

17  
**P.R.Government College(Autonomous)  
Kakinada**

(Affiliated to AdikaviNannaya University)



**Department of Chemistry**

**B.Voc(Pharmaceutical Chemistry)**

**Under NSQF Scheme**

**Board of studies**

**2021-22**

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**Note:** BOS is to provide final soft copy in PDF and word formats and four copies of hard copies in bounded form to the office of Dean Academic affairs.

**P.R.Government College(Autonomous),KakinadaRe  
commendedCompositionoftheBoardofStudiesofB.Voc  
(PharmaceuticalChemistry)  
Andit'sFunctionsofanAutonomousC  
ollege2021-22**

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**Composition**

**1.Chairman,BoardofStudies:**

**Sri T.V.V.SatyaNarayanaM.Sc.,**

**NodalOfficerforB.Voc.(PharmaceuticalChemistry)**

**2.Theentirefacultyofeachspecialization.**

- 1. Dr.D.Rama Rao**
- 2. Dr. D. Chenna Rao**
- 3. V. Sanjeev Kumar**
- 4. P. Vijay Kumar**
- 5. V.RamaBabu**
- 6. N.BujjiBabu**
- 7. T.UmaMaheswara Rao**
- 8. Dr.A.ChandraLeela**
- 9. Dr.Ch.Praveen**

**3.SubjectexpertsfromoutsidethecollegetobenominatedbytheAcademicCouncil**

**SriV.MallikharjunaSharma, LecturerinChemistry, ASD women  
Govt.College(A),Kakinada**

**Dr.k. Jhansi, LecturerinChemistry.**

**4.OneexperttobenominatedbytheVice-Chancellorfromapanelofsix**

**RecommendedbytheCollegePrincipal,  
Prof.K.Deepthi, AdikaviNannayaUniversity, Rajamundry.**

**5.Expertfromindustry**

- 1 Ch.S.N.Murthy, Director, Venky pharma pvt.Ltd, Yanam.**

**6.One postgraduatemeritoriousalumnusnominatedbythePrincipal.**

**V.MallikarjunaSarma, M.Sc., OrganicChemistry**

Signatures of the members who attended the Board of studies in B. Voc (Pharmaceutical Chemistry)

**Date:10.12.2021 Time: 3.00 Pm**

**Mode of conduct of meeting: offline mode in P.R. Govt. College(A), Kakinada.**

| S.no | Name of the member                       | Designation                                                                                 | Signature                         |
|------|------------------------------------------|---------------------------------------------------------------------------------------------|-----------------------------------|
| 1    | Sri. T. V. V. Satyanarayana              | Chairman, Board of Studies, Nodal Officer for B. Voc (Pharmaceutical Chemistry)             | T. V. V. Satyanarayana 10/12/2021 |
| 2    | Prof. K. Deepthi                         | University Nominee Asst. Professor & Head of the Department of Chemistry, AKNU, Rajamundry. | K. Deepthi                        |
| 3    | Sri. K,anand                             | Subject Expert                                                                              | K. Anand 10/11/21                 |
| 4    | DR.RAMESH BOGA                           | Founder & MD Boga R Laboratories, Peddapuram & Suvane, USA                                  |                                   |
| 5    | V. Mallikarjuna Sarma                    | Lecturer in Chemistry A.S.D Govt College Kakinada                                           | V. Mallikarjuna Sarma 10/12/2021  |
| 7    | Dr. D. Chenna Rao                        | Member Lecturer in chemistry Department of Chemistry                                        | Dr. D. Chenna Rao 10/12/2021      |
| 8    | V. Sanjeev Kumar                         | Member Lecturer in chemistry                                                                | V. Sanjeev Kumar                  |
| 9    | P. Vijay Kumar                           | Member Lecturer in Chemistry                                                                | P. Vijay Kumar                    |
| 10   | V. Rama Babu                             | Member Lecturer in Chemistry                                                                | V. Rama Babu                      |
| 11   | Student members: Hephshibah. K Mohan. Ph | Admn No:5215422 Admn No:5215420                                                             | Hephshibah. K Mohan. Ph           |

ACTION PLAN BOS MEETING-CHEMISTRY HELD ON 06-04-2021.

Department activities for the academic year 2020-2021.

Annexure I

**1. Organizing National/State level seminars/Workshops/Conferences/Training programmes etc., with topics and other details.**

**(Mandatory for each Department)**

- i) Staff development programme
- ii) Training in the use of HPLC
- iii) Awareness on OZONE protection
- iv) National Chemistry day
- v) Chem.fest
- vi) National Science day 2020
- vii) Guest lectures
- viii) Training in water analysis

**2. Change of modules in the syllabus content.**

Syllabus designed for first and second and final years as per university regulations. CBCS introduced for final year w.e.f. 2018-19 & CBCS introduced for I & II year w.e.f. 2020-21.

**3. Plan for utilization of funds for Autonomous/UGC/other grants available for arranging guest lectures, faculty improvement programmes, study tours, equipping laboratories, reference books & other necessary teaching-learning material with ICT enabled teaching.**

**I. Study visits to:**

Rs, 50,000

- 1. Hetero Laboratories, Nakkapally
- 2. Dr. Reddy's Laboratories, Yanam.
- 3. National Institute of Hydrology, Kakinada.
- 4. Nagarjuna Fertilizers and Chemicals Ltd, Kakinada.
- 5. Coromandel International Ltd., Kakinada
- 6. Venky Parenterals, Yanam

**II.**

**1. Sophisticated version UV-Visible spectrophotometer-**

5.0 lakhs

**2. Other equipment**

1.50 lakhs

**3. Consumables**

1.98 lakhs

**4. Plan for organizing subject oriented community outreach programmes & allocation of necessary funds. (Mandatory for each Department)**

- |     |                              |     |        |
|-----|------------------------------|-----|--------|
| i)  | Adoption of village          | Rs. | 20,000 |
| ii) | Medical Awareness programmes | Rs. | 10,000 |

**5. Institution of new medals/incentives/prizes etc., from alumni, philanthropists, parents, faculty etc., - Strategies to be recommended**

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**6. Introduction of new Online programmes –PG/UG/Diploma and certificate courses.**

**Swayam online course**

Industrial Pharmacy

**7. Any other programme that enhance the learning capacity of students and their employable & knowledge skills.**

Training in the use of instruments like AAS, UV-

Vis, HPLC, flame photometer, uranium analyzer, soil and water analysis projects, air quality projects.

**8. Change in internal assessment exams for conducting Mid Semester by way of Project work/Assignment.**

It is proposed to conduct an online Examination for Mid Semester Examination from 2020-21.

**9. Suggest panel of examiners/papers setters & other experts/nominees for BOS deliberations.**

**Chemistry:**

1. Dr. D. S. V. N. N. Rama Murthy, GDC(A), Tuni
2. Sri V. Sridhar, Arts College, Rajahmundry
3. Dr. B. Mallikarjuna, Arts College, Rajahmundry

Department of B.Voc (Pharmaceutical Chemistry) Board of Studies Meeting

Dt. 10-12-2021

Resolutions:

The meeting of Board of studies in B.Voc (Pharmaceutical Chemistry) is convened on 10-12-2021 at dept of chemistry in P.R. Govt. College (A). The Principal Dr. B.V. Tirupanyam, Dr. K. Deepthi, University Nominee, Sri K. Anand, GDC Pithapuram..., Subject Expert, Sri V. Mallikarjuna Sarma, GDC (W), Kakinada, all members of the faculty of Chemistry and student representatives attended the meeting. Agenda items are discussed and resolutions are made.

