow \sin(A + B) = \frac{\sqrt{3}}{2}$$

$$\Rightarrow \sin(A + B) = \sin 60$$

$$A + B = 60$$

$$\cos(A - B) = 1$$

$$\cos(A - B) = \cos 0$$

$$A - B = 0$$
...(ii)

Adding (i) and (ii)  

$$2A = 60$$
  
 $A = 30^{\circ}$   
From (i)  
 $30 + B = 60$   
 $B = 30^{\circ}$   
 $\angle A = 30^{\circ}, \angle B = 30^{\circ}$   
**24.** Tangent to a circle from an external point are equal  
 $RA = RC$ 



So,

 $\angle RAC = \angle RCA$ Let  $\angle RAC = \angle RCA = x$ We know that BAR and DCR are straight line.  $\angle BAC + \angle CAR = RC$  $\Rightarrow$  $\angle BAC + x = 180$  $\angle BAC = 180 - x$  $\Rightarrow$ Similarly,  $\angle DCA = 180 - x$  $\angle BAC = \angle DCA$ So 25. (a) When the line segment

А	Κ		1	В
(3, –5)		Р		(-1, 6)

Let Ratio

 $m_1: m_2 = K: 1$ 

Let Co-ordinate of P(x, y) divide the line segment in the ratio K:1

$$x = \frac{m_1 x_2 + m_2 x_1}{m_1 + m_2}, \ y = \frac{m_1 y_2 + m_2 y_1}{m_1 + m_2}$$
$$x = \frac{K(-1) + 1 \times 3}{K+1}, \ y = \frac{K \times 6 - 1 \times 5}{K+1}$$
$$x = \frac{-K+3}{K+1}, \ y = \frac{6K-5}{K+1}$$

Given line y = xPut value of x and y in the equ. of line -K + 3 6K - 5

$$\frac{K+1}{K+1} = \frac{K+1}{K+1}$$

$$\Rightarrow -K+3 = 6K-5$$

$$\Rightarrow -K-6K = -5-3$$

$$7K = 8$$

$$K = \frac{8}{7}$$

(b) A(3, 0), B(6, 4) and C(− 1, 3) are vertices of △ABC and E on AC



A median of a triangle is a line segment that connects a vertex to the midpoint of the opposite side.  $\therefore$  *E* is mid point of *AC* Co-ordinate of *E* 

$$\left(\frac{-1+3}{2}, \frac{0+3}{2}\right) = \left(1, \frac{3}{2}\right)$$

Distance of BE is

$$BE = \sqrt{(6-1)^2 + \left(4 - \frac{3}{2}\right)^2} \\ = \sqrt{5^2 + \left(\frac{5}{2}\right)^2} \\ = \sqrt{25 + \frac{25}{4}} \\ = \sqrt{\frac{125}{4}} \\ = \frac{5\sqrt{5}}{2}$$

26. (a) Given:

$$S_m = S_n$$
Show:
$$S_{(m+n)} = 0$$

Let the A.P. be denoted as *a*<sub>1</sub>, *a*<sub>2</sub>, *a*<sub>3</sub>,....*a*<sub>n</sub>.....

With common difference *d*.

$$S_m = \frac{m}{2} [2a_1 + (m-1)d]$$
$$S_n = \frac{n}{2} [2a_1 + (n-1)d]$$

Given both are equal

$$\begin{aligned} &\frac{m}{2}[2a_1 + (m-1)d] = \frac{n}{2}[2a_1 + (n-1)d] \\ \Rightarrow &\frac{1}{2}[2a_1m + (m-1)md] = \frac{1}{2}[2a_1n + (n-1)nd] \\ \Rightarrow &\frac{1}{2}[2a_1m + m^2d - md] - \frac{1}{2}[2a_1n + n^2d - nd] = 0 \\ \Rightarrow &\frac{1}{2}[2a_1m - 2a_1n + m^2d - n^2d - md + nd] = 0 \\ \Rightarrow &\frac{1}{2}[2a_1(m-n) + d(m^2 - n^2) - d(m-n)] = 0 \\ \Rightarrow &\frac{1}{2}(m-n)[2a_1 + (m+n-1)d] = 0 \\ &\frac{2a_1 = -[m+n-1]d...(i)}{2a_1} \end{aligned}$$

