

# GOVT. COLLEGE FOR MEN (A) KADAPA

NAAC Reaccredited with 'B++' Grade

Kadapa-516004

## BOARD OF STUDIES MEETING IN COMPUTER SCIENCE

w.e.f 2025-26



## DEPARTMENT OF COMPUTER SCIENCE

Date: 16-09-2025

I & II SEMESTERS

# **GOVERNMENT COLLEGE FOR MEN**

**(Autonomous)**

**Reaccredited with 'B++' Grade by NAAC**

**Kadapa - 516004**

**B.Sc. Honours Artificial Intelligence**

**Board of Studies**

on

**16<sup>th</sup> September 2025**

with effect from **2025-26** Academic Year



**DEPARTMENT**

**OF**

**COMPUTER SCIENCE & APPLICATIONS**

**BOARD OF STUDIES MEETING**

**IN**

**B.Sc. Artificial Intelligence**

**GOVERNMENT COLLEGE FOR MEN (A), KADAPA**  
**DEPARTMENT OF COMPUTER SCIENCE & APPLICATIONS**  
**B.Sc. Honours Artificial Intelligence**

	<b>Category</b>	<b>Name &amp; Designation of the Person</b>	<b>Chairperson /Member</b>
1.	Head Department of Computer Science and Applications	<b>Smt. Y Anitha</b> Lecturer in Computer Science	Chairman
2.	Faculty Members	<b>Sri T Manohar Reddy,</b> Lecturer in Computer Science  <b>Sri K H Sampath Kumar Raju</b> Lecturer in Computer Science  <b>Smt. B Renuka Devi</b> Lecturer in Computer Science  <b>Sri M Mahaboob Subhani</b> Lecturer in Computer Science  <b>Smt. K.Deepthi</b> Lecturer in Computer Science  <b>Smt. P. Rama Lakshumma</b> Lecturer in Computer Science	Member  Member  Member  Member  Member
3	Subject expert in the Subject to be nominated by the Vice-Chancellor from a panel of six recommended by the principal	<b>Dr B Reddaiah,</b> Associate Professor, Dept. of CSE, YVCET of YVU, Proddatur, Andhra Pradesh.	Member
4	Subject Experts in the Subject from outside the college to be nominated by the Academic Council	<b>Dr C. Shoba Bindu,</b> Professor, Department of CSE, JNTUA Anantapuramu, Andhra Pradesh.  <b>Dr A Sri Lakshmi,</b> Lecturer in Computer Applications, Govt. Degree College, Nagari, Chittoor(dt), Andhra Pradesh.	Member  Member
5	A representative from industry/ corporate sector related to placements nominated by the principal	<b>Sri. G Trivikram,</b> Senior project Manager, Kumaran Systems, Bangalore.	Member
6	One Meritorious Alumnus	<b>Sri K Krishna Geeth,</b> Senior Software Engineer, Wipro Technologies, Hyderabad.	Member

**GOVERNMENT COLLEGE FOR MEN (A), KADAPA**  
**DEPARTMENT OF COMPUTER SCIENCE & APPLICATIONS**  
**B.Sc. Honours Artificial Intelligence**

**Minutes of Board of Studies**

**Date: 16-09–2025**

Members of the board of studies attended meeting Online through Google Meet Video Conferencing tool under the chairmanship of **Smt. Y. Anitha**, Lecturer in-charge of the Department of Computer Science and Applications on **16-09–2025 at 12:00 PM** to discuss and finalize the following agenda.

**Agenda:**

1. To discuss the syllabus for 1<sup>st</sup> and 2<sup>nd</sup> Semester of B.Sc. Honours Artificial Intelligence with effect from 2025-2026 academic year
2. To discuss the internal and external question papers patterns for 1<sup>st</sup> and 2<sup>nd</sup> Semester of B.Sc. Honours Artificial Intelligence with effect from 2025-2026 academic year.
3. To consider the list of question paper setters and list of examiners.

**Resolution:** All the members unanimously resolved to approved

1. It is resolved to approve the Course structure of the programme for 1<sup>st</sup> and 2<sup>nd</sup> Semester of B.Sc. Honours Artificial Intelligence with effect from 2025-2026.
2. The proposed syllabus for 1<sup>st</sup> and 2<sup>nd</sup> Semester of B.Sc. Honours Artificial Intelligence with effect from 2025-26 academic year.
3. External and Internal Evaluation with the ratio of 60 and 40.
4. Internal and external question papers pattern and blueprint for external question paper for 1<sup>st</sup> and 2<sup>nd</sup> Semester of I B.Sc. Honours Artificial Intelligence are also finalized.

**Internal Evaluation Pattern for 5 th Semester of B.Sc. Honours Artificial Intelligence**

S.NO.	TEST	MARKS
1.	Two Mid Examinations	20+20
2.	Seminar / Group Discussion	05+05
3.	Project Based Learning (Course Wise)	10
4.	Peer Group Learning (Course Wise)	10
5.	Attendance and Participation in Clean and Green Activities	05
	<b>Total Marks</b>	<b>75</b>

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Suggested to conduct Mid examinations using the following types of questions:

- \* One out of three Essay type questions carrying 5 marks
- \* Five out of seven Short answer questions carrying 2 marks each(5x2=10)
- \* Ten objective questions carrying 0.5 mark each with multiple choice' filling blanks, true/false statements etc.,
- \* The duration of the paper should be for 1 hour for a total of 20 marks.

∴ Should scale down 75 marks to 40 marks by using formula:

$$\text{Scaled Marks} = \frac{\text{total scored marks} * 40}{75}$$

**External Evaluation Pattern for 1<sup>st</sup>Semester of B.Sc. Honours Artificial Intelligence**

Time: 3 Hrs.

Model Question Paper

Max. Marks: 60

**Section – A**

**5 x 4 = 20 Marks**

Answer any **FIVE** questions from the following **1 to 8** questions.

Each question carries **4** marks.

**[At least one question should be given from each unit]**

**Section – B**

**5 x 8 = 40 Marks**

Answer any **FIVE** questions from the following **9 to 16** questions.

