Reg. No.: .....

Name: .....

University of Kerala

W6887

Third Semester FYUGP Degree Examination, November 2025

Discipline Specific Core Course

PHYSICS

UK3DSCPHY201-Digital Electronics and Datascience

Academic Level: 200-299

2024 Admission

Time: 1 Hour 30 Minutes(90 Mins.) **Max. Marks: 42**

Part A 6 Marks.Time:6 Minutes.(Cognitive Level:Remember(RE)/Understand(UN)) Objective Type. 1 Mark Each.Answer all questions

Qn.No.	Question	CL	CO
1	List any two types of data collections.	RE	4
2	Mention the number of cells in a three variable Karnaugh Map	RE	3
3	The output of a buffer gate is the same as its input - Explain	UN	2
4	Write down the decimal equivalent of the binary number 1010_2	UN	1
5	Explain data preprocessing	UN	4
6	Write down the excess-3 code of the decimal number 127.	UN	1

Part B 8 Marks.Time:24 Minutes.(Cognitive Level:Understand(UN)/Apply(AP))Short Answer. 2 marks each.Answer all questions

Qn.No.	Question	CL	CO
7	Illustrate the construction of an AND gate using NAND gates.	UN	2
8	Distinguish between Exclusive NOR and Exclusive OR gates.	UN	2
9	Calculate the binary equivalents of: (a) the decimal number 108.364 (b) the octal number 567	AP	1
10	Demonstrate data types and discuss the challenges with unstructured data.	AP	4

Part C 28 Marks.Time:60 Minutes (Cognitive Level:Apply(AP)/Analyse(AN)/Evaluate(EV)/Create(CR)) Long Answer.7 marks each.Answer all 4 Questions choosing among options * within each question

Qn.No.	Question	CL	CO
11	A) Determine the hexadecimal equivalent of the following binary numbers	AP	1

Qn.No.	Question	CL	CO
	(i) 11010111 (ii) 10100110 (iii) 00110011110 (iv) 11001111 OR B) Determine the binary, octal and hexadecimal equivalent of the given decimal number 397		
12	A) (a) Investigate the different forms in which "dirty data" can appear during data pre-processing. (b) Analyze the different procedures involved in data pre-processing. OR B) Analyze how data science integrates with other disciplines such as statistics, computer science, and domain-specific fields (e.g., healthcare, finance, marketing).	AN	4
13	A) Determine the solution of $X = AB\bar{C}D + AB\bar{C}\bar{D} + ABCD + ABC\bar{D}$ using Karnaugh map OR B) Justify the correctness of the relation $A(\bar{A} + C)(\bar{A}B + C)(\bar{A}BC + \bar{C}) = 0$	EV	3
14	A)	EV	3

Qn.No.	Question	CL	CO
	Generate the solution of the given Boolean expression and construct the logic circuit $B \cdot (A + B) + A \cdot (\bar{B} + A)$ OR B) Formulate the solution of the Boolean expression $Y = \bar{A} \cdot B \cdot C + \bar{A} \cdot \bar{B} \cdot C + A \cdot B \cdot \bar{C} + A \cdot \bar{B} \cdot \bar{C}$		