

NOTIFICATION

No. 49/ 2017

Date: 17./06/2017

Subject : I) Continuation of Prospectus No.2014121 prescribed for B.Sc.Part-I for the Session 2017-18.

II) Introduction of new subjects i.e. Food Processing and Technology for B.Sc. Part-I (Sem-I & II) from the session 2017-18.

I) It is notified for general information of all concerned that the Prospectus of B.Sc.Part-I (Sem-I & II) bearing No.2014121 prescribed for the Academic Session 2016-17 shall continue for the session 2017-18 along with the following substitutions :

- 1) The syllabi for the subjects 'Compulsory English; Compulsory Marathi; Compulsory Hindi, Compulsory Urdu; Compulsory Sanskrit; & Supplementary English' for B.Sc.Part-I (Sem-I & II) printed on page Nos.1 to 13 be substituted by the **Appendix-A** appended with this Notification."
- 2) The syllabi for the subject 'Geology' for B.Sc.Part-I (Sem-I & II) printed on page Nos.33-34 & 110-116 be substituted by the **Appendix-B** appended with this Notification."
- 3) The syllabi for the subjects 'Computer Science, Computer Application, Information Technology & Computer Application (Vocational)' for B.Sc.Part-I (Sem-I & II) printed on page Nos.61 to 66 and 146 to 151 be substituted by the **Appendix-C** appended with this Notification.

II) It is further notified for general information of all concerned that the authorities of the University have introduced the new subject **Food Processing and Technology** at B.Sc.Part-I (Sem-I & II) from the session 2017-18 as "1S Food Processing Technology (Food Chemistry)" and "2S Food Processing Technology (Food Nutrition)" as given in **Appendix-D**.

Sd/-
(Dr.A.P.Deshmukh)
Registrar
Sant Gadge Baba Amravati University

Appendix-A

Syllabus prescribed for B.Sc.Part-I (Sem-I & II) (Languages)
'Compulsory English; Compulsory Marathi, Compulsory Hindi, Compulsory Urdu,
Compulsory Sanskrit, Supplementary English'

B.Sc. Part I (Sem-I & Sem-II)
Compulsory English

Prose Section:

- | | |
|--|-------------------|
| 1. The Child | -Premchand |
| 2. A Simple Philosophy | - Seathl |
| 3. Values in Life | - R. Kipling |
| 4. Water- The Elixir of Life | - CV Raman |
| 5. Introduction to the Right to Information Act 2005 | - Pralhad Kachare |
| 6. What is courage? | - W. Slim |
| 7. The Hazards of Food Colouring | - — |
| 8. Kabuliwallah | - R. Tagore |
| 9. The Eyes Are not Here | - Ruskin Bond |
| 10. My Lost Dollar | - Stephen Leacock |

Poetry Section :

- | | |
|---|----------------------|
| 1. Say Not the Struggle Naught Availeth | - Arthur Hugh Clough |
| 2. God's Grandeur | - GM Hopkins |
| 3. Ode To Autumn | - John Keats |
| 4. The Bangle Sellers | - Sarojini Naidu |
| 5. Stay Calm | - G. Kleiser |
| 6. A Psalm of Life | - H. W. Longfellow |
| 7. O Captain, My captain! | - Walt Whitman |
| 8. The Quality of Mercy | - W. Shakespeare |
| 9. Father Returning Home | - Dilip Chitre |
| 10. The World is Too Much with Us | - W. Wordsworth |

Grammar : For I & II Semester

- 1) Parts of Speech.
- 2) Use of Articles, Prepositions and Tense.
- 3) Transformation of Sentences.

Communication Skills:

For I Semester

- 1) Everyday English Part I
- 2) Preparing Curriculum Vitae
- 3) Letter Writing (Applications, Business, Formal letters)

For II Semester

- 1) Everyday English Part II
- 2) Report Writing
- 3) Paragraph Writing

COMPULSORY ENGLISH
1S Compulsory English

- | | |
|-------------------------|-----------------|
| i) Theory | 40 marks |
| ii) Internal Assessment | <u>10 marks</u> |
| Total | 50 marks |

i) Theory : Time : 2 Hours

Total marks : 40

Prose Section :

- | | |
|--|-------------------|
| 1. The Child | - Premchand |
| 2. A Simple Philosophy | - Seathal |
| 3. Values in Life | - R. Kipling |
| 4. Water- The Elixir of Life | - C.V.Raman |
| 5. Introduction to Right to Information Act 2005 | - Pralhad Kachare |

Poetry Section :

- | | |
|---|----------------------|
| 1. Say Not the Struggle Naught Availeth | - Arthur Hugh Clough |
| 2. God's Grandeur | - GM Hopkins |
| 3. Ode to Autumn | - J Keats |
| 4. Bangle Sellers | - S Naidu |
| 5. Stay Calm | - G. Kleiser |

Grammar : For Sem-I

- 1) Parts of Speech.
- 2) Use of Articles, Prepositions and Tense.
- 3) Transformation.

Communication Skills : For Sem-I

- 1) Everyday English Part I
- 2) Preparing Curriculam Vitae
- 3) Letter Writing (Applications, Business, Formal letters)

Distribution of Marks.

Maximum Marks : 40

Time : Two Hours

- | | | |
|-------|---|----------|
| Q.1 : | There shall be five short answer questions based on prescribed prose. | 05 marks |
| Q.2 : | There shall be four long answer questions based on prescribed prose. Out of these, students will have to answer any two questions of five marks each. | 10 marks |
| Q.3 : | There shall be four long answer questions based on prescribed poems. Out of these, students will have to answer any two questions of five marks each. | 10 marks |
| Q.4 : | There shall be five questions of one mark each, for Do as directed from Grammer - Parts of Speech, Use of articles and Prepositions, Tenses, Transformation of Sentences. | 05 marks |
| Q.5 : | There shall be five questions of one mark each, from Everyday English | 05 marks |
| Q.6 : | There shall be one question on Preparing a Curriculam Vitae or Letter Writing . | 05 marks |

- | | | |
|----------------------------------|--------------------|-------------------|
| ii) Internal Assessment – | i) One Unit Tests | - 06 marks |
| | ii) One Assignment | - <u>04 marks</u> |
| | Total | 10 marks |

2S Compulsory English

- | | |
|-------------------------|-----------------|
| i) Theory | 40 marks |
| ii) Internal Assessment | <u>10 marks</u> |
| Total | 50 marks |

i) Theory : Time : 2 Hours

Total Marks : 40

Prose Section :

- | | |
|----------------------------------|-----------|
| 6. What is courage? | - W. Slim |
| 7. The Hazards of Food Colouring | - |

8. Kabuliwallah - R. Tagore
9. The Eyes Are not Here - Ruskin Bond
10. My Lost Dollar - Stephen Leacock

Poetry Section :

6. A Psalm of Life - H. W. Longfellow
7. O Captain, My captain! - Walt Whitman
8. The Quality of Mercy - W. Shakespeare
9. Father Returning Home - Dilip Chitre
10. The World is too much with us - W. Wordsworth

Grammar :

For Sem-II

- 1) Parts of Speech.
2) Use of Articles, Prepositions and Tenses.
3) Transformation.

For Sem-II

- 1) Everyday English Part II
2) Report Writing
3) Paragraph Writing

Distribution of Marks.

Maximum Marks : 40

Time : Two Hours

- Q.1 : There shall be five short answer questions based on prescribed prose. 05 marks
Q.2 : There shall be four long answer questions based on prescribed prose.
Out of these, students will have to answer any two questions of five marks each. 10 marks
Q.3 : There shall be four long answer questions based on prescribed
poems. Out of these, students will have to answer any two
questions of five marks each. 10 marks
Q.4 : There shall be five questions of one mark each, for Do as
directed from Grammar - Parts of Speech, Use of articles and
Prepositions, Tenses, Transformation of Sentences. 05 marks
Q.5 : There shall be five questions of one mark each, from Everyday English 05 marks
Q.6 : There shall be one question either on Report writing or Paragraph writing. 05 marks

- ii) Internal Assessment – i) One Unit Tests - 06 marks
ii) One Assignment - 04 marks
Total 10 marks

List of Reference Books :

- 1) Intermediate English Grammar, Raymond Morphy, Publisher- Cambridge.
2) High School English Grammar, P.C.Wren & Martin, Publisher- S.Chand.
3) Developing Communication Skills, Krishna Mohan & Meera Banargee, Publisher- Macmillan India Limited.
4) Macmillan Foundation English, R.K. Dwivedi & A. Kumar, Publisher- Macmillan India Limited.
5) Exploring Language & Literature, Publisher Orient Blackswan
6) Advanced Skills in English, Publisher Orient Blackswan

Names of the books & its publisher from where the prescribed prose and poetry pieces are available :

- 1) Glimpses of Life: an anthology of Life Publisher- Orient Blackswan
2) Wisdom and Experience: An Anthology for Degree classes- Orient Blackswan
3) Echoes: A Course in English Literature and Language, Madhulika Jha, Orient Blackswan
4) Honey Dew: An Anthology of Prose, Poetry and One-act Plays, publisher - Orient Blackswan
7) Prism Spoken and written Communication Prose and poetry, Board of editors, Orient Blackswan.
8) Radiance, Communication skills, Prose and Poetry, publisher- orient Blackswan
9) The Joy of Reading Selected prose and Poetry, publisher- orient Blackswan
10) New Dawn, An anthology of prose and Poetry, publisher- orient Blackswan
11) Literary Landscapes, Board of Editors, publisher- orient Blackswan
12) Visionary Gleam, Orient Blackswan
13) Auroral Musings, Orient Blackswan
14) Springs of Gold, Orient Blackswan
15) Intermediate English Grammar, Raymond Morphy, Publisher- Cambridge.
16) High School English Grammar, P.C.Wren & Martin, Publisher- S.Chand.
17) Developing Communication Skills, Krishna Mohan & Meera Banargee, Publisher- Macmillan India Limited.
18) Macmillan Foundation English, R.K. Dwivedi & A. Kumar, Publisher- Macmillan India Limited.
१९) कायदा माहितीचा अन् अभिव्यक्तिस्वातंत्र्याचा, The Author Pralhad Kachare's sent article on RTI

मराठी अनिवार्य
विज्ञान स्नातक भाग -१, सत्र-१ व सत्र-२

सत्र-१

घटक अ (गद्य)

१.	समाजसुधारक की क्रांतिकारक	:	भा.ल. भोळे
२.	या देशाला काय देऊ शकतो	:	ए.पी.जे.अब्दुल कलाम
३.	अंधश्रद्धांचा महापूर	:	डॉ. नरेंद्र दामोळकर
४.	डॉ. आंबेडकरांचा स्त्री विषयक दृष्टिकोन	:	डॉ. भगवान ठाकूर
५.	विचारनियम - (पॉवर ऑफ हॅपी थॉट्स)	:	सरश्री
६.	आपले राष्ट्रीय महापाप	:	स्वामी विवेकानंद

घटक ब (पद्य)

संतवाणी.

१.	अनुवंदना ज्ञानेश्वर
२.	जनाबाई
३.	महदाइसा
४.	तुकाराम

घटक क (व्यावहारिक मराठी)

कार्यालयीन पत्र व्यवहार

संदर्भ ग्रंथ सुची : सत्र-१

घटक-अ : गद्य

- समाजसुधारक की क्रांतिकारक : भा.ल.भोळे
पुस्तक: महात्मा ज्योतीराव फुले, वारसा आणि वसा, लेखक: भाष्कर लक्ष्मण भोळे, प्रकाशक: साकेत बाबा भांड, साकेत प्रकाशन प्रा.लि.१९५, महात्मा गांधी नगर, स्टेशन रोड, औरंगाबाद.
- टर्निंग पॉईंट्स: अनुवाद अंजली नरवणे
प्रकाशक: सुनील अनिल मेहता, मेहता पब्लिशिंग हाऊस, सदाशिव पेठ, पुणे; पुनर्मुद्रण, जानेवारी २०१४.
- जागतिकीकरणातील सांस्कृतिक संघर्ष : संपादक : उत्तम कांबळे; प्रकाशक: सुगावा प्रकाशन, सदाशिव पेठ, पुणे.
- आंबेडकरी साहित्य: स्थिती आणि स्थित्यंतरे; लेखक: भगवान ठाकूर, प्रकाशन: अरुणा सबाने, आकांक्षा प्रकाशन, बजाज नगर, नागपूर.
- विचार नियम, (द पॉवर ऑफ हॅपी थॉट्स): लेखक: सरश्री अनुवाद, संपादक – प्रेमा भटेवरा, प्रकाशन: तेजज्ञान ग्लोबल फाऊंडेशन, कृपास्थान, बंगला नं.५०, धनलक्ष्मी सोसायटी, संतोष हॉलच्या समोर, युनियन बँके जवळ, सनसिटी रोड, आनंद नगर, सिंहगड रोड, पुणे.
- नवा भारत घडवा : स्वामी विवेकानंद; प्रकाशन: स्वामी व्योमरूपानंद, अध्यक्ष, रामकृष्ण मठ, धंतोली नागपूर.

