SAMPLE PAPER

CLASS – X | CBSE | MATHEMATICS

Time: 3 hours **Maximum Marks : 80**

GENERAL INSTRUCTIONS

1. This Question Paper has 5 Sections A-E.
2. Section **A** has 20 MCQs carrying 1 mark each
3. Section **B** has 5 questions carrying 02 marks each.
4. Section **C** has 6 questions carrying 03 marks each.
5. Section **D** has 4 questions carrying 05 marks each.
6. Section **E** has 3 case based integrated units of assessment (04 marks each) with sub parts of the values of 1, 1 and 2 marks each respectively.
7. All Questions are compulsory. However, an internal choice in 2 Qs of 5 marks, 2 Qs of 3 marks and 2 Questions of 2 marks has been provided.
8. Draw neat figures wherever required. Take $\pi = 22/7$ wherever required if not stated.

ALLEN SOUTH INDIA SUCCESS JOURNEY

1 AIR
TANISHKA
2 Years
Classroom Student

NEET (UG) RESULT 2022

02 in Top 100 AIR with 700 Marks | 06 in Top 500 AIR with 685 Marks
42 Students Scored 650 & Above | 115 Student Scored 600 & Above

AIR 51

700/720

JAHNAVI BANOTRA
ALLEN Bengaluru
Classroom Student

AIR 70

ROHIT SURESH
ALLEN Bengaluru
Classroom Student

AIR 150

695/720

RINIT RAVICHANDRAN
ALLEN Chennai
Classroom Student

AIR 170

ANANYA SHAHI
ALLEN Bengaluru
Classroom Student

JEE (ADV) RESULT 2022

02 in Top 30 AIR | 04 in Top 200 AIR | 08 in Top 500 AIR
23 in Top 1000 AIR | 46 in Top 2000 AIR

AIR 13

VISHAL BYSANI
ALLEN Bengaluru
Classroom Student

AIR 27

TEJAS SHARMA
ALLEN Bengaluru
Classroom Student

KCET RESULT 2022

3 in Top 10 | 5 in Top 20 | 14 in Top 50 | 26 in Top 100 | 72 in Top 500

AIR 5

VISHAL BYSANI
ALLEN Bengaluru
Classroom Student

AIR 6

SAAGAR K V
ALLEN Bengaluru
Classroom Student

AIR 8

G V SIDDARTH
ALLEN Bengaluru
Classroom Student

AIR 14

RAJIV R B
ALLEN Bengaluru
Classroom Student

AIR 15

TEJAS SHARMA
ALLEN Bengaluru
Classroom Student

COMED-K RESULT 2022

3 in Top 10 Rank | 6 in Top 20 Rank | 13 in Top Rank

RANK 1

A Venkat
Classroom

RANK 2

Vishal B
Classroom

RANK 7

Aarav Giri
Classroom

IMO OSLO2022

63rd International
Mathematical Olympiad **IMO-2022**
at Oslo, Norway

GOLD MEDAL
Mohit Hulse
Classroom

BRONZE MEDAL
Atul S. Nadig
Classroom

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Kaustav Mishra
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(Mohit Hulse is an Indian origin Allen classroom student who represented UK in 63rd International Mathematical Olympiad (IMO '22) at Oslo, Norway)

IJSO

19th INTERNATIONAL JUNIOR SCIENCE OLYMPIAD (IJSO-2022)

5 Out of 6 Team members
who will represent Team India are
ALLEN PNCF students

Banibrata Majee (Classroom) | Devesh Bhaiya (Classroom) | Rajdeep Mishra (Classroom) | Vasu Vijay (Classroom) | Avaneesh Bansal (Workshop)

MIT Massachusetts Institute of Technology

ALLENites Make Nation Proud by Getting Admission in
the Most Prestigious College in The World Of Engineering

