RR COLLEGE OF PHARMACY

Chikkabanavara, Bengaluru-560090

INTERNAL QUALITY ASSURANCE CELL (IQAC)

CHECKLIST FOR COURSE FILES

Academic Year 2022-23 **Course: BPHARM , 1ST YEAR / 1st semester**

Subject: Pharm. Analysis **Subject Code: BP102T**

Sl. No	Contents		Present	Review remarks
1.	Student List		Yes / No	yes
2.	College Calendar of events		Yes / No	yes
3.	University calender of events		Yes / No	yes
4.	Time table			
	• Class Timetable		Yes / No	yes
	• Individual Timetable		Yes / No	yes
5.	Syllabus copy		Yes / No	yes
6.	Lesson Plan		Yes / No	yes
7.	Introduction of the subject			
	• Significance of the Subject	In One Sheet	Yes / No	yes
	• Programme Outcomes		Yes / No	yes
	• Programme Specific Outcomes		Yes / No	~~yes~~ NA
	• Course Outcomes		Yes / No	yes
8.	Proctor list		Yes / No	yes
9.	Question Bank (Module wise)		Yes / No	yes
10.	Question Paper & Schemes			yes
	1st IA Test		Yes / No	yes
	2nd IA Test		Yes / No	yes
	3rd IA Test		Yes / No	- NA
11.	Old Question Paper		Yes / No	yes
12.	Course Material (Class PowerPoint Presentations/Handouts/Worksheets)		Yes / No	yes
13.	Assignments, Quizzes, Class Tasks		Yes / No	yes
14.	IA marks			
	• 1st Test	In One Sheet	Yes / No	yes
	• 2nd Test		Yes / No	yes
	• 3rd Test		Yes / No	- NA
	• Final Marks		Yes / No	yes
15	• Attendance sheet		Yes / No	yes
16	• Students feedback		Yes / No	yes
17	• Result analysis		Yes / No	yes

Note: Make any corrections if required and get approved by QAC Office

S.D. VACHALA
Name of the Faculty

21/7/23
Signature with Date

Name of the reviewer

Signature with Date

R R COLLEGE OF PHARMACY, BANGALORE

B PHARM STUDENT LIST 2022-23

I SEM B PHARM

SL NO	College ID	NAME OF THE STUDENT
1.	22RP061	AARIF MUSHTAQ KHAN
2.	22RP117	ABHILASH AMRUTHESHWAR
3.	22RP040	ABIR BASU MAJUMDER
4.	22RP087	AISWARYA LAKSHMANAN
5.	22RP069	AJADH FAIZ P
6.	22RP024	AJAY K JOSE
7.	22RP016	AJU SHINTO K
8.	22RP107	ALFIYAMOL S
9.	22RP022	ANEEK SAHA
10.	22RP088	ANUDIPA DATTA
11.	22RP012	ANUSKA ROY
12.	22RP018	ARJUN K P
13.	22RP078	ASHU KUMARI R
14.	22RP049	BABY LALRUATPUII
15.	22RP052	BANASHREE RAY
16.	22RP112	BHOOMIKA MUTHURAJ
17.	22RP113	BINDU RATHOD S
18.	22RP046	BISHAL MUHURI
19.	22RP057	BISHOP BASAK

20.	22RP039	CHAITHRA Y S
21.	22RP089	CHANDRATAP D E
22.	22RP054	DAMESHA NONGSIEJ
23.	22RP017	DEEPESH CHAUDHARY
24.	22RP111	DEEPTI N
25.	22RP042	DHANISH T K
26.	22RP056	DIYA KRISH
27.	22RP014	FEBA ANCY GEORGE
28.	22RP106	HEMANTH S L
29.	22RP118	H NANDHINI
30.	22RP060	JYOTHI B
31.	22RP010	KEERTHANA KRISHNAN
32.	22RP068	KESHAV RANJAN
33.	22RP026	KRISHNENDU SINGHA
34.	22RP059	KRITIKA BASU
35.	22RP067	KUMARI KUSUM LATA
36.	22RP108	LATHA K H
37.	22RP021	LIZA SINHA
38.	22RP058	MAUMITA CHAKMA
39.	22RP062	MOHAMMAD MOHASIN
40.	22RP081	MOHAMMED MEHZARUDDIN
41.	22RP043	MOUMITA NATH
42.	22RP035	NANDANA SANEESH
43.	22RP110	NANDINI H
44.	22RP030	NANGKHRAWKUPAR NONGBSAP

45.	22RP085	NDIBE ANTHONY CHINEMEREM
46.	22RP066	NINGBORLANG NONGBRI
47.	22RP045	NIRANJAN KUMAR SAH
48.	22RP023	OZA TUSHAR SHYAMSUNDAR
49.	22RP011	POULAMI MONDAL
50.	22RP072	PUJA KUMARI
51.	22RP034	RAHULDEV BARMAN
52.	22RP004	RAJ SHEKHAR AZAD
53.	22RP055	RAJSHEKHAR DAS
54.	22RP074	RANIT SARKAR
55.	22RP109	RANJITHA R
56.	22RP038	RITIK KUMAR
57.	22RP080	RIYA K K
58.	22RP036	RIYA PURUSHU
59.	22RP079	RIYA SUSAN PHILIP
60.	22RP065	ROHAN RAJ
61.	22RP008	SAMIP POUDEL
62.	22RP050	SAMRAT KUMAR NATH
63.	22RP070	SERAM LINTHOINGANBI CHANU
64.	22RP028	SHARATH GOWDA M
65.	22RP083	SHEIKH MOHAMMAD ABBAN
66.	22RP105	SHIVA S
67.	22RP115	SHREYA B S
68.	22RP082	SINGH RASHMI DIGVIJAY
69.	22RP037	SOUMEN PATRA

70.	22RP044	SOUMYADEEP DATTA
71.	22RP077	SUBHAJYOTI SARKAR
72.	22RP013	SUBHODEEP GHOSH
73.	22RP033	SUNANDA SEN
74.	22RP076	SUPRIYA MONDAL
75.	22RP084	TANUJA AJIT THOMBARE
76.	22RP063	UZAIR REYAZ
77.	22RP075	VEENA M
78.	22RP051	VIKASH KUMAR
79.	22RP025	VISMAYA K P

Calender of events

R.R. COLLEGE OF PHARMACY
IQAC

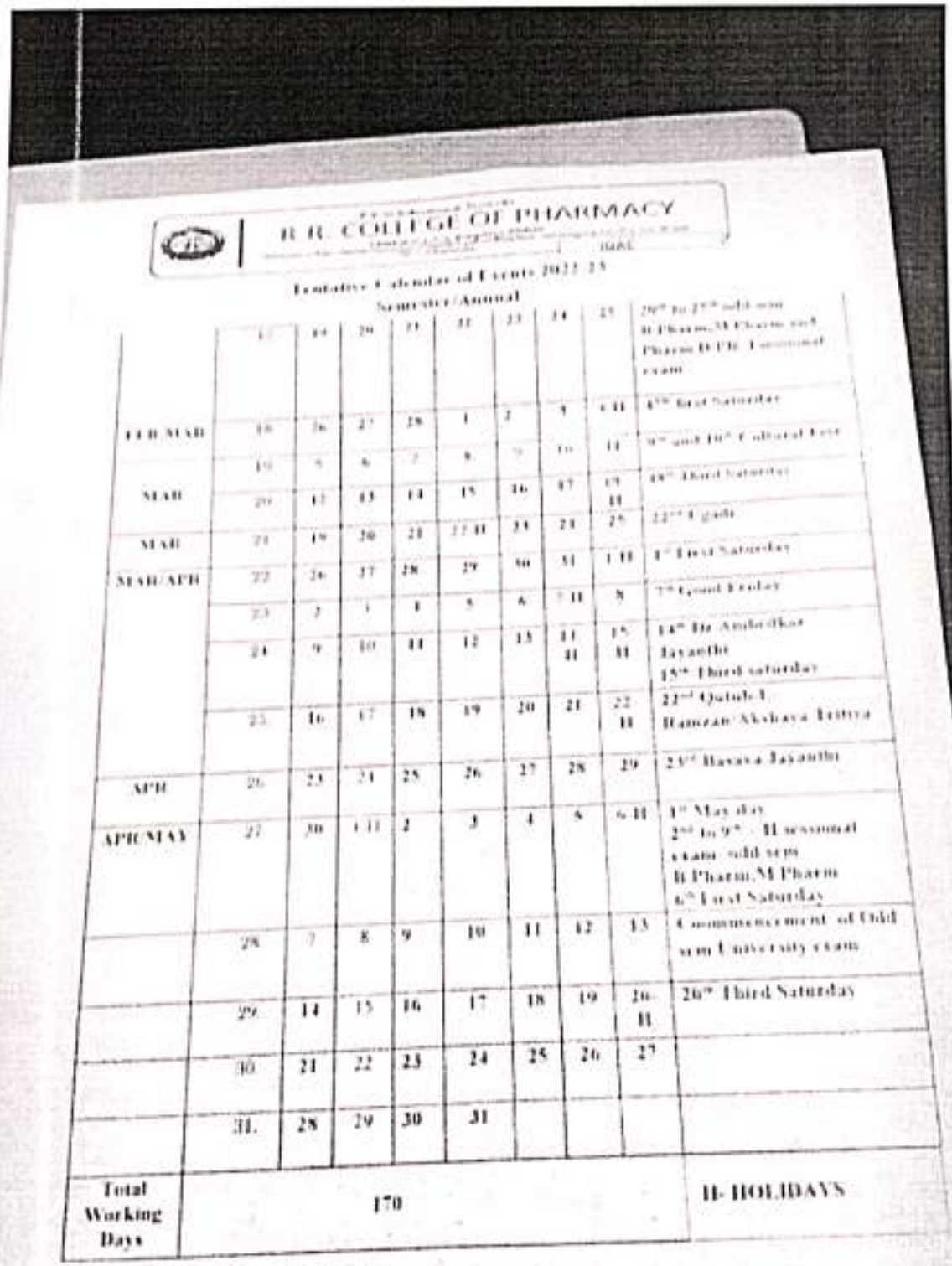
Tentative Calendar of Events 2022-23
Semester/Annual

MONTH	No of WEEKS	DAY & DATE							DETAILS OF EVENTS
		Sun	Mon	Tue	Wed	Thu	Fri	Sat	
NOV	1			1-11	2	3	4	5-11	1st Karnataka rajosthava 2nd Commencement of classes for 1st sem B.pharm and 1st Pharm.D 5th first Saturday
	2	6	7	8	9	10	11	12	
	3	13	14	15	16	17	18	19-11	15th Commencement of even and annual university examination 19th 3rd Saturday
	4	20	21	22	23	24	25	26	
NOV/DEC	5.	27	28	29	30	1	2	3-11	3rd first Saturday
	6.	4	5	6	7	8	9	10	
	7.	11	12	13	14	15	16	17-11	17th third Saturday
	8.	18	19	20	21	22	23	24	
	9.	25	26	27	28	29	30	31	25th Christmas
JAN-2023	10.	1	2	3	4	5	6	7-11	2nd Commencement of classes for odd sem Bpharm,Mpharm and Pharm D/PB 7th first Saturday
	11.	8	9	10	11	12	13	14-11	14thsankarathi
	12.	15	16	17	18	19	20	21-11	21st third saturday
	13.	22	23	24	25	26-11	27	28	26th Republic Day 23rd Jan to 6th Feb Orientation programme
JAN/FEB	14.	29	30	31	1	2	3	4-11	4TH First Saturday
FEB	15.	5	6	7	8	9	10	11	
	16.	12	13	14	15	16	17	18-11	18th first Saturday and Maha shivaratri

