

**ORDINANCES
AND OUTLINES OF TESTS,
SYLLABI AND COURSES OF READING**

FOR

BACHELOR OF COMPUTER APPLICATIONS (B.C.A)

(SEMESTER SYSTEM)

PART-I

(Semester Ist and IInd)

FOR

2013-14 & 2014-15, 2015-16 SESSIONS

**PUNJABI UNIVERSITY,
PATIALA – 147 002**

ORDINANCES
(FOR B.C.A. UNDER THE +3 SCHEME)
Applicability of Ordinances for the time being in force

Notwithstanding the integrated nature of a course spread over more than one academic year, the ordinances in force at the time a student joins a course shall hold good only for the examination held during or at the end of the academic year. Nothing in these Ordinances shall be deemed to debar the University from amending the ordinances subsequently and the amended ordinances, if any, shall apply to student whether old or new.

1. The course for the Degree of B.C. A. (Bachelor of Computer Applications) shall be spread over Three academic years to be called Semester I, II, III, IV, V and VI. The examination for the I, III and V semesters shall be held in the month of November/December and for the II, IV and VI semesters in the month of May/June or on such other dates as may be fixed by the Academic Council.
2. The outlines of tests and syllabi shall be such as prescribed by the Academic Council from time to time.
3. The candidates will be required to pay examination fees as prescribed by the University from time to time.
4. Application for admission to the examination shall be made on the prescribed form countersigned by the authorities as mentioned in the relevant ordinances. The last date by which admission forms and fees must reach the Registrar shall be as follows:

Annual Examination	Without late fee	With late fee of Rs. 100/-	With late fee of Rs. 300/-	With late fee of Rs. 500/-	With late fee of Rs. 1000/-
I, III and V semester Regular and Re-appear Candidates	Sept. 30	Oct. 15	Oct. 31	Up to 21 days before the commencement of the examination (written or practical whichever is earlier)	Up to ten days before the commencement of the examination (Written or practical whichever is earlier) with the approval of the Vice-Chancellor
II, IV and VI semester Regular and Re-appear Candidates	Feb. 28	Mar. 15	Mar. 31	-do-	-do-

5. The medium of instructions and examination shall be English only.
6. In each course 20% of the total marks are assigned to the internal assessment and 80% marks in the University.

7. (a) The minimum number of marks required to pass the examination shall be 35% in each paper by obtaining minimum 35% of the marks in the Internal assessment and 35% of the marks in the University examination separately for each paper.
- (b) When a candidate has failed or placed under re-appear in the University examination, but passes in internal assessment, the marks in the continuous assessment shall be carried for subsequent examinations.
8. (a) A candidate who fails not in more than two papers may be declared 're-appear' in those papers at a subsequent examination within two chances and may be permitted to re-appear in those papers.

The examination of the reappear papers of odd semester will be held with regular examination of the odd semester and reappear examination of even semester will be held with regular examination of even semester. But if a candidate is placed under reappear in the last semester of the course, he will be provided chance to pass the reappear with the examination of the next semester, provided his reappear of lower semester does not go beyond next semester.

- (b) If a candidate fails in more than two papers, he/she will be declared 'fail'. If such candidate has taken provisional admission to next semester before the declaration of result of the previous semester, his/her admission shall be cancelled immediately on declaration of the result of previous semester. He/She will have to clear the examination for the very semester as a private candidate along with the regular students of that semester.

9. **A Candidate shall be allowed to join:**

(i) **First Semester:**

Provided that he/she has passed at least, one academic year previously, the +2 examination of Punjab School Education Board, or any other examination recognised as equivalent thereto.

(ii) **Second Semester:**

Provided that he/she has undergone a regular course of studies of first semester as provided under the regulations and fulfils the conditions as laid in ordinance 7 and 8 above.

(iii) **Third Semester:**

Provided that he/she has undergone a regular course of studies of First and Second semesters as provided under the regulations in sequential order and fulfils the conditions as laid in ordinance 7 and 8 above.

(iv) **Fourth Semester:**

Provided that he/she has undergone a regular course of studies of First, Second and Third semesters as provided under the regulations in sequential order and has passed the First Semester Examination as a whole, and fulfils the conditions as laid in ordinance 7 and 8 above.

(v) **Fifth Semester:**

Provided that he/she has undergone a regular course of studies of First, Second, Third and Fourth semesters as provided under the regulations in sequential order and has passed the First and Second Semester examinations as a whole, respectively; and fulfils the conditions as laid in ordinance 7 and 8 above.

(vi) **Sixth Semester:**

Provided that he/she has undergone a regular course of studies of First, Second, Third, Fourth and Fifth semesters as provided under the regulations in sequential order and has passed First, Second and Third Semester examinations as a whole, respectively and fulfils the conditions as laid in ordinance 7 and 8 above.

10. Three weeks after the termination of examination or as soon thereafter as possible, the Registrar shall publish the result of the candidates. Each candidate shall receive a certificate indicating details of marks obtained in each examination. Successful candidates at the end of Semester-VI examination shall receive a degree stating the division according to **ordinance 15**.
11. The minimum number of marks required to pass the examination in each Part shall be 35% in each subject, provided that in subject with practical the percentage shall be required separately in written and practical/lab work. The candidate shall also be entitled to grace marks as admissible under the ordinances relating to the `**GENERAL GRACE MARKS**`.
12. The examination in Semester I, II, III, IV, V and VI shall be open to a person who satisfies the requirements at A and B as given below:

'A'

The first semester examination shall be open to a person: Has passed at least, one academic year previously, the +2 examination of Punjab School Education Board, or any other examination recognised as equivalent thereto and fulfils the conditions provided in ordinance 12 **'B'**.

Semesters II, III, IV, V and VI examinations shall be open to a person who has passed the previous semester examination/s or fulfils the conditions provided in ordinance 12 **'B'**.

'B'

- (I) (a) Has remained on the rolls of a college admitted to the privileges of the University throughout the academic year preceding the examination.

- (b) (i) Every candidate will be required to attend a minimum of 75% lectures delivered to that class in each paper.
- (ii) In case of students, whose names are struck off from the rolls due to non-payment of fee, and is admitted later on, his/her attendance shall not be counted for that period.
- (iii) The shortage in the attendance to lectures by the candidate will be condoned as per rules made by the University from time to time.