#### Oswaal CBSE Chapterwise & Topicwise ONE for ALL MATHEMATICS (STANDARD), Class – 10

Sum of the first (m + n) term of the given A.P.

$$S_{m+n} = \frac{m+n}{2} [2a_1 + (m+n-1)d]$$
 ...(ii)

Put (i) in (ii)

$$\Rightarrow \qquad S_{m+n} = \frac{m+n}{2} [-(m+n-1)d + (m+n-1)d]$$

OR

(b)

Three consecutive term are 
$$a - d$$
,  $a$ ,  $a + d$   
Given, Sum of three consecutive = 24  
 $a - d + a + a + d = 0$   
 $\Rightarrow \qquad 3a = 24$   
 $a = 8$  ...(i)  
 $(a - d)^2 + a^2 + (a + d)^2 = 194$   
 $\Rightarrow a^2 + d^2 - 2ad + a^2 + a^2 + d^2 + 2ad = 194$   
 $\Rightarrow \qquad 3a^2 + d^2 = 194$   
 $\Rightarrow \qquad 3 \times 64 + d^2 = 194$   
 $d^2 = 194 - 192$   
 $d^2 = 2$   
 $d = \pm \sqrt{2}$ 

The Number  $8 \pm \sqrt{2}, 8, 8 \mp \sqrt{2}$ 

 $S_{m+n} = 0$ 

27. If possible, let  $\sqrt{5}$  be rational and let its simplest

form be  $\frac{p}{p}$ . q

Then p and q are integers having no common factor other than 1, and  $q \neq 0$ 

Now 
$$\sqrt{5} = \frac{p}{q}$$
  
 $\Rightarrow \qquad 5 = \frac{p^2}{q^2}$  [on squaring both sides]  
 $\Rightarrow \qquad 5q^2 = p^2$  ...(i)  
 $\Rightarrow 5 \text{ divides } p^2$ 

 $\Rightarrow$  5 divides *p* 

[:: 5 is prime and 5 divides  $p^2 \Rightarrow 5$  divides p] Let p = 5R for some integer R Putting p = 5R in (i), we get  $5q^2 = 25R^2$  $q^2 = 5R^2$  $\Rightarrow$ 

$$\begin{array}{ll} \Rightarrow 5 \text{ divides } q^2 & [\because 5 \text{ divides } 5k^2] \\ \Rightarrow 5 \text{ divides } q & [\because 5 \text{ divides } q] \\ \text{Thus, 5 is a common factor of } p \text{ and } q. \text{ But, this} \end{array}$$

contradicts the fact that p and q have no common factor other than 1. Hence,  $\sqrt{5}$  is irrational.

 $\Rightarrow$ 



(::  $\angle BAQ = 30^{\circ}$ given) As *AB* is a diameter, *AQB* is a Semicircle.  $\angle AQB = 90^{\circ}$ (angle in semicircle =  $90^{\circ}$ ) From Fig.  $\angle AQP = \angle AQB + \angle BQP$  $\angle AQP = 90^{\circ} + 30^{\circ}$  $\Rightarrow$  $= 120^{\circ}$ In  $\triangle AQP$ ,  $\angle QPA + \angle BAQ + \angle AQP = 180^{\circ}$  $\Rightarrow$  $\angle QPA + 30^{\circ} + 120^{\circ} = 180^{\circ}$  $\Rightarrow$  $\angle QPA = 180 - (30^{\circ} + 120^{\circ})$  $\Rightarrow$  $\angle QPA = 30^{\circ}$ ...(ii) From (i) and (ii) we get  $\angle BQP = \angle QPB = 30^{\circ}$ Therefore, QB = BPOR

(b) Given A quad. ABCD circumscribes a circle with centre O.



To Prove

and

$$\angle AOB + \angle COD = 180^{\circ}$$
$$\angle AOD + \angle BOC = 180^{\circ}$$

Join OP, OQ, OR and OS.