RR COLLEGE OF PHARMACY

Chikkabanavara, Bengaluru-560090

INTERNAL QUALITY ASSURANCE CELL (IQAC)



R.R. COLLEGE OF PHARMACY

IQAC

Tentative Calendar of Events 2022-23

Semester/Annual

	17	19	20	21	22	23	24	25	20th to 27th odd sem B.Pharm,M.Pharm and Pharm D.PR. Sessional exam
FEB/MAR	18	26	27	28	1	2	3	4 H	4th first Saturday
	19	5	6	7	8	9	10	11	9th and 10th Cultural Fest
MAR	20	12	13	14	15	16	17	18 H	18th Third Saturday
MAR	21	19	20	21	22 H	23	24	25	22nd Ugadi
MAR/APR	22	26	27	28	29	30	31	1 H	1st First Saturday
	23	2	3	4	5	6	7 H	8	7th Good Friday
	24	9	10	11	12	13	14 H	15 H	14th Dr Ambedkar Jayanthi 15th Third saturday
	25	16	17	18	19	20	21	22 H	22nd Qutub-I-Ramzan/Akshaya Tritiya
APR	26	23	24	25	26	27	28	29	23rd Basava Jayanthi
APR/MAY	27	30	1 H	2	3	4	5	6 H	1st May day 2nd to 9th - II sessional exam odd sem B.Pharm,M.Pharm 6th First Saturday
	28	7	8	9	10	11	12	13	Commencement of Odd sem University exam
	29	14	15	16	17	18	19	20 H	20th Third Saturday
	30	21	22	23	24	25	26	27	
	31	28	29	30	31				
Total Working Days	170								H- HOLIDAYS

RGUHS University Calendar of Events- 2022-23

ರಾಜೀವ್ ಗಾಂಧಿ ಆರೋಗ್ಯ ವಿಜ್ಞಾನಗಳ ವಿಶ್ವವಿದ್ಯಾಲಯ, ಕರ್ನಾಟಕ,

ನಂ. ಟಿ ಬ್ಲಾಕ್, ಜಯನಗರ, ಬೆಂಗಳೂರು - 560 041

Rajiv Gandhi University of Health Sciences, Karnataka

4th 'T' Block, Jayanagar, Bangalore - 560 041

Ref No: RGUHS/AC2-ADM/COE/2022-2023 Date: 05.12.2022

REVISED NOTIFICATION

Ref: 1. RGUHS/AC2-ADM/COE/2022-2023 dated: 20.07.2022, 26.09.2022 & 28.11.2022
2. PCI Letter No.11-56/2022-PCI/13107 dated: 29.08.2022
3. GOK Letter No: HFW 30 PTD 2022 dated: 28.10.2022
4. Letter No. DCD/GCP/ADM-100/2022-23 dated: 03.12.2022 received from the Principal, Government College of Pharmacy, Bangalore
5. KEA Letter No. ED/KEA/GEN/SLP/2022 dated: 03.12.2022

Calendar of Events for admission to 1st Semester B.Pharm Course for the academic year 2022-23 is hereby notified as follows:

Sl. No.	DESCRIPTION OF EVENTS	SCHEDULE
1.	Last date of admission and a) Online uploading of admission Statements on RGUHS website www.rguhs.ac.in, along with the latest students clear colour photos. b) email the list of students admitted to registrar@rguhs.ac.in, **sc@rguhs.ac.in and deputyregistrarpharmacy@gmail.com**	**31.12.2022**
2.	Commencement of academic session	**01.12.2022**
3.	Online payment of admission fees payable to the university in **full** (partial payments is NOT allowed)	**03.01.2023**
4.	Getting admission register certified by the registrar or his designated Official of the university and producing the proof of having remitted the prescribed fee in full to the university (attested photocopies of the same to be left with university).	**On or before 06.01.2023**
5.	Last date for submission of Online entered printed admission statement with originals of the required documents including **eligibility certificate** (wherever applicable)	**On or before 06.01.2023**
6.	College wise verification of documents for Admission & approval	**16th Jan 2023 to 31st Jan 2023**
7.	Tentative last date for hosting Admission approval statement in the university website www.rguhs.ac.in	**10.02.2023**
8.	Tentative last date for posting the hard copy of Admission approval statement to the Principal of the concerned institute.	**15.02.2023**
9.	Tentative date of exam	**Apr / May 2023**

PTO

RR COLLEGE OF PHARMACY

Chikkabanavara, Bengaluru-560090

INTERNAL QUALITY ASSURANCE CELL (IQAC)

Ref No: RGUHS/AC2/ADM/COL/2022-2023 Date: 01.12.2022

Note:

1. The admitting college should have been notified as affiliated to the University with permission to admit students for the concerned course for the year **2022-23** before the last date of admission.
2. Request for correction of name in the online admission statement will not be entertained. Entry of wrong data in the online admission statement by itself does not vest the right of admission approval. Number and the name of students uploaded in the online admission statement and email must match with each other and shall not exceed the number of sanctioned intake. Any excess admissions beyond the approved intake will be rejected.
3. If any of the above dates in Calendar of events happens to be holiday, the following Working day shall be taken into consideration **except for payment of fee and fine which is available through online payment.**
4. Admission Register shall contain the date, amount and number of the receipt corresponding to the name of the student with the signature of the student. Admission of those Students who have not paid the admission fee in time will not be approved.
5. If any student's name's could not be uploaded in the online portal on or before last date due to any technical or whatever reasons the same can be intimated till midnight (11.59 PM) on the last date to RGUHS by sending email to Registrar, Hon'ble Vice Chancellor. The name of students in bold letters mentioning the reason for consideration of their admissions, **any request for admission shall not be considered after the last date.**
6. Date of verification of documents for admission approval will be intimated to the college by the university. The Principal and the concerned officials of the college must be present on the specified date and time without fail with any other document that they may wish to submit. University will go ahead with verification of documents pertaining to their college even in their absence.
7. No Correspondence regarding deficient documents except during verification. Principal is expected to keep track of the deficiencies and fulfill them well before the last date prescribed without any prompting.
8. Principal of the institutions should download admission approval of students and display the same in the college notice board and website and discharge all disapproved students immediately. The University shall not entertain any further correspondence from anybody regarding disapproved students.
9. Exact dates of commencement of Theory & Practical examinations and date of declaration of results will be notified by the Registrar (Evaluation) separately.
10. **Submission of Eligibility Certificates is mandatory of all the candidates i.e Foreign / NRI / Non Karnataka admitted for the academic year 2022-23 along with their other original documents.**

REGISTRAR

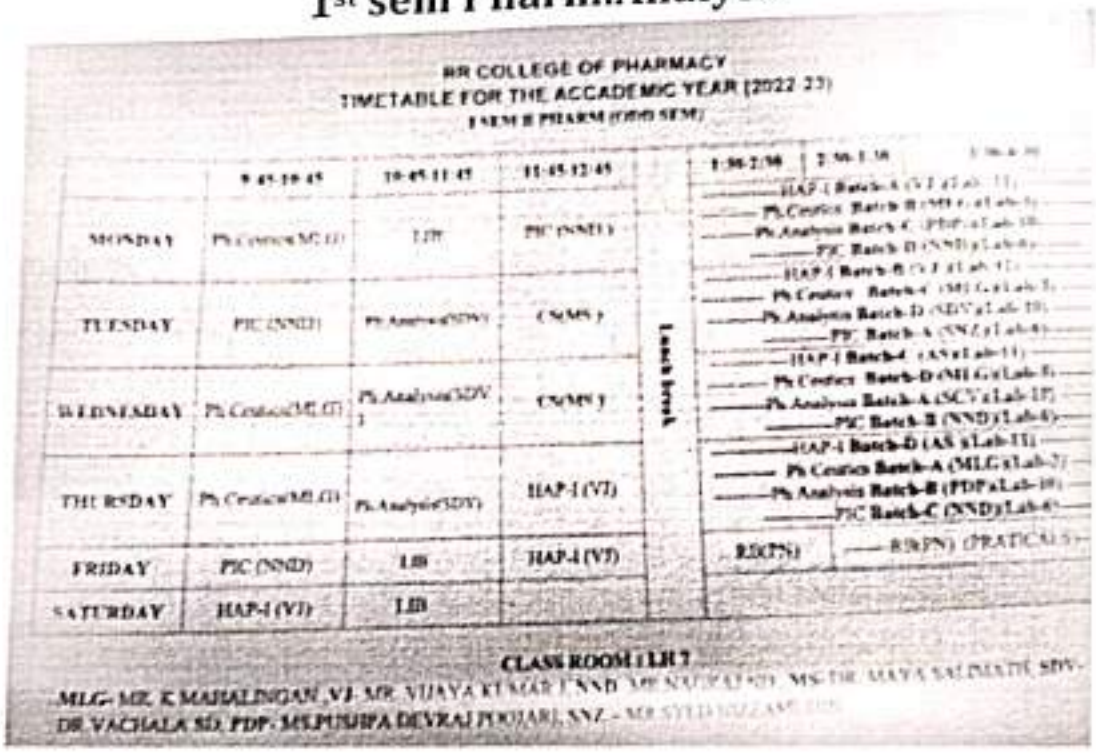
To,

ALL CONCERNED THROUGH www.rguhs.ac.in .

1. Secretary to Governor, Raj Bhavan, Bangalore 560 001.
2. Secretary to Medical Education, Dept, of H & FW, Govt, of Karnataka, Vikasa Soudha, Bangalore 560 001.
3. Director of Medical Education, Ananda Rao Circle, Bangalore 560 009.
4. The Principal of all Pharmacy Colleges affiliated to RGUHS, Bangalore
5. All officers of the University / All Sections in the University / AR's Regional Centers.
6. PA to Vice - Chancellor , Registrar, Registrar (Eva) , and Finance Officer, RGUHS, Bangalura
7. The System Analyst, RGUHS to host on the official Website.

