CRITERION 7

7.2: Best Practices

7.2.1 QlM: Describe two best practices successfully implemented by the Institution as per NAAC format provided in the Manual.

Response:
Best Practice I
1. Title of the Practice: Academic Book for student's in Teaching and Learning process.

2. Objectives of the Practice:
Academic Book for students in teaching and learning process will be suitable to
1. Give openings for scholars to “learn how to learn”.
2. Maximize individual literacy growth, attainment and enhancement in results.
3. Figure positive station for learning and coverage of the right content at the right depth.
4. Give support in enjoying of knowledge and understanding of the course.

3. The Context
1. It was anatomized that scholars were unfit to get proper structure of the Course.
2. It was bent to give overall study material to scholars with Course Structure and Course perpetration.

3. Academic Book includes Evaluation guidelines as per university for internal and external assessment, Course Structure, Syllabus Course Outcomes, Programme Outcomes, Programme Specific Outcomes, Mapping of Course Outcomes and Programme Outcomes with justification, Teaching Plan, Class test, Assignments, Question bank, Question Papers of University.
4. This helped scholars to overcome their difficulties in understanding the Course and recover their confidence and interest in literacy.

4. The Practice

Academic Book is the tool which has been effectively stationed for tutoring and literacy of scholars in council. The Academic book is prepared with an end of "learn how to learn". Academic book is arranged, finalize and published before the launch of semester. Academic Book is circulated to scholars through Social Media and Library. It provides the information of individual Courses in the semester. It serves as an effective tool in enjoying of introductory knowledge and appreciation understanding of the course. This practice enables scholars to get advanced information of the lecture and scholars find sufficient time for reference and tone- study. This will stimulate interactive literacy and also promote better understanding, deep sapience and in depth of knowledge of the subject. The scholars nurture tone- literacy, enhance the position of understanding. It involves the creation of a literacy terrain in which scholars are encouraged to suppose precisely, critically and express their studies, which they wish to defy and resolve difficulties rather than buff over them, it involves constantly covering and reflecting on the processes of tutoring and pupil understanding and seeking to ameliorate them.

5. Evidence of Success:

The practice for scholars has worked well for individual literacy growth, attainment and enhancement in University results. Positive station for learning and Coverage of the right content is in right depth. The scholars have developed analytical skills, cognitive skills and an ingrain passion for

literacy. The below practice has given a boost for the nonstop enhancement of the academic results to give authentic relations between the faculty and the scholars.

6. Problems Encountered and Resources Required:
Problems Encountered: Due to change in University pattern and syllabus the faculty needs to take additional efforts to design the academic book.
Resources Required: Resources were used from College Library, Question Papers of Internal and External Exam etc.

Best Practice II
1. Title of the Practice: Women empowerment to create power in students over their own lives, society and in community.

2. Objectives of the Practice:
Women Empowerment will be able to:
1. Give self- confidence, self- defense, self- determination and positive attitudinal change.
2. Develop competent and socially sensitive women druggist committed to healthcare requirements of society.
3. Help them to be truly ambitious and to dream for their betterment.
4. Strengthening legal systems aimed at elimination of all forms of demarcation against women's.
5. Punctuate the significance of spirituality, health, hygiene and safety. Inculcate entrepreneurial station among youthful girls, scientists at the foremost so that they can be "job providers" rather than "job campaigners".

3. The Context
1. It was profound that woman should be empowered as per need to develop them in moment's world.
2. Empowered women define their station, values and geste in relation to their own real interest.
3. The practice was initiated to raise self - esteemed and self - confidence of women to exclude all forms of violence against women's.

4. Fostering decision timber and their participation in all walks of life.

4. The Practice

1. In order to empower Women under pupil development cell organizes Nirbhay Kanya Abhiyan, Nirbhaya programme, International womens day festival etc.
2. Students perform the activities under Corporate Social Responsibilities like Say no to plastic, Say No to Tobacco, Tree Plantation, Cleanliness awareness, endowment to village people and village schools sensitize students about their role as responsible women of today by participating in NSS camp.

3. Scholars are involved in National Pharmacy Week programme like Debate, Rangoli, Elocution, Drawing, Essay, Pharma marketing competition, Sports. These leads to emotional, intellectual, social, and inter-personal development of women.
4. Spiritual practices and yoga has stoked the attention power which is putatively redounded in boost up of University ranks.
5. Lectures on women safety are also conducted. The girl scholars are assured of their well- being, safety, security and internal health and are encouraged to approach any faculty for their grievances.
6. Educational and motivational addresses and events have been engaged to make them know their significance as a druggist in the society.
7. Efforts are taken by the entire council staff and operation to feed to the shaping of the future of scholars in a distinctive manner by furnishing them platform to show their gift and bring out their scientific and specialized capabilities along with cultivating a genuine inclination towards advanced education.

5. Evidence of Success:

The scholars who enter the Pharmacy education get converted into competent professionals with advanced personality traits.
The change in the geste & communication of the scholars from first time to final time is an ample evidence for the success of the programs being

organized. Scholars are signed and are set up to be progressing well in top companies. They achieve more tone- respect and confidence by their benefactions to their communities. Holistic development rather than only academic success contributes in creating socially sensitive individualities which is a prominent demand of educational institute.

6. Problems Encountered and resources required:

Motivation & encouragement through awards and prizes. The college has to manage within the revenue from student's admission and deficit being met by the college management.

PRAVARA RURAL EDUCATION SOCIETY'S
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PRAVARA RURAL EDUCATION SOCIETY'S
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Date: 10/01/2022

The IQAC & CDC Meeting as per the agenda mentioned herewith is scheduled on 13 January 2022, at 11.00 Am in Board Room, PRCOP College.

All are requested to attend the same without fail.

Agenda for the meeting:

Agenda no.	Particulars
1.	To read and approve minutes of the last meeting and action taken report
2.	To review the compliance of activity and academic calendar of odd semester, AY 2021-22 and propose suitable measures to sustain and enhance academic quality.
3.	To consider and approve academic feedback with action taken report for odd semester, AY 2021-22
4.	To consider and approve report on student training and placement activities.
5.	To review result analysis of May/June 2021 examination and attainment of CO-PO.
6.	To consider the report of research, attended seminar/ webinar/conference/ training programme / workshop / value added courses of staff.
7.	To review on AQAR submission and compilation of files
8.	To take review on B.Pharm increase in intake from 60 to 100.
9.	To review start of new courses Pharm.D, M.Pharm Pharmaceutics and Pharmacology
10.	To review on requirement of infrastructure, chemical and equipment in view of enhancement of courses.
11.	Any other matter with the permission of chair

PRAVARA RURAL COLLEGE OF PHARMACY * PRAVARANAGAR *

Dr. Sanjay Bhawar
Principal and Member of secretary
Principa.
Pravara Rural College of Pharmacy
Pravaranagar, A/p. Loni- 413 736

PRAVARA RURAL EDUCATION SOCIETY'S
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MINUTES INTERNAL QUALITY ASSURANCE CELL (IQAC) AND

COLLEGE DEVELOPMENT COMMITTEE

Meeting : 2021-2022/ 08

Date: 13 January, 2022 **Time:** 11.00 am

Venue : Board Room, Pravara Rural College of Pharmacy, Loni.

SCHEDULE OF THE MEETING

Sr.No	Time	Particular	Venue
1.	11.00 am onwords	Arrival of CDC & IQAC member and special invitee	Board Room,PRCOP
2.	11.00-11.05 am	Welcome of CDC & IQAC Members by the principal	Seminar Hall,PRCOP
3.	11.05-11.10 am	Proposing agenda of the meeting for discussion	
4.	11.10-12.00 pm	Presentation on agenda of the meeting	
5.	12.00-12.05pm	Vote of thanks	
6.		National anthem	
7.	12.05-12.30 pm	High tea	Food court

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MINUTES INTERNAL QUALITY ASSURANCE CELL (IQAC) AND COLLEGE DEVELOPMENT COMMITTEE(CDC)

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11.	Any other matter with the permission of chair

Following member to remain present for the meeting

Sr. No	Name	IQAC Designation
1.	Dr. Sanjay.B.Bhawar	Chairperson
2.	Dr. Ravindra Jadhav	IQAC Coordinator
3.	Shri.Bharat V Ghogare	Member from trust
4.	Adv. Appasaheb Dighe	Director PRES
5.	Mr. Bansi Patil Tambe	Local Member of CDC
6.	Dr. Rahul Kunkulol	Nominee from Local society
7.	Mr. Prashant Gagare	Nominee from industry
8.	Dr.Rasika Bhalake	Nominee from Alumni
9.	Mr. Pratik .V.Malwade	Nominee from Student
10.	Mr.Sunil R Adhav	Nominee from stakeholder

11.	Dr.Ravindra B. Laware	Teacher member
12.	Mr. RajendraTambe	Administrative member
13.	Mrs.Hemlata.S.Bhawar	Member of Teacher
14.'	Mrs. Sunaina R. Vikhe	Member of Teacher
15.	Mr.Someshwar mankar	Invited member TPO
16.	Dr. Santosh Dighe	Teacher member
17.	Dr. Suhas Siddheshwar	Representative of Teaching
18.	Mr.R.A.Vikhe	Representative of Non-Teaching

Following member were absent for the meeting

1. Hon. Shri. RadhakrishnaVikhePatil, Chairman, PRES
2. Dr. Bhaskarrao N.Kharde, Member from trust
3. Dr.Sambhaji Nalkar, Chief Scientist of KVK,Babhaleshwar

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Dr. Sanjay Bhawar welcomed all the members and read the agenda of the meeting. Agenda was taken up for discussion-

Agenda No. 1. To read and approve minutes of the last meeting and action taken report	Presenter:- Dr.Sanjay Bhawar

Dr.Sanjay Bhawar briefed the members on last MOM which have been sent to the members. Dr. Ravindra Jadhav presented action taken report of last IQAC & CDC meeting.

