QP CODE: 22100038

22100038

Reg No : .....

Name : .....

B.Sc DEGREE (CBCS) REGULAR / REAPPEARANCE EXAMINATIONS, JANUARY 2022

Fifth Semester

CORE COURSE - PH5CRT07 - DIGITAL ELECTRONICS AND PROGRAMMING

(Common for B.Sc Physics Model I, B.Sc Physics Model II Applied Electronics, B.Sc Physics Model II Computer Applications & B.Sc Physics Model III Electronic Equipment Maintenance)

2017 Admission Onwards

A3B02982

Time: 3 Hours Max. Marks : 60

Part A

*Answer any **ten** questions.*

*Each question carries **1** mark.*

1. What are the values of two inputs for which the output of NAND gate is low?
2. Draw the logic diagram for the Boolean equation $\overline{(x+y)}(\bar{x}+\bar{y})$
3. Write an example of a Boolean function in POS form.
4. Obtain the K-map for the Boolean function $F = \bar{A}\bar{B} + AB$.
5. What is full adder?
6. What is a clocked SR flip flop?
7. Justify the JK flip-flop as a universal flip-flop.
8. What is sampling in analog to digital conversion?
9. Give the typical bit width of an int type variable.
10. What is the use of const qualifier in C++?
11. What is an exit contolled loop?
12. Write down the syntax for declaring a function in C++.

(10×1=10)

Part B

*Answer any **six** questions.*

*Each question carries **5** marks.*

13. (a) State First De-Morgan's theorem and implement the logic circuit for the same
    (b) Find the complement of the function $Y = AB + CD$, then show that $Y + \bar{Y} = 1$

14. Prove the following identity with the help of a detailed truth table $\overline{\overline{\overline{xy} + \bar{y} + xy}} = 1$.

15. Draw and explain the circuit diagram of 1 to 8 demultiplexer.

16. Draw and explain 3 to 8 decoder circuit diagram.

17. With neat sketches, explain 3-bit binary ripple counter.

18. What are different escape sequences in C++?

19. How will you find the largest among three given integers using C++?

20. How will you store the text "Ideas" in a variable?

21. What are objects ? How are they created?

(6×5=30)

Part C

*Answer any **two** questions.*

*Each question carries **10** marks.*

22. What is Boolean algebra? List laws of boolean algebra.

23. Define a register. Explain the different data movement methods. With the neat sketches explain SIPO register.

24. Explain the principle of D/A converters. Explain D/A converter using R-2R ladder network. What are the applications of DAC?

25. What are different built-in datatypes in C++? Illustrate their usage.

(2×10=20)

22103397

QP CODE: 22103397

Reg No : .....

Name : .....

B.Sc DEGREE (CBCS) REGULAR / REAPPEARANCE EXAMINATIONS, NOVEMBER 2022

Fifth Semester

CORE COURSE - PH5CRT07 - DIGITAL ELECTRONICS AND PROGRAMMING

Common for B.Sc Physics Model I, B.Sc Physics Model II Applied Electronics, B.Sc Physics Model II Computer Applications & B.Sc Physics Model III Electronic Equipment Maintenance

2017 Admission Onwards

85542E86

Time: 3 Hours Max. Marks : 60

Part A

*Answer any **ten** questions.*

*Each question carries **1** mark.*

1. Symbolically represent two input NOR gate.
2. State the basic AND relations in Boolean algebra using 'A' as one variable.
3. Draw the logic diagram to implement the Boolean expression $F = X(Y \oplus Z) + \bar{V}$
4. Briefly explain ‘minterm’.
5. What is the principle of Demultiplexer?
6. What are the applications of Flip-Flops?
7. What is serial in Parallel out register?
8. Why do you need a digital to analog converter?
9. Name the << operator in C++.
10. Can unsigned int datatype be used to store the number 50,000? Why?
11. What do you meant by variables in a C++ program?
12. What is meant by encapsulation in OOP?

(10×1=10)

Part B

*Answer any **six** questions.*

*Each question carries **5** marks.*

13. (a) State second De-Morgan's theorem and implement the logic circuit.
    (b) Find the complement of the function F = (AB+CD), then show that $F\bar{F} = 0$

14. Draw the K-Map for the Boolean function
    $F = \bar{A}\bar{B}\bar{C}\bar{D} + \bar{A}B\bar{C}\bar{D} + \bar{A}\bar{B}\bar{C}D + \bar{A}B\bar{C}D + \bar{A}\bar{B}C\bar{D}.$
    Obtain the simplified expression for F.

15. What is subtractor? What is half subtractor? Explain

16. How does a decoder circuit work? Explain with example.

17. Draw the logic circuit and truth table for a clocked JK flip-flop. Explain its operation

18. Write short notes on relational operators in C++.

19. Write a C++ code segment to check whether the given number is completely divisible by 5 or 10 and display the result.