Class time table

1st sem Pharm.Analysis



RR COLLEGE OF PHARMACY

TIMETABLE FOR THE ACCADEMIC YEAR (2022-23)

I SEM II PHARM (ODD SEM)

	9.45-10.45	10.45-11.45	11.45-12.45		1.30-2.30	2.30-3.30	3.30-4.30
MONDAY	Ph.Ceutics(MLG)	LIB	PIC (NND)	Lunch break	HAP-I Batch-A (VJ) (Lab-11) Ph.Ceutics Batch-B (MLG) (Lab-3) Ph.Analysis Batch-C (PDP) (Lab-10) PIC Batch-D (NND) (Lab-6)		
TUESDAY	PIC (NND)	Ph.Analysis(SDV)	CS(MS)		HAP-I Batch-B (VJ) (Lab-11) Ph.Ceutics Batch-C (MLG) (Lab-3) Ph.Analysis Batch-D (SDV) (Lab-10) PIC Batch-A (SNZ) (Lab-6)		
WEDNESDAY	Ph.Ceutics(MLG)	Ph.Analysis(SDV)	CS(MS)		HAP-I Batch-C (AS) (Lab-11) Ph.Ceutics Batch-D (MLG) (Lab-3) Ph.Analysis Batch-A (SCV) (Lab-10) PIC Batch-B (NND) (Lab-6)		
THURSDAY	Ph.Ceutics(MLG)	Ph.Analysis(SDV)	HAP-I (VJ)		HAP-I Batch-D (AS) (Lab-11) Ph.Ceutics Batch-A (MLG) (Lab-3) Ph.Analysis Batch-B (PDP) (Lab-10) PIC Batch-C (NND) (Lab-6)		
FRIDAY	PIC (NND)	LIB	HAP-I (VJ)		RI(PN)	RI(PN) (PRATICALS)	
SATURDAY	HAP-I (VJ)	LIB					

CLASS ROOM : LH 7

MLG- MR. K MAHALINGAN, VJ- MR. VIJAYA KUMAR, NND- MR. NAGRAJ [illegible], MS- DR. MAYA SALIMATH, SDV- DR. VACHALA SD, PDP- MS.PUSHPA DEVRAJ POOJARI, SNZ - MR. SYED NIZZAM [illegible]

Individual time table

1st sem Pharm.Analysis

	9.30-10.30	10.30-11.30	11.30-12.30	LUNCH BREAK	1.30-2.30	2.30-3.30	3.30-4.30
MONDAY					Pharm analysis practicals-batch-B		
TUESDAY		Pharm analysis			Pharm analysis practicals-batch-A		
WEDNES DAY		Pharm analysis			Pharm analysis practicals-batch-D		
THURS DAY		Pharm analysis			Pharm analysis practicals-batch-C		
FRIDAY							
SATURDAY							

Syllabus copy

BP102T Pharmaceutical Analysis I – Theory

UNIT-I

(a) Pharmaceutical analysis- Definition and scope

i) Different techniques of analysis
ii) Methods of expressing concentration
iii) Primary and secondary standards.
iv) Preparation and standardization of various molar and normal solutions- Oxalic acid, sodium hydroxide, hydrochloric acid, sodium thiosulphate, sulphuric acid, potassium permanganate and ceric ammonium sulphate

(b)**Errors**

Sources of errors, types of errors, methods of minimizing errors, accuracy, precision and significant figures

(c)Pharmacopoeia, Sources of impurities in medicinal agents,limit tests.

UNIT-II

Acid base titration

Theories of acid-base indicators, classification of acid-base titrations and theory involved in titrations of strong, weak, and very weak acids and bases, neutralization curves

Non aqueous titration

Solvents, acidimetry and alkalimetry titration and estimation of Sodium benzoate and Ephedrine HCl

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UNIT-III

Precipitation titrations

Mohr's method, Volhard's, Modified Volhard's, Fajans method, estimation of sodium chloride.

Complexometric titration

Classification, metal ion indicators, masking and demasking reagents, estimation of Magnesium sulphate, and calcium gluconate.

Gravimetry

Principle and steps involved in the gravimetric analysis. Purity of the precipitate: co-precipitation and post precipitation, Estimation of barium sulphate.

Diazotisation titration.

Basic Principles, methods and application of diazotisation titration.

UNIT-IV

Redox titrations

(a) Concepts of oxidation and reduction
(b) Types of redox titrations (Principles and applications)
Cerimetry, Iodimetry, Iodometry, Bromatometry, Dichrometry, Titration with potassium iodate

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UNIT-V

Electrochemical methods of analysis

Conductometry

Introduction, Conductivity cell, Conductometric titrations, applications.

Potentiometry

Electrochemical cell, construction and working of reference (Standard hydrogen, silver chloride electrode and calomel electrode) and indicator electrodes (metal electrodes and glass electrode), methods to determine endpoint of potentiometric titration and applications.

Polarography

Principle, Ilkovic equation, construction and working of dropping mercury electrode and rotating platinum electrode, applications

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Pharmaceutical Analysis I Theory Recommended Books: (Latest Editions)

1. A.H. Beckett & J.B. Stenlake's, Practical Pharmaceutical Chemistry Vol I & II, Stahlone
   Press of University of London
2. A.I. Vogel, Text Book of Quantitative Inorganic analysis
3. P. Gundu Rao, Inorganic Pharmaceutical Chemistry
4. Bentley and Driver's Textbook of Pharmaceutical Chemistry
5. John H. Kennedy, Analytical chemistry principles
6. Indian Pharmacopoeia.

Practical Syllabus

Pharmaceutical Analysis I Practical: Lab Manual, Journal, PDF

Limit Test

(1) Chloride
(2) Sulphate
(3) Iron
(4) Arsenic

Preparation and standardization

(1) Sodium hydroxide
(2) Sulphuric acid
(3) Sodium thiosulfate
(4) Potassium permanganate
(5) Ceric ammonium sulphate

Assay along with Standardization of Titrant

(1) Ammonium chloride by acid-base titration
(2) Ferrous sulphate by Cerimetry
(3) Copper sulphate by Iodometry
(4) Calcium gluconate by complexometry
(5) Hydrogen peroxide by Permanganometry

(6) Sodium benzoate by non-aqueous titration
(7) Sodium Chloride by precipitation titration

Determination of Normality by electro-analytical methods

(1) Conductometric titration of strong acid against a strong base
(2) Conductometric titration of strong acid and weak acid against a strong base
(3) Potentiometric titration of strong acid against a strong base

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Recommended Books: (Latest Editions)

1. A.H. Beckett & J.B. Stenlake's, Practical Pharmaceutical Chemistry Vol I & II, Stahlone Press of University of London
2. A.I. Vogel, Text Book of Quantitative Inorganic analysis
3. P. Gundu Rao, Inorganic Pharmaceutical Chemistry
4. Bentley and Driver's Textbook of Pharmaceutical Chemistry
5. John H. Kennedy, Analytical chemistry principles
6. Indian Pharmacopoeia.

Lesson Plan

Significance of the Subject:
1. Understand the qualitative and quantitative methods of analysis.
2. Study of purity and estimation of compounds.
3. Study of errors and their minimization.

College Name: R.R College of Pharmacy	Academic year :2022-23
Programme : B.Pharmacy	Semester or Year : I semester
Subject Name : Pharmaceutical Analysis	Subject Code : BP102T
Total contact hours : 45	IA Marks: 2 5 marks
Faculty Name : S.D. Kachale.	Reviewed by : Signature :

Course Objective:
Upon completion of the course the students shall be able to 1. Understand the principles of volumetric and electro chemical analysis.
2. Carryout various volumetric and electrochemical titrations.
3. Develop the analytical skills.
Course Outcomes:
CO1: Explain the Methods of expressing concentration, Preparation and standardization of Primary and secondary standards, Errors, Accuracy, precision and impurities.
CO2: Explain the principles and classifications of Acid-Base titration and Non Aqueous titration
CO3: Explain the principle, instrumentation and applications of Precipitation titration, Complexometric titrations, Gravimetry and Diazotization titration.
CO4: Explain the principle and concept of Redox titrations and their types.
CO5: Explain the principle and concept of conductometry, potentiometry, and polorographic titrations.

R.R COLLEGE OF PHARMACY, BANGALORE

Course out Comes and Programme outcomes

Name of Course: Pharmaceutical Analysis

Faculty in Charge: S. D. Vachala.

Section: Theory

Total Hours:- 45

Year: B.pharm 1st Sem (2022-2023)

Class No	Module No & Hours as per University	Topic to be covered	Teaching aids (CT/ Online/PPT)	Skill Development *Refer Below)	Date		Blooms level (Refer Below)	CO's	Remarks
					Planned	Completed			
1.	Module1 And 10 hours	**Introduction** (Definition and Scope)	CT	PS	13/12/22	13/12	L1, L2	CO 1	—
2.		Different techniques of analysis	CT	PS	16/12/22	16/12	L1, L2	CO 1	✓
3.		Methods of expressing concentration	CT	PS	20/12/22	20/12	L1, L2	CO 1	—
4.		Primary and secondary standards.	CT	PS	23/12/22	23/12	L1, L2	CO 1	—
5.		Preparation and standardization of various molar and normal solutions- Oxalic acid, sodium hydroxide.	CT	PS	24/12/22	24/12	L1, L2, L3	CO 1	—
6.		hydrochloric acid, sodium thiosulphate, sulphuric acid	CT	PS	24/12/22	24/12	L1, L2, L3	CO 1	—
7.		Preparation and standardization of potassium permanganate and ceric ammonium	CT	PS	27/12/22	28/12	L1, L2, L3	CO 1	—

		sulphate							
8.		**Errors:** Sources of errors, types of errors	CT	PS	30/12/22	30/12	L1, L2	CO 1	—
9.		methods of minimizing errors	CT	PS	31/12/22	31/12	L1, L2	CO 1	—
10.		Accuracy, precision and significant figures	CT	PS	3/1/23	3/1	L1, L2	CO 1	—
11.	Module2	**Acid base titration:** Theories of acid base indicators	CT	PS	6/1/23	6/1	L1, L2	CO 2	—
12.	And	Classification of acid base titrations	CT	PS	10/1/23	10/1	L1, L2	CO 2	—
13.	10 hours	Classification of acid base titrations	CT	PS	13/1/23	13/1	L1, L2	CO 2	—
14.		Theory involved in titrations of strong, weak, and very weak acids and bases, neutralization curves	CT	PS	14/1/23	14/1	L1, L2	CO 2	—
15.		Theory involved in titrations of strong, weak, and very weak acids and bases, neutralization curves	CT	PS	14/1/23	14/1	L1, L2 and L3	CO 2	—
16.		Theory involved in titrations of strong, weak, and very weak acids and bases, neutralization curves	CT	PS	16/1/23	16/1	L1, L2 and L3	CO 2	—
17.		Theory involved in titrations of strong, weak, and very weak acids and bases, neutralization curves	CT	PS	20/1/23	20/1	L1, L2 and L3	CO 2	—
18.		**Non aqueous titration:** Solvents used in NAT	CT	PS	24/1/23	24/1	L1, L2 and L3	CO 2	—

19.		Acidimetry and alkalimetry titration	CT	PS	27/1/23	27/1	L1, L2 and L3	CO 2	—
20.		Estimation of Sodium benzoate and Ephedrine HCl	CT	PS	28/1/23	28/1	L1, L2 and L3	CO 2	—
21.	Module 3 And 10 hours	**Precipitation titrations**: Mohr's method, Volhard's method	CT	PS	28/1/23	28/1	L1, L2 and L3	CO 3	—
22.		Modified Volhard's method	CT	PS	31/1/23	31/1	L1, L2 and L3	CO 3	—
23.		Fajans method	CT	PS	1/2/23	01/2	L1, L2 and L3	CO 3	—
24.		Estimation of sodium chloride.	CT	PS	3/2/23	3/2	L1, L2 and L3	CO 3	—
25.		**Complexometric titration:** Classification	CT	PS	6/2/23	6/2	L1, L2 and L3	CO 3	—
26.		Complexometric titration: Classification	CT	PS	10/2/23	10/2	L1, L2 and L3	CO 3	—
27.		Metal ion indicators	CT	PS	10/2/23	10/2	L1, L2 and L3	CO 3	—
28.		Masking and demasking reagents	CT	PS	11/2/23	11/2	L1, L2 and L3	CO 3	—