Action Taken Report of last IQAC & CDC meet

Sr	Decisions	Action taken	Compliance & remark
1.	To prepare activity and academic calendar for Academic Year 2021-22 well in advance and display on institute website	Activity and academic calendar for AY 21-22 is finalized and available on institute website (Agenda No 2)	Complied
2.	To read constitution of new IQAC for the year 2021-22 to 2023-24 and welcome the member	New constitution of IQAC done. As per statutory norms.	Complied
3.	To read re-constitution CDC for the year 2021-22 and welcome the member	New constitution of CDC done. As per statutory norms.	Complied
4.	To read reconstitution GB (Year of establishment-2019 and valid till 2024)	New constitution of GB done. As per statutory norms. (Year of establishment-2019 and valid till 2024)	Complied
5.	To read and approve minute of the last meeting and action taken report	Last MOM was discuss and approved.	Complied
6.	To review the compliance of the activity and academic calendar of odd semester, A.Y 2020-21 and proposed suitable measure to sustain and enhance academic quality.	Review of the activity calendar was taken and discussed.	Complied
7.	To consider and approve academic feedback with action taken report for odd semester A.Y 2020-21	The teacher feedback was consider for subject distribution. Review on academic feedback discussed with committee member.	Complied
8.	To consider and approve report on student training and placement activity	TPO gave presentation on student training and placement activity.	Complied
9.	To review result analysis of February 2021 examination	Exam department presented result analysis of each class of February 2021 examination.	Complied
10.	Review and planning for academic activity in pandemic affected time	Online lecture were conducted and study material circulated via online tools.	Complied
11.	To review status of planning of NAAC peer team visit	NAAC peer team visited and inspected college. received "A" Grade.	Complied

Conclusion/ Suggestion:- The report of last IQAC for the A.Y 2021-2022 is accepted and approved by IQAC& CDC.

PRAVARA RURAL COLLEGE OF PHARMACY * PRAVARANAGAR *

Agenda No. 2. To review the compliance of activity and academic calendar of odd semester, AY 2021-22 and propose suitable measures to sustain and enhance academic quality.	Presenter:- Mrs. Sunaina R. Vikhe

Mrs. Sunaina R. Vikhe briefed the members that

i) Academic and activity calendar for academic year 2021-22 is prepared as per policy document and ready for discussion and approval of IQAC & CDC.

ii) The schedule for continuous assessment examination is included in the academic calendar, as was recommended by members of IQAC& CDC.

iii) Inputs from all the departments and sections-like academic, administrative, examination, cultural, Student welfare, alumni, library, sports, TPC, NSS, planning and development etc were taken into consideration for finalizing the academic calendar.

iv) The approved calendar will be displayed on notice board and uploaded on institute website for the notice of all stakeholders.

PRAVARA RURAL COLLEGE OF PHARMACY

Academic Calendar – 2021-22 (Even Semester)

Week No.	Month	Week Days							No. of Working Days	Events
		Mon	Tue	Wed	Thu	Fri	Sat	Sun		
	Jan-22								0	January 12: National Youth Day
		3	4	5	6	7	8		6	January 17: Commencement of Classes
		10	11	12	13				4	January 20: Workshop on Hands on training-Equipment
		17	18	19	20	21	22		6	January 24-January 30: NSS Camp January 24: Expert lecture
		24	25		27	28	29		5	January 26: Republic Day
		31							1	January 27th-January 29th: Intercollegiate sports day January 30: Martyrs Day Jan 31: Academic Review
	Feb-22		1	2	3	4			4	February 1-6, 2022: Sports, Cultural Days
		7	8	9	10	11	12		6	February 8: Expert lecture
		14	15	16	17	18			5	February 10:Industrial visit (Third & Final Year)
		21	22	23	24	25	26		6	February 11:Industrial visit (First & Second Year)
		28							1	February 12:Industrial visit (M.Pharm) February 19- Chatrapati Shivaji Maharaj Jayanti February 21-28: Sessional & Continuous assessment February 27: Marathi Bhasha Din February 28: National Science Day
	Mar-22			2	3	4			3	March 2: Internal Academic Audit
		7	8	9	10	11	12		6	March 3: Expert lecture March 4: National Safety Day
		14	15	16	17	18			5	March 7-March 10: International Conference
		21	22	23	24	25	26		6	March 8: International Women's Day
		28	29	30	31				4	March 14: Parent Teachers meet March 16:Expert lecture March 15: World Consumer Rights Day March 20: International Day of Happiness March 22: World Water Day March 24: World TB Day
	Apr-22					1	2		2	April 7: World Health Day

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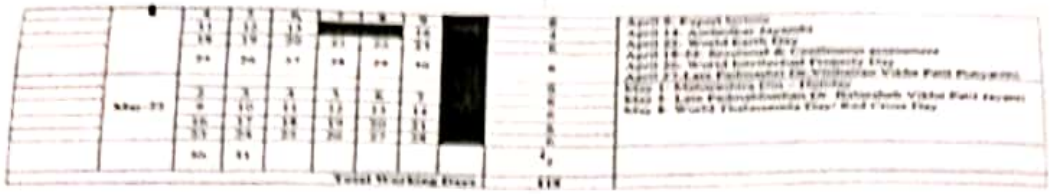

Conclusion/ Suggestion:- The academic and activity calendar for the Academic year 2021-22 is accepted and approved by the IQAC & CDC members.

Agenda No. 3. To consider and approve academic feedback with action taken report for odd & even semester.	Presenter:- Mrs. Sunaina R. Vikhe

Mrs. Sunaina R. Vikhe briefed the members that academic feedback was collected through online and offline mode

The feedback was collected, analyzed discussed for appropriate action.

FEEDBACK ANALYSIS 2020-21: EVEN SEMESTER

MODE OF FEEDBACK: ONLINE, GOOGLE FORM

	Total number of responses received	KDwledge base of the teacher	Communication Skills	Sincerity / Commitment of the teacher	Interest generated by the teacher	Accessibility of the teacher during online and offline of the class	Ability to design quizzes /Tests /assignments / examinations and projects to evaluate students understanding of the course	Attitude of the teacher	Are the online lectures interactive	Is the lecture conducted for complete time	whether teaching is adher to syllabus	TOTAL MARKS OUT OF	TOTAL MARKS OBTAINED	PERCENTAGE OBTAINED [%]
FIRST YEAR B. PHARMACY														
HAP II	43	159	152	147	137	147	133	150	152	140	152	1720	1469	85.40%
POC I	43	149	153	153	152	145	134	149	160	132	168	1720	1495	86.91%
BIOCHEM	43	136	142	139	130	139	142	133	136	156	156	1720	1409	81.91%
PATHOLOGY	43	143	142	143	130	141	124	132	144	160	156	1720	1415	82.26%
CA	43	136	132	138	130	136	143	133	140	156	156	1720	1400	81.39%
EVS	43	158	124	127	155	124	150	121	120	144	156	1720	1379	80.17%
SECOND YEAR B. PHARMACY														
POC II	58	184	193	200	181	193	184	188	216	192	224	2320	1955	85.99 %
MEDICHEM I	58	181	172	197	177	190	174	182	212	172	224	2320	1881	81.07%
PP II	58	217	214	212	206	204	186	201	212	192	228	2320	2072	89.31 %

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PHYSICS	50	213	213	211	207	195	191	195	212	204	228	0	2061	
THIRD YEAR B PHARMACY														
MEDICI												200		85.25%
PCOL III	50	182	177	182	169	170	167	174	180	188	196	0	1785	85.85 %
HEVI	50	158	154	152	151	150	154	156	168	156	168	200 0	1617	81.65%
PHARMA	50	165	155	162	152	152	154	161	172	176	184	200 0	1633	85.05%
BM BIOTECH	50	163	169	168	161	160	158	162	184	180	196	200 0	1701	85.75%
QA	50	176	169	176	165	164	166	164	184	188	184	200 0	1736	87.1 %
	50	176	173	173	165	164	167	169	168	188	192	200 0	1754	
FINAL YEAR B PHARMACY														
P P U												132		89.77 %
ADDS	33	115	114	114	113	114	114	109	132	128	132	0	1185	
CS	33	110	123	120	112	115	130	120	104	106	107	132 0	1153	87.34 %
PAVI	33	130	127	126	112	115	130	120	124	106	117	132 0	1225	92.80 %
MEDICH EM N	33	115	114	114	113	114	114	119	132	131	102	132 0	1168	88.48 %
COLOGY V	33	110	129	128	112	115	130	120	104	106	107	132 0	1157	86.86 %
NPCM	33	130	127	126	112	115	130	120	124	106	117	132 0	1217	92.19 %
QAT	33	111	121	120	112	111	130	120	101	106	107	132 0	1161	87.95 %

TOTAL MARKS OUT OF = TOTAL NUMBER OF STUDENTS RESPONDED X TOTAL NUMBER OF QUESTIONS (10) X MAX MARKS (4)

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FEEDBACK ANALYSIS 2021-22: ODD SEMESTER; MODE OF FEEDBACK: OFFLINE

NAME OF THE SUBJECT	Total number of responses received	TOTAL MARKS OUT OF	TOTAL MARKS OBTAINED	PERCENTAGE OBTAINED [%]	Subject Incharge
FIRST YEAR B PHARMACY					
Human Anatomy and Physiology II BP201T	47	2068	1761	85.15	Ms. R.D.Ghogare
Pharmaceutical Organic chemistry I BP202T	47	2068	1844	89.16	Dr. R.J.Bhor
Biochemistry BP203T	47	2068	1485	71.85	Mrs. H.S.Bhawar
Pathophysiology BP204T	47	2068	1318	63.73	Miss.S.S.Dhavane/ Mrs. S.A.Vikhe
Human Anatomy and Physiology II BP207P	47	2068	1794	86.75	Ms. R.D.Ghogare
Pharmaceutical Organic chemistry I BP208P	47	2068	1867	90.28	Dr. R.J.Bhor
Biochemistry BP209P	47	2068	1617	78.19	Mrs. H.S.Bhawar
SECOND YEAR B PHARMACY					
Pharmaceutical Organic Chemistry III BP401T	74	3256	2299	75.6	Dr. R. K. Godage
Medicinal Chemistry I BP402T	74	3256	2708	83.1	Mr. A. S. Dighe
Physical Pharmaceutics II BP403T	74	3256	2959	90.8	Mrs. K. V. Dhamak
Pharmacology I BP404T	74	3256	2439	74.9	Mrs. S.A.Vikhe
Pharmacognosy and Phytochemistry I,BP405T	74	3256	3050	93.6	Dr. S. R. Vikhe
Medicinal Chemistry I – Practical BP406P	74	3256	2867	88	Mr. A. S. Dighe
Physical Pharmaceutics II – Practical BP407P	74	3256	2827	86.8	Mrs. K. V. Dhamak
Pharmacology I – Practical BP408P	74	3256	2940	90.29	Mrs. S.A.Vikhe

