

Hall Ticket Number :

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R-23

Q.P.Code: 23A0511T

B.Tech. I Semester Regular Examinations January 2024

Introduction to Programming

(Common to All Branches)

Max. Marks: 70

Time: 3 Hours

- Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B**)
2. In Part-A, each question carries **Two marks**.
3. Answer **ALL** the questions in **Part-A** and **Part-B**

PART-A

(Compulsory question)

- | | CO | BL |
|---|----|----|
| 1. Answer all the following short answer questions (10 X 2 = 20M) | | |
| a) Define flowchart and explain different symbols used for constructing flowchart. | 1 | 1 |
| b) Evaluate the expression $a+b*c/d$ where $a=20$, $b=10$, $c=15$ and $d=5$. Also print the value through C program. | 1 | 1 |
| c) List the control structures in C. | 2 | 1 |
| d) List the decision-making statements in C. | 2 | 1 |
| e) Explain recursion with example. | 3 | 1 |
| f) List the types of functions in C. | 3 | 1 |
| g) Display the first n natural number with user-defined function | 4 | 1 |
| h) Compare structure and union in terms of memory allocation with an example | 4 | 1 |
| i) List basic operations of a file. | 5 | 1 |
| j) Explain a file opening mode with an example. | 5 | 1 |

PART-B

Answer *five* questions by choosing one question from each unit (5 x 10 = 50 Marks)

- | | Marks | CO | BL |
|---|-------|----|----|
| UNIT-I | | | |
| 2. a) Differentiate among compiler, assembler, and interpreter. | 5M | 1 | 2 |
| b) Discuss tokens in C with examples. | 5M | 1 | 2 |
| OR | | | |
| 3. a) Explain all the data types with their ranges and examples. | 5M | 1 | 2 |
| b) Summarize Type Conversion and type casting in C. | 5M | 1 | 2 |
| UNIT-II | | | |
| 4. a) Discuss briefly about multi-way selection statements with an example. | 5M | 2 | 2 |
| b) Write a C program to find the sum of odd numbers using jumping statements. | 5M | 2 | 2 |

OR

5. a) Discuss about different format strings in c 5M 2 2
 b) Write a C program to compute the real roots of a quadratic equation $a*x^2 + b*x+c = 0$. The program should request for the values of the constants a, b and c and print the values of root1 and root2.

Use the following rules:

- i. No solution, if both a and b are zero There is only one root, if $a=0$
 ii. There are no real roots, if $b^2-4*a*c$ is negative
 iii. Otherwise, there are two real roots.

Write a C program to test all the above conditions 5M 2 4

UNIT-III

6. a) List the string handling function with an example 5M 3 2
 b) Write a C program to copy the string str2 into str1 without using strcpy() function 5M 3 2

OR

7. a) Explain call by value and call by reference with examples. 5M 3 2
 b) Write a C program to check whether a string is palindrome or not without using string function. 5M 3 2

UNIT-IV

8. a) Explain usage of structure in terms of definition, declaration and accessing members with syntax and example 5M 4 2
 b) Differentiate structures and unions. 5M 4 2

OR

9. a) What are pointers? Describe pointer arithmetic with examples 5M 4 2
 b) Explain call by reference mechanism with an example program 5M 4 2

UNIT-V

10. a) C program to read name and marks of n number of students and store them in a file. 5M 5 2
 b) Write C program that uses both recursive and non-recursive functions to find the sum of n natural numbers. 5M 5 2

OR

11. a) Write C program that uses both recursive and non-recursive functions to find the factorial of a given number. 5M 5 2
 b) Explain various storage classes in C with an example 5M 5 2

*** End ***

QPCode: 23AHS11T

B.Tech. I Semester Regular Examinations January 2024

Linear Algebra and Calculus

(Common to All Branches)

Max. Marks: 70

Time: 3 Hours

- Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B**)
 2. In Part-A, each question carries **Two marks**.
 3. Answer **ALL** the questions in **Part-A** and **Part-B**

PART-A**(Compulsory question)**

1. Answer **all** the following short answer questions (10 X 2 = 20M)
- | | | |
|--|-----|----|
| | CO | BL |
| a) Define the rank of a matrix. What is the rank of an identity matrix of order n? | CO1 | L1 |
| b) State Cauchy's Binet formula. | CO1 | L1 |
| c) Show that the Eigen values of a matrix A and its transpose A ¹ are same. | CO2 | L1 |
| d) State Cayley-Hamilton theorem. | CO2 | L1 |
| e) State Rolle's theorem. | CO3 | L1 |
| f) State Maclaurin's theorem with Lagrange's form of remainder. | CO3 | L1 |
| g) If $f(x, y) = ax^2 + 2hxy + by^2$, then find its first and second order partial derivatives. | CO4 | L2 |

h) If $x = r \cos \theta$, $y = r \sin \theta$ then find $J \left(\frac{x, y}{r, \theta} \right)$.