29.		Estimation of Magnesium sulphate, and calcium gluconate.	CT	PS	11/2/23	11/2	L1, L2 and L3	CO 3	—
30.		**Gravimetry:** Principle and steps involved in gravimetric analysis. Purity of the precipitate: co-precipitation and post precipitation, Estimation of barium sulphate.	CT	PS	13/2/23	13/2	L1, L2 and L3	CO 3	—
31.		Principles, procedure and applications of diazotization titration.	CT	PS	17/2/23	17/2	L1, L2 and L3	CO 3	—
32.	Module 4 And 08 hours	**Redox titrations** Concepts of oxidation and reduction	CT	PS	18/2/23	18/2	L1, L2 and L3	CO 4	—
33.		Types of redox titrations (Principles and applications)	CT	PS	18/2/23	18/2	L1, L2 and L3	CO 4	—
34.		Types of redox titrations (Principles and applications)	CT	PS	3/3/23	3/3	L1, L2 and L3	CO 4	—
35.		Cerimetry, Iodimetry and Iodometry	CT	PS	7/3/23	7/3	L1, L2 and L3	CO 4	—
36.		Bromometry and Dichrometry	CT	PS	10/3/23	10/3	L1, L2 and L3	CO 4	—
37.		Titration with potassium iodate	CT	PS	11/3/23	11/3	L1, L2 and	CO 4	—

							L3		
38.	Module 05 And 7 hours	**Electrochemical methods of analysis Conductometry-** Introduction, Conductivity cell	CT	PS	11/3/23	11/3	L1, L2 and L3	CO 5	—
39.		Conductometric titrations, applications	CT	PS	14/3/23	14/3	L1, L2 and L3	CO 5	—
40.		**Potentiometry** - Electrochemical cell	CT	PS	17/3/23	17/3	L1, L2 and L3	CO 5	—
41.		Construction and working of reference (Standard hydrogen, silver chloride electrode and calomel electrode)	CT	PS	21/3/23	21/3	L1, L2 and L3	CO 5	—
42.		Indicator electrodes (metal electrodes and glass electrode),	CT	PS	24/3/23	24/3	L1, L2 and L3	CO 5	—
43.		Methods to determine end point of potentiometric titration and applications.	CT	PS	25/3/23	25/3	L1, L2 and L3	CO 5	—
44.		**Polarography** - Principle, Ilkovic equation	CT	PS	25/3/23	25/3.	L1, L2 and L3	CO 5	—
45.		construction and working of dropping mercury electrode and rotating platinum electrode, applications	CT	PS	28/3/23	28/3	L1, L2 and L3	CO 5	—

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Lecture/IV: Industrial Visits/CS: Case Studies/AA: Article based Assignment or Survey/SDE: Skill Development Exercises /PS: Presentations/ RP: Role Play/SG: Simulation Games/QZ: Quiz/V: Videos/PSS: Problem Solving Skills/PC: Practicals

Bloom's Taxonomy Level	
L1-Remembering L2-Understanding L3-Applying L4-Analysing L5-Evaluating L6-Creating	
Text Books:	
1	Bentley and Driver's Textbook of Pharmaceutical Chemistry
2	Indian Pharmacopoeia.
3	A.I. Vogel, Text Book of Quantitative Inorganic analysis
4	A.H. Beckett & J.B. Stenlake's, Practical Pharmaceutical Chemistry Vol I & II, Stahlone Press of University of London
Reference Books:	
1	P. Gundu Rao, Inorganic Pharmaceutical Chemistry; A.H. Beckett & J.B. Stenlake's, Practical Pharmaceutical Chemistry
2	A.I. Vogel, Text Book of Quantitative Inorganic analysis
3	A.H. Beckett & J.B. Stenlake's, Practical Pharmaceutical Chemistry Vol I & II, Stahlone Press of University of London;
4	John H. Kennedy, Analytical chemistry principles;
5	Pharmaceutical Drug Analysis, Ashutoshkar Kar

Self-Study topics (not included in syllabus)			
Sl.No.	**Self-Study topics**	**Suggested reference**	**Cos**

Course Articulation Matrix

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	✓										✓	
CO2	✓										✓	
CO3	✓										✓	

CO4	✓									✓	
CO5	✓			✓						✓	

Add rows as Per number of COs
Add Colum's as Per number of POs

Curricula Gap Analysis

Sl.No.	Curricula Gap	Action taken	Date-Month-Year	Resource Person with designation	% of students present	Relevance to POs, PSOs
1						

Signature of Faculty	Signature of HOD

Introduction of the subject

Course outcome and program outcome

Sl. No	Course Outcome (CO)	Cognitive level (CL) R/U/AP/An/E/C	Knowledge Categories (KC) F/C/P/MC	Hours	Programme outcomes (PO) PO1/PO2,PO3….PO11
1	Explain the Methods of expressing concentration, Preparation and standardization of Primary and secondary standards, Errors, Accuracy, precision and impurities.	U	C	10	PO1, PO11
2	CO2: Explain the principles and classifications of Acid-Base titration and Non Aqueous titration	U	C	10	PO1, PO11

4	**CO3:** Explain the principle, instrumentation and applications of Precipitation titration, Complexometric titrations, Gravimetry and Diazotization titration.	U	C	10	PO1, PO11
4	**CO4:** Explain the principle and concept of Redox titrations and their types.	U	C	8	PO1, PO11
5	Explain the principle and concept of conductometry, potentiometry, and polorographic titrations.	U	C	7	PO1,PO4, PO11

Sign of

Faculty In charge

Lesson plan

Course: B.pharmacy
Academic Year: 1st semester
Subject: Pharmaceutical Analysis (Practical)
No of hours prescribed by university: 45 hrs

Semester/Year: 2022-23
Name of Faculty: S D Vachala
Subject code: BP108T

S NO	Topic	Batch A(Wednesday)		Batch D (Tuesday)		Remarks
		Planned Date	Executed date	Planned Date	Executed date	
1.	Preparation and standardization of Sodium hydroxide	7/12/22	7/12	6/12/22	6/12	–
2.	Preparation and standardization of Sulphuric acid	14/12/22	14/12	13/12/22	13/12	–
3.	Preparation and standardization of Sodium thiosulfate	21/12/22	21/12	20/12/22	20/12	–
4.	Preparation and standardization of Potassium permanganate	28/12/22	28/12	27/12/22	27/12	–
5.	Preparation and standardization of Ceric ammonium sulphate	4/1/23	4/1	3/1/23	3/1	–
6.	Limit test for chloride	11/1/23	11/1/23	10/1/23	10/1	–
7.	Limit test for sulphate	18/1/23	18/1/23	17/1/23	17/1	–
8.	Limit test for iron	25/1/23	25/1	24/1/23	24/1	–
9.	Limit test for arsenic	1/2/23	1/2	31/1/23	31/1	–
10.	Assay of the following compounds along with Standardization of Titrant Ammonium chloride by acid base titration.	8/2/23	8/2	7/2/23	7/2	–
11.	Assay of the following compounds along with Standardization of Titrant Ferrous sulphate by Cerimetry	15/2/23	15/2	14/2/23	14/2	–
12.	Assay of calcium gluconate	8/3/23	8/3	7/3/23	7/3	–
13.	Assay of hydrogen peroxide	15/3/23	15/3	14/3/23	14/3	–
14.	Determination of Normality by electro-analytical methods: Conductometric titration of strong acid against strong base	29/3/23	29/3/23	21/3/23	21/3/23	–
15	Potentiometric titration of strong acid against strong base	5/4/23	5/4	28/3/23	28/3	–

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Course: B.pharmacy
Academic Year: 1st semester
Subject: Pharmaceutical Analysis (Practical)
No of hours prescribed by university: 45 hrs

Semester/Year: 2022-23
Name of Faculty: Ms. pushpa.
Subject code: BP108T

S NO	Topic	Batch B (Thursday)		Batch C (Monday)		Remarks
		Planned Date	Executed date	Planned Date	Executed date	
1.	Preparation and standardization of Sodium hydroxide	1/12/22	1/12	5/12/22	5/12	–
2.	Preparation and standardization of Sulphuric acid , hydrogen phthalate	8/12/22	8/12	12/12/22	12/12	–
3.	Preparation and standardization of Sodium thiosulfate	22/12/22	22/12	19/12/22	19/12	–
4.	Preparation and standardization of Potassium permanganate	29/12/22	29/12	26/12/22	26/12	–
5.	Preparation and standardization of Ceric ammonium sulphate	5/1/23	5/1	2/1/23	2/1	–
6.	Assay of the following compounds along with Standardization of Titrant Ammonium chloride by acid base titration.	12/1/23	12/1	9/1/23	9/1	–
7.	Assay of the following compounds along with Standardization of Titrant Ferrous sulphate by Cerimetry	19/1/23	19/1	16/1/23	16/1	–
8.	Assay of Copper sulphate	2/2/23	2/2	23/1/23	23/1	–
9.	Assay of hydrogen peroxide	9/2/23	9/2	30/1/23	30/1	–
10.	Assay of sodium benzoate	16/2/23	16/2	6/2/23	6/2	–
11.	Assay of sodiumchloride	9/3/23	9/3	13/2/23	13/2	–
12.	Assay of calcium gluconate	16/3/23	16/3	6/3/23	6/3	–
13.	Determination of Normality by electro-analytical methods (1) Conductometric titration of strong acid against strong base (2) Conductometric titration of strong acid and weak acid against strong base (3) Potentiometric titration of strong acid against strong base	23/3/23	23/3	13/3/23	13/3	–
14.	Limit test for chloride, sulphate	30/3/23	30/3	20/3/23	20/3	–
15	Limit test for arsenic, iron, heavymetals	6/4/23	6/4	27/3/23	27/3.	–

Faculty in Charge

HOD

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R.R COLLEGE OF PHARMACY, BANGALORE

Course out Comes and Programme outcomes

Name of Course: Pharmaceutical analysis Faculty in Charge: S. D. Vachale.

Section: Practical Total Hours: 60 Year: B.pharm 1st Sem

Sl. No	Course Outcome (CO)	Cognitive level (CL) R/U/AP/An/E/C	Knowledge Categories (KC) F/C/P/MC	Hours	Programme outcomes (PO) PO1/PO2,PO3....PO 11
1	Limit test for chloride, sulphur, iron, heavymetals and arsenic	U,An,Ap	P	12	PO1 , PO11
2	Preparation, standardization and assay of compounds by acid base titration, reduction titration, complexometric titration	U,An,Ap	P	40	PO1 , PO11
3	Determine the strength of strong acid against strong base and mixture of strong acid and weak acid against strong base by conductometry and potentiometry	U,An,Ap	P	8	PO1,PO4, PO11

Sign of Faculty In charge:

RR COLLEGE OF PHARMACY

Chikkabanavara, Bengaluru-560090

INTERNAL QUALITY ASSURANCE CELL (IQAC)

Proctor list

SL.NO	CLASS	STUDENT ROLL NO.	PROCTORS	SIGNATURE
1	I &II SEM B.PHARM	1-13	Mr. K. Mahalingan	
		14-26	Dr. S.D Vachala	
		27-39	Mr. Nagaraj. N. D	
		40-52	Mr. VijayKumar . J	
		53-65	Mr.Kiran R	
		66-79	Mr.Aanand Gupta	

Question Bank (Module wise)

Pharmaceutical analysis
QP Code: 2629
Question Bank

Sources of Errors and Minimization of Errors

2 Marks:

1. Explain the importance of significant figures.
2. Define & differentiate accuracy and precision.
3. What are errors? Classify them with examples.