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Pharmacognosy and Phytochemistry I - Practical BP409P	74	3256	2750	84.4	Dr. S. R. Vikhe
THIRD YEAR B PHARMACY					
Medicinal Chemistry III - Theory BP601T	32	1408	1270	90.1	Mr. S.D. Magar
Pharmacology III - Theory BP602T	32	1408	1061	75.3	Dr. S. B. Dighe
Herbal Drug Technology - Theory BP603T	32	1408	1208	85.7	Mr. D. N. Vikhe
Biopharmaceutics and Pharmacokinetics-Theory BP604T	32	1408	1104	78.4	Mr. M.S.Bhosale
Pharmaceutical Biotechnology - Theory BP605T	32	1408	1295	91.9	Dr. S. D. Mankar
Quality Assurance - Theory BP606T	32	1408	1028	73.01	Dr. S. S. Siddheshwar
Medicinal chemistry III - Practical BP607P	32	1408	1274	90.48	Mr. S.D. Magar
Pharmacology III - Practical BP608P	32	1408	1063	75.49	Dr. S. B. Dighe
Herbal Drug Technology - Practical BP609P	32	1408	1200	85.22	Mr. D. N. Vikhe
FINAL YEAR B PHARMACY					
Biostatstics and Research Methodology BP801T	56	2464	1863	75.6	Dr. S.B.Bhawar
Social and Preventive Pharmacy BP802T	56	2464	1982	80.4	Ms. R. D. Ghogare / Dr. A.P. Patel
Pharmaceutical Regulatory Science BP804ET	56	2464	2040	82.7	Mr. M. H. Kolhe
Quality Control and Standardizations of Herbals BP806ET	56	2464	2014	81.7	Dr. R. S. Jadhav

TOTAL MARKS OUT OF = TOTAL NUMBER OF STUDENTS RESPONDED X TOTAL NUMBER OF QUESTIONS [11] X MAX MARKS [4]

Principal
Pravara Rural College of Pharmacy
Pravaranagar

Conclusion/ Suggestion:- The Academic feedback with action taken report for odd & even semester was approved and appreciated by committee member.

PRAVARA RURAL COLLEGE OF PHARMACY * PRAVARANAGAR *

Agenda No. 4. To consider and approve report on student training activities.	Presenter:- Mr. Someshwar Mankar

Mr. Someshwar Mankar briefed the members on student monitoring system for the academic year 2021-22 that

LIST OF TRAINING ACTIVITY OF STUDENTS NAME WITH NAME OF COMPANY

Sr. No	Activities / Event Name	Date /Day	Name of company with Address	Name of experts	Stack holder (student participate) Branch, Year,	No of Students Participated	Outcome of Event
1	"Strategy for GPAT & NIPER Preparation"	16.08.2021	Pharm Elite, Mumbai	Mr.Aakash Nathani	S.Y, T.Y & Final year B.Pharm	UG-104	Students learn the basics things and how to prepare for GPAT.
2	"Career and Clinical Trials Data Analytics"	04.09.2021	Kite-Ai, Pune	Ms.Gayatri Shardul	T.Y.B.Pharm	UG-104	Students understand the advanced techniques of Clinical Research.
.3	"GPAT & NIPER Preparation 2022"	18.09.2021	Dr. VVPF, College of Pharmacy, Viladghat, A.Nagar.	Mr.Vikrant Dhamak	S.Y, T.Y and Final Year.B.Pharm	UG-100	Students know the various tricks to solve GPAT Test.
4.	Career opportunities in Pharmaceuti cal Industry"	25.09.2021	Smartchem plus, Nashik.	Mr. Amol Gavande	S.Y, T.Y and Final Year.B.Pharm	UG-100	Students aware about the industry & it minimizes the gap between industry & Institution.
5.	"Workshop on medical coding"	02.10.2021	IKS Healthcare Pvt.Ltd	Mr.Kiran Pawale	T.Y.& Final Year B.Pharm, M.Pharm	UG -90 PG-10	Students seeks the knowledge about medical coding
6.	"Recent advances in Granulation and Tableting technology"	15.10.2021	Alkem Lab Pvt.Ltd	Mr.Samadh an Mhaske	T.Y.& Final & PG.	UG-77	Students seeking knowledge about granulation techniques.
7.	"Biosimilars product development	23.10.2021	Enzene Bioscience Ltd	Mr.Prashan t Kshirsagar	T.Y.& Final Year B.Pharm, M.Pharm	UG-85 PG- 10	Students learn about biosimilars.

	an overview"						
8.	"Workshop on Personality Development "	25.11.2021	Jeevansanjivani society, Wai, Satara	Mr.Rajesh Chavan	S.Y, T.Y and Final Year.B.Pharm	UG-127	Stuedents learn about the basic thing of personality development.
9.	"Tips & Tricks to crack GPAT & NIPER 2022"	11.12.2022	Astra zenca AB, Swedan	Mr.Harshd Jadhav	S.Y, T.Y and Final Year.B.Pharm	UG-106	Students understood about tips and tricks to solve GPAT & NIPER 2022.
10	"Conceptual learning in Pharmaceutics"	12.12.2021	Remedium Laboratories, Hydrabad	Dr. Srujan Kumar Reddy	S.Y, T.Y and Final Year.B.Pharm	UG-100	Students learn basic concept of pharmaceutics.
11	"Importance of Profession ready training and placement program"	04.01.2022	CLINI India	Mr. Vishal Chaudhari	S.Y, T.Y ,Final Year.B.Pharm&M.Pharm	UG-82 PG-08	It gives idea about importance of professional ready training & Placement program.

Conclusion/ Suggestion:-

1. The committee member appreciated excellent effort of TPC for student training activity
2. The report of training and placement cell organized for the year 2021-2022 is accepted and approved by member of IQAC and CDC.

Agenda No. 5. To review result analysis of May/June 2021 examination and attainment of CO-PO.	**Presenter:- Dr. Ravindra Jadhav**

1. **Dr.Sanjay Bhawar** presented report on result analysis of may-june 2021.
2. The Attainment CO-PO matrix was presented by exam department in front committee members.

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CO-PO-PSO attainment Matrix

Direct method of Assessment of CO – PO/PSO Attainment

At the end of each programme PO/PSO assessment is done from CO attainment of all curriculum components.Program Outcomes are defined by National Board of Accreditation New Delhi while the Program Specific Outcomes (PSOs) are defined by individual programs. COs are mapped with Program outcomes and Program Specific Outcomes (PSOs).

CO Attainment:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	Average Value	%
CO1	2.66	1.4	1.6	2.1	1.4	2.49	2.4	2.27	2.66	2.26	2.55	2.05	68.56
CO2	2.66	1.4	1.6	1.4	1.4	2.49	2.4	2.27	2.66	1.51	2.55	2.05	68.51
CO3	2.66	2	2.3	0.7	1.4	2.49	2.4	1.51	2.66	0.75	2.55	2.06	68.53
CO4	2.66	0.7	2.3	1.4	1.4	1.66	2.4	1.51	2.66	1.51	2.55	2.04	67.88
CO attained Indirect method												2.05	68.37
CO attained Direct Method												3.00	100.00
Co attained- Direct + Indirect method												2.53	84.18

PO Attainment:

POs	PO1	2	3	4	5	6	7	8	9	10	11	Avg
Direct Attainment	3.00	2.00	2.50	2.00	2.00	2.75	3.00	2.50	3.00	2.00	3.00	2.53
Indirect Attainment(I)												
Graduate Exit Survey	2.57	2.09	2.19	2.22	1.99	2.49	2.46	1.99	2.11	2.11	2.49	
Alumni Survey	2.08	2.05	2.14	2.14	2.08	1.98	2.41	2.08	2.54	2.41	1.09	
Average of Indirect PO attainment	2.325	2.07	2.165	2.18	2.035	2.235	2.435	2.035	2.325	2.26	1.09	2.2
Overall PO Attaintment	2.66	2.04	2.33	2.09	2.03	2.49	2.43	2.27	2.66	2.26	2.55	2.36

Overall PSO Attainment:

		PSO1	PSO2	PSO3	PSO4	Ave
Indirect PSO attainment	Average of Attainment (Graduate exit survey)	2.46	2.19	2.11	2.57	
	Average of Attainment (Alumni exit survey)	2.14	2.14	2.41	1.99	
Average of indirect PSO attainment		2.30	2.17	2.26	2.28	2.25
Direct PSO attainment		1.89	1.78	1.85	1.87	2.33
PSO attained		2.09	1.97	2.06	2.07	2.05

Conclusion/ Suggestion:- Committee congratulated all students and staff excellent result and approved the CO-PO attainment.

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Agenda No. 6. To consider the report of research, attended seminar/ webinar/conference/ training programme / workshop / value added courses of staff.	Presenter:- Dr. Ravindra Jadhav

1. The report of research and development cell for the year 2021-2022 is accepted and approved by member of IQAC and CDC
2. The committee members appreciated the efforts taken by research and development cell for motivation of the staff in seminar, webinar, conference, training programme and workshop.