Each question carries **8** marks.

**[At least one question should be given from each unit]**

5. The list of Question paper setters and the list of examiners

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**DEPARTMENT OF COMPUTER SCIENCE & APPLICATIONS**

**B.Sc. Honours Artificial Intelligence**

**Members Present:**

	<b>Name of the Member</b>	<b>Signature with date</b>
1.	<b>Smt Y. Anitha</b> (Chairman)	
2.	<b>Dr B. Reddaiah</b> (Nominee from the University)	
3	<b>Dr C. Shoba Bindu</b> (Subject Expert)	
4	<b>Dr A. Sri Lakshmi</b> (Subject Expert)	
5	<b>Sri G Trivikram</b> (Industrialist)	
6	<b>Sri K Krishna Geeth</b> (Alumnus)	
7	<b>Sri T. Manohar Reddy</b> (Member)	
8	<b>Sri K. H. Sampath Kumar Raju</b> (Member)	
9	<b>Smt B Renuka Devi</b> (Member)	
10	<b>Sri M Mahaboob Subhani</b> (Member)	
11	<b>Smt K. Deepthi</b> (Member)	
12	<b>Smt P. Rama Lakshumma</b> (Member)	

**GOVERNMENT COLLEGE FOR MEN (A), KADAPA**  
**DEPARTMENT OF COMPUTER SCIENCE & APPLICATIONS**  
**B.Sc. Honours Artificial Intelligence**

Revised UG Syllabus under CBCS

with effect from 2025–2026 Academic Year

**Structure for I B.SC. Honours Artificial Intelligence**

**MAJOR SUBJECTS**

Year	Semester	Course Code	Course Name	Hours per week			Credits
				L	T	P	
I	I		Computer Fundamentals and Office Automation- Theory	3	0	0	3
			Computer Fundamentals and Office Automation-Practical	0	0	2	1
			Problem Solving Using C-Theory	3	0	0	3
			Problem Solving Using C-Practical	0	0	2	1
	II		Data Structures Using C-Theory	3	0	0	3
			Data Structures using C-Practical	0	0	2	1
			Python Programming –Theory	3	0	0	3
			Python Programming -Practical	0	0	2	1
	<b>Total</b>						<b>16</b>

**SKILL ENHANCEMENT COURSE**

Year	Semester	Course Code	Course Name	Hours per week	Credits
I	I	1	AI Fundamentals	4	4
			AI Fundamentals -Practical Session	2	0
	<b>Total</b>				<b>4</b>

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**DEPARTMENT OF COMPUTER SCIENCE & APPLICATIONS**  
**B.Sc. Honours Artificial Intelligence**

Course Code	<i>Course Title</i> <b>Computer Fundamentals and Office Automation</b>	Program & Semester I B.Sc. Honours AI I Semester			
		L	T	P	C
Teaching	Hours Allocated:3				
Pre-requisites		3	0	0	3

**Course Objectives:**

1. Understand foundational computing concepts, including number systems, the evolution of computers, block diagrams, and generational progress.
2. Develop knowledge of computer architecture, focusing on system organization and networking fundamentals.
3. Acquire practical skills in document creation, formatting, and digital Presentations using word processing tools.
4. Gain proficiency in spreadsheet operations, such as data entry, formulas, functions, and charting techniques.
5. Introduce data visualization and basic modelling principles, fostering analytical thinking in structuring and interpreting data sets.

**Course Outcomes:**

1. At the End of the Course, The Students will be able to explain different number systems, the historical evolution of computers, and identify key components in a block diagram.
2. Learners will demonstrate basic blocks of a computer and fundamental networking knowledge.
3. Learners will create professional-level documents and design visually appealing presentations using word processing software and presentation software.
4. Learners will manipulate data within spreadsheets, apply formulas, and generate accurate summaries and visualizations.
5. Learners will apply data modelling techniques to analyze, organize, and represent data effectively in various scenarios.

**Syllabus**

**Unit 1. Number Systems, Evolution, Block Diagram and Generations:**

Number Systems: Binary, Decimal, Octal, Hexadecimal; conversions between number systems.

Evolution of Computers: History from early mechanical devices to modern-day systems.

**Block Diagram of a Computer:** Components like Input Unit, Output Unit, Memory, CPU (ALU + CU).

**Generations of Computers:** First to Fifth Generation – technologies, characteristics, examples.

**Unit– II. Basic organization and N/W fundamentals:**

Computer Organization: Functional components – Input/output devices, Storage types, Memory hierarchy.

Types of Computers: Micro, Mini, Mainframe, and Supercomputers.

Networking Fundamentals: Definition, need for networks, types (LAN, WAN, MAN), topology (Star, Ring, Bus).

Internet Basics: IP Address, Domain Name, Web Browser, Email, WWW.

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**Unit – III. Word Processing and presentations:**

Word Processing Basics: Using MS Word/Google Docs – formatting, styles, tables, mail merge.

Presentation Tools: Using PowerPoint/Google Slides – slide design, animations, transitions.

Applications: Creating resumes, reports, brochures, and presentations.

Keyboard Shortcuts.

**Unit –IV. Spreadsheet Basics:**

Spreadsheet Concepts: Understanding rows, columns, cells in tools like MS Excel/Google Sheets, cell referencing.

Functions and Formulae: SUM, AVERAGE, IF, COUNT.

Charts and Graphs: Creating visual representations

Data Handling: Sorting, filtering, conditional formatting.

Text Functions: LEFT, RIGHT, MID, LEN, TRIM, CONCAT, TEXTJOIN

Advanced Functions: Logical: IF, AND, OR, IFERROR,

**Lookup:** VLOOKUP, HLOOKUP, XLOOKUP, INDEX, MATCH.

**Unit –V. Data Analysis and Visualization:**

Conditional Formatting: Custom rules, Color scales, Icon sets, Data bars

Data Analysis Tools: Pivot Tables and Pivot Charts, Data Validation (Drop-downs, Input Messages, Error Alerts), What-If Analysis: Goal Seek, Scenario Manager, Data Tables

Charts and Dashboards: Creating Interactive Dashboards, Using slicers with Pivot Tables, Combo Charts and Spark lines

Productivity Tips: Using Named Ranges, Freeze Panes, Split View.