20. How do you declare an array in C++?

21. What is function overloading? Illustrate using an example.

(6×5=30)

Part C

*Answer any **two** questions.*

*Each question carries **10** marks.*

22. (a) Obtain the truth table and logic circuit for the Boolean function
    $F = \bar{x}\bar{y}z + \bar{x}yz + x\bar{y} + xz.$ Simplify the function using Boolean identities and draw the logic circuit for the same.
    (b) A sensor has three inputs A, B, C. Get the Boolen Equation for the sensor output.

sensor inputs

A	B	C	Output
0	0	0	0
0	0	1	0
0	1	0	0
0	1	1	1
1	0	0	0
1	0	1	1
1	1	0	1
1	1	1	1

23. What is a counter? With neat sketches, explain binary ripple counter. What are the applications of counters?

24. Explain the principle of A/D converters. Explain counter type A/D converter. What are the application of ADC?

25. Write a C++ program to find the sum of even numbers between 0 and 100.

(2×10=20)

23129060

QP CODE: 23129060

Reg No : .....

Name : .....

B.Sc DEGREE (CBCS) REGULAR / REAPPEARANCE EXAMINATIONS, OCTOBER 2023

Fifth Semester

CORE COURSE - PH5CRT07 - DIGITAL ELECTRONICS AND PROGRAMMING

Common for B.Sc Physics Model I, B.Sc Physics Model II Applied Electronics, B.Sc Physics Model II Computer Applications & B.Sc Physics Model III Electronic Equipment Maintenance

2017 Admission Onwards

DB999A0F

Time: 3 Hours Max. Marks : 60

Part A

*Answer any **ten** questions.*

*Each question carries **1** mark.*

1. What is Boolean algebra?
2. Simplify the Boolean expression to minimum number of literals $(x + y)(x + \bar{y})$
3. Write an example of a Boolean function in SOP form.
4. Obtain the K-map for the Boolean function $F = \bar{A}\bar{B} + AB$.
5. How many full adders are needed for 4 bit binary adder/subtractor?
6. What is the principle of Multiplexer?
7. Why JK flip flop is called master slave?
8. What is quantization in analog to digital conversion?
9. How do you store / handle a name in a C++ program?
10. What do you mean by type casting in C++?
11. How will you construct an infinite loop using C++ programming?
12. How will you store register numbers of 50 students in C++?

(10×1=10)

Part B

*Answer any **six** questions.*

*Each question carries **5** marks.*

13. What is a coincidence checker circuit? Explain it with logic circuit, truth table and symbol.
14. Reduce the following Boolean expression $\bar{X}\bar{Z} + XYZ + X\bar{Z} + X\bar{Y}$ to two literals. Draw logic diagram of the circuit that implement the original and simplified expression.
15. How does a encoder circuit work? Explain with example.
16. Explain the working of SR flip flop with truth table and circuit diagram.
17. Why do you need to convert digital to analog? Explain any one of the DAC.
18. Write a C++ code to display the output the text Computational Physics on a new line.
19. What are literals? Mention its types with examples.
20. Write short notes on logical operators in C++.
21. What are library functions? Give any three examples for library functions used in C++.

(6×5=30)

Part C

*Answer any **two** questions.*

*Each question carries **10** marks.*

22. (a) Obtain the truth table and logic circuit for the Boolean function $F = \bar{x}\bar{y}z + \bar{x}yz + x\bar{y} + xz$.Simplify the function using Boolean identities and draw the logic circuit for the same.

    (b) A sensor has three inputs A, B, C. Get the Boolen Equation for the sensor out put.

sensor inputs

A	B	C	Output
0	0	0	0
0	0	1	0
0	1	0	0
0	1	1	1
1	0	0	0
1	0	1	1
1	1	0	1
1	1	1	1

23. Define a register. Explain the different data movement methods. With the neat sketches explain SIPO register.
24. What is a counter? With neat sketches, explain 4-bit binary ripple counter. What are the applications of counters?
25. Write a C++ program to check whether the given number is postive, negative or zero.

(2×10=20)

QP CODE: 19102437

19102437

Reg No : .....

Name : .....

BSc DEGREE (CBCS) EXAMINATION, OCTOBER 2019

Fifth Semester

Core Course - PH5CRT07 - DIGITAL ELECTRONICS AND PROGRAMMING

B.Sc Physics Model I ,B.Sc Physics Model II Applied Electronics ,B.Sc Physics Model II Computer Applications,B.Sc Physics Model III Electronic Equipment Maintenance

2017 Admission Onwards

29E8F767

Maximum Marks: 60

Time: 3 Hours

Part A

*Answer any **ten** questions.*

*Each question carries **1** mark.*

1. Draw the logic circuit of (A+B)+C = A+(B+C) for both LHS and RHS.
2. State the duality theorem.
3. Write the other canonical form of $F(x, y, z) = \sum(1, 2, 5)$
4. Give the number of cells in an n-variable K-Map.
5. What is a full adder circuit?
6. What is mean by edge triggered flip flops?
7. What is meant by T flip flop?
8. What are the application of counters?
9. How will you define a variable in C++?
10. Give an example of single line comment.
11. What '\t' means in C++?
12. How will you define an inline function in C++?