	CO4	L2
--	-----	----

i) Evaluate $\int_0^1 \int_0^{\sqrt{1+x^2}} \frac{dx dy}{1+x^2+y^2}$.

	CO5	L2
--	-----	----

j) Evaluate $\int_0^{\frac{\pi}{2}} \int_0^{\frac{\pi}{2}} \frac{1}{x^2+y^2} dx dy$.

	CO5	L1
--	-----	----

PART-B

Answer five questions by choosing one question from each unit (5 x 10 = 50 Marks)

Marks CO BL

UNIT-I

2. a) Find the rank of the matrix $B = \begin{bmatrix} 0 & 1 & -3 & -1 \\ 1 & 0 & 1 & 1 \\ 3 & 1 & 0 & 2 \\ 1 & 1 & -2 & 0 \end{bmatrix}$

	5M	CO1	L2
--	----	-----	----

b) Solve by Gauss elimination method the following equations
 $x - 2y + 3z = 2, 2x + y + z + t = -4, 4x - 3y + z + 7t = 8.$

	5M	CO1	L3
--	----	-----	----

OR

3. Show that the system of equations
 $2x_1 - 2x_2 + x_3 = \lambda x_1, 2x_1 - 3x_2 + 2x_3 = \lambda x_2, -x_1 + 2x_2 = \lambda x_3$
 can possess a non trivial solution only if $\lambda = 1, \lambda = -3$.
 Obtain the solution in each case.

	10M	CO1	L3
--	-----	-----	----

UNIT-II

4. Verify Cayley-Hamilton theorem for the following matrix and hence find the

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

10M CO2 L3

OR

5. Reduce the following quadratic form $2x_1x_2 + 2x_1x_3 - 2x_2x_3$ into canonical form or sum of squares through orthogonal reduction and hence find the nature.

10M CO2 L3

UNIT-III

6. State first mean value theorem, and using it prove that $(0 < a < b < 1)$,
 $\frac{b-a}{1+b^2} < \tan^{-1} b - \tan^{-1} a < \frac{b-a}{1+a^2}$.

Hence show that $\frac{f}{4} + \frac{3}{25} < \tan^{-1} \frac{4}{3} < \frac{f}{4} + \frac{1}{6}$.

10M CO3 L3

OR

7. Expand \log_e^x in powers of $(x-1)$ and hence evaluate $\log_e^{1.1}$ correct to 4 decimal places.

10M CO3 L3

UNIT-IV

8. If $u = x^2 - y^2, v = 2xy$ and $x = r \cos \theta, y = r \sin \theta$, find $\frac{\partial(u,v)}{\partial(r,\theta)}$.

10M CO4 L3

OR

9. If $u = \log(x^3 + y^3 + z^3 - 3xyz)$ then show that $(\frac{\partial}{\partial x} + \frac{\partial}{\partial y} + \frac{\partial}{\partial z})_z u = \frac{-9}{(x+y+z)^2}$

UNIT-V

10. Change the order of integration in $I = \int_0^1 \int_{x^2}^{2-x} xy dx dy$ and hence evaluate the same.

10M CO5 L3

OR

11. Evaluate, by changing to spherical polar coordinates

$$\int_0^1 \int_0^{\sqrt{1-x^2}} \int_0^{\sqrt{1-x^2-y^2}} \frac{dx dy dz}{\sqrt{1-x^2-y^2-z^2}}$$

10M CO5 L4

*** End ***

Hall Ticket Number :									
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R-23

Q.P.Code: 23A0111T

B.Tech. I Semester Regular Examinations January 2024

Basic Civil & Mechanical Engineering

(Common to CE, ME, CSE, CSE(DS) and AI&ML)