**Textbooks:**

1. Fundamentals of Computers, Reema Thareja, Oxford University Press, Second Edition.
2. Fundamentals of Computers, V. Rajaraman – PHI Learning.
3. Introduction to Computers by Peter Norton – McGraw Hill.
4. Microsoft Office 365 In Practice by Randy Nordell – McGraw Hill Education.

**References:**

1. Excel 2021 Bible by Michael Alexander, Richard Kusleika – Wiley
2. Networking All-in-One for Dummies by Doug Lowe – Wiley
3. Microsoft Official Docs and Training: <https://learn.microsoft.com>
4. Google Workspace Learning Center: <https://support.google.com/a/users/>

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**I B.Sc. Honours Artificial Intelligence**

<b>Course Code</b>	<b>Course Title</b> <b>Computer Fundamentals and Office Automation</b>	<b>Program &amp; Semester</b>			
		I B.Sc. Honours AI I Semester			
<b>Teaching</b>	Hours Allocated:2	<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
<b>Pre-requisites</b>		<b>0</b>	<b>0</b>	<b>2</b>	<b>1</b>

**List of Experiments:**

1. Demonstration of Assembling and Disassembling of Computer Systems.
2. Identify and prepare notes on the type of Netwo2k topology of your institution.
3. Prepare your resume in Word.
4. Using Word, write a letter to your higher official seeking 10-days leave.
5. Prepare a presentation that contains text, audio and video.
6. Using a spreadsheet, prepare your class Time Table.
7. Using a Spreadsheet, calculate the Gross and Net salary of employees (Min 5) considering all the allowances.
8. Generate the class-wise and subject-wise results for a class of 20 students.  
Also generate the highest and lowest marks in each subject.
9. Using IF, AND, OR, and IFERROR to Automate Grade Evaluation.
  - a. Create a table of student scores in different subjects.
  - b. Use IF to assign grades (A/B/C/Fail).
  - c. Use IFERROR to handle missing scores or invalid data.
10. Employee Database Search Using VLOOKUP, HLOOKUP, XLOOKUP, INDEX, and MATCH
  - a. Create a database of employees (Name, ID, Department, Salary).
  - b. Implement VLOOKUP to search by employee ID.
  - c. Use HLOOKUP to extract department heads by role.
  - d. Apply XLOOKUP for more flexible searches.
  - e. Use INDEX + MATCH as an alternative to VLOOKUP.
11. Sales Report Analysis Using Pivot Tables and Charts
  - a. Use a dataset of product sales (Product, Region, Date, Quantity, Revenue)
  - b. Create Pivot Tables to summarize data by region/product.
  - c. Insert Pivot Charts for visual analysis (e.g., bar, line).
  - d. Add slicers to make the dashboard interactive.
12. Designing a Data Entry Form with Drop-downs and Input Rules
  - a. Create a student registration form.
  - b. Add drop-down lists for course selection using Data Validation.
  - c. Add input messages to guide users.
  - d. Add error alerts for wrong entries.
13. Monthly Budget Planning using Goal Seek and Scenario Manager
  - a. Create a simple personal budget (income, expenses, savings).
  - b. Use Goal Seek to determine income needed to save a desired amount.
  - c. Use Scenario Manager to compare different budgeting scenarios (best/worst/realistic case).

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- d. Create a one-variable Data Table to analyze how different expenses affect savings.
14. Dashboard Creation Using Combo Charts, Sparklines & Slicers
- a. Use existing sales or attendance data.
  - b. Insert combo charts (e.g., column + line).
  - c. Add sparklines to show trends.
  - d. Use slicers with Pivot Tables to control dashboard elements.
  - e. Finalize and format for interactivity.

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**Model Question Paper**  
**I B.Sc. Honours Artificial Intelligence - I Semester**

**Paper Title: Computer Fundamentals and Office Automation**

**Time: 3 hours**

**Max. Marks: 60 Marks**

**SECTION – A**

**Answer any Five of the following questions.**

**5 x 4 = 20 M**

1. Define Number Systems (Binary, Decimal).
2. Block Diagram of a Computer:  
Input Unit, Central Processing Unit, Memory Unit, Output Unit.
3. Explain Types of Computers (Micro, Mini, Mainframe, and Supercomputers).
4. What is Network Topologies. Explain.
5. Define Tables and Graphics - Inserting and formatting tables,  
Adding images, shapes, icons.
6. Explain Document Layout - Page setup, Headers, footers, and page numbering.
7. Explain Spreadsheet Concepts: Understanding rows, columns, cells in tools like MS Excel.
8. What is Data Validation (Dropdowns, Input Messages, Error Alerts).

**SECTION – B**

**Answer any Five of the following questions.**

**5 x 8 = 40 M**

9. Explain Block Diagram of the Computers?
10. What is Computer? Explain the characteristics of Computer?
11. Explain about Internet Basics?
12. Discuss the features provided by MS –WORD?
13. Explain how to Creating a Presentation using a Template?
14. Discuss the features provided by MS – Excel?
15. Explain about changing column widths and row heights?
16. Explain Data Analysis Tools: Pivot Tables and Pivot Charts?

