B.C.A. (Part-I) EXAMINATION - 2022

(Faculty of Science)

(Three-Year Scheme of 10+2+3 Pattern)

COMPUTER ORGANIZATION

Time Allowed : Three Hours

Maximum Marks : 100

No supplementary answer-book will be given to any candidate. Hence the candidates should write the answer precisely in the main answer-book only.

All the parts of **one** question should be answered at one place in the answer-book. One complete question should not be answered at different places in the answer-book.

Write your roll number on question paper before start writing answers of questions.

PART - I

Very short questions.

10x2=20

1. (a) What is computer architecture ?

    (b) What is a system clock in computer ?

    (c) What is an AGP slot ?

    (d) What is palmtop computer ?

    (e) What is USB port ?

    (f) What is meant by memory buffer ?

    (g) What is stack pointer ?

    (h) What is a microprocessor in computer ?

    (i) What is DMA controller ?

    (j) What is Auxiliary memory ?

PART - II

Short questions.

5x4=20

2. What is Von Neumann Architecture ? Explain with diagram.

3. What are the main types of computer ? Explain.

4. What is ALU ? Explain the operations performed by ALU.

5. What is Virtual memory and how does it works ?

6. What is bus architecture and explain its types ?

PART - III

7. What are the five generations of computer ? Explain.   12

OR

Write a short notes on :   4x3=12

    (a)   Motherboard

    (b)   Plotter

    (c)   Random and Sequential access

    (d)   Tracks and Sectors

8. What is instruction cycle and its steps ? Explain with the help of diagram.   12

OR

What is control unit ? How does the control unit work ?   12

9. What is Register Transfer Language ? Explain with example.   12

OR

What are the types of instructions in Computer Architecture ?   12

10. What is the use of addressing modes ? Explain the types of addressing modes.   12

OR

What is memory hierarchy and why it is needed ?   12

11. (a)   Differentiate between Microprocessor and Microcontroller.   6

    (b)   Explain the features of 8085 microprocessor.   6

OR

What are the different features of CISC and RISC architectures ? Explain.   12

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101/131

B.C.A. (Part-I) EXAMINATION - 2022

100096

[Also Common for (Hons.) Part-I]

(Three-Year Scheme of 10+2+3 Pattern)

ELEMENTARY PHYSICS

Time Allowed : Three Hours

Maximum Marks : 100

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PART - I

10x2=20

1.   (a)   Write two examples of good electrical conductor and insulator.

    (b)   Sketch the electric field of lines from a positive test charge and negative test charge.

    (c)   Draw the magnetic field of lines for a current carrying circular loop.

    (d)   State the Faraday's first law of electromagnetic induction.

    (e)   Draw the logic symbol for two input AND and EX-OR gate.

    (f)   Solve the $Y = A.(1+A)$.

    (g)   What do you mean by combinational circuit ?

    (h)   Name the IC which is used for Parity checker.

    (i)   Classify the sequential logic circuits.

    (j)   What do you mean by edge trigger D flip- flop.

PART - II

5x4=20

2.   Define the concept of electric flux. What will be maximum and minimum value of it ?

3.   Explain the magnetic properties of materials and classify it.

4.   Design AND gate using NAND gate and explain it with truth table.

5.   Draw the block diagram and truth table for 4:1 multiplexer.

6.   Draw the block diagram, circuit diagram and truth table for R-S flip flop.

P.T.O.

PART - III

7. (a) Derive an expression for effective capacitance for series and parallel connected of capacitors in a suitable circuit.

    (b) Two point charges of 1 μC and 2 μC are placed 10 cm apart. Determine the position on line at which Electric field will be zero.

3+3=6

6

OR

    (a) Derive an expression for effective Resistance for series and parallel connected of resistors in a suitable circuit.

3+3=6

    (b) Three capacitors have capacities 5 μF, 3 μF and 2 μF respectively. How you will connect to get
         (i)   Maximum capacitance and
         (ii) Minimum capacitance. Calculate their values also.

