



RAJMATA JIJAU SHIKSHAN PRASARAK MANDAL'S  
**COLLEGE OF PHARMACY (B.Pharm.)**

Approved by PCI, AICTE, Govt. of Maharashtra & DTE

Affiliated to Savitribai Phule Pune University, Pune

DTE Code:- 6382 University Code:- CPHPO13150



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ISO : 14001-2015

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President

Hon. Shri. Sudhir V. Mungase  
Secretary

Hon. Shri. Ajit D. Gavhane  
Treasurer

Dr. Kishor S. Jain  
Principal

## 2.2.1


The institution assesses the learning levels of the students and organizes special Programmes for advanced learners and slow learners

राजमाता जिजाऊ शिक्षण प्रसारक मंडळाचे, कॉलेज ऑफ फार्मसी

Gat No.101/102, Moshi-Alandi Road, Dudulgaon, Pune.

Post-Alandi, Tal.: Haveli, Pune-412105, Maharashtra (India)

Phone : (020) 20280280, 7447763086, 9422322070

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# COLLEGE OF PHARMACY

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Affiliated to University of Pune

Gat No.101/102, A. Post-Dudulgaon, Post-Alandi, Tal-Haveli, Dist-Pune - 412 105

E-mail: rjspmcp123@gmail.com Web: www.rjspmpharmacy.com

Univ Id: PU/PN Pharm/286/2007 College Code:1081 DTE Code:6382



**The institution assesses the learning levels of the students and organizes special Programmes for advanced learners and slow learners**

**(Academic Year 2022-2023)**

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**1) List of advanced learners and slow learners  
(A.Y. 2022-2023)**

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Dr. Kishor S. Jain  
Principal

## List of Advanced Learners (A.Y. 2022-2023)

Class: First Year B. Pharm.

Sem: I & II

Name of the Class teacher: Ms. Hagawane S. V.

Roll No.	Name of Student
103	BIJWE PRATHAMESH SANJAY
104	BOTRE AISHWARYA BABUSHA
105	BRAMHANE PIYUSH SACHIN
109	GAROLE ADITI RAVINDRA
110	GHANGHAV PRATIKSHA SATYAWAN
117	KAKADE SONAM SANTOSH
119	KENDRE SHIVKANYA VYANKAT
121	KHARABI MAYURI HANUMANT
161	SARNAIK VEDANT SUNIL
129	SHINDE AKSHADA BHASKAR
163	SHINDE PRASAD RAJARAM

(Ms. Hagawane S. V.)  
Signature of the Classteacher



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Treasurer

Dr. Kishor S. Jain  
Principal

## List of Slow Learners (A.Y. 2022-2023)

Class: First Year B. Pharm.

Sem: I & II

Name of the Class teacher: Ms. Hagawane S. V.

Roll No.	Name of Student
122	KUCHEKAR VRISHALI LAXMAN
162	SHINDE HARSHAL SHEKHAR
120	KHAIRE SHRAVANI EKNATH
155	NALWADE ABHIJEET KAILAS
160	RANDIVE SHRIDHAN BALKRISHNA
166	WAGHMODE ONKAR ANNASAHEB
164	SONAWANE TANUJA ANKUSH
106	BURUNGALE NAVNATH AKARAM
144	ITAPE PRATIK APPARAO
107	DHOLE VIGHNESH GIRISH
156	NAYANA KAILAS OVHAL
115	JADHAV VAISHNAVI VASANT
168	YADAV RASIKA SATISH
113	HOLE POURNIMA SURESH
125	PINGALE SAHIL ANANDA

(Ms. Hagawane S. V.)  
Signature of the Classteacher



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Principal

## List of Advanced Learners (A.Y. 2022-2023)

Class: Second Year B. Pharm. Sem: III & IV

Name of the Class teacher: Mr. Omkar H. Kolhe

Roll No.	Name of Student
215	GAJARE SAKSHI LAHU
228	KHOSE SHRUTIKA SURENDRA
246	AWATE ANJALI VIJAY
254	JADHAV PRATHAMESH RAMESH
258	NAGARE PRIYA VIJAY

(Mr. Omkar H. Kolhe)  
Signature of the Class teacher

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## List of Slow Learners (A.Y. 2022-2023)

Class: Second Year B. Pharm. Sem: III & IV

Name of the Class teacher: Mr. Omkar H. Kolhe

Roll No.	Name of Student
201	VADAVKAR SAURABH GORAKH
202	ASAWALE SWAPNIL NANDKUMAR
203	BABAR ANUSHKA AMARJEET
204	BATAWAL GITANJALI DILIP
206	BHENDE VAISHNAVI MURALIDHAR
207	BORHADE OMKAR MARUTI
208	BURDE CHAITANYA RAMDAS
209	CHOPADE PRIYANKA PANDIT
210	DAUNDKAR SNEHAL DATTATRAY
212	DIGHE ABHIJIT BALASAHEB
213	GADE SANDIP ATMARAM
219	GUNDAL ANAGHA PRAMOD
223	KAMTHE ANISHA RAJENDRA
224	KATKAR ANIKET BANDU
225	KATNAIK POOJA PANDURANG
226	KAUTKAR SUJIT BALSHIRAM
227	KEDAR ONKAR DIGAMBAR
229	KHURPE OMKAR PANDURANG
230	LANDGE MANSI MARUTI
233	NARAWADE KOMAL VISHWANATH
235	PANCHAL SWASTIK DILIP
236	PANDERE SALONI DEEPAK
237	PATOLE VARAD MAHESH
238	RAHANE SAKSHI RAJENDRA
239	RATHOD NIKITA BANSI
240	RATHOD SANKET GORAKH
241	ROKADE PRATIK SHANKAR
242	RUPANAVAR PRANAYA BHARAT
245	TAMBE SAYALI MANOJ
247	YADAV AKSHATA BHAUSAHEB
248	CHOUNDKAR MAYURI SANJAY
249	DHADGE PRATIKSHA ANIL
250	FARNE SUMIT SURESH
251	GAIKWAD SHRAVANI SANJAY



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Treasurer

Dr. Kishor S. Jain  
Principal

252	HOLE SAURABH ROHIDAS
256	LEWADE VISHWAJIT DNYANESHWAR
259	NANEKAR DIYA RAHUL
260	NAVALE SUVARNA KASHINATH
262	SANDBHOR SAKSHI TUKARAM

(Mr. Omkar H. Kolhe)  
Signature of the Class teacher



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Principal

## List of Advanced Learners (A.Y. 2022-2023)

Class: Third Year B. Pharm.

Sem: V & VI

Name of the Class teacher: Mr. Ghodekar S.N.

KHEDKAR PRATIKSHA S

NAGARE ADITI SUDHAKAR

PATHAN ERAM FAIYAZ

THAKUR SARATHI SUNIL



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(Mr. Ghodekar S.N.)

Signature of the Class teacher

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Treasurer

Dr. Kishor S. Jain  
Principal

## List of Slow Learners (A.Y. 2022-2023)

Class: Third Year B. Pharm.

Sem: V & VI

Name of the Class teacher: Mr. Ghodekar S.N.

Name of Student
BOCHARE TEJAS PRAMOD
DEORE ABHISHEK NARENDRA
GEDAM CHAITANYA SURESH
HINGE NIKHIL PANDURANG
KASABALE AKASH SUNIL
KHURSADE RAM SUSHANT
KUDALE DNYANESHWARI ANIL
KUMBHAR OMKAR NITIN
LANDGE AKASH BALAJI
LOKHANDE ADWAIT ANAND
NAVALE PALLAVI DEVIDAS

  
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(Mr. Ghodekar S.N.)  
Signature of the Class teacher



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## List of Advanced Learners (A.Y. 2022-2023)

Class: Final Year B. Pharm. Sem: VII & VIII

Name of the Class teacher: Ms. Shakila S. Shaikh

Roll No.	Name of Student
451	PATOLE SANCHITA RAJARAM

*Shakila*

(Ms. Shakila S. Shaikh)

Signature of the Class teacher



*Shakila*

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## List of Slow Learners (A.Y. 2022-2023)

Class: Final Year B. Pharm.

Sem: VII & VIII

Name of the Class teacher: Ms. Shakila S. Shaikh

Roll No.	Name of Student	Roll No.	Name of Student
401	ANARSE SURAJ SANTOSH	427	KADAM ABHAY GORAKH
402	BABAR PIYUSH RAVINDRA	430	KANAWADE CHAITALI LAHANU
403	BAVALE SAKSHI PRABHAKAR	431	KANKALE NAYANA EKNATH
405	BOTE SONAL MARGU	434	KSHIRSAGAR PRATIK SANTOSH
406	BUCHUDE RESHMA SAVKAR	435	KURHADE HRSHIKESH DIGAMBAR
407	DAMALE ATHARV ANIL	437	LANDGE DHEERAJ BAPURAO
408	DAMSE TRIVENI SURESH	439	LOHAR CHAITALI ATUL
413	DUNGHAV NAGESHWAR MAHADEV	443	MOHITE SUDESHNA SANTAJIROO
415	GAIKWAD NEHA DATTATRAY	446	NEWASE VAISHNAVI VIJAY
418	GAWADE MONIKA RAOSAHEB	448	PARMESHWAR NILESH DEEPAK
422	GHULE JAVRAJ	449	PATIL SOURABH YUVRAJ
423	GUNJAL HARSHAD BABASAHEB	450	PATIL VIJAY SANJAY
424	HALEMANI SHREEDHAR MALLIKARJUN	453	PAWARA MANGESH NARSING
425	HOLE RAHUL DATTATRAY	454	POTWALE SACHIN NARSING



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Roll No.	Name of Student	Roll No.	Name of Student
455	RANPISE OMKAR NAVNATH	462	SHINDE RUSHIKESH VIKRAM
457	RODAGE NIKITA SANJAY	463	SHINDE SIDDHANT SANJAY
458	SATHE GANESH SURESH	465	THITE CHAITRALI VIJAY
459	SAWANT SAKSHEE VISHWAS	466	WAGHMARE SUMIT MAHENDRA
460	SHETE ANIKET SOMNATH	467	WAGHMARE SUMIT SIDDHARATH
461	SHINDE NIVRUTTI LAXMAN	468	YADAV ABHISHEK BHAUSAHEB

*Shakila*

(Ms. Shakila S. Shaikh)

Signature of the Class teacher



*Shub*

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Principal

## Efforts taken for Advanced Learners (A.Y. 2022-2023)

Class: First Year B. Pharm.

Sem: I & II

Name of the Class teacher: Ms. Hagawane S. V.

Sr. No.	Name of Activity Conducted	Date of Activity (DD-MM-YYYY)
1	Provide some personality development courses	03/0/2023
2	To stimulate critical thinking and problem-solving skills in some pharmaceutical formulations	10/01/2023
3	Offering independent study options for students who want to delve deeper into specific topics of interest	25/01/2023
4	Encourage the students to do assignments based studies	11/02/2023
5	Offering professional development programs such as leadership, entrepreneurship, etc	04/03/2023
6	Encourage the students to take part in various competitions such as poster and paper presentation, Addmad show, Debate, Pharma reels and video making, etc	08/04/2023

(Ms. Hagawane S. V.)  
Signature of the Clasteacher



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Secretary

Hon. Shri. Ajit D. Gavhane  
Treasurer

Dr. Kishor S. Jain  
Principal

## Efforts taken for Slow Learners (A.Y. 2022-2023)

Class: First Year B. Pharm.

Sem: I & II

Name of the Class teacher: Ms. Hagawane S. V.

Sr. No.	Name of Activity Conducted	Date of Activity (DD-MM-YYYY)
1	Organize small group learning sessions	03/04/2023
2	Utilize a variety of teaching methods, including audio visual aids, hands-on activities, and interactive technologies	28/04/2023
3	Provide personal attention towards emotional or psychological challenges of students	04/05/2023
4	Maintain open communication with the parents or guardians	10/05/2023
5	Provide learning resources including lecture notes, recordings, and supplementary materials	07/06/2023

(Ms. Hagawane S. V.)  
Signature of the Classteacher



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Dr. Kishor S. Jain  
Principal

## Efforts taken for Advanced Learners (A.Y. 2022-2023)

**Class: Second Year B. Pharm. Sem: III & IV Name of the Class teacher: Mr. Omkar H. Kolhe**

Sr. No.	Name of Activity Conducted	Date of Activity (DD-MM-YYYY)
1	Conducted Guest lecture on physical and mental balance	06/04/2022
2	Conducted Guest lecture related Career after Pharmacy.	10/11/2022
3	Continuous Assessment was taken and provide timely feedback to guide	04/12/2022

(Mr. Omkar H. Kolhe)  
Signature of the Class teacher



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Treasurer

Dr. Kishor S. Jain  
Principal

## Efforts taken for Slow Learners (A.Y. 2022-2023)

**Class: Second Year B. Pharm. Sem: III & IV Name of the Class teacher: Mr. Omkar H. Kolhe**

Sr. No.	Name of Activity Conducted	Date of Activity (DD-MM-YYYY)
1	Conduct extra classes for the difficult subjects in the curriculum.	08/10/2022
2	Provision of simple and standard lecture notes/course materials	27/11/2022
3	Getting the support of the advanced learners to the slow learners in making their learning process more participatory and interesting.	16/10/2022
4	Use visual aids, diagrams, and multimedia resources, animation to make complex concepts more understanding and to enhance understanding.	16/11/2022

(Mr. Omkar H. Kolhe)  
Signature of the Class teacher

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Principal

## Efforts taken for Advanced Learners (A.Y. 2022-2023)

Class: Third Year B. Pharm.

Sem: V & VI

Name of the Class teacher: Mr. Ghodekar S.N.

Sr. No.	Name of Activity Conducted	Date of Activity (DD-MM-YYYY)
1	Conducted Guest lecture related Career after Pharmacy.	10/11/2022
2	Conducted Guest lecture for Skill Development	18/11/2022
3	"Health & Meditation" education.	26/06/2023
5	The faculty mentors regularly interact with the parents of their mentees throughout the semester.	22/07/2023

  
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(Mr. Ghodekar S.N.)  
Signature of the Clasteacher



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## Efforts taken for Slow Learners (A.Y. 2022-2023)

Class: Third Year B. Pharm.

Sem: V & VI

Name of the Class teacher: Mr. Ghodekar S.N.

Sr. No.	Name of Activity Conducted	Date of Activity (DD-MM-YYYY)
1	Personal counselling	15/10/2022
2	Simple hand written notes for easy understanding	10/11/2022
3	Each subject topics were discussed properly	11/02/2023
4	Arranged guest lecture for difficult subjects from syllabus	21/04/2022
5	Engaged them in multiple ways	26/08/2022

  
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(Mr. Ghodekar S.N.)  
Signature of the Classteacher

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## Efforts taken for Advanced Learners (A.Y. 2022-2023)

Class: Final Year B. Pharm.

Sem: VII& VIII

Name of the Class teacher: Ms. Shakila S. Shaikh

Sr. No.	Name of Activity Conducted	Date of Activity (DD-MM-YYYY)
1	Conducted Guest lecture for Personality & Skill Development	18/11/2022
2	The advanced learners are encouraged towards self-learning with an access to e-learning platforms like SWAYAM-NPTEL, Coursera etc. Our Students are encouraged to register for courses in NPTEL and get certified.	11/12/2022
3	The advanced learners are encouraged to participate in conference, workshop and paper presentations to learn beyond the syllabus. (Avishkar)	15/09/2022
4	Awareness sessions on competitive exams and higher education.	29/08/22
5	Plan Motivational/carrier counselling sessions.	10/11/22
6	The faculty mentors regularly interact with the parents of their mentees throughout the semester.	6/12/22

*Shakila*

(Ms. Shakila S. Shaikh)

Signature of the Class teacher



*Shakila*

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## Efforts taken for Slow Learners (A.Y. 2022-2023)

Class: Final Year B. Pharm.

Sem: VII& VIII

Name of the Class teacher: Ms. Shakila S. Shaikh

Sr. No.	Name of Activity Conducted	Date of Activity (DD-MM-YYYY)
1	Simple Notes provided for easy and quick understanding	11/07/2022
2	Asked the students to give more focus on difficult subjects	20/08/2022
3	The faculty mentors regularly interact with the parents of their mentees throughout the semester.	30/08/2022
4	Developing self-learning materials (SLM)	30/08/2022
5	Additional learning opportunities through online sources like Youtube, Whatsapp, etc	3/09/22
6	Organised Industrial visits for actual hands-on training.	26/04/22 &21/05/22
7	Encouraging them to spend more time on reading in libraries outside the class hours	19/11/2022

*Shakila*

(Ms. Shakila S. Shaikh)

Signature of the Class teacher



*Shub*

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**3) Special Programmes for advanced  
learners and slow learners  
(A.Y. 2022-2023)**

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Ref. No.: RJSPM/COP/ARC/2022-23

Date: 24/09/2022

To,  
The IQAC Co-ordinator  
SPPU, Pune.

**Subject:** Regarding submission of report of college level "AVISHKAR COMPETITION-2022".

**Reference:** IQAC-69 dated 08/09/2022.

Respected Sir/Madam,

With reference to above cited subject, we are submitting the report of college level "AVISHKAR COMPETITION-2022" organized at our College, on 15<sup>th</sup> September 2022 as per the guidelines given in the circular (IQAC-69 dated 08/09/2022).

Kindly accept the same and acknowledge.

Thanking You.  
Yours faithfully

(Dr K.S.Jain)

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Dudulgaon, Pune-412 105.