10 Marks:

1. Explain various methods of minimization of errors, Discuss the different methods to minimize errors in analysis.

Pharmaceutical analysis:-

2 Marks:

1. What is back titration?
2. What is a blank titration?
3. Define the terms normality, molarity, molality, and percentage w/v.
4. Define the term titration, titrant, titrand and equivalent point.

5 Marks

1. Explain the different methods of expressing concentration of a solution with examples.
2. What is primary standard? Enumerate the criteria for a substance to be classified as a primary standard. Mention their uses in different titrations.
3. What is back titration? Under what conditions are such titrations used? Explain with examples.
4. How do you calculate the equivalent weight and molecular weight of a substance. Give examples

10 marks

5. Define pharmaceutical analysis. Classify the different methods of analysis.

Neutralisation titration and Nonaqueous titration

2 Marks

1. What are acid base indicators? Give examples
2. Name some indicators used in non-aqueous titrations.
3. Name the solvents used in nonaqueous titrations

4. What is acetous perchloric acid.
5. What is leveling and differentiating effects
6. What is the role of acetic anhydride in preparation of perchloric acid solution.
7. Give the pH range of phenolphthalein and methyl orange indicators
8. Write a note on mixed indicator.
9. Define acid and base with example

5 Marks

1. How can you prepare and standardize 0.1N Sodium hydroxide solution and 0.1 N HCl
2. Give the preparation, standardization and storage of Perchloric acid?
3. Write the method of preparation and standardization of 250 ml of 0.1 M sodium hydroxide.
4. Discuss the theory of non-aqueous titrations.
5. Write a note on the applications of non-aqueous titrations in pharmaceutical analysis.
6. Name the different types of solvents used in non-aqueous titrations and explain their uses in different titrations.
7. Write the principle and procedure for the non-aqueous titration of sodium benzoate.
8. How do you prepare, standardize and store a 0.1 N Perchloric acid solution?
9. Explain the different neutralization curves for acid vs base.
10. Explain theory of acid base indicators in detail.

Redox titrations:

10 Marks

1. What are the various methods of determining the end point in a redox titration?
2. What are Redox titrations? Explain the preparation, assay and use of Copper sulphate and hydrogen peroxide.
3. Describe the principle and reactions involved in the assay of copper sulphate and potassium permanganate.
4. Discuss iodometry and iodimetry titrations briefly with examples.

5 Marks

1. Discuss the theory of redox titrations.
2. Explain the advantages of cerimetry over permanganometry and describe one of its applications in pharmaceutical analysis.
3. Write the principle of bromometric titration with examples.
4. Write notes on redox indicators.
5. Differentiate between iodometry and iodimetry titrations.
6. Explain the preparation and standardization of 0.1N $KMnO_4$, $Na_2S_2O_3$.
7. Explain the preparation and standardization of 0.1N $KMnO_4$, Iodine solution.
8. Write a note on titration of potassium iodide by using potassium iodate solution.

2 Marks

1. What is redox potential.
2. Define oxidation and reduction.
3. How do you store $KMnO_4$ and Iodine solution?
4. Give the role of starch as indication in redox titrations
5. Calculate gram equivalent weight of potassium permanganate and Iodine.
6. Calculate gram equivalent weight of Hydrogen peroxide and oxalic acid.
7. Calculate gram equivalent weight of Sodium thiosulphate and potassium iodate.
8. Explain the role of 2,6-dichlorophenol indophenols in redox titrations.
9. What are self-indicators? Give examples.

Precipitation titrations:

5 Marks

1. Write the principle for Fajan's method in detail.
2. Explain the mechanism of action of indicators in Fajan's method.
3. Write any two methods of determining the end point in a precipitation titration.
4. Define and classify precipitation titrations and give the principle involved in the assay of sodium chloride.
5. Explain the various methods of argentimetric titration with examples.
6. Describe the principle and procedure for the Mohr's method for the determination of chlorides.
7. Explain modified Volhard's method for the determination of sodium chloride
8. Compare and contrast Mohr's method and Volhard's method.

2 Marks

1. Why are nitrobenzene and nitric acid used in modified Volhard's method?
2. What are adsorption indicators
3. Write the role of potassium chromate in Mohr's method.

Complexometric titrations:

5 Marks

1. Explain the advantages of EDTA as a complexing agent in complexometric titration.
2. Classify the various EDTA titrations and explain each one in detail.
3. Write the principle and reaction involved in the assay method of calcium gluconate.
4. How do you prepare and standardize 0.05 M disodium EDTA solution
5. Write short notes on complexometric back titrations/displacement titrations.
6. What are complexometric titrations? Explain the different types with examples.

2 Marks

1. What are masking and demasking agents?
2. Write a note on metal ion indicators with examples.
3. What is a ligand. Give examples.
4. What is chelating agents. Give examples

5. What are sequestering agents. Give examples.
6. Write any 4 indicators for complexometric titrations.
7. What is the difference between chelates and the complexes.

Gravimetry

10 marks

1. Define gravimetry. Explain the Steps involved in gravimetry.
2. Assay of compounds by gravimetry.

2 marks

1. Define co-precipitation & post precipitation.
2. Contamination in co and post precipitation.
3. Digestion
4. Washing of precipitate.

POTENTIOMETRY

10 marks

1. Write the construction and working of any one indicator electrode and reference electrode with their merits and demerits.
2. Write the principle of potentiometry. Describe the construction, working, advantage and disadvantages of glass electrode.

5 marks

1. Explain the principle of potentiometry for determining the electrode potential by Nernst equation.
2. Write the construction and working of normal hydrogen electrode with neat labeled diagram
3. Write the construction and working of Glass electrode with advantages and disadvantages
4. Explain the construction, working, merits and demerits of calomel electrode.
5. Explain the construction, working, merits and demerits of Quinhydrone electrode.
6. Write the working principle and construction of any one Reference electrode.
7. Write the working principle and construction of any one Indicator electrode.
8. Brief out the potentiometric titrations with their merits and demerits
9. Explain the various methods of detecting end point in potentiometric titrations.
10. Write the applications of potentiometry

2 marks

2. What is reference electrode? Give examples
3. What is indicator electrode? Give examples
4. What is null point potentiometry?
5. Write the importance of Nernst equation.
6. What is electrochemical cell?
7. What is potentiometer? Write its importance.
8. What is potentiometric titration?
9. What is dead stop end point titration?
10. Write the advantages of potentiometric titrations over conventional titration methods

CONDUTOMETRY

5 marks

1. Explain the theory and principle of conductometry
2. Explain the conductometric titration curves for strong acid with strong base and strong acid with weak base.
3. Explain the conductometric titration curves for weak acid with strong base, weak acid with weak base and very weak acid with strong base.
4. Expain the conductometric titration curves of displacement and precipitation titrations
5. Explain the conductometric titration curves – a) strong acid with strong base b) mixture of strong acid and weak acid with strong base
6. Write the application of conductometry in pharmaceutical analysis
7. Compare the merits and demerits of Conductometric and potentiometric titrations
8. Discuss in brief construction and working of electrochemical cell
9. Discuss the construction and working of conductivity meter
10. Discuss the principles involved in conductometric titrations with the aid of graphs.

2 marks

1. What is conductometry?
2. Define molar conductance and equivalent conductance
3. Define conductance and resistance
4. What is conductivity cell?
5. What is conductometric titration
6. Write the differences between conductometry and potentiometry.

Polarography

2 marks

1) Define polarography
2) Ilkovic equation

5 marks

1) Explain the Construction and working of dropping mercury electrode.
2) Write the Applications of polarography.
3) Explain the Theory of polarography

RR COLLEGE OF PHARMACY

Chikkabanavara, Bengaluru-560090

INTERNAL QUALITY ASSURANCE CELL (IQAC)

Sessional Question Paper & Schemes

R. R. College Of Pharmacy, Chikkabanavara, Bengaluru-90

I- Sessional (Theory) Exam- Academic year: 2022-23

I Semester B. Pharm. **Sub: Pharmaceutical Analysis** **Subj code: BP-102T**
Date: 21/02/2023 **Max. Marks: 30**
Day : Tues day **Time: 10.30AM -12.00 Noon** **Duration: 1hr 30 min.**

Your answer should be specific to the question asked. Draw a neat diagram wherever require.

I - Answer "ANY ONE" of the following. **1X10 = 10**

1.	What are precipitation titrations? Classify them. Explain the estimation of Sodium chloride by Mohr's method. (2+2+6)	CO3
2.	What are acid-Base titrations? Write a note on theories of acid base titration. Explain the titration curve of strong acid Vs weak Base. (2+2+6)	CO2

II - Answer "ANY TWO" of the following. **2X5 = 10**

3.	Explain the assay of Magnesium Sulphate.	CO3
4.	How will you prepare and standardize - (2.5+2.5) a) 500ml of 0.1N HCl b) 250ml of 0.05M disodium EDTA	CO2
5.	Define and classify errors. How to minimize errors? (1+!+3)	CO1

III - Answer "ALL" of the following. **5X2 = 10**

6.	Define primary and secondary standard solutions.	(1+1)	CO1
7.	What are pM indicators? Give examples.	(1+1)	CO3
8.	Define masking and demasking.	(1+1)	CO3
9.	Define and classify ligands .	(1+1)	CO3
10.	Enlist the methods of expressing concentration.		CO1

R. R. College Of Pharmacy, Chikkabanavara, Bengaluru-90

II- Sessional (Theory) Exam- Academic year: 2022-23

I Semester B. Pharm. Sub: Pharmaceutical Analysis Subj code: BP-102T
Date: 25/04/2023 Max. Marks: 30
Day : Tues day Time: 10.30AM -12.00 Noon Duration: 1hr 30 min.

Your answer should be specific to the question asked. Draw a neat diagram wherever require.

I - Answer "ANY ONE" of the following. 1X10 = 10

1.	What are Redox titrations? Classify them. Explain the assay of Copper sulphate.	CO4
2.	Define potentiometric titration. Explain the principle of it. Describe the construction, working, advantage and disadvantages of glass electrode.	CO5

II - Answer "ANY TWO" of the following. 2X5 = 10

3.	Explain the conductometric titration curves for strong acid with strong base and strong acid with weak base.	CO5
4.	Explain the Construction and working principle of dropping mercury electrode.	CO5

5.	Explain the assay of ferrous sulphate.	CO4

III - Answer "ALL" of the following. 5X2 = 10

6.	Define reference and indicator electrode with examples.	CO5
7.	Steps involved in gravimetric analysis.	CO3
8.	Define diffusion current (id).	CO5
9.	Define conductance and specific conductance.	CO5
10.	Ilkovic equation.	CO5

Old Question Paper

RR COLLEGE OF PHARMACY, CHIKKABANAWARA, BANGALORE-90

I Year B.Pharm, I Sessional Examination 2019

Subject: Pharmaceutical Analysis

Date:15/10/2019 **Max marks: 30**

Day: Tuesday (Morning)
Duration:1hr 30m

I Answer "ANY ONE" of the Following.

1.Explain briefly methods of minimizing the errors.

2. Explain briefly Mohr's method, Volhard's methods, Fajan's method for precipitation reactions.

II Answer "ANY TWO" Of the Following.

