2022/TDC/ODD/SEM/CSCDSE–501T (A/B)/092

TDC (CBCS) Odd Semester Exam., 2022

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

Honours students will answer Option—A and Pass students will answer Option—B

OPTION—A

(For Honours Students)

Course No. : CSCDSE–501T (A)

(Numerical Method)

UNIT—I

1. Answer any *three* of the following as directed : 1×3=3

   (a) What do you mean by floating point numbers? Give example.

(Turn Over)

(2)

(b) The number of significant digits in 0.00082 is _____.

(Fill up the blank)

(c) Round off the number 0.0024368 to four significant digits.

(d) What is error? Give example.

2. Answer any *one* of the following questions : 2

   (a) When are digits significant?

   (b) If $\pi = \dfrac{22}{7}$ is approximate as 3.14, find the absolute and relative error.

3. Answer any *one* of the following questions : 5

   (a) Discuss the different types of error in numerical methods.

   (b) Write a note on numerical analysis methods and their uses.

UNIT—II

4. Answer any *three* of the following as directed : 1×3=3

   (a) Secant method is also called _____.

   (Fill up the blank)

(Continued)

(3)

(b) What is the value of $f'(x)$, if the curve $f(x)$ is constant in Newton-Raphson method?

(c) What is the use of Gauss-Jordan method?

(d) Is Regula Falsi method always convergent?

5. Answer any *one* of the following questions : 2

   (a) State the differences between Bisection and Regula Falsi method.

   (b) Discuss the convergence rate of Newton-Raphson method.

6. Answer any *one* of the following questions : 5

   (a) Find a real root of $x^3 - x - 1 = 0$ using Bisection method up to 4th decimal places.

   (b) Using Newton-Raphson method, find the real root of the equation $3x = \cos x + 1$ correct up to two decimal places.

UNIT—III

7. Answer any *three* of the following questions : 1×3=3

   (a) What do you mean by interpolation?

(Turn Over)

(4)

(b) Write an advantage of Gauss-Jordan method.

(c) What are forward and backward difference operators?

(d) Write the Lagrange interpolation formula for first order.

8. Answer any *one* of the following questions : 2

(a) How do you know when to use forward and backward interpolation?

(b) Explain Gauss-Seidal method.

9. Answer any *one* of the following questions : 5

(a) Calculate $f(35.5)$ from the following table :

x :	35	36	39	41
$f(x)$:	42875	46656	59319	68921

(b) Weight of a student corresponding to different years are as follows :

Age	Weight (in kgs)
0	2·25
5	9·90
10	17
15	33·5
20	41·357

Estimate the weight at the age of 7.5 years.

(Continued)

(5)

UNIT—IV

10. Answer any *three* of the following questions : 1×3=3

(a) Where is numerical differentiation used?

(b) Give an example of extrapolation.

(c) Write the formula of trapezoidal rule.

(d) What is the rule of Euler's method?

11. Answer any *one* of the following questions : 2

(a) What is numerical integration method? Why do we use it?

(b) Differentiate Simpson's $\frac{1}{3}$rd and Simpson's $\frac{3}{8}$th rule.

12. Answer any *one* of the following questions : 5

(a) Evaluate $\int_0^1 \frac{dx}{1+x^2}$ by Simpson's $\frac{1}{3}$rd rule by taking $h = 0·25$ and $h = 0·125$.

(b) Given the equation $\frac{dy}{dx} = 3x^2 + 1$, $y_0 = 2$, estimate y using Euler's method taking interval, $h = 0·5$ and $h = 0·25$.

(Turn Over)

UNIT—V

13. Answer any *three* of the following as directed :   1×3=3

   (a) Mention two extrapolation methods.

   (b) What is RK2 method?

   (c) What do you mean by finite difference?

   (d) Euler's method is better than Heun method.

                       (Write True or False)

14. Answer any *one* of the following questions :   2

   (a) Why is midpoint method more accurate than Euler?

   (b) How many steps does 4th order R-K method use?

15. Answer any *one* of the following questions :   5

   (a) Derive the second-order Runge-Kutta method.

   (b) Explain modified Euler's method.

OPTION—B

(For Pass Students)

Course No. : CSCDSE–501T (B)

(Internet Technology)

UNIT—I

1. Answer any *three* of the following questions :   1×3=3

   (a) What is object?

   (b) What is the syntax of 'Array' class?

   (c) How are 2D arrays initialised?

   (d) What is the meaning of object instantiation?

2. Answer any *one* of the following questions :   2

   (a) How can objects be passed to a function? Give example.

   (b) How to compare two strings using Array class?

3. Answer any *one* of the following questions :   5

   (a) Explain Array list class hierarchies. Also mention contractors of Array list.

(8)

(b) What are the different ways to instantiate and use an object? Explain with syntax.

UNIT—II

4. Answer any *three* of the following questions :

1×3=3

(a) What is the use of delete operator?

(b) What are the fundamental data types in JavaScript?

(c) Mention the keywords that are used to declare JavaScript variable.

(d) What is the meaning of 'document. write()'?

5. Answer any *one* of the following questions : 2

(a) What are the different types of build-in function used in JavaScript?

(b) Write down the advantages of Java-Script.

6. Answer any *one* of the following questions : 5

(a) Write a JavaScript program to check whether a given number is prime or not.

(Continued)

(9)

(b) How are events handled in JavaScript? Explain with example.

UNIT—III

7. Answer any *three* of the following questions :

1×3=3

(a) Write down the purpose of SQL package in JDBC.

(b) What is ODBC?

(c) Write down the purpose of class.forname().

(d) What is JDBC API?

8. Answer any *one* of the following questions : 2

(a) What is the role of JDBC Driver Manager Class?

(b) What is the purpose of ResultSet object?

9. Answer any *one* of the following questions : 5

(a) Explain JDBC architecture in detail.

(b) How to process SQL statement with JDBC? Explain with an example.

(Turn Over)

(10)

UNIT—IV

10. Answer any *three* of the following questions : 1×3=3

(a) What is MVC model?

(b) Write down the feature of JSP.

(c) What is Servlet?

(d) What is Criptlet tag?

11. Answer any *one* of the following questions : 2

(a) Write down the difference between include directive and include action.

(b) Explain different types of elements in a JSP page.

12. Answer any *one* of the following questions : 5

(a) Explain different phases in JSP life cycle.

(b) How are exceptions handled in JSP? Explain with example.

UNIT—V

13. Answer any *three* of the following questions : 1×3=3

(a) Mention advantages of JavaBeans.

(11)

(b) What is introspection?

(c) What is the purpose of get Property Name()?

(d) What is JAR file?

14. Answer any *one* of the following questions : 2

(a) Write down the steps to create a JAR file.

(b) How to access the JavaBeans class?

15. Answer any *one* of the following questions : 5

(a) Explain the implementation of Java-Beans with a suitable example.

(b) Explain database connection with Java-Beans.

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