Abhay Bestrapalli
Classroom

Mohit Hulse
Classroom

18 TIMES ALL INDIA RANK-1

In JEE & Pre-Medical Entrance Exams
in Last 13 Years from Classroom

Authenticity of Result : Power of **ALLEN**

SECTION - A

1. Which term of the A.P $6,13,20,27.....$ is 97

(A) 14 (B) 13

(C) 15 (D) 12

2. Find the ratio of the total surface area & lateral surface area of a cube.

(A) 6:2 (B) 3:2

(C) $2\sqrt{3}:1$ (D) $4:3$

3. Find the value of x, if 3 – x, x + 2, 2x + 1 are in A.P.

(A) 0 (B) 2

(C) 1 (D) –1

4. A bag contain 5 red balls & some blue balls. If probability of drawing a blue ball is double that of red ball. Find number of blue balls in the bag ?

(A) 5 (B) 3

(C) 10 (D) 6

5. One card is drawn from a well shuffled deck of 52 cards. The probability that it is black queen is

(A) $\frac{1}{26}$ (B) $\frac{1}{13}$

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

6. If $\sin\theta = \frac{1}{3}$, find the value of $2\cot^2\theta + 2$.

(A) 15 (B) 16

(C) 17 (D) 18

7. For what value of k is –4 a zero of the polynomial $f(x) = x^2 - x - (2k + 2)$

(A) 6 (B) –6

(C) 9 (D) –9

8. The value of k for which the system of equation x + y – 4 = 0 and 2x + ky = 3 has no solution is

(A) –2 (B) $\neq 2$

(C) 3 (D) 2

9. A wheel makes 1000 revolutions in covering a distance of 88 km. The radius of the wheel is,

(A) 11 m (B) 14 m

(C) 12 m (D) 10 m

10. The numerical value of $\left(\frac{1}{\cos\theta} + \frac{1}{\cot\theta}\right)\left(\frac{1}{\cos\theta} - \frac{1}{\cot\theta}\right)$ is,

(A) 0 (B) –1

(C) 1 (D) 2

11. Given that $\sin\theta = \frac{a}{b}$ then $\cos\theta$ is equal to

(A) $\frac{b}{\sqrt{b^2 - a^2}}$ (B) $\frac{b}{a}$

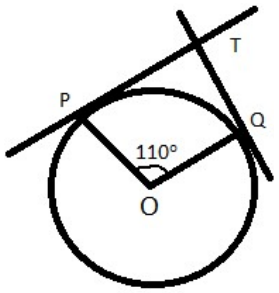
(C) $\frac{\sqrt{b^2 - a^2}}{b}$ (D) $\frac{a}{\sqrt{b^2 - a^2}}$

12. Abscissa of centroid of triangle having vertices (a, b – c) ; (b, c – a) ; (c, a – b) is

(A) 0 (B) $\frac{a+b+c}{3}$

(C) a + b + c (D) $\frac{2a+2b+2c}{3}$

13. In the given figure, if TP and TQ are tangents to a circle with centre O, so that $\angle POQ = 110°$, then $\angle PTQ$ is



(A) 110° (B) 90°

(C) 80° (D) 70°

14. The sum of the zeroes of the polynomial $2x^2 - 8x + 6$ is

(A) – 3 (B) 3

(C) – 4 (D) 4

15. The distance of the point P (3, - 4) from the origin is

(A) 7 units (B) 5 units

(C) 4 units (D) 3 units

16. The mid point of the line segment joining the points (- 5, 7) and (- 1, 3) is

(A) (-3, 7) (B) (-3, 5)

(C) (-1, 5) (D) (5, -3)

17. The number of decimal places after which the decimal expansion of the rational number 14587/1250 will terminate is

(A) 1 (B) 2

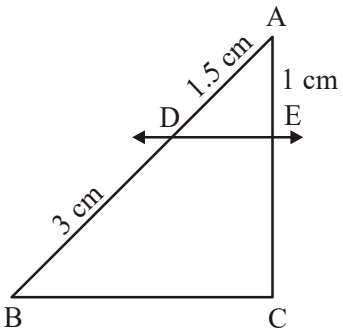
(C) 3 (D) 4

18. If sin (A+B) = sin A cos B + cos A sin B then find sin 75° =

(A) $\frac{\sqrt{3}+1}{2\sqrt{2}}$ (B) $\frac{\sqrt{3}-1}{2\sqrt{2}}$

(C) $\frac{\sqrt{3}-1}{2}$ (D) $\frac{\sqrt{3}+1}{\sqrt{2}}$

19. In the given figure, DE || BC. What is the value of EC ?



(A) 4 (B) 5

(C) 6 (D) 2

20. A vertical stick 12 m long casts a shadow 8 m long on the ground. At the same time tower casts the shadow 40 m long on the ground. Find height of tower ?