3. Write the different methods of expressing the concentration.

4. Write the principal and reaction involved in the standardization of KMnO4 and Na2S2O3.

5.Explain the different theories in acid base titrations.

III Answer "All" of the following.

6.Define Pharmaceutical Analysis.

7.Define primary standard and secondary standard.

8.Define accuracy and precision.

9.Define levelling effect and differentiating effect of solvents.

10. Give the principal involved in estimation of NaCl.

RR COLLEGE OF PHARMACY, CHIKKABANABARA, BANGALORE-90

I Year B.Pharm, II Sessional Examination 2019

Subject: Pharmaceutical Analysis

Date: 03/12/2019 **Max marks: 30**
Day: Tuesday (Afternoon) **Duration: 1hr 30m**

I Answer "ANY ONE" of the Following.

1. Define gravimetry. Explain the Steps involved in gravimetry

2. Describe the principle and reactions involved in the assay of copper sulphate and potassium permanganate.

II Answer "ANY TWO" Of the Following.

3. Differentiate between iodometry and iodimetry.
4. Explain the conductometric titration curves for strong acid v/s strong base and strong acid v/s weak base.
5. Explain the construction and working of dropping mercury electrode.

III Answer "All" of the following.

6. Write the Ilkovic equation.
7. Define oxidation and reduction.
8. Calculate the gram equivalent weight of potassium permanganate and oxalic acid.
9. Write the Nernst equation with importance.
10. Define conductance and resistance.

Rajiv Gandhi University of Health Sciences, Karnataka

First Semester B.Pharm Degree Examination – June-2019

Time: Three Hours **Max. Marks: 75 Marks**

Pharmaceutical Analysis - I

Q.P. CODE: 5002

Your answers should be specific to the questions asked
Draw neat labeled diagrams wherever necessary

LONG ESSAYS (Answer any Two) 2 x 10 = 20 Marks

1. With suitable examples, define primary standard substances and secondary standard substances. What are the requirements for a substance to be designated as a primary standard? How will you prepare 250 ml of 0.5N HCl solution and standardize it? (Sp.gravity of conc HCl=1.18 g/ml and concentration 37% w/w).
2. Explain the theories of neutralization indicators. Write a note on mixed indicators.
3. What is cerrimetry? How is it useful? Explain the preparation, standardization of 0.1N ceric ammonium sulphate solution and assay of ferrous sulphate I.P

SHORT ESSAYS (Answer any Seven) 7 x 5 = 35 Marks

4. Enumerate the techniques of minimizing errors.
5. Define non-aqueous titration and give its application. Write a note on 'effect of temperature' and 'levelling solvents'.
6. Explain the titration curve of strong acid versus weak base. Mention the choice of indicator for the titration with suitable reasons.
7. Define and explain the principle of complexometric titrations.
8. With suitable equations, explain the principles of assay of NaCl I.P
9. What is gravimetric analysis? Explain the precautions during washing of a precipitate.
10. Explain the working of a calomel electrode. Give its uses.
11. Define conductometry. Mention its applications. Explain conductometric titration curve of strong acid versus strong base.
12. Give the construction and working of a dropping mercury electrode.

SHORT ANSWERS 10 x 2 = 20 Marks

13. Define the terms 'titrand' and 'titrant'.
14. Name any four indicators used in non aqueous titrations.
15. Define acidimetry. Mention two compounds assayed by this technique.
16. Explain 'masking' and 'demasking' in complexometry.
17. What are the limitations of Mohr's method?
18. Explain the terms 'molarity' and '% w/w'.
19. Short note on Iodimetry.
20. Why is starch not used as an indicator in redox titrations having high acid concentrations?
21. What is a reference electrode? Name two.
22. Define molar conductivity, its equation and describe the terms.

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Rajiv Gandhi University of Health Sciences, Karnataka

First Semester B.Pharm Degree Examination - DEC-2018

Time: Three Hours **Max. Marks: 75 Marks**

Pharmaceutical Analysis - I
Q.P. CODE: 5002

Your answers should be specific to the questions asked
Draw neat labeled diagrams wherever necessary

LONG ESSAYS (Answer any Two) **2 x 10 = 20 Marks**

1. Define and classify determine errors with examples. List the methods of minimising errors.
2. Classify acid base titrations. Explain the Quinonoid theory of indicators with example.
3. Define oxidizing and reducing agents with suitable examples. Explain the principle involved in the iodometric titrations.

SHORT ESSAYS (Answer any Seven) **7 x 5 = 35 Marks**

4. How do you prepare and standardise the following compounds - a) 500ml of 0.1N hydrochloric acid b) 250ml of 0.1N sodium hydroxide.
5. What is usefulness of mixed and universal indicators?
6. Explain the uses of the following in non aqueous titrations - a) perchloric acid b) acetic acid c) acetic anhydride d) crystal violet.
7. Explain the principle and procedure involved in Volhards method and modified Volhards method.
8. Explain the principle and procedure involved in the estimation of Calcium Gluconate.
9. Explain what is co-precipitation and post-precipitation with example.
10. Explain the titrimetric curves obtained in conductometric titration a) strong acid Vs weak base b) strong base Vs strong acid.
11. Explain the construction and working of glass electrode. What are the advantages of glass electrode?
12. Give the construction and working of DME.

SHORT ANSWERS **10 x 2 = 20 Marks**

13. Give the pH range of phenolphthalein and methyl orange indicators.
14. Give the role of starch as an indicator in redox titrations.
15. Give a list of methods of expressing concentration.
16. How do you calculate stiochiometric end point in acid base titrations.
17. Name the solvents used in non-aqueous titrations.
18. What is the difference between chelates and the complexes?
19. List the optimum conditions for precipitation in gravimetric analysis.
20. Calculate equivalent weight of Hydrogen peroxide and Oxalic acid.
21. Name two compounds which can be estimated by conductometry.
22. Write the importance of Nernst equation.

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LIBRARY

Rajiv Gandhi University of Health Sciences, Karnataka

First Semester B.Pharm Degree Examination - DEC-2017

Time: Three Hours **Max. Marks: 75 Marks**

Pharmaceutical Analysis - I
Q.P. CODE: 5002

Your answers should be specific to the questions asked
Draw neat labeled diagrams wherever necessary

LONG ESSAYS (Answer any Two) 2 x 10 = 20 Marks

1. What are errors and classify them. Define accuracy and precision. Describe the steps to minimize errors.
2. What are Neutralization curves? Explain the selection of indicators in the titration between weak acid with strong base using neutralization curves.
3. Define oxidation and reduction. Explain the principle involved in titration with potassium dichromate. Give its applications with suitable examples.

SHORT ESSAYS (Answer any Seven) 7 x 5 = 35 Marks

4. What is pharmaceutical analysis? Explain different types of analysis. What is its scope in pharmacy?
5. What are indicators? Explain the theory of indicators used in acid base titrations?
6. Explain the reason behind why water is not used in non-aqueous titration.
7. Give the mechanism of action of adsorption indicators with suitable examples.
8. Classify complexometric titrations. Explain each type with suitable examples.
9. What is gravimetry? Explain the following terms a) Digestion b) ignition c) Ash treatment d) Incineration.
10. Write the principle, instrumentation and applications of conductometry.
11. Enumerate the various types of electrodes in potentiometry. Give the working of Calomel electrode.
12. What is polarography? Explain the terms a) limiting current b) polarographic maxima c) diffusion current d) supporting electrolytes.

SHORT ANSWERS 10 x 2 = 20 Marks

13. What are systematic errors and random errors? Give examples.
14. What is color change interval of an acid base indicator? Give its importance.
15. How do you prepare acetous Perchloric Acid?
16. Complete and balance the equation: $KMnO_4 + H_2SO_4 + H_2C_2O_4 \rightarrow$
17. What is masking agent? Give example for masking by precipitation.
18. Write the conditions for process of digestion in Gravimetry.
19. What is Specific conductance and Molar conductance?
20. What is standard hydrogen electrode?
21. Define Qualitative Analysis and Quantitative Analysis.
22. What is Cerimetry? Give its applications.

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Course Material (Class PowerPoint Presentations/Handouts/Worksheets)

Gravimetry

Definition:

Gravimetric analysis is a technique through which the amount of an analyte (the ion being analyzed) can be determined through the measurement of mass. Gravimetric analyses depend on comparing the masses of two compounds containing the analyte.

An example of a gravimetric analysis is the determination of chloride in a compound.

Advantages of Gravimetric Analysis

1. precise analysis.
2. It is used to determine the atomic masses of many elements to six-figure accuracy.
3. It provides a little room for instrumental error and does not require a series of standards for calculation of an unknown.

Disadvantages of Gravimetric Analysis

1. It usually provides only for the analysis of a single element, or a limited group of elements, at a time. Comparing modern dynamic flash combustion coupled with gas chromatography with traditional combustion analysis.

Features & properties

- It is traditional method of separation of element
- It is cheap ,simple to carry & accurate.
- Apparatus required to carry out gravimetric are easily available.
- It is low process specially when accurate result is required.
- Wide range of sample Composition (Nano gm to kg) can be carried out through gravimetric analysis.
- No calibration is required.

Quantitative Applications

Precipitation gravimetry continues to be listed as a standard method for the determination of SO_{4}^{2-} in water and wastewater analysis

Several organic functional groups or heteroatoms can be determined using precipitation gravimetric methods.

A precipitation reaction is a useful method for identifying inorganic and organic analytes.

Types of Gravimetric Analysis

There are 4 fundamental types of gravimetric analysis. Of which, there are 2 common types involving changes in the phase of the analyte to separate it from the rest of a mixture, resulting in a change in mass.

Volatilization gravimetric

• Volatilization Gravimetric involves separating components of our mixture by heating or chemically decomposing the sample to a gas. The weight of the gas then serves as a measure of the analyte concentration.

Precipitation gravimetric

• Precipitation Gravimetric uses a precipitation reaction to separate one or more parts of a solution by incorporating it into a solid. The precipitate is then weighed.

Electrogravimetry

• Electrogravimetry is a method used to separate and quantify ions of a substance, usually a metal.

Thermogravimetric

• Thermogravimetric is a method of thermal analysis in which changes in physical and chemical properties of materials are measured as a function of increasing temperature or as a function of time.

Principle of precipitation gravimetric analysis

In precipitation gravimetric analyte is converted to sparingly soluble precipitate this precipitate is then filtered and it was free of impurity converted to a product of known composition by suitable heat treatment and weighed.

Example – estimation of calcium in solution.

Calcium precipitate with ammonium oxalate to form calcium oxalate (precipitate form) then dried and ignited. The process converted the precipitate entire to calcium oxalate (weighed form) and then weighed.