OR

- (II) Has completed the prescribed course of instructions for the examination but has not appeared or having appeared has failed in the examination. Such a candidate may appear in any subsequent semester examination within the period prescribed in the Statutes.
13. The pass students or the students declared reappear in not more than two papers in B. C. A. Part-I & II from Punjab University, Guru Nanak Dev University and Punjab Technical University shall be treated at par with the corresponding students of this University, only if he/she will have cleared the deficiency papers as a supplementary. Such Candidates will be given two attempts. The marks secured by such students shall be scaled to the marks allotted to each subject by this University.
 14. Candidates who have not studied the subject of Punjabi up to matriculation shall be required to pass Punjabi either up to matriculation standard or *Punjabi Preveshka* during the course period to qualify for the award of degree.
 15. The successful candidates shall be classified on the basis of aggregate marks secured in B. C. A. Part-I, Part-II and III taken together as under:
 - (a) 75% or more in First division with Distinction.
 - (b) 60% or more but less than 75% in the First division.
 - (c) 50% or more but less than 60% in the Second division.
 - (d) 35% or more but less than 50% in the Third division.
 16. A University medal will be awarded to student who secures First position in the University on the basis of the marks obtained in all three parts taken together. The general rules and conditions of the University for the Award of medal/prizes etc. will be applicable in the award of University medal to the topper of this examination.
 17. *A candidate who is declared reappear or fail at any stage shall not be eligible for scholarship, Prize or Medal.*

SYLLABUS BACHELOR OF COMPUTER APPLICATIONS

OUTLINE OF PAPERS AND TESTS for B.C.A. First Year – First Semester 2013-14 & 2014-15 Sessions

Code	Title of Paper	Hours per Week	University Examination	Internal Assessment	Max. Marks	Exam. Duratio n Hours
BCA-111	General English – I	4	80	20*	100	3
BCA-112	Punjabi (Compulsory) or Punjabi Compulsory (Mudla Gyan) **	4	40	10	50	3
BCA-113	Fundamentals of Information Technology	4	80	20	100	3
BCA-114	Basic Mathematics	4	80	20	100	3
BCA-115	Programming Fundamentals using C	4	80	20	100	3
BCA-116	Software Lab – I (based on paper BCA-115: Programming Fundamentals using C)	8	60	40	100	3
Total			420	130	550	

Note:

1. The break up of marks for the practical will be as under:

i. Internal Assessment	40 Marks
ii. Viva Voce (External Evaluation)	20 Marks
iii. Lab Record Program Development and Execution(External Evaluation)	40 Marks

2. The break up of marks for the internal assessment for theory except BCA-111 will be as under:

i. One or two tests out of which minimum one best will be considered for assessment.	15 Marks
ii. Attendance, Class participation and behaviour	5 Marks

*The break up of marks for the internal assessment for BCA-111: General English – I will be as under:

- | | |
|---|----------|
| i. Formal assessment through Interview/Self Introduction/Recitation
etc. | 10 Marks |
| ii. Conversation Skills (particularly listening and speaking to be
evaluated through oral examination) | 5 Marks |
| iii. Attendance, Class participation and behaviour | 5 Marks |

**** Only those students who have not studied Punjabi up to matriculation can opt for Punjab Compulsory (Mudla Gyan). The code for the paper is same.**

OUTLINE OF PAPERS AND TESTS
for
B.C.A. First Year – Second Semester
2013-14 & 2014-15 Sessions

Code	Title of Paper	Hours per Week	University Examination	Internal Assessment	Max. Marks	Exam. Duration Hours
BCA-121	General English – II	4	80	20*	100	3
BCA-122	Punjabi (Compulsory) or Punjabi Compulsory (Mudla Gyan) **	4	40	10	50	3
BCA-123	Digital Electronics	4	80	20	100	3
BCA-124	Data Structures	4	80	20	100	3
BCA-125	Mathematical Foundation of Computer Science	4	80	20	100	3
BCA-126	Software Lab – II (based on BCA- 124: Data Structures)	8	60	40	100	3
Total			420	130	550	

Note:

1. The break up of marks for the practical will be as under:
 - i. Internal Assessment 40 Marks
 - ii. Viva Voce (External Evaluation) 20 Marks
 - iii. Lab Record Program Development and Execution(External Evaluation) 40 Marks

2. The break up of marks for the internal assessment for theory papers except BCA-121 will be as under:
 - i. One or two tests out of which minimum one best will be considered for assessment. 15 Marks
 - ii. Attendance, Class participation and behaviour 5 Marks

- *The break up of marks for the internal assessment for BCA-121: General English – II will be as under:
 - i. Formal assessment through Interview/Self Introduction/Recitation etc. 10 Marks
 - ii. Conversation Skills (particularly listening and speaking to be evaluated through oral examination) 5 Marks
 - iii. Attendance, Class participation and behaviour 5 Marks

BCA-111: General English – I

Max Marks: 80

Min Pass Marks: 35%

Maximum Time: 3 Hrs.

Lectures to be delivered: 45-55 Hrs

General English has been designed to develop the student's general competence in English. The overall aims of the course are to enable the learner to use English effectively for study purpose across the curriculum and develop and integrate the use of the four language skills, i.e. listening, speaking, reading and writing.

Texts Prescribed for Grammar and Vocabulary:

W. Standard Allen: Living English Structure (Orient Longman)

Wilford D. Best: The Student's Companion (Rupa)

SECTION A: Comprehension

15 Marks

One unseen passages of 250-300 words in length with a variety of comprehension questions including 05 marks for word-attack skills such as word formation and inferring meaning, finding opposites etc. The passage can be a factual passage (e.g., instruction, description, report etc.) or a literary passage (e.g., extract from fiction, drama, poetry, essay or biography), or a discursive passage involving opinion, (argumentative, persuasive or interpretative text).

SECTION B: Vocabulary

15 Marks

Change the Number (attempt any 5 out of 7)(½ marks each)	2 ½ marks
Change the Gender (attempt 5 any out of 7)(½ marks each)	2 ½ marks
Words commonly mis-spelt (correct any 5 out of 7)(½ marks each)	2 ½ marks
Antonyms(attempt any 5 out of 7) (½ marks each)	2 ½ marks
Synonyms (attempt any 5 out of 7) (½ marks each)	2 ½ marks
Fill up using correct determinant (attempt any 5 out of 7) (½ marks each)	2 ½ marks

SECTION B: Grammar

25 Marks

<i>Filling up the correct form types of the tense</i> in the sentence: present/ past /future tense with simple/continuous/perfect/ perfect continuous forms (Attempt any 5 out of 7)	5 marks
<i>Reordering word groups in the sentence to make a meaning full sentence.</i> (Attempt any 5 out of 7)	5 marks
<i>Identify various types of clauses and phrases in the sentence:</i> finite and non-finite subordinate clauses: noun clauses and phrases, adjective clauses and phrases, adverb clauses and phrases(Attempt any 5 out of 7)	5 marks
<i>Conversion among various types of sentences:</i> affirmative, interrogative sentences, negation, exclamations (Attempt any 5 out of 7)	5 marks
<i>Write meaning of given word and using in the sentence</i> (Attempt any 5 out of 7)	5 marks

SECTION D: Composition

25 Marks

Composition on a given topic/title based on any current social, environment, health issues. Students will be asked to attempt any one out of 4-5 options with word limit 150-175.

