SAMPLE PAPER

CLASS – X | CBSE | SCIENCE

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

GENERAL INSTRUCTIONS

i. This question paper consists of 39 questions in 5 sections.

ii. All questions are compulsory. However, an internal choice is provided in some questions. A student is expected to attempt only one of these questions.

iii. Section A consists of 20 objective type questions carrying 1 mark each.

iv. Section B consists of 6 Very Short questions carrying 02 marks each. Answers to these questions should in the range of 30 to 50 words.

v. Section C consists of 7 Short Answer type questions carrying 03 marks each. Answers to these questions should in the range of 50 to 80 words

vi. Section D consists of 3 Long Answer type questions carrying 05 marks each. Answer to these questions should be in the range of 80 to 120 words.

vii. Section E consists of 3 source-based/case-based units of assessment of 04 marks each with sub-parts

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

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)

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
PHYSICS

1. An object is placed at a distance of 10 cm in front of plane mirror distance of image from mirror will be :

(A) 20 cm (B) 5 cm

(C) 10 cm (D) 40 cm

2. The colour of sky appears blue because :

(A) Blue light gets absorbed in the atmosphere

(B) Ultraviolet radiations are absorbed in the atmosphere

(C) Violet and blue lights get scattered more than light of all other colours

(D) Light of all other colours is scattered more than the violet and blue colour light by the atmosphere.

3. A concave mirror forms a real image that is twice the size of object. If the object is 30 cm from the mirror, the radius of curvature of the mirror must be about :

(A) 20 cm (B) 13 cm

(C) 40 cm (D) 27 cm

4. Image of an object formed on the retina of our eyes is :

(A) Real and inverted (B) Virtual and erect

(C) Real and erect (D) Virtual and inverted

5. Angle of deviation caused by dispersion of light by a prism is least for :

(A) Red light (B) Yellow light

(C) Blue light (D) Violet light

CHEMISTRY

6. The below reaction is used in the manufacture of washing soda commercially. This process is known as Solvay's process. Identify X and Y in the reaction

$$NaCl + H_2O + CO_2 + X \longrightarrow NaHCO_3 + Y$$

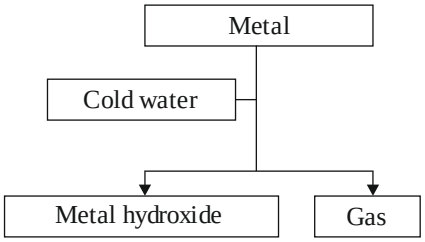
	X	Y
(A)	NH_4Cl	NH_3
(B)	NH_3	NH_4Cl
(C)	N_2	NH_4Cl
(D)	NCl_3	NH_4Cl

7. Bindhu mixed equal volume of silver nitrate solution with a solution of sodium chloride. What would she observe?

(A) Formation of yellow precipitate (B) Formation of white precipitate

(C) Release of carbon dioxide gas (D) Formation of green precipitate

8.



Which of the following combination(s) are correct?

	Metal	**Gas evolved**
i	Sodium	Yes
ii	Potassium	No
iii	Iron	Yes
iv	Calcium	Yes

(A) (i) and (ii) (B) (ii) and (iii)

(C) (i) and (iii) (D) (i) and (iv)

9. Which of the following correctly represents a balanced chemical equation ?

(A) $3Hg(OH)_2 + 2H_3PO_4 \rightarrow Hg_3(PO_4)_2 + 6H_2O$ (B) $N_2 + H_2 \rightarrow 2NH_3$

(C) $H_2O_2 \rightarrow 2H_2O + O_2$ (D) $As + 6NaOH \rightarrow 2Na_2AsO_3 + 3H_2$

10. Which of the given options correctly represents the parent acid and base of potassium phosphate

Option	Parent acid	Parent base
(A)	CH_3COOH	$CaSO_4$
(B)	HCl	NaOH
(C)	H_3PO_4	KOH
(D)	H_2SO_4	K_2SO_4