We know that the tangent drawn from an external point of a circle subtends equal angles at the centre.

$$\therefore \qquad \angle 1 = \angle 2,$$
  

$$\angle 3 = \angle 4,$$
  

$$\angle 5 = \angle 6,$$
  

$$\angle 7 = \angle 8,$$
  
And 
$$\angle 1 + \angle 2 + \angle 3 + \angle 4 + \angle 5 + \angle 6 + \angle 7 + \angle 8$$
  

$$= 360^{\circ} \quad [\angle S \text{ at a Point}]$$
  

$$\Rightarrow 2(\angle 2 + \angle 3) + 2(\angle 6 + \angle 7) = 360^{\circ}$$
  

$$2(\angle 1 + \angle 8) + 2(\angle 4 + \angle 5) = 360^{\circ}$$
  

$$\Rightarrow \qquad \angle 2 + \angle 3 + \angle 6 + \angle 7 = 180^{\circ}$$
  

$$\angle 1 + \angle 8 + \angle 4 + \angle 5 = 180^{\circ}$$
  

$$\Rightarrow \qquad \angle AOB + \angle COD = 180^{\circ}$$
  

$$\angle AOD + \angle BOC = 180^{\circ}$$

**29.** 
$$\sec^2\theta - \tan^2\theta = 1$$

...(i)

$$(\sec \theta - \tan \theta)(\sec \theta + \tan \theta) = 1$$
L.H.S
$$= \frac{(\sec \theta - \tan \theta)(\sec \theta + \tan \theta) + (\sec \theta - \tan \theta)}{1 + \sec \theta + \tan \theta}$$

$$= \frac{(\sec \theta - \tan \theta)[\sec \theta + \tan \theta + 1]}{[1 + \sec \theta + \tan \theta]}$$

$$= \sec \theta - \tan \theta$$

$$= \frac{1}{\cos \theta} - \frac{\sin \theta}{\cos \theta}$$

$$= \frac{1 - \sin \theta}{\cos \theta}$$
L.H.S = R.H.S Hence Proved.

30.

Marks obtained	Number of Students $f_i$	x <sub>i</sub>	<i>x<sub>i</sub></i> – 25	u <sub>i</sub> f <sub>i</sub>
0–10	12	5	- 20	- 240
10-20	23	15	- 10	- 230
20-30	34	25	0	0
30-40	25	35	10	250
40–50	6	45	20	120
	100			- 100

Let assumed mean = 25

 $u_i = x_i - 25$ Short cut method

 $\overline{x} = a + \sum \frac{u_i f_i}{f_i}$  $= 25 + \frac{(-100)}{100}$  $\begin{array}{c} = 25 - 1 \\ \overline{x} = 24 \end{array}$ 

**31.** Let the digit in ten's place be *x*. Then the one's place digit will be x - 5The product of two digit = 36x(x-5) = 36

$$x^{2}-5x-36 = 0$$
  

$$\Rightarrow x^{2}-9x+4x-36 = 0$$
  

$$\Rightarrow (x-9)(x+4) = 0$$
  

$$x = 9, -4$$
  
No = 04

No. = 
$$94$$
  
SECTION – D

**32.** (a) 
$$3x + y + 4 = 0$$
  $3x - y + 2 = 0$ 



(b) Let *x* be the number of Right Answer *y* be the number of wrong Answer : According to the question, 3x - y = 404x - 2y = 50...(i) ...(ii) Multiply with 2 in eq. (i) 6x - 2y = 804x - 2y = 50...(iii) ...(iv) 2x = 30x = 15Putting the value of *x* in eqn. (i)  $3 \times 15 - y = 40$ -y = 40 - 45



33. (a) Given: A  $\triangle ABC$  in which DE ||BC and DEintersects AB and AC at D and



Join BE and CD. Draw EL  $\perp$  AB and DM  $\perp$  AC.

We have,

$$ar(\Delta ADE) = \frac{1}{2} \times AD \times EL \quad \left[ \therefore \Delta = \frac{1}{2}B \times H \right]$$
  
and 
$$ar(\Delta DBE) = \frac{1}{2} \times DB \times EL$$
  
$$\therefore \quad \frac{ar(\Delta ADE)}{ar(\Delta DBE)} = \frac{\frac{1}{2} \times AD \times EL}{\frac{1}{2} \times DB \times EL}$$
  
$$= \frac{AD}{DB} \qquad \dots(i)$$

Similarly

*.*..