Max. Marks: 70

Time: 3 Hours

- Note: 1. Question Paper consists of two parts (**Part-1** and **Part-2**)
2. Use separate Answer booklets for **Part-1** and **Part-2**
3. Part-1 & Part-2 of question paper consists of Part-A & Part-B
4. In Part-A, each question carries **One marks**.
5. Answer **ALL** the questions in **Part-A** and **Part-B**

PART-1 (Basic Civil Engineering)

PART-A

(Compulsory question)

- | | | |
|--|-----|----|
| 1. Answer all the following short answer questions (5 X 1 = 5M) | CO | BL |
| a) List out various disciplines in Civil Engineering. | CO1 | L2 |
| b) Define Surveying. | CO2 | L2 |
| c) What is the definition of a contour line? | CO2 | L2 |
| d) Name any two Railway Gauges. | CO3 | L2 |
| e) Define Hydrology. | CO3 | L2 |

PART-B

Answer *five* questions by choosing one question from each unit (3 x 10 = 30 Marks)

Marks CO BL

UNIT-I

- | | | | |
|--|-----|-----|----|
| 2. Explain role and scope of Civil Engineering in the society. | 10M | CO1 | L2 |
|--|-----|-----|----|

OR

- | | | | |
|---|-----|-----|----|
| 3. What are the various materials used for construction? Explain in detail. | 10M | CO1 | L2 |
|---|-----|-----|----|

UNIT-II

- | | | | |
|---|-----|-----|----|
| 4. Enumerate the objectives of Surveying and Explain in detail the types of Bearings. | 10M | CO2 | L2 |
|---|-----|-----|----|

OR

- | | | | |
|---|-----|-----|----|
| 5. Explain in detail about all available estimates for buildings. | 10M | CO2 | L2 |
|---|-----|-----|----|

UNIT-III

- | | | | |
|--|-----|-----|----|
| 6. Differentiate between Flexible Pavements and Rigid Pavements. | 10M | CO3 | L2 |
|--|-----|-----|----|

OR

- | | | | |
|---|-----|-----|----|
| 7. What is rainwater harvesting? Explain the methods used for the rainwater harvesting. | 10M | CO3 | L1 |
|---|-----|-----|----|

PART-2 (Basic Mechanical Engineering)**PART-A****(Compulsory question)**

- | | | |
|--|-----|----|
| 1. Answer all the following short answer questions (5 X 1 = 5M) | CO | BL |
| a) Interpret the fields which dealt by a Mechanical Engineer? | CO1 | L2 |
| b) Summarize the mechanical engineering role in Aerospace sector | CO1 | L2 |
| c) Explain the basic Refrigeration and air conditioning cycles? | CO2 | L2 |
| d) Outline the links and Joints used in robot? | CO3 | L3 |
| e) Illustrate the advantages and Disadvantages of hydro power plants. | CO3 | L2 |

PART-B**Answer five questions by choosing one question from each unit (3 x 10 = 30 Marks)**

Marks CO BL

UNIT-I

- | | | | |
|---|-----|-----|----|
| 2. Analyze the mechanical engineering technologies role in Energy sector? | 10M | CO1 | L4 |
|---|-----|-----|----|

OR

- | | | | |
|--|----|-----|----|
| 3. a) Distinguish the ferrous and non-ferrous metals? | 5M | CO1 | L2 |
| b) What do you mean by composites? Outline the applications of composites? | 5M | CO1 | L2 |

UNIT-II

- | | | | |
|---|-----|-----|----|
| 4. Classify the manufacturing processes and analyze about any three types of manufacturing processes. | 10M | CO2 | L4 |
|---|-----|-----|----|

OR

- | | | | |
|---|----|-----|----|
| 5. a) Distinguish between 2 stroke and 4 stroke IC engines? | 5M | CO2 | L4 |
| b) Explain the working principle of Boilers with a neat sketch? | 5M | CO2 | L2 |

UNIT-III

- | | | | |
|--|-----|-----|----|
| 6. Draw the layout of a steam Power Plant and explain its working. | 10M | CO3 | L2 |
|--|-----|-----|----|

OR

- | | | | |
|--|----|-----|----|
| 7. a) State the type of mechanical power transmission and explain any one in detail. | 5M | CO3 | L4 |
| b) Explain the Basic components of Robot configurations? | 5M | CO3 | L2 |

