2023/TDC(CBCS)/ODD/SEM/
CSCDSE–501T(A/B)/092

TDC (CBCS) Odd Semester Exam., 2023

COMPUTER SCIENCE

(5th Semester)

Course No. : CSCDSE–501T

Full Marks : 50
Pass Marks : 20

Time : 3 hours

The figures in the margin indicate full marks for the questions

Candidates have to answer the questions *either* from Option—A or Option—B.

OPTION—A

Course No. : CSCDSE–501T (A)

(Numerical Method)

SECTION—A

Answer *fifteen* questions, selecting *three* from each Unit : 1×15=15

Unit—I

1. Write one application of numerical analysis.

2. What are the different sources of error?

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3. Truncation of 93·2155 to four significant figures is _____.

(Fill up the blank)

4. Define inherent error.

Unit—II

5. Is Gauss elimination an iterative method?

6. If the root lies between a and b in Bisection method then $f(a) * f(b)$ _____0.

(Fill up the blank with appropriate symbol)

7. Write one advantage of Regula-Falsi method.

8. What kind of problem can be solved using Gauss elimination method?

Unit—III

9. If C is constant then ΔC=?

10. What are the benefits of interpolating data?

11. What do you mean by extrapolation?

12. Write the Newton's forward formula.

Unit—IV

13. Why Simpson's rule is better than Trapezoidal rule?

14. What is the order of Euler's method?

15. Second order RK method is also known as _____.

(Fill in the blank)

16. What is modified Euler's method?

Unit—V

17. Why is RK method faster than Euler?

18. Why are ordinary differential equations important?

19. What is Heun's method used for?

20. What is midpoint method?

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SECTION—B

Answer *five* questions, selecting *one* from each Unit : 2×5=10

Unit—I

21. The approximate value of the number $\frac{1}{3}$ is given as 0·34. Find the absolute and relative errors.

22. What are the two types of truncation error? Define them.

Unit—II

23. Write the basic principle and formula of Newton-Raphson method.

24. Discuss the geometric interpretation of Regula-Falsi method.

Unit—III

25. If $f(1) = 2$, $f(3) = 4$ and $f(4) = 16$, then what is the value of $f(9)$ using Lagrange's interpolation formula?

26. What is cubic spline interpolation?

Unit—IV

27. Derive Simpson's $\frac{1}{3}$rd rule.

28. What is the Romberg method of integration? Why is it used?

Unit—V

29. What are main differences between Heun's and Euler's method?

30. Prove that Euler's method is the RK method of first order.

SECTION—C

Answer *five* questions, selecting *one* from each Unit : 5×5=25

Unit—I

31. Explain in brief the types of errors one might encounter in performing numerical calculations.

32. If $\Delta x = 0 \cdot 005$, $\Delta y = 0 \cdot 001$ be the absolute error in $x = 2 \cdot 11$ and $y = 4 \cdot 15$, find the relative error in the computation of $x + y$. Also how do you relate error and accuracy?

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Unit—II

33. Find the real root of the equation

$$x^3 - 2x - 5 = 0$$

using Regula-Falsi method, correct up to 4 significant digits.

34. Solve the equation $x^3 - 9x + 1 = 0$ for the root lying between 2 and 3, correct to 3 significant figures using Bisection method.

Unit—III

35. Calculate $f(48 \cdot 8)$ from the following table :

x	:	45	46	47	48	49	50
$f(x)$	:	1	1·03553	1·07237	1·11061	1·15037	1·19175

36. The observed values of a function are 168, 120, 72 and 63 at the four positions 3, 7, 9, 10. Estimate the value of the function at the position 6.

Unit—IV

37. Evaluate

$$\int_0^1 \frac{1}{1+x}\,dx$$

correct up to three decimal places using trapezoidal rule. Also compute $\log_e 2$.

38. Given

$$\frac{dy}{dx} = y - x$$

where $y(0) = 2$. Find $y(0 \cdot 2)$ and $y(0 \cdot 4)$ using Runge-Kutta second order method.

Unit—V

39. Given the equation

$$\frac{dy}{dx} = 3x^2 + 1,\ y_1 = 2$$

estimate y_2 by Euler's method using

(a) $h = 0 \cdot 5$

(b) $h = 0 \cdot 25$

40. Derive the formula for Euler's method.

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OPTION—B

Course No. : CSCDSE–501T (B)

(Internet Technology)

SECTION—A

Answer *fifteen* questions, selecting *three* from each Unit as directed : 1×15=15

Unit—I

1. How is an array declared?

2. What is the use of add() method?

3. Array class creates for primitive/non-primitive data type.
(Choose the correct word)

4. Write the name of the method to determine the size of the array.

Unit—II

5. What do you mean by scripting language?

6. How do you declare variable in JavaScript?

7. Write the purpose of '* *' operator in JavaScript.

8. What is event handler?

Unit—III

9. What is SQL exception class?

10. Which interface is responsible for transaction management in JDBC?

11. Return type of class.Forname() is _____.
(Fill up the blank)

12. Write the purpose of driver manager class.

Unit—IV

13. Which directives are used in JSP custom tag?

14. How to disable session in JSP?

15. Write the different elements in JSP page.

16. What is the purpose of include directive in JavaScript?

Unit—V

17. What is JavaBean?

18. What does JAR file contain?

19. Define introspection in JavaBean .

20. Write the characteristics of JavaBean.

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SECTION—B

Answer *five* questions, selecting *one* from each Unit : 2×5=10

Unit—I

21. Why is array list better than array?

22. How do you create an object of a class?

Unit—II

23. What is non-primitive data type? Mention non-primitive data types available in JavaScript.

24. Write a simple JavaScript to print a message "not to adopt any unfair means during exam." using alert() function.

Unit—III

25. What are the functions of the JDBC connection interface?

26. Write a short note on JDBC record set.

Unit—IV

27. What are the implicit objects in JSP?

28. What do you mean by JSP declarations?

Unit—V

29. Write down the purpose of get Property Name() and set Property Name().

30. Write down the general syntax of JavaBean class.

SECTION—C

Answer *five* questions, selecting *one* from each Unit : 5×5=25

Unit—I

31. Write a Java program to explore any five methods of ArrayList class.

32. Discuss the characteristics of object.

Unit—II

33. Explain with example different operators used in JavaScript.

34. Write a JavaScript code to find the factorial of an integer number.

Unit—III

35. Explain the steps to connect Java application with database using JDBC.

36. What is JDBC? Explain the components of JDBC for interacting with a Database.

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Unit—IV

37. Explain the difference between Servlet and JSP.

38. Explain the different phases in JSP life cycle.

Unit—V

39. Explain Enterprise JavaBean (EJB) architecture.

40. Write a Java program which demonstrates the concept of JavaBean.

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