1. It is resolved to follow the revised Choice Based Credit System for B. Voc courses scrupulously as per the directions of Andhra Pradesh State Council of Higher Education (APSCHE), Vijayawada and also as per the directions of Adikavi Nannaya University, Rajamahendravaram with effect from the academic year 2020-21.
2. It is resolved to follow the revised curricular framework for B. Voc courses scrupulously as per the directions of Andhra Pradesh State Council of Higher Education (APSCHE), Vijayawada and also as per the directions of Adikavi Nannaya University, Rajamahendravaram with effect from the academic year 2020-21.
3. It is resolved to choose Life Skill courses and Skill Development Courses in concurrence with the vocational course.
4. It is resolved to conduct industrial visits for B. Voc students to make them acquainted with the industrial environment.
5. It is resolved to admit both Intermediate (MPC) stream and Intermediate (Bi.P.C) stream students into B. Voc courses and design the curriculum accordingly.
6. It is resolved to run B.Voc (Pharmaceutical Chemistry) in two streams namely
  - i. B.Voc (Pharmaceutical Chemistry) Maths stream and

II. B.Voc(Pharmaceutical Chemistry) Biology stream

7. It is resolved to organize Guest lectures by eminent professors and Industrial Experts.
8. Resolved to implement pass minimum for internal assessment for CBSE pattern students as the pattern is learner oriented.
9. Resolved \_\_\_\_\_ to \_\_\_\_\_ submit proposals to conduct a faculty development programme in instrumentation techniques/advanced topics with the assistance of industry representatives and university representatives.
10. Resolved to conduct Industrial Internship for a period of two months during the summer after completion of semester end examinations.
11. It is resolved to make it mandatory for the students in the entire V semester to undergo industrial internship for a period of 6 months in a Pharma Industry.
12. It is resolved to get the students of B.Voc(Pharmaceutical Chemistry) registered in NAPS (National Apprenticeship Promotion Scheme).
13. It is resolved that the B.Voc(Pharmaceutical Chemistry) course is restructured in B.Sc(Professional)(Pharmaceutical Chemistry). The proposal is put forward to Academic Council and General Body Meeting.
14. It is resolved to follow strictly the guidelines of UGC under NSQF scheme for the recruitment and engagement of faculty and non-teaching staff.
15. It is resolved to follow the \_\_\_\_\_ same \_\_\_\_\_ syllabi for English, Second Language, Life Skill Courses and Skill Development Courses as those prescribed for UG Courses by APSCHE, Vijayawada.
16. It is resolved to follow the same syllabi for main subjects namely Mathematics, Botany and Chemistry as those prescribed for UG Courses by APSCHE, Vijayawada.
17. It is resolved to implement 50% external & 50% internal marks for both theory & practicals from the academic year 2020-2021 for first year students only.
18. It is resolved to implement 60% external & 40% internal marks for both theory & practicals from the academic year 2020-2021 for second & third year students
19. Resolved to reduce 40 marks of Theory internal to 20 marks for mid exams and 20 marks for co-curricular activities (Seminar / Assignment / Quiz / Group Discussion) and reduce 50 marks of theory internal to 25 marks for mid exams and 25 marks for co-curricular activities (Seminar / Assignment / Quiz / Group Discussion).
20. Resolve to conduct practical examinations semester wise.

The following paper setters are recommended

- i) Dr. D. S. V. N. N. Rama Murthy, GDC(A), Tuni
- ii) K. Anand, GDC Pithapuram.,
- iii) Sri V. Mallikarjuna Sarma, GDC(W), Kakinada

## About B. Voc (Pharmaceutical Chemistry)

The University Grants Commission (UGC) had launched a scheme on 27 February, 2014 for skills development based higher education as part of college/university education, leading to Bachelor of Vocation (B. Voc.) degree with multiple entry and exit points. Considering the implementation modalities, the guidelines of the scheme have been revised in the year 2015. The B. Voc. Programme is focused on universities and colleges providing undergraduate studies which would also incorporate specific job roles and their NOSs along with broad based general education. This would enable the graduates completing B. Voc to make a meaningful participation in accelerating India's economy by gaining appropriate employment, becoming entrepreneurs and creating appropriate knowledge.

### Objectives

1. To provide judicious mix of skills relating to a profession and appropriate content of general education.
2. To ensure that the students have adequate knowledge and skills, so that they are work ready at each exit point of the programme.
3. To provide flexibility to students by means of pre-defined entry and multiple exit points.
4. To integrate NSQF within the undergraduate level of higher education in order to enhance employability of the graduates and meet industry requirements. Such graduates apart from meeting the need of local and national industry are also expected to be equipped to become part of the global workforce.
5. To provide vertical mobility to students coming out of (a) 10+2 with vocational subjects; and (b) Community Colleges.

### Course Objectives:

To make student

1. Understand the basic concepts of Organic Chemistry
2. Understand different types of organic reactions
3. Acquire knowledge on qualitative and quantitative chemical analysis
4. Develop skills in the usage and application of laboratory instruments
5. Understand the mechanisms of various organic reactions
6. Acquire knowledge on various types of Pharmacopoeia.
7. Understand various forms of medicines and the role of additives in formulations
8. Acquire knowledge on different types of instrumentation techniques in chemical analysis.
9. Understand stereochemistry of carbon compounds and its importance in organic chemistry
10. Acquire knowledge on the basic concepts of computers
11. Develop skills in MS Word, MS Excel and MS PowerPoint applications.
12. Develop communication and soft skills.

13. Undergo industrial training and acquire skills in various instrumentation techniques.
14. Visit pharmaceutical industries and understand the functioning of plant,

### **Course Outcomes:**

At the end of the course, the student will be able to

1. Acquire competence and skills in various techniques in chemical analysis.
2. Ready to get a suitable position or job roles such as Quality Control Chemist, Quality Assurance Chemist, Production Chemist in a Pharmaceutical Industry.
3. Choose for an academic progression under vertical mobility for higher studies.
4. Eligible for various competitive examinations in various posts recruited by State and Central Governments.

Sem-I

| Category       | Subject/Paper           | Course | Theory /Practical | No.of Hrs./ Week | No offered | Evaluation |          |       |
|----------------|-------------------------|--------|-------------------|------------------|------------|------------|----------|-------|
|                |                         |        |                   |                  |            | Internal   | External | TOTAL |
| Firstlanguage  | ENGLISHPRAXISCOURSE-I   |        | Theory            | 4                | 3          | 50         | 50       | 100   |
|                | SecondLanguage          |        | Theory            | 4                | 3          | 50         | 50       | 100   |
|                | LifeSkillCourses        |        | Theory            | 2                | 2          |            | 50       | 50    |
|                | SkillDevelopment Course |        | Theory            | 2                | 2          |            | 50       | 50    |
| MajorSubject-1 | ElectricalAppliances    |        | Theory            | 2                | 2          |            | 50       | 50    |
|                | Mathematics /           | C1     | Theory            | 6                | 5          | 50         | 50       | 100   |
|                | Chemistry               | C1     | Theory            | 4                | 4          | 50         | 50       | 100   |
|                | Chemistry               |        | Practical         | 2                | 1          |            | 50       | 50    |
|                | BasicPharmaceutics-I    | C1     | Theory            | 4                | 4          | 50         | 50       | 100   |
|                | BasicPharmaceutics-I    |        | Practical         | 2                | 1          |            | 50       | 50    |
|                | BasicPharmaceutics-II   | C2     | Theory            | 2                | 2          | -          | 50       | 50    |
| Vocational     | BasicPharmaceutics-II   |        | Practical         | 2                | 1          |            | 50       | 50    |
|                |                         |        | TOTAL             | 34               | 28         | 250        | 550      | 800   |