(A) 60 m (B) 40 m

(C) 80 m (D) 100 m

SECTION - B

1. Find the four angles of cyclic quadrilateral ABCD in which

$\angle A = (2x - 1)^\circ$ $\angle B = (y + 5)^\circ$ $\angle C = (2y + 15)^\circ$ $\angle D = (4x - 7)^\circ$

2. If a, b, c are in AP, then find the roots of $ax^2 + 2bx + c = 0$

(OR)

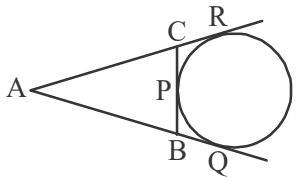
Find the mode of following data :

Classes	0 – 50	50 – 100	100 – 150	150 – 200	200 – 250
Frequency	12	13	15	8	12

3. Find the probability that a leap year selected at random will contain 53 sundays

4. If $2\sin(A + B) = \sqrt{3}$ and $\tan B = 1$, find sin2A

5. In the given figure a circle touches the sides BC of ΔABC at P and AB and AC are produced at Q and R respectively. If AQ = 15 cm. Find the perimeter of ΔABC



(OR)

The perimeter of a sector of circle with central angle 90° is 25 cm. Find the radius of a circle

SECTION - C

1. Find 31st term of an A.P., whose 11th term is 38 and 16th term is 73.

(OR)

Prove that $\sqrt{2}+\sqrt{3}$ is irrational.

2. A motor boat whose speed is 18 km/hr in still water takes 1 hour more to go 24 km upstream than to return downstream to the same spot. Find the speed of the stream

3. Water flows at the rate of 10m/min, through a cylindrical pipe having its diameter as 5mm. How much time will it take to fill a conical vessel whose diameter of base is 40cm and depth 24cm.

4. The mean of the following frequency table is 50. But the frequency f_1 and f_2 in class 20-40 and 60-80 are missing. Find the missing frequencies.

Class	0 – 20	20 – 40	40 – 60	60 – 80	80 – 100	Total
Frequency	17	f_1	32	f_2	19	120

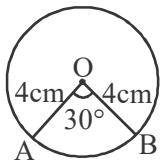
5. The area of a rectangle gets reduced by 9 square units if its length is reduced by 5 units, and the breadth is increased by 3 units. If we increase the length by 3 units and breadth by 2 units, the area is increased by 67 square units. Find the length of breadth of the rectangle.

(OR)

If α and β are the zeroes of the quadratic polynomial $p(s)=3s^2-6s+4$, find the value of

$\frac{\alpha}{\beta}+\frac{\beta}{\alpha}+2\left(\frac{1}{\alpha}+\frac{1}{\beta}\right)+3\alpha\beta$.

6. Find the area of sector of circle with radius 4 cm and of angle $30°$. Also find the area of the corresponding major sector.[Take $\pi=3.14$]



SECTION - D

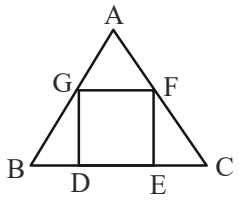
1. The angle of elevation of a cloud from a point 200 metres above a lake is 30° and the angle of depression of the reflection of the cloud in the lake is 60°. Find the height of the cloud.

(OR)

If the polynomial $f(x)=x^4-6x^3+16x^2-26x+10$ is divided by another polynomial $x^2 - 2x + k$, the remainder comes out to be a, find k & a.