घटक-ब (पद्य) :

संतवाणी : संदर्भ ग्रंथ

- श्री. सकलसंत गाथा, संपादक डॉ.र.रा.गोसावी, प्रकाशक: सारश्री प्रकाशन, सदाशिव पेठ, पुणे.
- महाराष्ट्र संत कवयित्री: जगन्नाथ रघुनाथ आजगांवकर, प्रकाशक:मंगेश नारायण कुळकर्णी, भारत गौरव ग्रंथमाला, कर्नाटक हाउस, चिराबाजार, मुंबई.
- श्री.तुकाराम महाराजांची गाथा: प्रकाशक: गीताप्रेस, गोरखपूर.

घटक-क (व्यावहारिक मराठी) :

कार्यालयीन पत्रव्यवहार:

संदर्भ ग्रंथ

- व्यावहारिक मराठी - लेखक ल.रा. नशिराबादकर, प्रकाशक : सौ.भाग्यश्री मोरेश्वर फडके, बी.कॉम., एल.एल.बी., फडके प्रकाशन, अथर्व अपार्टमेंट, प्लॉट नं.१०, टी.पी.एस. नंबर २-२१७/७ए, दुधाडी, कोल्हापुर- ६९६०१७.

सत्र-२

घटक अ (गद्य)

१.	श्रीचा शैक्षणिक दृष्टिकोन	:	प्रा.शोभा कडू
२.	विज्ञान व तंत्रज्ञान-जागृती पर्व	:	रघुनाथ माशेलकर
३.	बाराव्या शतकातील आद्यसमाजसुधारक महात्मा बसवेश्वर	:	डॉ. अशोक ग. मेनकुदळे
४.	राष्ट्रसंत तुकडोजी-आधुनिक परिप्रेक्ष्य	:	डॉ. श्रीकांत तिडके
५.	गाडगे बाबाचे अखेरचे कीर्तन	:	गाडगे बाबा
६.	तोडून टाका या सात स्वदेशी बेड्या	:	वि.दा. सावरकर

घटक ब (पद्य)

१.	राजेश महल्ले	:	माती
२.	डॉ. मच्छिंद्र चोरमारे	:	शेवटी माणूस उरावे माणसाने
३.	श्रीकृष्ण राऊत	:	दिडी
४.	अरुण सांगोळे	:	ज्ञानवंदना

घटक क (व्यावहारिक मराठी)

प्रसार माध्यमांसाठी लेखन

संदर्भ ग्रंथ सुची:- सत्र-२
घटक-अ (गद्य)

१. प्रज्ञाचक्षु जीवन आणि कार्य, प्रकाशक - सौ.विमल मोहोड, मोती नगर, ३६६, पायवाट, अमरावती.
२. मुद्रा महाराष्ट्राची, प्रकाशक: सचिव, श्री.शिवाजी शिक्षण संस्था, अमरावती.
३. ऐसी कळवळ्याची जाती (प्रा.डॉ.रमाकांत कोलते, गौरव ग्रंथ), प्रकाशन, प्रा.घनश्याम दरणे, संयोजक - डॉ.रमाकांत कोलते, गौरव समिती, यवतमाळ, मधुसुदन बजाज, बजाज पब्लिकेशन्स, सावनपुरा, अमरावती.
४. गाडगे बाबांचे अखेरचे किर्तन : गाडगेबाबा, संपादक-प्राचार्य, रा.तु.भगत, चैतन्य प्रकाशन, कोल्हापूर.
५. जात्युच्छेदक निबंध : स्वातंत्र्य विर सावरकर, प्रकाशक: रिया पब्लिकेशन ६७८, ई निदान हॉस्पिटल समोर, शाहूपुरी, दुसरी गल्ली, कोल्हापूर.

संदर्भ ग्रंथ सुची:-
घटक-ब (पद्य)

१. सगर : राजेश महल्ले, प्रकाशन : स्वरूप प्रकाशन, सौ.उषा मुलाटे (अक्षर), ८५८, सह्याद्री नगर, सिडको, औरंगाबाद.
२. कोंडी फोडून पुढे : डॉ.मच्छिंद्र चोरमारे, सुविधा प्रकाशन, १४९, शनिवार पेठ, पुणे.
३. गुलाल आणि इतर गझला : श्रीकृष्ण राऊत, प्रकाशन : सौ.उषा राऊत अकोला.
४. ज्ञान वंदना : अरुण सांगोळे, शिवसंस्था विशेषांक दि.२७.१२.२०११, प्रकाशक : श्री.शिवाजी शिक्षण संस्था, अमरावती.

घटक-क (व्यावहारिक मराठी)

प्रसारमाध्यमांसाठी लेखन :

संदर्भ ग्रंथ :

१. व्यावहारिक मराठी - लेखक ल.रा. नशिराबादकर, प्रकाशक : सौ.भाग्यश्री मोरेश्वर फडके, बी.कॉम., एल.एल.बी., फडके प्रकाशन, अथर्व अपार्टमेंट, प्लॉट नं.१०, टी.पी.एस. नंबर २-२१७/७ए, दुधाडी, कोल्हापुर- ६१६०१७.

मराठी अनिवार्य

विज्ञान स्नातक भाग-१, सत्र १ व सत्र-२
सत्र-१

वेळ २ तास

गुण - ४०

या विषयाची एक प्रश्नपत्रिका राहिल.

या पाठ्यपुस्तकातील घटक अ (पाठ क्र.१ ते ६) व घटक ब (कविता क्र.१ ते ४) व घटक क (व्यावहारिक मराठी) यावर प्रश्न व गुणविभागणी खालील प्रमाणे राहिल.

प्रश्न-१	घटक अ- दिर्घोत्तरी प्रश्न (कोणताही एक)	गुण-१०
प्रश्न-२	घटक अ- लघुत्तरी प्रश्न (कोणतेही दोन)	गुण-(५अ५उ१०)
प्रश्न-३	घटक ब- लघुत्तरी प्रश्न (कोणतेही दोन)	गुण-(५अ५उ१०)
प्रश्न-४	घटक क- व्यावहारिक मराठी-कार्यालयीन पत्रव्यवहार पाच गुणांचे दोन प्रश्न राहिल.	गुण-(५अ५उ१०)
टिप :	गृहपाठ : एक	गुण-४
	घटक चाचणी : एक	गुण-६

विज्ञान स्नातक भाग-१, सत्र-१ व सत्र-२
सत्र-२

वेळ २ तास

गुण-४०

या विषयाची एक प्रश्नपत्रिका राहिल.

या पाठ्यपुस्तकातील घटक अ (पाठ क्र.७ ते १२) व घटक ब (कविता क्र.५ ते ८) व घटक क (व्यावहारिक मराठी) यावर प्रश्न व गुणविभागणी खालील प्रमाणे राहिल.

प्रश्न-१	घटक अ- दिर्घोत्तरी प्रश्न (कोणताही एक)	गुण-१०
प्रश्न-२	घटक अ- लघुत्तरी प्रश्न (कोणतेही दोन)	गुण-(५अ५उ१०)
प्रश्न-३	घटक ब- लघुत्तरी प्रश्न (कोणतेही दोन)	गुण-(५अ५उ१०)
प्रश्न-४	घटक क- व्यावहारिक मराठी-प्रसारमाध्यमांसाठी लेखन पाच गुणांचे दोन प्रश्न राहिल.	गुण-(५अ५उ१०)
टिप :	गृहपाठ : एक	गुण-४
	घटक चाचणी : एक	गुण-६

विषय : हिंदी अनिवार्य
बी.एस.सी. भाग-१

गद्य विभाग :

- १) यज्ञ (निबंध) - महात्मा गांधी
- २) बड़े घर की बेटी (कहानी) - मुंशी प्रेमचंद
- ३) बुधिया (रेखाचित्र) - रामवृक्ष बेनीपुरी
- ४) समय काटनेवाले (निबंध) - हरिशंकर परसाई
- ५) शिवाजी का सच्चा स्वरूप (एकांकी) - सेठ गोविंददास
- ६) हम भ्रष्टन के भ्रष्ट हमारे (व्यंग्य) - शरद जोशी
- ७) आचरण की सभ्यता (निबंध) - सरदार पूर्णसिंह
- ८) उधार मांगना भी एक कला है (व्यंग्य) - बरसानेलाल चतुर्वेदी
- ९) बकुल फिर आना (कहानी) - मालती जोशी
- १०) सबिया (रेखाचित्र) - महादेवी वर्मा
- ११) खून का रिश्ता (कहानी) - भीष्म साहनी
- १२) पृथ्वीराज की आँखें (एकांकी) - डॉ.रामकुमार वर्मा

पद्य विभाग :

- १) रहीम के दोहे - रहीम
- २) एकता - मैथिलीशरण गुप्त
- ३) ताज - सुमित्रानंदन पंत
- ४) जनता जगी हुई है - रामधारी सिंह दिनकर
- ५) वात्सल्य वर्णन - सूरदास
- ६) जाग तुझको दूर जाना - महादेवी वर्मा
- ७) दान - सुर्यकांत त्रिपाठी निराला
- ८) नया तूर्य - भवानीप्रसाद मिश्र

बी.एस.सी. भाग-१, सत्र-१
विषय : हिंदी अनिवार्य

गद्य विभाग : प्रथम इकाई

- १) यज्ञ (निबंध) - महात्मा गांधी
- २) बड़े घर की बेटी (कहानी) - मुंशी प्रेमचंद
- ३) बुधिया (रेखाचित्र) - रामवृक्ष बेनीपुरी
- ४) समय काटनेवाले (निबंध) - हरिशंकर परसाई
- ५) शिवाजी का सच्चा स्वरूप (एकांकी) - सेठ गोविंददास
- ६) हम भ्रष्टन के भ्रष्ट हमारे (व्यंग्य) - शरद जोशी

पद्य विभाग : द्वितीय इकाई

- १) रहीम के दोहे - रहीम
- २) एकता - मैथिलीशरण गुप्त
- ३) ताज - सुमित्रानंदन पंत
- ४) जनता जगी हुई है - रामधारी सिंह दिनकर

तृतीय इकाई : व्यवहारिक भाषा और व्याकरण

- १) अंग्रेजी का हिंदी में अनुवाद
- २) मुहावरों का अर्थ देकर वाक्य में प्रयोग
- ३) शब्द शुद्धि

कुल अंक : ५०

- १) प्रश्नपत्र - ४०
- २) आंतरिक मूल्यांकन - १०

प्रश्नपत्र

समय २ घंटे

: अंक - ४०

१) प्रथम इकाई : गद्य विभाग

- | | | |
|---|---|----|
| क) दीर्घात्तरी प्रश्न (१) विकल्प के साथ | : | ०८ |
| ख) लघुत्तरी प्रश्न (२) विकल्प के साथ | : | १० |
| ग) अतिलघुत्तरी प्रश्न (४ में से २) | : | ०२ |

२) द्वितीय इकाई : पद्य विभाग

- | | | |
|--------------------------------------|---|----|
| घ) लघुत्तरी प्रश्न (२) विकल्प के साथ | : | ०८ |
| च) अतिलघुत्तरी प्रश्न (४ में से २) | : | ०२ |

३) तृतीय इकाई : व्यावहारिक भाषा और व्याकरण

- | | | |
|--|---|----|
| छ) अनुवाद - अंग्रेजी का हिंदी में | : | ०४ |
| ज) मुहावरों का अर्थ बतलाकर वाक्यों में प्रयोग कीजिए (४ में से २) | : | ०४ |
| झ) शब्द शुद्धि (कोई दो) | : | ०२ |

आंतरिक मूल्यांकन (Internal Assessment)

: अंक - १०

- | | | |
|-------------------------------|---|----|
| अ) गृहपाठ योजना - एक | : | ०४ |
| ब) कक्षा अंतर्गत परीक्षा - एक | : | ०६ |

बी.एस.सी. भाग-१, सत्र-२
विषय : हिंदी अनिवार्य

गद्य विभाग : चतुर्थ इकाई

- १) आचरण की सभ्यता (निबंध) - सरदार पूर्णसिंह
- २) उधार मांगना भी एक कला है (व्यंग्य) - बरसानेलाल चतुर्वेदी
- ३) बकुल फिर आना (कहानी) - मालती जोशी
- ४) सबिया (रेखाचित्र) - महादेवी वर्मा
- ५) खून का रिश्ता (कहानी) - भीष्म साहनी
- ६) पृथ्वीराज की आँखे (एकांकी) - डॉ.रामकुमार वर्मा

पद्य विभाग : पंचम इकाई

- १) वात्सल्य वर्णन - सूरदास
- २) जाग तुझको दूर जाना - महादेवी वर्मा
- ३) दान - सुर्यकांत त्रिपाठी निराला
- ४) नया तूर्य - भवानीप्रसाद मिश्र

षष्ठ इकाई : व्यावहारिक भाषा और व्याकरण

- अ) पत्रलेखन (कार्यालयीन)
- ब) लोकोक्तियाँ
- क) वाक्य शुद्धि

कुल अंक : ५०

- १) प्रश्नपत्र - ४०
- २) आंतरिक मूल्यांकन - १०

प्रश्नपत्र

समय २ घंटे

: अंक - ४०

१) चतुर्थ इकाई : गद्य विभाग

- क) दीर्घात्तरी प्रश्न (१) विकल्प के साथ : ०८
- ख) लघुत्तरी प्रश्न (२) विकल्प के साथ : १०
- ग) अतिलघुत्तरी प्रश्न (४ में से २) : ०२

२) पंचम इकाई : पद्य विभाग

- घ) लघुत्तरी प्रश्न (२) विकल्प के साथ : ०८
- च) अतिलघुत्तरी प्रश्न (४ में से २) : ०२