$$ar(\Delta ADE) = ar(\Delta ECD)$$
$$= \frac{1}{2} \times AE \times DM$$

=

and  $ar(\Delta ECD)$ 

$$\therefore \qquad \frac{ar(\Delta ADE)}{ar(\Delta ECD)} = \frac{AE}{EC} \qquad \dots (ii)$$

Now  $\triangle DBE$  and  $\triangle ECD$  being on the same base DE and between the same parallel DE and BC  $ar(\Delta DBE) = ar(\Delta ECD)$ 

OR

$$\frac{AD}{DB} = \frac{AE}{EC}$$

(b) We have



Oswaal CBSE Chapterwise & Topicwise **ONE** for **ALL** MATHEMATICS (STANDARD), Class – 10

$$= \frac{\frac{1}{2}BC}{\frac{1}{2}QR} = \frac{BD}{QM} \qquad \dots (i)$$

In  $\triangle ABD$  and  $\triangle PQM$ , we have

$$\frac{AB}{PQ} = \frac{AD}{PM} = \frac{BD}{QM}$$
 from (i)

 $\begin{array}{ll} \therefore & \Delta ABD \sim \Delta PQM & [by SSS-Similarity] \\ And So, & \angle B = \angle Q \\ [Corresponding angles of similar triangles are equal] \end{array}$ 

Now, in  $\triangle ABC$  and  $\triangle PQR$  we have

and 
$$\frac{AB}{PQ} = \frac{BC}{QR}$$
 [Frowed above]



Given : Height of a light house AB = 45 m To find: CD = ?Sol: Distance between the ships = CD $\angle ACB = 30^{\circ}$  and  $\angle ADB = 60^{\circ}$ (alternate angles are equal) Now, In right angle  $\triangle ABC$  $\tan 30 = \frac{AB}{2}$ 

$$\frac{1}{\sqrt{3}} = \frac{45}{BC}$$
$$BC = 45\sqrt{3} \qquad \dots(i)$$

In right angle  $\triangle ABD$ ,

$$\tan 60^\circ = \frac{AB}{BD}$$
$$\sqrt{3} = \frac{45}{BD}$$
$$BD = \frac{45 \times \sqrt{3}}{\sqrt{3} \times \sqrt{3}} = \frac{45\sqrt{3}}{3} = 15\sqrt{3}$$

From (i) and (ii) we get,

$$BD = BC + BD$$
  
=  $45\sqrt{3} + 15\sqrt{3} = 60\sqrt{3}$   
=  $60 \times 1.73$   
=  $103.8$  m  
35. Let the radius of circle be *r* and the arc length is *l*  
Perimeter of a sector is given as. [ $\because l = r\theta$ ]

$$P = 2r + r\theta \qquad r = 5.6 \text{ m}$$

$$P = 20 \text{ m}$$

$$[\because \text{ I radian} = \frac{180}{\pi} \text{ degree } \pi = \frac{22}{7}]$$

$$\theta = \frac{11}{7} \times \frac{180}{\pi} \text{ degree}$$
  

$$\theta = 90^{\circ} \text{ degree}$$
  
Area of sector 
$$= \frac{\theta}{360} \times \pi r^{2}$$
  

$$= \frac{90}{360^{\circ}} \times \frac{22}{7} \times 5.6 \times 5.6$$
  

$$= \frac{1}{4} \times \frac{22}{7} \times 5.6 \times 5.6 = \frac{689.92}{28}$$
  
Area 
$$= 24.64 \text{ m}^{2}$$

36. (i) Two

37.