3+3=6

8. Derive an expression for magnetic field due to bar magnet on (i) a point on the axis of magnet and (ii) point on the equatorial line.

OR

6+6=12

    (a) Derive an expression for magnetic field at axial distance x due to circular coil carrying current I ampere in it.

6

    (b) Derive an expression for magnetic force per unit length for a current carrying parallel wires; current in each wire is 1A; separated by distance 2 m. What will be the maximum and minimum force per unit length ?

3+3=6

9. Draw the R-D logic diagram for AND and OR gate. Explain the working mechanism with truth table.

6+6=12

OR

    (a) State the Boolean algebra rules for digital electronics. Prove it using truth table.

6

    (b) State the De Morgan's theorems. And reduce below expression by using it.

6

$$Y = \overline{\overline{(A+B)} + \overline{(A+B)}}$$

10. Discuss the 16:1 Multiplexer with giving pin out diagram, truth table and logic diagram.

12

OR

    Discuss the BCD to seven segment decoder with giving pin out diagram, truth table and Boolean expressions for desired outputs.

12

11. What do you mean by sequential circuits ? Discuss in details the asynchronous and clocked R-S flip flop with suitable logic diagram and truth table. How does it differ from D flip-flop ?

2+4+4+2=12

OR

    Using three (03) J-K flip flops, design down counter. Describe the working mechanism using time diagram and truth table.

3+3+3+3=12

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102/132

Bas. Maths.

B.C.A. (Part-I) EXAMINATION – 2022

100203

(Faculty of Science)

(Three-Year Scheme of 10+2+3 Pattern)

BASIC MATHEMATICS

Maximum Marks : 100

Time Allowed : Three Hours

Answer of all the questions (short answer as well as descriptive) are to be given in the main answer-book only. Answers of short answer type questions must be given in sequential order. Similarly all the parts of one question of descriptive part should be answered at one place in the answer-book. One complete question should not be answered at different places in the answer-book.

Write your roll number on question paper before start writing answers of questions.

PART-I : (Very short answer) consists of **10** questions of **2** marks each. Maximum limit for each question is upto **40** words.

PART-II : (Short answer) consists of **5** questions of **4** marks each. Maximum limit for each question is upto **80** words.

PART-III : (Long answer) consists of **5** questions of **12** marks each with internal choice.

PART - I

1. (i) Let A $= \{ -2, -1, 0, 1, 2 \}$ and the function $f : A \rightarrow R$ is defined by $f(x) = x^2 + 1$. Find the range of f.

   (ii) Define Bijective function.

   (iii) Find whether the following matrix is singular or not.

   $$A = \begin{bmatrix} 1 & 1 & 1 \\ 1 & 2 & 4 \\ 2 & 2 & 2 \end{bmatrix}$$

   (iv) If $A = \begin{bmatrix} 2 & 4 \\ 4 & 3 \end{bmatrix}$, $X = \begin{bmatrix} x \\ 1 \end{bmatrix}$, $B = \begin{bmatrix} 8 \\ 11 \end{bmatrix}$ and $AX = B$

   then find x.

   (v) Prove that $\mu^2 = 1 + \dfrac{\delta^2}{4}$, Where notations have their usual meaning.

   (vi) Solve the quadratic equation $25x(x+1) = -4$.

   (vii) Find the mean of first ten natural numbers.

   (viii) Define Correlation.

   (ix) Find the probability of throwing a prime number with a dice.

   (x) In how many ways can 8 persons be arranged around a table ?

PART - II

Attempt all the parts.

