7. (a) Define level of gates. What are multilevel gate network ? Realize the function : **9**

$$f = B(A + CD) + A\bar{C}$$

as multilevel NAND-NAND gate network. **9**

(b) Diffrentiate Positive logic, Negative logic and Mixed logic. **6**

Unit IV

8. (a) Explain the working of a full subtractor. Draw and explain its logic symbol, symbol using two-half subractors, truth table of full subtractor. **10**

(b) What is a Demultiplexer ? Write its uses. **5**

9. (a) What is a Digital Comparator ? Explain working with block diagram of a *n*-bit comparator. **6**

(b) Explain design and working of a BCD-to-Seven-segment decoder. **9**

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B-211

B.C.A. EXAMINATION, May 2017

(Second Semester)

(B. Scheme) (Main & Re-appear)

BCA-102-B

DIGITAL CIRCUITS AND LOGIC DESIGN

Time : 3 *Hours*] [*Maximum Marks* : 75

Before answering the question-paper candidates should ensure that they have been supplied to correct and complete question-paper. No complaint, in this regard, will be entertained after the examination.

Note : Attempt *Five* questions in all, selecting at least *one* question from each Unit. Q. No. **1** is compulsory. All questions carry equal marks.

1. (a) Convert Decimal 27.315 to binary. **3×5=15**

(b) Define 'Parity Bit' in error detecting codes.

(c) Prove Boolean theorem $x + xy = x$ using truth table.

(d) Write names of universal gates. Why these are important ?

(e) Define combinational circuit with block diagram.

Unit I

2. (a) Write full form of ASCII. Explain ASCII character representation. **8**

(b) Compare fixed point and floating point representation of numbers. **7**

3. (a) What is Hamming Code ? How can it be used for error detecting and correcting ? **9**

(b) Determine the number of bits required to represent in floating point notation the exponent for decimal numbers in the range of $10^{\pm 86}$. **6**

Unit II

4. (a) Using Boolean Algebra, verify : **6**

$(A+B)\,(B+C)\,(C+A) = AB + BC + CA$

(b) What is 'Minterm' ? How is it obtained ? What is property of this ? Obtain canonical sum of product form of the function $Y(A, B) = A + B)$. **9**

5. (a) Minimize the given function using K-map and convert the minimized function into POS form $f(A, B, C, D) = \Sigma\,(1, 3, 5, 7, 9, 10, 12, 13)$. **5**

(b) Determine the don't care condition in the following Boolean expression $BE + \bar{B}D\bar{E}$, which is a simplified version of the expression $\bar{A}BE + BCDE + B\bar{C}\bar{D}E + \bar{A}\bar{B}D\bar{E} + \bar{B}\bar{C}D\bar{E}$. **10**

Unit III

6. (a) Define a logic gate. Draw logical symbol and truth table for basic gates; AND, OR, NOT gates. Draw circuit diagram for realization of OR gate using diodes. 7

(b) What are universal gates ? What is their use ? Relize NOT, AND and OR gates using NAND gate. **8**

(b) What is a String ? Write the syntax of string declaration ? Write a program to reverse a string. **10**

Section C

7. (a) Differentiate between scanf and gets, printf and puts in context of strings. **10**

(b) What is a Structure ? Write down the syntax of structure declaration. What are the uses of bit field in structures ? **10**

8. Explain the purpose of following functions with suitable example and syntax : **20**

(a) fprintf( )

(b) rewind( )

(c) fputs( )

(d) fseek( )

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B-163

B.C.A. EXAMINATION, May 2017

(Second Semester)

(Old Scheme) (Re-appear Only)

BCA

BCA-106

PROGRAMMING IN C

Time : 3 *Hours*] [*Maximum Marks :* 100

Before answering the question-paper candidates should ensure that they have been supplied to correct and complete question-paper. No complaint, in this regard, will be entertained after the examination.

Note : Q. No. **1** is compulsory. Apart from that candidate is required to attempt any *four* questions selecting at least *one* question from each Section.