10 Marks

Formal Letter Writing (invitation, accepting/rejecting an invitation, apology, welcome, thanking complements)

7 ½ Marks

Translating a paragraph from Punjabi/Hindi to English (50-75 words)

7 ½ Marks

BCA-112 : ਪੰਜਾਬੀ ਲਾਜ਼ਮੀ

ਸਮਾਂ : 3 ਘੰਟੇ

ਕੁੱਲ ਅੰਕ : 50 (ਬਿਊਰੀ 40)
(ਇੰਟਰਨਲ 10)

ਕੁੱਲ ਅਧਿਆਪਨ ਪੀਰੀਅਡ: 75 (4 ਪੀਰੀਅਡ ਪ੍ਰਤੀ ਹਫ਼ਤਾ)

ਪਾਸ ਹੋਣ ਲਈ ਅੰਕ: 35 ਪ੍ਰਤੀਸ਼ਤ

ਸਿਲੇਬਸ ਅਤੇ ਪਾਠ-ਪੁਸਤਕਾਂ

1. ਪੰਜਾਬੀ ਦੀ ਪਾਠ ਪੁਸਤਕ : ਸੰਪਾਦਕ ਬਲਦੇਵ ਸਿੰਘ ਚੀਮਾ, ਪ੍ਰਕਾਸ਼ਨ: ਪਬਲੀਕੇਸ਼ਨ ਬਿਊਰੋ, ਪੰਜਾਬੀ ਯੂਨੀਵਰਸਿਟੀ, ਪਟਿਆਲਾ।
2. ਪੈਰ੍ਹਾ ਰਚਨਾ
3. ਵਿਆਕਰਨ
(ੳ) ਵਿਆਕਰਨ ਦੇ ਬੁਨਿਆਦੀ ਤੱਤ
(ਅ) ਸ਼ਬਦ ਸ਼੍ਰੇਣੀਆਂ ਅਤੇ ਰੂਪਾਂਤਰਨ
4. ਕ੍ਰਮਾਂਕ 1 ਦੇ ਆਧਾਰ ਤੇ ਛੋਟੇ ਪ੍ਰਸ਼ਨ

ਅੰਕ-ਵੰਡ ਅਤੇ ਪੇਪਰ ਸੈਟਰ ਲਈ ਹਦਾਇਤਾਂ

- ਕਿਸੇ ਕਵਿਤਾ ਦਾ ਸਾਰ ਜਾਂ ਉਸ ਦਾ ਵਿਸ਼ਾ ਵਸਤੂ (ਦੋ ਵਿਚੋਂ ਇੱਕ) 8 ਅੰਕ
ਕਿਸੇ ਰਚਨਾ (ਕਹਾਣੀ, ਲੇਖ) ਦਾ ਵਿਸ਼ਾ ਵਸਤੂ ਜਾਂ ਸਾਰ (ਦੋ ਵਿਚੋਂ ਇੱਕ) 8 ਅੰਕ
(ੳ) ਪੈਰ੍ਹਾ ਰਚਨਾ (ਤਿੰਨ ਵਿਸ਼ੇ ਦੇ ਕੇ ਇੱਕ ਕਰਨ ਲਈ ਆਖਿਆ ਜਾਵੇਗਾ) 8 ਅੰਕ
ਨੰਬਰ 3 ਉੱਤੇ ਦਿੱਤੇ ਵਿਆਕਰਨ ਦੇ ਸਿਲੇਬਸ ਦੇ ਆਧਾਰ ਉੱਤੇ ਵਰਣਾਤਮਿਕ ਚਾਰ ਪ੍ਰਸ਼ਨ ਪੁੱਛੇ ਜਾਣਗੇ, ਦੋ ਦਾ ਉੱਤਰ ਦੇਣ ਲਈ ਕਿਹਾ ਜਾਵੇਗਾ। 8 ਅੰਕ
(ੳ) ਕ੍ਰਮਾਂਕ 1 ਦੀ ਪਾਠ-ਪੁਸਤਕ ਵਿਚੋਂ ਚਾਰ ਵਾਕਾਂ ਦਾ ਵਿਹਾਰਿਕ ਵਿਆਕਰਨਕ ਵਿਸ਼ਲੇਸ਼ਣ। ਇਹ ਪ੍ਰਸ਼ਨ ਨੰ: 3 ਵਿਚ ਨਿਰਧਾਰਿਤ ਵਿਆਕਰਨ ਵਾਲੇ ਪੱਖਾਂ ਉੱਤੇ ਹੀ ਆਧਾਰਿਤ ਹੋਵੇਗਾ।
4×1=4 ਅੰਕ
(ਅ) ਕ੍ਰਮਾਂਕ 1 ਦੇ ਆਧਾਰ ਤੇ 4 ਛੋਟੇ ਪ੍ਰਸ਼ਨ ਪੁੱਛੇ ਜਾਣ। 4×1=4 ਅੰਕ

ਪੰਜਾਬੀ ਲਾਜ਼ਮੀ (ਮੁੱਢਲਾ ਗਿਆਨ)
ਸਮੈਸਟਰ ਪ੍ਰਣਾਲੀ (ਸਮੈਸਟਰ ਪਹਿਲਾ)
2013-14, 2014-15 ਸੈਸ਼ਨ ਲਈ

ਸਮਾਂ : 3 ਘੰਟੇ

ਕੁੱਲ ਅੰਕ : 50 (ਬਿਊਰੀ 40)

ਅੰਦਰੂਨੀ ਮੂਲਾਂਕਣ : 10

ਬਾਹਰੀ ਮੂਲਾਂਕਣ : 40

ਕੋਰਸ ਸਮਾਂ: ਛੇ ਪੀਰੀਅਡ ਪ੍ਰਤੀ ਹਫ਼ਤਾ

ਪਾਸ ਹੋਣ ਲਈ ਅੰਕ: 35 ਪ੍ਰਤੀਸ਼ਤ

1. ਗੁਰਮੁਖੀ ਵਰਨਮਾਲਾ ਤੇ ਲੇਖਣ-ਪ੍ਰਬੰਧ
(ੳ) ਅੱਖਰ ਸਿੱਖਿਆ : ਤਰਤੀਬਵਾਰ ਤੇ ਭੁਲਾਂਵੇ ਅੱਖਰ।
(ਅ) ਅੱਖਰ ਬਣਤਰ : ਅੱਖਰ ਰੂਪ ਤੇ ਲੇਖਣ ਦੇ ਨਿਯਮ।
2. ਗੁਰਮੁਖੀ ਅੱਖਰ ਤੇ ਪੰਜਾਬੀ ਧੁਨੀਆਂ ਦਾ ਪ੍ਰਬੰਧ
(ੳ) ਸਵਰ ਤੇ ਵਿਅੰਜਨ : ਵਰਗੀਕਰਨ ਦੇ ਸਿਧਾਂਤ ਤੇ ਉਚਾਰਨ।
(ਅ) ਸਵਰ ਸੂਚਕ ਅੱਖਰਾਂ ਤੇ ਧੁਨੀਆਂ ਦੀ ਪਛਾਣ ਤੇ ਵਰਤੋਂ।
(ੲ) ਵਿਅੰਜਨ ਸੂਚਕ ਅੱਖਰਾਂ ਤੇ ਧੁਨੀਆਂ ਦੀ ਪਛਾਣ ਤੇ ਵਰਤੋਂ।
(ਸ) ਲਗਾਂ-ਮਾਤਰਾਂ ਦੀ ਪਛਾਣ ਤੇ ਵਰਤੋਂ।
(ਹ) ਲਗਾਖਰਾਂ ਦੀ ਪਛਾਣ।
3. ਲਿਪੀ ਦੇ ਅੱਖਰਾਂ ਦੀ ਵਰਤੋਂ ਦੇ ਨਿਯਮ
(ੳ) ਪੂਰੇ ਤੇ ਅੱਧੇ ਅੱਖਰਾਂ ਦੀ ਪਛਾਣ ਤੇ ਵਰਤੋਂ।
(ਅ) ਸਵਰ ਸੂਚਕ ਅੱਖਰਾਂ ਦੀ ਪਛਾਣ ਤੇ ਵਰਤੋਂ
(ੲ) ਸਵਰ ਵਾਹਕਾਂ ਦੀ ਪਛਾਣ ਤੇ ਵਰਤੋਂ।
(ਸ) ਮਾਤਰਾ ਤੇ ਸਵਰ ਵਾਹਕਾਂ ਦੀ ਸਾਂਝੀ ਵਰਤੋਂ।
(ਹ) ਮਾਤਰਾ ਦੀ ਵਿਅੰਜਨ ਸੂਚਕਾਂ ਨਾਲ ਵਰਤੋਂ।
4. ਪੰਜਾਬੀ ਸ਼ਬਦਾਵਲੀ ਨਾਲ ਜਾਣ ਪਛਾਣ
(ੳ) ਗਿਣਤੀ
(ਅ) ਹਫ਼ਤੇ ਦੇ ਦਿਨ
(ੲ) ਰੰਗਾਂ ਦੇ ਨਾਂ
(ਸ) ਪਸ਼ੂ ਪੰਛੀਆਂ ਦੇ ਨਾਂ
(ਹ) ਪੰਜਾਬੀ ਰਿਸ਼ਤਾ-ਨਾਤਾ ਪ੍ਰਬੰਧ ਦੀ ਸ਼ਬਦਾਵਲੀ
(ਕ) ਘਰੇਲੂ ਵਸਤਾਂ ਦੀ ਸ਼ਬਦਾਵਲੀ