no.	Name of the Staff (Surname/First name/ Middle name)	Designation	Department	Research/ Review	Title of paper
1.	Kolhe Mahesh Hari	Assistant Proffesor	QAT	Research	Development of Floating Tablet of Amlodipine Besylate for Bioavailability Improvement in Animal Model
2.	Kolhe Mahesh Hari	Assistant Proffesor	QAT	Research	Development of Capsule Containing Immediate Release Tablet and Extended Release Floating Tablet for Monitoring Release of Atenolol
3.	Kolhe Mahesh Hari	Assistant Proffesor	QAT	Review	A review on Analytical Methods for Estimation of Linagliptin in Bulk and Tablet Dosage form
4.	Kolhe Mahesh Hari	Assistant Proffesor	QAT	Review	A Review on Analytical Method for Determination of Lamotrigine in Bulk and Pharmaceutical Dosage Form
5.	Kolhe Mahesh Hari	Assistant Proffesor	QAT	Research	Development and Validation of A RP HPLC Method for the Simultaneous Analysis of Lopinavir and Ritonavir in Tablets Dosage Form.
6.	Kolhe Mahesh Hari	Assistant Proffesor	QAT	Review	Vesicular Delivery of Curcumin for Topical Application: A Review
7.	Kolhe Mahesh Hari	Assistant Proffesor	QAT	Research	Formulation and evaluation of vesicular delivery of curcumin for topical application
8.	Kolhe Mahesh Hari	Assistant Proffesor	QAT	Review	Ranolazine: A review on its safety, efficacy and therapeutic indications and overview on analytical methods
9.	Kolhe Mahesh Hari	Assistant Proffesor	QAT	Review	Development and validation of RP-HPLC method for estimation of Secnidazole in API and Pharmaceutical Dosage Form
10.	Kolhe Mahesh Hari	Assistant Proffesor	QAT	Review	A Review on Analytical Methods for estimation of Apremelast in Bulk, Pharmaceutical Formulation and in Biological Samples
11.	Kolhe Mahesh Hari	Assistant Proffesor	QAT	Research	RP-HPLC Method Development and Validation of Linagliptin in Bulk and Pharmaceutical Dosage Form
12.	Kolhe Mahesh Hari	Assistant Proffesor	QAT	Review	Study on Wound healing plants, their Formulation and Evaluation
13.	Kolhe Mahesh Hari	Assistant Proffesor	QAT	Review	Analytical Technique for Carvedilol and Ivabradine Determination from Pure and

					Pharmaceutical Dosage Forms: A Review
14.	Kolhe Mahesh Hari	Assistant Proffesor	QAT	Research	Stability Indicating Method Development and Validation of Carvedilol and Ivabradine in Bulk and its Formulation by Reverse Phase High Performance Liquid Chromatography Method
15.	Magar Sagar Dattatray	Assistant Proffesor	Pharmaceutic al Chemistry	Research	development and validation of rphplc method for estimation of tenoxicam in its bulk and pharmaceutical dosage form
16.	Mr. Bhosale Mayur S	Assistant Proffesor	Pharmaceutic al Chemistry	Review Article	overall review on: effective therapeutic benefits of microalgae: spirulina
17.	Mr. Bhosale Mayur S	Assistant Proffesor	Pharmaceutic al Chemistry	RESEARCH	formulation and evaluation of natural lipsticks prepared from delonix regia petals extract
18.	Mr. Bhosale Mayur S	Assistant Proffesor	Pharmaceutic al Chemistry	Review Article	overall review on: current scenario in waste managment system
19.	Mr. Bhosale Mayur S	Assistant Proffesor	Pharmaceutic al Chemistry	Review Article	overall review on: effective therapeutic benefits of microalgae: spirulina
20.	Mr. Bhosale Mayur S	Assistant Proffesor	Pharmaceutic al Chemistry	Review Article	a review on:therapeutic activities of spirulinaon skin
21.	Mr. Bhosale Mayur S	Assistant Proffesor	Pharmaceutic al Chemistry	Research Article	Metabolism of Arsenic in Human by AS3MT Gene
22.	Mr. Bhosale Mayur S	Assistant Proffesor	Pharmaceutic al Chemistry	Review Article	A Review on Biologiv(Cal Activity of "Benzimidazole as a Imidazole Derivatives"
23.	Mr. Bhosale Mayur S	Assistant Proffesor	Pharmaceutic al Chemistry	Research Article	Comparative Synthetic Study, in silico Screening and Biological Evaluation of some Substituted Tetrahydropyrimidine-2-thione Derivatives as Potential DHFR Inhibitors
24.	Mr. Bhosale Mayur S	Assistant Proffesor	Pharmaceutic al Chemistry	Review Article	Recent Progress on Synthesis and Bio-activities of Tetrahydropyrimidine-2-one derivatives
25.	Mr. Bhosale Mayur S	Assistant Proffesor	Pharmaceutic al Chemistry	Review Article	An Overview on Estimation of Lacidipine from Bulk and Formulation
26.	Mr. Bhosale Mayur S	Assistant Proffesor	Pharmaceutic al Chemistry	Research Article	development and validation of rp-hplc method for simultaneous estimation of azilsartan medoxomil and cilnidipine in bulk and tablet dosage form
27.	Mr. Bhosale Mayur S	Assistant Proffesor	Pharmaceutic al Chemistry	Research Article	method development and validation of ezetimibe and simvastatin in pharmaceutical dosage form by rp-hplc
28.	Mr. Bhosale Mayur S	Assistant Proffesor	Pharmaceutic al Chemistry	Review Article	a review: analytical method for determination of pregabalin and etoricoxib in pharmaceutical dosage form
29.	Mr. Bhosale Mayur S	Assistant Proffesor	Pharmaceutic al Chemistry	Review Article	a review: analytical method for simultaneous determination of ezetimibe and simvastatin in combined pharmaceutical dosage form by rp-hplc method
30.	Mr. Bhosale Mayur S	Assistant Proffesor	Pharmaceutic al Chemistry	Review Article	A Review on Murraya koenigii: for Hair Growth Promoter
31.	Mr. Bhosale Mayur S	Assistant Proffesor	Pharmaceutic al Chemistry	Review Article	A Review on Jackfruit: It is profitable to human beings

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32.	Dr. Sunayana Vikhe	Assistant Proffesor	Pharmacognosy	Research Article	*Antidiabetic And Antihyperlipidemic Activities Of Feronia Elephantum Gum In Streptozotocin Induced Diabetic Rats.*
33.	Mrs.K.V.Dhamak	Assistant Proffesor	QAT	Review	Analytical Technique for Carvedilol and Ivabradine Determination from Pure and Pharmaceutical Dosage Forms: A Review
34.	Mrs.K.V.Dhamak	Assistant Proffesor	QAT	Research	Stability Indicating Method Development and Validation of Carvedilol and Ivabradine in Bulk and its Formulation by Reverse Phase High Performance Liquid Chromatography Method
35.	Siddheshwar Suhas Shivaji	Proffesor	Pharmaceutics	Review	A Review On Analytical Method For Determination Of Lamotrigine In Bulk And Pharmaceutical Dosage Form
36.	Siddheshwar Suhas Shivaji	Proffesor	Pharmaceutics	Review	A Review On Analytical Method For Determination Of Venlafaxine HCL In Bulk And Pharmaceutical Dosage Form
37.	Siddheshwar Suhas Shivaji	Proffesor	Pharmaceutics	Review	A Review On Analytical Method For Estimation Of Linagliptin In Bulk And Tablet Dosage Form
38.	Siddheshwar Suhas Shivaji	Proffesor	Pharmaceutics	Review	Review Paper On Ayush System Of Medicine Against Covid-19
39.	Amol S Dighe	Assistant Proffesor	Pharmachemistry	Research	Method Development And Validation Of Assay Method For Simultaneous Estimation Of Bilastine And Montelukast Sodium By Using Rp-Hplc
40.	Amol S Dighe	Assistant Proffesor	Pharmachemistry	Research	In silico Investigation and Molecular Docking Study of Triazolo-thiadiazole Derivatives for Antimicrobial, Anti-inflammatory and Anti-diabetic Activity
41.	Dighe Santosh Bhausaheb	Assistant Proffesor	Pharmacology	Research	Phytochemical study and Anxiolytic potential *of Martynia annua Linn* seeds
42.	Dighe Santosh Bhausaheb	Assistant Proffesor	Pharmacology	Research	Pharmacognostic, phytochemical & & Anti-inflammatory activity of ougeinia ojjeneinensis leaves
43.	Dighe Santosh Bhausaheb	Assistant Proffesor	Pharmacology	Research	Phytochemical study and anxiolytic activity of hibiscus cannabis leaves
44.	Dighe Santosh Bhausaheb	Assistant Proffesor	Pharmacology	Research	Pharmacognostic and physicochemical phytochemical and evaluation of abortifacient activity of Calotropis gigantean leaf
45.	Dighe Santosh Bhausaheb	Assistant Proffesor	Pharmacology	Research	Phytochemical , Pharmacognostic study and anti-inflammatory activity of Mundulea seriacea
46.	Dighe Santosh Bhausaheb	Assistant Proffesor	Pharmacology	Research	Development of herbal ointment from Bauhinia racemosa leaves for wound healing activity
47.	Dighe Santosh Bhausaheb	Assistant Proffesor	Pharmacology	Research	Pharmacognostic phytochemical standardization and anticonvulsant activity study of sesbania grandiflora flowers
48.	Dighe Santosh Bhausaheb	Assistant Proffesor	Pharmacology	Research	Pharmacognostic phytochemical study and antitussive activity of cordial sinesis leaves
49.	Dighe Santosh	Assistant	Pharmacology	Research	Pharmacognostical phytochemical study

	Bhausaheb	Proffesor			and anti-inflammatory activity of benincasa hispida leaves
50.	Godge Rahul Keshav	Assistant Proffesor	Pharmaceutical Chemistry	Review	Empagliflozin And Linagliptin: An Analytical Review

Seminar/ Conference/ Workshop/Symposium attended by staff

Sr. no.	Name of the Staff (Surname/First name/ Middle name)	Designation	Department	Seminar/ Conference/ Workshop/Symposium /other	Title of Seminar/ Conferrence/ Workshop
1	Siddheshwar Suhas Shivaji	Professor	Pharmaceutics	Workshop/Training	Technical hands on training of instruments handling"
2	Siddheshwar Suhas Shivaji	Professor	Pharmaceutics	Conference	Saae-india (society for alternatives to animal experiments-india)
3	Siddheshwar Suhas Shivaji	Professor	Pharmaceutics	Conference	Recent trends in pharmaceutical research
4	Rohit Jaysing Bhor	Associate Professor	Pharmaceutical Chemistry	Webinar	"intellectual property right"
5	Mankar Someshwar D	Associate Professor	Pharmaceutics	Conference	Pharmaceutical research and innovation to tackle future healthcare arena
6	Mankar Someshwar D	Associate Professor	Pharmaceutics	Conference	"Recent trends in pharmaceutical research"

