



**WEST BENGAL STATE UNIVERSITY**  
B.Sc. Honours Part-I Examination, 2020

**COMPUTER SCIENCE**

**PAPER-CMSA-I**

Time Allotted: 2 Hours

Full Marks: 50

*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.*

**Answer any three questions from the following**

16×3 = 48

1. (a) Convert the following: 2  
 $(2CF2.F2)_{16} = (?)_8$
- (b) In arithmetic operation 2's Complement is better than 1's Complement – Justify your answer. 2
- (c) Calculate 2's complement of the binary number 101100. Distinguish between data and information. 2+2
- (d) Write a short note on Memory Hierarchy. 4
- (e) Simplify the following expression using Boolean algebra. 2+2  
(i)  $A + AB$                       (ii)  $AB + AB'$
  
2. (a) Using DeMorgan's theorem, show that: 2+2  
(i)  $(A + B)'(A' + B')' = 0$   
(ii)  $A'B + A'B' = 1$
- (b) Explain AND gate and draw the schematic block diagram of a 3 – input AND gate with its truth table. 4
- (c) Explain the function of Address Bus and Control Bus. 2+2
- (d) Minimize the following boolean function using K-map: 4  
 $F(A, B, C, D) = \sum m(0, 1, 2, 5, 7, 8, 9, 10, 13, 15)$
  
3. (a) Explain Thevenin's theorem of circuit analysis. 3
- (b) Explain the working of CE amplifier. 3
- (c) Describe CMOS, NMOS and PMOS. 2×3 = 6
- (d) Differentiate between Intrinsic and Extrinsic semiconductor. What is Monostable Multivibrators? 2+2

4. (a) What is a latch? 2  
(b) Explain flip – flop with its function. Draw the schematic diagram of a JK flip flop with its working principle. 3+4  
(c) Design and explain the working of 16 to 1 line multiplexer. 4  
(d) Write a short note on Encoders. 3
5. (a) What is parallel binary adder? What are the steps of removing race condition? 2+2  
(b) Describe about the Shift Registers with diagram. Write a short note on D flip flop. 4+4  
(c) Classify different types of Scale of Integration. 4
6. (a) Define the following: 2+2  
(i) Instruction Register (IR)  
(ii) Accumulator  
(b) Explain the features of RISC processor. 4  
(c) Write a short note on Heterogeneous Storage. 4  
(d) Explain three address instruction with example. Explain the features of USB. 2+2

**[2 marks for Neatness]**

*N.B. : Students have to complete submission of their Answer Scripts through E-mail / Whatsapp to their own respective colleges on the same day / date of examination within 1 hour after end of exam. University / College authorities will not be held responsible for wrong submission (at in proper address). Students are strongly advised not to submit multiple copies of the same answer script.*

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