11. Out of the following pairs of compounds, the unsaturated compounds are

(A) C_2H_6 and C_4H_6 (B) C_6H_{12} and C_5H_{12}

(C) C_4H_6 and C_6H_{12} (D) C_2H_6 and C_4H_{10}

12. Find the incorrect match:

(A) Bauxite $\rightarrow$ Oxide ore (B) Zinc blende $\rightarrow$ Sulphide ore

(C) Calamine $\rightarrow$ Carbonate ore (D) Horn Silver $\rightarrow$ Phosphate ore

13. Assertion : Commercial Name of calcium hydride is known as Hydrolith

Reason : Metal Hydride are covalent in nature

(A) Assertion and Reason are both correct and Reason is the correct explanation of Assertion

(B) Assertion and Reason are both correct and reason is not the correct explanation of Assertion

(C) Assertion is true, reason is false

(D) Both Assertion and Reason are false

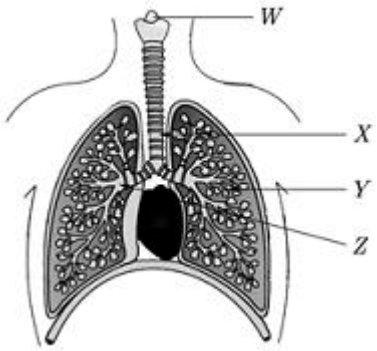
BIOLOGY

14. Glycolysis occurs in the ———and produces———, which in the presence of O_2 enters the———

(A) Cytosol, pyruvate, mitochondria (B) Cytosol, glucose, mitochondria

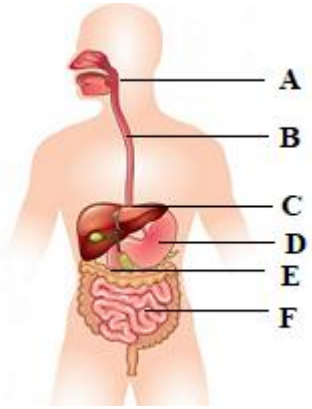
(C) Mitochondria, pyruvate, chloroplast (D) Chloroplast, glucose, cytosol

15. The diagram shows part of the human gas exchange system. Here, W X, ,Y and Z are?



	Bronchus	Bronchiole	Larynx	Trachea
(A)	W	X	Z	Y
(B)	X	Z	Y	W
(C)	Y	W	X	Z
(D)	Z	Y	W	X

16. Which of these correctly represent the labels B C D and E



(A) Pancreas , Oesophagus , Stomach , Liver (B) Oesophagus , Liver , Stomach , Pancreas

(C) Stomach , Liver , Oesophagus , Pancreas (D) Oesophagus , Pancreas , Liver , Stomach

17. Hormone released by placenta :

(A) Estrogen (B) Progesterone

(C) hCG hormone (D) Both (B) and (C)

18. Menopause in woman

(A) Phase when ovulation and menstruation starts (B) Begin when no follicles are left in ovaries

(C) Occurs at the age of 30 years (D) When egg is not fertilized

19. Filteration of the blood takes place at

(A) PCT (B) DCT

(C) Collecting duct (D) Malphigian capsule

20. Expiration involves

(A) Relaxation of diaphragm and intercostals muscles

(B) Contraction of diaphragm and intercostals muscles

(C) Contraction of diaphragm muscles

(D) Contraction of inter costal muscles

SECTION - B

PHYSICS

21. Explain laws of reflection with the help of a ray diagram

CHEMISTRY

22. Answer the following questions?

(a) Why graphite is used as lubricant?

(b) How many hexagonal and pentagonal rings are present in C_{60} molecules

BIOLOGY

23. If a plant is kept covered with a polythene sheet, we notice some water drops on the inner side of the sheet after sometime. What are they due to ? What is the significance of this process ?