३) षष्ठ इकाई : व्यावहारिक भाषा और व्याकरण

- छ) पत्रलेखन (कार्यालयीन) - : ०४
- ज) लोकोक्तियों का अर्थ बतलाकर वाक्य में प्रयोग किजीए (४ में से २) : ०४
- झ) वाक्य शुद्धि (कोई दो) : ०२

आंतरिक मूल्यांकन (Internal Assessment)

: अंक - १०

- अ) गृहपाठ योजना - एक : ०४
- ब) कक्षा अंतर्गत परीक्षा - एक : ०६

संदर्भ ग्रंथ सूची :

- १) हिन्दी साहित्य का सरल इतिहास - विश्वनाथ त्रिपाठी - ओरीयंट लॉगमॅन.
- २) अनुवाद एवं भाषांतरण - रविंद्र गर्गेश एवं के.के.गोस्वामी - ओरीयंट लॉगमॅन.
- ३) सरल पत्रलेखन - वी.पी.सोनी - किताब घर.
- ४) कबीर, सुर, तुलसी - योगेंद्र प्रताप सिंह - लोकभारती प्रकाशन.
- ५) प्रेमचंद कि कहानियोंमें सांस्कृतिक चेतना - डॉ.महेशचंद्र - पब्लिशर्स अँड डिस्ट्रिब्यूटर्स.
- ६) हिंदी व्याकरण मिमांसा - काशीराम शर्मा - राजकमल प्रकाशन.
- ७) मेरी श्रेष्ठ व्यंगरचनाएँ - परसाई हरिशंकर.
- ८) लोकोक्तियाँ और मुहूर्तवरे - डॉ.मदनलाल शर्मा - पब्लिशर्स अँड डिस्ट्रिब्यूटर्स.
- ९) आधुनिक हिंदी कहानी - लक्ष्मीनारायणलाल शर्मा - लोकभारती प्रकाशन.
- १०) महादेवी का नया मूल्यांकन - डॉ.गणपती चंद्रगुप्त - लोकभारती प्रकाशन.

अन्य किताबे :

- १) हिंदी गद्य-पद्य संग्रह - ओरीयंट ब्लैकस्वान.
- २) साहित्य सागर - ओरीयंट ब्लैकस्वान.
- ३) साहित्य धारा - ओरीयंट ब्लैकस्वान.
- ४) काव्य सागर - ओरीयंट ब्लैकस्वान.
- ५) साहित्य सरिता - ओरीयंट ब्लैकस्वान.

Compulsory Sanskrit
B.Sc. Part-I (Semester I & Semester II)

Semester I

गद्य विभाग	शीर्षक	कवी	मूलग्रंथ
१.	प्राणसंवादः	--	छान्दोग्योपनिषद्
२.	सोमशर्मपितृकथा	विष्णुशर्मा	पञ्चतन्त्रम्
३.	आज्ञापत्राणि	कौटिल्यः	कौटिलीयम् अर्थशास्त्रम्
४.	दानवीरकर्णः	भासः	कर्णभारम्
पद्य विभाग	शीर्षक	कवी	मूलग्रंथ
१.	दिलीपयात्रावर्णनम्	कालिदासः	रघुवंशम्
२.	महिलोन्नतिः	वर्णेकर	ग्रामगीतामृतम्
३.	बुद्धावतरणम्	अश्वघोषः	बुद्धचरितम्
४.	सुभाषितानि	अभ्यासमंडळ	--

Semester II

गद्य विभाग	शीर्षक	कवी	मूलग्रंथ
१.	सत्यकामजाबालकथा	--	छान्दोग्योपनिषद्
२.	डॉ. सत्यव्रतशास्त्री	अभ्यासमंडळ	--
३.	वर्णोच्चारस्थानानि	अभ्यासमंडळ	--
४.	अनर्थपरंपरा	बाणभट्ट	कादम्बरी
पद्य विभाग	शीर्षक	कवी	मूलग्रंथ
१.	शिवसंकल्पसूक्तम्	--	शुक्लयजुर्वेदः
२.	आरामतडागवर्णनम्	व्यासः	महाभारतम्
३.	वैद्यकीयसुभाषितानि	अभ्यासमंडळ	--
४.	उमाबटुसंवादः	कालिदासः	कुमारसंभवम्

आवश्यक संस्कृत
पहिला सत्र

१. सैद्धांतिक	-	४० गुण
२. आंतरिक मुल्यमापन	-	१० गुण
एकूण	-	५० गुण

वेळ - २ तास]

[एकूण गुण - ४०

गद्य विभाग	शीर्षक	कवी	मूलग्रंथ
१.	प्राणसंवादः	--	छान्दोग्योपनिषद्
२.	सोमशर्मपितृकथा	विष्णुशर्मा	पञ्चतन्त्रम्
३.	आज्ञापत्राणि	कौटिल्यः	कौटिलीयम् अर्थशास्त्रम्
४.	दानवीरकर्णः	भासः	कर्णभारम्
पद्य विभाग	शीर्षक	कवी	मूलग्रंथ
१.	दिलीपयात्रावर्णनम्	कालिदासः	रघुवंशम्
२.	महिलोन्नतिः	वर्णेकर	ग्रामगीतामृतम्
३.	बुद्धावतरणम्	अश्वघोषः	बुद्धचरितम्
४.	सुभाषितानि	अभ्यासमंडळ	--

गुणविभाजन
प्रश्नपत्रिकेचे स्वरूप

प्र. १. भाषांतर गद्यविभागामधील दोन पैकी एक	५ गुण
प्र. २. भाषांतर पद्यविभागामधील दोन पैकी एक	५ गुण
प्र. ३. दीर्घोत्तरी प्रश्न गद्यविभागामधील दोन पैकी एक	१० गुण
प्र. ४. दीर्घोत्तरी प्रश्न पद्यविभागामधील दोन पैकी एक	१० गुण
प्र. ५. विवेचक टीपा चार पैकी दोन	१०गुण

आंतरिक मुल्यमापन : १० गुण

- १) घटक चाचणी : ०६ गुण
- २) Assignment : ०४ गुण

आवश्यक संस्कृत
दूसरा सत्र

१. सैद्धांतिक	-	४० गुण
२. आंतरिक मुल्यमापन	-	१० गुण
एकूण	-	५० गुण

वेळ - २ तास]
गद्य विभाग

[एकूण गुण - ४०

	शीर्षक	कवी	मूळग्रंथ
१.	सत्यकामजाबालकथा	--	छान्दोग्योपनिषद्
२.	डॉ. सत्यव्रतशास्त्री	अभ्यासमंडळ	--
३.	वर्णोच्चारस्थानानि	अभ्यासमंडळ	--
४.	अनर्थपरंपरा	बाणभट्ट	कादम्बरी

पद्य विभाग

	शीर्षक	कवी	मूळग्रंथ
१.	शिवसंकल्पसूक्तम्	--	शुक्लयजुर्वेदः
२.	आरामतडागवर्णनम्	व्यासः	महाभारतम्
३.	वैद्यकीयसुभाषितानि	अभ्यासमंडळ	--
४.	उमाबटुसंवादः	कालिदासः	कुमारसंभवम्

गुणविभाजन
प्रश्नपत्रिकेचे स्वरूप

प्र. १. भाषांतर गद्यविभागामधील दोन पैकी एक	५ गुण
प्र. २. भाषांतर पद्यविभागामधील दोन पैकी एक	५ गुण
प्र. ३. दीर्घोत्तरी प्रश्न गद्यविभागामधील दोन पैकी एक	१० गुण
प्र. ४. दीर्घोत्तरी प्रश्न पद्यविभागामधील दोन पैकी एक	१० गुण
प्र. ५. विवेचक टीपा चार पैकी दोन	१०गुण

आंतरिक मुल्यमापन : १० गुण

- १) घटक चाचणी : ०६ गुण
२) Assignment : ०४ गुण

Supplementary English
B.Sc. part I (Sem I & Sem II)

Prose Section :	1. How Wealth Accumulates and Men Decay 2. A Letter by Hazlitt to His Son 3. The Happy Prince 4. The Three Questions 5. Steve Jobs 6. The Diamond Necklace 7. On Forgetting 8. The Death of a Hero 9. The Last Leaf 10. Mohammad Yunus	-G.B.Shaw -William Hazlitt - Oscar wilde - Leo Tolstoy - Guy de Maupassant - Robert Lynd - Jai Nimbkar - O'Henry
Poetry Section :	1. The Tiger 2. Brahma 3. Sonnet To Science 4. Where the Mind is without Fear	-William Blake - RW Emerson - Edgar Allan Poe - Rabindranath
Tagore	5. The Toys 6. Success is Counted Sweetest 7. The Golden Pitcher 8. If	- Conventry Patmore - Emily Dickinson - Acharya Vidyasagar - Rudyard Kipling
Grammar :	Parts of Speech, Use of Articles and Prepositions, Tenses & Transformation of Sentences.	
Professional Communication :	1) Interviews Communication 2) Group discussions 3) Soft Skills 4) Curriculum vitae	
Writing Skills :	1) Report Writing, 2) Dialogue Writing	

Supplementary English
1S Supplementary English

i) Theory	40 marks
ii) Internal Assessment	<u>10 marks</u>
Total	50 marks

SANT GADGE BABA AMRAVATI UNIVERSITY GAZETTE - 2017 - PART TWO -207

i) Theory :	Time : 2 Hours	Total marks : 40
Prose Section :	1. How Wealth Accumulates and Men Decay -G.B.Shaw 2. A Letter by Hazlitt to His Son -William Hazlitt 3. The Happy Prince - Oscar wilde 4. The Three Questions - Leo Tolstoy 5. Steve Jobs	
Poetry Section :	1. The Tiger - William Blake 2. Brahma - RW Emerson 3. To Science - Edgar Allan Poe 4. Where the Mind is without Fear - Rabindranath Tagore	
Grammar :	Parts of Speech, Use of Articles and Prepositions, Tenses & Transformation of Sentences.	
Professional Communication :	1) Interviews Communication 2) Group discussions	
Writing Skills :	Report Writing	

Distribution of Marks.

Maximum Marks : 40	Time : Two Hours
Q.1 :	There shall be five short answer questions based on prescribed prose. 05 marks
Q.2 :	There shall be five long answer questions based on prescribed prose, out of these students will have to answer any two questions of five marks each. 10 marks
Q.3 :	There shall be four long answer questions based on prescribed poems. Out of these, students will have to answer any two questions of five marks each. 10 marks
Q.4 :	There shall be five questions of one mark each, from Grammar Section-Parts of Speech, Use of articles and Prepositions, Tenses, Transformation of Sentences. 05 marks
Q.5 :	There shall be one question either on Interviews communication or on Group Discussions. 05 marks
Q.6 :	There shall be one question on Report writing. 05 marks

ii) Internal Assessment	-	i) One Class Test	- <u>06 marks</u>
		ii) One Assignment	- <u>04 marks</u>
		Total	10 marks

2S Supplementary English

i) Theory	40 marks
ii) Internal Assessment	<u>10 marks</u>
Total	50 marks

i) Theory : Time : 2 Hours Total Marks : 40

Prose Section :	6. The Necklace - Guy de Maupassant 7. Forgetting - Robert Lynd 8. The Death of a Hero - Jai Nimbkar 9. The Last Leaf - O'Henry 10. Mohammad Yunus
Poetry Section :	5. The Toys - Coventry Patmore 6. Success is Counted Sweetest - Emily Dickinson 7. The Golden Pitcher - Acharya Vidyasagar 8. If - Rudyard Kipling
Grammar :	Parts of Speech, Use of Articles and Prepositions, Tenses & Transformation of Sentences.
Professional Communication :	3) Soft Skills 4) Curriculum vitae
Writing Skills :	Dialogue Writing

Distribution of Marks.

