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Question Paper Code : 81505

B.E./B.Tech. DEGREE EXAMINATIONS, NOVEMBER/DECEMBER 2025.

First Semester

Civil Engineering

GE 3151 — PROBLEM SOLVING AND PYTHON PROGRAMMING

(Common to Aeronautical Engineering/Aerospace Engineering/Automobile Engineering/Biomedical Engineering/Civil Engineering (Environmental Engineering)/Computer Science and Design/Computer Science and Engineering/Computer Science and Engineering (Artificial Intelligence and Machine Learning)/Computer Science and Engineering (Cyber Security)/Computer and Communication Engineering/Electrical and Electronics Engineering/Electronics and Communication Engineering/Electronics and Instrumentation Engineering/ Electronics and Telecommunication Engineering/Environmental Engineering/Geoinformatics Engineering/Industrial Engineering/Industrial Engineering and Management/Instrumentation and Control Engineering/Manufacturing Engineering/Marine Engineering/Materials Science and Engineering/Mechanical Engineering/Mechanical Engineering (Sandwich)/Mechanical Engineering (Specialised in Automobile)/Mechanical Engineering (Specialised in Smart Manufacturing)/Mechanical and Automation Engineering/Mechatronics Engineering/Medical Electronics/Petrochemical Engineering/Production Engineering/Robotics and Automation/Safety and Fire Engineering/Agricultural Engineering/Artificial Intelligence and Data Science/ Bio Technology/Biotechnology and Biochemical Engineering/Chemical Engineering/ Chemical and Electrochemical Engineering/Computer Science and Business Systems/Fashion Technology/Food Technology/Handloom and Textile Technology/ Information Technology/Petrochemical Technology/Petroleum Engineering/ Pharmaceutical Technology/Plastic Technology/Textile Chemistry/ Textile Technology)

(Regulations 2021)

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. What is algorithmic problem solving?
2. List any two differences between iteration and recursion

3. What is the use of comments in Python?
4. How will you declare and initialize a tuple?
5. Mention any two use cases of break and continue statements.
6. What is the purpose of function composition?
7. How is dictionary different from a list?
8. Write the syntax of list slicing.
9. What is the significance of command line arguments?
10. Define exception handling in Python with syntax.

PART B — (5 × 16 = 80 marks)

11. (a) (i) Describe the different building blocks of an algorithm with examples. (8)
(ii) Write an algorithm to insert an element in a sorted list. (8)

Or

- (b) (i) Explain how control flow plays a key role in solving computational problems. (8)
(ii) Develop a recursive function to solve the factorial problem. (8)
12. (a) (i) Explain the process of tuple assignment and its importance in Python. (8)
(ii) Write a Python program to circulate the values of three variables. (8)

Or

- (b) (i) Describe precedence and associativity of operators in Python with an example. (8)
(ii) Write a Python program to convert temperature from Fahrenheit to Celsius. (8)
13. (a) (i) Explain the concept of chained conditional statements in Python with examples. (8)
(ii) Write a Python program to find square root of a number using Newton's method. (8)

Or

- (b) (i) Differentiate between linear search and binary search algorithms. (8)
(ii) Write a recursive function to compute power (base^{exponent}). (8)

14. (a) (i) Explain list comprehension with two examples. (8)
(ii) Write a Python program to sort the given list using selection sort. (8)

Or

- (b) (i) Describe the operations that can be performed on a dictionary in Python. (8)
(ii) Develop a Python application to generate a student marks report using dictionary and lists. (8)
15. (a) (i) Write a Python program to copy contents from one file to another. (8)
(ii) Write a Python program to validate student marks (0 to 100) using exception handling. (8)

Or

- (b) (i) Explain how errors and exceptions are handled in Python. (8)
(ii) Illustrate the creation and use of modules with a program that calculates area of geometric shapes. (8)
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