**P.R.GOVERNMENT COLLEGE(A), KAKINADA DEPARTMENT OF CHEMISTRY  
B.VOC(PHARMACEUTICAL CHEMISTRY)(MATHS STREAM) CURRICULAR FRAMEWORK (CREDIT STABLE)  
SEMESTER - II**

| Category                   | Subject/Paper                            | Course | Theory / Practical | No. of Hrs./ Week | No of credits | Evaluation |                |
|----------------------------|------------------------------------------|--------|--------------------|-------------------|---------------|------------|----------------|
|                            |                                          |        |                    |                   |               | Internal   | External TOTAL |
| First language             | ENGLISH PRACTICE COURSE-II               |        | Theory             | 4                 | 3             | 50         | 50 100         |
| Second Language            | Telugu/Sanskrit/Hindi                    |        | Theory             | 4                 | 3             | 50         | 50 100         |
| Life Skill Courses         | Information and Communication Technology |        | Theory             | 2                 | 2             | -          | 50 50          |
| Skill Development Course-1 | Food Adulteration                        |        | Theory             | 2                 | 2             | -          | 50 50          |
| Skill Development Course-1 | Dairy technology                         |        | Theory             | 2                 | 2             | -          | 50 50          |
| Major Subject-1            | Mathematics                              | C2     | Theory             | 6                 | 5             | 50         | 50 100         |
| Major Subject-2            | Chemistry                                | C2     | Theory             | 4                 | 4             | 50         | 50 100         |
|                            | Chemistry                                |        | Practical          | 2                 | 1             |            | 50 50          |
| Vocational                 | Basic Analytical Chemistry-I             | C3     | Theory             | 4                 | 4             | 50         | 50 100         |
|                            | Basic Analytical Chemistry-I             |        | Practical          | 2                 | 1             |            | 50 50          |
|                            | Health Education and Community Pharmacy  | C4     | Theory             | 2                 | 2             | -          | 50 50          |
|                            | Health Education and Community Pharmacy  |        | Project            | 2                 | 1             | -          | 50 50          |
|                            | ;                                        |        | TOTAL              | 36                | 30            | 250        | 600 850        |

**P.R.GOVERNMENT COLLEGE(A),  
KAKINADA DEPARTMENT OF CHEMISTRY  
B.VOC(PHARMACEUTICAL CHEMISTRY)(MATHS STREAM) CU  
CURRICULAR FRAMEWORK (CREDIT STABLE)**

**Semester-III**

| Category                 | Subject/Paper                          | Course | Theory<br>/Practical | No.<br>of Hrs.<br>/ Week | No<br>of credits | Evaluation |            |            |
|--------------------------|----------------------------------------|--------|----------------------|--------------------------|------------------|------------|------------|------------|
|                          |                                        |        |                      |                          |                  | Internal   | External   | TOTAL      |
| First Language           | ENGLISH PRACTICE COURSE-III            |        | Theory               | 4                        | 3                | 40         | 60         | 100        |
| Second Language          | Telugu/Sanskrit/Hindi                  |        | Theory               | 4                        | 3                | 40         | 60         | 100        |
| Life Skill Course-I      | Environment Education                  |        | Theory               | 2                        | 2                | -          | 50         | 50         |
| Life Skill Course-II     | Personality Development and Leadership |        | Theory               | 2                        | 2                | -          | 50         | 50         |
| Skill Development Course | Environment Audit                      |        | Theory               | 2                        | 2                | -          | 50         | 50         |
| Major Subject-1          | Mathematics                            | C3     | Theory               | 6                        | 5                | 40         | 60         | 100        |
| Major Subject-2          | Chemistry                              | C3     | Theory               | 4                        | 4                | 40         | 60         | 100        |
|                          | Chemistry                              |        | Practical            | 2                        | 1                |            | 50         | 50         |
|                          | Advanced Pharmaceutics-I               | C5     | Theory               | 4                        | 4                | 40         | 60         | 100        |
|                          | Advanced Pharmaceutics-I               |        | Practical            | 2                        | 1                |            | 50         | 50         |
|                          | Advanced Pharmaceutics-II              | C6     | Theory               | 2                        | 2                | -          | 50         | 50         |
|                          | Advanced Pharmaceutics-II              |        | Project              | 2                        | 1                | -          | 50         | 50         |
|                          |                                        |        | <b>TOTAL</b>         | <b>36</b>                | <b>30</b>        | <b>200</b> | <b>650</b> | <b>850</b> |

**P.R.GOVERNMENT COLLEGE(A),  
KAKINADA DEPARTMENT OF CHEMISTRY  
B.VOC(PHARMACEUTICAL CHEMISTRY)(MATHS STREAM) CURRICU  
LAR FRAMEWORK (CREDIT TABLE)  
Semester – IV**

| Category        | Subject/Paper                    | Course | Theory<br>/Practical<br>I | No. of<br>Hrs./<br>Week | No<br>of credits | Evaluation |            |            |
|-----------------|----------------------------------|--------|---------------------------|-------------------------|------------------|------------|------------|------------|
|                 |                                  |        |                           |                         |                  | Internal   | External   | TOTAL      |
| Major Subject-1 | Mathematics                      | C4     | Theory                    | 6                       | 5                | 40         | 60         | 100        |
|                 | Mathematics                      | C5     | Theory                    | 6                       | 5                | 40         | 60         | 100        |
| Major Subject-2 | Chemistry                        | C4     | Theory                    | 4                       | 4                | 40         | 60         | 100        |
|                 | Chemistry                        |        | Practical                 | 2                       | 1                |            | 50         | 50         |
|                 | Chemistry                        | C5     | Theory                    | 4                       | 4                | 40         | 60         | 100        |
|                 | Chemistry                        |        | Practical                 | 2                       | 1                |            | 50         | 50         |
| Vocational      | Basic Analytical Chemistry-II    | C7     | Theory                    | 4                       | 4                | 40         | 60         | 100        |
|                 | Basic Analytical Chemistry-II    |        | Practical                 | 2                       | 1                |            | 50         | 50         |
|                 | Industrial Safety and Management | C8     | Theory                    | 4                       | 4                | 40         | 60         | 100        |
|                 | Industrial Safety and Management |        | Practical                 | 2                       | 1                |            | 50         | 50         |
|                 |                                  |        | <b>TOTAL</b>              | <b>36</b>               | <b>30</b>        | <b>300</b> | <b>500</b> | <b>800</b> |

P. R. GOVERNMENT COLLEGE(A),  
KAKINADA DEPARTMENT OF CHEMISTRY  
B.VOC(PHARMACEUTICAL CHEMISTRY)(MATHS)STREAM CURRICU-  
LAR FRAMEWORK(CREDITTABLE)

Semester-V

| Subject/Paper                                                                                             | Theory<br>/Practical<br>t | No<br>of credit<br>s | Evaluation |
|-----------------------------------------------------------------------------------------------------------|---------------------------|----------------------|------------|
| First Phase of Apprenticeship bet-<br>ween 1 <sup>st</sup> and<br>2 <sup>nd</sup> year (Summer Vacation)  |                           | 0.4                  | 100        |
| Second Phase of Apprenticeship be-<br>tween 2 <sup>nd</sup> and<br>3 <sup>rd</sup> year (Summer Vacation) |                           | 0.4                  | 100        |
| INDUSTRIAL INTERNSHIP                                                                                     |                           | 4.8                  | 3000       |
| TOTAL                                                                                                     |                           | 30                   | 1000       |