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**DEPARTMENT OF COMPUTER SCIENCE & APPLICATIONS**

**I B.Sc. Honours Artificial Intelligence - I Semester**

**Paper Title: Computer Fundamentals and Office Automation**

**BLUE PRINT FOR THE MODEL PAPER**

S.NO.	Type of Question	To be given in the Question Paper			To be answered		
		No. of Questions	Marks allotted to each question	Total Marks	No. of Questions	Marks allotted to each question	Total Marks
1	Section - A (Short Questions)	8	4	32	5	4	20
2	Section - B (Essay Questions)	8	8	64	5	8	40
<b>Total Marks</b>				<b>96</b>	<b>Total Marks</b>		<b>60</b>

**BLUE PRINT FOR THE QUESTION PAPER SETTING**

Chapter Name	Short Questions 4 Marks	Essay Questions 8 Marks	Marks allotted to the Chapter
UNIT - I	2	2	24
UNIT - II	2	2	24
UNIT - III	2	2	24
UNIT - IV	1	1	12
UNIT - V	1	1	12
<b>Total No. of Questions</b>	<b>8</b>	<b>8</b>	<b>96</b>

**GOVERNMENT COLLEGE FOR MEN (A), KADAPA****DEPARTMENT OF COMPUTER SCIENCE & APPLICATIONS****I B.Sc. Honours Artificial Intelligence**

<b>Program Code</b>	<b>Course Title</b> <b>Problem Solving Using C</b>	<b>Program &amp; Semester</b> I B.Sc. Honours AI I Semester			
<b>Teaching</b>	Hours Allocated:3	<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
<b>Pre-requisites</b>		<b>3</b>	<b>0</b>	<b>0</b>	<b>3</b>

**Course Objectives:**

1. Understand the fundamentals of computer programming, Apply structured Problem solving approaches using algorithms, flowcharts, and C programming constructs.
2. Develop efficient logic using decision-making, loop, and jump control statements.
3. Utilize derived data types like arrays and strings for modular program design.
4. Design and implement modular solutions using functions, recursive logic, pointer operations, and dynamic memory management.
5. Handle complex data structures including structures, unions, and text file operations.

**Course Outcomes:**

At the end of the course, students will be able to:

1. Understand basic computing concepts, programming paradigms and write structured C programs.
2. Apply control flow statements to solve logical and repetitive tasks in C.
3. Implement arrays and string operations to manage and manipulate data efficiently.
4. Design modular code using functions, recursion, and appropriate parameter passing.
5. Utilize pointers and memory operations for effective data handling.  
Demonstrate competence in dynamic memory allocation and text file processing.

**Syllabus****Unit 1. Introduction to computer programming:**

Introduction, Types of software, Compiler and interpreter, Concepts of Machine level, Assembly level and high-level programming, Flowcharts and Algorithms,

**Fundamentals of C:** History of C, Features of C, C Tokens-variables and keywords and identifiers, constants and Data types, Rules for constructing variable names, Operators, Structure of C program, Input /output statements in C - Formatted and Unformatted I/O.

**Unit– II. Control statements:**

Decision making statements: if, if else, else if ladder, switch statements. Loop control statements: while loop, for loop and do-while loop. Jump Control statements: break, continue and goto.

**Unit – III .Derived data types in C:**

Arrays: One Dimensional arrays - Declaration, Initialization and Memory representation; Two Dimensional arrays -Declaration, Initialization and Memory representation. Strings: Declaring & Initializing string variables; String handling functions, Character handling functions.

**Unit –IV. Functions:**

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

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Function Prototype, definition and calling. Return statement. Nesting of functions. Categories of functions. Recursion (Basic Concept only). Parameter Passing by address & by value. Local and Global variables. Storage classes: automatic, external, static and register

**Unit –V Dynamic Memory Management:**

Introduction, Functions-malloc, calloc, realloc, free Structures: Basics of structure, structure members, accessing structure members, nested structures, array of structures, structure and functions, structures and pointers. Unions - Union definition; difference between Structures and Unions. Working with text files - modes: opening, reading, writing and closing text files.

**Text Books:**

1. Programming in ANSI C, E. Balagurusamy, Tata McGraw Hill, 6<sup>th</sup> Edn,
2. Computer fundamentals and programming in C, Reema Theraja, Oxford University Press

**Reference Books:**

1. Let us C, Y Kanetkar, BPB publications
2. Head First C: A Brain-Friendly Guide, David Griffiths, Dawn Griffiths.

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**I B.Sc. Honours Artificial Intelligence**

Program Code	Course Problem Solving Using C - Practical	Program & Semester I B.Sc. Honours AI I Semester			
Teaching	Hours Allocated:2	L	T	P	C
Pre-requisites		0	0	2	1

**List of Experiments:**

1. Write a program to check whether the given number is Armstrong or not.
2. Write a program to find the sum of individual digits of a positive integer.
3. Write a program to generate the first n terms of the Fibonacci sequence.
4. Write a program to find both the largest and smallest number in a list of integer Values.
5. Write a program to demonstrate change in parameter values while swapping two integer variables using Call by Value & Call by Address
6. Write a program to perform various string operations.
7. Write a program to search an element in a given list of values.
8. Write a program that uses functions to add two matrices.
9. Write a program to calculate factorial of given integer value using recursive functions.
10. Write a program for multiplication of two N X N matrices.
11. Write a program to sort a given list of integers in ascending order.
12. Write a program to calculate the salaries of all employees using Employee (ID, Name, Designation, Basic Pay, DA, HRA, Gross Salary, Deduction, Net Salary) structure.
  - a. DA is 30 % of Basic Pay
  - b. HRA is 15% of Basic Pay
  - c. Deduction is 10% of (Basic Pay + DA)
  - d. Gross Salary = Basic Pay + DA+ HRA
  - e. Net Salary = Gross Salary - Deduction
13. Write a program to read / write the data from / to a file.
14. Write a program to reverse the contents of a file and store in another file.
15. Write a program to create Book (ISBN, Title, Author, Price, Pages, Publisher) structure and store book details in a file and perform the following operations.
  - a. Add book details
  - b. Search a book details for a given ISBN and display book details, if available
  - c. Update a book details using ISBN
  - d. Delete book details for a given ISBN and display list of remaining Books

**GOVERNMENT COLLEGE FOR MEN (A), KADAPA**  
**DEPARTMENT OF COMPUTER SCIENCE & APPLICATIONS**  
Model Question Paper  
**I B.Sc. Honours Artificial Intelligence - I Semester**  
**Paper Title: Problem Solving Using C**

**Time: 3 hours**

**Max. Marks: 60 Marks**

**SECTION - A**

**Answer any Five of the following questions.**

**5 x 4 = 20 M**

1. Explain block diagram of a computer.
2. Write rules for constructing variable names.
3. When do we use break? Give an example.
4. Write about Jump Control Statement.
5. Write any five-Character handling functions with example.
6. Explain function declaration and definition.
7. Write about Pointer Arithmetic.
8. Write about array of Structures with example.