FDP/ Other Course attended by staff

Sr. no.	Name of the Staff (Surname/First name/ Middle name)	Designation	Department	FDP/ Other Course	Title of FDP/ Other Course
1.	Ghogare Rajashree.D	Assistant Professor	Pharmacology.	FDP	"Research & Regulatory Requirements: An Industry Perspective"
2.	Ghogare Rajashree.D	Assistant Professor	Pharmacology	National Webinar	"Research & Regulatory Requirements: An Industry Perspective"
3.	Mankar Someshwar D	Associate Professor	Pharmaceutics	FDP	Innovation,Startup and Entrepreneurship development in Pharmaceutical Science
4.	Mankar Someshwar D	Associate Professor	Pharmaceutics	FDP	'EmergingTrendsandChallengesinTechno-stabilizationofPharmaceuticals'
5.	Mankar Someshwar D	Associate Professor	Pharmaceutics	FDP	Pharmaceutical Quality System for Product Life Cycle Management
6.	Mankar Someshwar D	Associate Professor	Pharmaceutics	FDP	Clinical Research Methodology
7.	Mankar Someshwar D	Associate Professor	Pharmaceutics	FDP	Life Skill- Management 2020-21
8.	Mankar Someshwar D	Associate Professor	Pharmaceutics	Seminar	Advancement in Pharmaceutical Education & Research
9.	Bhosale Mayur S	Assistant Professor	Pharmaceutical chemistry	Webinar	"Immunity Boosters (Medicinal Plants) and Yogic Lifestyle to Prevent COVID-19"
10.	Bhosale Mayur S	Assistant Professor	Pharmaceutical chemistry	seminar	"Alternative Energy Resources for Future",
11.	Bhosale Mayur S	Assistant Professor	Pharmaceutical chemistry	FDP	"Various facets of Quality in Pharmaceutical Industry"

12.	Siddheshwar Suhas Shivaji	Professor	Pharmaceutics	FDP	Inculcating Universal Human Values in Technical Education
13.	Siddheshwat Suhas Shivaji	Professor	Pharmaceutics	Webinar	Research and Regulatory requirements : An Industry Perspective
14.	Dhamak Kavita Vitthalrao	Assistant Professor	Quality Asurance Techniques	WEBINAR	Recent Avenues in Drug Discovery and Development
15.	Dhamak Kavita Vitthalrao	Assistant Professor	Quality Asurance Techniques	FDP	Research and Regulatory Requirements: An Industry Perspective
16.	Dhamak Kavita Vitthalrao	Assistant Professor	Quality Asurance Techniques	Lecture Series	IIC Impact Lecture Series
17.	Bhawar Hemlata Sanjay	Assistant Professor	Phramchemistry	QIP	Focused Shift In Pharma Outlook:From Evolution To Revolution"in virtual mode
18.	Godge Rahul Keshav	Assistant Professor	Pharmaceutical Chemistry	FDP	Manuscript Drafting and Research Proposal, Project Drafting for Funding Process"
19.	Godge Rahul Keshav	Assistant Professor	Pharmaceutical Chemistry	FDP	"Inculcating Universal Human Values in Technical Education"

Conclusion/ Suggestion:- Committee appreciated the effort taken by Research and development cell and report has been accepted and approved

Agenda No. 7. To review on AQAR submission and compilation of Files.	**Presenter:- Dr. Ravindra Jadhav**

1. **Dr. Ravindra Jadhav** presented IQAC regarding progress of AQAR submission for the year 2021-2022

Conclusion/ Suggestion:-

- The committee recommended to compile the record Required for AQAR of year 2021-2022 and submit it within timeline.

Agenda No. 8. To take review on increase intake in B. Pharm course from 60 to 100.	**Presenter:- Dr. Ravindra Jadhav**

1. **Dr. Ravindra Jadhav** presented the report regarding to course intake of B.Pharm increase from 60 to 100.

Conclusion/ Suggestion:-

1. The committee recommended to apply for increase intake in B. Pharm course from 60 to 100 and instructed to fulfill the requirement for the same.

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Agenda No. 09. To review start of new cources D.Pharm,Pharm.D, M.Pharm in Pharmaceutics and Pharmacology.	Presenter:- Dr. Ravindra Jadhav

Dr. Ravindra Jadhav presented the report regarding to start new courses of D.Pharm, Pharm.D, M.Pharm in Pharmaceutics and Pharmacology.

Conclusion/ Suggestion:-

The committee recommended to apply for D.Pharm, Pharm.D, M.Pharm in Pharmaceutics and Pharmacology fulfill the requirement for the same.

Agenda No. 10. To review on requirement of infrastructure, chemical and equipment in view of enhancement of courses	Presenter:- Dr. Ravindra Jadhav

Dr. Ravindra Jadhav briefed the members on requirement of equipment, chemicals, glassware and books for academic year 2021-22 in view of enhancement of courses

i) Internal audit of equipment, glassware, chemicals and furniture is to be conducted before commencement of academic activities. Audit shall be conducted by the team appointed by the Principal.
ii) Working and not working status of equipment shall be reported to HOD.
iii) Faculty is asked to forward requirement for the equipment, chemicals, glassware and maintenance work to respective HOD.
iv) All faculties shall forward book requirement considering changes in syllabus of UG and PG programme, to Library committee.
v) The requirement shall be given in necessary format with requisition form and budget provision.

Conclusion/ Suggestion:-

1. To present status report on internal audit and requirement of equipment, glassware and books in next IQAC & CDC meet.
2. To initiate procedure for academic year 2022-23, possible by the end of May/ June 2023 so as to avoid rush .

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Agenda No. 11. Any other matter with the permission of chair	Presenter:- Dr. Ravindra Jadhav

1. As per the suggestion received from all stakeholders is has been decided that from 2021-2022 following will be the best practice :-
    a. Women Empowerment
    b. Academic Book

Conclusion/ Suggestion:-The suggestion received from stakeholder regarding best practice is accepted and approved by committee members.

The Meeting of IQAC & CDC was concluded with vote of thanks proposed by Dr. Sanjay Bhawar to Hon. Chairman and all the members for their valuable contribution for the meet.

Dr. Ravindra Jadhav

IQAC coordinator

IQAC Incharge
Pravara Rural College of Pharmacy
Pravaranagar, Tal. Rahata, Dist. Ahmednagar

PRAVARA RURAL COLLEGE OF PHARMACY * PRAVARANAGAR *

Dr. Sanjay Bhawar

Principal

Principal
Pravara Rural College of Pharmacy
Pravaranagar, A/p. Loni 413 736

Copy to

1. IQAC file
2. CDC File
3. Members of IQAC

SUBJECT

BP 403 T. PHYSICAL PHARMACEUTICS-II

SCHEME

BP 403T Physical Pharmaceutics-II

Second Year B. Pharm (Semester-IV)

Academic Year 2021-22

PRAVARA RURAL EDUCATION SOCIETY'S
PRAVARA RURAL COLLEGE OF PHARMACY
LONI

Scheme and Evaluation guidelines

SCHEME FOR TEACHING

Course of study for semester IV

Course Code	Course Name	Lectures Assigned			
		Theory	Practical	Tutorial	Credit Points
BP 403 T	Physical Pharmaceutics-II	03	-	01	04

SCHEME FOR INTERNAL AND END SEMESTER EXAMINATIONS

Course Code	Course Name	Evaluation Scheme						
		Internal Assessment				End Semester Exams		Total Marks
		Continuous Assessment Mode	Sessional Marks		Total	Marks	Duration	
			Marks	Duration				
BP403 T	Physical Pharmaceutics-II	10	15	1 Hr	25	75	3 Hrs	100

Internal assessment: Continuous mode

The marks allocated for Continuous mode of Internal Assessment shall be awarded as per the scheme given below.

Table-1: Scheme for awarding internal assessment: Continuous mode

Theory		
Criteria	**Maximum Marks**	
Attendance (Refer Table)	4	2
Academic activities (Average of any 2 activities e.g. quiz, assignment, open book test, field work, group discussion and seminar)	4	03
Student – Teacher interaction	2	
Total	**10**	**5**
Practical		
Attendance (Refer Table)	2	
Based on Practical Records, Regular viva voce, etc.	3	
Total	**5**	

Table-: Guidelines for the allotment of marks for attendance

Percentage of Attendance	**Theory**	**Practical**
95 – 100	4	2
90 – 94	3	1.5
85 – 89	2	1
80 – 84	1	0.5
Less than 80	0	0

Sessional Exams

Two Sessional exams shall be conducted for each theory / practical course as per the schedule fixed by the college(s). The scheme of question paper for theory and practical Sessional examinations is given below. The average marks of two Sessional exams shall be computed for internal assessment as per the requirements given in tables – X. Sessional exam shall be conducted for 30 marks for theory and shall be computed for 15 marks. Similarly Sessional exam for practical shall be conducted for 40 marks and shall be computed for 10 marks. The duration for the conduct of the exam is as below

Exam Type	Marks allotted	Duration
Theory	30	1.5 Hr
Practical	40	04 Hr

Question paper pattern for theory Sessional For subjects having University exams

I. Objective Type Questions (Answer 05 out of 7)	=5 x 2 = 10
II. Long Answers (Answer 1 out of 2)	=1 x 10 = 10
III. Short Answers (Answer 2 out of 3)	=2 x 5 = 10
Total	**30 marks**

For subjects having Non University Examination

I. Long Answers (Answer 1 out of 2)	=1 x 10 = 10
II.Short Answers (Answer 4 out of 6)	=4 x 5 = 20
Total	**30 marks**

Question paper pattern for practical sessional examinations

I. Synopsis	= 10
II. Experiments	= 25
III. Viva voce	= 05
Total	**40 marks**

SYLLABUS
BP 403 T. Physical Pharmaceutics-II

Topic No.	Name of topic and contents	No of Hrs.
UNIT-I	**Colloidal dispersions:** Classification of dispersed systems & their general characteristics, size & shapes of colloidal particles, classification of colloids & comparative account of their general properties. Optical, kinetic & electrical properties. Effect of electrolytes, coacervation, peptization& protective action.	**07**
UNIT-II	**Rheology:** Newtonian systems, law of flow, kinematic viscosity, effect of temperature, non-Newtonian systems, pseudoplastic, dilatant, plastic, thixotropy, thixotropy in formulation, determination of viscosity, capillary, falling sphere, rotational viscometers, Visco elasticity Deformation of solids: Plastic and elastic deformation, Heckel equation, Stress, Strain, Elastic Modulus	**10**
UNIT-III	**Coarse dispersion:** Suspension, interfacial properties of suspended particles, settling in suspensions, formulation of flocculated and deflocculated suspensions. Emulsions and theories of emulsification, microemulsion and multiple emulsions; Stability of emulsions, preservation of emulsions, rheological properties of emulsions and emulsion formulation by HLB method.	**10**
UNIT-IV	**Micromeretics:** Particle size and distribution, mean particle size, number and weight distribution, particle number, methods for determining particle size by different methods, counting and separation method, particle shape, specific surface, methods for determining surface area, permeability, adsorption, derived properties of powders, porosity, packing arrangement, densities, bulkiness & flow properties.	**08**
UNIT-V	**Drug stability:** Reaction kinetics: zero, pseudo-zero, first & second order (complex reaction: reversible, parallel and side reactions), units of basic rate constants, determination of reaction order. Physical and chemical factors influencing the chemical degradation of pharmaceutical product: temperature, solvent, ionic strength, dielectric constant, specific & general acid base catalysis, Simple numerical problems. Stabilization of medicinal agents against common reactions like hydrolysis & oxidation. Accelerated stability testing in expiration dating of pharmaceutical dosage forms. Photolytic degradation and its prevention	**10**