2. If $f : R \to R$ and $g : R \to R$ are two functions defined by $f(x) = \dfrac{1}{2-x}$ and $g(x) = \dfrac{1}{1+x}$

   Find $fog(x)$ and $gof(x)$

3. Find the inverse of matrix by adjoint method.

   $$A = \begin{vmatrix} 1 & 2 & 5 \\ 3 & 1 & 4 \\ 1 & 1 & 2 \end{vmatrix}$$

4. Express $x^3 - 2x^2 + x - 1$ into a factorial polynomial.

5. If the mean of the following data is 20.2, find the value of k.

x :	10	15	20	25	30
f :	6	8	20	k	6

6. How many different words can be formed by the word "COMMERCE" when all vowels are not together.

PART - III

Attempt all the questions by taking **any two** parts from each question.

7. (a) Let $A = R - \{3\}$, $B = R - \{1\}$ and $f : A \to B$ s.t. $f(x) = \dfrac{x-2}{x-3}$. Prove that f is bijection. Also find f^{-1}.

   (b) If $f(x) = \dfrac{x-1}{x+1}$, $x \neq -1$, 1 then prove that fof^{-1} is an identity function.

   (c) If $A = \{1, 2, 3, 4\}$, $B = \{3, 5, 7, 9\}$, $C = \{7, 23, 47, 79\}$ and f: $A \to B$ s.t. $f(x) = 2x + 1$; g :$B \to C$ s.t. $g(x) = x^2 - 2$ then write $(gof)^{-1}$ and $f^{-1}og^{-1}$ as set of ordered pairs.

8. (a) Find the solution of the following system of equations.

   $5x + 3y + 7z = 4$

   $3x + 26y + 2z = 9$

   $7x + 2y + 10z = 5$

   (b) Find the eigen values and corresponding eigen vectors of the matrix.

   $$A = \begin{vmatrix} 8 & -6 & 2 \\ -6 & 7 & -4 \\ 2 & -4 & 3 \end{vmatrix}$$

   (c) Find the value of x such that

   $$[1 \times 1] \begin{vmatrix} 1 & 3 & 2 \\ 2 & 5 & 1 \\ 15 & 3 & 2 \end{vmatrix} \begin{vmatrix} 1 \\ 2 \\ x \end{vmatrix} = 0$$

9. (a) Evaluate $\Delta^3 [(1-x)(1-2x)(1-3x)]$

   (b) The sum of two numbers is 15. If the sum of their reciprocals is $\dfrac{3}{10}$ then find the numbers.

   (c) The product of Kamal's age five year ago with his age 9 years later is 15. Find Kamal's present age.

10. (a) Calculate the standard deviation and coefficient of standard deviation from the following data.

Class :	0 − 2	2 − 4	4 − 6	6 − 8	8 − 10
Frequency :	2	5	15	7	1

    (b) Find the coefficient of correlation from the following data.

X :	46	54	56	56	58	60	62	66
Y :	36	40	49	54	42	58	54	58

    (c) Consider the two regression lines $3x + 2y = 26$ and $6x + y = 31$. Find the mean values and coefficient of correlation between x and y.

11. (a) Prove that $^nC_r + {}^nC_{r-1} = {}^{n+1}C_r$

    (b) How many 6 digit numbers may be formed using the digits 0, 1, 2, 3, 4, 5 if repetition is not allowed.

    (c) A bag contains 2 white, 4 black and 5 red balls. Three balls are drawn at random. Find the probability that all three balls are of same colour.

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B.C.A. (Part-I) EXAMINATION - 2022

GENERAL ENGLISH

Time Allowed : Three Hours

Maximum Marks : 100

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No supplementary answer-book will be given to any candidate. Hence the candidates should write the answer precisely in the main answer-book only.

Write your roll number on question paper before start writing answer of questions.

Question paper consists of **Three** parts.

All three parts are **compulsory**.

Part-I : (Very short answer) consists of **10** questions of **2** marks each. Maximum limit for each question is upto **40** words.

Part-II : (Short answer) consists of **5** questions of **4** marks each. Maximum limit for each question is upto **80** words.

Part-III : (Long answer) consists of **5** questions of **12** marks each with internal choice.

PART - I

Each question is of **2** marks.

Word limit for each answer is **40** words.

1. Answer the following.   10x2=20

   (a) Frame two sentences using modal 'Ought' and 'Must'.

