U.G. DEGREE EXAMINATION - JULY, 2022

Computer Science/Computer Applications

(From CY – 2020 onwards)

First Semester

MATHEMATICS – I

Time : 3 hours   Maximum marks : 70

PART A — (3 × 3 = 9 marks)

Answer any THREE questions out of Five questions in 100 words.

All questions carry equal marks.

1. If the Eigenvalues of A arc of order 3 × 3 are 2,3 and 1, then find the eigenvalues of adjoint of A.

2. If $y = \sqrt{(\sin x + \sqrt{\sin x + \sqrt{\sin x....}}}$ to infinity), find $\dfrac{dy}{dx}$.

3. Form the partial differential equation by eliminating a and b from $z = (x^2 + a^2)(y^2 + b^2)$.

4. Define Fourier series.

5. A firm manufactures two types of products A and B and sells them at a profit of Rs. 2 on type A and Rs. 3 on type B. Each product of processed on two machines M_1 and M_2. Type A requires 1 minute of processing time on M_1 and 2 minute on M_2. Type B requires 1 minute on M_1 and 1 minute on M_2. Machine M_1 is available for not more than 6 hours 40 minutes while machine M_2 is available for 10 hours during any working day. Formulate the problem as a LPP so as to maximize the profit.

PART B — (3 × 7 = 21 marks)

Answer any THREE questions out of Five questions in 200 words.

All questions carry equal marks.

6. Verify Cayley — Hamilton theorem and find A^4
when $A = \begin{bmatrix} 2 & -1 & 2 \\ -1 & 2 & -1 \\ 1 & -1 & 2 \end{bmatrix}$.

7. Evaluate $\int \dfrac{dx}{(x+1)\sqrt{x^2 + x + 1}}$.

8. Find the singular solution of the equation $z = px + qy + p^2 + pq + q^2$.

9. Find the half-range Fourier cosine series for $f(x) = x$ in $(0, \pi)$.

10. Solve the following L.P.P by the graphical method

    Maximize $Z = 3x_1 + 2x_2$

    Subject to

    $-2x_1 + x_2 \le 1$
    $x_1 \le 2$
    $x_1 + x_2 \le 3$ and
    $x_1, x_2 \ge 0$

PART C — (4 × 10 = 40 marks)

Answer any FOUR questions out of Seven questions in 500 words.

All questions carry equal marks.

11. Find all the Eigenvalues and Eigenvectors of the matrix $\begin{bmatrix} -2 & 2 & -3 \\ 2 & 1 & -6 \\ -1 & -2 & 0 \end{bmatrix}$.

12. If $y = \sin(m \sin^{-1} x)$, prove that
$(1 - x^2)y_2 - xy_1 + m^2 y = 0$ and
$(1 - x^2)y_{n+2} - (2n+1)xy_{n+1} + (m^2 - n^2)y_n = 0$.

13. Find the general solution of
$(mz - ny)p + (nx - lz)q = ly - mx$.

14. Find the Fourier series for the function $f(x) = x^2$,
$-\pi < x < \pi$, show that

$$\frac{1}{1^2} + \frac{1}{2^2} + \frac{1}{3^2} + \frac{1}{4^2} + \dots = \frac{\pi^2}{6} .$$

15. Use simplex method to solve the LPP

Maximize $Z = 4x_1 + 10x_2$

Subject to

$2x_1 + x_2 \le 50$
$2x_1 + 5x_2 \le 100$
$2x_1 + 3x_2 \le 90$ and
$x_1, x_2 \ge 0$

16. Solve $z^2(p^2 + q^2 + 1) = 1$.

17. Diagonalize the matrix $\begin{bmatrix} 2 & 1 & -1 \\ 1 & 1 & -2 \\ -1 & -2 & 1 \end{bmatrix}$

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U.G. DEGREE EXAMINATION – JULY 2022.

