

MAHATMA GANDHI UNIVERSITY, KOTTAYAM

MGU-UGP (HONOURS)

FIRST SEMESTER EXAMINATION

(2024 ADMISION ONWARDS)

MG1MDCECT103 - Audio Electronics

Duration: 1.5 hour

Maximum Marks: 35

Practical Examination – Model Question Paper

Instructions:

- **Demonstrate** the given task
- **Viva session** (Minimum 5 questions from the Practical Module)
- **Lab Report**

Evaluation Criteria:

- **Viva:** 10 marks
- **Lab Report:** 10 marks
- **Demonstration:** 15 marks

Tasks: (*Choose any one*)

1. Create a conversion cable from XLR to TRS and test its functionality with microphones and mixers.
2. Design and assemble an adapter to connect TRS audio outputs to RCA inputs for audio devices.
3. Build a simple adapter to connect RCA outputs to a 3.5mm headphone jack.
4. Create an adapter that converts a mono signal to stereo and test it with various audio sources.
5. Construct a dual 3.5mm to dual RCA cable for connecting audio devices to mixers or amplifiers.
6. Design and construct a basic audio amplifier using transistors or op-amps and test its performance with a speaker.
7. Design and construct a two-channel mixer using op-amps or transistors.
8. Construct a low-pass filter circuit to observe its audio signals and frequency response.
9. Design and implement a tone control circuit (bass, midrange, treble) and test its effect on audio playback.
10. Create a noise filter circuit to reduce unwanted noise from audio signals.
11. Build a subwoofer amplifier circuit and test its performance with low-frequency audio signals.
12. Make an IC UM66-based signal injector circuit.
13. Make an electronic piano using NE555 IC

MAHATMA GANDHI UNIVERSITY, KOTTAYAM

MGU-UGP (HONOURS)

FIRST SEMESTER EXAMINATION

(2024 ADMISION ONWARDS)

MG1MDCECT102 DATA ANALYTICS

Duration: 1½ hours

Maximum Marks: 35

Practical Examination – Model Question Paper

Instructions:

- **Demonstrate** the given task
- **Viva session** (Minimum 5 questions from the Practical Module)
- **Lab Report**

Evaluation Criteria:

- **Viva:** 10 marks
- **Lab Report:** 10 marks
- **Demonstration:** 15 marks

Tasks: (*Choose any one*)

1. Create a table for recording student details. Format the table with proper headers, borders and alignment.
2. Create a dataset of employee salary with not less than 5 records in Excel worksheet. Use Excel functions to demonstrate the calculation of the total salary and average salary.
3. Create a dataset of marks scored by students in different subjects. Use Excel to sort the dataset based on total marks in descending order and find the maximum marks scored in each subject.
4. Create a dataset for marks scored by students in three different internal exams for a subject. Use Excel to calculate the average mark and find the least score in the dataset.
5. Create a dataset for sales data of salesperson for 3 consecutive months. Highlight the salesperson who achieved the target using conditional formatting.
6. Design a Google Form to collect basic details of students, using at least 5 different data fields. Make sure to include the following field types to gather data: Textbox, Checkbox, and Radio Button.
7. Design a Google Form to conduct a customer satisfaction survey with three main sections: Customer Details, Product Rating, and Feedback.

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MGU-UGP (HONOURS)

FIRST SEMESTER EXAMINATION

(2024 ADMISION ONWARDS)

MG1MDCECT101 FOUNDATIONS OF AI AUTOMATION

Duration: 1½ hours

Maximum Marks: 35

Practical Examination – Model Question Paper

Instructions:

- **Demonstrate** the given task
- **Viva session** (Minimum 5 questions from the Practical Module)
- **Lab Report**

Evaluation Criteria:

- **Viva:** 10 marks
- **Lab Report:** 10 marks
- **Demonstration:** 15 marks

Tasks: (Choose any one)

Using ChatGPT

Make a story with a theme. Can specify any theme.

Make poems with any theme in any poetic style-Wordsworth, Shakespear etc.

Using Google Docs and ChatGPT

Prepare resume on a given docs Template.

Prepare SOP for applying in a University for Masters

Prepare resume for a specific job in a specific template

Prepare a leave letter for your absence due to some personal reasons/healthy reasons

Prepare a covering letter for applying for job attaching your prepared resume

Using Google Slides and ChatGPT

Prepare slides for a presentation in a specific template

Using DALL-E

Create an image from a given textual theme and save it in jpeg format

MAHATMA GANDHI UNIVERSITY, KOTTAYAM

MGU-UGP (HONOURS)

MG1MDCECT100 - HOME APPLIANCES AND TROUBLESHOOTING

PRACTICAL EXAMINATION

Duration: 1.5 hours

Maximum Marks: 35

Instructions:

- Demonstrate the task
- Viva session (*Minimum 5 questions from the Practical Module*)
- Lab Report