- Encl.**
1. Results of competition as per the said format.
  2. List of Participants
  3. Abstract of each successful participants
  4. Geo-tagged photos (2)
  5. A3 size posters
  6. Video clip (1 min)





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**COLLEGE LEVEL AVISHKAR COMPETITION -2022 -RESULTS**

Sr. No.	Category	UG	PG	Level *	
				PPG (M. Phil & PhD students those who are pursuing PhD From SPPU)	Teacher( Approved teacher those who are pursuing PhD From SPPU)
1	Pure Sciences	<b>Winner</b> -"Paper Manufacturing from Algae" by Rahul Shirsath <b>Runner-up</b> "Herbal Steroidal GYM suppliments" by Manjusha Kantule	--	--	--
2	Medicine And Pharmacy	<b>Winner</b> - "Digital Medicine Garden" by Giriraj Gavhane <b>Runner-up</b> -" <i>Tinospora cordifolio</i> : Herbal nanoemulsion as a novel dosage form" by Monika Nehere	--	--	--
3	Agriculture Ana Animal Husbandry	<b>Winner</b> -"Herbal Rat supplement Spray" by Sanchita Patole <b>Runner-up</b> -"Advance Crop Brush cutter" by Hrushikesh Phirke	--	--	--
4	Commerce, Management & Law	--	--	--	--
5	Engineering & Technology	<b>Winner</b> - "Gas Leakage Detector" by Nikhil Hinge <b>Runner-up</b> -"Graphene from plastic waste" by Subodh Nandeshwar	--	--	--
6	Humanities, Languages, Fine Arts	<b>Winner</b> - "Effect of Indian Classical music on Health and life" by Shreyas Salvi <b>Runner-up</b> -"Current increase in Drug Addiction" by Chaitali Kanawade	--	--	--

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Mr. Vilasrao V. Lande (Ex. MLA)  
President

Mr. Sudhir V. Mungase  
Secretary

Mr. Ajit D. Gavhane  
Treasurer

**Report on College level "AVISHKAR COMPETITION-2022"**

RJSPM, College of Pharmacy, Pune, organized a college level "Avishkar Competition-2022" on 15<sup>th</sup> September 2022. A workshop on Avishkar was also organized on 8<sup>th</sup> September 2022 to guide the students for participation. Prof. A. B. Kumbhar and Prof S. N. Ghodekar who were the participants till state level Avishkar competition-2017 guided and motivated the students to participate. They also resolved various doubts asked by the students.

In Avishkar competition-2022 total 15 groups participated from different disciplines/categories.


Two panels of Judges evaluated the posters and participants.

Panel-1 Dr. J. S. Dhumal and Prof. P.V. Rane

Panel-2 Prof. S. N. Ghodekar and Prof. A. N. Phuge.

  
ARC



  
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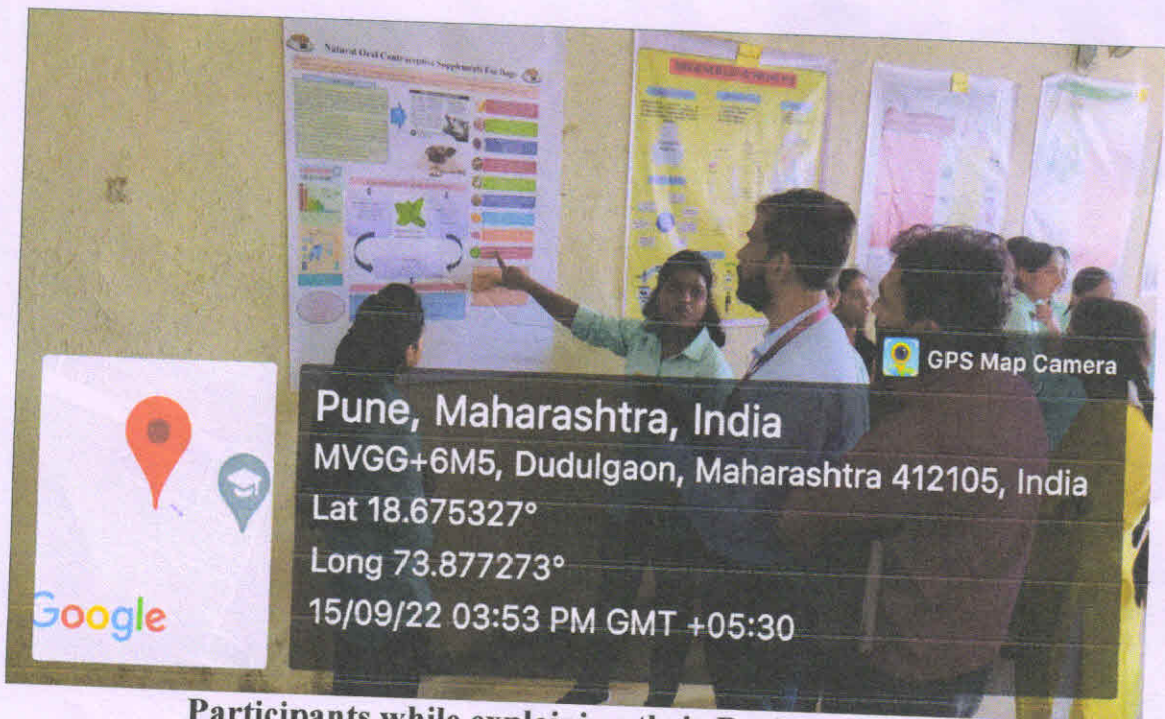




Pune, Maharashtra, India  
MVGG+6M5, Dudulgaon, Maharashtra 412105, India  
Lat 18.675207°  
Long 73.877321°  
15/09/22 02:56 PM GMT +05:30

GPS Map Camera

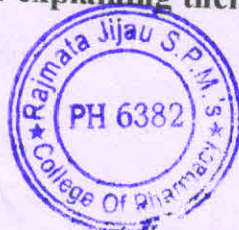
**Prof. Amol B. Kumbhar while instructing students**



Pune, Maharashtra, India  
MVGG+6M5, Dudulgaon, Maharashtra 412105, India  
Lat 18.675327°  
Long 73.877273°  
15/09/22 03:53 PM GMT +05:30

GPS Map Camera

**Participants while explaining their Project & Topic**

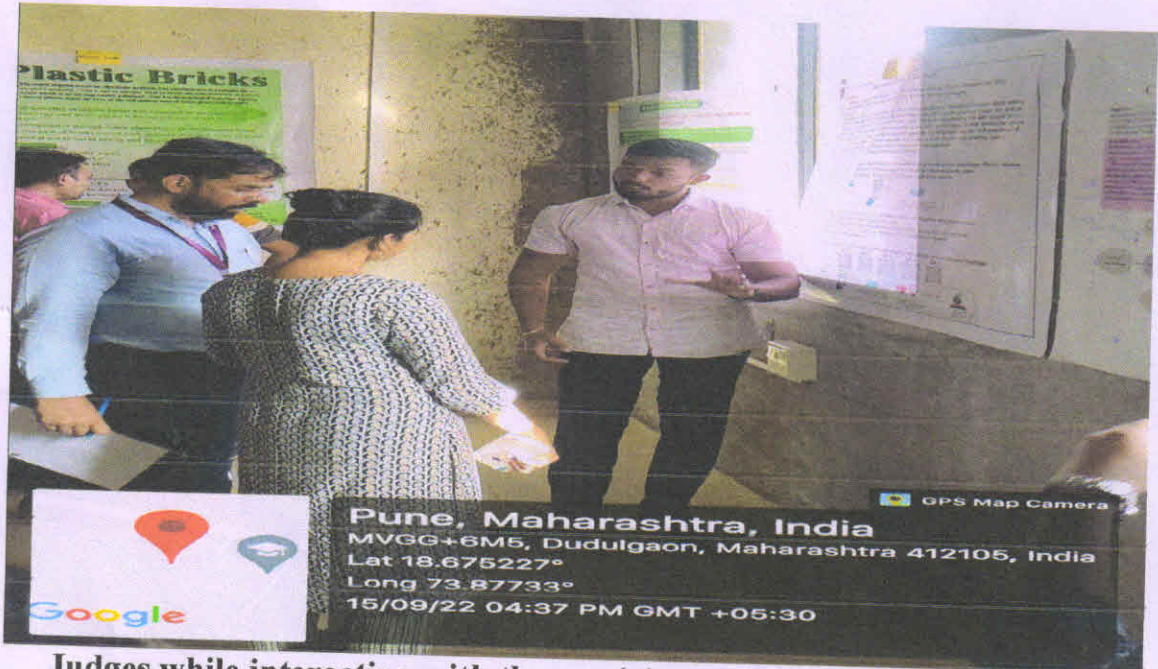




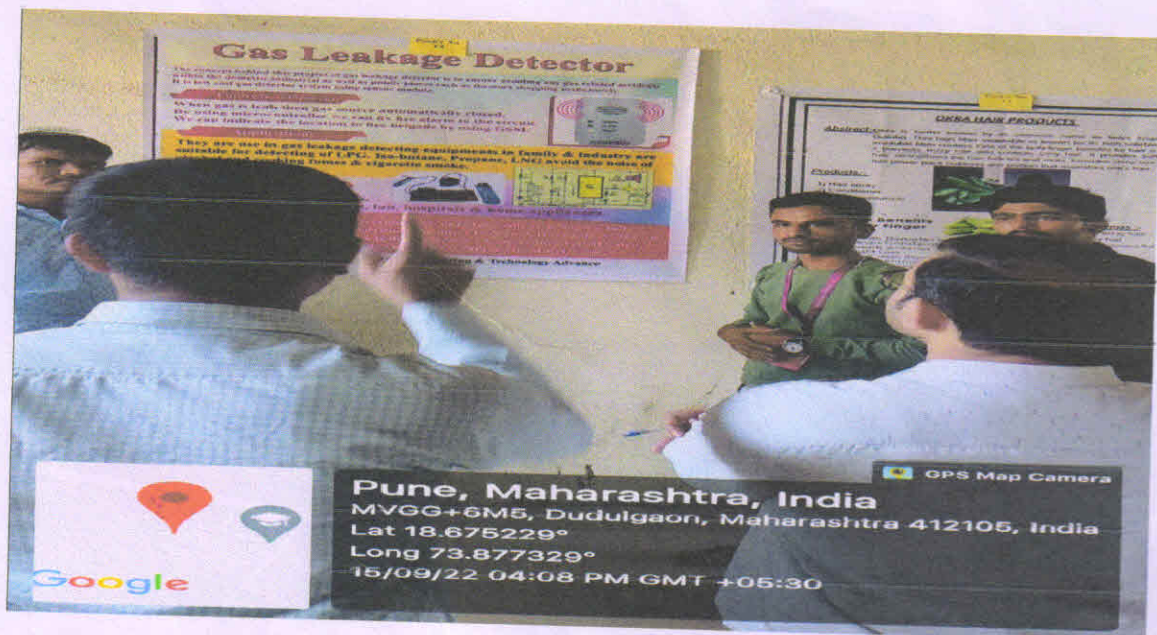


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Judges while interacting with the participants & evaluating them



Judges while interacting with the participants & evaluating them





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## SUMMARY

RAJMATA JIJAU SHIKSHAN PRASARAK MANDAL'S  
**COLLEGE OF PHARMACY**  
Moshi-Alandi Road, Dadulgaon, Pune – 412105

**Seminar**  
**Topic - Career after Pharmacy**



**Speaker – Mr. Aditya Bramhakule**  
Scientific and Medical Writer-Grade II  
at Crest (Springer Nature Technology and Publishing Solutions)

**Various Career Opportunities in Pharma IT**  
Thursday, 10<sup>th</sup> November, 2022  
Time – 03:30 PM Onwards  
Venue – Seminar Hall

**Ms. Vipra R. Vaidya**  
Co-Curricular In-charge, RJSPM's COP

**Dr. Kishor S. Jain**  
Principal, RJSPM's COP

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**Description-** Seminar on “Career after Pharmacy” which was held on 10-11-2022 for Third & Final Year students.

**Speaker** – Mr. Aditya Bramhakule who is working as scientific and Medical writer – Grade II at Crest (Springer Nature Technology and Publishing Solutions)

Lecture started with introduction of Resource person Mr. Aditya Bramhakule

**Contact details:-** 9730465530

The main aim of the guest lecture was to make the students aware about the career opportunities in Pharmacy education.

- The students were also informed regarding the varied skills and attributes required in a Pharmacy professional to succeed in the fast changing Pharmaceutical Sector. Various new allied sectors of Pharmacy that have grown tremendously in recent days like Clinical Data Management, Pharmacovigilance, clinical trials, Medical Coding, Audit Handling. He explained the roles and responsibilities of Medical Writing. Clinical Research Associate and Clinical Research Co-ordinator professional. He also





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Secretary

Hon. Shri. Ajit D. Gavhane  
Treasurer

Dr. Kishor S. Jain  
Principal

enlightened the students regarding various regulatory bodies in India and other countries.

- He acquainted students regarding some add-on courses for Medical Coding and Pharmacovigilance
- The event concluded with vote of thanks and appreciation of resource person

**Duration** – 90min

**Outcomes-**

The discussion provided to the students a platform for sharing their thoughts and was endowed with proper guidance regarding each and every aspect of career. So this seminar gives valuable contributions for students.

**Faculty In charge-**

Asst. Prof. Vipra. R. Vaidya

**Number of Participants-** 64



  
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Rajmata Jijau Shikshan Prasarak Mandal's  
COLLEGE OF PHARMACY  
Dudulgaon, Pune-412 105.





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Treasurer

Dr. Kishor S. Jain  
Principal

## Guest Lecture

Report of Guest Lecture on Topic,

### “Career After Pharmacy”

Speaker : Mr. Aditya Bramhakule

Time: 3.30pm to 4.30 pm

Date: 10<sup>th</sup> November, 2022



Feliciation of Mr. Aditya Bramhakule sir by Asst. Professor Ms. Vipra R. Vaidya



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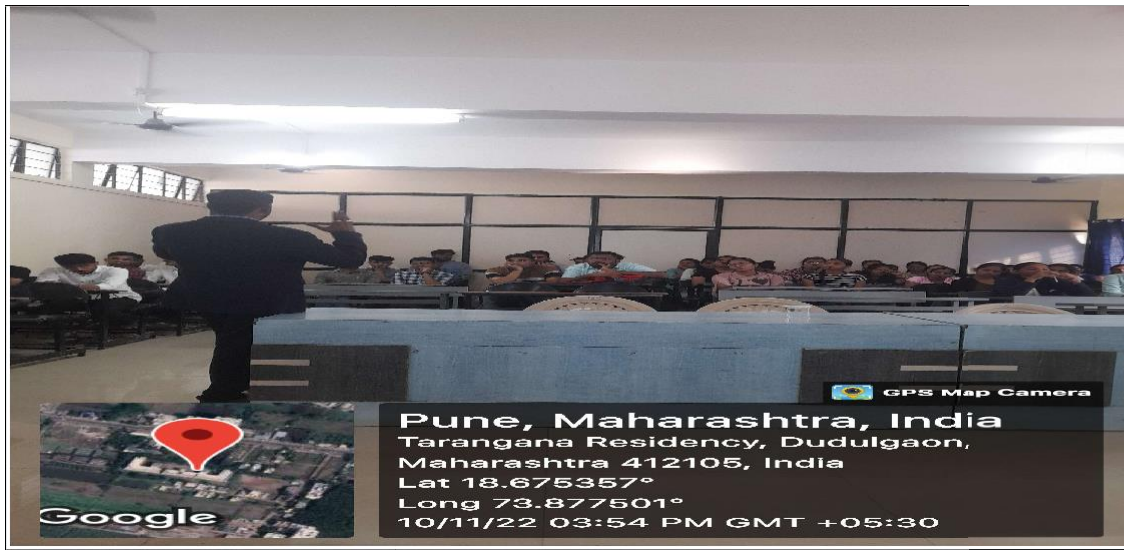
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Dr. Kishor S. Jain  
Principal



**Students While Listening the Seminar Actively**



**Mr. Aditya Bramhakule Sir Interacting With Our Students**

# **Industrial Visit**

**A  
REPORT ON  
INDUSTRIAL VISIT  
AT  
CHAKAN LIFE SCIENCES PRIVATE LIMITED**

**ON 26<sup>th</sup>APRIL, 2022**

**BY STUDENTS OF  
FINAL YEAR B. PHARMACY**

**ACCOMPNIED BY  
PROF. A.B. KUMBHAR, ASST. PROF.O.H.KOLHE AND ASST.PROF. A.Z.GITE**

**ORGANISED BY  
RJSPM'S COLLEGE OF PHARMACY, DUDULGAON, ALANDI**





## Objective:

- To build up knowledge.
- To explore students to industrial environment.
- To build industry institute relation and interaction.
- To understand health, safety and environmental aspects in industry.
- To interact with peoples, build contacts for future career advancement.

**Name Of industry: CHAKAN LIFE SCIENCES**

**Location: BHARE, MULSHI, PUNE**

The visit was organized with the prior permission and guidance of Hon. Principal **Dr. K.S.JAIN** and HOD of Pharmacy Department Prof. **A.B.Kumbhar**.

*On 26<sup>th</sup> April, 2022 (Tuesday) students of RJSPM's First year B.Pharmacy got good opportunity to visit one of the top Pharmaceutical Industry "CHAKAN LIFE SCIENCES PRIVATE LIMITED". This plant is located at Bhare, Mulshi, Pune. Total 23 students along with 3 faculty members have joined this industrial visit. This plant mainly deals with manufacturing of medical device/Repacking.*



**RJSPM,s Students at Chakan life sciences Bhare, Mulshi, Pune**

**A  
REPORT ON  
INDUSTRIAL VISIT  
AT  
NULIFE PHARMACEUTICAL**



**ON 21<sup>st</sup> May, 2022**

**BY STUDENTS OF  
FIRST YEAR B. PHARMACY**

**ACCOMPNIED BY**

**Asst.Prof. S.N.Ghodekar, Asst.Prof. S.V.Mane and Asst.Prof.A.Z.Gite**

**ORGANISED BY**

**RJSPM'S COLLEGE OF PHARMACY, DUDULGAON, ALANDI**



**Objective:**

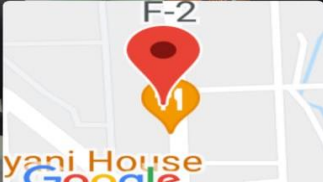
- To build up knowledge.
- To explore students to industrial environment.
- To build industry institute relation and interaction.
- To understand health, safety and environmental aspects in industry.
- To interact with peoples, build contacts for future career advancement.

**Name Of industry: NULIFE PHARMACEUTICAL****Location: MIDC, Pimpri, Pune**

The visit was organized with the prior permission and guidance of Hon. Principal **Dr. K.S.Jain** and HOD of Pharmacy Department Prof. **A.B.Kumbhar**.