Maximum Marks : 40	Time: Two Hours
Q.1 :	There shall be five short answer questions based on prescribed prose. 05 marks
Q.2 :	There shall be five long answer questions based on prescribed prose, out of these students will have to answer any two questions of five marks each. 10 marks
Q.3 :	There shall be four long answer questions based on prescribed poems. Out of these, students will have to answer any two questions of five marks each. 10 marks
Q.4 :	There shall be five questions of one mark each, from Grammar Section-Parts of Speech, Use of articles and Prepositions, Tenses, Transformation of Sentences. 05 marks
Q.5 :	There shall be one question either on soft skills or on Curriculum vitae. 05 marks
Q.6 :	There shall be one question either on Dialogue writing. 05 marks

ii) Internal Assessment –	i) One Unit Test	- 06 marks
	ii) One Assignment	- 04 marks
		Total 10 marks

List of Reference Books :

1. Intermediate English Grammar, Raymond Morphy, Publisher- Cambridge.
2. Macmillan Foundation English, R.K. Dwivedi & A. Kumar, Publisher- Macmillan India Limited.
3. Cornerstone Developing Soft skills, Robert Sherfield, Rhoda Montgomery & Patricia Moody, Publisher- Pearson Education.
4. English for Life Skills, Publisher Orient Blackswan

Names of the books & its publisher from where the prescribed prose and poetry pieces are available :

1. Modern Trailblazers, Akshay Dhote, Hitendra Dhote, Orient Blackswan
2. Visionary Glean, Orient Blackswan
3. Poetry Down the Ages, Orient Blackswan
5. Auroral Musings, Orient Blackswan
6. Rainbow, publisher Orient Blackswan
7. Poetic Symphony, an anthology of sonnets, elegies, odes and ballads, Orient Blackswan
8. Literary Landscapes, an anthology of prose and poetry, Orient Blackswan

Appendix-B

Syllabi prescribed for B.Sc.Part-I (Sem-I & II) to be implemented from the A.S. 2017-18

Semester-I

1S: Geology

**General Geology, Physical Geology, Mineralogy,
Crystallography & Field Geology**

- UNIT-I** : General Geology: definition of geology, branches and scope. Earth in the solar system Origin of the earth: Nebular, Planetesimal and Tidal hypothesis, Age of earth: relative and radioactive methods of age determination – U/Pb, Rb/Sr, K/Ar and Carbon-14 method. constitution of earth: crust, mantle and core. Lithosphere, hydrosphere, atmosphere and biosphere.
- UNIT-II** : **Physical Geology:** Rock weathering – physical weathering, chemical weathering and biological weathering. Geological work done by wind, Rivers, underground water and Glaciers.
- UNIT-III** : **Physical geology:** Volcanism: Structure of volcano, products of volcanoes. Types of volcanic eruption, Causes and distribution of volcanoes. Earthquakes: definition, terminology, Elastic rebound theory – causes, effects, magnitude and intensity; Seismogram and Seismograph. Classification of earthquake; Seismic belts of India. Diastrophism – epeirogenic and orogenic movements; Stages in orogenic cycle.
- UNIT-IV** : **Mineralogy:** definition of mineral, rock forming & ore minerals, Physical properties of minerals: Determination of specific gravity by Walker's steelyard & Jolly's spring balance. structures of Silicates, Physical, chemical, optical properties of Feldspar, Mica, Pyroxene, Amphibole, Garnet and Olivine groups mineral groups. Optical mineralogy – Nature of light, Ordinary and plane polarized light; Reflection and refraction, total internal reflection and critical angle; Double refraction - Nicol prism, Becke line Petrological microscope – its parts and functioning. Properties of minerals under ordinary and plane polarized light and between cross Nicol.
- UNIT-V** : **Crystallography** – Elementary idea about crystal structure: crystal, forms, faces, edges, solid angle and interfacial angle and its measurement. Laws of crystallography Crystal symmetry: planes, axes, centre, crystallographic axes. Miller's indices and Weiss Parameters. Classification of crystal in to seven systems with their symmetry elements of normal classes; Cubic, Orthorhombic, Tetragonal, Hexagonal, Monoclinic and Triclinic.
- UNIT-VI** : **Field Geology:** Significance of geological field work, Study of toposheet: numbering, latitude, longitude, scale and conventional signs. Surveying- various types, use and aim. Introduction to surveying equipment's.

PRACTICAL -SEMESTER I

Mineralogy : Megascopic identification of common minerals – Quartz and its varieties, Microcline/ Orthoclase, Albite, Apatite, Dolomite, Graphite, Natrolite, Stilbite Chlorite, Augite, Garnet Topaz, Labradorite, Hypersthene, Tremolite, Biotite, Muscovite, Calcite, Hornblende, Kyanite, Talc, Dolomite, Olivine, Tourmaline, Corundum, Gypsum, Hematite, Chromite, Chalcopyrite, Asbestos, Barite, Fluorite, Chlorite and magnesite.

Microscopic identification of common minerals : Quartz, Hornblende, Muscovite, Biotite, Garnet, Calcite, Orthoclase, Microcline, Plagioclase, Augite, Olivine, Hypersthene, Tourmaline, Chlorite, Epidote

Crystallography

1. Study of elements of Symmetry in the crystals of normal seven classes.
2. Study and reading of wooden crystallography models belonging Normal class of seven major crystal systems.

Toposheets identification

Toposheets: reading of toposheet with reference to toposheet number, latitude, longitude, state, district, scale, adjacent toposheet numbers and conventional signs.

Examination will be of 4 hours duration and Carry 50 Marks.

The Distribution of marks for Practical will be as follows.

Semester – I

i) Megascopic identification of Minerals samples	12 marks
ii) Optical Minerals:	08 marks
iii) Symmetry of elements of crystals :	10 marks
iv) Toposheet reading and interpretation :	10 marks
v) Record	05 marks
vi) Viva-voce	05 marks

Total – 50 marks

Reference Books :

1. Text Book of Engineering Geology - Parbin Singh, Katson Publishing, Ludhina.
2. Text Book of Geology - P.K.Mukerjee - World Press Pub., Calcutta.
3. Text Book of Geology – Santosh Garg - Khanna Publ., Delhi.
4. Dynamic Earth - Skinner Potter - Pub. John, Wiley.
5. Text Book of Physical Geology - G.B.Mahaptra- Pub. C.B.S., New Delhi.
6. Fundamentals of Geology - Vol. I, II, Borges, Gwalanietal - Pub. Himalaya Pub., Bombay.
7. Physical Geology - Datta A.K., Pub.Kalyani Pub.
8. Concepts in Geology - Chakranarya, Kulkarni, Pub.Scientific Publication, Pune.
9. Fundamentals of Mineralogy and Petrology - M.A.Koregave, Pub.Book World Enterpress- Bombay.
12. Rutley's Elements of Mineralogy: H.F.Read
13. Dana, E.S. and Ford, W.E.(1949) A Text Book of Mineralogy. Wiley Eastern Ltd.
14. Roger and Kerr: Optical Mineralogy.
15. Field Geology: Frederic H. Lahee. CBS Publishers & Distributers 4596/1A, 11 Darya Ganj, New Delhi-110002 (India)

Semester-II

2S: Geology

Igneous, Sedimentary and Metamorphic Petrology

- Unit-I :** Igneous rocks: Definition of petrology, petrography, petrogenesis. Concept of rock cycle, magma and its composition, pyrogenetic minerals, formation of crystals and glass; intrusive – concordant and discordant forms of igneous rocks. Extrusive forms.
Texture in Igneous rocks: definition, types and controlling factors- crystallinity, granularity, shape of crystals and mutual relations, equigranular (granitic), inequigranular (porphyritic), directive and intergrowth, glassy.
Structure in Igneous Rocks: vesicular, amygdaloidal, blocky, pillow, flow and columnar joints; distinction between textures and structures.
- Unit – II :** Evolution of Magama: Differentiation, Fractional Crystallization, Magmatic missing assimilation. Classification of Igneous rocks: IUGS Classification. Other aspects of classification – Plutonic, Hypabyssal and Volcanic , Chemical, Silica based, Silica saturation, CIPW, mineralogical, Colour Index and Tabular Classification. Bowens Reaction series, Characteristics of acidic, alkaline and basic igneous rocks.
Characters of some common igneous rocks and their Indian occurrences
- Unit- III :** Concept of phase Rule: system, phase, component. Degree of freedom. Equilibrium. One component system of augite and quartz, two (Binary) component system, Binary system with complete solid solution – plagioclase feldspar, mixed crystal, diopside- anorthite eutectic system, ternary system and their petrogenetic significance. Ternary system of diopside, albite and anorthite. Distribution of Igneous rocks in time and space, variation diagram, kindreds of igneous rocks, petrographic provinces and periods.
- Unit-IV :** Sedimentary Rocks: formation of sedimentary rocks – erosion, transportation and deposition, diagenesis and lithification. Classification of sedimentary rocks, sedimentary structures, sedimentary depositional environment, concept, types of environments – Aeolian, Fluvial, Glacial, Near shore and Deep sea.
- Unit-V :** Metamorphic Rocks: Agents of metamorphism; kinds of metamorphism; classification of metamorphic rocks, textures and structures of metamorphic rocks, cataclastic, thermal, dynamothermal and plutonic metamorphism and their products.
- Unit-VI :** Sedimentary Petrology: Deposit of chemical origin – concretions, secretions, colloids, siliceous, carbonate, ferruginous, salts.
Deposits of organic origin; organic rocks of calcareous origin, phosphatic deposits of organic/siliceous. Deposition of organic origin and carbonaceous deposits. Characters of common sedimentary rocks.
Metamorphic Petrology ; Stress and Antistress minerals, metasomatism – types and additive processes. Injection, pneumatolytic and autometamorphism. Characters of common metamorphic rocks.

PRACTICALS: SEMESTER-II

- 1) Megascopic identification of igneous, sedimentary and metamorphic rocks (As in theory)
- 2) Microscopic study of igneous, sedimentary and metamorphic rocks (As in theory)

The Practical Examination will be of 4 hours duration & carries 50 Marks.

The distribution of Marks for Practicals will be as follows :

i) Megascopic identification of igneous, sedimentary and metamorphic rocks (As in theory):	20 marks
ii) Rocks in thin section (As in theory):	12 marks
iii) Exercise on ACF, AKF and AFM diagrams	08 marks
iv) Record	05 marks
v) Viva-voce	05 marks

Total – 50 marks

List of Equipment's & Materials for B.Sc. : Petrology Practicals:-

1. A set of 200, Rocks specimens for megascopic study (set should include all the types of rocks). As listed in practicals and their varieties.
2. A set of 100 rock slides for Microscopic study (Set should include all slides of all the rocks listed in practicals and their varieties.
3. A set of 50, rocks slides showing typical textures of Ingenous, Sedimentary and metamorphic rocks.
4. A set of 100 mineral slides for Microscopic study (Set should include all slides of all the mineral listed in practicals and their varieties.

Reference Books

1. Text Book of Engineering Geology - Parbin Singh, Katson Publishing, Ludhina.
2. Text Book of Geology - P.K.Mukerjee - World Press Pub., Calcutta.
3. Text Book of Geology - Santosh Garg - Khanna Publ., Delhi.
4. Dynamic Earth - Skinner Potter - Pub.John, Wiley.
5. Text Book of Physical Geology - G.B.Mahaptra- Pub. C.B.S., New Delhi.
6. Fundamentals of Geology - Vol. I, II, Borges, Gwalanietal - Pub. Himalaya Pub., Bombay.
7. Physical Geology - Datta A.K., Pub.Kalyani Pub.
8. Concepts in Geology - Chakranarya, Kulkarni, Pub.Scientific Publication, Pune. 101 102
9. Fundamentals of Mineralogy and Petrology - M.A.Koregave, Pub.Book World Enterpress- Bombay.
10. 1. G.W.Tyrell (1998) Principles of Petrology B.I.Publications Pvt.Ltd., New Delhi.
11. H.F.Read: Rutley's Elements of Mineralogy.
12. Dana, E.S. and Ford, W.E.(1949) A Text Book of Mineralogy. Wiley Eastern Ltd.
13. Roger and Kerr: Optical Mineralogy.
14. Jensen, M.L.and Bateman, A.M.(1981) Economic Mineral Deposits. John Wiley and Sons, New York.
15. Deb, S. (1980) Industrial Minerals and Rocks of India. Allied Publishers, New Delhi.
16. Deshpande, G.G. (1998) Geology of Maharashtra. Geological Society of India, Bangalore.
17. M.S.Krishnan (1982) Geology of Inida and Burma. CBS Publishers.
18. D.N.Wadia (1998) Geology of India. Tata McGraw Hill, India.
19. Optical Mineralogy; Winchell
20. Optical Mineralogy; Royer and Kerr

Appendix-C

Syllabus prescribed for B.Sc. Part I (Semester-I & II) Computer Science / Computer Application/ Information Technology to be implemented from the Academic Session 2017-18 & onwards.

B.Sc.Part-I (Semester-I)

The Examination in Computer Science of First Semester shall comprise of one theory paper of 80 Marks of three hours duration and internal assessment of 20 Marks. The practical examination will be of 4 Hrs. duration and carry 50 Marks.

The distribution of marks for practical examination is as under:

1. Program writing / execution (on group A & B)	: 30 Marks
2. Practical record	: 10 Marks
3. Viva Voce	: 10 Marks

Total 50 Marks

**1S: Computer Science / Computer Application/ Information Technology
Paper – I
Fundamentals of Information Technology and C Programming**

Unit-I : **Introductions to Computers:** Characteristics, Generation & classification of computers, block diagram of computer, Memory and their types: Primary and secondary, Flash & buffer, Peripheral devices: Keyboard, Mouse, scanner, Printers :Impact, Non-Impact, DMP, inkjet, Laser.

- Unit-II :** **Introduction to OS:** Needs & functions of OS, Types of OS : Single user & multi-user, Batch, multiprogramming, Time Sharing, online real time System, features of Unix OS, Windows.
File Handling: File naming, Files Structure, File Types, File access, File Attributes: protection, password, creator, owner, hidden flag, read only flag, actual size. Operations on file: create, delete, open, close, read, write, append, seek, rename
- Unit-III :** **Networking:** Introduction, Need of computer communication network, Communication protocol, Types of network : LAN, WAN, MAN. Topology: Star, Ring, Bus & Mesh.
Introduction to Internet: History, Types of Internet Connection: Direct, dial-up, broadband, Internet protocol: TCP/IP, FTP, HTTP, Domain, URL, e-mail address, Web browser: Internet Explorer, Netscape navigator, search engines.
- Unit-IV :** **Programming Concept:** Algorithm, Flowcharting, Programming languages, assembler, interpreter, compiler, programming process: Program Design, coding, compilation, Execution, testing, debugging, documentation, structured programming: features and approaches.
Elements of C : Introduction to C, History, Features, structure of C Program, Header file, character set, keywords, identifiers
- Unit-V :** Constants and Variables, Data types: Primary, derive, user define, typedef, storage class, Symbolic constant and their types. Operators: Arithmetic, Relational, logical, assignment, Increment and decrement, bitwise, Conditional Expressions: Arithmetic expression and Precedence of arithmetic expressions, type conversion.
- Unit-VI :** **I/O Operations:** Formatted I/O statements: printf(), scanf(), Unformatted I/O statements: getch(), getche(), getchar(), putchar(), putche(),putchar(),gets(),puts().
Control statements: conditional: simple if, if-else nesting of if else, switch, goto statement. Looping statement: while, Do-While, for, Nesting of loops, Break and Continue Statement.