2. If $\sec\theta + \tan\theta = P$, show that $\dfrac{P^2 - 1}{P^2 + 1} = \sin\theta$

3. In figure, DEFG is a square and $\angle BAC = 90°$



Prove that

(i) $\Delta AGF \sim \Delta DBG$ (ii) $\Delta AGF \sim \Delta EFC$

(iii) $\Delta DBG \sim \Delta EFC$ (iv) $DE^2 = BD \times EC$

4. Find the cordinates of the centre of the circle passing through the points (0,0),(-2,1)and(-3,2). Also find its radius ?

(OR)

(i) A solid is in the shape of a cone standing on a hemisphere with both their radii being equal to 1cm, and the height of the cone is equal to it's radius. Find the volume of solid in terms of π

(ii) A solid wooden toy is in the shape of a right circular cone mounted on a hemisphere. If the radius of the hemisphere is 4.2 cm and the total height of the toy is 10.2 cm find the volume of the wooden toy ?

SECTION - E

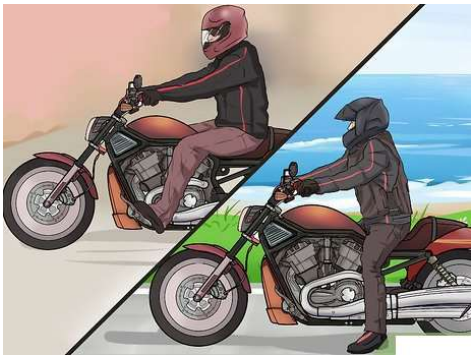
1. A farmer wants to dig a well in his house premises for his household purpose. He dug a well 30m deep and 7m diameter. The earth from digging the well can be used construction of his house. For this, he wants to prepare bricks of size $15cm \times 8cm \times 5cm$ each.

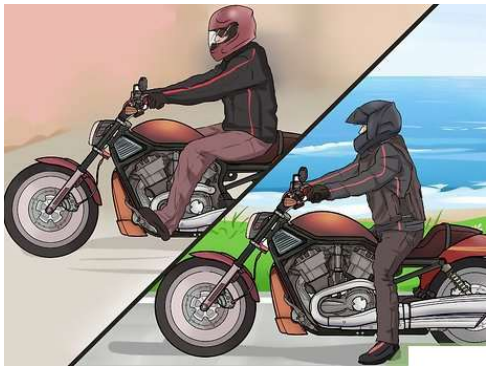
Study the above data and answer the following

(i) Find the surface area of each brick.

(ii) Find the number of bricks he prepared with the earth which he obtained during digging the well

2. Amar bought a motor cycle. He does not know how to ride it. So he decided to learn every day for 1 hour. After getting same practice he would like to increase the speed day by day. First day he drove with the speed of 10 km/hr, second day 15 km/hr, third day 20 km/hr, 4th day 25 km/hr, 5th day 30 km/hr and so on. He decided to learn within 12 days.





Study the data and answer the following.

1. Find the distance travelled by Amar on each day.
2. Is this data forms AP
3. If yes, find the total distance travelled by Amar in 12 days.

3. A seminar is being conducted by an Educational Organisation, where the participants will be educators of different subjects. The number of participants in Hindi, English and Mathematics are 60, 84 and 108 respectively.

(i). In each room the same number of participants are to be seated and all of them being in the same subject, hence maximum number of participants that can be accommodated in each room are

(ii). What is the minimum number of rooms required during the event?

(iii). The LCM of 60, 84 and 108 is

(iv). The product of HCF and LCM of 60, 84 and 108 is

OUR ACHIEVEMENTS IN INTERNATIONAL OLYMPIADS

International Biology Olympiad

33rd International Biology Olympiad **IBO-2022**
at Yerevan, Armenia

SILVER MEDAL
Rohit Panda
Classroom

International Chemistry Olympiad

54th International Chemistry Olympiad **IChO-2022**
Tianjin, China

SILVER MEDAL
Mahit Gadhiwala
Classroom

International Earth Science Olympiad

15th International Earth Science Olympiad **IESO-2022**
ITALY - AOSTA

5 GOLD, 2 SILVER & 1 BRONZE MEDALS
Won by ALLENites in Individual & Team Events

4 out of 8 Students of the Wining Indian Team are Allen Classroom Students.
The Indian Team have Bagged 10 Gold, 4 Silver & 6 Bronze Medals in Individual & Team Events.