**P.R.GOVERNMENT COLLEGE(A),  
KAKINADA DEPARTMENT OF CHEMISTRY  
B.VOC(PHARMACEUTICAL CHEMISTRY)(MATHS STREAM) CURRICU  
LAR FRAMEWORK (CREDIT TABLE)  
Semester – VI**

| Category   | Subject/Paper                               | Course | Theory<br>/Practical | No. of<br>Hrs./<br>Week | No<br>of<br>Credits | Evaluation |                   |
|------------|---------------------------------------------|--------|----------------------|-------------------------|---------------------|------------|-------------------|
|            |                                             |        |                      |                         |                     | Internal   | External<br>TOTAL |
| Vocational | Pharma Regulatory Affairs                   | C9     | Theory               | 4                       | 4                   | 40         | 60                |
|            | Pharma Regulatory Affairs                   |        | Practical            | 2                       | 1                   |            | 50                |
|            | Pharmaceutical Inorganic Chemistry          | C10    | Theory               | 4                       | 4                   | 40         | 60                |
|            | Pharmaceutical Inorganic Chemistry          |        | Practical            | 2                       | 1                   |            | 50                |
|            | Advanced Analytical Chemistry               | C11    | Theory               | 4                       | 4                   | 40         | 60                |
|            | Advanced Analytical Chemistry               |        | Practical            | 2                       | 1                   |            | 50                |
|            | Basic Quality Control and Quality Assurance | C12    | Theory               | 4                       | 4                   | 40         | 60                |
|            | Basic Quality Control and Quality Assurance |        | Practical            | 2                       | 1                   |            | 50                |
|            | Documentation for Quality Control           | C13    | Theory               | 4                       | 4                   | 40         | 60                |
|            | Documentation for Quality Control           |        | Practical            | 2                       | 1                   |            | 50                |
|            | Pharmaceutical and Medicinal Chemistry      | C14    | Theory               | 4                       | 4                   | 40         | 60                |
|            | Pharmaceutical and Medicinal Chemistry      |        | Practical            | 2                       | 1                   |            | 50                |
|            |                                             |        | <b>TOTAL</b>         | <b>36</b>               | <b>30</b>           | <b>240</b> | <b>660</b>        |
|            |                                             |        |                      |                         |                     |            | <b>900</b>        |

**P.R.GOVERNMENTCOLLEGE(A),KAKINADADEPARTM  
ENTOFCHEMISTRY**

**B.VOC(PHARMACEUTICALCHEMISTRY)(BIOLOGYSTREAM)CU  
RICULARFRAMEWORK(CREDITSTABLE)**

**SEMESTER-I**

| Category                   | Subject/Paper         | Course | Theory<br>/Practical | No.<br>ofHr<br>s./<br>Week | No<br>ofcredi<br>ts | Evaluation |                   |
|----------------------------|-----------------------|--------|----------------------|----------------------------|---------------------|------------|-------------------|
|                            |                       |        |                      |                            |                     | Internal   | External<br>TOTAL |
| <b>Firstlanguage</b>       | ENGLISHPRAXISCOURSE-I |        | Theory               | 4                          | 3                   | 50         | 50<br>100         |
| SecondLanguage             | Telugu/Sanskrit/Hindi |        | Theory               | 4                          | 3                   | 50         | 50<br>100         |
| LifeSkillCourse            | ComputerApplications  |        | Theory               | 2                          | 2                   | -          | 50<br>50          |
| SkillDevelopment<br>Course | Plantnursery          |        | Theory               | 2                          | 2                   | -          | 50<br>50          |
| MajorSubject-1             | Botany                | C1     | Theory               | 4                          | 4                   | 50         | 50<br>100         |
|                            | Botany                |        | Practical            | 2                          | 1                   |            | 50<br>50          |
| MajorSubject-2             | Chemistry             | C1     | Theory               | 4                          | 4                   | 50         | 50<br>100         |
|                            | Chemistry             |        | Practical            | 2                          | 1                   |            | 50<br>50          |
| <b>Vocational</b>          | BasicPharmaceutics-I  | C1     | Theory               | 4                          | 4                   | 50         | 50<br>100         |
|                            | BasicPharmaceutics-I  |        | Practical            | 2                          | 1                   |            | 50<br>50          |
|                            | BasicPharmaceutics-II | C2     | Theory               | 2                          | 2                   | -          | 50<br>50          |
|                            | BasicPharmaceutics-II |        | Practical            | 2                          | 1                   |            | 50<br>50          |
|                            |                       |        | <b>TOTAL</b>         | 34                         | 28                  | 250        | 600<br>850        |

| Category                   | Subject/Paper                            | Course | Theory /Practical<br>I | No. ofHrs./<br>Week | No ofcredits | Evaluation |          |       |
|----------------------------|------------------------------------------|--------|------------------------|---------------------|--------------|------------|----------|-------|
|                            |                                          |        |                        |                     |              | Internal   | External | TOTAL |
| First language             | ENGLISH PRAXIS COURSE-II                 |        | Theory                 | 4                   | 3            | 50         | 50       | 100   |
| Second Language            | Telugu/Sanskrit/Hindi                    |        | Theory                 | 4                   | 3            | 50         | 50       | 100   |
| Life Skill Courses         | Information and Communication Technology |        | Theory                 | 2                   | 2            | -          | 50       | 50    |
| Skill Development Course-1 | Food Adulteration                        |        | Theory                 | 2                   | 2            | -          | 50       | 50    |
| Skill Development Course-2 | Fruits and vegetables preservation       |        | Theory                 | 2                   | 2            | -          | 50       | 50    |
| Major Subject-1            | Botany                                   | C2     | Theory                 | 4                   | 4            | 50         | 50       | 100   |
|                            | Botany                                   |        | Practical              | 2                   | 1            |            | 50       | 50    |
| Major Subject-2            | Chemistry                                | C2     | Theory                 | 4                   | 4            | 50         | 50       | 100   |
|                            | Chemistry                                |        | Practical              | 2                   | 1            |            | 50       | 50    |
| Vocational                 | Basic Analytical Chemistry-I             | C3     | Theory                 | 4                   | 4            | 50         | 50       | 100   |
|                            | Basic Analytical Chemistry-I             |        | Practical              | 2                   | 1            |            | 50       | 50    |
|                            | Health Education and Community Pharmacy  | C4     | Theory                 | 2                   | 2            | -          | 50       | 50    |
|                            | Health Education and Community Pharmacy  |        | Project                | 2                   | 1            | -          | 50       | 50    |
|                            |                                          |        | <b>TOTAL</b>           | 36                  | 30           | 250        | 650      | 900   |



| Category                 | Subject/Paper                          | Course | Theory /Practical | No. ofHrs./ Week | No offered | Evaluation |            |            |
|--------------------------|----------------------------------------|--------|-------------------|------------------|------------|------------|------------|------------|
|                          |                                        |        |                   |                  |            | Internal   | External   | TOTAL      |
| First language           | ENGLISH PRAXIS COURSE-III              |        | Theory            | 4                | 3          | 40         | 60         | 100        |
| Second Language          | Telugu/Sanskrit/Hindi                  |        | Theory            | 4                | 3          | 40         | 60         | 100        |
| Life Skill Course-I      | Environment Education                  |        | Theory            | 2                | 2          | -          | 50         | 50         |
| Life Skill Course-II     | Personality Development and Leadership |        | Theory            | 2                | 2          | -          | 50         | 50         |
| Skill Development Course | Environment Audit                      |        | Theory            | 2                | 2          | -          | 50         | 50         |
| Major Subject-1          | Botany                                 | C3     | Theory            | 4                | 4          | 40         | 60         | 100        |
|                          | Botany                                 |        | practical         | 2                | 1          |            | 50         | 50         |
| Major Subject-2          | Chemistry                              | C3     | Theory            | 4                | 4          | 40         | 60         | 100        |
|                          | Chemistry                              |        | Practical         | 2                | 1          |            | 50         | 50         |
|                          | Advanced Pharmaceutics-I               | C5     | Theory            | 4                | 4          | 40         | 60         | 100        |
|                          | Advanced Pharmaceutics-I               |        | Practical         | 2                | 1          |            | 50         | 50         |
| Vocational               | Advanced Pharmaceutics-II              | C6     | Theory            | 2                | 2          | -          | 50         | 50         |
|                          | Advanced Pharmaceutics-II              |        | Project           | 2                | 1          | -          | 50         | 50         |
|                          |                                        |        | <b>TOTAL</b>      | <b>36</b>        | <b>30</b>  | <b>200</b> | <b>700</b> | <b>900</b> |