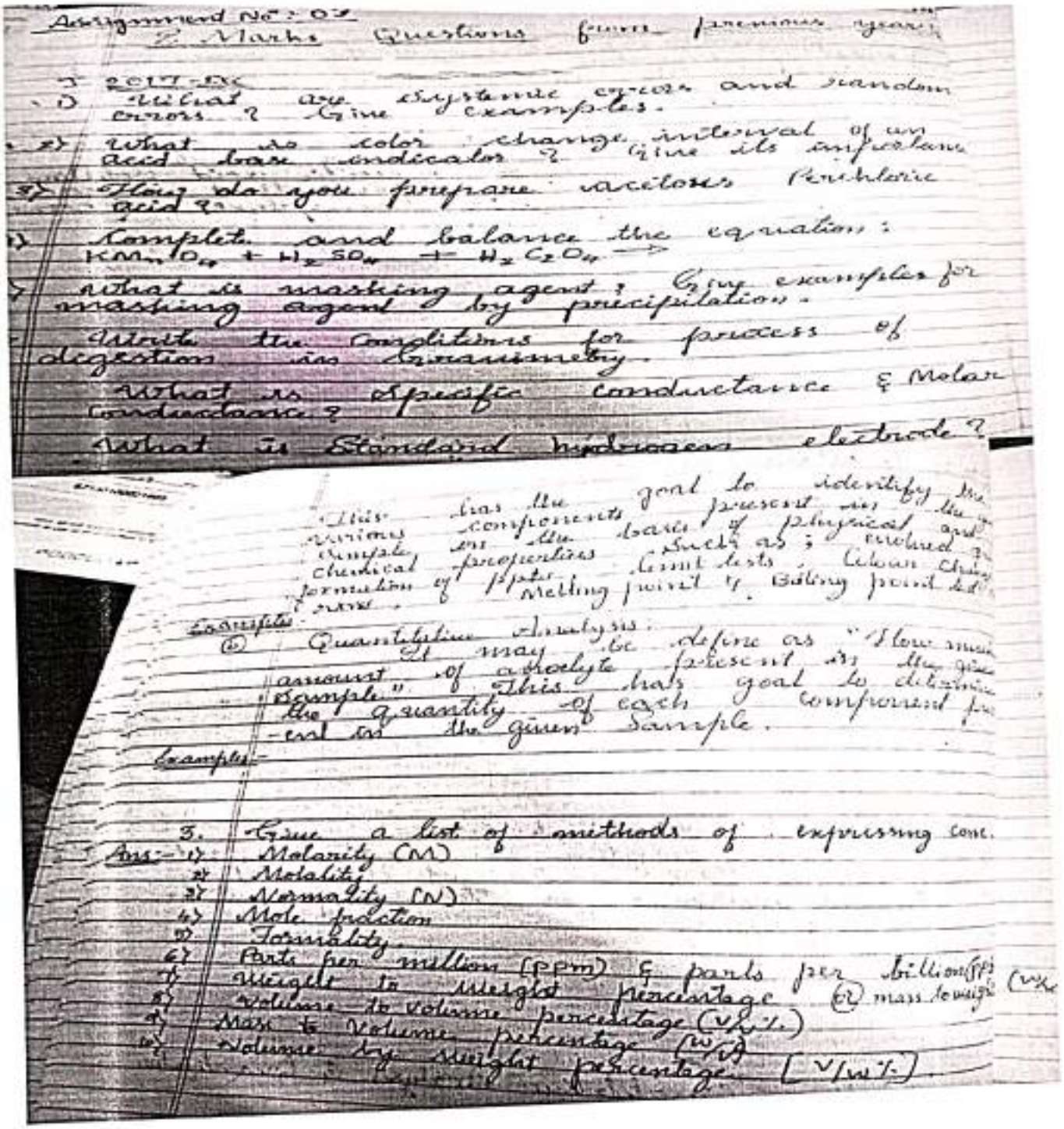
The precipitate is heated dried & ignited the process converted the precipitate entirely to calcium oxide .After cooling the crucible and precipitate are weighed and mass of calcium is determined .

% Analyte = weight of precipitate × gravimetric factor / weight of sample

Steps involved in gravimetric analysis

1. Sampling
2. Preparation of solution or dissolution
3. Precipitation
4. Testing the completeness of precipitation
5. Digestion or ageing of precipitate
6. Filtration
7. Washing of precipitate
8. Drying or ignition of precipitate
9. Weighing

Assignments, Quizzes, Class Tasks



Assignment No: 03
2 Marks Questions from previous years

I 2017-DC
1) What are systemic errors and random errors? Give examples.
2) What is color change interval of an acid base indicator? Give its importance
3) How do you prepare acetous Perchloric acid?
4) Complete and balance the equation:
$KMnO_4 + H_2SO_4 + H_2C_2O_4 \rightarrow$
5) What is masking agent? Give examples for masking agent by precipitation.
6) Write the conditions for process of digestion in Gravimetry.
7) What is Specific conductance & Molar conductance?
8) What is Standard hydrogen electrode?

This has the goal to identify the various components present in the given sample on the basis of physical and chemical properties such as; involved formation of ppts, limit tests, Colour change, Melting point & Boiling point test.

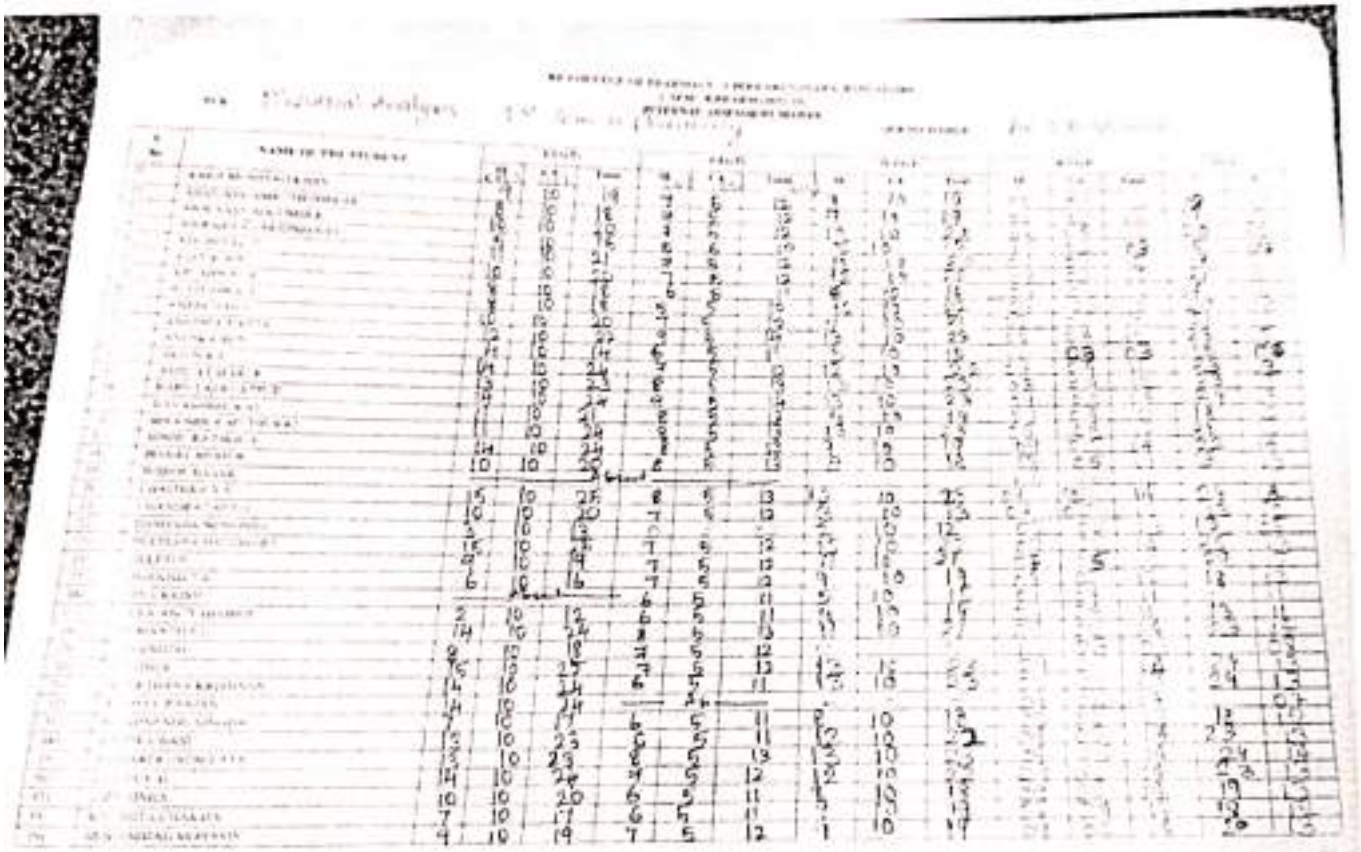
Examples:
(1) Quantitative Analysis:
It may be define as "How much amount of analyte present in the given sample". This has goal to determine the quantity of each component present in the given sample.

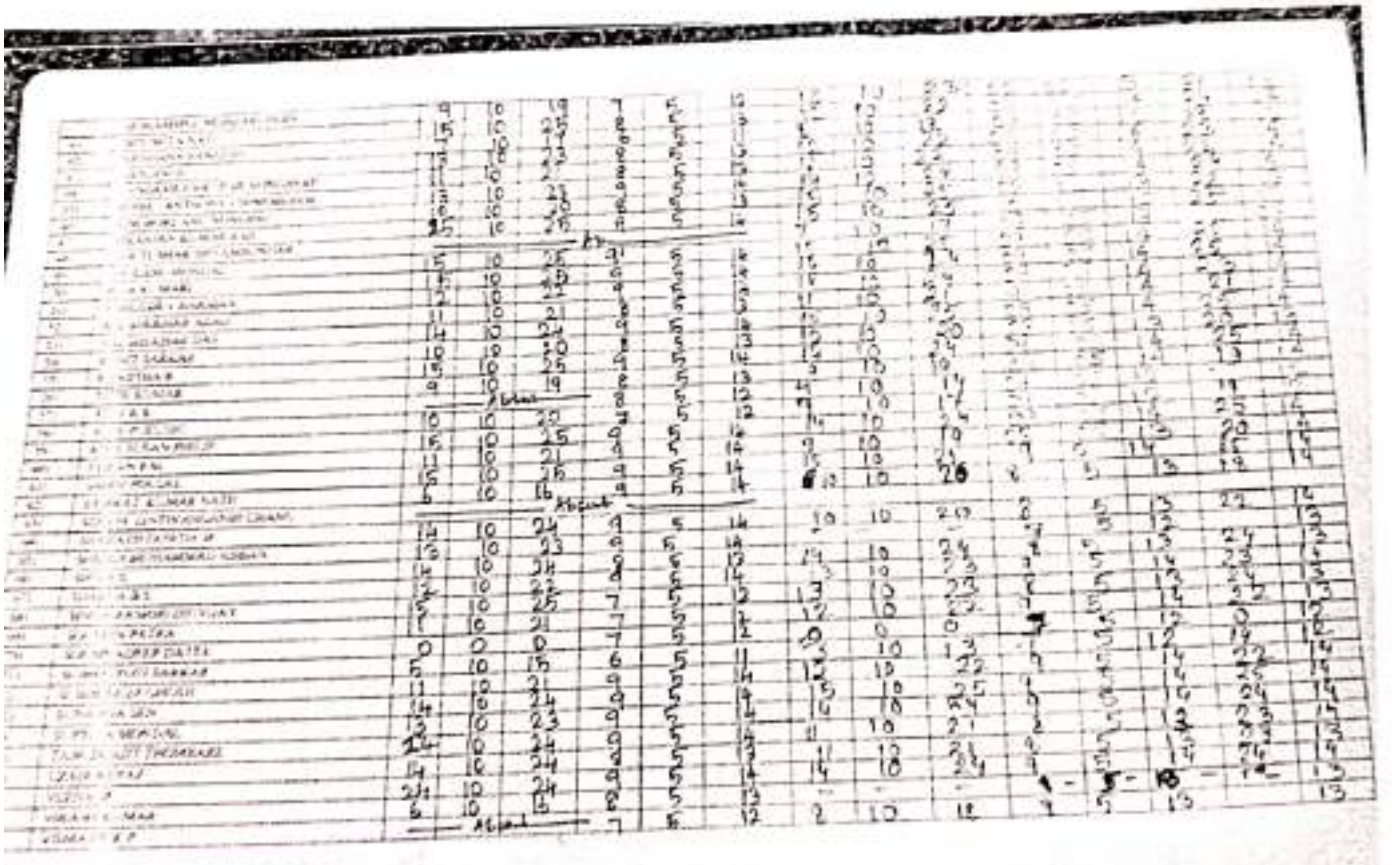
Examples:-

3. Give a list of methods of expressing conc.

Ans:- 1) Molarity (M)
2) Molality
3) Normality (N)
4) Mole fraction
5) Formality
6) Parts per million (ppm) & parts per billion (ppb)
7) Weight to weight percentage (or) mass to weight (w/w)
8) Volume to volume percentage (v/v%)
9) Mass to volume percentage (w/v)
10) Volume by weight percentage [v/w%]