Computer Applications / Computer Science

(From CY-2020 Onwards)

First Semester

PROBLEM SOLVING TECHNIQUES

Time : 3 hours　　　　　　　　Maximum marks : 70

SECTION A — (3 × 3 = 9 marks)

Answer any THREE questions out of five questions in 100 words. All questions carry equal marks.

1. What is Empty Box Problem?

2. List out the Nervous couples problem?

3. Write about Subtraction – set games.

4. How to set Boolean Equality?

5. Write about Negation.

SECTION B — (3 × 7 = 21 marks)

Answer any THREE questions out of five questions in 200 words. All questions carry equal marks.

6. Explain about the Block and White Colouring.

7. Explain about Fake-Coin Detection.

8. Briefly Explain Bridge Problem.

9. Write about the brute force search.

10. Explain about the Knights and Knaves.

SECTION C — (4 × 10 = 40 marks)

Answer any FOUR questions out of five questions in 500 words. All questions carry equal marks.

11. Describe in detail about problem solution.

12. Explicate in detail about Sums of Games.

13. Explain any two types of Calculational Logic in detail.

14. Discuss about Sam Loyd's chicken – Chasing Problem?

15. Discuss about the Regular Sequences in detail.

16. Describe Knights Circuit with neat diagram.

17. Explain any one partitioning the board with diagram.

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U.G. DEGREE EXAMINATION – JULY 2022.

Computer Science

(From CY – 2020 Onwards)

First Semester

FUNDAMENTALS OF COMPUTING

Time : 3 hours   Maximum marks : 70

SECTION A — (3 × 3 = 9 marks)

Answer any THREE questions out of Five questions in 100 words

All questions carry equal marks.

1.   What are the Advantages of a Computer?

2.   Write short note on Serial Port.

3.   List out the application of Computer.

4.   Define Software and its needs.

5.   Write about the Wide area network (WAN).

SECTION B — (3 × 7 = 21 marks)

Answer any THREE questions out of Five questions in 200 words.

All questions carry equal marks.

6. Explain the Characteristics of Computer.

7. Explain in detail about the SCANNER and its types.

8. Differentiate the Primary and Secondary Storage.

9. Discuss about the Utility software and its types.

10. Explain about transmission modes.

SECTION C — (4 × 10 = 40 marks)

Answer any FOUR questions out of Seven questions in 500 words.

All questions carry equal marks.

11. Explain the Evolution of Computer in detail.

12. Elucidate the von Neumann Architecture.

13. Explain in detail about the Read Only Memory (ROM).

14. Write detailed note on Operating System and its functions.

15. Explain LAN Topologies with suitable diagram.

16. Explain in detail about the Generation of computers.

17. Explain about the Terminals and its types.

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U.G. DEGREE EXAMINATION — JULY, 2022.

Computer Applications / Computer Science

(From CY – 2020 onwards)

Second Semester

PROGRAMMING IN C/C PROGRAMMING

Time : 3 hours   Maximum marks : 70

PART A — (3 × 3 = 9 marks)

Answer any THREE questions out of Five questions in 100 words.

All questions carry equal marks

1. Write a program in C to print the numbers 0 from 4 to 9 and their squares.

2. What is an expression? Evaluate the following expression

   (a) $100\%20 <= 20 - 5 + 100\%10 - 20 == 5 >= 1 != 20$

   (b) $a+ = b* = C- = 5$ where $a = 3$ $b = 5$ and $c = 8$

3. What is an assignment statement? Give the general form of an assignment statement.

4. Define variable and constant. Discuss about the different data types used in PHP.

5. Discuss the concept of array. Write down the anatomy of an array.

PART B — (3× 7= 21 Marks)

Answer any THREE questions out of Five questions in 200 words.

All questions carry equal marks.

6. Write the guidelines to use scanf( ) and printf( ) functions in C language and What is the purpose of scanf( ) and printf( ) statement?

