MAHATMA GANDHI UNIVERSITY, KOTTAYAM

MGU-UGP (HONOURS) FIRST SEMESTER EXAMINATION

(2026 ADMISSION ONWARDS)

FUNDAMENTALS OF DIGITAL LOGIC AND COMPUTER ORGANIZATION
Course Code: MG1DSCADS100

PRACTICAL EXAMINATION – QUESTION PAPER

Duration: 2 Hours
Maximum Marks: 35

Instructions

1. Demonstrate the given practical task.
2. Attend a viva voce session consisting of a minimum of 5 questions from the Practical Module.
3. Submit the certified laboratory record.

Evaluation Criteria

Component	**Marks**
Viva Voce	10
Laboratory Report	10
Demonstration	15
Total	**35**

(Choose any one Question)

1. Construct AND, OR, NOT, NAND, NOR, XOR and XNOR gates using ICs and verify their truth tables. [CO4]

2. Implement the given Boolean expressions using logic gates and verify its truth table.

$$Y = \bar{A}\,B + AC$$

$$Y = (A \cdot B) \bar{+} (B \cdot C).$$

[CO4]

3.Verify De Morgan's theorems using basic logic gates and demonstrate the equivalence of both sides. [CO4]

4. Design and implement a Full Adder circuit using logic gates and verify its truth table. [CO4]

5.Construct a 3-to-8 decoder using logic gates and verify its output for all input combinations. [CO4]

6. Implement a seven-segment display circuit to display decimal digits from 0 to 9. [CO4]

7. Construct an 8:1 multiplexer using logic gates and verify its operation for different select inputs. [CO4]

8. Construct a 1:8 demultiplexer and verify its operation for different select inputs. [CO4]

9. Design and implement an 8:3 encoder using logic gates and verify its truth table. [CO4]

10. Construct SR, JK and D flip-flops using flip-flop ICs ad verify its truth tables [CO4]

11. Design and implement a 2-bit synchronous binary counter using flip-flops and verify its counting sequence. [CO4]

12. Construct an SR flip-flop using NAND gates and verify its truth table. [CO4]

QPCODE **Reg.No : .....**

Name : .....

MAHATMA GANDHI UNIVERSITY, KOTTAYAM

MGU-UGP (HONOURS) REGULAR EXAMINATION

FIRST SEMESTER

MG1DSCADS100: FUNDAMENTALS OF DIGITAL LOGIC AND COMPUTER ORGANIZATION

(2026 ADMISSION ONWARDS)

Duration: 1.5 Hours **Maximum Marks: 50**

Remember(K), Understand(U), Apply(A), Analyse(An), Evaluate(E), Create(C), Skill(S), Interest(I) and Appreciation(Ap)

Students should attempt at least one question from each course outcome to enhance their overall outcome attainability.

Part A

Short Answer Type Questions
Answer any **10** questions Each
question carries **1** marks

1. Define the radix of a number system. [K] /[CO1]
2. Explain the 2's complement of a binary number. [K] /[CO1]
3. Represent the decimal number 7 in 8421 BCD code. [U] /[CO1]
4. Identify the law represented by A+A=A. [K] /[CO1]
5. Identify the simplified form of the Boolean expression AB + A'B. [U] /[CO2]
6. List the three major types of computer instructions in basic computer [K] /[CO2]
7. Explain the purpose of the instruction decode phase. [U]/[CO2]
8. State the purpose of CPU registers. [K]/[CO2]
9. Define stack pointer (SP). [K]/[CO2]
10. State any one advantage of immediate addressing mode. [U]/[CO2]

11. Identify the data transfer instruction in the following: MOV R1, R2 or ADD R1, R2. [U]/[CO3]
12. Indicate the purpose of program control instructions. [U]/[CO3]

[2x10 = 20]

Part B

Short Essay Type Questions

Answer any 6 questions

Each question carries 5 marks

13. Compare half adders and full adders based on inputs, outputs, carry handling, and applications. [U] /[CO1]
14. Explain how selection lines control the operation of a multiplexer and describe its use in digital circuits. [U] /[CO1]
15. Explain the operation of an SR latch with a logic diagram and truth table. [U] /[CO2]
16. Illustrate positive-edge and negative-edge triggering using timing diagrams. [A]/[CO2]
17. Explain the concept of memory hierarchy with a neat diagram. [U] /[CO3]
18. Explain the characteristics and functions of auxiliary memory. [U] /[CO3]

[5x6 = 30]

Part C

Essay Type Questions

Answer any 2 questions

Each question carries 10 marks

19. Explain and compare the working of encoders and decoders . [U] /[CO1]
20. Compare RS and JK flip-flops in terms of construction and truth tables. [An]/[CO2]
21. Explain the different cache mapping techniques with suitable diagrams. [U] /[CO3]

[2x15 = 30]

MAHATMA GANDHI UNIVERSITY, KOTTAYAM

MGU-UGP (Honours)/ MGU-BBA (Honours)/ MGU-BCA (Honours) REGULAR EXAMINATION

First SEMESTER

MG1MDCADS100 – COMPUTER ESSENTIALS

(2024 ADMISSION ONWARDS)

Duration: 1 hours **Maximum Marks: 35**

Remember(K), Understand(U), Apply(A), Analyse(An), Evaluate(E), Create(C), Skill(S), Interest(I) and Appreciation(Ap)

Students should attempt at least one question from each course outcome to enhance their overall outcome attainability.