IA marks



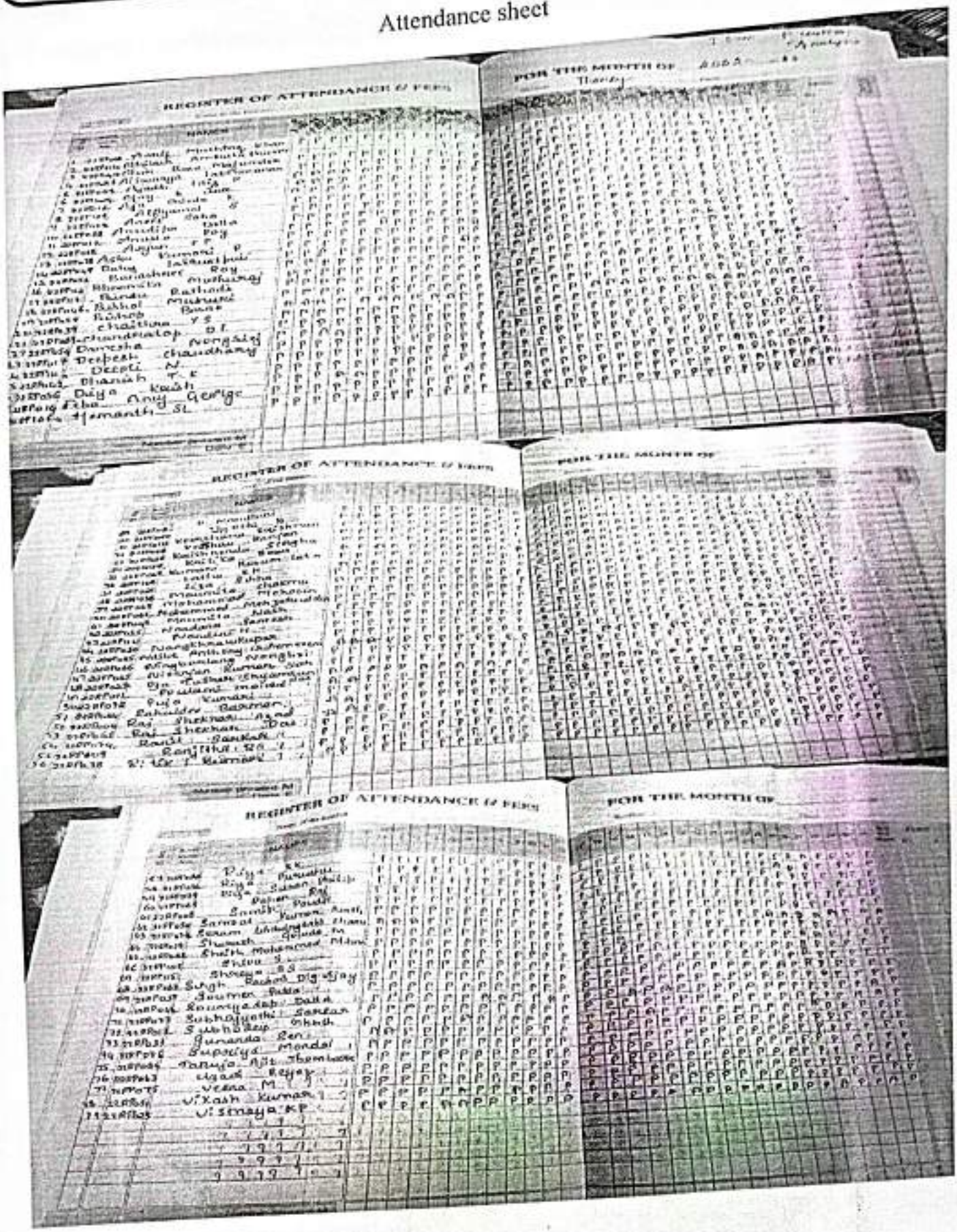


RR COLLEGE OF PHARMACY

Chikkabanavara, Bengaluru-560090

INTERNAL QUALITY ASSURANCE CELL (IQAC)

Attendance sheet



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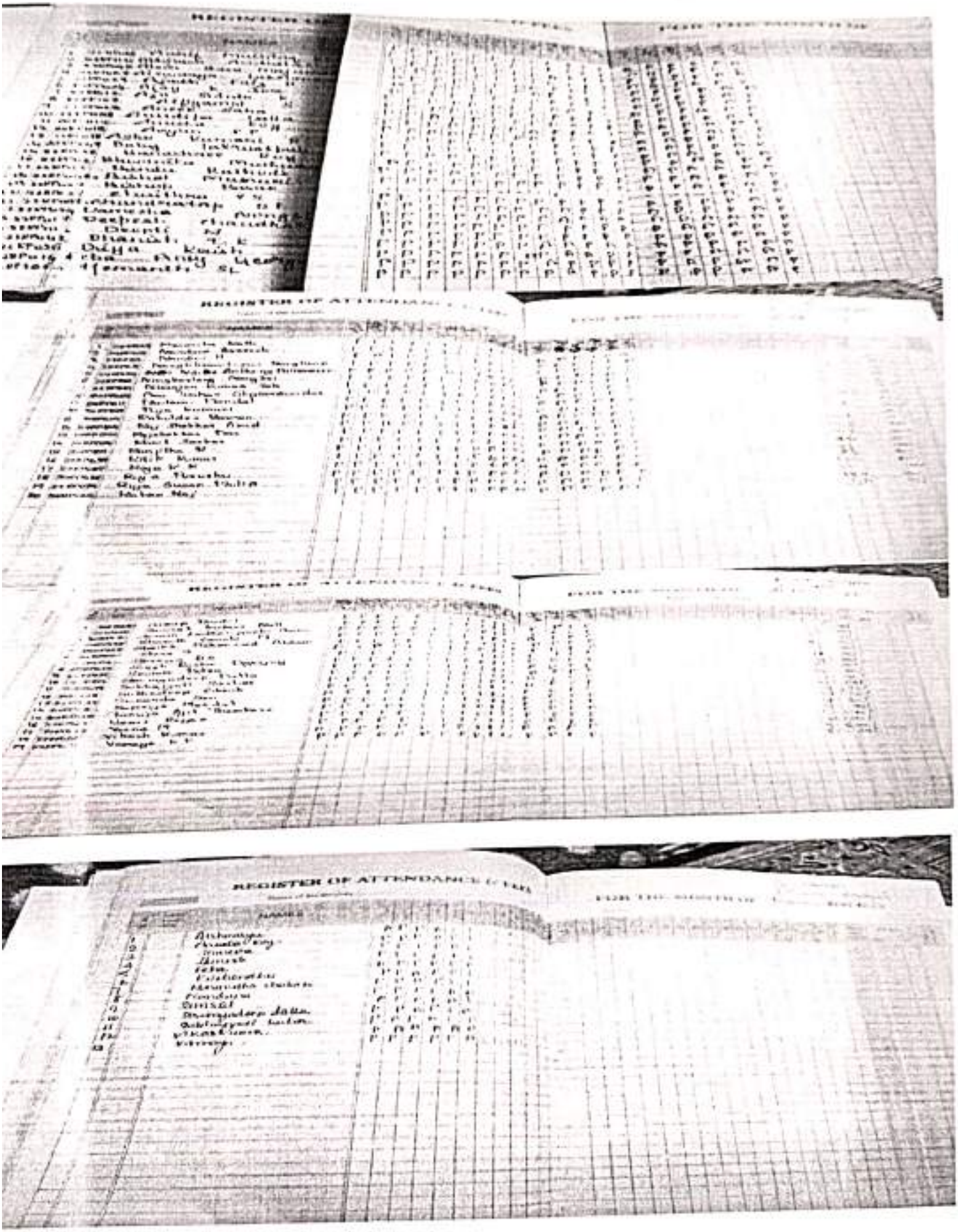
Chikkabanavara, Bengaluru-560090

INTERNAL QUALITY ASSURANCE CELL (IQAC)



Faculty feedback analysis.

R.R. College of Pharmacy

Faculty Appraisal By Students

ACADEMIC YEAR 2022-23	Year/Semester: 1st Sem		Class: B Pharma			
No. of Respondents: 53 Class Strength: 79	Phase II					
Parameters	Mr. Vijaya Kumar. J (HAP)	Mr Kiran (P'ceutics I)	Mr. Nagaraj .N (Pharmaceu	Dr.Vachala. S.D (Ph analysis)	Mrs.Vismaya Mani (Communication	Ms. Nisha.(Remidial Biology)
	% (Feed back)					
1. The teacher ensures punctuality towards class and subject adherence	81.5	90.2	90.6	92.1	76.69	61.13
2. The teacher communicates the lesson plan before starting the class	82.6	90.2	91.3	92.8	79.62	64.15
3. The pace of syllabus coverage is as per lesson plan	83.4	90.2	90.9	92.1	78.11	62.26
4. The teacher demonstrates good knowledge of the subject and has clarity of communication in the teaching	82.3	91.3	90.9	92.8	78.11	60.38
5. The teacher spends adequate time in the class in clarifying the doubts and matters relevant to the subject	82.3	90.2	91.3	92.1	79.25	61.51
6. The teacher motivates and stimulates to think about improving the knowledge about the subject	85.3	91.3	89.5	92.5	76.69	60.75
7. Special Classes/Skill Development Activities relevant to subject by teacher is useful	79.2	85.3	85.3	85.7	73.21	59.62
8. The teachers are approachable for clarification and doubts related to academic subjects	81.9	87.9	87.5	87.2	75.47	60.38
9. The internal assessment evaluation by the teacher is transparent	81.5	88.3	87.9	89.4	80.38	61.89
10. The teacher treats all the students equally	78.1	91.3	89.4	89.4	79.25	62.64
11. The teacher is effective in handling the subject.	81.1	92.1	90.6	92.1	78.11	61.89
Phase II total %	81.7	89.8	89.6	90.7	77.7	61.5
Phase I Total %	87.2	93.0	94.4	96.2	85.3	79.2
Average %	84.5	91.4	92.0	93.5	81.5	70.3

Rolled out on 25-04-2023

Director-QAC

PRINCIPAL
R.R. College of Pharmacy
Chikkabanavara, Bangalore