24. Explain briefly double circulation

25. Name one sexually transmitted disease. Each caused due to bacterial infection and viral infection. How can they be prevented ?

26. (i) In human body what is the role of

(a) Seminal vesicles (b) Prostate gland

SECTION - C

PHYSICS

27. A proton is moving in a uniform magnetic field what will be the path of the proton.

If its initial direction is-

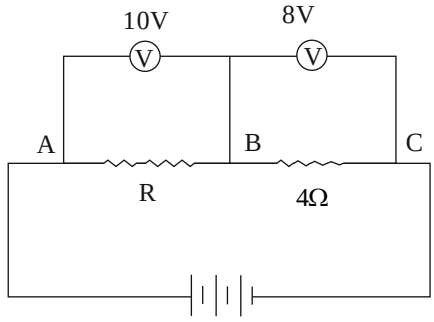
(a) (i) Parallel to the field.

(ii) Perpendicular to the field.

(b) What will happen to the momentum of proton in both the above mentioned cases? will it change?

28. A spherical mirror produces a magnification of + 1.5. Explain all the nature and size of the image formed by it . Which type of spherical mirror is this?

29. Consider the circuit shown in figure. The voltmeter on the left reads 10V and that on the right reads 8V. Find (a) The current through the resistance R, (b) the value of R, and (c) the potential difference across the battery.



CHEMISTRY

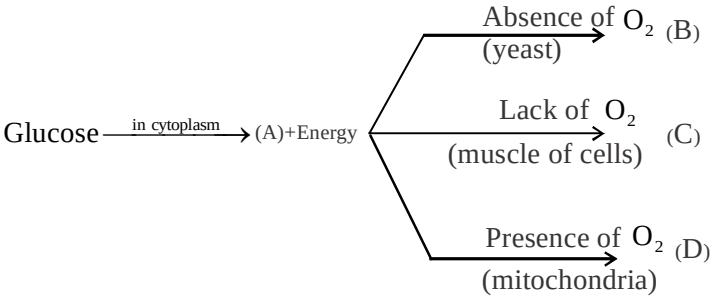
30. Name the oxidising agent used for the conversion of ethanol to ethanoic acid (give equation), distinguish between ethanol and ethanoic acid on the basis of

i. Litmus test ii. Reaction with sodium hydrogen carbonate

31. Define Homologous series. Explain atleast four characteristics of homologous series.

BIOLOGY

32. **(a)** Fill in this flow chart and state what is A,B, C and D



(b) What is the name given to the process to form A and D.

33. What are the parts of central nervous system ? Give two functions of each part.

SECTION - D

PHYSICS

34. (i) What is Overloading? How it occurs?

(ii) Some devices used at a home are given along with their numbers, power ratings & usage time.

Device	Number	Power	Usage time
Refrigerator	1	400 W	8hour/day
Electric Bulb	2	40 W	4 hour/day
Tube light	4	60 W	4 hour/day
Fan	4	100 W	6 hour/day

Find the total units (in KWH) of energy consumed for 30 days. What is the cost of the total energy consumed for 30 days if one unit consists Rs.3.00

CHEMISTRY

35. A. Give one example each of the sodium salts as

i. Acidic salt ii. Normal salt iii. Mixed salt iv. Complex salt

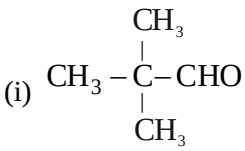
B. a. Define a balanced chemical equation

b. Write balanced chemical equation for the following reaction

i. Phosphorus burns in presence of chlorine to form phosphorus pentachloride

ii. Burning of natural gas (Methane).

c. Write the IUPAC name for the following.

(i) 

(ii) $CH_3 - CH_2 - CH_2 - OH$

BIOLOGY

36. (a) Draw a neat and well labeled diagram of nephron.

(b) State and explain the steps of urine formation.

