JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST-2 EXAMINATION-MARCH-2026

COURSE CODE (CREDITS): 20B1WEC734 (3) MAX. MARKS: 25

COURSE NAME: Digital Systems

COURSE INSTRUCTOR: Dr. Pardeep Garg MAX. TIME: 1.5 Hours

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	Use a multiplexer having 3 select lines to implement the logic for the function (f) as shown. Also, realize the same using a 16:1 MUX. $f=\sum m\ (0, 1, 2, 3, 4, 10, 11, 14, 15)$	CO-1,3	2.5+2.5=5
Q2	Design a BCD-to-seven segment decoder: i) Show its truth-table ii) Obtain the Boolean expression for any 2 output (segments) and show their logic circuit implementation.	CO-1,3	2+4=6
Q3	Differentiate between combinational and sequential circuits.	CO-2	2
Q4	Design a logic circuit which converts S-R flip-flop to J-K flip-flop.	CO-2	4
Q5	What is the excitation table in context of flip-flops; obtain the same for all flip-flops.	CO-2	3
Q6	A 4-bits serial-in-serial-out shift register has to be designed using D flip-flops in such a way that the data can be shifted in both (left and right) directions simultaneously on command using the same designed circuit (one circuit only). Draw the logic diagram of such design and explain its working.	CO-2	5