Books Recommended:

1. Fundamentals of Computers : V Rajaraman, PHI publications
2. Computer Fundamental and Networking : P.K.Sinha.
3. Information Technology concepts : Dr. Madhulika Jain, Shashank & Satish Jain [BPB Publication, New Delhi].
4. Fundamental of Information Technology - Alexis and Mathews Leon [Vikas Publication].
5. Let us C - Y.Kanetkar, BPB Publications
6. Programming in C : E Balagurusamy, TMH publications
7. Programming with C : Ravichandran
8. Programming with C : Byron Gottfried, Tata McGraw-Hill Publication
9. C Programming Techniques - A.M.Padma Reddy, Sri Nandi Publication, Bangalor
10. C Programming - Holzner, PHI Publication
11. Modern Operating Systems: Andrew S. Tanenbaum
12. Computer Network : Andrew S. Tanenbaum, PHI Publication.
13. Programming in ANSI C : Ramkumar and Rakesh Agrawal, TMH Publication

Practical : Minimum 16 Practical base on

A: MS-Office (word, Excel, PowerPoint) (Minimum 8 practical)

B: Unit IV to Unit VI (Minimum 8 practical)

B.Sc.Part-I (Semester-II)

The Examination in Computer Science of Second Semester shall comprise of one theory paper of 80 Marks of three hours duration and internal assessment of 20 Marks. The practical examination will be of 4 Hrs. duration and carry 50 Marks.

The distribution of marks for practical examination is as under:

- | | |
|---|------------|
| 1. Program writing/execution (On group A & B) | : 30 Marks |
| 2. Practical record | : 10 Marks |
| 3. Viva Voce | : 10 Marks |

Total 50 Marks

**2S: Computer Science / Computer Application/ Information Technology
Paper – II
Web Technology and Advanced programming in C**

- Unit-I :** **HTML :** History of Markup Languages, Introduction to HTML, Structure of HTML Document, Elements, attributes, Tags: <HTML>, <HEAD>, <TITLE>, <BODY>, Heading tags, <P>,
,,<I>,<HR>, Table tags, List tags, <A>, <LINK>, , <MARQUEE>, <BLOCKQUOTE>, Attributes : align, background color, text color .
- Unit-II :** **Style Sheet :** Introduction, Advantages and applications of style sheet, CSS: Introduction, syntax of CSS with example, Type of style sheet(Internal, External and Inline), Units, Classes and Id attributes, Properties: Test, Font, Color, background, border, display, height, line-height, margin, width. CSS with HTML.

- Unit-III :** **XML:** Features of XML, Simple XML document, Elements, Attributes, Components of XML document: document prolog and document instance.
DTD(Document Type Definition): Introduction, Need of DTD, declaring elements, element content model, declaring attributes, attribute types, Internal and External DTD. CSS with XML.
- Unit IV :** **Array:**Introduction, Declaration and Initialization of one and two dimensional array.
Pointers: Introduction, Understanding pointers, Declaration and initialization, accessing variable through its pointer, pointer expression, pointer increment and scale factor , pointers and arrays, pointers and character strings, pointers and functions.
Strings: Declaring and initialization of string variable, operations on string: reading and writing, String functions: strcpy(), strcmp(), strcat(),strlen().
- Unit-V :** **Functions:** Introduction, Need of function, function, prototype, function calling, call by value, call by reference, return value and their types, function parameters, local and global variable, functions with arrays, function recursion.
- Unit-VI :** **Structure:** Introduction, declaration, initialization, Accessing Structure Elements , arrays of structure , nested structure.
Unions: Introduction, Comparison of Structure and Union.
File Handling : Introduction, defining and opening a file, Reading from a File, Writing to a File, closing a file , I/O Operations on file : fgetc(),fputc(), fputs(), fgets(), fscanf(), fprintf(), fread(), fwrite() and simple programs on these functions.

Books Recommended:

1. Let us C - Y.Kanetkar, BPB Publications
2. Programming in C : E Balagurusamy, TMH publications
3. Programming with C : Ravichandran
4. C Programming Techniques - A.M.Padma Reddy, Sri Nandi Publication, Bangalore.
5. Programming in ANSI C : Ramkumar and Rakesh Agrawal, TMH Publication
6. C Programming - Holzner, PHI Publication
7. Mastering XML: Ann Navaro, Chuck White, Linda Burman, BPB Publication.
8. The Complete reference-Web Design, Second Edition By Thomas A. Powell, TMH.
9. HTML 4.0 : E.Stephen Mack & Janan Platt, BPB Publication.
10. HTML IN 21 Days: Tech Media Publication.
11. HTML Complete :BPB Publication.
12. Inside XML : BPB Publication.
13. Web References www.w3c.org, W3Schools.com.

Practical : Minimum 16 Practical base on

- A: Unit I , Unit II and Unit III (Minimum 8 practical)
B: Unit IV, Unit V and Unit VI (Minimum 8 practical)

Syllabi prescribed for M.Sc.-Part I [Semester I & II] Computer Software to be Implemented from the Academic Session 2017-18.

**Semester-I - Theory
Paper- 1MCSW1 - Advanced Programming in JAVA**

- Unit-I :** **Introduction to Java**, Java development tools, Control Structures: Simpleif, If..else, switch statement, Loop structure : For , Do..while, While loop control using break and continue.
Objects and classes: class variable, instance variable, class methods, Access specifier, access modifiers. Methods: mainmethod, creating methods, calling methods, overloading methods, abstraction, recursion. Object: Initialization of object using constructors, parameterized constructor, Dynamic Memory allocation, Garbage collection. Passing objects to methods. Packages: creating and importing packages, Arrays :Declaration, initialization, sorting searching, array of objects.
- Unit-II :** **String:** String class, String Buffer, String Tokenizer. Command line arguments. Inheritance: super class, subclass , super keyword, this keyword, final modifier, abstract class, Method overriding. Interface: implementing interfaces **Exception Handling :** Error and Exception class, Errorhandling routine, try , catch , throw, throws, finally, uncaught exceptions, built-in exception, nested try-catch, user definedexception. Thread: Thread class, Runnable interface, states, priority and synchronization. Java I/O classes, File handling, **Packages:**API Packages, Reflection.
- Unit-III :** **Event handling:** Event Delegation model, Adapter classes, Event classes, Event Listener Interfaces, Handling Mouse and Keyboard events. **Applet:** Life cycle of an applet, paint, repaint, update methods. Graphics class, AWT class hierarchy, Frames, Layout managers, components, containers. Color class, Font class. User Interface: Button, Label, TextField, TeatArea, Choice, List, CheckBox, CheckBox Group, Dialog Boxes, Menu, Multiple Windows.
- Unit-IV :** **Swing:** JApplet, Icons & Labels, text fields, buttons, comboboxes, Tabbed Panes, Scroll Panes, Trees , tables, Exploring Swing. **Servelet:** Life cycle of a servelet, JSDK, Servelet API, Servelet Package, Classes and interfaces in servelet, Servelet parameters, reading and initializing servelet, HTTP, Request/ Response.

Unit-V : **JDBC:** Java database connectivity, Types of JDBC drivers , Writing first JDBC applications, Types of statement objects (Statement, Prepared Statement and Callable Statement), Types of result set, ResultSet Metadata, Inserting and updating records, JDBC and AWT, Connection pooling.

Unit-VI : **Remote Method Invocation**, Stand alone applications ,Client /Server application using RMI., Socket programming. **Java Beans:** Bean development kit, JAR Files, creating Bean, Properties of bean, Bean Info Interface, Java Bean API. Writing simple bean, Beans persistence and introspection, EJB, Architecture, Container classes, Interfaces, EJB types- Session, Entity, Message Driven.

Books:

1. The Complete Reference Java- 5th edition – Herbert Schildt and Patrick Naughton- Tata McGraw Hill
2. Developing Java Servlets James Goodwill
3. Learning Java- Rich Raposa, Willey, dreamTechPublication
4. Inside Servlets Dustine R Callway
5. Programming in Java 2 – Rajaram, -Scitech Pub. India pvt Ltd.

Paper - 1MCSW2 - Software Engineering & Software Testing

Unit-I : System Concept: Definition, Characteristics of System, Elements of System; Types of System: Physical or Abstract Systems, Open or Closed Systems, Man-made Information Systems; Subsystem. System Analyst: Role; Skills: Interpersonal, Technical; Information Gathering Tools (Fact Finding Techniques); Feasibility Study.

Introduction to Software Engineering: Definition and Characteristics of Software; Software Application Domains; Software Engineering: Definition, Layered Model.

Unit-II : Evolution role of software, Software crisis and myths, Software Process Framework; Process Models: SDLC (Waterfall); Incremental; Evolutionary Models: RAD, Prototyping, Spiral; Concurrent Development Model; Components based Development Model. Software project planning: scope, resources, estimation, decomposition technique, Tools. Software risks: identification, risk: identification, risk projection, refinement & RMMM plan.

Unit-III : SCM process. Version control: SCM standards. System engineering: Hierarchy, Business Process & Product engineering: Overviews. Project scheduling: Concepts, people Efforts, Task set, Task network, Scheduling. EV analysis, Project Plan.

Requirements Engineering: Requirements Engineering Tasks: Inception, Elicitation, Elaboration, Negotiation, Specification, Validation. Requirements Management; Steps in Requirements Engineering. Requirements Analysis: Objectives;

Unit-IV : Design process. Design principle & concepts. Effective modular design. Design model & documentation. Software architecture, Data Design, Architectural styles, equipment mapping, Transforms & Transaction mappings. User interface design: Golden Rule, UID, Task analysis & modeling, ID activities, Tools design evolution. Component level design: Structured programming, comparison of design notation.

Unit-V : Basics of Software Testing : Inspection and Testing. Testing objectives Terms : fault, failure, error, fault masking, test, test case. Fundamental Test process : test planning, test specification, Test execution, test records, test completion. Prioritizing the tests .Psychology of testing .Difference between QA and Testing, The general V-model

Unit-VI : Testing in the Software Lifecycle : Component Testing ,Integration testing , System Testing ,Acceptance Testing , Maintenance testing. Software Testing Process: Requirement Phase , Design Phase , Program (Build) Phase , Test Phase ,Installation Phase , Maintenance Phase . Test Plan : Objective of the test ,Scope of the test , Approach , Resources , Roles and Responsibilities, Entry and Exit Criteria, Risks, Defect Management

Books:

1. System Analysis and Design: Ellias M. Awad (Galgotia)
2. Software Engineering–A Practitioner’s Approach (7th Ed): Roger S. Pressman (Mc-Graw Hill)
3. Forouzan Data Communication and Networking McGraw Hill

Paper – 1MCSW3 - .Net Technology using ASP

Unit-I : Introduction to .net frameworks, page class, page life cycle, web forms.web controls, server controls, Server control events, user controls, web namespaces, validation, transaction management, session variables, session state object.

Unit-II : Ritch page composition: working with master page, working with themes, working with wizards. ADO.NET data providers, connecting to data source: connection string, connection pooling, Data container objects: data sets, data tables, data relations, data binding models: expression and components.

Unit-III : Windows forms, ASP.NET and ASP .NET AJAX, ADO.NET, Windows workflow foundation, Windows presentation foundation, Windows communication foundation, Windows cardspace, Application tracking managing web application. LINQ,

Unit-IV : Application structure and State: Structure of an application .The Global. asax application file, using states, http handlers. Navigation controls: tree view, menu. SiteMapPath: using the TreeView class, the tree view control. Menu class, menu control. using SitemapPath class, using SitemapPath controls.

- Unit-V** : LINQ Queries: introducing LINQ queries, working with files and streams, caching, application globalization, asp.net web services: securing web services, creating web services, deploying web services. MVC frameworks.
- Unit-VI** : Security and cryptography in asp.net: Type-Safe Code, Verifiably Type-Safe MSIL code. Security in .NET Framework 4.5, ASP.NET Security architecture, Introducing Authentication and Authorization, mobile web application architecture.