[The point at which curve touch the *x*-axis is zero's] Here, x = 0, 5(ii) Given

**SECTION - E** 

$$h = 25t - 5t^{2}$$
Maximum height at a point  $\left(\frac{5}{2}, 0\right)$ 

$$h = 25 \times \frac{5}{2} - 5\left(\frac{5}{2}\right)^{2}$$

$$= \frac{125}{2} - \frac{125}{4}$$

$$= 62.5 - 31.25$$

$$h = 31.25$$
(iii) (a) Ball take time to reach height 30 m  
 $30 = 25t - 5t^{2}$   
 $5t^{2} - 25t + 30 = 0$   
 $\Rightarrow t^{2} - 5t + 6 = 0$   
 $\Rightarrow t^{2} - 3t - 2t + 6 = 0$   
 $(t - 3)(t - 2) = 0$   
 $t = 3, 2$   
**OR**  
(b) when height is  $= 20$  m  
 $20 = 25t - 5t^{2}$   
 $\Rightarrow 5t^{2} - 25t + 20 = 0$   
 $\Rightarrow t^{2} - 5t + 4 = 0$   
 $t^{2} - 4t - t + 4 = 0$   
 $(t - 4)(t - 1) = 0$   
 $t = 4, 1$   
Given  
Cylindrical height  $= 8$  m  
Diameter of base  $= 28$  m  
Total height of tent  $= 18.5$  m  
(i) Radius  $= 14$  m  
(Slant height)^{2} = (Height)^{2} + (Radius)^{2}



 $l^2 = (10.5)^2 + (14)^2$ = 110.25 + 196 $l^2 = 306.25$ l = 17.5 m(ii) Floor Area of Tent is  $= \pi r^2$  $=\frac{22}{7}\times14\times14$  $= 22 \times 7 \times 14$ Area = 616 m<sup>2</sup> (iii) (a) Area of cloth used for making tent.  $= 2\pi rh \times \pi lr$  $=2\pi r[h+l]$  $= 2 \times \frac{22}{7} \times 14[8 + 17.5]$  $= 2 \times 22 \times 2[25.5] \\= 88 \times 25.5$  $= 2244 \text{ m}^2$ OR (b) Total volume Inside the Test  $= \pi r^2 h + \frac{1}{2} \pi r^2 h$  $=\pi r^2 \left(h+\frac{1}{3h}\right)$  $=\frac{22}{7} \times 14 \times 14 \left(8 + \frac{1}{3} \times 10.5\right)$  $= 22 \times 2 \times 14(8 + 3.5)$  $= 616 \times 11.5$  $= 7084 \text{ cm}^3$ No. of favourable outcomes **38.** P(A) =Total no. of outcomes (i) Given Bus + Ship = 33 + 36 $= 69^{\circ}$ 

#### **Outside Delhi Set-2**



(Bus or ship) =  $\frac{69^{\circ}}{360} \times 120$ Total person on Bus or Ship = 23 people  $P(A) = \frac{23}{2}$ *.*.. 120 A = he/she travelled by bus or ship (ii) Car is most favourite mode of transport No. of people =  $\frac{177}{360} \times 120$ = 59 people (iii) (a) Probability that he did not use train is  $\frac{4}{5}$ Probability that people use train is  $\frac{1}{5}$  $[\because P(A) + P(\overline{A}) = 1]$ No. of people who used train  $\frac{1}{5} \times 120$ = 24 people OR (b) Given Probability that randomly selected person used aeroplane is  $\frac{7}{60}$ Total No. of people =  $\frac{7}{60} \times 120$ = 14 people Revenue collected by air is  $= 14 \times 5000$ 

 $Total = 360^{\circ}$ 

we know

= 14 × 5000 = ₹ 70,000

30/2/2

$$\alpha + \beta = \frac{9}{2}$$

$$\alpha\beta = \frac{5}{2}$$

$$\alpha^{2} + \beta^{2} = (\alpha + \beta)^{2} - 2\alpha\beta$$

$$= \left(\frac{9}{2}\right)^{2} - 2 \times \frac{5}{2}$$

$$= \frac{81}{4} - 5$$

$$= \frac{61}{4}$$

13. Option (D) is correct. Explanation:  $p(x) = 5x^2 - 4x + (2 + k)$  p(2) = 0  $5(2)^2 - 4(2) + 2 + k = 0$  20 - 8 + 2 + k = 0k = -14