ਪੇਪਰ ਸੈਟਰ ਲਈ ਹਦਾਇਤਾਂ

ਹਰ ਭਾਗ ਨੂੰ ਬਰਾਬਰ ਅੰਕਾਂ ਦੀ ਪ੍ਰਤੀਨਿਧਤਾ ਦਿੱਤੀ ਜਾਵੇ।

(ਵਿਦਿਆਰਥੀ ਪਹਿਲੀ ਵਾਰ ਗੁਰਮੁਖੀ ਲਿਪੀ ਸਿੱਖ ਰਹੇ ਹਨ। ਹੋ ਸਕਦਾ ਹੈ ਵਿਦਿਆਰਥੀ ਪੰਜਾਬੀ ਭਾਸ਼ਾ ਤੋਂ ਅਨਜਾਣ ਹੋਣ, ਸੋ ਪ੍ਰਸ਼ਨਾਂ ਦਾ ਪੱਧਰ ਵਿਦਿਆਰਥੀਆਂ ਦੀ ਸੀਮਾ ਨੂੰ ਧਿਆਨ ਵਿੱਚ ਰੱਖਿਆ ਜਾਵੇ।)

ਸਹਾਇਕ ਪੁਸਤਕਾਂ

1. ਸਤਿਨਾਮ ਸਿੰਘ ਸੰਧੂ, ਆਓ ਪੰਜਾਬੀ ਸਿਖੀਏ, ਪਬਲੀਕੇਸ਼ਨ ਬਿਊਰੋ, ਪੰਜਾਬੀ ਯੂਨੀਵਰਸਿਟੀ, ਪਟਿਆਲਾ, 2009। (ਹਿੰਦੀ ਤੋਂ ਪੰਜਾਬੀ ਸਿਖਣ ਲਈ)
2. ਸਤਿਨਾਮ ਸਿੰਘ ਸੰਧੂ, ਗੁਰਮੁਖੀ ਸਿੱਖੇ, ਪਬਲੀਕੇਸ਼ਨ ਬਿਊਰੋ, ਪੰਜਾਬੀ ਯੂਨੀਵਰਸਿਟੀ, ਪਟਿਆਲਾ, 2011। (ਅੰਗਰੇਜ਼ੀ ਤੋਂ ਪੰਜਾਬੀ ਸਿਖਣ ਲਈ)
3. ਸੀਤਾ ਰਾਮ ਬਾਹਰੀ, ਪੰਜਾਬੀ ਸਿਖੀਏ, ਪਬਲੀਕੇਸ਼ਨ ਬਿਊਰੋ, ਪੰਜਾਬੀ ਯੂਨੀਵਰਸਿਟੀ, ਪਟਿਆਲਾ, 2002 (ਹਿੰਦੀ)
4. ਰਾਜਵਿੰਦਰ ਸਿੰਘ, ਪੰਜਾਬੀ ਗਿਆਨ ਸੀ.ਡੀ. (ਕੰਪਿਊਟਰ ਐਪਲੀਕੇਸ਼ਨ ਟੂ-ਲਰਨ ਐਂਡ ਟੀਚ ਪੰਜਾਬੀ), ਪਬਲੀਕੇਸ਼ਨ ਬਿਊਰੋ, ਪੰਜਾਬੀ ਯੂਨੀਵਰਸਿਟੀ, ਪਟਿਆਲਾ, 2011।
5. Hardev Bahri, Teach Yourself Punjabi, Publication Bureau, Punjabi University, Patiala, 2011.
6. Henry A. Gleason and Harjeet Singh Gill, A Start in Punjabi, Publication Bureau, Punjabi University, Patiala, 1997.
7. Ujjal Singh Bahri and Paramjit Singh Walia, Introductory Punjabi, Publication Bureau, Punjabi University, Patiala, 2003.

BCA-113: Fundamentals of Information Technology

Max Marks: 80

Min Pass Marks: 35%

Maximum Time: 3 Hrs.

Lectures to be delivered: 45-55 Hrs

INSTRUCTIONS FOR THE PAPER SETTER

The question paper will consist of three sections: A, B & C. Sections A & B will have four questions each from the respective sections of the syllabus carrying 15 marks for each question. Section C will have 10 short-answer type questions carrying a total of 20 marks, which will cover the entire syllabus uniformly..

INSTRUCTIONS FOR THE CANDIDATES

Candidates are required to attempt two questions each from the sections A & B of the question paper and the entire section C.

SECTION-A

Computer Fundamentals: Block diagram of a computer, characteristics of computers and generations of computers.

Input Devices: Keyboard, Mouse, Joy tick, Track Ball, Touch Screen, Light Pen, Digitizer, Scanners, Speech Recognition Devices, Optical Recognition devices – OMR, OBR, OCR

Output Devices: Monitors, Impact Printers - Dot matrix, Character and Line printer, Non Impact Printers – DeskJet and Laser printers, Plotter.

Memories: Main Memories - RAM, ROM and Secondary Storage Devices - Hard Disk, Compact Disk, DVD.

Computer Languages: Machine language, assembly language, high level language, 4GL, Introduction to Compiler, Interpreter, Assembler, System Software, Application Software.

SECTION-B

Number System: Non-positional and positional number systems, Base conversion, Concept of Bit and Byte, binary, decimal, hexadecimal, and octal systems, conversion from one system to the other.

Binary Arithmetic: Addition, subtraction and multiplication., 1's complement, 2's complement, subtraction using 1's complement and 2's complement.

Operating System: Batch, Multiprogramming, time-sharing, on-line and real time operating system, Multi-processor, Multi-tasking.

Computer Network: Network types, network topologies.

Introduction to the Concept to Internet: Evolution of Internet, Internet Applications, WWW, E-mail, FTP, TELNET, Web Browsers.

Applications of Information Technology and Trends: IT in Business and Industry, IT in Education & training, IT in Science and Technology, IT and Entertainment, Current Trends in IT Application - AI, Virtual Reports, voice recognition, Robots, Multimedia Technology.

References:

- 1 P.K. Sinha and P. Sinha, Foundations of Computing, First Edition, 2002, BPB.
- 2 Chetan Srivastva, Fundamentals of Information Technology, Kalyani Publishers.
- 3 Turban Mclean and Wetbrete, Information Technology and Management, Second Edition, 2001, John Wiley & Sons.
- 4 Satish Jain, Information Technology, BPB, 1999.