   (b) What is a good communication ? Write with examples.

   (c) What is the difference between formal and informal communication ?

   (d) Frame two sentences using 'AND' and 'BUT'.

   (e) What are the types of letters ?

   (f) Make two sentences using the prefix 'im'.

(g) What is the difference between CV, Resume and Bio-data ?

(h) What is a Business Report ?

(i) Change the voice of the sentences. (any 4)

    (i) The girls are playing Ludo.

    (ii) Children were writing a novel.

    (iii) Jill had attended the Lecture.

    (iv) I have visited Museum.

    (v) Subodh have learnt English.

    (vi) They have been writing a Report.

(j) Write a short note on the process of communication.

PART - II

Each question is of 4 marks.

Attempt any five

Word limit for each answer is 80 words.   **5x4=20**

2. Write a letter to the Sales Manager of Dell ordering Software and Hardware items for your company.

3. What do you understand by Electronic Media ? Explain.

4. *Write any five Guidelines an interviewee must follow.*

5. What are the advantages of Visual Presentation ?

OR

What is the difference between Report, Letter and Presentation ?

6. What are the merits and demerits of written communication ?

OR

What is Art of Listening ? Explain types of Listening along with examples.

PART - III

Each question is of 12 marks.

Attempt any five

Draw comprehensive sketches wherever necessary.   **5x12=60**

7. Define Application and its types. Write a note on its form and content along with a draft.

OR

Frame 12 (twelve) sentences using following conjunctions :

And, but, or, nor, yet, so, because, since, when, what, as, so, that, either, neither.

8. What is the importance of listening also explain its barriers ?

OR

Write a letter on the yearly academic activities held in your campus.

9. Your campus organised an exhibition-cum-sale of the items prepared under work experience certificate by your Department students. There was an overwhelming response from the public. Prepare a report in 100-125 words for the local daily as a coordinator of your Department, BCA.

Choose the correct form of verb that agrees with the subject.

(a) Sparrow (fly/flies) in the sky.

(b) None (know/knows) the dilemma, I have been into.

(c) Neither (is/are) correct.

(d) Where (is/are) the scissors ?

(e) Jack (doesn't/don't) know the answer.

(f) Ritesh and Suresh (is/are) in the campus.

(g) The Prime Minister, together with his wife, (greets, greet) the press cordially.

(h) Police (has/have) come.

(i) Economics (is/are) interesting subject.

(j) Your trousers (are/is) at the laundry.

(k) The committee (is/are) considering the budget right now.

(l) Each (talk/talks) on the matter.

10. Draft Curriculum Vitae along with job application.

OR

Frame any six sentences using any adjectives.

11. What are the 7'C in communication ? Also give examples.

OR

Define Adverbs along with examples and its types.

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106/136   Off. Man. Tool

B.C.A. (Part-I) EXAMINATION - 2022   100150
(Faculty of Science)

(Three-Year Scheme of 10+2+3 Pattern)

OFFICE MANAGEMENT TOOLS

Time Allowed : Three Hours   Maximum Marks : 100

Question paper consists of **three** parts. **All Three** parts are **compulsory**.

PART-I : (Very Short answer) consists of **10** questions of **two** marks each. Maximum limit for each question is upto **40** words.

PART-II : (Short answer) consists of **5** questions of **four** marks each. Maximum limit for each question is upto **80** words.

PART-III : (Long answer) consists of **5** questions of **twelve** marks each with one question from each part with internal choice.

Write your roll number on question paper before start writing answers of questions.

PART - I
                                                                        10x2=20

1.   (a)   Differentiate between save and save as.

      (b)   Describe the autocorrect feature.

      (c)   Define Macros.

      (d)   Define Pivot table.

      (e)   Why do we use action buttons in PowerPoint Presentation ?

      (f)   Write the purpose of master slide.

      (g)   What is Table ?

      (h)   Explain the use of slide sorter in MS PowerPoint.

