

JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT
TEST-1 EXAMINATION-2026

B.Tech- VIIth Semester (CSE/IT/BT/BI/CE)

MAX. MARKS: 15

COURSE CODE (CREDITS): 20B1WEC734 (3)

COURSE NAME: Digital Systems

MAX. TIME: 1 Hour

COURSE INSTRUCTOR: Dr. Pardeep Garg

Note: (a) All questions are compulsory. (b) The candidate is allowed to make suitable numeric assumptions wherever required for solving problems. (c) Calculator is not allowed.

Q. No	Question	CO	Marks
Q1	Assume an arbitrary number system having a radix of 5 and 0, 1, 2, P, Q as its independent digits. Determine the decimal equivalent of (20QP.P1)	CO-1	1.5
Q2	Convert (F8D) ₁₆ into 2's complement format, and gray code.	CO-1	1.5
Q3	Represent (π {3.14159}) into IEEE single-precision format.	CO-1	2
Q4	Reduce the following Boolean expressions using the Boolean Algebra: i) $F = B'C'D + (B+C+D)' + B'C'D'E$ ii) $G = A'B'C' + A'BC' + AB'C' + ABC'$	CO-1	2
Q5	Write down the minimized expression by solving the following expression using K-map and implement the minimized expression using AOI logic and universal gates: $f = \sum m(0, 1, 4, 5, 6, 7, 9, 11, 15) + d(10, 14)$	CO-1	2.5+1.5=4
Q6	Design and discuss the functioning of a 4-bit binary parallel adder-subtractor circuit (in one circuit) that can perform both addition and subtraction (using Complement's method) of two 4-bit unsigned binary numbers, $A = A_3A_2A_1A_0$ and $B = B_3B_2B_1B_0$.	CO-1	2.5
Q7	A logic circuit with 4 inputs A, B, C, D has to be designed in such a way that it will produce output '1' only whenever two adjacent input variables are 1s. A and D are also to be treated as adjacent. Obtain the truth-table for it.	CO-1	1.5