**SECTION - B**

**Answer any Five of the following questions.**

**5 x 8 = 40 M**

9. What is Software. Explain various types of Software.
10. Explain structure of C program with example program and file used.
11. Explain Decision making statements with syntax and example.
12. Explain while and for loops with syntax and example programs.
13. Explain Two-dimensional array declaration, initialization, accessing elements.
14. Explain parameter passing by address and by value with examples.
15. Explain Dynamic Memory Management in detail.
16. Explain differences between Structures and Unions.

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**DEPARTMENT OF COMPUTER SCIENCE & APPLICATIONS**  
**I B.Sc. Honours Artificial Intelligence - I Semester**  
**Paper Title: Problem Solving Using C**  
**BLUE PRINT FOR THE MODEL PAPER**

S.NO.	Type of Question	To be given in the Question Paper			To be answered		
		No. of Questions	Marks allotted to each question	Total Marks	No. of Questions	No. of Questions	Marks allotted to each question
1	Section – A (Short Questions)	8	4	32	5	4	20
2	Section – B (Essay Questions)	8	8	64	5	8	40
<b>Total Marks</b>				<b>96</b>	<b>Total Marks</b>		<b>60</b>

**BLUE PRINT FOR THE QUESTION PAPER SETTING**

Chapter Name	Short Questions 4 Marks	Essay Questions 8 Marks	Marks allotted to the Chapter
UNIT - I	2	2	24
UNIT - II	2	2	24
UNIT - III	1	2	20
UNIT - IV	2	1	16
UNIT - V	1	1	12
<b>Total No. of Questions</b>	<b>8</b>	<b>8</b>	<b>96</b>

**GOVERNMENT COLLEGE FOR MEN (A), KADAPA**  
**DEPARTMENT OF COMPUTER SCIENCE & APPLICATIONS**  
**I B.Sc. Honours Artificial Intelligence**

<b>Program Code</b>	<b>Course Title</b> <b>Data Structures using C</b>	<b>Program &amp; Semester</b> I B.Sc Honours AI II Semester			
<b>Teaching</b>	Hours Allocated:3	<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
<b>Pre-requisites</b>	C Programming	<b>3</b>	<b>0</b>	<b>0</b>	<b>3</b>

**Course Objectives:**

1. Understand fundamental concepts of algorithms and data structures with focus on complexity analysis and abstract data types.
2. Explore various types of linked lists and their dynamic memory representations and operations.
3. Analyze and implement linear data structures, such as stacks and queues, and examine their real-world applications.
4. Apply sorting and searching algorithms, understanding their performance implications and Optimization strategies.
5. Design and manipulate hierarchical and graph-based structures, applying traversal algorithms and understanding their practical uses in computing.

**Course Outcomes:**

Learners will be able to:

1. Explain algorithm characteristics, time and space complexity, and asymptotic notations with clarity.
2. Implement and analyze different types of linked lists, including insertion, deletion, and traversal operations.
3. Develop stack and queue data structures using arrays and linked lists, and apply them in expression evaluation.
4. Apply efficient searching and sorting algorithms to solve computational problems and evaluate performance trade-offs.
5. Construct and traverse tree and graph structures, using them to solve problems like shortest path and spanning trees.

**Syllabus****Unit 1. Basic Concepts:**

Algorithm: Definition and characteristics, Complexity analysis: Space Complexity, Time Complexity, Asymptotic Notations

Introduction to Data structures: Definition, Types of Data structures, Abstract Data Types (ADT), Introduction to Linked Lists, Representation of linked lists in Memory, Comparison between Linked List and Array

**Unit– II. Linked Lists:**

Types of Linked Lists - Singly Linked list, Doubly Linked list, Circularly Singly Linked list, Circularly Doubly Linked list; Implementation of Single Linked List ADT: Creating a List Traversing a linked list, Searching in linked list, Insertion and deletion into linked list (At first Node, Specified Position, Last node).

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**Unit – III. Stacks and Queues:**

Introduction to stack ADT, Implementation of stacks using array and Linked List, Application of stacks - Polish Notations - Converting Infix to Post Fix Notation - Evaluation of Post Fix Notation. Queues: Introduction to Queue ADT, Implementation of Queues using array and Linked List, Application of Queues Types of Queues- Circular Queues, De-queues, Priority Queue, Heaps.

**Unit –IV. Searching and Sorting:**

Linear or Sequential Search, Binary Search, Hashing and collision resolution.  
Sorting: Selection Sort, Bubble Sort, Insertion Sort, Quick Sort and Merge Sort.

**Unit –V Trees and Graphs:**

Tree Terminology, Binary Tree Representation, Traversal techniques, Expression Tree, Binary Search Tree- Definition, Operations on a Binary Search Tree: Creation, Search, Insertion & deletion.

Graphs: Introduction to Graphs, Terminology, Representation (Adjacency Matrix, Adjacency List), Traversal of Graphs (DFS, BFS), Applications of Graphs, Concept of Shortest Path Problems, Concept of Minimum Cost Spanning Tree

**Textbooks:**

1. Data Structures Using C, Balagurusamy E. Tata McGraw Hill
2. Data Structures using C, Reema Thareja, Third Edition, Oxford University Press

**Reference Books:**

1. Data Structures, Lipschutz, Schaum's Outline Series, Tata McGraw-Hill
2. Data Structures Using C, Ch. Vijay Kumar, Pen Press International

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**I B.Sc. Honours Artificial Intelligence**

Course Code	Course Title	Program & Semester			
	<b>Data Structures Using C LAB</b>	I B.Sc. Honours AI II Semester			
<b>Teaching</b>	Hours Allocated:2	<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
<b>Pre-requisites</b>	Basic Programming	<b>0</b>	<b>0</b>	<b>2</b>	<b>1</b>

