K22U 3638

Reg. No. : .....

Name : .....

Third Semester B.Sc. Degree (CBCSS – OBE – Regular/Supplementary/ Improvement) Examination, November 2022
(2019 Admission Onwards)
COMPLEMENTARY ELECTIVE COURSE IN MATHEMATICS
3C03 MAT-BCA : Mathematics for BCA III

Time : 3 Hours Max. Marks : 40

PART – A

(Short Answer Questions)

Answer **any four** questions from this Part. **Each** question carries **1** mark.

1. Verify that $y = c/x$ where c is an arbitrary constant is a solution of ODE $xy' = -y$ for $x \neq 0$.
2. Show that the ODE, $y' = 1 + x^2$ is separable and hence find the solution.
3. Find the characteristic equation of the differential equation $y'' - 2y = 0$.
4. Let $f(t) = e^t$, $t \geq 0$. Find $F(s)$.
5. Find the fundamental period of the function $f(x) = \sin(10x)$.

PART – B

(Short Essay Questions)

Answer **any seven** questions. **Each** question carries **2** marks.

6. Show that the differential equation $\cos(x + y)dx + (3y^2 + 2y + \cos(x + y))dy = 0$ is an exact differential equation.
7. Find an integrating factor of the ODE, $-ydx + xdy = 0$.
8. Solve $y' = (4x + y)^2$.
9. Give examples for each of the following :
   a) Homogeneous Linear Ordinary Differential Equation.
   b) Bernoulli Equation.

P.T.O.

10. Reduce the equation $y' + y/x = y^2$ to a linear ODE.

11. Solve the differential equation $y'' + y' + 0.25y = 0$.

12. Find the Wronskian of the functions $y_1 = \sin 2x$, $y_2 = \cos 2x$.

13. Find the Laplace transform of cosh at and sinh at.

14. Find the inverse Laplace transform of $F(s) = \dfrac{1}{s^2 + 3s + 2}$.

15. Find the Fourier coefficient a_0 for the function $f(x) = \begin{cases} -k, -\pi < x < 0 \\ k, 0 < x < \pi \end{cases}$ and $f(x + 2\pi) = f(x)$.

PART – C

(Essay Questions)

Answer **any four** questions. **Each** question carries **3** marks.

16. Solve $y' = xy + x + y + 1$.

17. Solve the Euler-Cauchy equation $x^2y'' + 1.5xy' - 0.5y = 0$.

18. Check whether the functions $y_1 = e^x \sin x$ and $y_2 = e^{-x} \sin x$ are linearly independent or not in the interval $(0, \pi)$.

19. Using Laplace Transform of the Derivative formula, find the Laplace Transform of $f''(t)$, where $f(t) = t \sin \omega t$ and $f'(0) = 0$.

20. Let $H(s) = \dfrac{1}{(s^2 + \omega^2)^2}$. Find $h(t)$.

21. Write the Fourier coefficients a_0, a_n, b_n for the function $f(x)$ of period $p = 2L$.

22. Find the Fourier series of the function $f(x) = x$ with $f(x + 2\pi) = f(x)$.

PART – D

(Long Essay Questions)

Answer **any two** questions. **Each** question carries **5** marks.

23. Find an integrating factor and solve the initial value problem $(e^{x+y} + ye^{y})\,dx + (xe^{y} - 1)\,dy = 0$, $y(0) = -1$.

24. Solve the initial value problem $y'' + 0.4y' + 9.04y = 0$, $y(0) = 0$, $y'(0) = 3$.

25. Find the inverse transform of $\ln \frac{s^2 + \omega^2}{s^2}$.

26. Find the Fourier series of the function $f(x) = \begin{cases} 0, & -2 < x < -1 \\ k, & -1 < x < 1 \\ 0, & 1 < x < 2 \end{cases}$.

K22U 2863

Reg. No. : .....

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III Semester B.C.A. Degree (CBCSS – Supplementary) Examination, November 2022
(2016-18 Admissions)
General Course
3A13BCA : DATABASE MANAGEMENT SYSTEM

Time : 3 Hours Max. Marks : 40

SECTION – A

1. **One word** answer. **(8×0.5=4)**
   a) The person having complete control of the database is _____
   b) Primary key is a _____
   c) Expand BCNF.
   d) Give an example for DCL command.
   e) A database can have _____views.
   f) Give an example for 1- many relationship.
   g) The goal of normalization is to _____
   h) The command to change the contents of the table is_____

SECTION – B

Write short notes on **any seven** of the following questions. **(7×2=14)**

2. Explain candidate key and alternate key.
3. What is functional dependency ?
4. Explain the four symbols in an ER diagram.
5. Explain Triggers.
6. Write the syntax to update a table.
7. Briefly explain set operations.

P.T.O.

8. Explain any two types of attributes.
9. Explain DCL commands.
10. Explain any two aggregate functions in SQL with example.
11. Write notes on tuple relational calculus.

SECTION – C

Answer **any four** of the following questions. **(4×3=12)**

12. Explain any three advantages of DBMS.
13. Explain data models.
14. Mention any three DML Commands.
15. Explain Left join with an example.
16. What is transitive dependency ? Explain with an example.
17. Explain any three categories of database users.

SECTION – D

Write an essay on **any two** of the following questions. **(2×5=10)**

18. What is an ER Diagram ? Draw an ER diagram for Library-student-books relationship.
19. 1) Create a table employee(employeeno, employeename,salary)
    2) Insert records.
    3) Display the details of employees whose salary is greater than 20000.
    4) Display the employee name and salary of all employees.
    5) Display the details of all employees.
20. What is normalization ? Explain the levels of normalization with example.
21. Explain mapping constraints with examples.

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Third Semester B.C.A. Degree (CBCSS – Supplementary) Examination, November 2022
(2016 – 18 Admissions)
Core Course
3B06BCA : COMPUTER ORGANIZATION

Time : 3 Hours Max. Marks : 40

SECTION – A

1. **One** word answer : **(8×0.5=4)**

   a) EBCDIC uses _____ bits to denote a character.

   b) The _____ instruction performs the function usually referred to as a subroutine call.

   c) The data register is sometimes called a _____.

   d) The transformation from the instruction code bits to an address in control memory where the routine is located is referred as a _____.

   e) A group of lines that serves as a connecting path for several devices is called a _____.

   f) The control variables at any given time can be represented by a string of 1's and 0's called _____.

   g) The _____ is a hardware implementation of a branch and save return address operation.

   h) I/O devices attached to the computer are also called _____.

P.T.O.

SECTION – B

Answer **any 7** questions : **(7×2=14)**

2. Write 14 in Sign Magnitude and Signed 2's compliment representation.
3. Define the internal hardware organization of a digital computer.
4. Explain LDA and STA instructions.
5. What is DMA ?
6. What are the characteristics of multiprocessors ?
7. Explain register and register indirect addressing mode.
8. Write A*(B + C)/D in reverse polish notation.
9. Write note on RISC.
10. Define overflow problem occurred in binary addition.
11. What is polling ?

SECTION – C

Answer **any 4** questions : **(4×3=12)**

12. Describe the micro programmed control organization.
13. Explain Direct and Indirect Addressing modes.
14. Write note on Fetch and decode phase of instruction cycle.

15. Explain the different data transfer instructions.

16. What are the types of commands that an interface may receive ?

17. Explain about auxiliary memory.

SECTION – D

Answer **any 2** questions : **(2×5=10)**

18. Explain the computer registers used in Basic Computer Organization.

19. Draw and explain the flowchart for memory reference instructions.

20. Discuss in detail about Stack Organization.

21. Explain the cache memory mapping methods.

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