Evaluation Criteria:

- Viva: 10 marks
- Lab Report: 10 marks
- Demonstration: 15 marks

Tasks: (*Choose any one*)

1. Solder a resistor onto a PCB. Ensure there's no excess solder, and verify the strength of the connection.
2. Use a desoldering pump to remove a component from a PCB. Evaluate the cleanliness of the removed joint and identify areas that need improvement.
3. Solder three points on a PCB and intentionally create one "dry solder" joint. Identify and troubleshoot the dry solder.
4. Solder an LED and 1K resistor to a PCB and connect proper power supply to glow the LED
5. Use a desoldering wick to remove solder from a component. Compare the effectiveness with a desoldering pump.
6. Use a multimeter to test for any unintended short circuits between two points.
7. Desolder and resolder a component. Observe and note any damage to the PCB pads.
8. In an LCD/LED TV, use a multimeter to test continuity on the fuse.
9. Demonstrate how we check power supply.
10. Demonstrate how we check capacitor in a board.
11. Test the condition of capacitor of a fan/motor .

12. Test the motor windings with a multimeter. Measure the resistance across each winding and note any discrepancies that indicate a fault.
13. Open an LED bulb and identify each internal component. Use a multimeter to check if each LED module is functional.
14. Measure the output voltages from the PSU of a home theater system.
15. Test an iron box's heating element for continuity and resistance.
16. Use a multimeter to check the motor windings in a mixer grinder. Identify possible symptoms if the windings are open or shorted.
17. Inspect the heating element and thermostat in a water heater.
18. Find the thermal fuse in a high-power appliance, test for continuity, and determine if it needs replacement.
19. Demonstrate the correct way to clean dust and residue from a PCB.
20. Apply solder and flux to a PCB connection. Observe how flux prevents dry solder joints and improves the quality of the joint.
21. Apply a protective coating to a PCB and explain how it prevents environmental damage.
22. Use a multimeter to test the earthing on an appliance.
23. Use a multimeter to test the phase voltage on an appliance/switch Box.

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MGU-UGP (HONOURS)

FIRST SEMESTER PRACTICAL EXAMINATION

(2024 ADMISION ONWARDS)

MG1DSCIAM100 INTERACTIVE ROBOTIC SYSTEMS

Duration: 2 hours

Maximum Marks: 35

Practical Examination – Model Question Paper

Instructions:

- **Demonstrate** the given task
- **Viva session** (Minimum 5 questions from the Practical Module)
- **Lab Report**

Evaluation Criteria:

- **Viva:** 10 marks
- **Lab Report:** 10 marks
- **Demonstration:** 15 marks

Tasks: (Choose any One/Two depending on the complexity)

1. Write a program to turn on and turn off LED
2. Write a program to create an SOS signal using LED
3. Control LED or a buzzer using LDR
4. Set up a light-controlled buzzer operation system
5. Design a parking Indicator using ultrasonic sensor
6. Create a smoke and fire alarm system
7. Assemble a robocar using geared DC motors and a Driver module
8. Write an Arduino program for PIR motion sensor-based burglar alarm using Wokwi simulator.
9. Write an Arduino program for PIR motion sensor-based burglar alarm and construct a circuit using Arduino Uno.
10. Write an Arduino program for LPG Gas leak detector using MQ2 sensor using Wokwi simulator.
11. Write an Arduino program for LPG Gas leak detector using MQ2 sensor and construct a circuit using Arduino Uno.
12. Gradually increase and decrease the intensity of LED use PWM function of Arduino.

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MGU-UGP (HONOURS)

FIRST SEMESTER PRACTICAL EXAMINATION
(2024 ADMISION ONWARDS)

BSc (Honours) Electronics with Computer Technology

MG1MDCECT104 - Creative Robotics

Duration: 1.5 hours

Maximum Marks: 35

a. Viva - 10

b. Lab report - 10

c. Demonstration – 15

*Attempt any **ONE**, marked in the question paper*

1. Run an Arduino program and setup a circuit to turn ON and OFF LED.
2. Run an Arduino program to create an SOS signal using LED.
3. Run an Arduino program for the Controlling of LED with LDR.
4. Set up a Light controlled buzzer operation system using Arduino code.
5. Design a parking indicator using ultrasonic sensor using Arduino code.
6. Create a smoke and fire alarm system using Arduino code.
7. Assemble a robocar using geared DC motors and a driver module with the help of Arduino program
8. Design a line follower robot project using Arduino program.

