

The Open University of Sri Lanka
Faculty of Natural Sciences
B.Sc. / B. Ed Degree Programme



Department	: Computer Science
Level	: Level 03
Name of the Examination	: Final Examination
Course Title and - Code	: Fundamentals of Computers - CSU3315
Academic Year	: 2020/2021
Date	: 26.12.2021
Time	: 09.30 a.m. – 11.30 a.m.
Duration	: 02 Hours

General Instructions

1. Read all instructions carefully before answering the questions.
 2. This question paper consists of **SIX (06)** questions in **03** pages.
 3. Answer **FOUR (04)** questions only. All questions carry equal marks.
 4. Answer for each question should commence from a new page.
 5. Draw fully labelled diagrams where necessary.
 6. Involvement in any activity that is considered as an exam offense will lead to punishment.
 7. Use blue or black ink to answer the questions.
 8. Clearly state your index number in your answer script.
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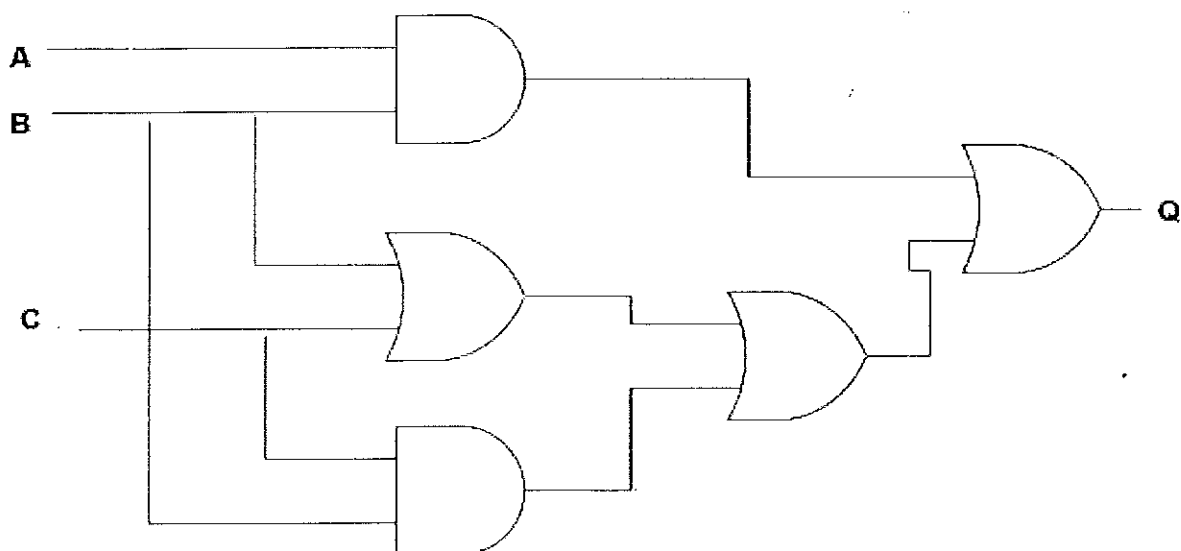
Q1)

- I) Briefly explain the key idea behind Von Neumann's Architecture.
- II) Describe the limitations/drawbacks of computer technology.
- III) Explain the most suitable printing technology for ATMs.
- IV) In a Hard disk drive, Disk rotating speed = 3600 rpm, one track contains 50 sectors, Number of bytes in a sector = 512 bytes.
 - a) Find the Latency time (Tl)
 - b) Calculate the transfer rate (in MB per second)
 - c) Calculate the time to read information
 - d) Calculate the average time to access a sector

Q2)

- I) Explain the difference between CRT and LCD monitors.
- II) What is the reason for having different keyboard layouts?
- III) Programming languages are categorized into generations. Briefly explain them.
- IV) Differentiate between the Application Software and System Software.

Q3)



- I) Derive the Boolean equation for the output **Q**.
- II) Minimize the Boolean equation and draw the simplified logic circuit for the minimized equation.
- III) Simplify the following Boolean expression.
- $$A + A' B + A' B' C + A' B' C' D + A' B' C' D' E$$
- IV) Draw truth tables for **NAND** and **NOR** logic gates.

Q4)

- I) Perform the following operations using Binary Arithmetic.
- a) $110111_2 + 10101010_2$
- b) $1011101_2 - 101101_2$
- c) $101101_2 / 111_2$
- d) $1011_2 * 1001_2$
- II) Carry out the following conversions.
- a) Convert 111010101_2 into **Decimal**
- b) Convert 5687_{10} into **Binary**.
- c) Convert 11111111_2 into **Hexadecimal**.
- III) Convert the following Octal numbers into Hexadecimal numbers.
- a) 32465
- b) 23456
- IV) Using 2's complement form, perform the following arithmetic operations,
- a) $28_{10} - 17_{10}$
- b) $35_{10} - 28_{10}$

Q5)

- I) What is a Computer Network? Give a brief introduction.
- II) Write short descriptions for the following:
 - a) Personal Area Network (PAN)
 - b) Wide Area Network (WAN)
 - c) Metropolitan Area Network (MAN)
- III) Write Advantages and Disadvantages of Peer-to-Peer networks.
- IV) Compare and contrast Peer-to-Peer Network and Client/Server Network.

Q6)

- I) Draw diagrams to explain Network topologies. Give advantages and disadvantages for each topology.
- II) Write short descriptions for the following:
 - a) Network Hub
 - b) Network Switch
 - c) Network Router
- III) Describe Intranet, Extranet, and the Internet.
- IV) What is an IP address? Introduce the Internet protocols and mention few major protocols with the specification.

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