**P.R.GOVERNMENT COLLEGE(A),  
KAKINADA DEPARTMENT OF CHEMISTRY  
B.VOC(PHARMACEUTICAL CHEMISTRY)(BIOLOGY STREAM)CU  
RICULAR FRAMEWORK(CREDIT TABLE)  
Semester-IV**

| Category        | Subject/Paper                    | Course | Theory<br>/Practical<br>I | No.<br>of Hr<br>s./<br>Week | No<br>of credi<br>ts | Evaluation |            |            |
|-----------------|----------------------------------|--------|---------------------------|-----------------------------|----------------------|------------|------------|------------|
|                 |                                  |        |                           |                             |                      | Internal   | External   | TOTAL      |
| Major Subject-1 | Botany                           | C4     | Theory                    | 4                           | 4                    | 40         | 60         | 100        |
|                 | Botany                           |        | Practical                 | 2                           | 1                    |            | 50         | 50         |
|                 | Botany                           | C5     | Theory                    | 4                           | 4                    | 40         | 60         | 100        |
|                 | Botany                           |        | Practical                 | 2                           | 1                    |            | 50         | 50         |
| Major Subject-2 | Chemistry                        | C4     | Theory                    | 4                           | 4                    | 40         | 60         | 100        |
|                 | Chemistry                        |        | Practical                 | 2                           | 1                    |            | 50         | 50         |
|                 | Chemistry                        | C5     | Theory                    | 4                           | 4                    | 40         | 60         | 100        |
|                 | Chemistry                        |        | Practical                 | 2                           | 1                    |            | 50         | 50         |
| Vocational      | Basic Analytical Chemistry-II    | C7     | Theory                    | 4                           | 4                    | 40         | 60         | 100        |
|                 | Basic Analytical Chemistry-II    |        | Practical                 | 2                           | 1                    |            | 50         | 50         |
|                 | Industrial Safety and Management | C8     | Theory                    | 4                           | 4                    | 40         | 60         | 100        |
|                 | Industrial Safety and Management |        | Practical                 | 2                           | 1                    |            | 50         | 50         |
|                 |                                  |        | <b>TOTAL</b>              | <b>36</b>                   | <b>30</b>            | <b>255</b> | <b>645</b> | <b>900</b> |

P.R.GOVERNMENT COLLEGE(A),  
KAKINADA DEPARTMENT OF CHEMISTRY  
B.VOC(PHARMACEUTICAL CHEMISTRY)(BIOLOGY STREAM) CU  
CURRICULAR FRAMEWORK (CREDIT TABLE)

Semester-V

| Subject/Paper                                                                                     | Theory<br>/Practical | No of credits | Evaluation |
|---------------------------------------------------------------------------------------------------|----------------------|---------------|------------|
| First Phase of Apprenticeship between 1 <sup>st</sup> and 2 <sup>nd</sup> year (Summer Vacation)  |                      | 04            | 100        |
| Second Phase of Apprenticeship between 2 <sup>nd</sup> and 3 <sup>rd</sup> year (Summer Vacation) |                      | 04            | 100        |
| INDUSTRIAL INTERNSHIP                                                                             |                      | 12            | 200        |
| TOTAL                                                                                             |                      | 20            | 400        |

**P.R.GOVERNMENT COLLEGE(A),  
KAKINADA DEPARTMENT OF CHEMISTRY  
B.VOC(PHARMACEUTICAL CHEMISTRY)(BIOLOGY STREAM) CU  
RICULAR FRAMEWORK (CREDIT TABLE)  
Semester - VI**

| Category   | Subject/Paper                               | Course | Theory /Practical | No. of Hrs./Week | No. of credits | Evaluation |            |            |
|------------|---------------------------------------------|--------|-------------------|------------------|----------------|------------|------------|------------|
|            |                                             |        |                   |                  |                | Internal   | External   | TOTAL      |
| Vocational | Pharma Regulatory Affairs                   | C9     | Theory            | 4                | 4              | 40         | 60         | 100        |
|            | Pharma Regulatory Affairs                   |        | Practical         | 2                | 1              |            | 50         | 50         |
|            | Pharmaceutical Inorganic Chemistry          | C10    | Theory            | 4                | 4              | 40         | 60         | 100        |
|            | Pharmaceutical Inorganic Chemistry          |        | Practical         | 2                | 1              |            | 50         | 50         |
|            | Advanced Analytical Chemistry               | C11    | Theory            | 4                | 4              | 40         | 60         | 100        |
|            | Advanced Analytical Chemistry               |        | Practical         | 2                | 1              |            | 50         | 50         |
|            | Basic Quality Control and Quality Assurance | C12    | Theory            | 4                | 4              | 40         | 60         | 100        |
|            | Basic Quality Control and Quality Assurance |        | Practical         | 2                | 1              |            | 50         | 50         |
|            | Documentation for Quality Control           | C13    | Theory            | 4                | 4              | 40         | 60         | 100        |
|            | Documentation for Quality Control           |        | Practical         | 2                | 1              |            | 50         | 50         |
|            | Pharmaceutical and Medicinal Chemistry      | C14    | Theory            | 4                | 4              | 40         | 60         | 100        |
|            | Pharmaceutical and Medicinal Chemistry      |        | Practical         | 2                | 1              |            | 50         | 50         |
|            |                                             |        | <b>TOTAL</b>      | <b>36</b>        | <b>30</b>      | <b>255</b> | <b>645</b> | <b>900</b> |

**P.R.GOVERNMENT COLLEGE(AUTONOMOUS)KAKINADA**  
**CURRICULAR FRAMEWORK FOR B.VOC COURSE UNDER NSQF FOR THE YEAR 2020-21**  
**B.Voc Pharmaceutical Chemistry (Maths stream/Biology stream)**

| SUBJECT/SEMESTER                         |                                                                                        | I     |     | II    |     | III   |     | IV  |     | V   |     | VI  |     |
|------------------------------------------|----------------------------------------------------------------------------------------|-------|-----|-------|-----|-------|-----|-----|-----|-----|-----|-----|-----|
|                                          |                                                                                        | H/W   | C   | H/W   | C   | H/W   | C   | H/W | C   | H/W | C   | H/W | C   |
| English                                  |                                                                                        | 4     | 3   | 4     | 3   | 4     | 3   |     |     |     |     |     |     |
| Second Language (Telugu/Hindi/Sanskrit)  |                                                                                        | 4     | 3   | 4     | 3   | 4     | 3   |     |     |     |     |     |     |
| Life Skill Courses                       |                                                                                        | 2     | 2   | 2     | 2   | 2+2   | 2+2 |     |     |     |     |     |     |
| Skill Development Courses                |                                                                                        | 2     | 2   | 2+2   | 2+2 | 2     | 2   |     |     |     |     |     |     |
| <b>Core Subjects</b>                     |                                                                                        |       |     |       |     |       |     |     |     |     |     |     |     |
| Major Subject-1                          | C1 to C5 Maths/Botany (Theory & Practicals)                                            | 6/4+2 | 4+1 | 6/4+2 | 4+1 | 6/4+2 | 4+1 | 4+2 | 4+1 |     |     |     |     |
|                                          | C1 to C5 Chemistry (Theory & Practicals)                                               | 4+2   | 4+1 | 4+2   | 4+1 | 4+2   | 4+1 | 4+2 | 4+1 |     |     |     |     |
| Vocational                               | C1 to C14 including SECP pharmaceutical Chemistry (Theory & Practicals)                | 4+2   | 4+1 | 4+2   | 4+1 | 4+2   | 4+1 | 4+2 | 4+1 | 4+2 | 4+1 | 4+2 | 4+1 |
|                                          | C2, C4, C6 (Theory and Lab/Institutional/Industrial Training Pharmaceutical Chemistry) | 2+2   | 2+1 | 2+2   | 2+1 | 2+2   | 2+1 | 4+2 | 4+1 | 4+2 | 4+1 | 4+2 | 4+1 |
| <b>Total Hrs/Week (Academic Credits)</b> |                                                                                        | 34    | 28  | 36    | 30  | 36    | 30  | 36  | 30  | 36  | 30  | 36  | 30  |
| <b>Extension Activities</b>              |                                                                                        |       |     |       |     |       |     |     |     |     |     |     |     |
| NCC/NSS/Sports/Extra Curricular          |                                                                                        |       |     |       |     |       |     |     |     |     |     |     |     |
| Yoga                                     |                                                                                        |       |     |       |     |       | 1   |     |     |     |     |     |     |
| Extra Credits                            |                                                                                        |       |     |       |     |       |     |     |     |     |     |     |     |
| <b>Hrs/W (Total Credits)</b>             |                                                                                        | 34    | 28  | 36    | 30  | 36    | 31  | 36  | 33  | 36  | 30  | 12  | 4   |

