



WEST BENGAL STATE UNIVERSITY
B.Sc. Honours/Programme 4th Semester Examination, 2023

CM SHGEC04T/MSGCOR04T-COMPUTER SCIENCE (GE4/DSC4)

Time Allotted: 2 Hours

Full Marks: 40

*The figures in the margin indicate full marks.
Candidates should answer in their own words and adhere to the word limit as practicable.
All symbols are of usual significance.*

Question No. 1 is compulsory. In addition, answer any *four* from the rest

1. Answer any *four* questions from the following: 2×4 = 8
- Define a decoder.
 - What do you mean by fan-out of a logic gate?
 - What is shift register?
 - What is a System Bus?
 - How many 128×8 memory chips are needed to provide a memory capacity of 4096×16 ?
 - Draw a AND gate using only NOR gates.
 - State the advantage of 2's complement representation over 1's complement representation.
 - What is interrupt?
2. (a) What do you mean by multiplexer? Construct 16-to-1 line multiplexer with two 8-to-1 line multiplexers and one 2-to-1 line multiplexer. Use block diagrams. 2+4
- (b) Why multiplexer is functionally complete? 2
3. (a) Simplify the following expression into SOP using K map 4
 $F(x, y, z, w) = \sum m(1, 5, 6, 12, 13, 14) + \text{don't care conditions } \sum d(2, 4).$
- (b) Realize a full adder circuit using half adders. 4
4. (a) Design a 4-bit synchronous counter with J-K Flip-Flop. 4
- (b) Distinguish between Synchronous and Asynchronous counter. 2
- (c) How many flip-flops are required for mod 64 counter? 2
5. (a) Draw a tristate buffer and explain its truth table. 4
- (b) Define priority encoder. 2
- (c) What is race around condition? 2

6. (a) Define cache. 2
(b) Distinguish between Isolated I/O and Memory-Mapped I/O. 4
(c) Explain Zero-Address instructions with suitable example. 2
7. (a) List the difference between static RAM and dynamic RAM. 4
(b) Give the difference between RISC and CISC. 4
8. Write short notes on: (Any *two*) 4×2 = 8
(a) Addressing Mode
(b) Types of interrupts
(c) Floating-point representation.