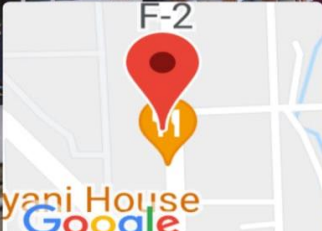
*On 21<sup>st</sup> May, 2022 (Saturday) students of RJSPM's Third year B.Pharmacy got good opportunity to visit one of the top pharmaceutical industry of the world "Nulife Pharmaceuticals Ltd". This plant is located at MIDC, Pimpri, Pune. Total 54 students along with 3 faculty members have joined this industrial visit. This plant mainly deals with manufacturing of lotion, ointment, ear drops, ayurvedic and allopathic liquid oral dosage forms and tablets.*





**Pimpri-Chinchwad, Maharashtra, India**  
63, Block F-2, MIDC, Pimpri Colony, Pimpri-Chinchwad  
Maharashtra 411018, India  
Lat 18.643122°  
Long 73.822592°

**RJSPM'S Team meet to eminent personalities Mr. Rajesh Jadhav and Mr. Prashant Saste.**



**Pimpri-Chinchwad, Maharashtra, India**  
63, Block F-2, MIDC, Pimpri Colony, Pimpri-Chinchwad,  
Maharashtra 411018, India  
Lat 18.643128°  
Long 73.822626°  
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**RJSPM,s Students at Nulife pharmaceuticals**

**A  
REPORT ON  
INDUSTRIAL VISIT  
AT  
PASSIFLORA LABORATORIES**



**ON 26<sup>th</sup> April, 2022**

**BY STUDENTS OF  
FINAL YEAR B. PHARMACY**

**ACCOMPNIED BY  
PROF. A.B.KUMBHAR AND ASST. PROF. O.H.KOLHE  
AND ASST.PROF.A.Z.GITE**

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## Objective:

- To build up knowledge.
- To explore students to industrial environment.
- To build industry institute relation and interaction.
- To understand health, safety and environmental aspects in industry.
- To interact with peoples, build contacts for future career advancement.

**Name Of industry: PASSIFLORA LABORATORIES**

**Location:Ghotawade Phata, Mulshi, Pune**

The visit was organized with the prior permission and guidance of Hon. Principal **Dr.K.S.Jain**.and HOD of Pharmacy Department Prof. **A.B.Kumbhar**.

*On 26<sup>th</sup> April 2022 (Tuesday) students of RJSPM's final year B.Pharmacy got good opportunity to visit one of the top pharmaceutical industry of the world "PASSIFLORA LABORATORIES". This plant is located at Ghotawade Phata, Mulshi, Pune. Total 26 students along with 3 faculty members have joined this industrial visit. This plant mainly deals with manufacturing of lotion, ointment, and liquid dosage forms and tablets.*



**RJSPM'S faculty members meet to eminent personality Mr. Pravin Jagtap**





**Kasar Amboli, Maharashtra, India**

**GM8H+W9X, Kasar Amboli, Maharashtra 412115, India**

**Lat 18.517819°**

**Long 73.67879°**

**06/04/2024 04:00 PM**

*RJSPM's Students at Passiflora laboratories production plant*



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## SUMMARY

RAJMATA JIJAU SHIKSHAN PRASARAK MANDAL'S  
**COLLEGE OF PHARMACY**  
Moshi-Alandi Road, Dudulgaon, Pune - 412105

**Webinar - Skill Development Training**

**Training Programme Details:**

- 120 hrs. (15 Days) duration, focusing on any pursuing their final year degree Batch.
- As of now, this program is open for all final year students with Family Income less than or equal to 4.0 Lac PA and this program would help the student during their placements.
- FREE TRAINING UNDER CSR initiative.
- All the participating student would get an e-Certificate once the validation is done.
- Trained and eligible candidate will get 100% Placement Assistance.

**Time - 03:30 PM**  
**Date - 18/11/2022**  
**Mode - Online**

Mr. Omkar H. Kolhe  
Coordinator

Ms. Vipra R. Vaidya  
Coordinator

**Zoom**

Hon. Shri Vilas V. Lande  
First MLA, Bhosari Constituency  
President, RJSPM

Shri Sudhir V. Mungase  
Secretary, RJSPM

Shri Ajit D. Gavhane  
Treasurer, RJSPM

Dr. Kishor S. Jain  
Principal, RJSPM's COP

www.rjspmpharmacy.com

rjspmpharmacy

### **Topic: "Skill Development Training"**

Webinar was organized on **18<sup>th</sup> of November at 3.30 PM** for final year B. Pharmacy students on topic "Skill Development Training".

**Speaker:** Ms. Apurva Deshmukh from Global Talent Track Foundation Pune.

Contact Details: **7276440645**

Lecture started with the introduction of resource person.

Ms. Apurva Deshmukh discussed the following points with the students-

1. Introduction to Skill Development Programmes.
2. Offering vocational courses simultaneously with the regular degree courses.
3. Helping students to discover their interests, aptitudes and potentialities.

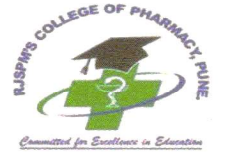


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4. Maximizing their potentialities and boosting self confidence.

**GTT provides-**

- Quality Training.
- Skills Training.
- Soft Skills Training.
- Professional Training and Legal Training.
- Team Training.
- This program was specially organized for students with family income less than 4 lacs PA
- Trained students will get e- certificates and 100 % placement Assistance

The session was concluded by giving vote of thanks and Appreciation of resource person.





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Principal

Report of Webinar on,

## “Skill Development & Training”

**Speaker :** Ms. Apurva Deshmukh, (GTT Foundation, Pune)

**Date:** 18/11/2022

**Time :** 3.30 pm – 4.30 pm

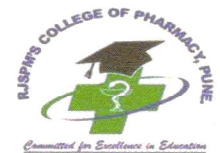


### **Introduction to GTT Foundation Team**



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## GTT FOUNDATION WEBINAR



**Students while listening the Webinar Actively**



**GTT team while delivering the webinar**





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Principal

## SUMMARY

**Topic- "HEALTH & MEDITATION"**

**Speaker- Sachin Ilhe (Sahaja Yoga Co-ordinator)**

**Date – 22/06/2023**

### **Description-**

Guest lecture on Topic- "Health & Meditation" which was held on 22/06/2023 for First Year students at seminar hall.

**Speaker – Mr. Sachin Ilhe, Sahajyoga Co-ordinator Pune**

The lecture started with the Introduction of "**Sahaja Yoga**" which is a unique form of meditation that focuses on self-realization and inner balance. It was founded by **Shri Mataji Nirmala Devi in 1970** and has gained popularity worldwide due to its accessibility and effectiveness in promoting holistic health. Sahaja Yoga combines traditional meditation practices with the awakening of the dormant spiritual energy known as "Kundalini" within us. By channeling this energy, practitioners can achieve a state of mental tranquility, emotional balance, and physical well-being.

### **Topic discussed -**

1. Speaker explains the history of Sahaja Yoga and the fundamental principles it is based on, including the awakening of Kundalini and the importance of self-realization, Sahaja Yoga meditation technique, which involves achieving a state of "thoughtless awareness" by silencing the mind and connecting with the inner self, he Discussed how regular Sahaja Yoga meditation can reduce stress and anxiety levels.
2. Speaker also discussed how to explore the positive impact of Sahaja Yoga on emotional health, such as increased emotional intelligence, improved self-awareness, and enhanced relationships with others.

**Duration – 90 min**





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## Conclusion:

Sahaja Yoga provides a powerful and accessible approach to improving health and well-being through meditation and self-realization. By integrating the practice of Sahaja Yoga into our daily lives, we can experience a profound transformation that encompasses physical, mental, and emotional dimensions, leading to a more fulfilling and harmonious existence.

**Number of Participants-** 64



  
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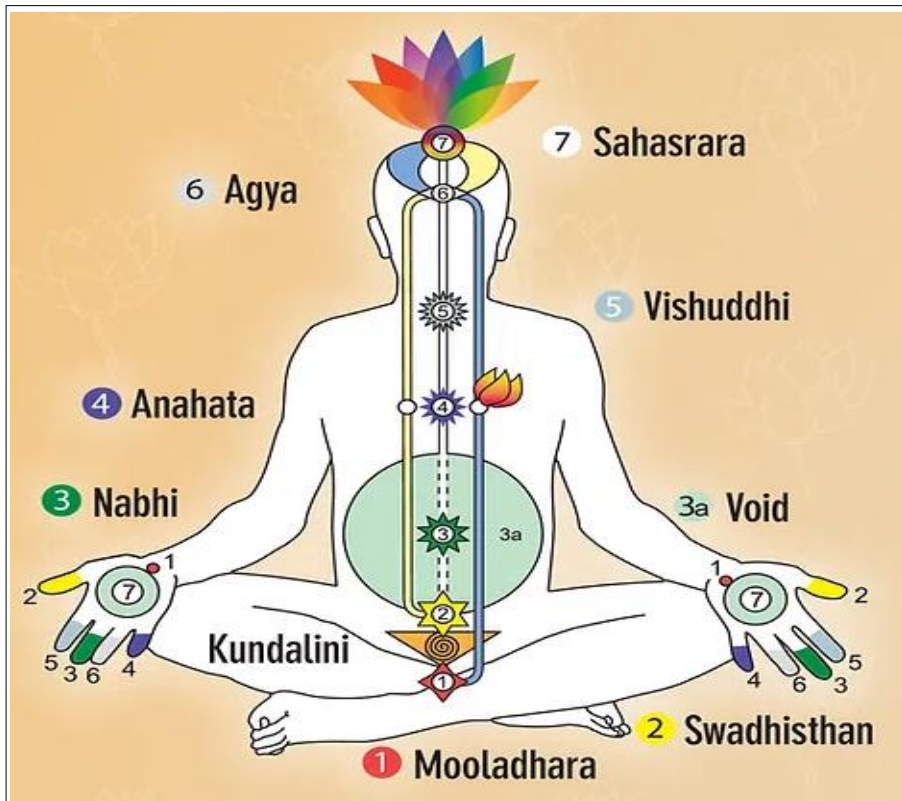
**Report of Guest lecture on,**

**TOPIC "Health & Meditation"**

By - Mr. Sachin Ilhe (Sahaja Yoga Co-ordinator) Charoli, Pune

DATE- 22 June, 2023

TIME: 10.30 AM TO 12.00 PM



**SAHAJA YOGA**  
SHRI MATAJI NIRMALA DEVI





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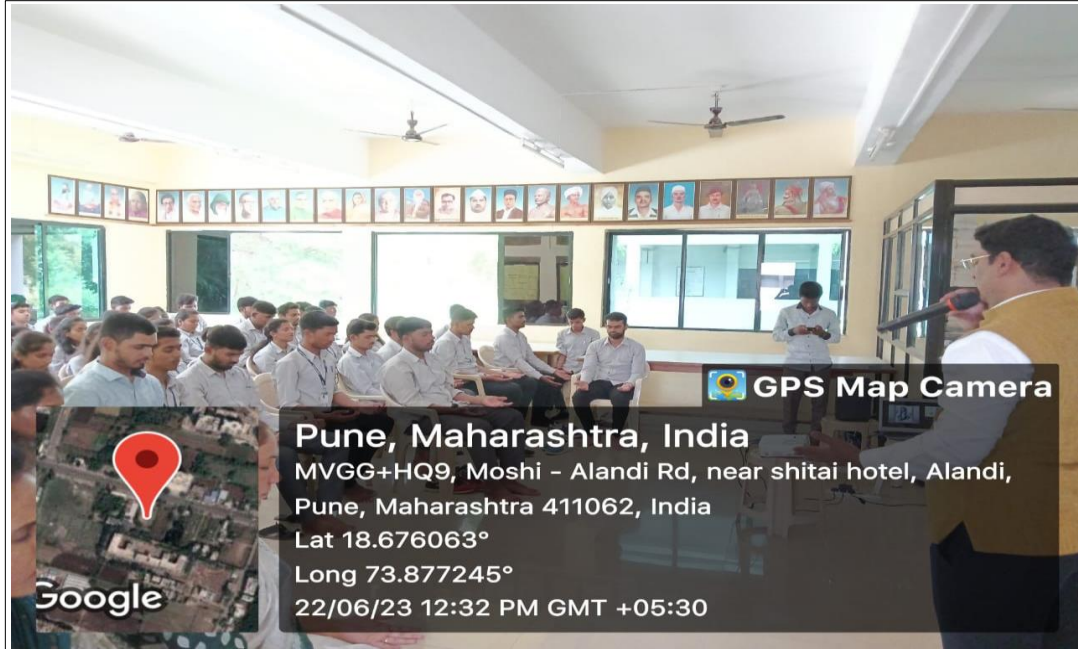
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Principal



Mr. Sachin Ilhe sir while introducing our students about "Sahaja Yoga"



Our students & staff members while listening to Mr. Sachin Ilhe sir





### YouTube Channel of Faculty Members

Sr. No.	Name of Faculty	Channel Name	Topic	Link	No. Of Videos
1.	Dr. K.S. Jain	Kishor Jain	Emerging Trends in Drug Discovery	<a href="https://www.youtube.com/watch?v=oArNDnc7-XO">https://www.youtube.com/watch?v=oArNDnc7-XO</a>	28
			IR Spectroscopy Part 5: Question Answers & Assignments	<a href="https://www.youtube.com/watch?v=C7AwTwqmy_Q">https://www.youtube.com/watch?v=C7AwTwqmy_Q</a>	
			Infrared Spectroscopy Part-4: FTIR Theory, Instrumentation and Applications of IR.	<a href="https://www.youtube.com/watch?v=lmYf_aUpRYo">https://www.youtube.com/watch?v=lmYf_aUpRYo</a>	
			Infrared Spectroscopy-Part-3: Instrumentation & Handling	<a href="https://www.youtube.com/watch?v=CXdOPuP5z5c">https://www.youtube.com/watch?v=CXdOPuP5z5c</a>	
			New Drug Discovery Methods & Tools Part I	<a href="https://www.youtube.com/watch?v=a7yggDfIX4I">https://www.youtube.com/watch?v=a7yggDfIX4I</a>	
			Polycyclic Aromatic Hydrocarbons (PAH) Part 4 Dr K S Jain	<a href="https://www.youtube.com/watch?v=PvRI6aU7RFk">https://www.youtube.com/watch?v=PvRI6aU7RFk</a>	
			PAH 3 Phenanthrene Dr K S Jain	<a href="https://www.youtube.com/watch?v=W19fxpc3My4">https://www.youtube.com/watch?v=W19fxpc3My4</a>	
			PAH 2 Anthracene Dr K S Jain	<a href="https://www.youtube.com/watch?v=dnMkrJqwy_Q">https://www.youtube.com/watch?v=dnMkrJqwy_Q</a>	
			PAH 1 : Napthalene Dr K S Jain	<a href="https://www.youtube.com/watch?v=2avsx_IBKtI">https://www.youtube.com/watch?v=2avsx_IBKtI</a>	
			IR Part 2 The IR Spectrum	<a href="https://www.youtube.com/watch?v=fqdCQT8XHhO">https://www.youtube.com/watch?v=fqdCQT8XHhO</a>	
			InfraRed Spectroscopy: Part 1 Theoretical Aspects Dr K S Jain	<a href="https://www.youtube.com/watch?v=cJpY4fVU_g">https://www.youtube.com/watch?v=cJpY4fVU_g</a>	
			Benene and Aromaticity-Part 1 Struture & Orbital picture Dr K S Jain	<a href="https://www.youtube.com/watch?v=ppI8NKWgdYk">https://www.youtube.com/watch?v=ppI8NKWgdYk</a>	
			Benene and Aromaticity-Part 2 Resonance & Aromaticity Dr K S Jain	<a href="https://www.youtube.com/watch?v=UfIF4P-Jifg">https://www.youtube.com/watch?v=UfIF4P-Jifg</a>	
			Benzene & Aromaticity Part 5- Selected derivatives & MCQs	<a href="https://www.youtube.com/watch?v=rz6wPUGTXYo">https://www.youtube.com/watch?v=rz6wPUGTXYo</a>	
			Benzene and Aomaticity -Part 4- Orientation of substitution in monosubstituted benzenes	<a href="https://www.youtube.com/watch?v=1O-7Emji-ps">https://www.youtube.com/watch?v=1O-7Emji-ps</a>	
			Benzene and Aromaticity -Part 3- Electrophilic Aromatic Substitution by Dr K S Jain	<a href="https://www.youtube.com/watch?v=61HA6tAyi10">https://www.youtube.com/watch?v=61HA6tAyi10</a>	
			IUPAC Nomenclature of Organic Compounds by Dr K S Jain	<a href="https://www.youtube.com/watch?v=iQ53eBqdGck">https://www.youtube.com/watch?v=iQ53eBqdGck</a>	
Classification of Organic Compounds- By Dr K.S.Jain	<a href="https://www.youtube.com/watch?v=lg68qZnGt_8">https://www.youtube.com/watch?v=lg68qZnGt_8</a>				
Career Opportunities in Pharmacy	<a href="https://www.youtube.com/watch?v=iicaCd9roVQ">https://www.youtube.com/watch?v=iicaCd9roVQ</a>				
Molecular modeling-CADD basics -Dr K S Jain	<a href="https://www.youtube.com/watch?v=A55vEBdXfeQ">https://www.youtube.com/watch?v=A55vEBdXfeQ</a>				





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E-mail: rjspmcp123@gmail.com Web: www.rjspmpharmacy.com