*** End ***

Hall Ticket Number :

R-23

Code: 23AHS14T

B.Tech. I Semester Regular Examinations January 2024

Chemistry

(Common to CSE, CSE(DS) and AI&ML)

Max. Marks: 70

Time: 3 Hours

Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B**)

2. In Part-A, each question carries **Two marks**.

3. Answer **ALL** the questions in **Part-A** and **Part-B**

PART-A

(**Compulsory question**)

- | | CO | BL |
|---|----|----|
| 1. Answer all the following short answer questions (10 X 2 = 20M) | | |
| a) Calculate the bond order based on MOT for O ₂ molecule with diagram | 1 | L3 |
| b) State the Schrodinger Wave equation and indicate the terms present in it. | 1 | L1 |
| c) Define nano materials. Give examples | 2 | L1 |
| d) Define n-type and p-type semiconductors with examples | 2 | L1 |
| e) State the Nernst equation for galvanic cell. | 3 | L1 |
| f) Define conductivity. Mention the units for conductivity. | 3 | L1 |
| g) Explain the functionality of monomers with suitable example | 4 | L2 |
| h) What are Biodegradable polymers? Give examples. | 4 | L1 |
| i) Summarize the electronic transitions formed in visible region. | 5 | L2 |
| j) Demonstrate the applications of HPLC | 5 | L3 |

PART-B

Answer **five** questions by choosing one question from each unit (5 x 10 = 50 Marks)

Marks CO BL

UNIT-I

- | | | | |
|--|----|---|----|
| 2. a) Apply molecular orbital theory to explain bond formation of and bond order in homo-nuclear diatomic molecules with the help of energy level diagram. | 5M | 1 | L3 |
| b) Describe the π -molecular orbitals of butadiene with a neat diagram. | 5M | 1 | L2 |

OR

- | | | | |
|--|-----|---|----|
| 3. Formulate (derive) the Schrödinger wave equation and describe its significance. | 10M | 1 | L6 |
|--|-----|---|----|

UNIT-II

- | | | | |
|--|----|---|----|
| 4. a) Explain the properties of carbon nano tubes and applications of CNT'S. | 6M | 2 | L2 |
| b) Describe the properties and applications of Super conductors. | 4M | 2 | L2 |

OR

5. a) Define Fullerenes. Describe the properties and applications of fullerenes. 6M 2 L1
 b) Describe the properties and applications of Super capacitors. 4M 2 L2

UNIT-III

6. a) Discuss the construction, working and reactions involved in lithium ion battery. 5M 3 L6
 b) Describe potentiometric titrations-redox titrations 5M 3 L2

OR

7. a) Discuss the construction, working of galvanic cell. Discuss the role of salt bridge. 5M 3 L6
 b) Describe conductometric titrations (acid-base titrations). 5M 3 L1

UNIT-IV

8. a) Discuss the preparation, properties and applications of Bakelite. 5M 4 L6
 b) Discuss preparation, properties and uses of Teflon 5M 4 L6

OR

9. a) Differentiate Thermo plastics from Thermosetting plastics 5M 4 L2
 b) Discuss preparation, properties and uses of Buna-S 5M 4 L6

UNIT-V

10. a) What is the region of the infrared spectrum? List out the applications of infrared spectroscopy. 6M 5 L1
 b) Differentiate between UV visible and IR spectroscopy. 4M 5 L2

OR

11. Illustrate the setup and functioning of an HPLC instrument, demonstrating the step-by-step procedure of analyzing a sample. 10M 5 L3

*** End ***

Hall Ticket Number :

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R-23

Code: 23AHS12T

B.Tech. I Semester Regular Examinations January 2024

Communicative English

(Common to CE, ME, CSE, CSE(DS) and AI&ML)

Max. Marks: 70

Time: 3 Hours

- Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B**)
2. In Part-A, each question carries **Two marks**.
3. Answer **ALL** the questions in **Part-A** and **Part-B**

PART-A

(Compulsory question)