Third Phase of Apprenticeship for the entire V/VI Semester  
 and Second Phase (2 Spells) of Apprenticeship between I and 2nd year and between 2nd and 3rd year Summer Vacation

### Marks and Credits Distribution

| S.No. | Course Type                                             | No. of Courses | Course wise Teaching Hrs/Week | Credits for each Course | Total Credits | Each Course Evaluation |              |                                  |       | Total (Theory + Practical) | Total Marks (Maths Stream/Biology Stream) |
|-------|---------------------------------------------------------|----------------|-------------------------------|-------------------------|---------------|------------------------|--------------|----------------------------------|-------|----------------------------|-------------------------------------------|
|       |                                                         |                |                               |                         |               | Theory                 |              | Practical (Maths Stream/Biology) |       |                            |                                           |
|       |                                                         |                |                               |                         |               | Continuous Assessment  | End Semester |                                  | Total |                            |                                           |
| 1     | English                                                 | 3              | 4                             | 3                       | 9             | 40                     | 60           |                                  | 100   | 100                        | 300                                       |
| 2     | Second Language                                         | 3              | 4                             | 3                       | 9             | 40                     | 60           |                                  | 100   | 100                        | 300                                       |
| 3     | Life Skill Courses                                      | 4              | 2                             | 2                       | 8             | 0                      | 50           |                                  | 50    | 50                         | 200                                       |
| 4     | Skill Development Courses                               | 4              | 2                             | 2                       | 8             | 0                      | 50           |                                  | 50    | 50                         | 200                                       |
| 5     | Core/SE-I Maths/Botany                                  | 5              | 6/4+2                         | 4+1                     | 25            | 40                     | 60           | 0/50                             | 100   | 100/150                    | 500/750                                   |
| 6     | Core/SE-II Chemistry                                    | 5              | 4+2                           | 4+1                     | 25            | 40                     | 60           | 0/50                             | 100   | 100/150                    | 750                                       |
| 7     | Vocational Courses (C1 to C14) Pharmaceutical Chemistry | 11             | 4+2                           | 4+1                     | 55            | 40                     | 60           | 50                               | 100   | 150                        | 1650                                      |
|       |                                                         |                |                               |                         |               |                        | 50           | 50                               | 50    | 100                        | 300                                       |
| 8     | Summer Vacation Internship                              | 2              |                               | 4                       | 8             |                        |              |                                  |       | 100                        | 200                                       |
| 9     | Industrial Internship for one full Semester             | 1              |                               | 12                      | 12            |                        |              |                                  |       | 200                        | 200                                       |
| 10    | Extension Activities (Non Academic Credits)             |                |                               |                         |               |                        |              |                                  |       |                            |                                           |
|       | NCC/NSS/Sports/Extra Curricular                         |                |                               | 2                       | 2             |                        |              |                                  |       |                            |                                           |
|       | Yoga                                                    | 2              |                               | 1                       | 2             |                        |              |                                  |       |                            |                                           |
|       | Extra Credits                                           |                |                               |                         |               |                        |              |                                  |       |                            |                                           |
|       | Hrs/W (Total Credits) & Marks                           | 43             |                               |                         | 172           |                        |              |                                  |       |                            | 4600/4850                                 |

**PITHAPURRAJAH'S GOVERNMENT COLLEGE (AUTONOMOUS), KAKINADA**  
**B.VOCCOURSES UNDER NSQF SCHEME**

**STUDENT ELIGIBILITY AND FACULTY ELIGIBILITY**

| S.NO | NAME OF THE COURSE                        | STUDENTS ELIGIBILITY<br>(10+2 OR EQUIVALENT WITH SPECIFIC GROUP IF ANY) | FACULTY ELIGIBILITY WITH SPECIALIZATION                                                    |
|------|-------------------------------------------|-------------------------------------------------------------------------|--------------------------------------------------------------------------------------------|
| 1    | B.VOC (COMMERCIAL AQUACULTURE)            | Intermediate/10+2 or equivalent with Bi.P.C/Biology                     | M.Sc<br>Aquaculture/Marine Biology/Zoology with fishery biology spe                        |
| 2    | B.VOC (HORTICULTURE)                      | Intermediate/10+2 or equivalent with Bi.P.C/Biology                     | M.Sc Horticulture/Biology/Botany with Horticulture Specialization                          |
| 3    | B.VOC (PHARMACEUTICAL CHEMISTRY)          | Intermediate or 10+2 with MPC/BiPC group                                | M.Pharm/M.Sc (Pharmaceutical Chemistry)/M.Sc (Chemistry)                                   |
| 4    | B.VOC (FOOD TECHNOLOGY)                   | Intermediate or 10+2 with MPC/BiPC group                                | M.Sc (Food Technology)/M.Sc (Food Processing)/M.Sc (Food and Nutrition)                    |
| 5    | B.VOC (JOURNALISM AND MASS COMMUNICATION) | Intermediate or 10+2 or equivalent                                      | M.A (Journalism)                                                                           |
| 6    | B.VOC (HOTEL MANAGEMENT)                  | Intermediate/10+2 or equivalent                                         | MBA (Hotel Management)/M.Com Hotel Management/M.Comor MBA with Diploma in Hotel Management |

## QUESTIONPAPERSETTERSFORB.VOC(PHARMACEUTICALCHEMISTRY)

The following papersetters for Vocational (Pharmaceutical Chemistry) papers are recommended.

| S. No. | Name of the Faculty     | Designation           | Address for Correspondence                                                          | Mobile Number          | E-mail ID                     |
|--------|-------------------------|-----------------------|-------------------------------------------------------------------------------------|------------------------|-------------------------------|
| 1      | Sri V. Sanjeev Kumar    | Lecturer in Chemistry | P.R. Government Degree College, Kakinada, East Godavari District.                   | 9849324966             | skvudi1972@gmail.com          |
| 2      | Malikarjuna Sarma       | Lecturer in Chemistry | A.S.D. GOVERNMENT COLLEGE for women (A), Kakinada Kakinada, East Godavari District. | 9676822550             | V.mallikarjunasarma@gmail.com |
| 3      | Sri V. Sridhar          | Lecturer in Chemistry | Government arts college (A), RAJAMUNDRY, East Godavari District                     | 8919262964, 7386048119 | sridhar.vegi07@gmail.com      |
| 4      | Dr. B. Malikarjuna      | Lecturer in Chemistry | Government College (Autonomous), Rajahmundry                                        | 8985503523             | mallik.chem@gmail.com         |
| 5      | Dr. G. Venkata Rao      | Lecturer in Chemistry |                                                                                     | 9440444223             | gnrgjcn@gmail.com             |
| 6      | Sri B. Venkata Rao      | Lecturer in Chemistry | Government arts college (A), RAJAMUNDRY, East Godavari District                     |                        | venkatbasa@gmail.com          |
| 7      | Smt. Manchiraju Padmaja | Lecturer in Chemistry | Government arts college (A), RAJAMUNDRY, East Godavari District                     | 9441653995             | padmaja717@gmail.com          |