      (i)   Differentiate Internal and External DOS commands.

      (j)   What is the use of 'Set Print Area' in MS Excel ?

PART - II

                                                                        4
2.   Write short note on the following :

      (a)   Custom animation   (b)   Text editor

      (c)   Windows explorer   (d)   Kernel and Shell

3. What is Report ? Write the steps to create report in MS Access.   4

4. Write the use and syntax of following commands.   4

    (a)   CD   (b)   MD   (c)   Copycon   (d)   RD

5. What do you understand by Header and Footer ? How do we create Header and Footer on odd and even pages ?   4

6. What are Primary key and Foreign key ? How do we create primary key in MS Access ?   4

PART - III

7. Write short note on :   12

    (a)   Booting Process

    (b)   My Computer

    (c)   System File

OR

Write the short note on the following (**any three**) :   12

    (a)   Disk Defragment   (b)   X Copy Command

    (c)   System tray in task bar   (d)   FAT (File Allocation Table)

8. What is Mail Merge ? Explain the complete steps to merge the text and addresses.   12

OR

Explain the use of following commands in MS Word.   12

    (a)   Format Painter   (b)   Title bar and Scroll bar

    (c)   Find and Replace   (d)   Line spacing

9. Explain the following in MS Excel.   12

    (a)   Macros   (b)   Conditional Formatting

OR

Explain the various type of charts in MS Excel.   12

10. Why do we use PowerPoint ? Discuss various features of PowerPoint in details.   12

OR

Explain different types of views available in PowerPoint.   12

11. Write the steps to create a Database and Table in Microsoft Access. Write the steps to create a query in database table.   12

OR

What do you mean by data types ? Explain various data types in MS Access.   12

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This question paper contains 2 printed pages.   Roll No. 322654

104/134   **Pri. of Pro. Lan. (Through 'C')**

B.C.A. (Part-I) EXAMINATION - 2022
(Faculty of Science)   100220
(Three-Year Scheme of 10+2+3 Pattern)

PRINCIPLES OF PROGRAMMING LANGUAGE
(THROUGH 'C')

Time Allowed : Three Hours   Maximum Marks : 100

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PART-III : (Long answer) consists of **5** questions of **12** marks each with internal choice.

PART - I

1. Attempt **all** questions. Each question carries **2** marks.   10x2=20

    (a) What do you mean by procedural programming language ?

    (b) What is a keyword in C ?

    (c) Define global and local variable in C with example.

    (d) What is a constant variable and how they are declared and initialized ?

    (e) Define the use of goto statement with example.

    (f) What do you mean by entry-controlled loop and exit-controlled loop ?

    (g) What do you mean by pre-defined and user defined functions ?

    (h) What is pointer variable ?

    (i) What do you mean by typedef ?

    (j) What is structure ? Write its declaration syntax.

PART - II

2. Attempt **all** questions. Each question carries 4 marks.   5x4=20

(a) Define the basic structure of C program.

(b) What is data type ? Draw the classification diagram of data types in C along with their size and range.

(c) What is loops in C ? Write difference between while and do while with example.

(d) Explain user defined and library functions in C with example.

(e) What do you mean by a text file and binary file in file handling ?

PART - III

3. Explain the history of evolution of C programming language. What is the basic concepts of C language ?   12

OR

Write difference between Algorithm, Pseudocode and Flow Chart with proper example.   12

4. Explain tokens in C language with proper example.   12

OR

Explain Decision making statement with suitable example.   12

5. What is 2-D array ? Write a code to declare and initialize a 2-D array.   12

OR

Explain string handling functions in C.   12

6. Explain formal and actual argument of a function. Write a program of call by reference in C.   12

OR   6+6=12

(a) What is null pointer and void pointer ?

(b) Explain pointer to pointer with proper example.

7. What do you understand by file handling ? Explain the methods used for file handling in C language with syntax.   12

OR   3x4=12

Explain the following :

(a) Typedef

(b) Union

(c) Size of structure

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