Recommended Books:

T/R	BOOK TITLE/AUTHORS/PUBLICATION
T1	Essentials of Physical Pharmaceutics by C.V. S. Subramanyam, 2/Ed, Vallabh Prakashan, New Delhi.
T2	Hadkar UB. A Textbook of Physical Pharmacy. 4th ed. Pune: Nirali Prakashan; 2007.
T3	Kapoor KL. Textbook of Physical Pharmacy. Vol. II, 3rd ed. McMillan India Ltd.
T4	Arnikar HJ, Kadam SS, Gujar KN. Essentials of Physical Chemistry and Pharmacy.1st ed. Chennai: Orient Longman Pvt. Ltd. Reprint 2007.
R1	Martin, Remington Practice of Pharmacy, Latest edition.
R2	Sinko PJ. Martins Physical Pharmacy and Pharmaceutical Sciences. 6th ed. Noida: Lippincott Williams and Wilkins; Reprint 2010.
R3	Liebermann HA, Lachman L, Schwartz JB. Theory and Practice of Industrial Pharmacy. Special Indian ed. Noida, UP: CBS Publishers & Distributers Pvt.Ltd; 2009.
R4	Bahl BS, Tuli GD. Essentials of Physical Chemistry.1sted. New Delhi: S. Chand and Co. Ltd; Reprint 2010.
R5	Marlton SH, Frultoon CF. Principles of Physical Chemistry.4th ed. New Delhi: Oxford and IBH Publishing Co. Pvt. Ltd.
R6	Madan and Tuli S. Essentials of Physical Pharmacy. Chand & Company, New Delhi

LESSION PLAN- FOURTH SEMESTER

BP 403 T. Physical Pharmaceutics-II

Bloom Levels (BL) : 1. Remember 2. Understand 3. Apply 4. Create				
Lect. No.	**Topics / Sub- Topics**	**Course Outcome/s Addressed**	**BL Level**	**Reference (Text Book, Website)**
1	**Orientation lecture**	**CO1, CO2, CO3, CO4**	**L1**	**-**
2	Chemical Kinetics and its applications in Pharmacy,	CO1, CO3, CO4	L2, L3	T1, R2
3	Law of mass action, Molecularity, order of a reaction and specific rate constant(K)	CO3	L2	T1, R2
4	Zero order, First order, apparent or pseudo order of reaction and complex reactions with derivations.	CO1, CO3	L2	T1, R6
5	Second order reaction	CO1, CO3	L2	T1, R6
6	Methods to determine order of a reaction	CO2	L2	T1, T3, R6
7	Factors affecting rate of chemical reaction- solvent, ionic strength, dielectric constant.	CO3	L2	T1, T3, R6
8	Effect of temperature on the rate of reaction, Energy of activation,	CO3	L1, L2	T1, T3, R6
9	Arrhenius equation and application, Collision theory and transition state theory	CO3, CO4	L3, L2	T1, T3, R2, R6
10	Routes of drug degradation and their protection from degradation- hydrolysis, oxidation, reduction	CO3	L2	T1, T3, R2, R6

11	Accelerated stability studies – concepts and application	CO3, CO4	L2, L3	T1, R6
12	Introduction & types	CO1	L2	T1, R2
13	optical, kinetic properties of colloids	CO4	L2	T1, R2
14	electrical properties of colloids electrical double layer	CO4	L2	T1, R2
15	Nernst & Zeta potential, Donnan membrane Equilibrium	CO3, CO4	L2, L3	T1, R1, R2, R4
16	Protective colloids,	CO1	L2	T1, T3, R2
17	stabilization of colloidal system	CO1, CO3	L1, L2	T1, R2, R6
18	DLVO theory, Schulz Hardy rule, Hoffmeister series, Applications in pharmacy	CO3, CO4	L2, L3	T2, R1, R4
19	Definition and Pharmaceutical applications of Rheology	CO1	L1	T1, R2, R6
20	Newtonian systems, law of flow, kinematic viscosity,	CO1, CO2	L1, L2	T1, R2
21	non-Newtonian systems- Plastic and pseudoplastic	CO1, CO2	L1, L2	T1, R2
22	Dilatant flow	CO1, CO2	L1, L2	T2, R2, R4
23	Concept of thixotrophy	CO1	L1	T1, R2, R6
24	Measurement of thixopropy, bulges and spurs	CO2	L2	T1, R2, R6
25	Measurement of Viscosity- Single point instrument	CO2	L2	T1, R2
26	Measurement of Viscosity- multipoint instrument	CO2	L2	T1, R2,
27	mechanical model to illustrate viscoelastisity, Plastic and elastic deformation	CO2, CO4	L2	T1, R2, T1, R2, R6
28	Heckel equation, Stress, Strain, Elastic Modulus	CO2,CO4	L2	T1, R2, R6
29	Particle size and distribution,	CO1	L1	T2, R2

	average particle size, number and weight distribution,			
30	Particle number and methods for determining particle size	CO2	L2	T2, R2
31	Methods for determining particle size by (different methods), counting and separation method	CO2	L2	T1, R2, R4
32	Particle shape and specific surface	CO1	L1	T1, R2
33	Methods for determining surface area, permeability and adsorption	CO2	L2	T1, R1,
34	Derived properties of powders- densities, porosity and packing arrangement	CO1	L2	T1, R1, R2
35	Flow properties of powder	CO1, CO2	L1, L2	T1, R1, R2
36	Factors affecting flow of powder	CO4	L2, L3	T1, R2
37	Suspension, interfacial properties of suspended particles	CO1	L1	T3, R1, R3
38	Settling in suspensions	CO1	L1	T3, R1, R3
39	Formulation of flocculated and deflocculated suspensions.	CO2	L2	T4, R1, R3
40	Emulsions and theories of emulsification	CO2, CO4	L2, L3	T4, R1, R3
41	Microemulsion and multiple emulsions	CO1	L1	T4, R1, R3
42	Stability of emulsions	CO3	L2	T4, R3
43	preservation of emulsions	CO1	L1	T4, R1
44	rheological properties of emulsions	CO2	L2	T3, R1, R5
45	Emulsion formulation by HLB	CO4	L3	R1, R3

	method.			

Delivery/ instructional methodologies:

Chalk & Talk	Stud. Assignment	Web Resources	
LCD/ Smart Boards	Stud. Seminars	Add-On Courses	

COURSE DELIVERY, OBJECTIVES, OUTCOMES

BP 403 T. Physical Pharmaceutics-II

Course Delivery

The course will be delivered through lectures, class room interaction, and presentations.

Scope

The course deals with the various physical and physicochemical properties, and principles involved in dosage forms/formulations. Theory and practical components of the subject help the student to get a better insight into various areas of formulation research and development, and stability studies of pharmaceutical dosage forms.

Course Objectives

Upon successful completion of the course, students will be able to:

1. Demonstrate the behaviour and interaction of drugs and excipients in the formulation development and evaluation of dosage forms.
2. Know types, properties and applications of colloids in the formulations.
3. Define reaction kinetics, reaction order, and discuss factors affecting the rate of the reaction.
4. Distinguish the principles of chemical kinetics & to use them for stability testing and determination of expiry date of formulations

5. Understand the different types of flow in order to identify and choose suitable flow characteristics for the formulation.
6. Understand the properties of particles and pharmaceutical powders, their significance in formulating pharmaceutical products, and the common methods for characterizing these properties.
7. Illustrate fundamentals and pharmaceutical applications of rheology.

Course Outcomes (COs):

After successful completion of course student will able to

CO1	**Knowledge [L1: Remembering]:** Relate the scientific concepts of dispersed system, viscosity, micromeritics, kinetics and colloids in connection with preparation, characterization and evaluation of dosage forms.
CO2	**Breadth [L2: Understanding]:** Explain the various methods for the determination of properties of dispersed systems, colloids and powders, order of reactions, reaction kinetics and flow of fluids.
CO3	**Comprehension [L2: Understanding]:** Illustrate the rate of reactions, stability of dispersed systems and colloids, degradation of drugs as well as principle and significance of accelerated stability testing,
CO4	**Application [L3: Applying]:** Apply fundamentals of kinetics, rheology, micromeritics, dispersed systems and colloids in formulation development evaluation and optimization.

Program Outcomes (POs)

The Program Outcomes of Bachelor in Pharmacy course are:

PO1. Pharmacy Knowledge: Possess knowledge and comprehension of the core and basic knowledge associated with the profession of pharmacy, including biomedical sciences; pharmaceutical sciences; behavioral, social, and administrative pharmacy sciences; and manufacturing practices.

PO2. Planning Abilities: Demonstrate effective planning abilities including time management, resource management, delegation skills and organizational skills. Develop and implement plans and organize work to meet deadlines.

PO3. Problem analysis: Utilize the principles of scientific enquiry, thinking analytically, clearly and critically, while solving problems and making decisions during daily practice. Find, analyze, evaluate and apply information systematically and shall make defensible decisions.

PO4. Modern tool usage: Learn, select, and apply appropriate methods and procedures, resources, and modern pharmacy-related computing tools with an understanding of the limitations.

PO5. Leadership skills: Understand and consider the human reaction to change, motivation issues, leadership and team-building when planning changes required for fulfillment of practice, professional and societal responsibilities. Assume participatory roles as responsible citizens or leadership roles when appropriate to facilitate improvement in health and well- being.

PO6. Professional Identity: Understand, analyze and communicate the value of their professional roles in society (e.g. health care professionals, promoters of health, educators, managers, employers, employees).