P.R.GOVERNMENT COLLEGE(A), KAKINADA B.  
Voc (PHARMACEUTICAL  
CHEMISTRY) FIRST YEAR SEMESTER-II  
COURSE-3: BASIC ANALYTICAL CHEMISTRY-I

**Course objectives:**

To make the student

- i. Understand the preparation of standard solutions.
- ii. Understand different theories of acids and bases.
- iii. Learn Stoichiometric calculations.

**Outcomes:**

The student will be able to

- i. Learn role of buffers in pharmacy
- ii. Understand the uses of acids and bases in pharmaceutical formulations
- iii. Calculate the oxidation number and its importance in redox reactions.
- iv. Learn the theoretical principles of inorganic qualitative analysis.
- v. Learn stoichiometric calculations

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**Unit-I Solutions, Acids and Bases**

Solutions, solvent and solute of a true solution. Theories of Acids and Bases - The Arrhenius theory with examples, Limitations - Bronsted-Lowry theory with examples and Limitations - Conjugate acid-base pairs with examples - Lewis Theory with examples - Role of acids and bases in Pharmacy. Uses of some acids and bases in Pharmaceutical formulations (Boric acid, Hydrochloric acid, Ammonia and Calcium Hydroxide). pH definition and calculation of pH of acids and base solutions. Buffer solutions. Definition and classification with examples. Role of buffers in Pharmacy. Selection of pharmaceutical buffers.

**Unit-II Stoichiometry-I**

Balancing chemical equations - Concept of mole, calculation of molecular weights and equivalent weights of acids ( $\text{HCl}$ ,  $\text{H}_2\text{SO}_4$ ,  $\text{CH}_3\text{COOH}$  &  $\text{HNO}_3$ ), bases ( $\text{NaOH}$ ,  $\text{Ca(OH)}_2$ ), oxidizing ( $\text{K}_2\text{Cr}_2\text{O}_7$ ,  $\text{KMnO}_4$  in acid and alkaline media) and reducing agents ( $\text{H}_2\text{C}_2\text{O}_4$ ,  $\text{FeSO}_4$ ) and salts ( $\text{NaCl}$ ,  $\text{Na}_2\text{CO}_3$ ,  $\text{K}_2\text{SO}_4$ ) with examples - Stoichiometric calculations involving weight-weight, weight-volume, mole-weight and mole - volume relations with examples. Oxidation state - Oxidation number - rules for calculation of oxidation numbers and calculation of oxidation numbers with examples ( $\text{K}_2\text{Cr}_2\text{O}_7$ ,  $\text{KMnO}_4$ ,  $\text{H}_2\text{SO}_4$ ,  $\text{Cr}_2\text{O}_3$ ,  $\text{K}_2\text{CrO}_4$ ,  $\text{MnO}_2$ ,  $\text{MnSO}_4$ ,  $\text{MnO}_4^-$ ,  $\text{Cr}_2\text{O}_7^{2-}$ ) - Concept of oxidation and reduction, oxidizing agent and reducing agent - Redox reactions

P.R.GOVERNMENT COLLEGE(A), KAKINADA B.V  
of (PHARMACEUTICAL  
CHEMISTRY) FIRST YEAR SEMESTER-II  
COURSE-3: BASIC ANALYTICAL CHEMISTRY-I

PAPER:- BASIC ANALYTICAL CHEMISTRY-I

Time 2 hrs.

Max marks-50M

PART-I

SECTION-A

Answer any THREE questions choosing at least ONE question from each section  
3x10=30M

1. One question is to be set from unit-I
2. One question is to be set from unit-I
3. One question is to be set from unit-II

SECTION-B

4. One question is to be set from unit-II
5. One question is to be set from unit-III
6. One question is to be set from unit-IV

PART-II

Answer any FOUR questions

4x5=20M

7. One question is to be set from unit-I
8. One question is to be set from unit-I
9. One question is to be set from unit-II
10. One question is to be set from unit-II
11. One question is to be set from unit-III
12. One question is to be set from unit-III
13. One question is to be set from unit-IV

P.R.GOVERNMENT COLLEGE(A), KAKINADA B.V  
∞ (PHARMACEUTICAL  
CHEMISTRY) FIRST YEAR SEMESTER-II  
COURSE-3: BASIC ANALYTICAL CHEMISTRY-I

PAPER:- BASIC ANALYTICAL CHEMISTRY-I

**QUESTION BANK**

**Essay questions (10M)**

**Unit-I**

1. Explain (i) Bronsted Lowry Acid-Base theory and (ii) Arrhenius theory of acids and bases with examples.
2. Define buffer solution. Explain the classification of buffers. Explain the selection of pharmaceutical buffers.
3. Explain the role of acids and bases in pharmacy. Write the uses of Hydrochloric acid and Calcium Hydroxide in pharmaceutical formulations.

**Unit-II**

1. If 40g of Calcium carbonate is completely calcined, how much amount of CaO is formed? And how much volume of  $\text{CO}_2$  is liberated?
2. The balanced equation for the synthesis of ammonia is  $3\text{H}_2(\text{g}) + \text{N}_2(\text{g}) \rightarrow 2\text{NH}_3(\text{g})$ . Calculate:  
a. the mass in grams of  $\text{NH}_3$  formed from the reaction of 64.0g of  $\text{N}_2$   
b. the mass in grams of  $\text{N}_2$  required to form 1.00kg of  $\text{NH}_3$ .
3. A metal reacts with an acid to produce 78.4L of hydrogen gas at STP. How many moles of  $\text{H}_2$  were produced?
4. Balance the following redox reaction by ion-electron method.  $\text{Fe}^{2+}(\text{aq}) + \text{Cr}_2\text{O}_7^{2-}(\text{aq}) \rightarrow \text{Fe}^{3+}(\text{aq}) + \text{Cr}^{3+}(\text{aq})$  (acid medium)
5. Balance the following redox reaction by ion-electron method.  $\text{MnO}_4^-(\text{aq}) + \text{I}^-(\text{aq}) \rightarrow \text{MnO}_2(\text{s}) + \text{I}_2(\text{s})$  (alkaline medium)

**Unit-III**

1. Explain common ion effect. Write the applications of common ion effect in qualitative analysis.
2. Explain Solubility product. Write the applications of Solubility product in qualitative analysis.
3. Write the reactions of (i) Chloride and (ii) Ammonium ions.
4. Write the reactions of (i) Acetate and (ii) Lead ions.

#### Unit-IV

1. Explain (i) Quinonoid theory and (ii) Ostwald theory of acid-base indicators.
2. Define "Molarity". How do you prepare a standard solution of 0.05 M and 0.1 N  $\text{Na}_2\text{CO}_3$ ?
3. What are oxidizing agents? How do you prepare 0.02 N  $\text{K}_2\text{Cr}_2\text{O}_7$  solution in acid medium?
4. Explain the theory of redox titrations. Write any two examples of redox indicators.