Books:

1. ASP.NET 4.5 Black Book.
2. ASP .Net – Complete Reference By Mathew MacDonald
3. Beginning ASP.NET 4.5 in C# and VB- (WROX)
4. ASP.NET: An Integrated Approach – Rick Miller

Paper- 1MCSW4 - Computer Networks

- Unit-I** : Digital Communication: Advantages; Data Transmission: Modes: Parallel, Serial: Asynchronous, Synchronous, Isochronous; Transmission Media: Guided and unguided; Modulation: Amplitude, Phase Shift, Frequency, QAM; Multiplexing: FDM, WDM, TDM, STDM, CDM; Switching: Circuit, Message, Packet; Delays in Packet Switched Network, Packet Loss; Network Reference Models: OSI: Layered Architecture and Services, TCP/IP: Layered Architecture and Services
- Unit-II** : Application Layer: Principles of Application Layer Protocols; Processes: Client-Server Model, Socket Interface; Services required by Application Layer; HTTP: Introduction, RTT, HTTP Handshake, types of HTTP Connections, HTTP Messages, Authentication and Cookies; FTP: Service Model, FTP Commands; Electronic Mail; SMTP; DNS: Services and working
- Unit-III** : Transport Layer: Transport-Layer Services and Principles; Multiplexing and Demultiplexing Applications; Connectionless Transport – UDP; Principles of Reliable of Data Transfer (RDT); Stop-and-wait and Pipelined protocols; GBN protocol; Connection-Oriented Transport: TCP; Flow Control; Principles of Congestion Control; Approaches towards Congestion Control; TCP Congestion Control
- Unit-IV** : Network Layer: Introduction; Network Service Model: Datagram, Virtual Circuit; Routing Principles; Routing Algorithms: Classifications; Hierarchical Routing; Internet Protocol: IP Addressing, IPv4: Classes and Packet format, DHCP; ICMP; Routing in the Internet: RIP, OSPF, BGP; Router; IPv6; Multicast Routing
- Unit-V** : Data Link Layer: Introduction; Services; Error Detection and Correction; Multiple Access Protocols and LANs; LAN Addresses and ARP; Ethernet; Hubs, Bridges and Switches; Wireless LANs: IEEE 802.11; The Point-to-Point Protocol; ATM, X.25 and Frame Relay.
- Unit-VI** : Network Security and Management: Secured Communication: Threats and Characteristics; Cryptography: Principles of Cryptography, Symmetric Key Cryptography, Public Key Cryptography; Privacy, Authentication, Integrity, No repudiation; Digital Signature; Key Distribution and Certification. Areas of Network Management; Network Management Architecture; Internet Network Management Framework; SMI, MIB, SNMP.

Books:

- 1) Computer Networking – James F. Kurose and Keith W. Ross (AddisonWesley)
- 2) Data Communication and Networking – Behrouz A. Forouzan (McGraw Hill)
- 3) Computer Network & Internet - Douglas E. Comer (Pearson)
- 4) Data and Computer Communication – William Stallings (Pearson)
- 5) Computer Networks - Andrew S. Tanenbaum (PHI)

Practicals for Semester-I :-

- 1) Lab-I: Practicals Based on Paper-1MCSW1 & 1MCSW2.
- 2) Lab-II : Practicals Based on Paper-1MCSW3 & 1MCSW4.

Semester-II

Paper – 2MCSW1 - Programming in C#

- Unit-I** : Understanding .net:origin of .net technology,.net framework,the common language runtime,framework base classes,user and program interfaces,visual studio .net,benefits c# and .net
- Unit-II** : Overview of C# : Introduction, namespaces,Types, variables, Expressions, Operators, Boxing and unboxing, Type declaration, Input from console, Printing and formatting the output, interactive I/O, CLR, Command line arguments, controls and statements : Decision making, Iteration , branching statements.
- Unit-III** : Classes, Objects, Objects as data types, static methods, class members, Controlling access, implementing class, Methods, Overloading methods, implementing methods, Abstract and base classes, virtual methods.
- Unit-IV** : Structs and Enum, arrays, strings, attributes, Exception and error handling, Common Exception classes, Exception handing routine, Types of Errors, Exception Handling Codes, Multiple Catch Statements, Catch Handler, Finally Statement, Nested Try Blocks
- Unit-V** : console I/O operations :console class,console input output,formatted output ,File manipulation: Managing file system,moving,coping,deleting files,reading,writing to files,file security.
- Unit-VI** : Data Access with .Net: ADO.net overview ,Database connections, commands, the Data Reader, the DataSet class, populating a DataSet, data set and commands , Accessing and using Data in ADO.

Books:

1. Er. V.K.Jain : The Complete guide to C# Programming (Dreamtech Press)
2. Eric Gunnerson : A Programmers introduction to C# (APress)
3. C# .Net Fundas - Y.P. Kanetkar , BPB
4. Programming C# By Jesse Liberty - Orelly
5. Programming in C# By E. Balguruswami –
6. C# Programming: Black Book – DreamTech Publication

Paper - 2MCSW2 - Distributed Operating System

- Unit-I** : Introduction to distributed systems: goals of distributed system, hardware and software concepts, design issues. Communication in distributed systems: Layered protocols, ATM networks, the client-server model, remote procedure call and group communication.
- Unit-II** : Synchronization in distributed systems: Clock Synchronization, mutual exclusion, Election Algorithms, the Bully algorithm, a ring algorithm, atomic transactions, dead lock in distributed systems, distributed dead lock prevention, and distributed dead lock detection.
- Unit-III** : Processes and processors in distributed systems: Threads, system, models, processor allocation, scheduling in distributed system, fault tolerance and real time distributed systems.
- Unit-IV** : Distributed file systems: Distributed file systems design, distributed file system implementation, trends in distributed file systems. Distributed shared memory: What is shared memory, consistency models, page based distributed shared memory, shared variable, distributed shared memory, object based DSM.
- Unit-V** : Case Study : AMOEBA : Introduction to AMOEBA, objects and capabilities in AMOEBA, Process Management in AMOEBA, Memory Management in AMOEBA, Communication in AMOEBA. The AMOEBA servers : The Bullet Server - Interface and Implementation, The Directory Server – Interface and Implementation, The Replication Server, The Run Server, The Boot Server, The TCP/IP Server, Other Servers.
- Unit-VI** : Case study MACH: Introduction to MACH, Process management, in MACH, Memory management in MACH, communication in MACH, UNIX emulation in MACH. Case study DCE: Introduction to DCE threads, RPC's, Time service, directory service, security service, distributed file system.

Books:

1. Andrew. S. Tanenbaum, Distributed operating system, PHI
2. Ceri & Palgathi, Distributed Database System, McGraw Hill
3. Raghu Rama Krishnan and Johannes Gehrli, Database Management System, McGraw Hill
4. Date C.J, An Introduction to Database system, Vol-I & II, Addition Wesley
5. Korth, Silbertz, sudarshan, Database Concepts, McGrew Hill
6. Elmasari, Navathe, Fundamentals of Database Systems, Addition Wesley
7. Data C.J. An introduction to database system, Addition Wesley
8. Rama Krishnan, Gehke, Database Management system, McGraw Hill
9. M. Tamer Ozsü and Patrick Valduriez, Principles of Distributed Database Systems II Edition Pearson Education Asia
10. Stefano Ceri and Giuseppe Pelagatti Distributed Database , Principles and Systems McGraw Hill

Paper- 2MCSW3 – Advanced Database Management System

- Unit-I** : **Introduction** : Review of Database Concepts, File Organization concepts, Normalization. Physical Database Design and Tunning. Index Selection, Overview of Database Tunning, Choices in tuning the conceptual schema. Choices in tuning queries and views, DBMS Benchmarking. Security. **Security and Authorization:** Introduction to database security, Issues, Control Measure, Grant and revoke. Permissions Access Control-Discretionary, Mandatory, Audit Trail, Challenges in database security
- Unit-II** : **OODBMS & ORDBMS** : Overview of Object-Oriented concepts & Characteristics, Objects, OIDs and reference types, Database design for ORDBMS, Comparing RDBMS, OODBMS & ORDBMS. **Advance Database Management System Concepts & Architecture:** Spatial data management, Web based systems Overview of client server architecture, Databases and web architecture, N-tier Architecture, Business logic – SOAP, Multimedia databases, Mobile database.
- Unit-III** : **Parallel databases:** Introduction, Parallel database architecture, I/O parallelism, Inter-query and Intra-query parallelism, Interoperation and Intra-operational parallelism, Design of parallel systems, **Distributed Databases:** Introduction, DDBMS architectures, Homogeneous and Heterogeneous Databases, Distributed data storage, Distributed transactions, Commit protocols, Availability,
- Unit-IV** : **Concurrency control** transactions and schedule, Serializability, Lock based concurrency control lock management, specialized locking techniques, control without locking. Crash Recovery, Introduction to crash recovery, Log, Check pointing, Recovery from a system crash.
- Unit-V** : **MySQL-** Introduction, Installation, Administration, PHP Syntax, MySQL Connection, Creating Database, Drop, Select, Datatypes, Create Table, Insert, Select, Where, Update, Delete, Like, Sorting, Join, Pattern Matching, Transactions, Alter, Index, Sequences, SQL Injection
- Unit-VI** : **Big Data with Hadoop**, Introduction to Bigdata, Overview, Hadoop environment setup, SDFS overview, Command reference, Hadoop streaming, Multinode cluster.

Books :

- 1) Database Management System -Raghu Ramkrishna McGraw Hill. International Editions.
- 2) Introduction to Database System by C.G.Date.
- 3) MySQL- Paul DuBois, 4th Edition
- 4) Database system concepts', 5th Edition –by Abraham Silberschatz, Henry Korth, S,Sudarshan, (McGraw Hill International)
- 5) Database systems : "Design implementation and management", by Rob Coronel, 4th Edition, (Thomson Learning Press)
- 6) Big Data-Black Book

Paper- 2MCSW4 - Fundamentals of Open Source Systems

- Unit-I** : Introduction to OSS, Need for OSS, History, FOSS initiative presentation, Security and Reliability, Applications
Introduction to Linux, Kernel/Ubuntu, Process, Concept Scheduling, Cloning, Signals, development with linux, OSS installation,
- Unit-II** : Shell Scripting : Basic shell commands, logging in, listing files, editing files, copying/moving files, viewing file contents, changing file modes and permissions, process management ; User and group management, file ownerships and permissions, PAM authentication ;
- Unit-III** : Introduction to Android, Android Platform, History, Architecture, Versions, DVM, Installing Eclipse and SDK packages, Virtual Device or Emulator, Hello World App, File system Hierarchy, Android Sample apps, Android User Interface, Event Handling, Styles and themes, Creating Custom components
- Unit-IV** : Python- Introduction, Syntax of Python, Data Types, Sets, Conditional Statements, Loops: While, For, Loop control statement
Abstraction, Parameters, Scooping, Recursion,
- Unit-V** : Advanced Python- Files, I/O Formatting, Errors and Exceptions, Functions, Modules, OOPS concepts: Classes, Inheritance, Garbage Collection, Method Overriding, Data Encapsulation, Building GUI Applications, Database Support,
- Unit-VI** : Open Source Cloud- Introduction, FOSS cloud software environment, Eucalyptus- History, Overview, Goals, Architecture, Terminology, Components, Mechanism, Open Nebula- Overview, History, Objectives, Features, Architecture, Computing Platform

Book:

1. Fundamental of Open Source Software – M.N. Rao, PHI publication
2. Beginning Python- Magnus Lie Hetland, Apress Publication
3. The Complete Reference- Python By Martin C. Brown
4. Learning Python – By Lutz M. Orelly Publishing
5. Linux Linleashed (Techmedia)
6. Back – Linux Kernel Internals (Addison –Wesley)
7. Linux Shell Scripting Cookbook By Sahnatanu Tushar & Sarath Lakshman
8. Mastering Shell Scripting- Andrew Mallett
9. LINUX: Linux Command Line, Cover all essential Linux commands. A complete introduction to Linux Operating System , By Ray Yao & Ruby Perl.

Practicals for Semester-II :-

- 1) Lab-III : Practicals Based on Paper-2MCSW1 & 2MCSW2.
- 2) Lab-IV : Practicals Based on Paper-2MCSW3 & 2MCSW4.

Additional Chances for the failure students of B.Sc. Part-I (Old Course) & M.Sc.Part-I (Old Course).

Recommend to provide three additional chances for the failure students of B.Sc. Part-I & M.Sc.Part-I (Computer Software) as given in the following table.

-Table-

Sr.No.	Name of the Examination	Additional chances provided
1	B.Sc. Part-I Sem-I (CS/CA/ IT/CA Voc.)	Winter-17, Summer-18 & Winter-18
2	B.Sc. Part-I Sem-II (CS/CA/IT/CA Voc.)	Summer-18, Winter-18 & Summer-19
3	M.Sc. Part-I Sem-I (Computer Software)	Winter-17, Summer-18 & Winter-18
4	M.Sc. Part-I Sem-II (Computer Software)	Summer-18, Winter-18 & Summer-19

Appendix-D

Syllabus prescribed for B.Sc. Part I (Semester-I & II) Computer Application (Vocational) to be implemented from the Academic Session 2017-18 & onwards.

B.Sc.Part-I (Semester-I)

The Examination in vocational subject Computer Application of First Semester shall comprise of one theory paper of 80 Marks of three hours duration and internal assessment of 20 Marks. The practical examination will be of 4 Hrs. duration and carry 50 Marks.