- | | | |
|---|----|----|
| 1. Answer all the questions (10 X 2 = 20M) | CO | BL |
| a) Do you agree with the last paragraph of the story "The Gift of the Magi"? Give reasons. | 1 | L2 |
| b) Write antonyms for the following words:
i) diffident ii) urban | 1 | L3 |
| c) Justify the brook's stand when it claims "For men may come and men may go, But I go on forever." | 2 | L4 |
| d) Differentiate between Homonyms and Homophones. | 2 | L2 |
| e) Write briefly about any one aspect of Elon Musk's innovations in his attempt at making technology a user friendly. | 3 | L2 |
| f) Explain the importance of paraphrasing / summarizing. | 3 | L2 |
| g) Describe a couple of the "peace toys" that Harvey brings for Eric and Bertie. What do these toys represent? | 4 | L2 |
| h) Define Jargon. Mention any four types of jargons that you know. | 4 | L3 |
| i) Define intrapersonal communication skills. | 5 | L2 |
| j) Convert the following sentences in passive voice.
i) When are you buying motor cycle?
ii) The chairman praised Sarala for her good work. | 5 | L3 |

PART-B

Answer **five** questions by choosing **one** question from each unit (5 x 10 = 50 Marks)

Marks CO BL

UNIT-I

- | | | | |
|---|-----|---|----|
| 2. How are the gifts given by the Magi can be compared to the gifts exchanged by the principal characters in O Henry's story "The Gift of the Magi."? | 10M | 1 | L2 |
| OR | | | |
| 3. a) Use the prefix or suffix to the given word provided in the bracket in its appropriate form.
i) You can't just believe it. The plot was _____ (believable)
ii) I saw her just a few days ago. Still, I miss her. It looks like she just _____ (appeared)
iii) I am sorry; I didn't mean to hurt you. I must have _____ you. (understood)
Use prefix in the below words to find out its opposite words.
i) Happy ii) Wrap iii) Connect | 5M | 1 | L3 |
| b) Write two synonyms for each word.
i) abate ii) cloth iii) hazardous iv) sparkle v) connect vi) frightened | 5M | 1 | L3 |

UNIT-II

4. Distinguish between the journeys undertaken by a human being and the brook. 10M 2 L2
- OR**
5. a) Fill in the blanks with 'a', 'an' or 'the' wherever necessary.
- i) The guide knows _____ way.
 - ii) Let us discuss _____ matter seriously.
 - iii) You are _____ fool to say that.
 - iv) French is _____ easy language.
 - v) Mumbai is _____ very dear place to live in.
- 5M 2 L3

- b) Fill in the blanks with suitable prepositions.

I am Andrew, and I live (i) London (ii) my wife. I like (iii) travel and every year. The guests are coming (iv) 6'o' clock (v) the evening on Thursday.

5M 2 L3

UNIT-III

6. Write in detail about the contributions of Elon Musk in the field of technology. 10M 3 L2

OR

7. a) Fill in the blanks with the correct form of verbs.
- i) Mathematics _____ (be) an interesting subject.
 - ii) John _____ (work) as a doctor.
 - iii) Sita is _____ (read) a novel right now.
 - iv) My father _____ (paint) the wall for two hours.
 - v) I _____ (not, meet) her yesterday.

5M 3 L3

- b) Form five compound words for each of the following cases:

i) Adjective + Noun ii) Verb + Noun

5M 3 L3

UNIT-IV

8. a) How does the boy's transformation of the peace toys into violent scenarios reflect their exposure to real-world conflicts and societal influences in the story "The Toys of Peace"?
- 5M 4 L4
- b) Analyse the role of education and upbringing in shaping children's perspectives. How does 'The Toys of Peace' highlight the challenge of redirecting established behaviors and attitudes ingrained in early childhood?
- 5M 4 L4

OR

9. Prepare a resume/CV with a cover letter for the following job advertisements.
- i) Wanted an Office Assistant for a reputed company based in Delhi. The candidate must be a graduate with an experience of at least two years. Computer knowledge and Communicative English are necessary. Apply within a week to post Box No. 5665, c/o Indian Express, Sk Marg, New Delhi 110046.
- 10M 4 L4

UNIT-V

10. The lesson "Power of Intrapersonal Communication" suggests that developing intrapersonal communication skills can lead to effective decision-making, problem-solving, and stress management. Can you think of any potential limitations or challenges in relying solely on intrapersonal communication for these processes? How might external perspectives and input play a role in enhancing these skills?
- 10M 5 L2

OR

11. Attempt an expository essay on "Class room learning and online learning." 10M 5 L2

*** End ***