



WEST BENGAL STATE UNIVERSITY
B.A./B.Sc. Honours 1st Semester Examination, 2021-22

CMAACOR02T-COMPUTER APPLICATION (CC2)

COMPUTER FUNDAMENTALS

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 Question Number 1 and any four from the rest

1. Answer any *five* questions from the following: 2×5 = 10
- (a) State the advantage of 2's complement representation over 1's complement representation.
 - (b) Distinguish between RAM and ROM.
 - (c) What is the Base of a number system?
 - (d) $(4321)_5 = (?)_7$.
 - (e) Draw logic diagram and write the truth table of T-flip flop.
 - (f) Distinguish between system software and application software.
 - (g) Distinguish between multi-user and multi-programming operating system.
 - (h) Differentiate between optical mouse and mechanical mouse.
2. (a) Design a 2×4 decoder using basic gates. Mention its truth table. (2+4)+4
- (b) Represent the decimal number 47 in
- (i) Binary code
 - (ii) Hexadecimal code
 - (iii) Gray code
 - (iv) BCD code
3. (a) Minimize the Boolean function using K-map (3+4)+3
- $$F(A, B, C, D) = \sum m(0, 2, 3, 6, 7, 12, 13, 14) + \sum d(1, 4, 11, 15).$$
- Represent this minimized function in a circuit using only NAND gates. Show each steps.
- (b) Is XOR is a universal logic gate? Justify.
4. (a) Draw a full adder circuit as combination of 2 half adders. 3+3+2+2
- (b) State DeMorgan's law and prove it for 2 variables.

- (c) Evaluate $(7352)_{10} - (9456)_{10}$ using 9's complement.
(d) State Duality principle.
5. (a) Define a Wi-Fi. How does it work? (1+4)+(1+4)
(b) Define a router and describe its functionality in brief.
6. (a) What is the necessity of cache memory? 2+2+2+2+2
(b) Compare Cache memory with VAM.
(c) Why virtual memory is required?
(d) What is system architecture?
(e) Define a buffer.
7. (a) Explain the working of PISO register. 3+(2+3)+2
(b) What is a counter? Differentiate between an Asynchronous and Synchronous counter.
(c) What is Ripple Counter?
8. Write short notes on any *two* of the following: 5×2 = 10
(a) Multiplexer vs. Demultiplexer
(b) Bar Code Reader
(c) EPROM
(d) MongoDB.

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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