*Explanation*: 1 + 2 + 3 + ... + 200

$$S_n = \frac{n(n+1)}{2} = \frac{200(200+1)}{2}$$
$$= 20100$$

 $= (1)^3 - 3\sin^2\theta\cos^2\theta (1)$ 

 $= 1 - 3 \sin^2 \theta \cos^2 \theta$ DIIC



$$BD = \sqrt{\frac{145}{4}} = \frac{\sqrt{145}}{2}$$
 units

#### SECTION - C

**28.** Let the three consecutive no. be x, x + 1 and x + 2 $(x+1)^2 + x(x+2) = 161$  $\Rightarrow x^2 + 2x + 1 + x^2 + 2x - 161 = 0$  $2x^2 + 4x - 160 = 0$  $\Rightarrow$  $x^2 + 2x - 80 = 0$  $\Rightarrow$  $x^2 + 10x - 8x - 80 = 0$  $\Rightarrow$ x(x+10) - 8(x+10) = 0 $\Rightarrow$ (x+10)(x-8) = 0 $\Rightarrow$ x + 10 = 0If x = -10It is not natural number If x - 8 = 0x = 8: Consecutive no.s are 8, 9 and 10. **31.** L.H.S.  $\sin^6\theta + \cos^6\theta$  $= (\sin^2\theta)^3 + (\cos^2\theta)^3$  $= (\sin^2\theta + \cos^2\theta)^3 - 3\sin^2\theta\cos^2\theta(\sin^2\theta + \cos^2\theta)$  $[a^3 + b^3 = (a + b)^3 - 3ab(a + b)]$ 

(a) Sin<sup>2</sup>θ + cos<sup>2</sup>θ = 1)  
= R.H.S. (sin<sup>2</sup>θ + cos<sup>2</sup>θ = 1)  
= R.H.S. Hence Proved  
**SECTION - D**  
**32.** Let the speed of an aircraft be x m/s.  

$$\int \frac{B}{\sqrt{30^{\circ}}} \frac{30 \text{ s}}{P} \frac{C}{Q}$$
Distance = Speed × time  
= x × 30  
BC = 30x m  
In ΔAPB, tan  $A = \frac{BP}{AP}$   
tan  $60^{\circ} = \frac{3500\sqrt{3}}{AP} = \sqrt{3}$   
 $\therefore AP = 3500 \text{ m}$   
In ΔACQ, tan  $A = \frac{CQ}{AQ}$   
tan  $30^{\circ} = \frac{3500\sqrt{3}}{3500 + 30x}$   
 $\frac{1}{\sqrt{3}} = \frac{3500\sqrt{3}}{3500 + 30x}$   
 $10500 - 3500 = 7000 = 30x$   
 $\therefore x = \frac{700}{30}$   
 $\frac{700}{3} = \frac{700}{3} \text{ m/s}$   
 $= \frac{700}{3} \times \frac{18}{5} \text{ km/h}$   
 $= 140 × 6 \text{ km/h}$   
 $\therefore$  Speed aircraft = 840 km/h

**33.** Let the length of rectangle be x m and breadth of rectangle be *y* m Area of rectangle =  $r_{1}$  m<sup>2</sup>

Area of rectangle = 
$$xy$$
 iff  
 $(x-5)(y+2) = xy - 80$   
 $xy - 5y + 2x - 10 = xy - 80$   
 $2x - 5y = -70$  ...(i)  
 $(x + 10)(y - 5) = xy + 50$   
 $xy - 5x + 10y - 50 = xy + 50$   
 $-5x + 10y = 100$   
 $-x + 2y = 20$  ...(ii)  
 $2x - 5y = -70$  ...(i)  
from (i) & (ii)  $x = 40$  m,  $y = 30$  m  
 $\therefore$  length of rectangle = 40 m  
and breadth of rectangle = 30 m

### Outside Delhi Set-3

Note: Except these, all other questions have been given in Outside Delhi Set-1 & 2 SECTION - A 1. Option (B) is correct. *Explanation:*  $d = \left| \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2} \right|$  $= \left| \sqrt{\left( a \sin \theta - a \cos \theta \right)^2 + \left( a \cos \theta + a \sin \theta \right)^2} \right|$  $= |\sqrt{a^2 \sin^2 \theta + a^2 \cos^2 \theta - 2a^2 \sin \theta \cos \theta + a^2 \cos^2 \theta + a^2 \sin^2 \theta + a^2 \cos^2 \theta + a^2 \cos^2$  $+a^2\sin^2\theta+2a^2\sin\theta\cos\theta$  $= \left| \sqrt{2a^2(\sin^2\theta + \cos^2\theta)} \right|$  $= |\sqrt{2a^2}|$  $=\sqrt{2}a$  units 8. Option (C) is correct. *Explanation*:  $4x^2 - 5x + 4$  $D = \sqrt{25 - 64} = \sqrt{-39} < 0$ Discriminant :. Roots are not real 9. Option (A) is correct. *Explanation:*  $a_{20} - a_{15} = 20$ a + 19d - a - 14d = 205d = 20d = 412. Option (C) is correct. *Explanation:*  $-x^2 + 8x + 9$  $\alpha+\beta\,=\,\frac{-8}{-1}\,=8$  $\alpha.\beta = \frac{9}{-1} = -9$  $\begin{aligned} (\alpha-\beta)^2 &= (\alpha+\beta)^2 - 4\alpha\beta \\ &= 64 + 36 = 100 \end{aligned}$  $\alpha - \beta = \sqrt{100} = \pm 10$ *:*.. SECTION – B 23. γ В **→** X X Ο A In ∆OAB OA = OB Equal radii As,  $\angle OBA = \angle OAB = 45^{\circ}$ Now, In triangle *OCB*  $\sin B = \frac{OC}{OB}$  $\sin 45^\circ = \frac{OC}{7}$ 

