



BBB-MCA1020

Seat No. _____

M. C. A. (Sem. I) (CBCS) Examination

July - 2021

MCA1020 : Computer Organization & Architecture

(New Course)

Time : $2\frac{1}{2}$ Hours]

[Total Marks : 70

Instruction : Attempt any five of the following.

- 1 (a) Attempt the following : 4
- (1) Convert $(4652)_8$ into the binary number system.
 - (2) Convert $(146)_{10}$ into a binary number system.
 - (3) Convert $(1A7)_{16}$ into the decimal number system.
 - (4) Convert $(1001001100)_2$ into decimal number system.
- (b) Explain addition of two binary numbers with example. 2
- (c) What is the function of Main Memory ? 3
- (d) Explain in detail any two input devices. 5
- 2 (a) Attempt the following : 4
- (1) Convert $(DA2)_{16}$ into the binary number system.
 - (2) Convert $(110010)_2$ into octal number system.
 - (3) Convert $(1056)_{16}$ into decimal number system.
 - (4) Convert $(11672)_5$ into decimal number system.
- (b) Explain complement operation with binary numbers. 2
- (c) Explain in brief any one storage device. 3
- (d) Explain in detail any two output devices. 5

- 3** (a) Attempt the following : **4**
- (1) What is truth table ?
 - (2) Draw three variable Karnaugh Map.
 - (3) What is Product of Sum (POS) ?
 - (4) Write truth table for XOR gate.
- (b) Define De Morgan's theorem. **2**
- (c) Simplify the following boolean expression **3**
- $$\overline{AB}(\overline{A+B})(\overline{B+B}) \text{ using boolean algebra.}$$
- (d) Explain AND & NAND gates with its diagram **5**
and truth table.
- 4** (a) Attempt the following : **4**
- (1) What is Boolean algebra ?
 - (2) What is karnaugh map ?
 - (3) What is sum of product (SOP) ?
 - (4) Write truth table for NOT gate.
- (b) Draw four variable Karnaugh Map. **2**
- (c) Draw circuit for Boolean equation : **3**
- $$Y = A'B'C'D + AB'C'D + ABC'D + ABCD'$$
- (d) Explain OR & NOR gates with its diagram and **5**
truth table.
- 5** (a) Attempt the following : **4**
- (1) What is the full form of EEPROM ?
 - (2) 1 MB is equivalent to how many bytes ?
 - (3) What is a full form of USB ?
 - (4) What is main memory ?
- (b) What is auxiliary memory ? **2**
- (c) What is ALU? What is a role of ALU ? **3**
- (d) Explain in detail any five addressing modes. **5**

- 6** (a) Attempt the following : **4**
- (1) What is the full form of EPROM ?
 - (2) Which is the smallest unit for measuring computer memory ?
 - (3) What is virtual memory ?
 - (4) What is associative memory ?
- (b) What is cache memory ? **2**
- (c) Write a note on instruction formats. **3**
- (d) What is 1004 ? Differentiate between RAM and ROM. **5**
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- 7** (a) Attempt the following : **4**
- (1) What is combinational circuit ?
 - (2) What is comparator ?
 - (3) What is digital logic circuit ?
 - (4) What is binary subtractor ?
- (b) Write a note on encoder. **2**
- (c) Draw full adder arithmetic circuit. **3**
- (d) What is multiplexer ? Explain in detail. **5**
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- 8** (a) Attempt the following : **4**
- (1) What is full adder ?
 - (2) What is integrated circuit ?
 - (3) What is demultiplexer ?
 - (4) What is binary adder ?
- (b) What are the applications of combinatorial circuit ? **2**
- (c) Design half adder as two-level AND-OR circuit. **3**
- (d) What is decoder ? Explain in detail. **5**

- 9** (a) Attempt the following : **4**
- (1) What is counter ?
 - (2) What is synchronous counter ?
 - (3) What is universal register ?
 - (4) What will be the output in SR, flip flop if $Q = 0$?
- (b) Explain storage register with parallel input. **2**
- (c) Explain ripple counter. **3**
- (d) Explain in detail JK Flip Flop. **5**
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- 10** (a) Attempt the following : **4**
- (1) What is Flip Flop ?
 - (2) What is asynchronous counter ?
 - (3) What is shift register ?
 - (4) A basic S-R flip-flop can be constructed by cross-coupling of which basic logic gates ?
- (b) Explain storage register with serial input. **2**
- (c) Explain increment counter. **3**
- (d) Explain D-Flip and compare it with SR flip flop. **5**
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