1 GOLD- 1 SILVER MEDAL
Abhijay S. Khehra
Classroom

2 GOLD MEDAL
Arush Chaudhary
Classroom

1 GOLD MEDAL
Avishi Agrawal
Classroom

1 GOLD MEDAL
1 SILVER- 1 BRONZE MEDAL
Siddhangana Sahoo
Classroom

International Mathematical Olympiad

OSLO2022

63rd International Mathematical Olympiad **IMO-2022**
at Oslo, Norway

GOLD MEDAL
Mohit Hulse
Classroom

BRONZE MEDAL
Atul S. Nadig
Classroom

BRONZE MEDAL
Kaustav Mishra
Classroom

(Mohit Hulse is an Indian origin Allen classroom student who represented UK in 63rd International Mathematical Olympiad (IMO '22) at Oslo, Norway)

International Physics Olympiad

52nd International Physics Olympiad **IPhO-2022**
Minsk, Belarus

GOLD MEDAL
Deevyanshu Malu
Classroom

SILVER MEDAL
Abhijeet Anand
Classroom

SILVER MEDAL
Harsh Jakhar
Classroom

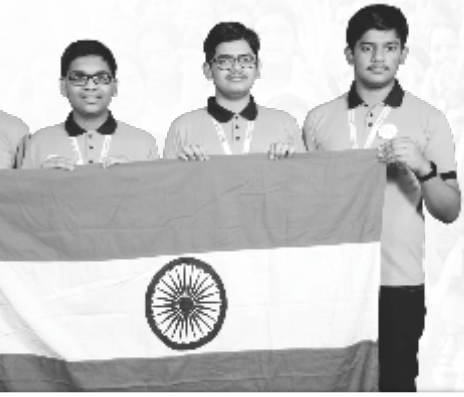
International Olympiad in Astronomy & Astrophysics

15th International Olympiad in Astronomy & Astrophysics **IOAA-2022**
at Kutaisi, Georgia

GOLD MEDAL
Md. Sahil Akhtar
Classroom

SILVER MEDAL
Atharva Mahajan
Classroom

IJSO



4 out of **6** Students of the winning **INDIAN TEAM** who Won **GOLD MEDALS** in **IJSO 2021,UAE** are from **ALLEN Classroom**

Ved Lahoti	Devesh Bhaiya	Animesh Pradhan	Rajdeep Mishra
Gold Medalist	Gold Medalist	Gold Medalist	Gold Medalist

Historic Performance of **Class 8th** student **Devesh Bhaiya** by winning **Gold Medal**

IJSO

19th INTERNATIONAL JUNIOR SCIENCE OLYMPIAD (IJSO-2022)

5 Out of 6 Team members who will represent Team India are **ALLEN** PNCF students

Banibrata Majee	Devesh Bhaiya	Rajdeep Mishra	Vasu Vijay	Avaneesh Bansal
Classroom	Classroom	Classroom	Classroom	Workshop

ALLEN South India Campuses

Bengaluru Campuses

Jayanagar Campus (HO)
No. .36, 15th Cross, 3rd Block, Near Southend Circle, Opp. City Central Library, Jayanagar, Bengaluru-560011

Koramangala Campus
No.41, 6th Block, 17th Main,100 Ft. Road, Near Malabar Gold, Koramangala

HSR Layout Campus
No.530 C / 531 A, Sector 3, 19th Main, Opp. Poorva, Vantage, Next to Boot Camp, HSR Layout

Basaveshwara Campus
Site No. 80, 2nd Block, 3rd Stage,In Front of Gangamma Thimmiah Conventional Hall, Basaveshwar Nagar

Banaswadi Campus
No. 311, 7th Main, HRBR Layout,2nd Block, Opp. to Cavalier Hospital, Banaswadi