Univ Id: PU/PN Pharm/286/2007 College Code:1081 DTE Code:6382



Sr. No.	Name of Faculty	Channel Name	Topic	Link	No. Of Videos
			QSAR (Hansch's LFER) Explained Dr K S JAIN	<a href="https://www.youtube.com/watch?v=8v7htORwWrA">https://www.youtube.com/watch?v=8v7htORwWrA</a>	
			DRUG DESIGN I Earlier Approaches Dr K S Jain	<a href="https://www.youtube.com/watch?v=NXIVYjml8p8">https://www.youtube.com/watch?v=NXIVYjml8p8</a>	
			Fibonacci in Drug Design	<a href="https://www.youtube.com/watch?v=kywOT8-uXks">https://www.youtube.com/watch?v=kywOT8-uXks</a>	
			3D QSAR Dr K S Jain	<a href="https://www.youtube.com/watch?v=9wOUAzTXeZo">https://www.youtube.com/watch?v=9wOUAzTXeZo</a>	
			Dr K S Jain : Aldehydes & Ketones	<a href="https://www.youtube.com/watch?v=rK8-WLlgSEw">https://www.youtube.com/watch?v=rK8-WLlgSEw</a>	
			Dr K S Jain : ANTI-TUBERCULAR AGENTS	<a href="https://www.youtube.com/watch?v=LIAIvYIZoT4">https://www.youtube.com/watch?v=LIAIvYIZoT4</a>	
			Dr K S Jain-ANTIMALARIALS	<a href="https://www.youtube.com/watch?v=6m5Vw78rQs">https://www.youtube.com/watch?v=6m5Vw78rQs</a>	
2.	Dr. J.S.Dhumal	Jeevan Dhumal	Pharmacognosy of Jute (S Y B Pharmacy Sem IV)	<a href="https://www.youtube.com/watch?v=vUMG2kXoX6g">https://www.youtube.com/watch?v=vUMG2kXoX6g</a>	31
			Pharmacognosy of Hemp (S Y B Pharmacy Sem IV)	<a href="https://www.youtube.com/watch?v=oS2eOswqwTc">https://www.youtube.com/watch?v=oS2eOswqwTc</a>	
			Pharmacognosy of Cotton (S Y B Pharmacy as pePCI syllabus)	<a href="https://www.youtube.com/watch?v=-jVqeZIDnml">https://www.youtube.com/watch?v=-jVqeZIDnml</a>	
			How to check B. Pharmacy provisional merit list ? Next step after checking the provisional list	<a href="https://www.youtube.com/watch?v=-vDouTnD2rE">https://www.youtube.com/watch?v=-vDouTnD2rE</a>	
			AFTER SUBMISSION OF ONLINE APPLICATION VERY IMPORTANT STEP B Pharm First & Direct Second Year CAP 20	<a href="https://www.youtube.com/watch?v=LnlIG8Kot7w">https://www.youtube.com/watch?v=LnlIG8Kot7w</a>	
			filling and confirmation of option form for post HSC diploma courses	<a href="https://www.youtube.com/watch?v=33lnL5YugXo">https://www.youtube.com/watch?v=33lnL5YugXo</a>	
			What is TFWS? Complete scheme details	<a href="https://www.youtube.com/watch?v=Gull6KQ71Xg">https://www.youtube.com/watch?v=Gull6KQ71Xg</a>	
			B.Pharmacy/ Pharm D. Admission Activity schedule 2020-21	<a href="https://www.youtube.com/watch?v=AjjwrZOGTus">https://www.youtube.com/watch?v=AjjwrZOGTus</a>	
			How to view Provisional merit list (Post HSC Diploma courses) & what to do in case of Grievance? D Pharm (Post HSC Diploma Courses) activity schedule 2020 21	<a href="https://www.youtube.com/watch?v=jwONFzF67Fg">https://www.youtube.com/watch?v=jwONFzF67Fg</a> <a href="https://www.youtube.com/watch?v=sS6OIEMZarM">https://www.youtube.com/watch?v=sS6OIEMZarM</a>	
			B Pharmacy eligibility criteria from 2020-21	<a href="https://www.youtube.com/watch?v=owCq6Eajxgg">https://www.youtube.com/watch?v=owCq6Eajxgg</a>	
			Best/Top 10 Pharmacy Colleges in Maharashtra	<a href="https://www.youtube.com/watch?v=QUFJAIkMBCA">https://www.youtube.com/watch?v=QUFJAIkMBCA</a>	
			World Pharmacist Day	<a href="https://www.youtube.com/watch?v=Xg1Zd-QpYPA">https://www.youtube.com/watch?v=Xg1Zd-QpYPA</a>	
			Top 10 Richest Indian Pharma Entrepreneurs,	<a href="https://www.youtube.com/watch?v=oKG2Q5sGCo4">https://www.youtube.com/watch?v=oKG2Q5sGCo4</a>	
			Dr. K. Anji Reddy, Founder, Dr. Reddy's Laboratories,	<a href="https://www.youtube.com/watch?v=w54wKptzRRg">https://www.youtube.com/watch?v=w54wKptzRRg</a>	





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E-mail: rjspmcp123@gmail.com Web: www.rjspmpharmacy.com

Univ Id: PU/PN Pharm/286/2007 College Code:1081 DTE Code:6382



Sr. No.	Name of Faculty	Channel Name	Topic	Link	No. Of Videos
			Success Story 1, Always Dream Big		
			D.Pharmacy	<a href="https://www.youtube.com/watch?v=pNIFdTGINsA">https://www.youtube.com/watch?v=pNIFdTGINsA</a>	
			Teacher Day Wishes	<a href="https://www.youtube.com/watch?v=QUFJA1kmBCA">https://www.youtube.com/watch?v=QUFJA1kmBCA</a>	
			Post HSC diploma Courses Dates extended for document verification and online application till 10 sep	<a href="https://www.youtube.com/watch?v=BrwOu9slrrk">https://www.youtube.com/watch?v=BrwOu9slrrk</a>	
			D Pharmacy Course Information (Duration, Course of study, Examination, training etc)	<a href="https://www.youtube.com/watch?v=eCKAXNskR2Q">https://www.youtube.com/watch?v=eCKAXNskR2Q</a>	
			Allotment List, Seat Acceptance, Auto freeze, Freeze, Betterment, CAP, Post HSC Diploma, 2020-21	<a href="https://www.youtube.com/watch?v=ySAOuIOFE2E">https://www.youtube.com/watch?v=ySAOuIOFE2E</a>	
			What is next after Declaration of Provisional merit list & Submission of Grievances? PostHSCDiploma	<a href="https://www.youtube.com/watch?v=ajpGk_MC9Js">https://www.youtube.com/watch?v=ajpGk_MC9Js</a>	
			Dates extended for Post HSC Diploma courses CAP 2020 (D. Pharm, HMCT & SCT)	<a href="https://www.youtube.com/watch?v=y3HxyjX-Qjk">https://www.youtube.com/watch?v=y3HxyjX-Qjk</a>	
			Process for Option Form Filling and Confirmation for Post Hsc Diploma courses 2020	<a href="https://www.youtube.com/watch?v=GSz474-xetc">https://www.youtube.com/watch?v=GSz474-xetc</a>	
			Fees Structure for Government and Unaided Private institutes, Post HSC Diploma, D. Pharm, SCT, HMCT	<a href="https://www.youtube.com/watch?v=aClcsEKeeDc">https://www.youtube.com/watch?v=aClcsEKeeDc</a>	
			How to Search College fees online? (Pharmacy, Engineering, Medical and Agriculture)	<a href="https://www.youtube.com/watch?v=00-O5p_37Gk">https://www.youtube.com/watch?v=00-O5p_37Gk</a>	
			How to send e-grievance after verification of documents (e-scrutiny) in Post HSC Diploma courses ?	<a href="https://www.youtube.com/watch?v=Zhe-zUnEmbE">https://www.youtube.com/watch?v=Zhe-zUnEmbE</a>	
			Cut off list for D. Pharmacy. मला माझ्या आवडत्या कॉलेज मध्ये प्रवेश मिळेल का?	<a href="https://www.youtube.com/watch?v=OqQ_3cFuxPY">https://www.youtube.com/watch?v=OqQ_3cFuxPY</a>	
			D Pharmacy, how merit list is prepared? Post HSC diploma courses Centralized admission process	<a href="https://www.youtube.com/watch?v=9UG2Jv6GPNg">https://www.youtube.com/watch?v=9UG2Jv6GPNg</a>	







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Sr. No.	Name of Faculty	Channel Name	Topic	Link	No. Of Videos
			Post HSC Diploma courses, What is next step after document verification?	<a href="https://www.youtube.com/watch?v=mRn1xBIHfDA">https://www.youtube.com/watch?v=mRn1xBIHfDA</a>	
			Post HSC diploma courses(D.Pharmacy, SCT & HMCT) Document verification कसे, कुठे, कधी करावे ?	<a href="https://www.youtube.com/watch?v=LRfHjpZ89nY">https://www.youtube.com/watch?v=LRfHjpZ89nY</a>	
			POST HSC Diploma Courses CAP 2020 विद्यार्थ्यांनी ऑनलाईन अर्ज भरण्यापूर्वी या गोष्टींची तयारी करा	<a href="https://www.youtube.com/watch?v=AgPR3e2415A">https://www.youtube.com/watch?v=AgPR3e2415A</a>	
3.	Prof. A. N. phuge	Ashish Phuge	Synthetic Antibacterial Agents - Part 1	<a href="https://www.youtube.com/watch?v=cleHhFD1dSO">https://www.youtube.com/watch?v=cleHhFD1dSO</a>	20
			Autocoids	<a href="https://www.youtube.com/watch?v=a8kTeD9lxZc">https://www.youtube.com/watch?v=a8kTeD9lxZc</a>	
			Fats and Oils	<a href="https://www.youtube.com/watch?v=ZWw59PS_gMw">https://www.youtube.com/watch?v=ZWw59PS_gMw</a>	
			Cycloalkanes	<a href="https://www.youtube.com/watch?v=Dk4hwkOHifQ">https://www.youtube.com/watch?v=Dk4hwkOHifQ</a>	
			Macrolide Antibiotics	<a href="https://www.youtube.com/watch?v=RVYLigYHpRo">https://www.youtube.com/watch?v=RVYLigYHpRo</a>	
			Polypeptide Antibiotic	<a href="https://www.youtube.com/watch?v=f-qBFprRIhk">https://www.youtube.com/watch?v=f-qBFprRIhk</a>	
			Antitubercular Agents	<a href="https://www.youtube.com/watch?v=lqSO7CCYOX4">https://www.youtube.com/watch?v=lqSO7CCYOX4</a>	
			Aminoglycosides	<a href="https://www.youtube.com/watch?v=ncj8jLO1cTY">https://www.youtube.com/watch?v=ncj8jLO1cTY</a>	
			Antiameobic Drugs	<a href="https://www.youtube.com/watch?v=YSCfPys19Qk">https://www.youtube.com/watch?v=YSCfPys19Qk</a>	
			Isoniazid	<a href="https://www.youtube.com/watch?v=CVvNKf8lPKE">https://www.youtube.com/watch?v=CVvNKf8lPKE</a>	
			Beta Lactamase Inhibitors	<a href="https://www.youtube.com/watch?v=Vwo1YDjP4Q8">https://www.youtube.com/watch?v=Vwo1YDjP4Q8</a>	
			Antileprotic Drugs	<a href="https://www.youtube.com/watch?v=DroHV6bp-Ms">https://www.youtube.com/watch?v=DroHV6bp-Ms</a>	
			Tetracycline Antibiotics	<a href="https://www.youtube.com/watch?v=6LToiy5YRoU">https://www.youtube.com/watch?v=6LToiy5YRoU</a>	
			Flucytosine	<a href="https://www.youtube.com/watch?v=mTB5XM-fW8Q">https://www.youtube.com/watch?v=mTB5XM-fW8Q</a>	
			Azoles	<a href="https://www.youtube.com/watch?v=VxZXiYvFrlw">https://www.youtube.com/watch?v=VxZXiYvFrlw</a>	
			Polyene Antibiotic	<a href="https://www.youtube.com/watch?v=W_SSvEe8Fv4">https://www.youtube.com/watch?v=W_SSvEe8Fv4</a>	
			Antiviral Agents	<a href="https://www.youtube.com/watch?v=VqO7Urd0LLY">https://www.youtube.com/watch?v=VqO7Urd0LLY</a>	
			Anthelmintics	<a href="https://www.youtube.com/watch?v=89trUvhlfxE">https://www.youtube.com/watch?v=89trUvhlfxE</a>	
			Chloramphenicol	<a href="https://www.youtube.com/watch?v=aPyEEuEFQwE">https://www.youtube.com/watch?v=aPyEEuEFQwE</a>	
			Antifungal Agents	<a href="https://www.youtube.com/watch?v=bYh3tRB_9IU">https://www.youtube.com/watch?v=bYh3tRB_9IU</a>	
4.	Prof A.K. Thikekar	Archana Thikekar	IR spectroscopy	<a href="https://www.youtube.com/watch?v=pmcOkQB59lw">https://www.youtube.com/watch?v=pmcOkQB59lw</a>	1



## HUMAN ANATOMY AND PHYSIOLOGY - I

### UNIT - I

[PART I]

Min

Date: / / 20

Page:

Ch-1 → Introduction to Human Body.

Ch-2 → Cellular level of organization.

Ch-3 → Tissue level of organization.

### Introduction to Human body

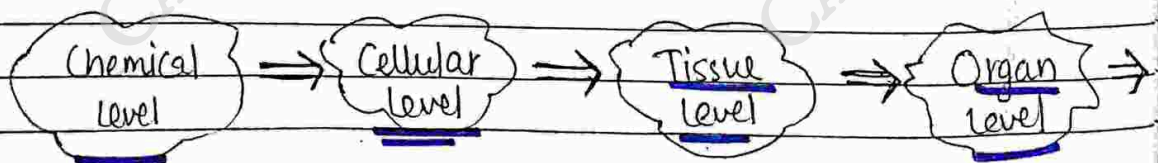
The study of human body involves two major principles :-

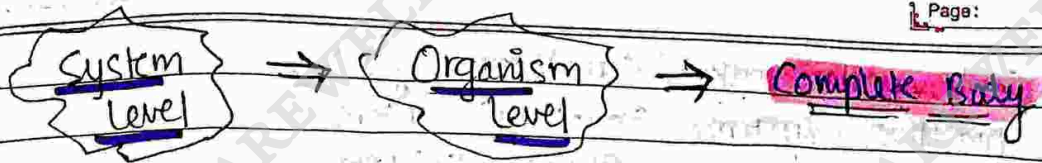
- i) Anatomy
- ii) Physiology

i) **Anatomy** → The branch of science which deal with the study of **structure** of different organs of human body.  
examples → **Histology** [study about tissue] etc

ii) **Physiology** → The branch of science which deal with the study of **functions** of different organs of human body.  
ex → Neurophysiology [study about function of neuron]  
Immunology etc--

- Levels of structural organization and body systems.





- i) Chemical level → Most basic level, two or more atoms joins together to form molecules like CO, O, N etc.
- ii) Cellular level → It is the basic structural and functional level of body i.e. cell.
- iii) Tissue level → These are the group of cell which works together to perform a particular function.
- iv) Organ level → Different types of tissue combine together to form organs which do proper functioning of body. ex → lungs, heart etc.
- v) System level → A group of organ combine together to form system.  
ex → Digestive system, Respiratory system etc.
- vi) Organism level → It is the highest level and a complete body made up with combined of all system.  
ex → Human Body.

### Body System →

There are 11 system in human body.

- 1) Nervous System
- 2) Integumentary System / Exocrine System
- 3) Respiratory System

→ Carewell Pharma



- 4) Cardiovascular System / Circulatory System.
- 5) Digestive System / Excretory system
- 6) Urinary System / Renal System
- 7) Reproductive System
- 8) Muscular System
- 9) Skeletal System
- 10) Immune System / Lymphatic System
- 11) Endocrine System.

- i) Nervous System → Its coordinate voluntary and involuntary action and transmit signal (information) by different parts of body.
- ii) Integumentary System → Skin, Hair, nails, sweat and other exocrine glands.
- iii) Respiratory System → It brings air into and out of the lungs to absorb oxygen and remove carbon dioxide.
- iv) Cardiovascular system → Organs → Heart, Blood vessels. It circulates blood around the body via the heart, arteries and veins, delivering oxygen and nutrients to organs and cells.
- v) Digestive System → Organs → Mouth, pharynx, stomach, intestine. To absorb nutrients and remove waste via the gastrointestinal tract.
- vi) Urinary System → Organs → kidney, Urethra, Urinary bladder. The system where the kidney filter blood to produce urine, and get rid of waste.

- vii) Reproductive System → The reproductive organ required for the production of offspring.
- viii) Muscular System → It enables the body to move using muscles.
- ix) Skeletal system → Bones maintain the structure of the body and its organs and give protection.
- x) Immune System / Lymphatic system →
  - It defends the body against pathogens that may harm the body.
  - The system consist of network of lymphatic vessels that carry a clear fluid called lymph.
- xi) Endocrine System → A system consists of different types of hormones which help in functioning in body. ex → T<sub>3</sub> & T<sub>4</sub> hormones (help in growth).

• Basic Life Process

- i) Metabolism < Catabolism  
Anabolism
- ii) Responsiveness
- iii) Movement
- iv) Growth
- v) Differentiation
- vi) Reproduction
- vii) Respiration







from the same unspecialized cell in Red bone marrow

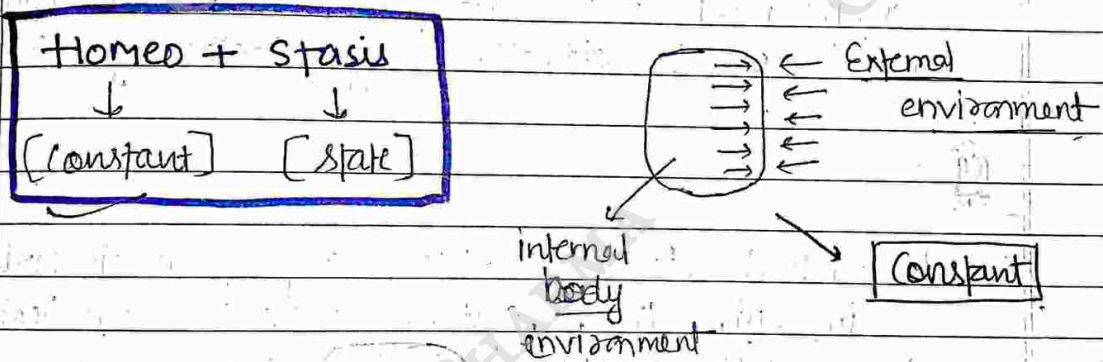
vi) Reproduction → It refers to the formation of new cells and also produce new offsprings.

eg → Old cells produce two new cells or parents cell produce fetus.

vii) Respiration → It involves the exchange of  $O_2$  and  $CO_2$  b/w the cells and the external environment.

eg → Human body do respiration etc.