(10×1=10)

Part B

*Answer any **six** questions.*

*Each question carries **5** marks.*

13. Draw logic diagram to implement the Boolean expression $F = (A \oplus B) + (A \odot B)$ Also obtain the simplified function and its logic circuit.

14. Verify the following boolean identity by perfect induction method $XYZ + \overline{X}YZ + XY\overline{Z} = YZ + XY\overline{Z}$.

15. What is a Multiplexer? Explain 8 to 1 Multiplexer.

16. Explain 3 to 8 decoder circuit diagram.

17. With the neat sketches, explain SISO registers.

18. Distinguish between the terms declaration, definition and initialization as applied to variables in C++.

19. Contrast between relational and logical operators in C++.

20. Illustrate an exit controlled loop in C++.

21. Write a C++ code segment to display a matrix.

(6×5=30)

Part C

*Answer any **two** questions.*

*Each question carries **10** marks.*

22. Distinguish between Basic and Universal gates with their standard symbols and truth tables. Why are they called so? Prove that NAND and NOR are Universal gates.

23. Explain the principle of D/A converters. Explain D/A converter using R-2R ladder network. What are the applications of DAC?

24. Explain the principle of A/D converters. Explain counter type A/D converter. What are the application of ADC?

25. What is a class in C++? How do you create an object of a class? Describe methods of defining member functions and accessing class members.

(2×10=20)

21100038

QP CODE: 21100038

Reg No : .....

Name : .....

BSc DEGREE (CBCS) EXAMINATION, FEBRUARY 2021

Fifth Semester

Core Course - PH5CRT07 - DIGITAL ELECTRONICS AND PROGRAMMING

B.Sc Physics Model I ,B.Sc Physics Model II Applied Electronics ,B.Sc Physics Model II Computer Applications,B.Sc Physics Model III Electronic Equipment Maintenance

2017 Admission Onwards

FD59F4F1

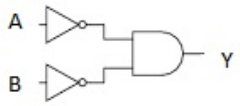
Time: 3 Hours | Max. Marks : 60

Part A

*Answer any **ten** questions.*

*Each question carries **1** mark.*

1. Give the truth table of NOR gate with three inputs.
2. Find the dual of the function $(\bar{x}y\bar{z} + \bar{x}\bar{y}z = 1)$
3. Write the other canonical form of $F(A, B, C, D) = \prod(3, 7, 8, 13, 15)$
4. Write the truth Table of the following logic circuit.



5. How does full subtractor work?
6. What is the use of a Multiplexer?
7. What is toggling in flip flop?
8. Why do you need a digital to analog converter?
9. What do you mean by type casting in C++?
10. Write part of a C++ code illustrating arithmetic operators.
11. Give an example for if statement.
12. What is meant by OOP?

(10×1=10)

Part B

*Answer any **six** questions.*

*Each question carries **5** marks.*

13. By using laws of Boolean algebra, Prove that $A(\bar{A}+C)((\bar{A}B+C)(\bar{A}BC+\bar{C})=0$

14. Make Karnaugh Map entries for variables F (A, B, C, D) = ∑ (0,1,2,3,,8,9,11,12,14,15) and obtain the simplest expression for F.

15. With neat sketches of logic diagram and timing diagrams, explain the operation of master-slave JK flip-flop.

16. With the neat sketches, explain SIPO registers.

17. Why do you need to convert analog to digital? Explain any one of the ADC.

18. Write a C++ code to display the output the text `Computational Physics` on a new line.

19. Describe int, short and char datatypes.

20. State difference between while and do.. while?

21. Give a C++ code segment to access the n^{th} element of an integer array.

(6×5=30)

Part C

*Answer any **two** questions.*

*Each question carries **10** marks.*

22. Simplify the expression $Y=\bar{A}.\bar{B}.\bar{C}+\bar{A}.\bar{B}.C+\bar{A}.\bar{C}$ and implement it using only NOR gates.

23. What is decoder and encoder? Explain with example.

24. What is a counter? Draw and explain the operation of Mod-8 ripple counter. What are the applications of counters?

25. (a) What are constants and how are they declared in C++? Mention its types with examples.
    (b) What is an escape sequence? Give examples and explain when they are used?

(2×10=20)