1. Explain the following : **20**

   (a) Identifiers

   (b) Syntax Errors

   (c) Hierarchy and Associativity of Arithmetic Operators

   (d) Pointers

   (e) Formatted I/O

   (f) Keywords

   (g) Header Filers

   (h) Conditional Operators

   (i) Union

   (j) Data Files.

Section A

2. (a) What is the help of suitable example differential between Macro and Functions. **1**

   (b) What are the different data types available in C ? Specify the keywords used and memory allocation for different data types. **7**

3. (a) What are the different bitwise and relational operators supported by C language ? Explain each with example. **13**

   (b) What do you mean by data type conversion ? Show with the help of some example. **7**

Section B

4. (a) Differentiate between If and Switch Statement. Illustrate with the help of suitable examples. **10**

   (b) Write a program to find largest of 3 numbers. **10**

5. (a) What is meant by function prototype ? Give suitable example to illustrate the need of functions. **10**

   (b) Differentiate between break and continue statement. Give suitable examples. **10**

6. (a) Write a program to find sum of even and sum of odd numbers in array of 20 numbers. **10**

9. (a) Calculate Mean deviation for the data :

Income (in Rs.)	No. of Families
20–30	120
30–40	201
40–50	150
50–60	75
60–70	25

(b) The scores of two batsman A and B for 20 innings are tabulated below which of the two may be regarded as the more consistent batsman ?

Score	No. of Innings	
	A	B
50	1	1
51	0	2
52	0	2
53	4	6
54	3	3
55	6	4
56	3	2
57	3	0

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B-213

B.C.A. EXAMINATION, May 2017

(Second Semester)

(B. Scheme) (Main & Re-appear)

BCA

BCA-106-B

MATHEMATICS–II

Time : 3 *Hours*] [*Maximum Marks* : 75

Before answering the question-paper candidates should ensure that they have been supplied to correct and complete question-paper. No complaint, in this regard, will be entertained after the examination.

Note : Q. No. **1** is compulsory. Attempt any *Four* questions taking *one* from each Unit. All questions carry equal marks.

1. (a) Illustrate by mean of Venn-Diagram that $A \cap (B \cup C) = (A \cap B) \cup (A \cap C)$.

(b) State any three properties of determinants.

(c) Find x, y, z, t when :

$$2\begin{bmatrix} x & z \\ y & t \end{bmatrix} + 3\begin{bmatrix} 1 & -1 \\ 0 & 2 \end{bmatrix} = 3\begin{bmatrix} 3 & 5 \\ 4 & 6 \end{bmatrix}$$

(d) Evaluate $\int x^2 e^x dx$.

(e) Find the value of $x^3 - 4x^2 - 9x + 97$ if $x = 4 + \sqrt{7}\, i$.

Unit I

2. (a) Write the following sets by roster method :

(i) The set of all natural numbers x s.t. $4x + 9 < 50$.

(ii) The set of all integers x s.t. $x^2 + 5x + 6 = 0$.

(iii) The set of all integers x s.t. $|x - 3| < 8$.

(b) Define set, empty set, finite set, infinite set, equal sets, subset of a set, power set, universal set, union of sets, difference of sets, complement of a set.

3. (a) Let X = {3, 4, 6, 8}. Determine whether or not the relation $R = \{(x, f(x)) : x \in X, f(x) = x^2 + 1\}$ from X to N is a function from X to N. In case this is a function, determine its range.

(b) If A = {1, 4}, B = {2, 3, 6} and C = {2, 3, 7}, then verify that :

(i) $A \times (B \cup C) = (A \times B) \cup (A \times C)$

(ii) $A \times (B - C) = (A \times B) - (A \times C)$

Unit II

4. (a) Evaluate :

$$\begin{vmatrix} x+\lambda & x & x \\ x & x+\lambda & x \\ x & x & x+\lambda \end{vmatrix}$$

(b) Solve the following system of equation by Cramer's rule :

$$2x - 3y - z = 0$$
$$x + 3y - 2z = 0$$
$$x - 3y = 0$$

5. (a) Find the inverse of the matrix :

$$\begin{bmatrix} 1 & -1 & 2 \\ 0 & 2 & -3 \\ 3 & -2 & 4 \end{bmatrix}$$

(b) If :

$$A = \begin{bmatrix} i & -2 & 3 \\ 2 & 3 & -1 \\ -3 & 1 & 2 \end{bmatrix}$$

then evaluate $A^2 - 3A + 9I$.