## HOMEOSTASIS



eg → Body temp. →  $37^\circ C$  → it will be constant

• When Internal environment is constant with respect to external environment.

or

Internal environment = External environment.

## feedback system →

If there are any changes take place in internal environment then feedback system is take back into its constant state or in Homeostasis.

→ It is of two types -

- i) Positive feedback System. (+) ↑
- ii) Negative feedback System. (-) ↓

i) Positive feedback system → When anything is decrease in our internal environment, then it is try to back into normal situation by increasing it.

(eg) →

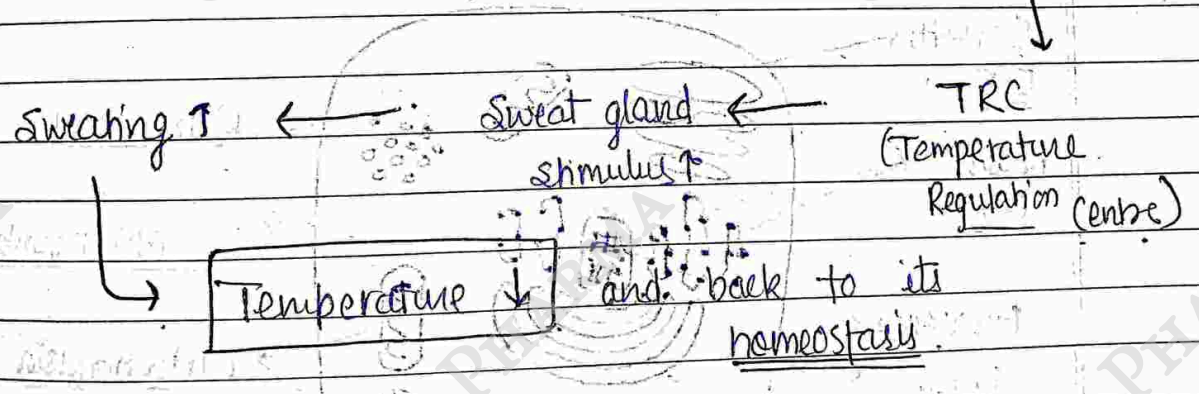
• In blood clotting, when any part of body injured, the system release chemical that activate blood platelets. Platelets are responsible for formation of blood clot and stop bleeding.

• During childbirth, it stimulate oxytocin, release through endocrine system. it stimulates the contraction of the uterus to help in childbirth.



ii) Negative feedback system → When anything is increase in our body (internal environment), then this system is by to back into its normal condition by decreasing it.

eg → Temp ↑ → Skin heat ↑ <sup>signal</sup> → Hypothalamus



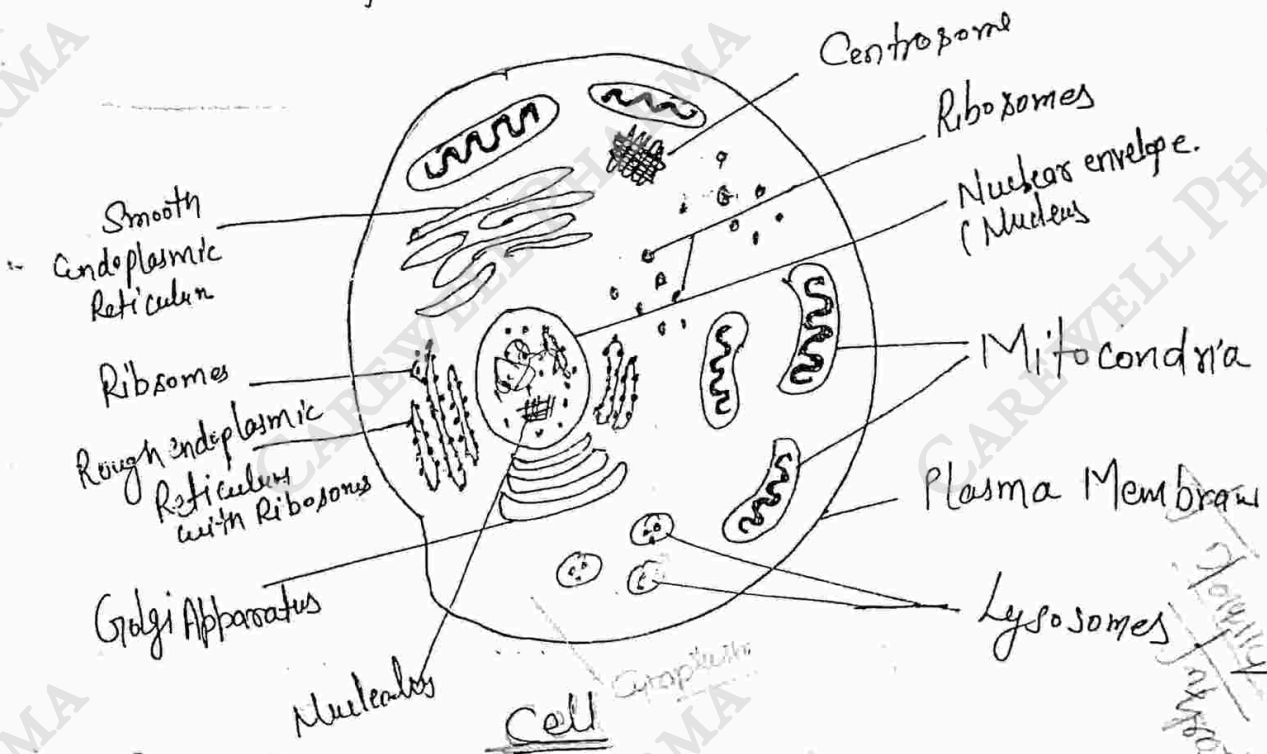


## UNIT-I

### Cell

Cell is the basic living, ~~structural~~ functional unit of body enclosed a membrane. There are about 200 different types of cells in our body. All cells arise from existing cells by the process of cell division, in which one cell divides into two identical cells.

Cell biology is the study of cellular structure & functions. Structure of the cell is intimately related to its function.



### 1 Parts of Cell

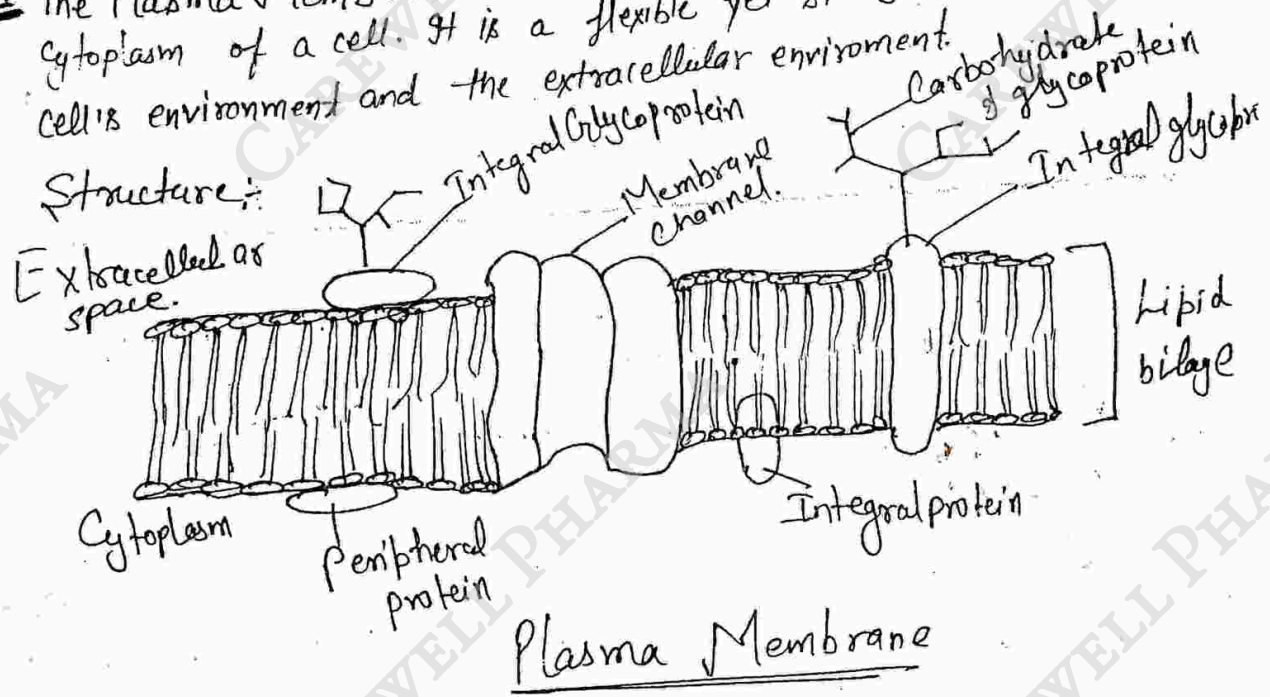
- 1. Plasma membrane:** It forms outer flexible surface of the cell that separates its internal environment from the external environment. This selective barrier regulates the flow of materials into the cell & out of a cell. It plays a key role in communication among cells & between cells & their external environment.
- 2. Cytoplasm:** It consists of all cellular contents between the plasma membrane & the nucleus. Cytoplasm has two components: Cytosol & Organelles.

② Cytosol:- It is the fluid portion of cytoplasm, contains water, dissolved substances & suspended particles.

③ Organelles:- They are surrounded by cytosol. Each type of organelles has a characteristic and specific functions, Ex- Include endoplasmic reticulum, Golgi complex, lysosomes, peroxisomes, ribosomes, mitochondria & cytoskeleton.

④ Nucleus:- This large organelle contains most of cellular DNA. A single mol of DNA is associated with several proteins to form a chromosome. It contains thousands of hereditary units called genes. The genes control most aspects of cellular structure and functions.

1 The Plasma Membrane:- Plasma membrane surrounds and contains the cytoplasm of a cell. It is a flexible yet sturdy barrier between the cell's environment and the extracellular environment.



The membrane is composed of proteins and lipids that are held together by non covalent forces.

(According to fluid mosaic model, the membrane is mosaic of proteins floating like icebergs in a lipid bilayer.)



The lipid bilayer consists of two back to back layers of phospholipids, cholesterol and glycolipids. The bilayer arrangement occurs because of amphipathic (both polar & non-polar parts) nature of the lipids.

Integral proteins extend into or through the lipid bilayer. Peripheral proteins associate with membrane lipids or integral proteins at the inner or outer surface of the membrane.

Many integral proteins are glycoproteins with sugar groups attached to the ends that face the extracellular fluid. Together with glycolipids & glycoproteins forms a glycocalyx on the extracellular surface of cells.

### Functions:-

1. Protection: It protects cell from injury.
2. Barrier: It hold or bound cell contents and maintains individuality of the cell.
3. Shape of the cell - It anchors structural elements of the cytoskeleton which provide distinct shape to specific cells.
4. Cell Recognition: Glycoproteins and glycolipids function as receptors for specific chemical signals from outside and trigger specific processes within the cell, eg: immune response, rejection of a sub. and signal transduction.
5. Cell junction: Membrane proteins helps adjacent cells to form various types of junctions for keeping the cells together during formation of tissues.
6. Microvilli: These are membrane proteins help evaginations specialized for increasing surface area for absorption.
7. Cell movements: Movements like undulations (eg - fibroblasts) & pseudopodia (eg macrophages) are formed by cell membrane. They also form sheaths around flagella.



(4)

8. Enzymes: Some membrane proteins catalyze biochemical reactions.
9. Transport proteins: Many membrane proteins form channels that facilitate the transport of water, ions & nutrients like sugar and amino acids.
10. Selective permeability: It allows entry to only selected substances and impermeable to others.
11. Bulk transport. Bulk intake of materials from outside by invagination of plasma membrane to form vesicles is called endocytosis. Throwing out of waste products & secretory materials by the reverse process is called exocytosis.
12. Impulse transmission: Nerve impulses travel through the plasma membrane of nerve cells.

2 Cytoplasm Cytosol  
Organelles

It has two components

- ② Cytosol & Organelles are the main components of Cytoplasm
- The gel like substance enclosed within the plasma membrane & is present external to the nucleus is called Cytoplasm.
  - The semifluid portion of Cytoplasm in which organelles and inclusions are suspended is called cytosol or intracellular fluid.

Cytosol is transparent, viscous gel like fluid containing 75 to 90% of water, suspended & dissolved components such as proteins, lipids & Carbohydrate, different inorganic substance & salts.

The cell organelles are embedded in Cytosol.

- Endoplasmic Reticulum
- Ribosomes
- Golgi Complex
- Mitochondria
- Cytoskeleton
- Centrosome
- Lysosomes
- Peroxisomes

## Endoplasmic Reticulum (ER)

The endoplasmic reticulum is a pattern of membrane enclosed channels called as cisternae of varying shapes. It is an interconnected network of internal membrane. It extends from the nuclear envelope throughout the cytoplasm.

Based on its association with ribosomes the ER is of two types.

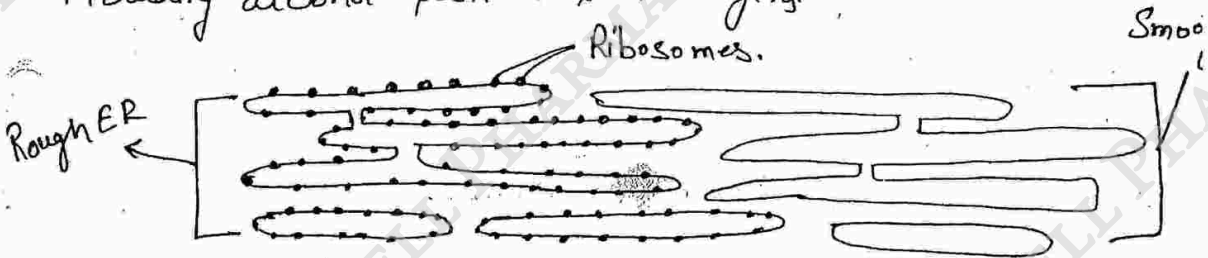
- i) Rough Endoplasmic Reticulum (RER)
- ii) Smooth Endoplasmic Reticulum (SER)

### i) Rough Endoplasmic Reticulum (RER):-

The ribosomes are attached on the surface. Hence they are granular in appearance & rough. It is responsible for synthesis of many secretory proteins & membranes. The proteins then enter the space within ER for processing & sorting.

### ii) Smooth Endoplasmic Reticulum (SER):-

The ribosomes are not attached to the surface; hence smooth in nature. Smooth ER is the site of fatty acid, phospholipids & steroid synthesis. It can inactivate or detoxify a variety of chemicals including alcohol pesticides & carcinogens.

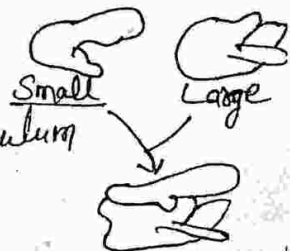


### Ribosomes.

These are tiny spheres that contain ribosomal RNA & several riboproteins; These are the site for protein synthesis. These are made up of two subunits; smaller subunit (40S): RNA of smaller size and the larger subunit (60S): RNA of larger size.

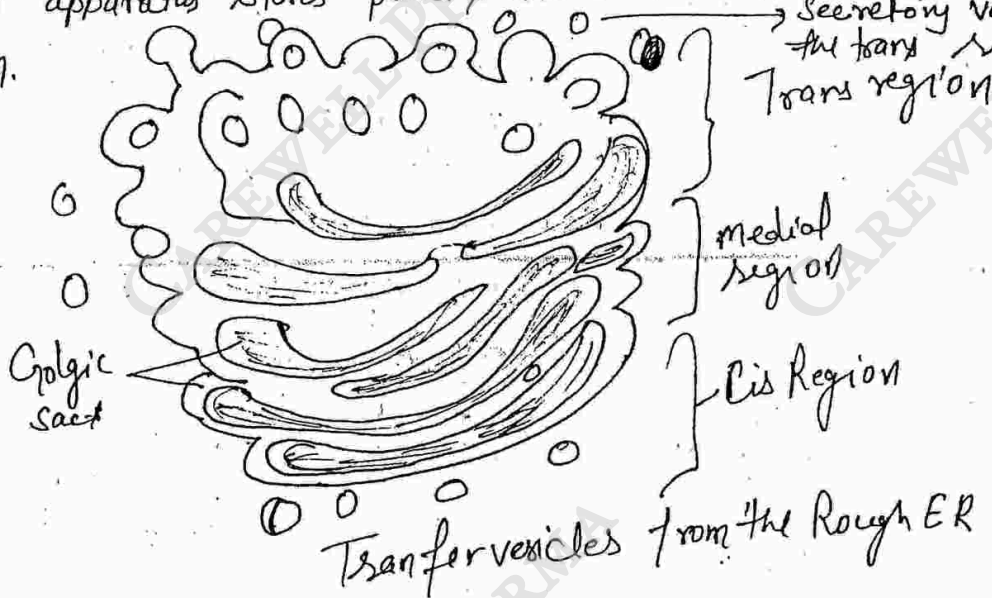
Ribosomes are of two types

- i) Membrane bound :- Attached to endoplasmic reticulum
- ii) Free Ribosomes :- These are free in cytosol

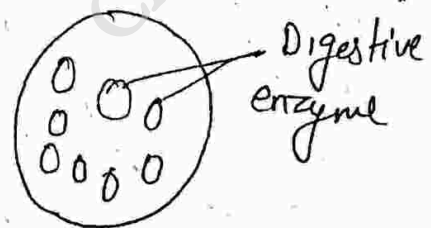




- 5) Golgi Complex - Golgi apparatus or Complex is present near the nucleus.
- It consists of four to six flattened sacs called as Cisterns placed upon each other like a pile of plates with expanded bulges at their ends. The stack of Golgi sacs has two defined regions i.e. Cis & Trans.
  - Proteins synthesized by the ribosomes are brought to the lumen of endoplasmic reticulum & then to golgi apparatus through transfer vesicles. The vesicles fuse with the Cis region of the Golgi Complex releasing their contents into the internal portion.
  - These proteins are modified and secreted outside the cell when needed through the secretory vesicles on the trans end.
  - Golgi apparatus stores proteins and is also responsible for modifying them.