7. Explain the two way selection (if, if-else, nested if-else, cascaded ifelse) in C language with syntax.

8. Explain void and parameter less functions in C with examples.

9. What is a file? Explain how the file open and file close functions handled in c.

10. What is a stack? Explain it with its applications.

PART C — (4 × 10 = 40 marks)

Answer any FOUR questions out of Seven questions in 500 words.

All questions carry equal marks.

11. What is an operator?   Explain the arithmetic, relational, logical and assignment operators in C language.

12. Explain the two way selection (if, if-else, nested if-else, cascaded if-else) in C language with syntax.

13. Explain void and parameter less functions in C with examples.

14. Write a C program to maintain a record of "n" student details using an array of structures with four fields (Roll number, Name, Marks, and Grade).   Each field is of an appropriate data type. Print the marks of the student given student name as input.

15. Write a C program to swap two numbers using call by pointers method.

16. Write and explain any two preprocessor directives in C.

17. What is a structure?   Explain the syntax of structure declaration with example.

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U.G. DEGREE EXAMINATION – JULY 2022.

Computer Science

(From CY – 2020 onwards)

Second Semester

DIGITAL ELECTRONICS

Time : 3 hours   Maximum marks : 70

PART A — (3 × 3 = 9 marks)

Answer any THREE questions out of five questions in 100 words.

All questions carry equal marks.

1. Define GRAY CODE.

2. What is parallel binary adder?

3. Describe the Clock Signal and Triggering.

4. Write note on Asynchronous sequential circuits.

5. Describe the PROGRAMMABLE LOGIC DEVICES.

PART B — (3 × 7 = 21 marks)

Answer any THREE questions out of five questions in
200 words.

All questions carry equal marks.

6.   Explain about the 1'S AND 2'S COMPLEMENTS.

7.   Discuss in detail about Design OF HALF AND
     FULL ADDRES.

8.   Explain the ASYNCHRONOUS OR RIPPLE
     COUNTRES in detail.

9.   Discuss in detail about the STABLE AND
     UNSTABLE STATES.

10. Explicate the MEMORY STRUCTURE in detail.

PART C — (4 × 10 = 40 marks)

Answer any FOUR questions out of seven questions in
500 words.

All questions carry equal marks.

11. Write detailed note on OCTAL NUMBER.

12.   Explain in detail about the Multiplexer.

13. Discuss about the FLIP FLOPS and its types in
     detail.

14. Explain the hazards in a digital circuit in detail.

15. Discuss about the Read Only Memory (ROM) and its types.

16. Explain the BINARY CODE with suitable example.

17. Describe the Decoder in detail.

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UG–AS-311   BSCSS–23

U.G. DEGREE EXAMINATION —
JULY 2022.

Computer Science

(From CY – 2020 onwards)

Second Semester

PRINCIPLES OF PROGRAMMING LANGUAGES

Time : 3 hours   Maximum marks : 70

PART A — (3 × 3 = 9 marks)

Answer any THREE questions out of five questions in
100 words.

All question carry equal marks.

1.   What is programming Language?

2.   Define Unions Types with syntax.

3.   Write short note on ML.

4.   What Logic programming?

5.   Write about the Concurrent Programming?

PART B — (3 × 7 = 21 marks)

Answer any THREE questions out of five questions in 200 words.

All questions carry equal marks.

6.   Explain the Language Evaluation Criteria.

7.   Discuss about the Primitive Data Types.

8.   Write about the Functional Programming and its Characteristics.

9.   Explain Operational semantics in detail.

10.   Discuss about the parallelism in Hardware.

PART C — (4 × 10 = 40 marks)

Answer any FOUR questions out of seven questions in 500 words.

All questions carry equal Marks.

11.   Explain the four different programming language paradigms in detail.

12.   Discuss about the Array types.

13.   Explain the first Functional Programming Language (LISP).

14. Explicate in detail about Relational Logic Programming.

15. Discuss about the Lexically Scopted Lambda Expressions.

16. Explain about the Programming Language Implementation.

17. Write detailed note about Variables and its types.

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