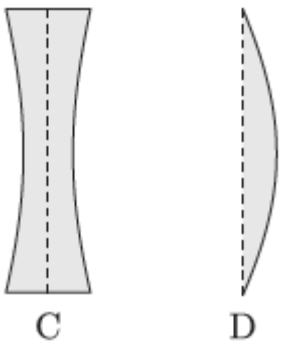
SECTION - E
PHYSICS

37. Lenses are objects made of transparent materials such as glass or clear plastic that has curved surfaces. Diverging lenses are thicker at their edges than at their centres and makes light rays passing through them spread out.Converging lenses are thicker in their middle than at this edges and make light rays passing through them focus at a point. These are used in spectacles to help people with poor vision see better. The converging lenses magnify by bending the rays of light that pass through them to meet at a point called focus. Thicker the converging lens is at its centre, the more its magnifies and closer the focus is to the lens.

(i) Ravi uses two lenses A and B of same size and same material as shown. P_1 and P_2 are the powers of A and B. An object is kept at the same distance from the lens between F and 2F of each lens on the princi pal axis in turn. Let I_1 and I_2 be the image formed by two lenses respectively. What is the relation of image distances of both lens ?

(ii) Write down the relation between the power of lens of both lenses ?

(iii) Meenakshi uses above two lenses A and B along with another two lenses C and D, as shown :



She is able to see the subject matter on the black board while sitting in the front row in the classroom but is unable to see the same matter while sitting in the last row.

Which of the above four lenses will she require to correct the defect in her vision? Why ?

OR

(iv) Natasha places an object on the principal axis of above given lens A. One end of this object coincides with the focus F and the other end with 2F. What will be the nature of the image formed by the lens on the other side ?

CHEMISTRY

38. The reactivity series is a list of metals arranged in the order of their decreasing activities. The metal at the top of the reactivity series is the most reactive and metal at the bottom is the least reactive. The more reactive metal displaces less reactive metal from its salt solution.

K	Potassium	More reactive
Na	Sodium	
Ca	Calcium	
Mg	Magnesium	
Al	Aluminium	
Zn	Zinc	Reactivity decreases.
Fe	Iron	
Pb	Lead	
[H]	[Hydrogen]	
Cu	Copper	
Hg	Mercury	
Ag	Silver	
Au	Gold	Least reactive

(i) Name the metals which react with steam but not with hot water.

(ii) What happen when calcium react with concentrated nitric acid and which method is used to extract metal present at the top of the reactivity series?

OR

(iii) Which of the following metals exist in their native states in nature?

I. Cu

II. Au

III. Zn

IV. Ag

BIOLOGY

39. Question numbers i - iv are based on the table given below. Study the table and answer the following questions

	Characters	Males	Females
1	Total no. of chromosomes	23 pairs	23 pairs
2	No. of autosome	22 pairs	22 pairs
3	No. of sex chromosome	1 pairs	1 pairs

(i) What is sex determination?

(ii) What are the sex chromosomes in the males?

(iii) What are the sex chromosomes in the females?

OR

(iv) Is the father responsible for the sex of the child ?

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

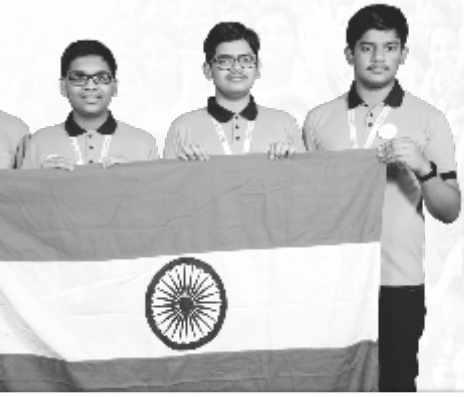
International Olympiad in Astronomy & Astrophysics

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

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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

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Web: www.allen.ac.in/bengaluru | **Tel.: 080-46704000**

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