**Lysosomes:** Lysosomes are secretory formed from the golgi' complex. These are membrane bound spherical vacuoles which function as the digestive system of the cell. It contains 60 kinds of powerful digestive & hydrolytic enzymes that can hydrolyse large molecules such as RNA & DNA or proteins & lipids. Lysosomal enzymes work best at acidic pH=5 and inactivated at natural pH value.





**Mitochondria:** Mitochondria generate ATP & are therefore called as powerhouse of cells. The number of mitochondria vary from cell to cell depending on their energy requirement.

• A mitochondria consists of two lipoprotein membranes.

• **Outer mitochondrial:** It is intact & covers the whole structure

• **Inner mitochondrial:** It contains a series of fold called as <sup>crystal</sup> cristae

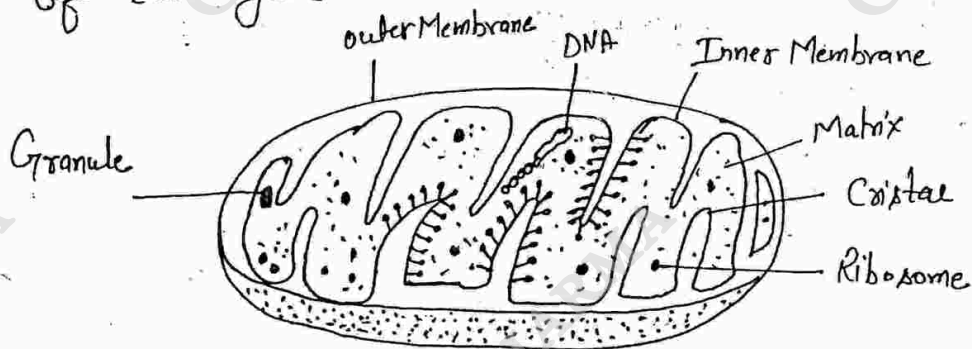
• The region between two membranes is called as the intermembrane <sup>space</sup>

• The inner fold of the mitochondrial membrane increase the surface <sup>area</sup> thereby increasing the output of cellular respiration. Large central

fluid filled cavity enclosed by the inner mitochondrial membrane is called mitochondrial matrix. • Oxidative enzymes of mitochondria

cause oxidation of nutrients,  $\text{CO}_2$  &  $\text{H}_2\text{O}$  release energy which utilized in formation of adenosine triphosphate. • Mitochondria also play

a critical role in apoptosis, cell signalling & cell growth & control of cell cycle.



Mitochondria

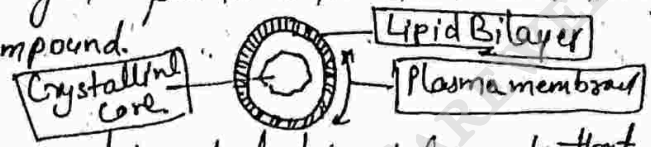
~~peroxisomes:~~

**Peroxisomes:** These organelles are similar in structure to lysosomes but comparatively smaller in structure. It contains many oxidase enzyme that can oxidize (remove of H) various organic substances such as fatty acids, amino acid & uric acid. In order to protect the cell from the toxic effects of  $\text{H}_2\text{O}_2$ , peroxisomes also contain the enzyme Catalase.

8.

(8)

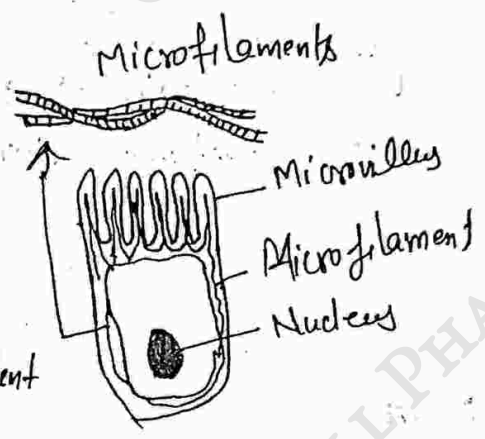
Catalase decompose hydrogen peroxide or utilizes it to oxidise another organic compound.



### Cytoskeleton.

It is a network of three types of protein filaments that extend through out the cytosol:

- Microfilaments
- Intermediate filaments
- Microtubules.

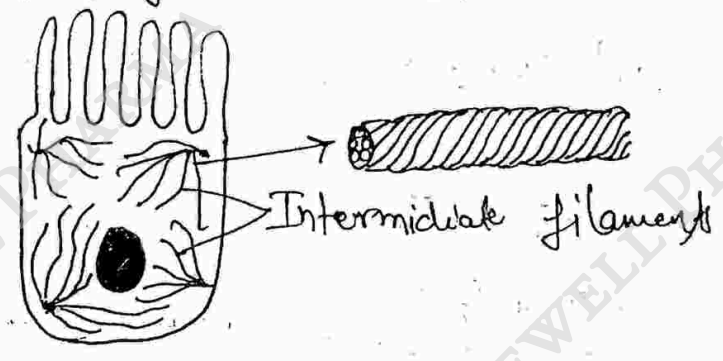


Micro filaments: Microfilaments are thin, Composed of protein actin & are most prevalent at the periphery of the cell.

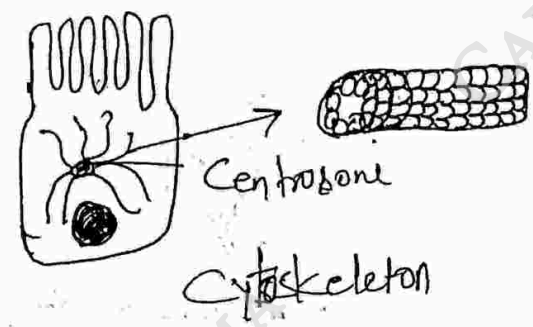
Intermediate: It is thicker than microfilaments. Several different proteins compose these exceptionally strong filaments

Microtubules: Largest cytoskeletal components are long unbranched hollow tubes composed mainly of the protein tubulin. Centrosome grow outward toward the periphery of the cell

Intermediate ⇒



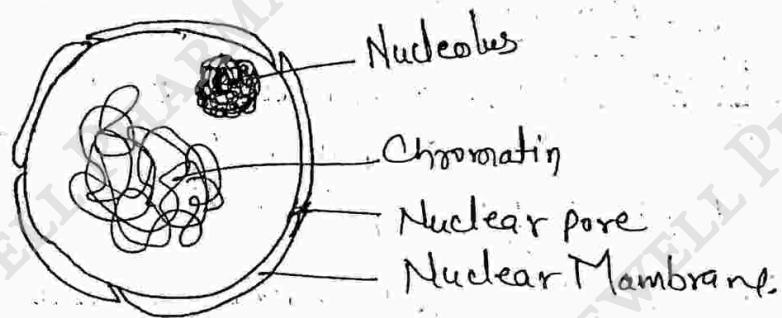
Microtubules





### 3 Nucleus

The nucleus is usually a spherical or oval in shape & largest structure in the cell. The nuclear membrane is a double membrane which separates nucleus from the cytoplasm. Both the inner & outer membrane is phospholipid bilayer. Nuclear membrane is externally continuous with endoplasmic reticulum. The nuclear membrane contains nuclear pores in the membrane where inner and outer part of membrane is fused.



Nucleus

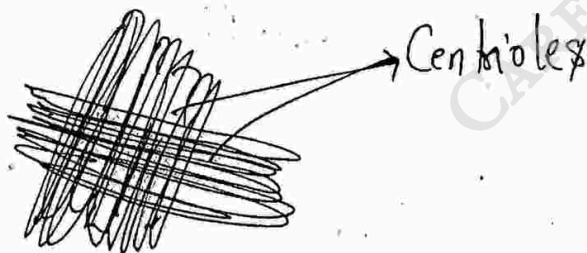
These pores act as channel for transfer of ions and water soluble molecules b/w the nucleus & the cytoplasm.

→ Nucleus contain a spherical structure called nucleolus & ~~it~~

→ Nucleolus contains aggregations of protein DNA & RNA

### Centrosome

This is directs organisation of microtubules within the cell. It consists of a pair of centrioles & plays an important role in during cell division.



Centrosome



## Process of Transport Across the Plasma Membrane

Material transport processes can be classified as active & passive depending on whether they require cellular energy.

### Passive Processes

Passive processes do not require input of cellular energy. A substance moves down its concentration gradient across membrane due to its kinetic energy.

### Active Processes

Active processes use cellular energy of ATP to drive a substance "uphill" against its concentration or electrical gradient.

## ① Movement of Small Molecules across the Membrane:-

### A) Diffusion

- Simple
- Facilitated
- Osmosis

### B) Active transport

- Primary
- Secondary

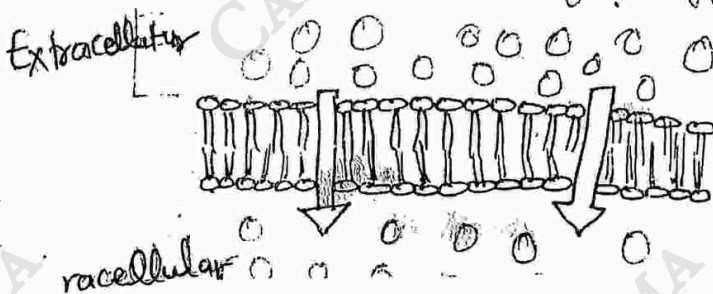
## ② Movement of large molecule across the membrane:-

- Endocytosis.
- Exocytosis.

③

### Simple diffusion / Passive transport:

It is a passive process where the solute molecules in a solution are carried in the direction of their concentration gradient i.e. from higher concentration to lower concentration without utilization of energy.



②  
Substances move across the cell membrane by the 3 basic Mechanisms:-

1.) Molecules remain in the aqueous phase & diffuse through aqueous channels or pores in the membrane.

2.) The molecules leave the aqueous phase on one side of the membrane, dissolve in lipid bilayer & cross it & again enter the aqueous phase on opposite side of membrane.

3.) The molecules combine with carrier molecule & help them across the cell membrane.

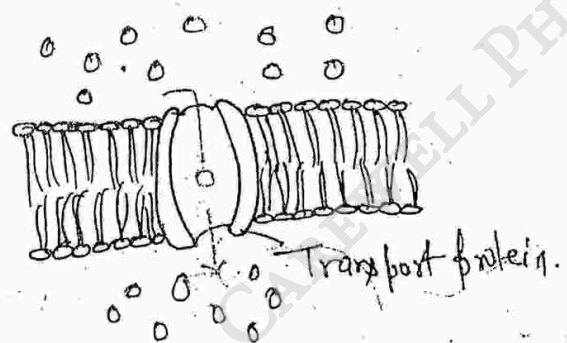
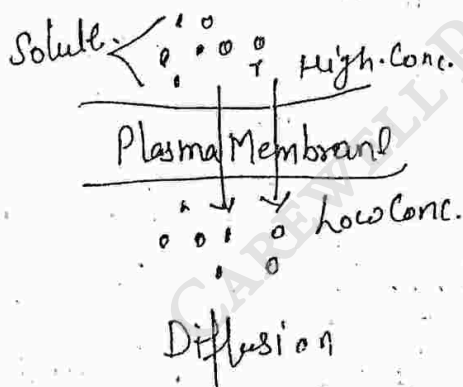
ii) Facilitated Diffusion:-

It also called as carrier-mediated diffusion. The carrier protein facilitates the diffusion of the substance to the other of membrane. Energy is not required for such transfer.

• Many lipid insoluble substances like Vitamins, Glucose, Urea or the membrane by this process.

• The transfer is in the direction of concentration gradient from higher concentration to lower concentration.

This transfer achieved through the structural changes in the protein when it bind with the material to be transferred.

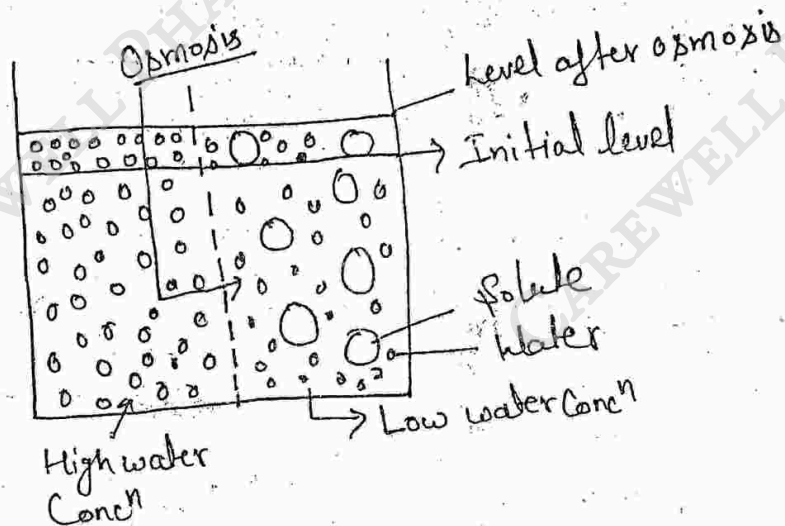


[Facilitated  
Diffusion]

## Osmosis:

It is defined as movement of solvent molecule across a semi-permeable membrane from an area of higher concentration to an area of lower concentration. It occurs only when a membrane is permeable to water but it is not permeable to certain solutes.

→ When the water moves into a body or cell by osmosis (called end-osmosis) it creates a hydrostatic pressure inside the body or cell (cell may burst). When water moves out of the cell due to osmosis (called exosmosis) the cell shrinks called crenation.



- The osmotic pressure of a solution is proportional to the conc<sup>n</sup> of the solute particles that cannot cross membrane. Higher the solute concentration, higher is the solution's osmotic pressure.

## B. Active Transport

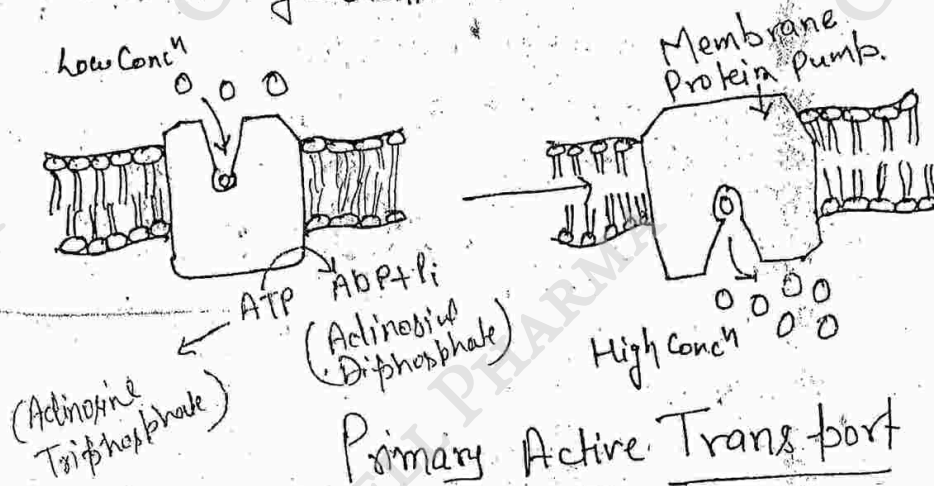
When the material is transported out against the conc<sup>n</sup> gradient i.e. from lower concentration to higher concentration with utilization of energy then the process is called active transport.

- Energy is obtained from hydrolysis ATP
- Active transport is of two types



Primary Active Transport (4)

The energy is obtained from hydrolysis of ATP to pump the ions or a substance across a plasma membrane against concentration gradient.

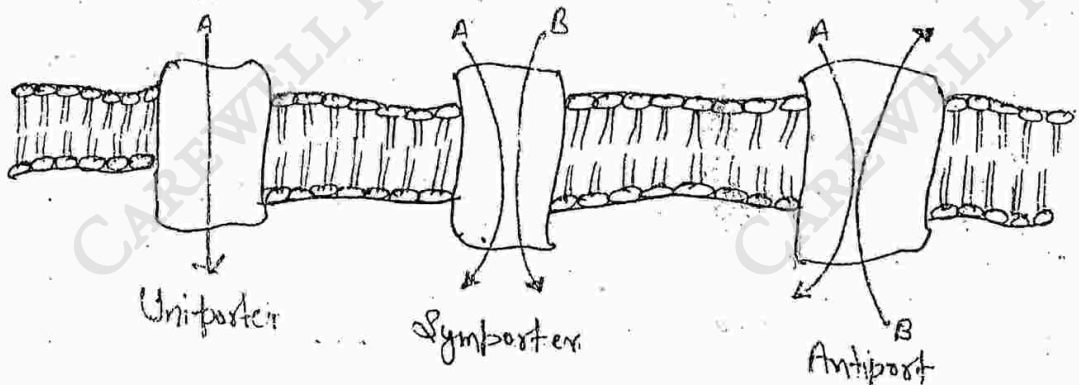


ii) Secondary Active Transport

The energy stored in a Na<sup>+</sup> or H<sup>+</sup> concentration gradient is used to transport other ions or solutes (Coupled transport)

Antiport move Na<sup>+</sup> or H<sup>+</sup> & other substance in opposite direction  
eg. Ca<sup>2+</sup>, H<sup>+</sup> out of cells.

Symporters Move Na<sup>+</sup> (or H<sup>+</sup>) & another substance in the same direction across the membrane eg. glucose amino acid into cells.



Secondary Active Transport

## ② Endocytosis:-

It is movement of substances into a cell in vesicles.

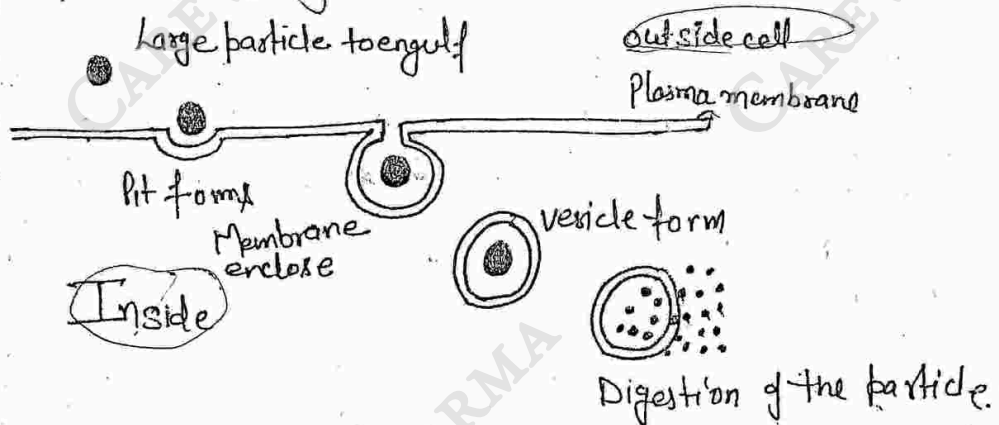
It is a transport mechanism which involves engulfing extracellular materials with in segment of the cell membrane to form a vesicle called as corpuscular or vesicular transport.