PO7. Pharmaceutical Ethics: Honour personal values and apply ethical principles in professional and social contexts. Demonstrate behavior that recognizes cultural and personal variability in values, communication and lifestyles. Use ethical frameworks; apply ethical principles while making decisions and take responsibility for the outcomes associated with the decisions.

PO8. Communication: Communicate effectively with the pharmacy community and with society at large, such as, being able to comprehend and write effective reports, make effective presentations and documentation, and give and receive clear instructions.

PO9. The Pharmacist and society: Apply reasoning informed by the contextual knowledge to assess societal, health, safety and legal issues and the consequent responsibilities relevant to the professional pharmacy practice.

PO10. Environment and sustainability: Understand the impact of the professional pharmacy solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

PO11. Life-long learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change. Self- assess and use feedback effectively from others to identify learning needs and to satisfy these needs on an ongoing basis.

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Mapping of Course Outcome (CO) with Program Outcome (PO)

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)
If there is no correlation, put "-"

	PO1 **Pharmacy Knowledge**	PO2 **Planning Abilities**	PO3 **Problem analysis**	PO4 **Modern tool usage**	PO5 **Leadership skills**	PO6 **Professional Identity**	PO7 **Pharmaceutical Ethics**	PO8 **Communication**	PO9 **The Pharmacist and society**	PO10 **Environment and sustainability**	PO11 **Life-long learning**
CO1	3	2	1	1	2	-	-	1	-	1	3
CO2	3	2	1	2	2	-	-	1	-	2	3

CO3	3	2	2	2	2	-	-	1	-	2	3
CO4	3	2	2	2	2	-	-	1	-	2	3
	3	2	1.5	1.75	2	-	-	1	-	1.75	3

CO1: Relate the scientific concepts of dispersed system, viscosity, micromeritics, kinetics and colloids in connection with preparation, characterization and evaluation of dosage forms.

	Level of mapping	Justification
PO1 **Pharmacy Knowledge**	3	CO1 is aligned with PO1 because it give the technical knowledge of application of physical pharmaceutics in design of formulation
PO2 Planning Abilities	2	CO1 is aligned with PO2 because it deals with effective planning abilities for designing and developing formulation using concept of Physical pharmaceutics
PO3 Problem analysis	1	CO1 is aligned with PO3 because it describe the need to understand the effect of formulation parameters over pharmacokinetic and pharmacodynamic processes while developing and optimizing the formulation for attaining desired quality
PO4 Modern tool usage	1	CO1 is aligned with PO4 because it demonstrate the use of modern computing tools and simulation programs like factorial design, mathematical models for evaluating mechanisms of drug release for formulation development, Mathematical model to predict stability of formulation
PO5 Leadership skills	2	CO1 is aligned with PO5 because it deals with ability to plan for seminar, to lead in group

		discussion, quiz and field work.
PO6 Professional Identity	-	
PO7 Pharmaceutical Ethics	-	
PO8 Communication	1	CO1 is aligned with PO8 because it describe the ability to comprehend and write assignments, making presentation and documentation
PO9 The Pharmacist and society	1	CO1 is aligned with PO9 because it deals with need to apply the reasoning to assess legal issues for effective formulation development as per compendia, CDSCO, GMP, GCP, WHO and ICH guidelines for accelerated stability studies
PO10 Environment and sustainability	-	-
PO11 Life-long learning	2	CO1 is aligned with PO11 because Formulation design and optimization is ever changing with regular amendments in guidelines and norms by regulatory bodies and there is need for life long learning of technological changes

CO 2 Explain the various methods for the determination of properties of dispersed systems, colloids and powders, order of reactions, reaction kinetics and flow of fluids.

	Level of mapping	Justification
PO1 **Pharmacy Knowledge**	3	CO2 is aligned with PO1 because it describe the effect of changes in physicochemical parameters like particle size, shape, viscosity, zeta potential, rate specific constant over efficacy of dosage form
PO2 Planning Abilities	2	CO2 is aligned with PO2 as it deals with basic knowledge of various methods to solve problems related to formulation development

PO3 Problem analysis	1	CO2 is aligned with PO3 because it describe the need to understand the effect of fundamental and derived properties of physical pharmaceutics over development and optimization of formulation.
PO4 Modern tool usage	1	CO2 is aligned with PO4 because it demonstrate the use of modern computing tools and simulation programs like factorial design, mathematical models for determination of physicochemical properties and parameters
PO5 Leadership skills	2	CO1 is aligned with PO5 because it deals with the ability to plan for seminar, to lead in group discussion, quiz and field work.
PO6 Professional Identity	-	-
PO7 Pharmaceutical Ethics	-	-
PO8 Communication	1	CO2 is aligned with PO8 because it describe ability to comprehend and write assignments, making presentation and documentation
PO9 The Pharmacist and society	2	CO2 is aligned with PO9 because it deals with the need to apply the reasoning to assess legal issues for effective formulation development as per compendia, CDSCO, GMP, GCP, WHO and ICH guidelines
PO10 Environment and sustainability	-	
PO11 Life-long learning	2	CO2 is aligned with PO11 because Formulation design and optimization is ever changing with regular amendments in guidelines and norms by regulatory bodies and there is need for life long learning of technological changes

CO 3 : Illustrate the rate of reactions, stability of dispersed systems and colloids, degradation of drugs as well as principle and significance of accelerated stability testing,

	Level of	Justification

	mapping	
PO1 **Pharmacy Knowledge**	3	CO3 is aligned with PO1 because it gives the knowledge of stability, degradation pathways and reaction kinetics.
PO2 Planning Abilities	2	CO3 is aligned with PO2 because it deals with effective planning abilities including time management and resource management for designing protocol of stability studies
PO3 Problem analysis	2	CO3 is aligned with PO3 because it describe analysis of factors affecting stability of pharmaceuticals
PO4 Modern tool usage	2	CO3 is aligned with PO4 because it demonstrate the use of modern computing tools and simulation programs for determination of stability of pharmaceuticals
PO5 Leadership skills	2	CO1 is aligned with PO5 because it deals with ability to plan for seminar, to lead in group discussion, quiz and field work.
PO6 Professional Identity	-	
PO7 Pharmaceutical Ethics	-	-
PO8 Communication	1	CO3 is aligned with PO8 because it describe the ability to comprehend and write assignments, making presentation and documentation
PO9 The Pharmacist and society	1	CO3 is aligned with PO9 because it deals with the need to apply the reasoning to assess legal issues for stability studies as per CDSCO, GMP, GCP, WHO and ICH guidelines
PO10 Environment and sustainability	-	-
PO11 Life-long learning	3	CO3 is aligned with PO11 because it demonstrate the need to update the knowledge of regulatory guidelines for stability of pharmaceuticals which are ever changing and varies from nation to nation.

CO 4 Apply fundamentals of kinetics, rheology, micromeritics, dispersed systems and colloids in formulation development evaluation and optimization.

	Level of mapping	Justification
PO1 **Pharmacy Knowledge**	3	CO4 is aligned with PO1 because it gives the knowledge of applications of physicochemical parameters in formulation development and optimization
PO2 Planning Abilities	2	CO4 is aligned with PO2 because it deals with effective planning abilities including time management and resource management for designing and optimizing formulation
PO3 Problem analysis	2	CO4 is aligned with PO3 because it describe analysis of factors affecting pharmaceuticals
PO4 Modern tool usage	2	CO4 is aligned with PO4 because it demonstrate the use of modern computing tools and simulation programs like factorial design, mathematical models for formulation development and evaluation
PO5 Leadership skills	2	CO4 is aligned with PO5 because it deals with the ability to plan for seminar, to lead in group discussion, quiz and field work.
PO6 Professional Identity	-	
PO7 Pharmaceutical Ethics	-	
PO8 Communication	1	CO4 is aligned with PO8 because it demonstrate ability to comprehend and write assignments, making presentation and documentation
PO9 The Pharmacist and society	1	CO4 is aligned with PO9 because it deals with the need to apply the reasoning to assess legal issues for effective formulation development as per compendia, CDSCO, GMP, GCP, WHO and ICH guidelines

PO10 Environment and sustainability	-	
PO11 Life-long learning	2	CO4 is aligned with PO11 because it demonstrate the need to update the knowledge of new computing methods, models, methodology and specifications for formulation development and evaluation

QUESTION BANK

BP 403 T. Physical Pharmaceutics-II

UNIT I: COLLOIDS

Question No.	Questions	CO Mapped	BL
1	What are colloids? Differentiate between colloids and coarse dispersion	1	1
2	Classify Colloids with example of each	1	2
3	State and explain Schulze-Hardy rule.	1	2
4	What is meant by protective colloid? Explain the concept with suitable examples.		2
5	Explain the concept of Donnan-membrane equilibrium and its role in pharmacy.	1,4	2
6	What do you understand by the following terms : i. Brownian motion ii. Gold number.	1	1
7	Explain Optical properties of colloids	1,2	2
8	Explain Kinetic properties of colloids	1,2	2
9	Explain Electrical properties of colloids	1,2	2
10	Define: Hofmeister series Coacervation	1	1
11	Elaborate on electrical properties of colloids and its role in stability of colloids.	3	3
12	Explain the concept of electrical double layer.	1,2	2
13	Illustrate role of Nernst and Zeta Potential in stability of colloids	3	2
14	Elaborate the steps in purification of colloids	1,2	2
15	Write a note on stabilization of colloids	3	2

UNIT II: RHEOLOGY

Question No.	Questions	CO Mapped	BL
1.	Define the Newtonian and non Newtonian system. Explain Dilantant system with example	1	1
2.	What is Newton's law of flow of fluids?	1	1
3.	What are applications of rheology in pharmaceuticals?	4	1
4.	Compare single point instruments with multipoint instrument for determination of viscosity	2	2
5.	What is the principle behind viscosity measurement by Ostwald viscometer?	2	1
6.	Differentiate between plastic and pseudoplastic flow?	1, 2	2
7.	Note on Viscoelasticity Falling Ball Viscometer Cup and Bob Viscometer Cone and plate Viscometer Bulges and spurs	1,2,3,4	2
8.	Define Thixotrophy and negative thixotrophy	1	1
9.	Explain thixothrophy with its applications in formulation development	2,3,4	2
10.	How thixotrophy is determined?	2	1