**List of Experiments**

1. Write a program to read ‘N’ numbers of elements into an array and also perform the following operation on an array
  - a. Add an element at the beginning of an array
  - b. Insert an element at given index of array
  - c. Update an element using a values and index
  - d. Delete an existing element
2. Write a program to implement Single Linked List with insertion, deletion and traversal operations
3. Write a program to implement Doubly Linked List with insertion, deletion and traversal operations
4. Write a program to implement the Stack operations using Arrays and Linked Lists.
5. Write a program to convert a given infix expression to a postfix expression using stacks.
6. Write a program to implement the Queue operations using Arrays and Linked Lists.
7. Write a program to implement the Circular Queue operations using Arrays.
8. Write a program for Binary Search Tree Traversals.
9. Write a program to search an item in a given list using the following Searching Algorithms
  - a. Linear Search
  - b. Binary Search.
10. Write a program for implementation of the following Sorting Algorithms
  - a. Bubble Sort
  - b. Insertion Sort
  - c. Quick Sort
  - d. Merge Sort.

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Model Question Paper

**I B.Sc. Honours Artificial Intelligence - II Semester**

**Paper Title: Data Structures using C**

**TIME: 3 hours**

**Max. Marks: 60 Marks**

**SECTION – A**

**Answer any Five of the following questions.**

**5 x 4 =20M**

1. Describe dynamic memory allocation functions with examples.
2. What is Time Complexity? Give on Example.
3. What are the applications of Linked Lists?
4. Write the differences between Linked List and Array.
5. Describe Converting Infix to Postfix Notation algorithm.
6. Describe about double ended queue.
7. What is Linear Search? Write about Linear Search algorithm.
8. Write about Binary Tree Traversal?

**SECTION – B**

**Answer any Five of the following questions.**

**5 x 8 = 40 M**

9. Define data structure and discuss the types of data structures in detail.
10. Explain about various operations on arrays with Algorithms.
11. Describe about Types of Linked Lists?
12. Explain the insertion of a node in a singly linked list at various positions.
13. Describe the array representation of stack and various stack operations
14. How to implement a linked representation of a Queue? Explain.
15. Explain Bubble Sort Technique.
16. Explain about BFS traversal.

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**I B.Sc. Honours Artificial Intelligence - II Semester**

**Paper Title: Data Structures using C**

**BLUE PRINT FOR THE MODEL PAPER**

S.NO.	Type of Question	To be given in the Question Paper			To be answered		
		No. of Questions	Marks allotted to each question	Total Marks	No. of Questions	Marks allotted to each question	Total Marks
1	Section – A (Short Questions)	8	4	32	5	4	20
2	Section – B (Essay Questions)	8	8	64	5	8	40
<b>Total Marks</b>				<b>96</b>	<b>Total Marks</b>		<b>60</b>

**BLUE PRINT FOR THE QUESTION PAPER SETTING**

Chapter Name	Short Questions 4 Marks	Essay Questions 8 Marks	Marks allotted to the Chapter
UNIT - I	2	2	24
UNIT - II	2	2	24
UNIT - III	2	2	24
UNIT - IV	1	1	12
UNIT - V	1	1	12
<b>Total No. of Questions</b>	<b>8</b>	<b>8</b>	<b>96</b>

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**DEPARTMENT OF COMPUTER SCIENCE & APPLICATIONS**  
**I B.Sc. Honours Artificial Intelligence**

Program Code	Course Python Programming	Program & Semester			
		I B.Sc. Honours AI II Semester			
Teaching	Hours Allocated:	L	T	P	C
Pre-requisites		3	0	0	3

### Course Objectives

1. The objective of this course is that the student will be able to learn problem solving skills using 'PYTHON' programming language.
2. The purpose of this course is to study main elements of python programming and perform data analysis using data structures and tools in python.
3. This course will enable the students to learn programming skills necessary to implement all the basic mathematical, scientific and real-world applications.

### Course Outcomes

Upon successful completion of the course, students should have the knowledge and skills to:

1. To Understand Features and basic concepts of python.
2. To learn control structures in python and apply them to real world problems.
3. To understand data structures in python and oops concepts
4. Build user defined functions and modules in python to improve code reusability.
5. To construct data and perform data analysis.

### Syllabus

#### Unit I: Basics of Python:

Introduction- Features of python, basic syntax, writing and executing the python program, literals-variables and constants, keywords, data types, operators, input operation, comments, operations on strings, type conversion. Selection or conditional branching statements-if, if-else, nested if, if-elif-else. Loops or iterative statements-while, for, nested loops, break, continue, pass, else statement with loops.

#### Unit II. Functions and Modules:

Functions-Definition and call, return statements, local and global variables, anonymous function-LAMBDA, recursive functions.

Modules-Using existing modules, making own modules, packages in python, Names of standard library modules.

#### Unit III. Data Structures:

List-Accessing lists, updating lists, nested lists, basic list operations, list methods, loops in lists.

Tuples-Creation, Accessing, updating, deletion in tuples and basic tuple operations.

Sets-creation, set operations. Dictionaries - creation, accessing, adding and modifying items, deleting items.

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#### **Unit IV. Object Oriented Programming concepts:**

Oops concept- Introduction, Classes and Objects, Class method.

Inheritance – Introduction, Inheriting classes in python, Types of Inheritance, Error and Exception Handling.

#### **Unit V. Data Analysis:**

Data preparation using pandas and series- pandas data frame basics, Creating your own data

Series, Data frames, Making changes to series and data frames Plotting- Matplotlib Introduction, Univariate plots-Histograms.