Types:- ① Phagocytosis

② Pinocytosis

① Phagocytosis:- It is a form of endocytosis in which the cell engulfs large solid particles, such as worms or cells, whole bacteria & viruses.

② Pinocytosis:- It is form of endocytosis in which tiny droplets of extracellular fluid taken up



## Exocytosis

It is movement of substances out of a cell in secretory vesicle that fuse with the plasma membrane & release their contents into the extracellular fluid.

eg Neurotransmitters

Hormones

Digestive enzymes.



## Cell Junctions

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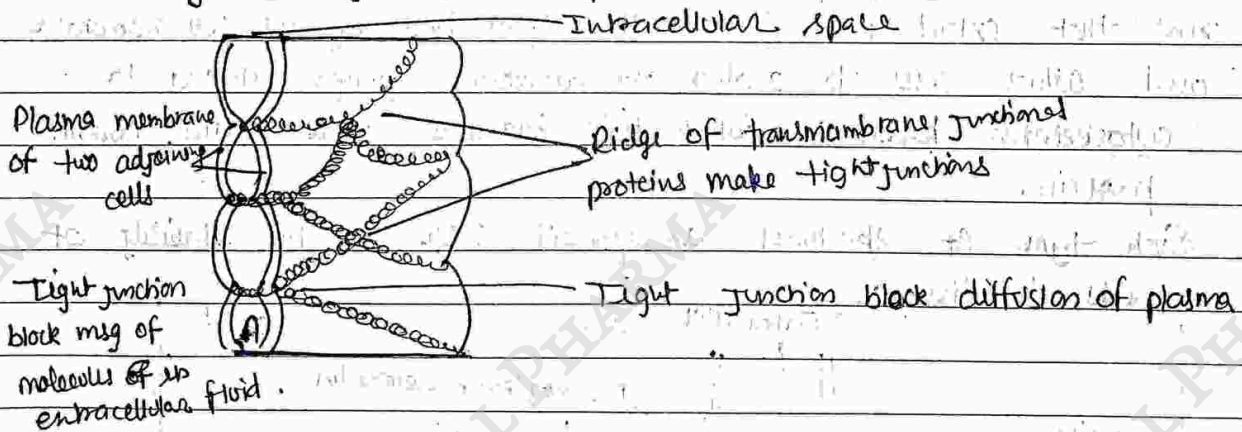
Cell junctions are contact points b/w the plasma membrane. It consists of multi-protein complexes that provide contact b/w a cell & the extracellular matrix. It is also called intracellular bridge.

Types of cell junctions →

- i) Tight junction
- ii) Adherent junction
- iii) Desmosomes
- iv) Hemidesmosomes
- v) Gap junction

### 1) Tight junction →

Tight junction consists of fixed ridges of tightly packed transmembrane junctional proteins. They regulate formation of barriers by modulating cell proliferation, differentiation, polarization & control barrier function by restricting paracellular diffusion. The above mechanism may pave way for new therapeutic strategies in drug delivery across epithelial barriers.



functions → Hold the cell together.

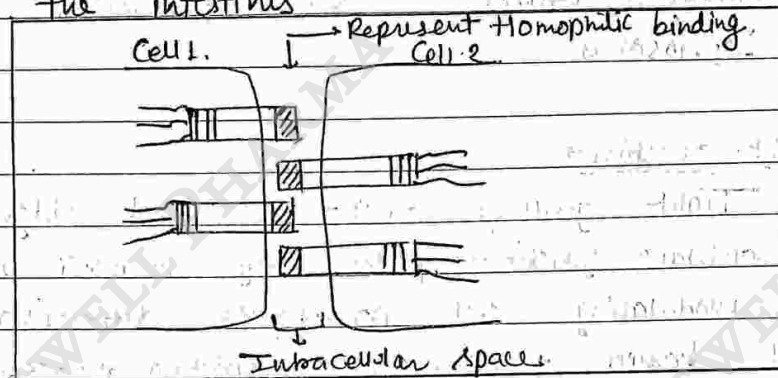
- Help to maintain the polarity of cell by preventing the lateral diffusion of protein b/w the apical & lateral/basal surfaces.
- Tight junction prevents the passage of molecules & ions through the space b/w plasma membrane of adjacent cells.

2) Adherent junctions → These are those protein complexes that occur at cell-cell junctions in epithelial and endothelial



tissue. Adherens junction contains plaque layer of proteins on the inside of the plasma membrane that attaches both to membrane proteins & microfilaments of the cytoskeleton. Also called as intermediate junction or belt desmosome.

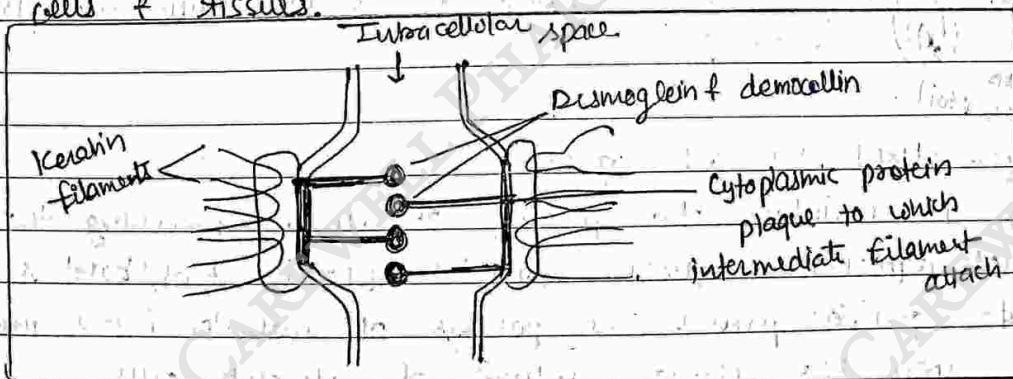
Adherens junction helps to epithelial surface to resist separation during various contractile activity such as movement of food through the intestines.



### ③. Desmosomes

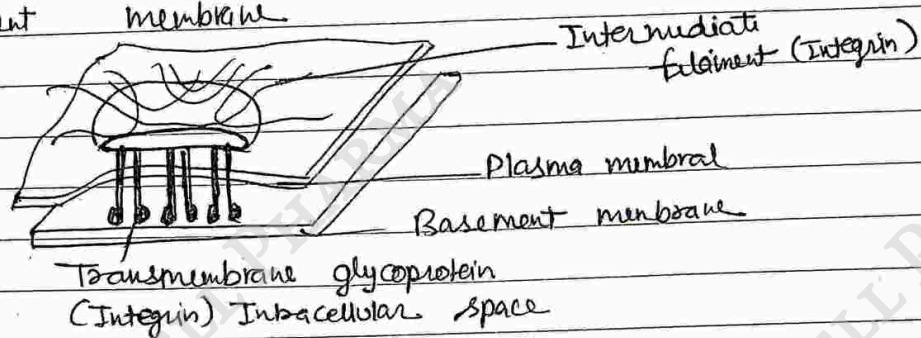
It contains plaque & trans-membrane glycoproteins such as cadherins that extend into intracellular space b/w adjacent cell membrane and attach cell to another. A desmosome plaque attached to cytoskeleton (known as intermediate filaments that consists keratin protein).

Such type of structural arrangement helps in the stability of cells & tissues.



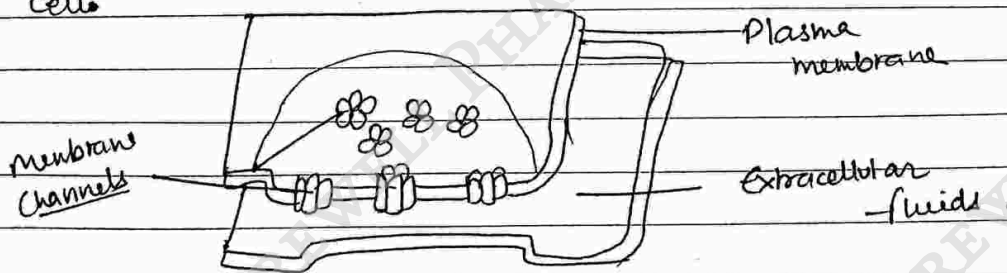
④ Hemidesmosomes → It resemble like desmosomes but they do not link the adjacent cell, the structure of Hemidesmosome

is half of desmosomes the inner side of plasma membrane, integrins attached to the intermediate filaments made up of keratin protein. The outer side of plasma membrane the integrins attached to the protein laminin present in the basement membrane.



④ Gap Junction →

Membrane proteins present in gap junction are called as connexins forming fluid-filled tunnels called connexons that connect neighboring cells. The plasma membrane of gap junctions are separated by a very narrow intracellular gap. A gap junction allows the communication of cells with one another. Gap junction enable nerve or muscle impulses to spread rapidly among nervous cells.





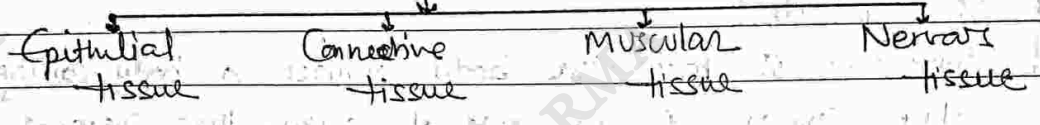
V-III

DATE \_\_\_\_\_

### Tissue

- The tissue of the body consist of large number of cells & they are classified according to the size, shape and functions of those cells.
- Tissue are classified into four major groups.

#### Tissue

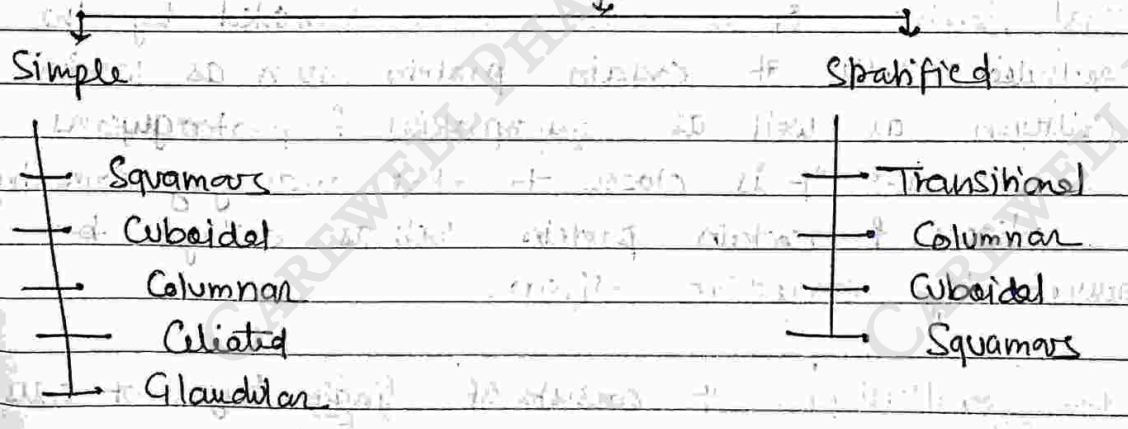


- Histology → It is the branch of science that deals with the study of tissue.

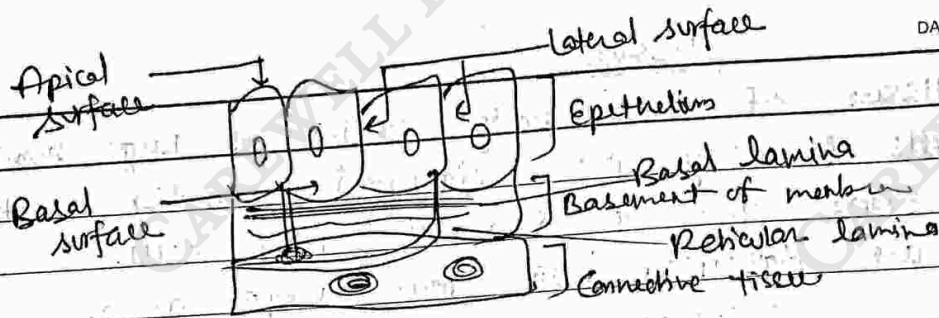
① Epithelial tissue → Epithelial tissue form the covering or lining to the free surface of the body. They perform vital function like protection, excretion, glandular secretion, & absorption.

- The epithelial tissue/cells contain minimal extracellular material But they are arranged on basement membrane

#### • Classification of epithelial tissue







### Surface of Epithelial

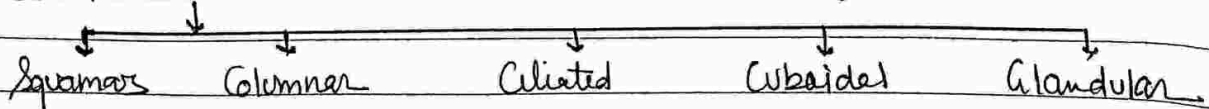
- ① **Apical surface** - It faces the body surface, a body cavity, the lumen of an internal organ that receives cell secretions. It may contain cilia & microvilli.
- ② **Lateral surface** - It faces the adjacent cell on either side. It may contain tight junction, adherens junction, desmosomes & gap junctions.
- ③ **Basal surface** - It is present opposite to that of apical surface. In multiple layer epithelial cells the apical layer is the most superficial layer of cell & the basal layer is the deepest layer of cells.

### Basement membrane -

It is a thin extracellular layer that consist of two layer i.e. Basal & Reticular lamina.

- **Basal lamina** -> It is closer to & secreted by the epithelial cells. It contain protein such as laminin & collagen as well as glycoproteins & proteoglycans.
- **Reticular lamina** -> It is closer to the underlying connective tissue & contain protein such as collagen but produced by connective tissue.

**Simple Epithelium** - It consists of single layer of cells.



## ① Simple Squamous epithelium →

It consist of single layer of flat cells arranged on basement membrane. The nucleus of each cell is oval or spherical.

• locations → hearts, blood vessels, lymphatic vessels, air sacs of lungs, & glomerular capsules of kidney.

• functions → • Blood filtration in the kidney.  
• Diffusion of  $O_2$  to blood vessels of the lungs.

## ② Cuboidal epithelium →

It consist of single layer of cube-shaped cells having centrally located nucleus.

location → It covers surface of ovary, lining kidney tubules & small duct of many gland, also in

thyroid glands & duct of some glands eg. Pancrease.

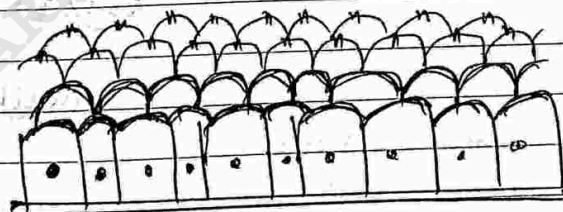
function → It performs the function of secretion and absorption.

## ③ Simple Columnar →

It consist of single layer of rectangular cell arranged on basement membrane. It contain goblet cell & cells with microvilli in some locations.

location → It lines the GIT, duct of many glands & gall bladder.

function → Secretion & absorption.



Columnar

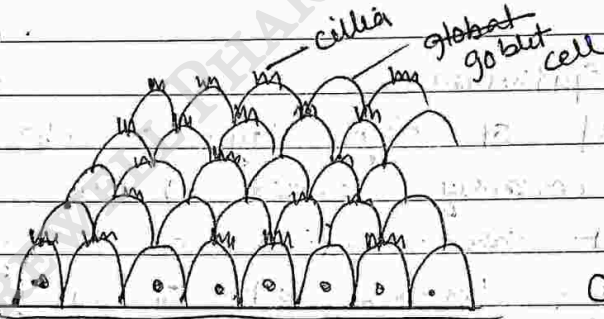


#### ④ Simple ciliated epithelium →

Consist of single layer of ciliated column like cell with nucleus near the base of cells. goblet cell in some location.

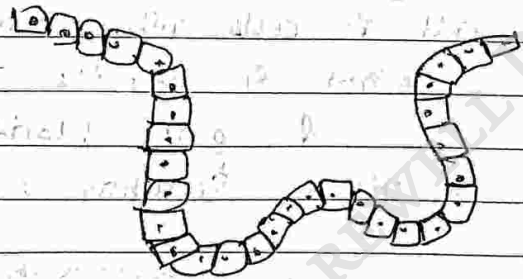
in location → few portion of upper respiratory tract uteris, ciliary tube, central canal of spinal cord, ventricles of the brain

function → Moves mucus & other substances by ciliary action.



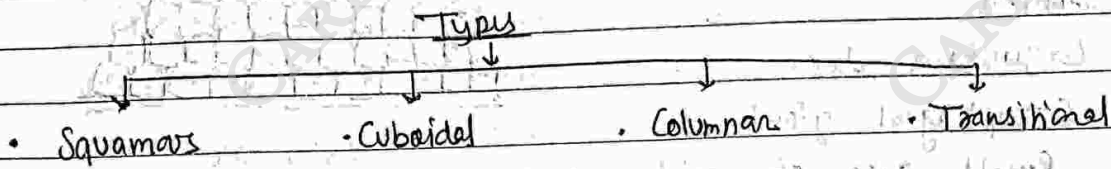
#### ⑤ Glandular epithelium

It consist of cylindrical or columnar cells. It is present in the secretory gland like salivary gland & breast. It is of two type. Unicellular & multicellular.





• Stratified epithelium  $\rightarrow$  It consists of several layers of cells.



① Stratified squamous epithelium  $\rightarrow$  Squamous cells from the apical layer & several layers deep to it cells from the basal layer replace surface cells as they are lost regularly.

Location  $\rightarrow$  Keratinized  $\rightarrow$  skin

Non-keratinized  $\rightarrow$  lining of mouth, oesophagus, pharynx, tongue, vagina

function  $\rightarrow$  Protection, limited secretion.