Bannerghatta Campus
No. 71, Bilekahalli, Panduranga Nagar, Near Adigas Restaurant, Bannerghatta Road

Hebbal Campus
No.3, 5th Main, Near Baptist Hospital, Yamaha Showroom Corner, Hebbal

Marathahalli Campus
Ground Floor, Purva Reviera Commercial Complex, 3rd Gate, Marathahalli

Sarjapura Campus
Survey No. 106/2, B. Hosahalli Road (behind S2 Housing Avantikaa, Sarjapur Main Rd, Bengaluru

Jalahalli Campus
G PLAZA No.01, Gangamma Circle, Jalahalli Opp. Prestige Welling Park Bangalore-560013

Whitefield Campus
No-918, Varthur Main Road Near Apnaday Market, Whitefield Bangalore-560066

Indiranagar Campus
Gravity #804, HAL 2nd stage, 7th Main, 1st Cross, Domulur Sub Division, Indiranagar, Bangalore-560038

Chennai Campuses

Ashok Nagar Campus (HO)
No. 346 & 347, Next to Kasi Theater, Jafferkhanpettai, Ashok Nagar, Chennai-600083
Tel : 9116687301/302

Madipakkam Campus
Pathima Markaz Building, Plot Nos. 14 & 19 and 15 & 18, Velachery Main Road, Ram Nagar, Madipakkam-600091
Tel : 9116687303/304

Anna Nagar West Campus
Newry Square, No. 99, 13th Main Road, 6th Avenue, 1st Block, Anna Nagar West, Chennai-600040
Tel : 6366366903/904

Adyar Campus
No. 7, City Tower, 2nd Floor, 3rd Cross Street, Kasthuribai Nagar, Adyar, Chennai-600020
Tel : 9116687307/308

Sholinganallur Campus
S.M.J. Tower, Door No.16, IT Expressway, Old Mahabalipuram Road, Sholinganallur, Chennai-600119
Tel : 6366366901/902

Kilpauk Campus
New No. 80, Old No. 419, Kilpauk Garden Road, Anna Nagar East, Chennai-600010
Tel : 9116687305/306

Paavai Campus

Avadi Campus
Avadi Road, Eswaran Nagar, Poonamallee, Chennai, Tamil Nadu
Tel : 9606060055/56

Paavai Campus
Paavai Vidya Nagar Puduchatram, Service Road Paavai Tamil Nadu-18
Tel.: 9611994455, 9566404272

Tirupati Campuses

AIR Road Campus
#170, First Floor, Above MGB Bajaj, New Balaji Colony AIR bypass road, Tirupati - 517501 | **Tel.: 9900070050**

Residential Campus
D.No. 162, Vedanthapura Agraharam, NR Layout, R.C. Road, Tirupati -517507
Tel.: 9900070050

Puducherry Campuses

Vedam Campus (HO)
No. 372 & 374, Bharathi Street, Puducherry-605001
Tel : 9900804950, 9741303080

Karaikal Campus
No. 63 Kamaraj Salai Karaikal (Opp. to Govt. Hospital) Puducherry-609605
Tel : 9741018090

Mysuru Campus | Mangaluru Campus | Coimbatore Campus

Mysuru Campus
B.M. Arcade, No-2923, 1st Main, 5th Cross, Saraswathipuram, Opp. SVC Bank, Mysuru-570009
Tel : 0821-4526818, 9945588588

Mangaluru Campus
Floor No. 4, No. 9, Landlinks City Point, Navbharath Circle, Kodiabail, Mangaluru, KA-575003
Tel : 9900090058

Coimbatore Campus
35, 7th street Tatabad, Gandhipuram Coimbatore - 641012,
Tel : 9606071654, 9900963850

Kochi Campus

Palarivattom Campus (HO)
RK Commercial, PJ Antony Cross Road, Palarivattom, Kochi-682025
Tel : 9116687309/311

#PreparationForSuccess

ALLEN CAREER INSTITUTE KOTA (RAJASTHAN) path to success

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