$$\frac{1}{\sqrt{2}} = \frac{OC}{7}$$
$$OC = \frac{7}{\sqrt{2}}$$
$$= \frac{7\sqrt{2}}{2} \text{ cm}$$

*:*..

- **25.** For a number to end with digit 0 its prime factorisation should have 2 and 5 as a common factor  $(8)^n = (2^3)^n = (2^{3n})$ 
  - $8^n$  does not have 5 in its prime factorisation.  $\therefore 8^n$  can not end with the digit 0

#### SECTION - C

26. L.H.S. = 
$$\frac{\csc^2 \theta - \sec^2 \theta}{\csc^2 \theta + \sec^2 \theta}$$
  
= 
$$\frac{1 + \cot^2 \theta - 1 - \tan^2 \theta}{1 + \cot^2 \theta + 1 + \tan^2 \theta}$$
  
= 
$$\frac{\cot^2 \theta - \tan^2 \theta}{2 + \cot^2 \theta + \tan^2 \theta}$$
  
= 
$$\frac{7 - \frac{1}{7}}{2 + \frac{1}{7} + 7}$$
  
= 
$$\frac{49 - 1}{\frac{7}{63 + 1}}$$
  
= 
$$\frac{48}{64}$$
  
= 
$$\frac{3}{4}$$
  
= R.H.S. Hence Proved  
30. Let the cost price be ₹ x  
Selling price = ₹ 75  
Gain = 75 - x  
Given, 
$$\frac{75 - x}{x} = \frac{x}{100}$$
  

$$7500 - 100x = x^2$$
  

$$x^2 + 100x - 7500 = 0$$
  

$$x(x + 150) - 50(x + 150) = 0$$
  

$$(x + 150)(x - 50) = 0$$
  
if  $x + 150 = 0$   
 $x = -150$  Not possible  
(price cannot be negative)  
 $x - 50 = 0$   
 $x = 50$   
 $\therefore$  Cost price be ₹ 50

**47** 30/2/3



Let the height of the tower (PD) be *h* m and width of the river (AD) be x m

In  $\Delta AOD$ ,

$$\tan A = \frac{PD}{AD}$$
$$\tan 60^\circ = \frac{h}{x}$$
$$\sqrt{3} = \frac{h}{x}$$
$$h = x\sqrt{3} \qquad \dots(i)$$

In  $\Delta DBP$ ,

$$\tan B = \frac{PD}{BD}$$
$$\tan B = \frac{h}{x+30}$$
$$\frac{1}{\sqrt{3}} = \frac{h}{x+30}$$
$$x + 30 = \sqrt{3}h$$
$$x + 30 = 3x$$
$$x = 15 \text{ m}$$
$$\therefore \text{ width of the river 15 m}$$
from (i) 
$$h = x\sqrt{3}$$

from (i)

∴ Height of the tower is 25.98 m





(b) Let the greater no. be *x* and smaller no. be *y* 3x = 4y + 3Given, ...(i) By using:  $Dividend = Divisor \times Quotient + Remainder.$ 7y = 5x + 1...(ii) Multiply by eqn (i) by 5 and (ii) by 3 15x - 20y = 15...(iii) -15x + 21y = 3...(iv) 21y - 5 y = 18  $x = \frac{18 \times 4 + 3}{3} = \frac{75}{3} = 25$ On adding from eqn (i) Greater number = 25Smallest number = 18

## UNIT – I NUMBER SYSTEMS



## REAL NUMBERS

## REVISION NOTES

Fundamental Theorem of Arithmetic: Fundamental theorem of Arithmetic states that "Every composite number can be expressed as a product of primes and this factorisation is unique, apart from the order in which the prime factors occur".