UNIT III: COARSE DISPERSION

Question No.	Questions	CO Mapped	BL
1	Define dispersed system.	1	1
2	Differentiate between flocculated and deflocculated suspension	1	2
3	Explain theories of emulsion	2, 4	2
4	Classify emulsion with suitable example of each.	1	2
5	Describe the stability of emulsions	3	2
6	Describe emulsion formulation by HLB method	4	2
7	What are various factors affecting stability of emulsion?	2, 3	1
8	Write a note on preservation of emulsion	1,4	1

UNIT IV: MICROMERITICS

Question	Questions	CO	BL
1	Define i. Particle diameters-Surface diameter, Volume diameter ii. Particle number	1	1
2	Explain applications of micromeritics in pharmacy	4	2
3	Enumerate the various derived properties of powder. How can these be determined?	2,4	2
4	Explain methods to determine particle size determination	2	2
5	Explain Factors affecting flow of powders	3,4	2
6	Define angle of repose, porosity and granule density	1	
7	Explain particle size determination by sedimentation method	2	2
8	Write the principle of particle size determination by coulter counter method	2	1
9	Explain sieving method for determination of particle size distribution		
10	Describe methods to determine Specific surface area	2	1
11	Write a brief note on adsorption method to determine surface area	2,3	1
12	Distinguish between True density and bulk density	2	2
13	What do you understand by derived and fundamental properties of powder?	1,2	1
14	What are adsorption isotherms? Explain Langmuir and Freundlich isotherms in detail?	1,2	1

UNIT V: DRUG STABILITY

Question	Questions	CO	BL
1	Define the terms i. Order of reaction ii. Molecularity of reaction iii. Complex order reaction	1	1
2	Derive an equation for zero order kinetics	2	2
3	Derive an equation for first order kinetics	2	2
4	Derive an equation for second order kinetics	2	2
5	describe Hydrolysis and oxidation degradation pathways of drug degradation	1	1
6	Why Half life of a zero order reaction is dependent on initial concentration of reactant while that of first order reaction is independent on initial concentration of reactant?	1	1
7	How is the half life for first order reactions calculated?	1	1
8	Distinguish between molecularity and order of reaction.	1	1
9	What is the effect of temperature on rate of reaction?	2	1
10	Describe Arrhenius equation and energy of activation	2	2
11	What are Apparent zero order reaction	1	1

12	Write a note on Accelerated stability studies	**3**	**2**
13	Assuming first order reaction justify time required for 99.9% drug decomposition is 3times the time required for completion of 90% drug decomposition.	**3**	**3**
14	How order of reaction is determines?	**2**	**1**

Total No. of Questions : 6] SEAT No. :

P2089 [Total No. of Pages : 2

[5552]-401
S.Y.B. Pharmacy
PHYSICAL PHARMACEUTICS - II
(2015 Pattern) (Semester - IV) (Theory)

Time : 3 Hours] *[Max. Marks :60*

Instructions to the candidates:

1) *All questions are compulsory.*
2) *Answers to the two sections should be written in separate books.*
3) *Neat diagrams must be drawn wherever necessary.*
4) *Figures to the right indicate full marks.*

SECTION - I

Q1) Explain the methods to determine shelf life of a pharmaceutical formulation. Write a note on accelerated stability studies. [10] CO2

OR

What do you understand by Newton's law of flow? Describe various types of flow: CO1

[12]

Q2) Attempt any four of the following :

a) Illustrate applications of rheology in suspension. CO4
b) Explain yield value in plastic flow? CO1
c) What is Langmuir adsorption isotherm? CO4
d) Explain surface tension. How can you measure it? CO2
e) Explain the HLB scale. CO1
f) Justify : first order reaction is independent on initial concentration of reactant. CO3
g) What do you understand by reversible reactions? CO3

[8]

Q3) Write notes on any two of the following:

a) Explain the concept of thixotropy and state its application in pharmacy. CO4
b) Surface active agents. CO1
c) Kraft and cloud point. CO1
d) Order and molecularity. CO3

P.T.O.

SECTION - II

Q4) Define colloids. What are its different types? Compare the properties of different types of colloids. [10] CO1, CO2

OR

Enumerate the various derived properties of powder. How can these be determined? CO2

Q5) Attempt any four of the following : [12]

a) Describe : Brownian motion and Gold number. Give its importance in the field of pharmacy. CO1, CO3

b) Explain coulter counter method in detail. CO2

c) Justify factors affecting flow of powders. CO1

d) Briefly describe DLVO theory. CO4

e) Explain method to determine particle size based on sedimentation method. CO2

f) What are protective colloids? What are its applications in pharmacy? CO4

g) Explain assessment of flow properties of powders. CO1

Q6) Write notes on any two of the following: [8]

a) Importance of particle size and size distribution. CO1

b) Colloidal system with reference to its stability. CO1

c) Method for determining surface area. CO2

d) Electrical double layer. CO4

■ ■ ■

Total No. of Questions—6] [Total No. of Printed Pages—3

Seat No.	

[5245]-4001

S.Y. B. Pharmacy (Fourth Semester) EXAMINATION, 2017

PHYSICAL PHARMACEUTICS—II

(2015 PATTERN)

Time : Three Hours **Maximum Marks : 60**

N.B. :— (*i*) *All* questions are compulsory.

(*ii*) Answers to the two sections should be written in separate answer books.

(*iii*) Neat diagrams must be drawn wherever necessary.

(*iv*) Figures to the right indicate full marks.

SECTION-I

1. Explain the difference between surface tension and interfacial tension. CO1
Describe the various methods used to measure surface tension and interfacial tension. CO2 [10]

Or

Explain the various methods to determine order of reaction. CO2

2. Attempt any *four* of the following : [12]

(*a*) What is the principle behind Ostwald viscometer ? CO2

(*b*) What is the difference between plastic and pseudoplastic flow ? CO1

(*c*) What is critical micelle concentration ? State its importance. CO4

(*d*) Explain adsorption isotherm. CO4

(*e*) What is plug flow and how can it be avoided ? CO1

(*f*) Describe mechanism of hydrolysis as degradation pathway with examples. CO4

(*g*) Discuss the effect of temperature on rate of a reaction. CO1

P.T.O.

3. Write notes on any *two* of the following : [8]

(*a*) Viscoelasticity CO1

(*b*) Bulges and spurs CO1

(*c*) Spreading coefficient CO1

(*d*) Accelerated stability studies. CO3

SECTION-II

4. Define and give importance of Micromeritics in pharmacy. CO1

Discuss the effect of the following factors on the flow properties of powders : CO1 [10]

(*a*) Particle shape

(*b*) Porosity and density

(*c*) Moisture, and

(*d*) Glidants.

Enlist methods to improve flow properties of powders. CO1

Or

Discuss the salient features of lyophobic and lyophillic colloids. CO1 Describe the various factors which influence their stability.

5. Attempt any *four* of the following : [12]

(*a*) State and explain Schulze-Hardy rule. CO4

(*b*) What is meant by protective colloid ? Explain the concept with suitable examples. CO1

(*c*) Define Angle of repose, Porosity and Granule density. CO1

(*d*) Describe the process of Micellar solubilization. Give its applications in pharmacy. CO1, CO4

(e) Draw a neat and labelled diagram of Coulter counter apparatus. CO2
In a Coulter counter, electrolyte solution is added in order to measure size distribution. Why ?

(f) Explain the concept of Donnan-membrane equilibrium. CO1.

(g) What do you understand by the following terms : CO1

(i) Brownian motion

(ii) Gold number.

6. Write notes on any *two* of the following : [8]

(a) Optical properties of colloids CO2

(b) Specific surface and its determination CO4

(c) Explain :

(i) Hofmeister series

(ii) Coacervation. CO1

(d) Derived properties of powders.

Total No. of Questions—6] [Total No. of Printed Pages—2

Seat No.	

[5345]-4001

S.Y. B.Pharmacy (IV Sem.) EXAMINATION, 2018
PHYSICAL PHARMACEUTICS—II
(2015 PATTERN)

Time : Three Hours Maximum Marks : 60

N.B. :— (*i*) *All* questions are compulsory.
(*ii*) Answers to the two sections should be written in separate answer-books.
(*iii*) Neat diagrams must be drawn wherever necessary.
(*iv*) Figures to the right indicate full marks.

SECTION - I

Q.1 Explain in details surface active agents and add a note on HLB scale. CO1 10 marks

OR

Explain the methods to determine shelf life of a pharmaceutical formulation. CO2
Write a note on accelerated stability studies. CO3

Q.2 Attempt any four of the following : 12 marks

a. Explain the mechanism for oxidation as degradation pathway with examples. CO1
b. Describe collision theory of chemical reaction. CO4
c. What do you understand by viscoelasticity? CO1
d. Explain why interfacial tension cannot be measured by capillary rise method. CO1
e. Sate the importance of critical micelle concentration. CO1
f. Illustrate the applications of thixotrophy in pharmaceutical formulations. CO4
g. Explain the principle behind Ostwald viscometer. CO1

Q.3. Write notes on any two of the following : 8 marks

a. Langmuir adsorption isotherm CO4
b. DuNouy Ring method CO2
c. Reversible reactions CO3
d. Dilatant flow CO1

P.T.O.

SECTION - II

Q.4 Define Micromeritics. Enlist different methods used for the determination of particle size and discuss in detail the Andreason Pipette method. 10 marks CO1, CO2

OR

Differentiate between lyophobic and lyophillic colloids. Discuss the stability of colloids including: a) Schulze-Hardy rule b) Hofmeister series c) Co-acervation CO1, CO4

Q.5 Attempt any four of the following : 12 marks

a. Explain: Protective colloid. CO2

b. What is meant by "equivalent spherical diameter"? Explain its importance in representing particle size. CO1

c. Give Pharmaceutical applications of colloids. CO4

d. Describe the process of Micellar solubilization. Give its applications in pharmacy. CO4

e. Draw a neat and labelled diagram of Coulter counter apparatus. In a Coulter counter, electrolyte solution is added in order to measure size distribution. Why? CO2

f. Explain the concept of Donnan-membrane equilibrium. CO4

g. With suitable examples explain factors affecting flow of powders. CO1

Q.6. Write notes on any two of the following : 8 marks

a. Optical properties of colloids CO1

b. Specific surface and its determination CO1

c. Brownian motion and Gold number CO1

d. Derived properties of powders CO1