#### SHORT ANSWER QUESTIONS (5M)

#### Unit-I

1. Explain Lewis theory with examples.
2. Define pH. Calculate the pH of 0.01 M  $\text{HNO}_3$ .
3. Define conjugate acid-base pair. Give examples.

#### Unit-II

1. Define mole, calculate the molecular weights and equivalent weights of  $\text{CH}_3\text{COOH}$ ,  $\text{Ca}(\text{OH})_2$ .
2. Write about relation between mole-weight and mole-volume with examples.
3. Define Oxidation number and write rules for calculation of oxidation numbers and calculate the oxidation number of  $\text{KMnO}_4$ .

#### Unit-III

1. Write the reactions of Nitrate ion.
2. Write the reactions of Cupric ion.
3. Write the reactions of Ferrous ion.

#### Unit-IV

1. Define the terms Titrant, titrand, analyte.
2. How do you prepare 250 ml of 0.25 M  $\text{NaOH}$  solution?
3. Explain the theory of acid-base titrations.

P.R.GOVERNMENTCOLLEGE(A),KAKINADAB.  
Voc (PHARMACEUTICAL  
CHEMISTRY)FIRSTYEARSEMESTER-II  
COURSE-3:BASICANALYTICALCHEMISTRY-I

PRACTICALS

Preparationofinorganiccompounds

- i. Potashalum
- ii. Mohrsalt
- iii. Tetra aminecopper(II)sulphate
- iv. Potassiumtrioxalatoferrate(II)trihydrate
- v. PreparationofBoricacid

P.R.GOVERNMENT COLLEGE(A), KAKINADA B.  
Voc (PHARMACEUTICAL  
CHEMISTRY) FIRST YEAR SEMESTER-II  
COURSE-4: HEALTH EDUCATION AND COMMUNITY PHARMACY

**Scope:**

The purpose of this course is to introduce to students a number of health issues and their challenges. This course also introduced a number of diseases caused due to nutritional deficiencies and microorganisms.

**Objectives:**

After the successful completion of this course, the students shall be able to:

- Acquire high consciousness/realization of current issues related to health and pharmaceutical problems within the country and worldwide.
- Have a critical way of thinking based on current healthcare development.
- Evaluate alternative ways of solving problems related to health and pharmaceutical issues

**UNIT I**

**Concept of Health:** Definition of physical Health, mental Health, social Health, spiritual Health, determinant of health, indicator of health, concept of disease, natural history of diseases, disease causing agents, concept of prevention of diseases

**UNIT II**

**Nutrition and Health:** Classification of foods, requirements, (disease-induced due to deficiency of proteins, vitamins and minerals-treatment and prevention), *Balanced diet, Nutritional deficiency disorders, their treatment & prevention*  
Demography and family planning-  
Demographic cycle, fertility, family planning, contraceptive methods, behavioral methods, natural family planning methods, chemical methods, mechanical methods, hormonal contraceptives. ; *Medical termination of pregnancy*

**UNIT III**

**First Aid:** Emergency treatment in shock, snake bite, burns, poisoning, heart diseases, fractures and resuscitation methods. Elements of minor surgery and dressings

**UNIT IV**

**Communicable & Noncommunicable Diseases:** Causative agents, mode of transmission and prevention

Respiratory infections- Chickenpox, measles, influenza, whooping cough and TB

Intestinal Infections-

poliomyelitis, Hepatitis, cholera, Typhoid, food poisoning, ~~Anthrop~~ ~~Infections~~

Malaria, filarial, plague, dengue

Surface infection- Rabies, Tetanus, Leprosy

Sexually transmitted diseases: Syphilis, Gonorrhea, AIDS

#### Recommended Books

1. Social Pharmacy-  
Innovation and development ed. Geoff Harding, Sarah Nettleton and ~~Kelvin~~ ~~for~~ ~~The Ph~~  
armaceutical Press.
2. Text Book of Community Pharmacy Practice. RPSGB Publication
3. Community Pharmacy Handbook- Jonathan Waterfield
4. S. Khurana, P. Suresh and R. Kalsi. Health Education & Community Pharmacy. ~~SV~~ ~~K~~ ~~Co~~
5. Social Pharmacy: Tayler, Geoffery. Pharmaceutical Press. London.

**P.R. GOVERNMENT COLLEGE (A), KAKINADA**  
**B. Voc (PHARMACEUTICAL CHEMISTRY)**  
**FIRST YEAR SEMESTER-II**  
**COURSE-4: HEALTH EDUCATION AND COMMUNITY PHARMACY**  
**Weightage to content**

| Sl. No. | Course Content | Essay (10M) | Short (5M) | Total marks |
|---------|----------------|-------------|------------|-------------|
| 1.      | UNIT-I         | 2           | 2          | 30          |
| 2.      | UNIT-II        | 2           | 2          | 20          |
| 3.      | UNIT-III       | 1           | 2          | 20          |
| 4.      | UNIT-IV        | 1           | 1          | 25          |
|         | Total          | 6           | 7          | 95          |

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**Model Question Paper**

Time 2hrs.

Max.Marks-50M

**PART-I**

**SECTION-A**

**Answer any THREE questions choosing at least ONE question from each section**

**3x10=30M**

1. One question is to be set from unit-I
2. One question is to be set from unit-I
3. One question is to be set from unit-II

**SECTION-B**

4. One question is to be set from unit-II
5. One question is to be set from unit-III
6. One question is to be set from unit-IV

**PART-II**

**Answer any FOUR questions**

**4x5=20M**

7. One question is to be set from unit-I
8. One question is to be set from unit-I
9. One question is to be set from unit-II
10. One question is to be set from unit-II
11. One question is to be set from unit-III
12. One question is to be set from unit-III
13. One question is to be set from unit-IV

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**Model Question Paper**

Time 2 hrs.

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2. One question is to be set from unit-I
3. One question is to be set from unit-II

**SECTION-B**

4. One question is to be set from unit-II
5. One question is to be set from unit-III
6. One question is to be set from unit-IV

**PART-II**

**Answer any FOUR questions**

**4x5=20M**

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**QUESTIONBANK**  
**Essayquestions(10M)**

**Unit-I**

1. Explain the following.
  - i. Physical health
  - ii. Mental health
  - iii. Social health
  - iv. Spiritual health
2. Explain determinant of health.
3. Explain indicator of health.

**Unit-II**

1. Explain deficiency diseases, treatment and prevention of diseases due to the deficiency of water soluble vitamins.
2. Define family planning. Write about various types of contraceptive methods.

**Unit-III**

1. Define first aid. Describe emergency treatment in shock and snake bite.
2. Define first aid. Describe emergency treatment in burns and poisoning.

**Unit-IV**

1. Explain causative agents, mode of transmission and prevention of chicken pox and rabies.
2. Explain causative agents, mode of transmission and prevention of polio myelitis and Hepatitis.
3. Explain causative agents, mode of transmission and prevention of chicken pox and rabies.
4. Explain causative agents, mode of transmission and prevention of Syphilis and AIDS.

### SHORTANSWERQUESTIONS(5M)

#### **Unit-I**

1. Describebrieflydiseasecausingagents.
2. Writeabouttheconceptofpreventionofdiseases.

#### **Unit-II**

1. Writeaboutclassificationoffoods.
2. Writethediseasescausedduetodeficiencyofproteins.Writethetreatmentandprev  
entionforthedeficiencyofproteins.
3. Writeanoteondemographycycle.

#### **Unit-III**

1. Describeemergencytreatmentforfractures.
2. Writeanoteondressings.

#### **Unit-IV**

1. Whatarecommunicableandnoncommunicablediseases?Giveexamples.
2. Writeaboutcausativeagents,modeoftransmissionandpreventionofmalari  
a.
3. Write about causative  
agents,modeoftransmissionandpreventionofleprosy.

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Practicals:

- 1.Projectwork