BCA-114: Programming Fundamentals using C

Max Marks: 80

Min Pass Marks: 35%

Maximum Time: 3 Hrs.

Lectures to be delivered: 45-55 Hrs

INSTRUCTIONS FOR THE PAPER SETTER

The question paper will consist of three sections: A, B & C. Sections A & B will have four questions each from the respective sections of the syllabus carrying 15 marks for each question. Section C will have 10 short-answer type questions carrying a total of 20 marks, which will cover the entire syllabus uniformly..

INSTRUCTIONS FOR THE CANDIDATES

Candidates are required to attempt two questions each from the sections A & B of the question paper and the entire section C.

Section - A

Programming Process: Problem definition, Algorithm development, Flowchart, Coding, Compilation and debugging.

Basic structure of C program: History of C, Structure of a C program, Character set, Identifiers and keywords, constants, variables, data types.

Operators and expressions: Arithmetic, Unary, Logical, Relational operators, assignment operators, Conditional operators, Hierarchy of operations type conversion.

Control statements: branching statements (if, if else, switch), loop statements (for, while and do-while), jump statements (break, continue, goto), nested control structures.

Functions: Library functions and user defined functions, prototype, definition and call, formal and actual arguments, local and global variables, methods of parameter passing to functions, recursion.

I/O functions: formatted & unformatted console I/O functions

Section - B

Storage Classes: automatic, external, static and register variables.

Arrays: – One dimensional and two dimensional arrays

Declaration, initialization, reading values into an array, displaying array contents

Strings: input/output of strings, string handling functions (strlen, strcpy, strcmp, strcat & strrev), table of strings.

Structures and unions: using structures and unions, comparison of structure with arrays and union.

Pointers: pointer data type, pointer declaration, initialization, accessing values using pointers, pointers and arrays.

Introduction to Files in C: opening and closing files. Basic I/O operation on files.

Text Book:

1 E. Balagurusamy, “Programming in C”, Tata McGraw Hill.

References:

1 Kernighan and Ritchie, “The C Programming Language”, PHI.

2 Byron Gotfried, “Programming in C”.

3 Kamathane, “Programming in C”, Oxford University Press.

BCA-115: Basic Mathematics

Max Marks: 80

Min Pass Marks: 35%

Maximum Time: 3 Hrs.

Lectures to be delivered: 45-55 Hrs

INSTRUCTIONS FOR THE PAPER SETTER

The question paper will consist of three sections: A, B & C. Sections A & B will have four questions each from the respective sections of the syllabus carrying 15 marks for each question. Section C will have 10 short-answer type questions carrying a total of 20 marks, which will cover the entire syllabus uniformly..

INSTRUCTIONS FOR THE CANDIDATES

Candidates are required to attempt two questions each from the sections A & B of the question paper and the entire section C.

Section - A

Complex Numbers: Complex Numbers in the form of $a+ib$, Real and Imaginary parts of a complex number, Complex conjugate, algebra of complex numbers, square roots of a complex number, cube roots of unity.

Quadratic Equations: Solutions of Quadratic equations (with real and complex coefficients), Relations between roots and coefficients, Nature of roots, Equations reducible to quadratic equations.

Sequence and Series: Sequence and series, Arithmetic Progression (A.P.), Arithmetic Mean (A.M.), n th term, sum to n terms of an AP, Geometric Progression (G.P.), general term of GP, sum to n terms of a GP, Infinite GP and its sum, Geometric mean (G.M.), Sum to n terms of special series $\sum n$, $\sum n^2$, $\sum n^3$

Section - B

Inequalities: Solution of Linear and Quadratic Inequalities.

Counting: The basics of counting, Permutation and combinations.

Binomial Theorem: Expansion, General term, middle term, Independent term.

Cartesian System of Rectangular Coordinates: Cartesian coordinate system, distance formula, section formula, centroid and incentre, area of triangle, condition for collinearities of three points in a plane.

Straight Line: Slope of a line, parallel and perpendicular lines, Equation of line in different forms, distance of a point from a line.

Circle: Standard form of equation of circle, General form, diameter form, three point form, Intersection of a line and a circle.

Text Book:

1. NCERT Textbooks of Mathematics for +1 and +2.

BCA-116: Software Lab – I

(Based on paper BCA-114: Programming Fundamentals using C)

Max Marks: 100

Maximum Time: 3 Hrs.

Min Pass Marks: 35%

Practical Sessions to be conducted: 12 periods per week)

This laboratory course will comprise as exercises to supplement what is learnt under paper BCA-114: Programming Fundamental using C. Students are required to develop the following programs with internal documentation:

1. Operators and data types in C

- a) Write a program to print the size of all the data types supported by C and its range.
- b) Write a program to convert temperature from Fahrenheit to Celsius.
- c) Write a program to find simple interest and compound interest.

2. Control statements

- a) Write a program to check whether the given number is a even number or not.
- b) Write a program to accept three numbers and find the largest among them.
- c) Write a program to count the different vowels in a line of text using switch.
- d) Write a program to accept two numbers and perform various arithmetic operations (+, -, *, /) based on the symbol entered.
- e) Write a program to find factorial of a number.
- f) Write a program to check whether a number is prime or not.
- g) Write a program to print all prime numbers between any 2 given limits.
- h) Write a program to check whether a number is palindrome or not.
- i) Write a program to print all the Armstrong numbers between any 2 given limits.

4. Arrays and strings

- a) Write a program to find largest element in an array.
- b) Write a program to find sum and average of numbers stored in an array.
- c) Write a program to check whether a string is a Palindrome.
- d) Write a program to perform matrix addition.
- e) Write a program to perform matrix multiplication.

6 Functions and recursion

- a) Write a program to find the roots of a quadratic equation using function.
- b) Write a recursive program to find the factorial of a number.
- c) Write a recursive program to find the nth Fibonacci number.

7. Structures and unions

- a. Create an employee structure and display the same.
- b. Create a student database storing the roll no, name, class etc and sort by name.

8. Aim: To learn about pointers

- a. Write a function to swap two numbers using pointers
- b. Write a program to access an array of integers using pointers

9. Aim: To learn about Files

a. Create a file and store some records in it. Display the contents of the same. Count numbers of characters, words and lines in the file.

The break up of marks for the practical will be as under

- | | | |
|-------------|---|-----------------|
| i. | Internal Assessment | 40 Marks |
| ii. | Viva Voce (External Evaluation) | 20 Marks |
| iii. | Lab Record, Program Development and Execution(External Evaluation) | 40 Marks |

BCA-121: General English – II

Max Marks: 80

Min Pass Marks: 35%

Maximum Time: 3 Hrs.

Lectures to be delivered: 45-55 Hrs

General English has been designed to develop the student's general competence in English. The overall aims of the course are to enable the learner to use English effectively for study purpose across the curriculum and develop and integrate the use of the four language skills, i.e. listening, speaking, reading and writing.

Texts Prescribed for Grammar and Vocabulary:

W. Standard Allen: Living English Structure (Orient Longman)

Wilford D. Best: The Student's Companion (Rupa)

SECTION A: Comprehension

15 Marks

One unseen passages of 300-350 words in length with a variety of comprehension questions including 05 marks for word-attack skills such as word formation and inferring meaning, finding opposites etc. The passage can be a factual passage (e.g., instruction, description, report etc.) or a literary passage (e.g., extract from fiction, drama, poetry, essay or biography), or a discursive passage involving opinion, (argumentative, persuasive or interpretative text).