MAHATMA GANDHI UNIVERSITY, KOTTAYAM

MGU-UGP (HONOURS)

FIRST SEMESTER EXAMINATION

(2024 ADMISION ONWARDS)

MG1DSCMOS100 PC HARDWARE AND SMARTPHONE TROUBLESHOOTING

Duration: 2 hours

Maximum Marks: 35

Practical Examination – Model Question Paper

Instructions:

- **Demonstrate** the given task
- **Viva session** (Minimum 5 questions from the Practical Module)
- **Lab Report**

Evaluation Criteria:

- **Viva:** 10 marks
- **Lab Report:** 10 marks
- **Demonstration:** 15 marks

Tasks: (*Choose any one*)

PC Assembly

*Prepare a PC configuration based on user requirements
Identify the hardware components and explain the working
Cable the essential components*

OS installation

*Assessment of minimal requirements in a PC
Connect a Hard disk to the given device
Install any OS and boot the device*

Hard disk Installation and Portioning

*Assessment/Study of HD types
Memory requirements and formats of OS
Formatting the HD and portioning based on user requirements*

PC Hardware Troubleshooting

*Troubleshooting common Hardware related issues
Identify the complaint/s and prepare replacement plan
Rectify- replace or repair?*

PC Troubleshooting

Troubleshooting software issues

Identify the complaint/s

Rectify, incurring minimal data loss

Smartphone Disassembly

Precautions to be taken to avoid further damage

Perform step by step disassembly of (water) damaged smartphone

Reassemble the device

Smartphone component replacement

Perform disassembly of smartphone

Identify the defective component

Replace components such Camera/Screen etc

Smartphone Troubleshooting

Trouble shooting of software related issues

Identify the complaints

Rectify and recondition the device

Smartphone Security

Conduct smartphone security audit

Devise a personal security plan

Mitigate application and OS attacks

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FIRST SEMESTER EXAMINATION
(2024 ADMISION ONWARDS)

MG1DSCECT100- EMERGING ELECTRONICS

Duration: 2 hours

Maximum Marks: 35

Practical Examination – Model Question Paper

Instructions:

- **Demonstrate** the given task
- **Viva session** (Minimum 5 questions from the Practical Module)
- **Lab Report**

Evaluation Criteria:

- **Viva:** 10 marks
- **Lab Report:** 10 marks
- **Demonstration:** 15 marks

Experiments: (*Choose any one*)

1. Draw a circuit diagram to verify Ohm's law.
2. Generate a sinusoidal wave having frequency 2 KHz and amplitude 10 V.
3. Study and plot the forward characteristics of PN junction Diode. Also find the static resistance, dynamic resistance and knee voltage.
4. Study and plot the characteristics of Zener Diode. Also find the static resistance, dynamic resistance and breakdown voltage.
5. Study and plot the forward characteristics of LED. Also find the static resistance and dynamic resistance.
6. Construct a Centre tapped full wave rectifier and draw its output.
7. Construct a half wave rectifier and draw its output.
8. Design and setup positive and negative clipper and plot its output waveforms.
9. Design and setup positive and negative clamper and plot the output waveforms.
10. Make an extension box with three plug sockets and three switches.
11. Design and develop a staircase lamp using two-way switches.
12. Write a simple Arduino code to blink an LED for one second.
13. Design an Arduino-based LED circuit that flashes three times on power-up.
14. Develop a program for an LED chasing effect.
15. Write an Arduino program to count pulses using an LDR.

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MGU-UGP (HONOURS)

FIRST PRACTICAL SEMESTER EXAMINATION

(2024 ADMISION ONWARDS)

MG1DSCECT101 - COMPUTER FUNDAMENTALS AND BASICS OF PC HARDWARE

Duration: 2 hours

Maximum Marks: 35

Practical Examination – Model Question Paper

Instructions:

- **Demonstrate** the given task. (Any one of the tasks listed below)
- A **Viva session** will follow your demonstration. (Minimum 5 questions from the Practical Module)
- **Lab Report** should cover all the subunits of the practical module.

Evaluation Criteria:

- **Viva:** 10 marks
- **Lab Report:** 10 marks
- **Demonstration:** 15 marks

Tasks: (*Choose any one*)

1. PC Assembly

- Assemble a computer by connecting the CPU, RAM, motherboard, power supply, and storage devices.
- Demonstrate each step and verify that the system is operational.

2. Operating System Installation

- Install an operating system of your choice (Windows, Linux).
- Show the steps for partitioning, formatting, and setting up basic configurations.

3. Troubleshooting Hardware Issues

- Diagnose a hardware issue provided (such as boot failure, display error, or connectivity problem).
- Document the troubleshooting steps taken and implement a solution.

4. Network Configuration

- Set up a basic LAN or Wi-Fi network connection, including IP configuration and router setup.
- Ensure the network connection is active and troubleshoot any issues.

5. BIOS/UEFI Configuration

- Access BIOS/UEFI settings on the provided system, configure boot priority, and adjust system time.

6. Security Setup

- Install and configure antivirus software. Enable data encryption on a selected storage drive and demonstrate the setup process.