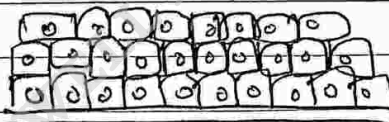


Squamous.

② Stratified cuboidal epithelium  $\rightarrow$  Consists of two or more layers of cells in which cells in the apical layers are cube shaped.

Location  $\rightarrow$  Duct of adult sweat glands & oesophageal glands & part of male urethra.

function  $\rightarrow$  Protection • limited secretion • Absorption.



Cuboidal

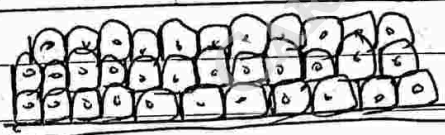
③ Stratified Columnar epithelium  $\rightarrow$

It consist of several layers or irregular shaped cells: only the apical layers has columnar cells.

DATE \_\_\_\_\_

Location →

- Vagina
- Cervix
- Oesophageal gland
- Small area of anal mucous membrane



Columnar

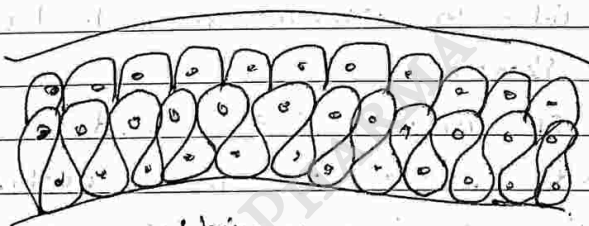
function → Protection & secretion

(iv) Transitional epithelium → Its appearance is variable. Shape of cells in apical layer ranges from squamous to [when stretched] to cuboidal [when relaxed].

Location →

lining urinary bladder & portions of ureters & urethra.

functions → Permits distention.



Relaxed

Urinary bladder



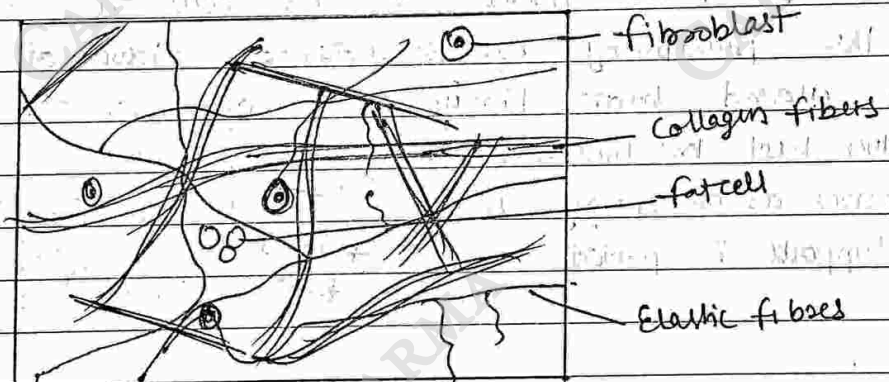
② Connective tissue

Connective tissue serves to connect or bind together different organs or different parts of an organ. They contain an intracellular substance matrix. It helps in binding & supporting the cells.

Classification

- Loose Connective tissue
- Dense fibrous tissue
- Elastic tissue
- Adipose tissue
- Cartilage
- Bone

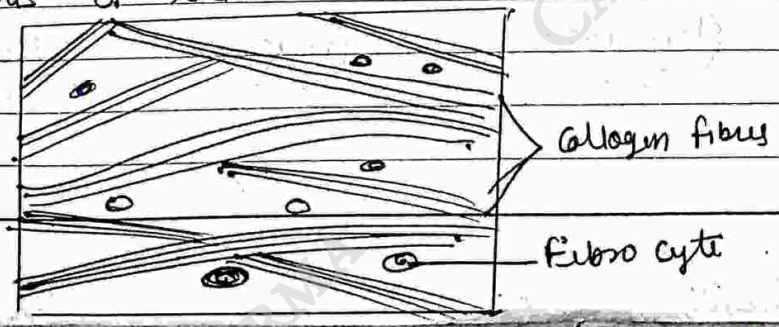
1) Loose connective tissue (Areolar tissue) → It is the most widely distributed tissue in the body. It is loose irregular connective tissue. It connects the skin to the underlying structures. Also it fills unoccupied spaces b/w organs. It is found b/w muscles, blood vessels & nerves.



functions - strength, elasticity, support

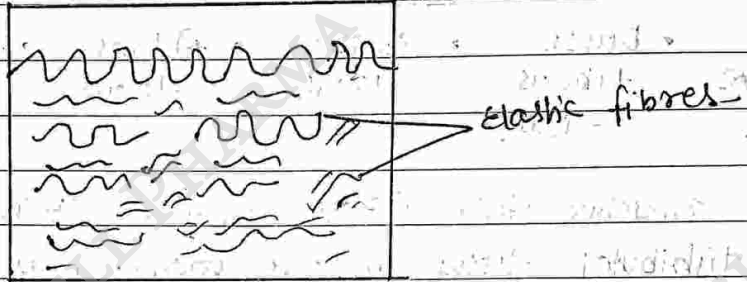
11) Dense fibrous tissue → The tissue has compactly arranged fibres with greatly reduced interspace. The cells are less no. than areolar tissue. This type tissue is present in dermis of skin.

- provide strong attachment with various structure



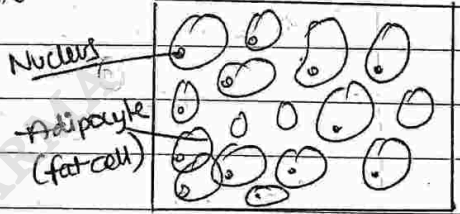


iii) Elastic tissue → This tissue is yellow in colour & contains more no. of elastic fibers. It is present in tissue where strength is required with elasticity.  
 eg. - trachea & Bronchi, lung  
 → Allows stretching of various organs.

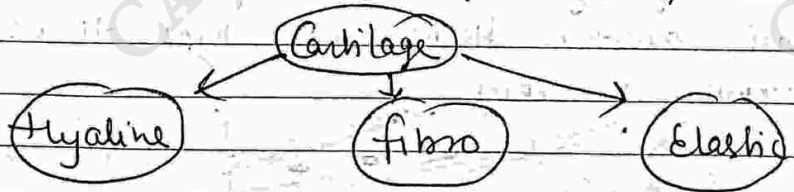


iv) Adipose tissue = (fatty tissue) → It contains large rounded cells & cytoplasm is loaded with fat. The nucleus of the cells is pushed towards the periphery eg. subcutaneous tissue of skin.  
 - around heart kidney, yellow bone marrow

- Reduce heat loss through skin.
- Serves as an energy reserve.
- Supports & protects

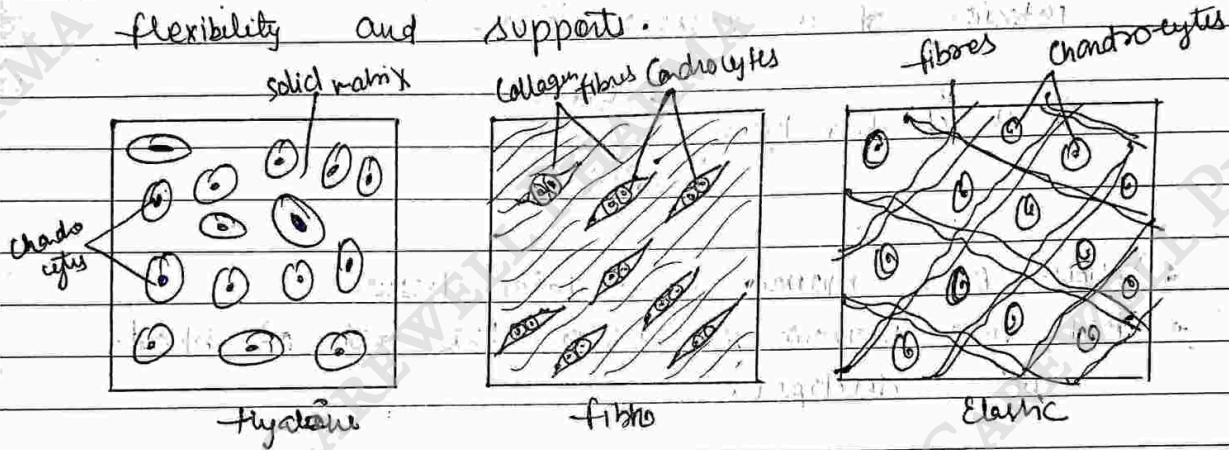


v) Cartilage → It has a tough, gelatinous and elastic ~~and~~ matrix formed of chondrin. The cells are more or less round and lie in groups of four embedded in the matrix.



(a) Hyaline Cartilage → Matrix is free from fibres and is transparent also the cells are arranged in small groups.  
 → located in end of bones, Nose, larynx, bronchia, bronchi.

- Provide smooth surface for movement at joints as well as flexibility and supports.



(b) Fibrocartilage → The ground substance contain thick bundles of collagen fibres. It is found in the intervertebral discs, pubic symphysis (hipbone join anteriorly).  
 • support & fixation.

(c) Elastic Cartilage → It contains a network of branching and rejoining collagenous fibres. located in parts of external ear & lid on the top lateral pharynx of larynx.  
 • Give support and maintain shape.

• Bone → It is the hard connective tissue. Bones contain a high concn of salts like calcium phosphate & calcium carbonate.  
 A bone consists of generally ⇒



(a) Periosteum → Membrane of fibrous tissue covering surface of bones.

(b) Compact bone → Hard dense substance found below periosteum

(c) Spongy bone → Porous tissue. It forms the interior of mature bone.

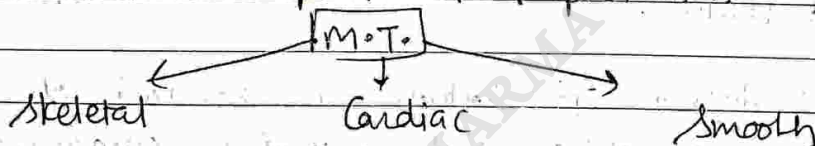
(d) Bone marrow → soft material which fills the hollow of interior of a mature bone

It is of two types 
{
yellow  
Red

- Yellow Bone marrow is a fatty tissue
- Red bone marrow from which the cell of blood are developed.

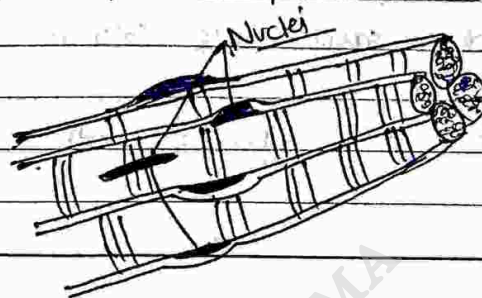
### (3) Muscular Tissue

Muscular tissue consists of fibres that are specialized for contraction. It provide motion, maintenance of posture, heat production & protection.



(A) Skeletal muscle tissue → It consist of long, cylindrical, striated fibres with many peripherally located nuclei. Usually attached to bones by tendons; voluntary control.

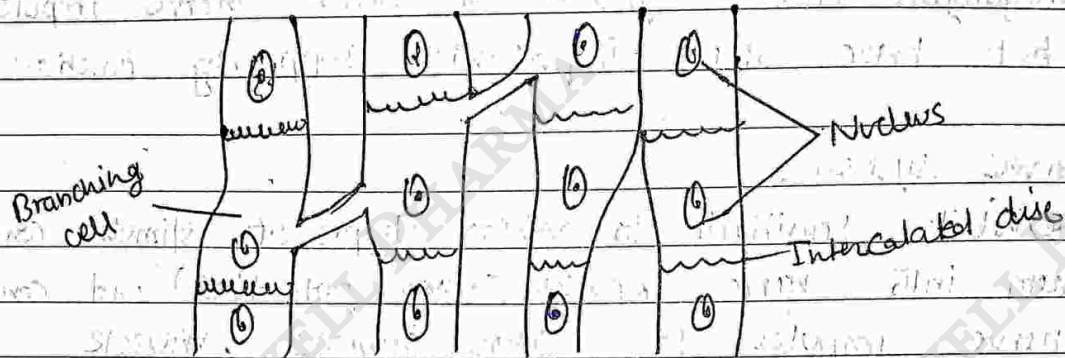
- motion, posture, heat production & protection.





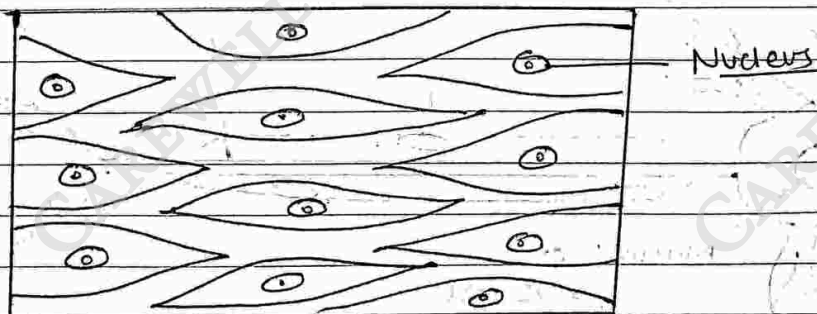
(B) Cardiac muscle tissue → It consist of branched striated fibres with one or two centrally located nuclei; Involuntary control.

- Heart wall
- Pumps blood to all parts of the body.



(C) Smooth muscle tissue → It consist of spindle shape, thickest in centre or tapering at both ends, non striated fibres with one centrally located Nucleus; Involuntary control.

- Iris of the eye, Blood vessels, lungs, stomach, gall bladder, intestines, urinary bladder.
- Motility → [contraction of blood vessels & airways, propulsion of food through GI tract, contraction of urinary bladder and gall bladder].



#### ④ Nervous Tissue

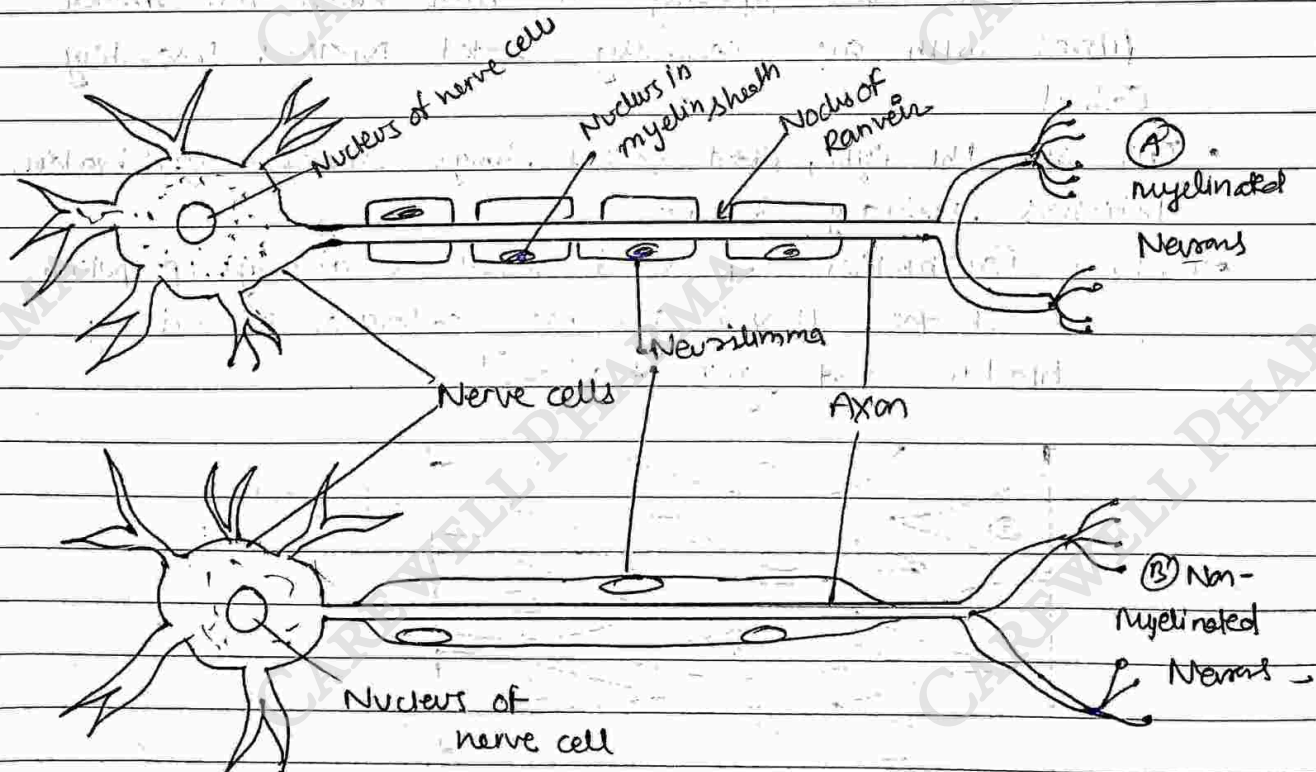
Nervous system is composed of neurons (nerve cells) & neuroglia (protective & supporting cells)

Neurons consist of a cell body process extending from the cell body (multiple dendrites & single axon).

Neuroglia do not generate or conduct nerve impulses but have other important supporting functions.

#### • Nervous system

⇒ exhibit sensitivity to various types of stimuli, converts them into nerve impulses (action potentials) and conducts nerve impulses to other neurons, muscle fibres or glands.





# Neuromuscular Junction

The neurons that stimulate skeletal muscle fibres to contract are called somatic motor neurons. Each somatic motor neuron has a threadlike axon that extends from the brain or spinal cord to a group of skeletal muscle fibres. Muscle action potential arises at the neuromuscular junction (NMJ), the synapse between a somatic motor neuron and a skeletal muscle fibre.

A synapse is a region where communication occurs between two neurons, or between a neuron and a target cell. At most synapses a small gap, called the synaptic cleft, separates the two cells. The first cell communicates with the second by releasing a chemical messenger called neurotransmitter.

At the neuromuscular junction, the end of the motor neuron, called the axon terminal, divides into a cluster of synaptic end bulbs, the neural part of the neuromuscular junction. Suspended in the cytosol within each synaptic end bulb are hundreds of membrane-enclosed sacs called synaptic vesicles. Inside each synaptic vesicle are thousands of molecules of