SECTION B: Vocabulary

20 Marks

Fill up using correct form of verb (Attempt any 5 out of 7) (½ marks each)

2 ½ marks

Usage of the adverb, adjective etc. (Attempt any 5 out of 7) (½ marks each)

2 ½ marks

Write Antonym of the given word and use both the given word and its antonym in the single sentence clarifying meaning and usage (Attempt any 5 out of 7)

5 marks

Give different meanings to Synonyms and use them in sentences (Attempt any 5 out of 7)

5 marks

Give meaning and make sentences for idioms (Attempt any 5 out of 7)

5 marks

SECTION C: Grammar

20 Marks

Conversion among various types of the tenses in the sentence: present/past/future tense with simple/continuous/perfect forms (Attempt any 5 out of 7)

5 marks

Conversion between Direct/Indirect speech (Attempt any 5 out of 7)

5 marks

Conversion between active/passive voice (Attempt any 5 out of 7)

5 marks

Conversion among various types of sentences: affirmative, interrogative sentences, negation, exclamations (Attempt any 5 out of 7)

5 marks

SECTION D: Composition

25 Marks

Composition on a given topic/title based on any current social, environment, health issues. Students will be asked to attempt any one out of 4-5 options with word limit 150-175.

10 Marks

Formal Letter Writing (Applying for a job, making a complaint, asking for information)

7 ½ Marks

Translating a paragraph from Punjabi/Hindi to English (50-75 words)

7 ½ Marks

BCA : 122 ਪੰਜਾਬੀ ਲਾਜ਼ਮੀ
ਸਮੇਸਟਰ ਦੂਜਾ

ਸਮਾਂ : 3 ਘੰਟੇ

ਕੁੱਲ ਅੰਕ : 50 (ਬਿਊਰੀ 40)
(ਇੰਟਰਨਲ 10)

ਕੁੱਲ ਅਧਿਆਪਨ ਪੀਰੀਅਡ: 75 (4 ਪੀਰੀਅਡ ਪ੍ਰਤੀ ਹਫ਼ਤਾ)

ਪਾਸ ਹੋਣ ਲਈ ਅੰਕ: 35 ਪ੍ਰਤੀਸ਼ਤ

ਸਿਲੇਬਸ ਅਤੇ ਪਾਠ-ਪੁਸਤਕਾਂ

1. ਅੰਮ੍ਰਿਤਾ ਪ੍ਰੀਤਮ : ਪਿੰਜਰ
2. ਚਿੱਠੀ ਪੱਤਰ
3. ਵਿਆਕਰਨ

(ੳ) ਭਾਸ਼ਾ ਵੰਨਗੀਆਂ: ਭਾਸ਼ਾ ਦਾ ਟਕਸਾਲੀ ਰੂਪ, ਭਾਸ਼ਾ ਤੇ ਉਪ-ਭਾਸ਼ਾ ਦਾ ਅੰਤਰ ਅਤੇ ਅੰਤਰ ਸਬੰਧ, ਪੰਜਾਬੀ ਉਪ-ਭਾਸ਼ਾਵਾਂ ਦੇ ਪਛਾਣ ਚਿੰਨ੍ਹ

(ਅ) ਗੁਰਮੁੱਖੀ ਲਿੱਪੀ ਅਤੇ ਸ਼ਬਦ ਜੋੜ

4. ਕ੍ਰਮਾਂਕ 1 ਦੇ ਆਧਾਰ ਤੇ ਛੋਟੇ ਪ੍ਰਸ਼ਨ

ਅੰਕ-ਵੰਡ ਅਤੇ ਪੇਪਰ ਸੈਟਰ ਲਈ ਹਦਾਇਤਾਂ

1. ਨਾਵਲ ਦਾ ਸਾਰ ਜਾਂ ਉਸ ਦਾ ਵਿਸ਼ਾ ਵਸਤੂ, ਪਾਤਰ ਉਸਾਰੀ (ਦੋ ਵਿਚੋਂ ਇੱਕ) 16 ਅੰਕ
2. ਚਿੱਠੀ ਪੱਤਰ 8 ਅੰਕ
3. ਨੰਬਰ 3 ਉਤੇ ਦਿੱਤੇ ਵਿਆਕਰਨ ਦੇ ਸਿਲੇਬਸ ਦੇ ਆਧਾਰ ਉਤੇ ਵਰਣਾਤਮਿਕ ਚਾਰ ਪ੍ਰਸ਼ਨ ਪੁੱਛੇ ਜਾਣਗੇ, ਦੋ ਦਾ ਉੱਤਰ ਦੇਣ ਲਈ ਕਿਹਾ ਜਾਵੇਗਾ। 8 ਅੰਕ
4.
(ੳ) ਕ੍ਰਮਾਂਕ 1 ਦੀ ਪਾਠ-ਪੁਸਤਕ ਵਿਚੋਂ ਚਾਰ ਵਾਕਾਂ ਦਾ ਵਿਹਾਰਿਕ ਵਿਆਕਰਨਕ ਵਿਸ਼ਲੇਸ਼ਣ। ਇਹ ਪ੍ਰਸ਼ਨ ਨੰ: 4 ਵਿਚ ਨਿਰਧਾਰਿਤ ਵਿਆਕਰਨ ਵਾਲੇ ਪੱਖਾਂ ਉਤੇ ਹੀ ਆਧਾਰਿਤ ਹੋਵੇਗਾ।
4×1=4 ਅੰਕ
(ਅ) ਕ੍ਰਮਾਂਕ 1 ਦੇ ਆਧਾਰ ਤੇ 4 ਛੋਟੇ ਪ੍ਰਸ਼ਨ ਪੁੱਛੇ ਜਾਣ। 4×1=4 ਅੰਕ

ਪੰਜਾਬੀ ਲਾਜ਼ਮੀ (ਮੁੱਢਲਾ ਗਿਆਨ)
ਸਮੈਸਟਰ ਪ੍ਰਣਾਲੀ (ਸਮੈਸਟਰ ਦੂਜਾ)
2013-14, 2014-15 ਸੈਸ਼ਨ ਲਈ

ਸਮਾਂ : 3 ਘੰਟੇ

ਕੁੱਲ ਅੰਕ : 50 (ਬਿਊਰੀ 40)