The distribution of marks for practical examination is as under:

- | | |
|--|------------|
| 1. Program based on Computer lab I | : 15 Marks |
| 2. Program based on Computer lab II | : 15 Marks |
| 3. Practical record | : 10 Marks |
| 4. Viva Voce (based on lab I & lab II) | : 10 Marks |

Total 50 Marks

1S: Computer Application (Vocational)

Paper-I

Basic of Computer & structured programming

- UNIT-I :** **Introduction to Computer :** Characteristics, types of computers: micro, mini, main and super, Block diagram of computer, types of memories : RAM, ROM, PROM, EPROM, EEPROM, Cache Memory, Secondary Storage Devices : hard disk, CD, DVD, Pen drives. I/O Devices : Keyboard, Mouse, Scanner, Touch Screen, light Pen, Printers : Impact and non-impact, Monitors : VDU, LCD & TFT.
- UNIT-II :** **Operating System:** Definition, Types and Functions of O.S(Memory, File, I/O and Processor Management), Booting process. Windows XP : Introduction, Features and taskbars, Desktop, Customizing Desktop, Icons.
- UNIT-III :** **C Language Fundamentals :** History and advantages of C language, structure of C program, character set, identifiers, keywords, constants and variables, symbolic constants, qualifiers, type conversion.
Operators and Expressions: Types of Operators - Arithmetic, Relational, logical, assignment, increment & decrement, bitwise.
- UNIT-IV :** **I/O Operations :** Formatted I/O : printf(), scanf() Unformatted I/O : getch(), getche(), getchar(), putchar(), putche(), puts().
Control structures : Branching - simple if, if-else, Conditional operator(? :), nested if, switch. Looping - while, do-while, for statements, comma operator, goto label, break, continue, nested loops: while, do-while, for.
- UNIT-V :** **Arrays & Strings :** Arrays - Declaration and initialization of one and two dimensional array. String - String functions, string operations Structure - Definition, declaration, initialization, array of structure, nested structure, union.
Pointers : Declaration, initialization, pointers and address arithmetic.
Functions in C : Introduction, definition of function, function prototype, function calling, call by value, call by reference, return value and their types, function parameters, local and global variable, functions with array, pointers and functions, pointers as function argument, pointer to functions, function returning, pointers, function recursion
- UNIT-VI :** **File Handling :** Prototype of file, opening and closing of file, I/O operations on file: fgetc(), fputc(), fgets(), fputs(), fscanf(), fprintf(), fread(), fwrite() and simple programs on these function. feof(), ferror().

Books Recommended :

- 1) Fundamentals of Computer - V.Rajaraman
- 2) Computer Fundamentals & Networking-P.K.Sinha
- 3) Fundamentals of Computer - B.Ram
- 4) C Programming - Byron Gottfried - Schaum Outline Series
- 5) Let Us C - Y.P. Kanetkar - BPB
- 6) Programming in C - E.Balagurusami
- 7) C-Dennis Ritchie
- 8) Programming in C - V.Rajaraman
- 9) Programming in ANSI C - Ramkumar and Rakesh Agrawal - TMH

Practical:

Computer Lab I : Minimum 8 practical based on MS Office (word, Excel and PowerPoint)

Computer Lab II : Minimum 8 practical based on Unit III, IV, V and VI.

B.Sc.Part-I (Semester-II)

The Examination in vocational subject Computer Application of Second Semester shall comprise of one theory paper of 80 Marks of three hours duration and internal assessment of 20 Marks. The practical examination will be of 4 Hrs. duration and carry 50 Marks.

The distribution of marks for practical examination is as under:

- | | |
|--|------------|
| 1. Program based on Computer lab I | : 15 Marks |
| 2. Program based on Computer lab II | : 15 Marks |
| 3. Practical record | : 10 Marks |
| 4. Viva Voce (based on lab I & lab II) | : 10 Marks |

Total 50 Marks

2S: Computer Application (Vocational)

Paper – II

Web Designing

- UNIT-I :** **Basic elements of communication system:** Network concept, advantages, goals, network topologies : Star, ring, completely connected N/W, Hybrid N/W, multipoint n/w, LAN, WAN, OSI model.
- UNIT-II :** **HTML :** Introduction, Need of HTML application of HTML, Basic structure of HTML, HTML tags and attributes : Adding tags, include attributes <HTML>, <HEAD>, <TITLE>, <BODY>, <P>,
, <HR>, Heading tags, table tags,<LINK>, , <ROWSPAN , <COLSPAN>, <MARQUEE>,<BLOCKQUOTE >, <A>, <I>, , list tag, Attributes : align, background colour, text color.
- UNIT-III :** **Style sheet:** advantages of style sheet & applications of style sheet, CSS : Introduction, CSS stylesheet properties : Units, classes and ID attributes. Properties: Text, font, colour, background, border, display, height, line, margin, width, CSS with HTML.
- UNIT-IV :** **Introduction to XML:** History of Markup languages, features of XML, Simple XML document, logical structure of XML elements, Components of XML documents : The document prolog and document instance. CSS with XML.
- UNIT-V :** **Document type Definition (DTD):** Introduction, need of DTD, declaring elements, element content models, declaring attributes, attribute types: internal and external DTD, entities and their types.
- UNIT-VI :** **XML Schemas:** Introduction, features, Comparison with DTD, Schema elements, element type element attributes, XML schema data types, converting DTD to schema, Namespaces: Introduction, declaration, default & prefix namespaces, scope of namespaces & Applications.

Books Recommended :

- 1) Computer Fundamental and Networking : P.K. Sinha
- 2) Local Area Network : Keiser, TMH, Publication
- 3) Computer Networks : Andrew S. Tanenbaum, PHI.
- 4) HTML in 21 days : Tech media publication
- 5) HTML4 for dummies Mastering by Ed Tittel, IDG Publications.
- 6) HTML4 Unleashed, Professional Reference Edition by Rick Darnell
- 7) Mastering XML, Ann Navaro, Chuck White, Linda Burman, BPB Publication.
- 8) Applied XML Solutions, BPB Publications.
- 9) Inside XML, BPB Publication
- 10) Essential XML. Box
- 11) XML and Related Technology, Kahate
- 12) XML How to Program Deitel

Practical:

Computer Lab I : Minimum 8 practical based on Unit I, II and III.

Computer Lab II : Minimum 8 practical based on Unit IV, V and VI.

Appendix-E

B.Sc.Part-I (Sem-I & II)

FOOD PROCESSING & TECHNOLOGY

The examination in Food Science of First semester shall comprise of one theory paper, internal assessment and practical examination. Theory paper will be of 3 Hrs. duration and carry 80 marks. The internal assessment will carry 20 marks. The practical examination will be of 6 to 8 hours duration and carry 50 marks.

The following syllabi is prescribed on the basis of six lectures per week and 6 practical periods per batch per week. Each theory paper has been divided into 6 units. There shall be one question in every unit with internal choice for each of 12 marks & one compulsory question covering all the syllabus of Semester-I (8 marks).

The distribution of marks in practical shall be as follows: (For Sem-I to VI)

- | | | |
|-------------------------|---|--------------------|
| A) Two short experiment | - | 20 marks (10 Each) |
| B) One long experiment | - | 15 marks |
| C) Viva voce | - | 10 marks |
| D) Practical Record | - | 5 marks |

Total - 50 marks

**FOOD PROCESSING & TECHNOLOGY
1S FOOD CHEMISTRY**

UNIT - I Concept of Food Science & Technology

Introduction and Definition of Food Science & Technology

Unit Operation: Definition of SI Unit of length, Weight, Volume.

Composition, formula and definition mole, atomic weight, equivalent weight and molecular weight.

Temperature (Conversion of Celsius Scale to Fahrenheit Scale). pH and buffer :Definition, ionization of acid (weak and strong acid, measurement of pH, pH value of some common food substances)

Important Terminologies (Definition and Relevance, Melting point, Boiling point, Smoking point, Surface Tension, Sol, Gel, viscosity, Emulsion & foam.)

Physical and chemical properties Melting point, Boiling point, Smoking point, Surface Tension, Sol, Gel, viscosity, Emulsion & foam.

UNIT - II Introduction and Terminology:

Food, Nutrition, Nutrients, Calories, Health, Malnutrition. Balanced Diet, Basic food groups.

Recommended Dietary Allowances of All Age Group.

Water activity & its importance.

Determination of Energy value of food stuff, calorimetry etc.

Concept of BMR

Factors affecting BMR: Age, body size, body composition and health.

UNIT – III Carbohydrates:

Definition, Composition, Classification, Food Sources, Functions of monosaccharide, disaccharides and polysaccharides.

Sugar: Sources of Sugar, Classification of Sugar, Properties of Sugar. Polysaccharides, Classification.

Starch: Structure, Amylose and Amylopectin.

Pectic Substances: Occurrences and Uses, biological importance.

Energy value and nutritional importance of carbohydrates.

Role of fiber in diet.

UNIT – IV Proteins :

Definition, Composition, Classification and Food Sources of Protein (good and poor sources).

Classification of Amino Acids, Essential and Non-Essential Amino Acids, Food Sources of Essential Amino Acids.

Function of Protein, Properties of Protein.

Denaturation of Protein, Factor Affecting Denaturation of Protein.

UNIT – V Fats and Lipids :

Definition and Formulas of Fats and Lipids.

Definition of Saturated and Unsaturated of Fatty Acids.

Food Sources of Fats, Oils, Saturated and Unsaturated Fatty Acids.

Properties of Fats and Lipids.

UNIT – VI Vitamins and Minerals:

History, Introduction, Definition of Vitamins and Minerals.

Formula and Food Sources of vitamins and minerals.

Classification of vitamins and minerals.

Requirement of vitamins and minerals in different age groups.

Practical

1. Preparation of Samples.
2. Preparation of Standard Solutions.
3. Identification of ash value of Food Stuff.
4. Moisture content of Food Stuff.
5. Determination of acidity and pH of Food.
6. Qualitative test for Carbohydrate
7. Qualitative test for Protein
8. Estimation of Total hardness of water using EDTA
9. Detection of presence of Starch by Iodine Test.
10. Estimation of Fat by Soxhelt method.

**FOOD PROCESSING & TECHNOLOGY
2S FOOD NUTRITION**

Maximum Marks 80

UNIT – I Definition of over nutrition & Under nutrition.

Nutrients of Food. Water as essential fatty acids.

Biological Function of Protein.

Types of Protein.

Evaluation of Protein Quality.

Effects of Deficiency of Proteins.

Oxidation of amino acid.

Conversion of amino acid to carbohydrates and fat.

UNIT – II Nutritional Aspect of Carbohydrates:

Utilization of Absorbed Carbohydrates in the body.
Oxidation of Carbohydrates (TCA cycle).
Effects of Deficiency and Excess Intake of Carbohydrates.
Study of Digestive System of Carbohydrates.
Energy yielding from Glycolysis.
Conversion of carbohydrates to fat and amino acids.

UNIT –III Enzymes: Introduction of Enzymes,

Classification of Enzyme.
Characteristics of enzymes.
Enzymatic activity: name and functions.
Factor Affecting Enzymes Action.
Enzyme specificity.
Role of Enzymes in Digestion and Absorption of Nutrient.
Role of Enzymes in various organs and digestive system: - digestion in mouth (salivary secretion, composition of saliva, function of saliva.), digestion in stomach (activity of gastric secretion- hydrochloric acid, hypo & hyper acidity), intestinal digestion(amylases).

UNIT-IV Classification of Lipids

Function of Fats, Fatty Acids.
Nutritional Aspects of Lipids
Effect of Deficiency Fatty Acids.
Effect of Excess of Fats and Lipids in Digestion and Absorptions Process.
Role of Fat in the Body.
Oxidation of Fatty Acid.

UNIT-V Vitamins and Minerals.

Functions and general function of Vitamins and Minerals.
Role of Vitamin and Minerals in Digestion and Absorption Process.
Deficiency Symptoms of Vitamins and Minerals.
Requirements of Vitamins and Minerals in all Age.

UNIT –VI Water

Importance of Water in body.
Role of Water in body.
Analytical Biochemistry: Homogenization, Chromatography, Calorimetry, Spectrophotometry, Electrophoresis, Elisa.

Practical

1. Estimation of Starch.
2. Estimation of Protein by Biuret methods.
3. Estimation of Protein by Kjeldhal's methods.
4. Chromatographic separation of Amino Acid in Food Stuff.
5. Estimation of Ascorbic Acid by Dye method
6. Estimation of Iron.
7. Estimation of sugar by Layne Eynon method.
8. To determine Saponification value of Oil.
9. To determine Iodine value of Oil.
10. Estimation of Fiber.
11. Determination of Achronic point of salivary amylase.
12. Estimation of glycine by formal titration.

List of Books (Common for Semester-I & II)

1. Chemistry, 4th edition, John McMurry, Pearson Education
2. Food- Nutrition and Health, Vijaya Khader; Kalyani Publishers.
3. Food and Nutrition Volume I & II; Dr. M. Swaminathan; Bappco.
4. Nutrition Science; B. Srilakshmi; New Age International Publisher.
5. Fundamental of Biochemistry; Dr. A. C. Deb; Center Book Agency.
6. Fundamental of Biochemistry; J.L. jain, Sanjay Jain; C. Chand.
7. Textbook of Biochemistry; Dr. Mn Chatterjee, Dr. Rana Shinde; Jaypee Brothers.
8. Analytical Chemistry of Foods ; C. S. James; Blackie Academic & Professional.
9. Food Science; Sumati R. Mudambi, Shalini M. Rao; New Age Intertional (p) Limited .
10. Handbook of Analysis and Quality Control For Fruits and Vegetables 2nd Edition ; S. Ranganna.
11. Food Science & Nutrition; Sunetra Roday; Oxford University Press.
12. Food Facts & Principle; Shakuntala Manay, M. Shadaksharaswamy; New Age International (p) Limited.
13. Laboratory Techniques in Food Analysis; D. Pearson; Butterworths.
14. Principle of Biochemistry; Lehninger.
15. Textbook of Biochemistry; G. R. Agrawal.
16. Food Chemistry; L. H. Meyer.
17. Food Science; N. N. Potter.
18. Nutrition & Dietetics 1st and 2nd Edition; Subhangini Joshi.
19. Therapeutic Nutrition – Robinson Normal.
20. Nutritive Value of Indian Food; Dr. C. Gopalan NIN Hyderabad.