#### **Text Books:**

1. Python Programming Using Problem Solving Approach –Reema Thareja , Oxford University Press, ©2017

2. Pandas for Everyone (Python data Analysis)-Daniel Y.Chen, Pearson Addison WesleyData and Analytics series,©2018.

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**I B.Sc. Honours Artificial Intelligence**

<b>Course Code</b>	<b>Course Title</b> <b>Python Programming Lab</b>	<b>Program &amp; Semester</b> I B.Sc. Honours AI II Semester			
<b>Teaching</b>	Hours Allocated:2	<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
<b>Pre-requisites</b>	Basic Programming	<b>0</b>	<b>0</b>	<b>2</b>	<b>1</b>

**List of Experiments**

1. Write a program to read and print values of variables of different data types.
2. Write a program to find the roots of quadratic equations.
3. Write a program to find the largest of 3 numbers.
4. Write a program to check whether a given number is prime or not.
5. Write a program to generate Fibonacci series.
6. Write a program to find whether a given number is Armstrong or not.
7. Write a program using functions to swap two numbers.
8. Write a program to find factorial of a number using recursion.
9. Write a program to find square root of a given number using math module.
10. Write a program to generate 10 random numbers between 1 to 100 using random module.
11. Create a list and perform different operations on it.
12. Create a tuple and perform different operations on it.
13. Create a set and perform different operations on it.
14. Create a dictionary and perform different operations on it.
15. Import pandas and create a data frame and perform operations on it.
16. Generate histogram using Matplotlib.
17. Generate scatter plot using Matplotlib.
18. Generate box plot using Matplotlib.

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**Model Question Paper**

**I B.Sc. Honours (Artificial Intelligence)- II Semester**

**Paper Title: Python Programming**

**Time: 3 hours**

**Max. Marks: 60 Marks**

**SECTION-A**

**Answer any Five of the following questions.**

**5 x 4 = 20 M**

1. What are the features of Python Language?
2. How can you write and execute Python application?
3. What is the purpose of a return statement in a function? Give an example?
4. How do you create an empty list in Python?
5. How do you create a tuple in Python?
6. What is a class in Python, and how is it defined?
7. What is the purpose of error and exception handling in Python?
8. What is Matplotlib, and why is it used in data visualization?

**SECTION-B**

**Answer any Five of the following questions.**

**5 x 8 = 40 M**

9. Explain various types of literals, variables and constants in Python.
10. Explain conditional branching statements in Python.
11. What is a function in Python, and why is it used?
12. How do you create your own module in Python? Provide a step-by-step example.
13. Explain the difference between a list and an array.
14. Explain the basic concepts of Object-Oriented Programming.
15. Define Inheritance. Explain various types of Inheritances.
16. What is the purpose of the head () and tail () methods in Pandas?

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**GOVERNMENT COLLEGE FOR MEN (A), KADAPA**  
**DEPARTMENT OF COMPUTER SCIENCE & APPLICATIONS**  
**I B.Sc. Honours (Artificial Intelligence) - II Semester**  
**Paper Title: Python Programming**

**BLUE PRINT FOR THE MODEL PAPER**

S.NO.	Type of Question	To be given in the Question Paper			To be answered		
		No. of Questions	Marks allotted to each question	Total Marks	No. of Questions	Marks allotted to each question	Total Marks
1	Section – A (Short Questions)	8	4	32	5	4	20
2	Section – B (Essay Questions)	8	8	64	5	8	40
<b>Total Marks</b>				<b>96</b>	<b>Total Marks</b>		<b>60</b>

**BLUE PRINT FOR THE QUESTION PAPER SETTING**

Chapter Name	Short Questions 4 Marks	Essay Questions 8 Marks	Marks allotted to the Chapter
UNIT - I	2	2	24
UNIT - II	2	2	24
UNIT - III	2	2	24
UNIT - IV	1	1	12
UNIT - V	1	1	12
<b>Total No. of Questions</b>	<b>8</b>	<b>8</b>	<b>96</b>

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**I B.Sc. Honours Computer Science**

Year	Semester	Course	Title of the Course	No of Hrs/ per week	No. of Credits
I	I	1	AI Fundamentals	4	4

**Learning Objectives:**

1. Understand the history and evolution of Artificial Intelligence and Identify major subfields of AI.
2. Investigate the role of AI in various industries like healthcare, agriculture, and education.
3. Examine concepts like bias, fairness, transparency, and accountability in AI systems.
4. Explore the integration of AI in scientific research and discuss future directions and evolving trends in AI.
5. Learn how prompt engineering is used in various sectors like education and content creation.

**Course Outcomes:**

Students will be able to

1. Describe the different subfields and their roles in AI applications.
2. Analyze the benefits and limitations of AI in diverse domains.
3. Evaluate AI systems in terms of inclusivity, privacy, and robustness.
4. Describe Generative AI and emerging technologies like ChatGPT.
5. Apply prompt engineering concepts to various real-world use cases.

**Syllabus**

**Unit I. AI and its Subfields**

Introduction to Artificial Intelligence, History, Definition, Artificial General Intelligence, Industry Applications of AI, Challenges in AI.

Knowledge Engineering, Machine Learning, Computer Vision, Natural Language Processing, Robotics.

**Unit II. Applications of AI**

Healthcare, Finance, Retail, Agriculture, Education, Transportation.

**Unit III. Bias and Fairness in AI Systems**

Ethics in AI, Bias and Fairness in AI Systems, Transparency in AI Systems, Accountability, Security, Privacy, Inclusivity, Sustainability, Robustness, Reliability.

**Unit IV. AI in Research, Generative AI and prompt engineering**

AI in Experimentation and Multi-disciplinary research, Generative AI introduction, ChatGPT, Hugging Face, Gemini and other tools basics, Perplexity, Prompt engineering Definition and its importance, Role of Prompt Engineering in AI/ML Interaction, Emerging trends and Future Directions in AI.

**Unit V. Applications of Prompt engineering Applications of Prompt Engineering:**

Education, Business & Commerce, Content Creation: AI for Creative Writing, AI for creative design, writing AI scripts for video, generating slides and slides GPT usage, Designing thumbnails and channel branding with AI

**Text Books:**

1. AI for Everyone: A Beginner's Handbook for Artificial Intelligence (AI) by Saptarsi Goswami, Amit Kumar Das, Amlan Chakrabarti
2. Prompt Engineering for Beginners: by Kapila Arora, Geetu Garg, Gaurav Arora.