Part A

Very Short Answer Questions

Answer any **10** questions

Each question carries 1 marks

1. Identify the four elements of a computer system [K] / [CO1]
2. Identify two examples of computer hardware. [K] / [CO1]
3. Identify the role of users in a computer system. [U] / [CO1]
4. Indicate the role of procedures in computer operations. [U] / [CO1]
5. Define an input device. [K] / [CO2]
6. Name a device used to digitize physical documents. [K] / [CO2]
7. Identify an input device used for voice entry. [U] / [CO2]
8. Distinguish between manual and direct input devices. [U] / [CO2]
9. Identify the smallest unit of a monitor display. [U] / [CO3]

10. Explain the two main categories of liquid crystal displays [U] / [CO3]

11. Simplify the concept of dot pitch [An] / [CO3]

12. Differentiate between monochrome and grayscale monitors [An] / [CO3]

[1x10 = 10]

Part B

Short Answer Questions

Answer any 3 questions

Each question carries **5** marks

13. Describe the relationship between hardware and software. [U] / [CO1]

14. Explain the role of users in operating a computer system. [U] / [CO1]

15. Describe the role of input devices in data entry operations. [U] / [CO2]

16. Explain the advantages of flat-panel monitors over CRTs. [u] / [CO3]

[5x3 = 15]

Part C

Essay Questions

Answer any 1 questions

Each question carries **10** marks

21. Describe various input devices and explain their specific applications. [U] / [CO2]

22. Illustrate the working of a laser printers. [An] / [CO3]

[10x1 = 10]

MAHATMA GANDHI UNIVERSITY, KOTTAYAM

MGU-UGP (Honours)/ MGU-BBA (Honours)/ MGU-BCA (Honours) REGULAR EXAMINATION

FIRST SEMESTER

MG1MDCADS100 – COMPUTER ESSENTIALS LAB EXAMINATION

(2026 ADMISSION ONWARDS)

Duration: 1 hours **Maximum Marks: 35**

Remember(K), Understand(U), Apply(A), Analyse(An), Evaluate(E), Create(C), Skill(S), Interest(I) and Appreciation(Ap)

1. Identify the different expansion slots on the motherboard. Explain their functions and differentiate between PCI and PCI Express (PCIe) slots. Demonstrate the correct procedures for installing and removing an expansion card. [A] / [CO4]

2. Identify the different I/O ports available on the motherboard, including USB Type and versions, LAN, HDMI, VGA, PS/2 and audio ports. Explain their functions, differentiate between their types, and demonstrate how to connect the appropriate peripheral devices to each port. [A] / [CO4]

3. Identify the different cables and wire colours of the SMPS (Switched-Mode Power Supply). Explain the function of each wire and state the voltage supplied by each wire colour. [A] / [CO4]

4. Identify the different types of cooling systems and storage devices (HDD and SSD), along with the motherboard I/O ports. Explain their functions and importance, differentiate between their types, and demonstrate how to install, connect and verify their proper operation. [A] / [CO4]

5. Identify the GPU, PSU (SMPS) and RAM modules on the motherboard. Explain their functions and importance, identify their different types and specifications, describe their power supply connections and RAM slot configurations, and demonstrate how to install, remove and verify their proper operation. [A] / [CO4]

6. Identify the different components of the motherboard. Explain the function and importance of each component. Locate the CPU socket, RAM slots, chipset, CMOS battery, expansion slots, storage connectors, power connectors and I/O ports. Describe their uses and demonstrate how to identify and connect the appropriate components correctly. [A] / [CO4]

7. Identify the CPU, RAM slots, expansion slots, CMOS battery, Northbridge and Southbridge on the motherboard. Explain their functions and importance, differentiate between their types, identify their locations, describe their working principles, and explain how they communicate with other hardware components. [A] / [CO4]

8. Perform the complete disassembly of a desktop computer by following the proper safety precautions and procedures. Identify and remove all major components systematically.

[A] / [CO4]

9. Perform the complete assembly of a desktop computer by following the correct procedures. Install and connect all major components, ensure proper cable management, and verify the system's functionality.

[A] / [CO4]

10. Safely remove and reinstall HDD/SSD storage devices and RAM modules. Identify their different types and connectors, correctly connect the SATA data and power cables, explain the functions of each cable, check the proper seating and connections of all components, and verify their proper operation after reassembly.

[A] / [CO4]