21. Basic principle of nutrition; Seema Yadav, pub. Anmol publication pvt New Delhi (1997)
22. Introduction to biochemistry, second edition; John, W. Suttie, pub., Holt-Saunders publication.
23. Biochemistry volume3; S. K. Dasgupta, The Macmillan company of India(1978)
24. Elements of biochemistry; H.S. Shivastav, pub., Rastogi fourth edition (2001)
25. Analytical Practical Biochemistry by Plummer, Academic Press.
26. Practical Biochemistry by J.Narayan.

FOOD PROCESSING & TECHNOLOGY
3S FOOD PRESERVATION

Maximum Marks 80

- UNIT – I** Food Microbiology
Principles of Food Preservation, microorganisms associated with foods- bacteria, yeast and mold. Importance of bacteria, yeast and molds in foods. Classification of microorganisms based on temperature, pH, water activity, nutrient and oxygen requirements, typical growth curve of micro-organisms. Food infection, food intoxication, definition of shelf life, perishable foods, semi perishable foods, shelf stable foods.
- UNIT – II** Food Preservation by Low temperature
Introduction to refrigeration, cool storage and freezing, definition, principle of freezing, freezing curve, changes occurring during freezing, types of freezing i.e. slow freezing, quick freezing, introduction to thawing, changes during thawing and its effect on food.
- UNIT –III** Food Preservation by high temperature
Introduction, classification of Thermal Processes, Principles of thermal processing, Thermal resistance of microorganisms, Thermal Death Time, Concept of D value, Lethality concept, characterization of heat penetration data, Thermal process Calculations
- UNIT-IV** Drying and Dehydration
Definition, drying as a means of preservation, differences between sun drying and dehydration (i.e. mechanical drying), heat and mass transfer, factors affecting rate of drying, normal drying curve. Driers used in the food industry: air convection dryer, tray dryer, tunnel dryer ,continuous belt dryer, fluidized bed dryer, spray dryer, drum dryer, vacuum dryer ,freeze drying , foam mat drying.
- UNIT-V** Food Preservation by Irradiation
Introduction, units of radiation, kinds of ionizing radiations used in food irradiation, mechanism of action, uses of radiation processing in food industry, concept of cold sterilization
- UNIT –VI** Packaging
Objectives of packaging, flexible packaging, properties of the following packaging materials- low density polyethylene, high density polyethylene, polypropylene ,polyvinyl chloride, polyvinylidene chloride, ethylene vinyl alcohol, polystyrene, polyethylene terephthalate, nylon, ethylene vinyl acetate. Controlled atmosphere storage & modified atmosphere storage.

Recommended Readings

1. Desrosier NW and Desrosier JN, The Technology of Food Preservation, CBS Publication, New Delhi, 1998
2. Paine FA and Paine HY, Handbook of Food Packaging, Thomson Press India Pvt Ltd, New Delhi- 1992
3. Potter NH, Food Science, CBS Publication, New Delhi, 1998
4. Ramaswamy H and Marcott M, Food Processing Principles and Applications CRC Press, 2006
5. Rao PG, Fundamentals of Food Engineering, PHI Learning Pvt Ltd, New Delhi, 2010
6. Toledo Romeo T, Fundamentals of Food Process Engineering, Aspen Publishers, 1999

Practical

1. Analysis of food raw materials.
2. Analysis of Biscuits/ cookies.
3. Analysis of Tea.
4. Analysis of coffee.
5. Analysis of honey.
6. Analysis of common salt.
7. Analysis of vinegar.
8. Analysis of Jam.
9. Analysis of squash.
10. Analysis of spices.
11. Estimation of total & free SO₂.
12. Analysis of ketchup.

FOOD PROCESSING & TECHNOLOGY
4S FOOD MICROBIOLOGY

Maximum Marks 80

- UNIT – I** Classification & terminology of microorganisms.
Study of morphology & physiology of bacteria, yeast, mold& actinomycetes.
Introduction of viruses. Nutritional requirements of microorganisms.
Autotrophic & heterotrophic mode of nutrition. Composition of nutrient media.

UNIT – II Isolation, characterization of reproduction of microorganisms.
Growth cycle of microorganisms, Synchronised growth.
Enumeration of microorganisms. Bacteriological analysis of food & water.
Significance of coliform bacteria in food.

UNIT –III Effect of temperature on growth of microorganisms.
Control of microorganisms by high & low temperature.
Determination of TDT curve.
Sources & prevention of contamination. Sanitation.

UNIT-IV Control of microorganisms by physical & chemical agents.
Evaluation of antimicrobial agents.
Effect of irradiation, dehydration & chemical on growth of microorganisms.
Microbiology of air, water & sewage.

UNIT-V Role of microbes in fermented foods. Benefits of Fermentation.
Fermented dairy products-Yoghurt, cheese, butter.
Microbiology of alcoholic fermentation.-wine, beer, distilled beverages.

UNIT –VI Food microbiology.
Role of microorganisms in food spoilage.
Industrial microbiology.
Bacteriological analysis of food

Recommended Readings

- 1) Frazier William C and Westhoff, Dennis C. Food Microbiology, TMH, New Delhi, 2004
- 2) Jay, James M. Modern Food Microbiology, CBS Publication, New Delhi, 2000
- 3) Garbutt, John. Essentials of Food Microbiology, Arnold, London, 1997
- 4) Pelczar MJ, Chan E.C.S and Krieg, Noel R. Microbiology, 5th Ed., TMH, New Delhi, 1993

Practical

1. Introduction to the Basic Microbiology Laboratory Practices and Equipments.
2. Functioning and use of compound microscope.
3. Cleaning and sterilization of glassware.
4. Preparation and sterilization of nutrient broth.
5. Cultivation and sub-culturing of microbes.
6. Preparation of slant, stab and plates using nutrient agar.
7. Morphological study of bacteria and fungi using permanent slides.
8. Simple staining.
9. Gram's staining.
10. Standard Plate Count Method.

FOOD PROCESSING & TECHNOLOGY
5S FOOD PROCESSING I

Maximum Marks 80

UNIT – I Pre & postharvest changes in fruits & vegetables.
Canning of fruits & vegetables. Selection of fruits and vegetables, process of canning.
Factors affecting the process- time and temperature.
Containers of packing, lacquering, syrups and brines for canning.
Spoilage in canned foods.

UNIT – II Fruit beverages, Introduction, Processing of fruit juices - selection, juice extraction, deaeration, straining, filtration and clarification.
Preservation of fruit juices - pasteurization, chemically preserved with sugars, freezing, drying, tetra-packing, carbonation.
Processing of squashes, cordials, nectars, concentrates and powder.

UNIT –III Jams -Introduction, Jam constituents, selection of fruits, processing & technology.
Jelly essential constituents, role of pectin, ratio.
Theory of jelly formation, Processing & technology, defects in jelly.
Marmalade : Types, processing & technology, defects.
Pickles- Types, Causes of spoilage in pickling.
Tomato products- pulping & processing of tomato juice, tomato puree, paste, ketchup, sauce and soup

UNIT-IV Live stock & poultry preparations, slaughter, cutting, grading, dressing & grading.
Various cuts of meat. Post mortem changes.
Preservation & packaging of meat, poultry & their products.

UNIT-V Process technology of fish & other aquatic animals.
Sources, methods of fishing, handling & storage.
Processing of fish & fish products.
By products of fish processing, fish oils.
Processing of other aquatic animals like crabs, shrimps, molluscs, etc.

UNIT –VI Composition of milk, processing, storage, distribution of milk.
Manufacture of cream, butter, ghee, evaporated, condensed & skimmed milk.
Whole & skimmed milk powder. Other fermented milk products.
Preparation of Indian milk products like khoa, channa, curd, etc.
Standards for milk products.

Practical

1. Preparation of sugar syrup.
2. Preparation of squash.
3. Preparation of tomato ketchup.
4. Preparation of Jam/ jelly/ marmalade.
6. Preparation of Truti fruity.
7. Preparation of chikki.
8. Preparation of hard boiled candy.
9. Preparation of cookies.
10. Preparation of cakes.
11. Preparation of bread.
12. Preparation of nankatai.

Recommended Readings

- 1) Rao D G. 2010. Fundamentals of food engineering. PHI learning private ltd.
- 2) Singh R P and Heldman D R. 1993, 2003, 2009. Introduction to food engineering. Academic press 2nd, 3rd and 4th edition.
- 3) Rao C G 2006 Essentials of food process engineering. B S publications
- 4) Food processing technology, Fellow P. 1988
- 5). The technology of food preservation, Desrosier, Norman W. and Desrosier., James N., 4th Ed., Westport, Conn. : AVI Pub. Co., 1977.
- 6). New Product Development From Concept to Marketplace, Fuller, Gordon W, CRC Press, 2004.
- 7) Whitehurst and Law, Enzymes in Food Technology, Whitehurst and Law, CRC Press, Canada, 2002
- 8). De Sukumar, Outlines of Dairy Technology, Oxford University Press, Oxford. 2007.
- 9) Hall GM, Fish Processing Technology, VCH Publishers Inc., NY, 1992
- 10) . Sen DP, Advances in Fish Processing Technology, Allied Publishers Pvt.Limited 2005
- 11). Shahidi F and Botta JR, Seafoods: Chemistry, Processing, Technology and Quality, Blackie Academic & Professional, London, 1994
- 12) . Webb and Johnson, Fundamentals of Dairy Chemistry, 3rd ed., CBS Publishers, New Delhi 1988

FOOD PROCESSING & TECHNOLOGY
6S FOOD PROCESSING II

Maximum Marks 80

UNIT – I Unit operations in Food Processing

Equipments for various operations like cleaning, sorting, grading.
Size reduction & separation, mixing, filtration, expression, centrifugation & crystallization.
Application of heat in concentration, chilling & refrigeration.
Thermal processing of foods. Methods of heat sterilisation & process time calculations.
Food irradiation. Plant hygiene & sanitation. Water quality.

UNIT – II Process technology of cereals, legumes and Oil Seeds

Post harvest storage & handling. Insect infestation & control.
Mycotoxins in cereals.
Oil seeds & their products. Milling of cereals & legumes. By products of milling industry.
Oil extraction, refining & hydrogenation. Manufacture of salad oils, cooking oils, shortening agents, margarine, lecithin, etc. Processing of oil seeds for food use.

UNIT –III Processing Technology of Baking and baked Products.

Selection of raw materials. Rheology of dough & dough testing methods.
Changes during fermentation of dough. Manufacture of bread, biscuits, crackers, cookies, cakes.
Manufacture of breakfast cereals, puffed cereals fortified & enriched products.
Extrusion cooked products. Quality control.

UNIT-IV Process Technology of Tea & coffee

Composition & processing. Flavour & aroma. Methods of evaluation of quality.
Process technology of cocoa, raw materials, chocolate, candy & confectionary products.
Quality control & standards.

UNIT-V Special foods .

Weaning & baby foods, processed protein and cereal foods. Textured proteins, synthetic foods,
Intermediate moisture foods, simulated milk products. Pre cooked & instant foods.
Quality food management.

UNIT –VI Fermentation Technology of alcohol, alcoholic beverages, vitamins, vinegar.

Organic acids, solvents. SCP, enzymes.
Cultivation of algae, mushroom. Waste Water treatment.

Recommended Readings

1. Desrosier NW and Desrosier JN, The Technology of Food Preservation, CBS Publication, New Delhi, 1998
2. Paine FA and Paine HY, Handbook of Food Packaging, Thomson Press India Pvt Ltd, New, Delhi- 1992.
3. Potter NH, Food Science, CBS Publication, New Delhi, 1998
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Practical

1. Estimation of Starch.
2. Determination of milk quality.
3. Preparation of certain milk products..
4. Preservation of fruits & vegetables by pickling.
5. Preparation of preserve.
6. Storage study of cereals & legume grains.
7. Preparation of dehydrated fruits & vegetables.
8. To determine Iodine value of Oil.
9. Check adulteration of various food products.
10. Determination of WAC of wheat flour & maida.
11. Study quality characteristics of foods preserved by freezing.
12. To perform pasteurization of fluids using different methods.
13. To perform blanching of different plant foods.

List of Books

1. Analytical Chemistry of Foods ; C. S. James; Blackie Academic & Professional.
2. Food Science; Sumati R. Mudambi, Shalini M. Rao; New Age International (p) Limited .
3. Handbook of Analysis and Quality Control For Fruits and Vegetables 2nd Edition ; S. Ranganna.
4. Food Science & Nutrition; Sunetra Roday; Oxford University Press.
5. Food Facts & Principle; Shakuntala Manay, M. Shadaksharaswamy; New Age International (p) Limited.
6. Laboratory Techniques in Food Analysis; D. Pearson; Butterworths.