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**Text Books:**

1. AI for Everyone: A Beginner's Handbook for Artificial Intelligence (AI) by Saptarsi Goswami, Amit Kumar Das, Amlan Chakrabarti
2. Prompt Engineering for Beginners: by Kapila Arora, Geetu Garg, Gaurav Arora.

**References:**

1. Let's Learn Artificial Intelligence: Base Module, Niti Ayog, Atal Innovation Mission.
2. Prompt Engineering for Generative AI: Future-proof inputs for Reliable AI-outputs by James Phoenix & Mike Taylor.
3. Generative AI Tutorial:[https://www.w3schools.com/gen\\_ai/](https://www.w3schools.com/gen_ai/)
4. Generative AI 360°: Practical Guide to ChatGPT, Midjourney & AI Tools to Boost Productivity & Creativity , For Professionals, Marketers & Entrepreneurs by Hitesh Motwani , ZebraLearn, 2025.
5. Generative AI: Prompt Engineering Basics:
6. Learn Generative AI Prompt Engineering for everyone.  
<https://www.coursera.org/learn/generative-ai-prompt-engineering-for-everyone?action=enroll>
7. Free Artificial Intelligence (AI) Tutorial - Hands-On Prompt Engineering for AI Beginners & Business User | Udemy,  
<https://www.udemy.com/course/prompt-engineering-for-ai-beginners-business-users>.

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**B.Sc. Honours Computer Science**

<b>Course Code</b>	<b>Course Title</b> <b>AI FUNDAMENTALS LAB</b>	<b>Program &amp; Semester</b> I B.Sc. Honours AI I Semester	
<b>Teaching</b>	Hours Allocated:2	<b>P</b>	<b>C</b>
<b>Pre-requisites</b>	Basic Programming	<b>2</b>	<b>0</b>

**List of Experiments**

1. Create a mind map of AI subfields: NLP, CV, ML, Robotics, Knowledge Engineering using Canva/Napkin AI/ Similar Open AI tool
2. Text Analysis with Open-Source NLP Tools: Tool: Voyant Tools (text analysis web app)
  - Input sample texts (e.g., news articles, speeches).
  - Explore word frequency, keywords, sentiment.
  - Understand how NLP extracts meaning from text.
3. Train a basic image classifier using webcam images. Observe how the model "learns."
  - " Using Google Teachable Machine
    - Train two image categories (e.g., "Smiling" vs. "Not Smiling") using their own webcam images.
    - Observe how the model learns to classify.
    - Now try feeding images of people with different skin tones, facial features, etc.
    - Observe misclassifications or differences in confidence.
4. Simulate an AI chatbot helping a farmer or a student. You may use any GenAI tool of your choice. You may use the prompt below and also try your own.

**Prompt:**

"Act as an agriculture assistant. A farmer wants to know the best crop based on soil and season. Ask questions and suggest crops."

5. Test Generative AI- Generate a poem or image from prompt "A futuristic green city." Using ChatGPT, Hugging Face (e.g., image or text generation)
6. Observe how generative AI models may show biased results when prompted with neutral profession Descriptions. (Bing Image Creator / DALL·E on ChatGPT/ChatGPT). Generate images using the following neutral prompts:
  - "A doctor treating a patient"
  - "A teacher in a classroom"
  - "A CEO giving a speech"
  - "A software engineer working from home"

Observe and discuss:

- What gender/race/age are most commonly shown?
- Are the results stereotypical or diverse?

7. Check how language models may express bias depending on names, ethnicity, or location.

**Use ChatGPT or Gemini**

**Prompts:**

**Prompt A:**

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“A person named Raj is applying for a bank loan. Will he be approved?”

**Prompt B:**

“A person named John is applying for a bank loan. Will he be approved?”

Change names, genders, and nationalities.

**Observe the following and report your findings:**

- Are the responses different?
- Is one version more positive or negative?
- Does the model express bias or hesitate?
- Should AI make such predictions?
- How do developers prevent this?

8. Exploring Text Generation and Summarization with Google AI Studio

Generate Creative Content

“Write a short story (150 words) about a robot who wants to become a chef.”

- Submit and read the AI-generated story.
- Discuss how detailed and creative the output is.

**Summarize a Paragraph**

**Prompt:**

Summarize the following paragraph in 3 sentences:

“Artificial Intelligence is a branch of computer science that aims to create intelligent machines that can mimic human thinking. It includes various subfields like machine learning, natural language processing, and robotics. AI is widely used in industries such as healthcare, finance, and transportation to improve efficiency and decision-making.”

- Submit and review the summary.
- Evaluate how well AI extracts key points.

**Refine Your Prompt**

**Try changing the summary prompt to:**

“Summarize the paragraph above in simple language for 10-year-olds.”

- Compare this output to the previous one.
- Note how prompt wording changes results.

9. AI for Creative Writing

**Prompt:**

“Write a short motivational story for 10-year-old students in under 150 words.”

10. Generate **Slides**: Tool: SlidesGPT/Other Free AI tool

**Prompt:**

“Create a 5-slide presentation on ‘AI in Smart Farming’.”

11. YouTube Thumbnails / Branding: Tool: Canva + Magic Media AI

Design a thumbnail using Canva’s AI tools with a prompt like:

“Design a YouTube thumbnail for a video titled ‘Top 5 AI Tools for Students’.”

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**Model Question Paper**  
**I B.Sc. Honours (Artificial Intelligence)**  
**Paper Title: AI FUNDAMENTALS**

**Time: 3 hours**

**Max. Marks: 60 Marks**

**SECTION-A**

**Answer any Five of the following questions.**

**5 x 4 =20M**

- 1.
- 2.
- 3.
- 4.
- 5.
- 6.
- 7.
- 8.

**SECTION-B**

**Answer any Five of the following questions.**

**5 x 8 = 40 M**

- 9.
- 10.
- 11.
- 12.
- 13.
- 14.
- 15.
- 16.

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**DEPARTMENT OF COMPUTER SCIENCE & APPLICATIONS**

**PANEL OF EXAMINERS**

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