It is also known as a **Unique Factorisation Theorem**.

i.e., Composite number = Product of prime numbers

```
OR
```

Any integer greater than 1 can either be a prime number or can be written as a unique product of prime numbers.

(i)  $2 \times 11 = 22$  is same as  $11 \times 2 = 22$ 

(ii) 6 can be written as  $2 \times 3$  or  $3 \times 2$ , where 2 and 3 are prime numbers.

(iii) 15 can be written as  $3 \times 5$  or  $5 \times 3$ , where 3 and 5 are prime numbers.

☑ *Note:* The prime factorisation of a natural number is unique, except to the order of its factors.

**e.g.**,: 12 obtained by multiplying the prime numbers 2, 2 and 3 together,

 $12 = 2 \times 2 \times 3$ We would probably write it as  $12 = 2^2 \times 3$ 

#### > Prime factorisation method to find *HCF* and *LCM*:

By using fundamental Theorem of Arithmetic, we shall find the *HCF* and *LCM* of given numbers (two or more). This method is known as prime factorisation method. The steps to find *LCM* and *HCF* of two given numbers by prime factorisation method are given below: **Step 1.** Find all the prime factors of given numbers.

**Step 1.** *Hitt all the plane lactors of given numbers.* **Step 2.** *HCF* of two or more numbers = product of the smallest power of each common prime factor, involved in the numbers.

**Step 3.** *LCM* of two or more numbers = Product of the greatest power of each prime factor, involved in the numbers.

Relation between HCF and LCM: For two positive integers a and b, we have HCF (a, b) × LCM (a, b) = a × b

Or, 
$$HCF(a, b) = \frac{a \times b}{LCM(a, b)}$$
  
and  $LCM(a, b) = \frac{a \times b}{a \times b}$ 

nd 
$$LCM(a, b) = \frac{u \times b}{HCF(a, b)}$$

#### **MNEMONICS**

#### Concept: Prime factorization

Mnemonics: Prince Nathan has seen High & Low Marks.

Interpretation:

÷.

 $\mathbf{P} \rightarrow \mathbf{P}$ roduct

 $N \rightarrow N$ umbers

**High**  $\rightarrow$  **Hig**hest Common Factor (HCF)

- Low  $\rightarrow$  Lowest Common Multiple (LCM)
- Example 1: If the *HCF* and *LCM* of two numbers are 9 and 360, respectively. If one number is 45, find the other number. [CBSE SQP- 2019]
   Sol. Since, *HCF* × *LCM* = Product of two numbers 1

$$9 \times 360 = 45 \times \text{II number}$$

II number = 
$$\frac{9 \times 360}{45} = 72$$
 1

Prime Number: A prime number is a whole number greater than 1 whose only factors are 1 and number itself.

e.g., 2, 3, 5, 11, 13, 17, 19, 23, 29 etc.

2 is the smallest prime number. It is the only even prime number.

Composite Number: The numbers (greater than 1) that are not prime are composite numbers. They are divisible by 1, by itself and by other numbers.
e.g., 4, 6, 8, 10, 12 are composite numbers.

**Pational Numbers:** Pational numbers are in

▶ **Rational Numbers:** Rational numbers are in the form of  $\frac{p}{q}$ , where *p* and *q* can be any integer and *q* ≠ 0. This means

q, where p and q can be any integer and  $q \neq 0$ . This means q

that rational numbers include natural numbers, whole numbers, integers, fractions of integers, and decimals (terminating decimals and recurring decimals).

For example, 10, 
$$\frac{22}{7}$$
 etc.

Irrational Numbers: Irrational numbers are the set of real numbers that cannot be expressed in the form

of a fraction,  $\frac{p}{q}$  where *p* and *q* are integers. The

denominator *q* is not equal to zero ( $q \neq 0$ ). Also, the decimal expansion of an irrational number is neither terminating nor repeating.

For Example,  $\sqrt{5}$ ,  $2\sqrt{6}$  etc.