ਅੰਦਰੂਨੀ ਮੂਲਾਂਕਣ : 10

ਬਾਹਰੀ ਮੂਲਾਂਕਣ : 40

ਕੋਰਸ ਸਮਾਂ: ਛੇ ਪੀਰੀਅਡ ਪ੍ਰਤੀ ਹਫ਼ਤਾ

ਪਾਸ ਹੋਣ ਲਈ ਅੰਕ: 35 ਪ੍ਰਤੀਸ਼ਤ

1. ਸ਼ਬਦ ਪ੍ਰਬੰਧ : ਸ਼ਬਦ ਜੋੜਾਂ ਦੀ ਵਰਤੋਂ
 (ੳ) ਦੋ ਅੱਖਰੀ ਸ਼ਬਦਾਂ ਦੇ ਸ਼ਬਦ ਜੋੜ
 (ਅ) ਤਿੰਨ ਅੱਖਰੀ ਸ਼ਬਦਾਂ ਦੇ ਸ਼ਬਦ ਜੋੜ
 (ੲ) ਬਹੁ ਅੱਖਰੀ ਸ਼ਬਦਾਂ ਦੇ ਸ਼ਬਦ ਜੋੜ
2. ਸ਼ਬਦਾਂ ਦੀਆਂ ਸ਼ਰੇਣੀਆਂ ਤੇ ਵਿਆਕਰਨਕ ਵਰਗਾਂ ਦੀ ਪਛਾਣ
 (ੳ) ਸ਼ਬਦਾਂ ਦੀਆਂ ਸ਼ਰੇਣੀਆਂ ਦਾ ਸਿਧਾਂਤ, ਪਛਾਣ ਤੇ ਵਰਤੋਂ
 (ਨਾਂਵ, ਪੜਨਾਂਵ, ਵਿਸ਼ੇਸ਼ਣ, ਕਿਰਿਆ, ਕਿਰਿਆ ਵਿਸ਼ੇਸ਼ਣ ਆਦਿ)
 (ਅ) ਵਿਆਕਰਨਕ ਵਰਗਾਂ ਦੀ ਪਛਾਣ ਤੇ ਵਰਤੋਂ
 (ਲਿੰਗ, ਵਚਨ, ਪੁਰਖ, ਕਾਲ ਆਦਿ)
3. ਸ਼ਬਦ ਬਣਤਰਾਂ ਤੇ ਵਿਆਕਰਨਕ ਇਕਾਈਆਂ ਦਾ ਸਿਧਾਂਤ ਤੇ ਵਰਤੋਂ
 (ੳ) ਪੰਜਾਬੀ ਸ਼ਬਦ ਬਣਤਰਾਂ ਦਾ ਸਿਧਾਂਤ, ਪਛਾਣ ਤੇ ਵਰਤੋਂ
 (ਅਗੇਤਰ, ਪਿਛੇਤਰ, ਸਮਾਸ, ਦੁਹਰਕਤੀ)
 (ਅ) ਵਿਆਕਰਨਕ ਇਕਾਈਆਂ ਦਾ ਸਿਧਾਂਤ, ਪਛਾਣ ਤੇ ਵਰਤੋਂ
 (ਵਾਕੰਸ਼, ਉਪ-ਵਾਕ ਤੇ ਵਾਕ)
 (ੲ) ਸ਼ਬਦਾਂ ਦਾ ਵਿਆਕਰਨਕ ਮੇਲ : ਸਿਧਾਂਤ ਤੇ ਵਿਹਾਰ
4. ਵਿਸਰਾਮ ਚਿੰਨ੍ਹਾਂ ਦੀ ਪਛਾਣ ਤੇ ਵਰਤੋਂ।

ਪੇਪਰ ਸੈਟਰ ਲਈ ਹਦਾਇਤਾਂ

ਹਰ ਭਾਗ ਨੂੰ ਬਰਾਬਰ ਅੰਕਾਂ ਦੀ ਪ੍ਰਤੀਨਿਧਤਾ ਦਿੱਤੀ ਜਾਵੇ।
(ਵਿਦਿਆਰਥੀ ਪਹਿਲੀ ਵਾਰ ਗੁਰਮੁਖੀ ਲਿਪੀ ਸਿੱਖ ਰਹੇ ਹਨ। ਹੋ ਸਕਦਾ ਹੈ ਵਿਦਿਆਰਥੀ ਪੰਜਾਬੀ ਭਾਸ਼ਾ ਤੋਂ ਅਨਜਾਣ ਹੋਣ, ਸੋ ਪ੍ਰਸ਼ਨਾਂ ਦਾ ਪੱਧਰ ਵਿਦਿਆਰਥੀਆਂ ਦੀ ਸੀਮਾ ਨੂੰ ਧਿਆਨ ਵਿੱਚ ਰੱਖਿਆ ਜਾਵੇ।)

ਸਹਾਇਕ ਪੁਸਤਕਾਂ

1. ਸਤਿਨਾਮ ਸਿੰਘ ਸੰਧੂ, ਆਓ ਪੰਜਾਬੀ ਸਿਖੀਏ, ਪਬਲੀਕੇਸ਼ਨ ਬਿਊਰੋ, ਪੰਜਾਬੀ ਯੂਨੀਵਰਸਿਟੀ, ਪਟਿਆਲਾ, 2009। (ਹਿੰਦੀ ਤੋਂ ਪੰਜਾਬੀ ਸਿਖਣ ਲਈ)
2. ਸਤਿਨਾਮ ਸਿੰਘ ਸੰਧੂ, ਗੁਰਮੁਖੀ ਸਿੱਖੇ, ਪਬਲੀਕੇਸ਼ਨ ਬਿਊਰੋ, ਪੰਜਾਬੀ ਯੂਨੀਵਰਸਿਟੀ, ਪਟਿਆਲਾ, 2011। (ਅੰਗਰੇਜ਼ੀ ਤੋਂ ਪੰਜਾਬੀ ਸਿਖਣ ਲਈ)
3. ਸੀਤਾ ਰਾਮ ਬਾਹਰੀ, ਪੰਜਾਬੀ ਸਿਖੀਏ, ਪਬਲੀਕੇਸ਼ਨ ਬਿਊਰੋ, ਪੰਜਾਬੀ ਯੂਨੀਵਰਸਿਟੀ, ਪਟਿਆਲਾ, 2002 (ਹਿੰਦੀ)
4. ਰਾਜਵਿੰਦਰ ਸਿੰਘ, ਪੰਜਾਬੀ ਗਿਆਨ ਸੀ.ਡੀ. (ਕੰਪਿਊਟਰ ਐਪਲੀਕੇਸ਼ਨ ਟੂ-ਲਰਨ ਐਂਡ ਟੀਚ ਪੰਜਾਬੀ), ਪਬਲੀਕੇਸ਼ਨ ਬਿਊਰੋ, ਪੰਜਾਬੀ ਯੂਨੀਵਰਸਿਟੀ, ਪਟਿਆਲਾ, 2011।
5. Hardev Bahri, Teach Yourself Punjabi, Publication Bureau, Punjabi University, Patiala, 2011.
6. Henry A. Gleason and Harjeet Singh Gill, A Start in Punjabi, Publication Bureau, Punjabi University, Patiala, 1997.
7. Ujjal Singh Bahri and Paramjit Singh Walia, Introductory Punjabi, Publication Bureau, Punjabi University, Patiala, 2003.

BCA-123: Digital Electronics

Max Marks: 80

Min Pass Marks: 35%

Maximum Time: 3 Hrs.

Lectures to be delivered: 45-55 Hrs

INSTRUCTIONS FOR THE PAPER SETTER

The question paper will consist of three sections: A, B & C. Sections A & B will have four questions each from the respective sections of the syllabus carrying 15 marks for each question. Section C will have 10 short-answer type questions carrying a total of 20 marks, which will cover the entire syllabus uniformly..

INSTRUCTIONS FOR THE CANDIDATES

Candidates are required to attempt two questions each from the sections A & B of the question paper and the entire section C.

Section-A

Fundamental Concepts: Introduction to Analog and Digital Systems, Digital Signals, Basic Digital Circuits: AND, OR, NOT, NAND, NOR, XOR and XNOR gates. Boolean Algebra Theorems, Characteristics of Digital IC.