Unit III

6. (a) Prove that :

$$\lim_{x \to \infty} \left(\sqrt{x^2 + x + 1} - x \right) \neq \lim_{x \to \infty} \left(\sqrt{x^2 + 1} - x \right)$$

(b) Find :

$$\frac{dy}{dx}$$

when

$$x = \cos^{-1}\left(\frac{1}{\sqrt{1+t^2}}\right), y = \sin^{-1}\left(\frac{t}{\sqrt{1+t^2}}\right).$$

7. (a) Evalute $\int \frac{x}{1+\sin x}\, dx$.

(b) Evaluate $\int \frac{x^2 + 8x + 4}{x^3 - 4x}\, dx$.

Unit IV

8. (a) Evaluate :

(i) i^{39} and i^{-79}

(ii) Find z if $|z + i| = |z - i|$

(b) If $\frac{a+ib}{c+id} = x + iy$, prove that :

$$x^2 + y^2 = \frac{a^2 + b^2}{c^2 + d^2}.$$

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B-215

B.C.A. EXAMINATION, May 2017

(Second Semester)

(B. Scheme) (Main & Re-appear)

(BCA)

HUM-502-B

ENGLISH-II

Time : 3 Hours] [*Maximum Marks : 75*

Before answering the question-paper candidates should ensure that they have been supplied to correct and complete question-paper. No complaint, in this regard, will be entertained after the examination.

Note : All questions are compulsory.

Unit I

1. Do as directed (Attempt any *ten*) : **10×2=20**

(a) Correct/Complete the sentences :

(i) If you miss your bus, I will be offered a lift.

(ii) I could have marry him if he asked me.

(iii) Unless you don't work hard you will not pass the examination.

(iv) He speaks.....he knew about everything.

(v) We eat.....we may live.

(vi) She is.....a kind woman that all love her.

(b) Change the voice :

(i) We make butter from milk.

(ii) Was she knocking at the door ?

(iii) Everybody will blame us.

(iv) I think they'll invite you to the party.

(v) Do not inform the police.

(vi) Somebody his stolen my car.

Unit II

2. (a) One word substitution (any *four*) : 4

(i) A person who easily believes others.

(ii) A person who is difficult to please.

(iii) A person who comes as a settler into a foreign country.

(iv) One walks in sleep.

(v) A person with narrow religious views.

(vi) One who eats too much.

(b) Write the meaning of the given etymological roots/prefix/suffix and make a word (attempt any *four*) : **4×2=8**

homo, anti, bi, ex, hetro, mono, biblio, pseudo, ab.

(c) Distinguish between the following word by using them in sentences (attempt any *four*) : **4×2=8**

advice and advise, accede and exceed, ascent and assent, all ready and already, factitious and fictitious.

Unit III

3. (a) Transcribe the following into IPA : (any *five*) : 5

(i) admiral

(ii) gazette

(iii) putting

(iv) rhythm

(v) bridge

(vi) threat

(vii) beak

(b) Mark primary stress on the following words (any *five*) : 5

(i) Biology

(ii) Pronunciation

(iii) Telephone

(iv) Hypocrisy

(v) Annual

(vi) Biology

(c) Write the weak form of the unerlined word : (any *five*) 5

(i) He hasn't seen Ram.

(ii) Please call him once.

(iii) He was going to market.

(iv) Would you like to take tea ?

(v) We shall go for a picnic tomorrow.

(vi) She is a friend of mine.

(d) Create a dialogue between the parents and the receptionist in the school. 5

Unit IV

4. (a) What is Listening ? What are the different steps involved in the process of listening ? 5

(b) Analyse the difference between effective listening and ineffective listening. 5

(c) What do you mean by note-taking technique ? Discuss the steps involved in note-taking while listening a speaker. 5