Number Systems: Positional and Non-positional number systems, Binary, Decimal, Octal and Hexadecimal, Base conversions, Binary arithmetic: Addition and Subtraction, 1's complement, 2's complement, subtraction using 1's complement and 2's complement.

Combinational Logic Design: SOP and POS Representation of Logic functions, K-Map representation and simplification up to 4 variable expressions, Don't care condition.

Section - B

Multiplexers: 4X1, 8X1 and 16X1. De-multiplexers: 1 to 4, 1 to 8 and 1 to 16. BCD to Decimal decoder, Decimal to BCD encoder. Parity generator and Parity checker.

Design of Half adder and Full adder

Flip-Flops: Introduction, Latch, Clocked S-R Flip Flop, Preset and Clear signals, D-Flip Flop, J-K Flip Flop, The race-around condition, Master Slave J-K Flip Flop, D-Flip-Flop, Excitation Tables of Flip Flops. Edge-Triggered Flip Flops.

A/D and D/A Converters: Introduction, Digital to Analog Converters: Weighted-Register D/A converter, R-2R Ladder D/A converter. Analog to Digital Converters: Quantization and encoding, Parallel-comparator A/D converter, Counting A/D converter.

Text Book:

1. Modern Digital Electronics by R. P. Jain, Fourth Edition, TMH

References:

1. Digital Principles and Applications by Albert Paul Malvino and Donald P. Leach, Fourth Edition, TMH
2. Digital Electronics: An Introduction to Theory and Practice by William H Gothmann, 2nd Edition, PHI

BCA-124: Mathematical Foundation of Computer Science

Max Marks: 80

Min Pass Marks: 35%

Maximum Time: 3 Hrs.

Lectures to be delivered: 45-55 Hrs

INSTRUCTIONS FOR THE PAPER SETTER

The question paper will consist of three sections: A, B & C. Sections A & B will have four questions each from the respective sections of the syllabus carrying 15 marks for each question. Section C will have 10 short-answer type questions carrying a total of 20 marks, which will cover the entire syllabus uniformly..

INSTRUCTIONS FOR THE CANDIDATES

Candidates are required to attempt two questions each from the sections A & B of the question paper and the entire section C.

Section - A

Matrices: Types of Matrices, Addition, Subtraction, Multiplication, Transpose, Conjugate and their properties, Symmetric, Skew-symmetric, Hermitian, Skew-Hermitian, Orthogonal and Unitary matrices, Minor, co-factors, Adjoint, Inverse of matrices, Solution of linear system of equations using matrices.

Rank of a matrix, consistency of linear system of equations, Characteristic equation, eigen values & eigen vectors, Diagonalization of matrices, Cayley Hamilton theorem.

Determinants: Expansion of determinants (upto order 4), solution of linear system of equations using Cramer rule, Properties of Determinants.

Probability: Elementary events, Sample space, Compound events, Type of events, Mutually Exclusive, Independent events, Addition Law of probability (for 2 and 3 events), Conditional probability, Multiplication Theorem of probability, Baye's theorem,

Section - B

Linear Programming: Foundations of the problem, Graphical method to solve LPP of two variables.

General Linear Programming problem: Simplex method, Artificial variable techniques, Two phase method, Dual of LPP

Transportation problem: Mathematical formulation of transportation problem, Initial Basic feasible solution (NWCM, LCEM, VAM methods), Optimal solution using MODI method, Degeneracy in transportation problrms.

Assignment Problem: Mathematical formulation of Assignment problem, Solution by Hungarian method, Unbalanced Assignment problem, Maximisation Assignment problem.

Text Book:

1. "Higher Engineering Mathematics", B. S. Grewal, 35th Edition, Khanna Publishers.

References:

1. "Advanced Engineering Mathematics", E.Kreyszig, 8th Edition, Wiley.
2. "Advanced Engineering Mathematics", R. K. Jain & S.R.K. Iyenger, Wiley Eastern. Edition
3. "Engineering Mathematics Vol I & II" S. S. Sastry, PHI.

BCA-125: Data Structures

Max Marks: 80

Min Pass Marks: 35%

Maximum Time: 3 Hrs.

Lectures to be delivered: 45-55 Hrs

INSTRUCTIONS FOR THE PAPER SETTER

The question paper will consist of three sections: A, B & C. Sections A & B will have four questions each from the respective sections of the syllabus carrying 15 marks for each question. Section C will have 10 short-answer type questions carrying a total of 20 marks, which will cover the entire syllabus uniformly..

INSTRUCTIONS FOR THE CANDIDATES

Candidates are required to attempt two questions each from the sections A & B of the question paper and the entire section C.

Section - A

Basic concepts and notations: Types of data structures, Data structure operations, Mathematical notations and functions, Algorithmic complexity, Big 'O' notation, Time and space trade off.

Arrays: Linear array, representation of array in memory, traversing linear array, insertion and deletion in an array, Two-dimensional array, row major and column major orders, sparse matrix.

Stacks: Representation of stacks in memory (linked and sequential), operations on stacks, Applications of stacks: string reversal, parentheses matching.

Queues: Representation of queues in memory (linked and sequential), operations on queues, insertion in rear, deletion from front.

Section - B

Linked list: Representation of linked list using static and dynamic data structures, insertion and deletion of a node from linked list, searching in link list, searching in sorted link list.

Trees: Definition and basic concepts, linked representation and representation in contiguous storage, binary tree, binary tree traversal, Binary search tree, searching, insertion and deletion in binary search tree.

Searching and sorting algorithms: Linear and binary search, bubble sort, insertion sort, selection sort, quick sort, merge sort.

Text Book

- 1 Seymour Lipschutz, "Theory and Practice of Data Structures", McGraw Hill.

References

- 1 Tenenbaum, Y. Lanhgsam and A. J. Augenstein, "Data Structures using C and C++", Prentice Hall of India.
- 2 Robert Sedgewick, "Algorithms in C", Pearson Education.

BCA-126: Software Lab – II
(Based on paper BCA-125: Data Structures)

Max Marks: 100 (

Maximum Time: 3 Hrs.

Min Pass Marks: 35%

Practical Sessions to be conducted: 12 Periods per week

This laboratory course will comprise as exercises to supplement what is learnt under paper BCA-124: Data Structures. Students are required to develop *following* programs in C language with internal documentation

- 1 Program to insert an element from an array.
- 2 Program to delete an element from an array.
- 3 Program to store an array using sparse representation.
- 4 Program to apply various operations on stack.
- 5 Program for parenthesis matching using stack
- 6 Program for String reversal using stack.
- 7 Program to insert and delete nodes in a queue.
- 8 Program to insert and delete nodes in a linked list.
- 9 Program to search a node in a linked list.
- 10 Program to insert or delete node in a binary tree.
- 11 Program to traverse binary tree
- 12 Program for implementing linear search.
- 13 Program for implementing binary search.
- 14 Program for implementing Bubble sort.
- 15 Program for implementing Selection sort.
- 16 Program for implementing Bubble sort.
- 17 Program for implementing Insertion sort.
- 18 Program for implementing Quick sort.
- 19 Program for implementing Merge sort.

The break up of marks for the practical will be as under

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|--|-----------------|
| i. Internal Assessment | 40 Marks |
| ii. Viva Voce (External Evaluation) | 20 Marks |
| iii. Lab Record, Program Development and Execution(External Evaluation) | 40 Marks |