MAHATMA GANDHI UNIVERSITY, KOTTAYAM

MGU-UGP (HONOURS)

SECOND SEMESTER EXAMINATION

(2024 ADMISION ONWARDS)

MG2DSCECT100 - Essential Concepts in Digital Electronics

Duration: 1½ hours Maximum Marks: 35

Practical Examination – Model Question Paper

Instructions:

- **Demonstrate** thegiven task. (Any one of the tasks listed below)
- **Viva session** (Minimum 5 questions from the Practical Module)
- **Lab Report**

Evaluation Criteria:

- **Viva**: 7 marks
- **Lab Report**: 8 marks
- **Demonstration**: 20 marks

Tasks: *(Choose any one)*

A. Lab experiment using Trainer kit

1. Design and set up a Half Adderusing XOR gates and AND gate
2. Design and set up a Full adder
3. Design and set up a 4:1 Multiplexer
4. Design and set up a 1:4Demultiplexer
5. Design and verify the performance of Serial in Serial out Shift registers
6. Design and verify the performance of Serial in Parallel out Shift Registers
7. Design and set up a 2-bit synchronous counter

B. Lab experiment using Simulation tool

1.Build and verify AND gate using Simulation tool

2.Build and verify OR gate using Simulation tool

3. Build and verify NOT gate using Simulation tool

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SECOND SEMESTER PRACTICALEXAMINATION

(2024 ADMISION ONWARDS)

MG2DSCECT101 - DATA COMMUNICATION

Duration:1.5hours MaximumMarks:35

PracticalExamination–ModelQuestionPaper

Instructions:

- **Demonstrate**thegiventask.(Anyoneofthetaskslisted below)
- A**Vivasession**willfollowyourdemonstration.(Minimum5questionsfromthe Practical Module)
- **LabReport**shouldcoverallthesubunitsofthepractical module.

EvaluationCriteria:

1. **Viva** - 10 Marks
2. **Demonstration** - 15 Marks
3. **Record** - 10 Marks

Tasks:*(Chooseanyone)*

Experiments:

1. Plot and measure Amplitude and Frequency of a Sine wave
2. Plot, Amplitude and Frequency of a Square wave
3. Plot,Amplitude and Frequency of a Triangular Wave
4. Simulate any ADC circuit for various amplitudes
5. Simulate DAC for any binary weighted / ladder circuit
6. Demonstrate sampling theorem
7. Demonstrate Quantization

Optional:

8. Measure and compare the quality of the received signals, observing factors like attenuation and interference in different guided medias
9. Implement a simple delta modulationcircuit.

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SECOND SEMESTER EXAMINATION

(2024 ADMISION ONWARDS)

MG2DSCIAM100 - Intelligent Automation Techniques

Duration: 2 hour **Maximum Marks: 35**

PracticalExamination–ModelQuestionPaper

Instructions:

- **Demonstrate**thegiventask
- **Viva session** (Minimum 5 questions from the PracticalModule)
- **LabReport**

EvaluationCriteria:

- **Viva**:7 marks
- **LabReport**:8marks
- **Demonstration**:20marks

Tasks:*(Chooseanyone)*

1. Using past temperature and humidity data, develop a simple algorithm to predicttomorrow's weather conditions (sunny, rainy, or cloudy). Implement your solution using Python and display the predicted outcome.
2. (a) Write down the steps involved in predicting the house price using Linear Regression
   (b) Implement the above procedure in Python using appropriate dataset.
3. (a) Write down the steps involved for Handwritten digit recognition using KNN
   (b) Implement the above procedure in Python using appropriate dataset.
4. (a) Write down the steps involved for Handwritten digit recognition using Gradient descent
   (b) Implement the above procedure in Python using appropriate dataset.
5. (a) Write down the steps involved in predicting disease using Linear Regression.
   (b) Implement the above procedure in Python using appropriate dataset.
6. (a) Write a Python program using KNN to classify different types of fruits based on features such as colour, size, and weight.
7. Implement KNN regression to predict the house prices from a dataset.

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MGU-UGP (HONOURS)

SECOND SEMESTER EXAMINATION

(2024 ADMISION ONWARDS)

MG2DSCIAM101 Automotive Systems for E- Vehicles

Duration: 2 hours **Maximum Marks:** 35

Practical Examination – Model Question Paper

Instructions:

- Demonstrate the given task. (Any one of the tasks listed below)
- Viva session (Minimum 5 questions from the Practical Module)
- Lab Report

Evaluation Criteria:

- Viva: 7 marks
- Lab Report: 8 marks
- Demonstration: 20 marks

Tasks: (Choose any one)

- ❖ Develop a comparator circuit using op-amp 741 (the reference voltage is 2V)
- ❖ Develop a zero-crossing detector using op-amp 741
- ❖ Develop an inverting amplifier using op-amp 741 to provide a gain 10
- ❖ Develop a non-inverting amplifier using op-amp 741 to provide a gain 11
- ❖ Develop a circuit which provides a DC output of 5V using W10 IC and Capacitor
- ❖ Develop a circuit to amplify the signal from LDR using op-amp 741

MAHATMA GANDHI UNIVERSITY, KOTTAYAM

MGU-UGP (HONOURS)

FIRST SEMESTER EXAMINATION

(2024 ADMISION ONWARDS)

MG2DSCMOS100 **- Foundation of Mobile Development Systems**

Duration: 2 hour **Maximum Marks: 35**

PracticalExamination–ModelQuestionPaper

Instructions:

- **Demonstrate**thegiventask
- **Viva session** (Minimum 5 questions from the PracticalModule)
- **LabReport**

EvaluationCriteria:

- **Viva**:7 marks
- **LabReport**:8 marks
- **Demonstration**:20marks

Tasks:

Dart programs*(Chooseanyone)*

1. A dart program to find a given number is odd or even

2. A dart program to find the given number is Armstrong or not

3. A dart program to find the sum of N numbers

4. A dart program to find the prime number series less than N

5. Write a dart program which will do the following tasks

   1.Create an empty list

   2. Add items to empty list

   3.Add an item in a specific location

   4.remove from list

   5.remove from specific location

6.Define a class Student with properties name, age, and grade. Create an object of the class and display the student's details.

7.Implement a Car class with attributes brand, model, and year. Add a method displayCarInfo() to show the car's details.

8.Create a Map to store student names as keys and their marks as values. Write a program to display all students who scored more than 75 marks.

9.Create a Map that stores country names as keys and their capital cities as value

10.Implement single inheritance: Create a Parent class with a method sayHello() and derive a Child class that calls this method.

Flutter programs*(Chooseanyone)*

1. A flutter program to display simple message using stateless widgets
2. A flutter program to Generate increment counter by pressing a button using statefull widgets
3. A flutter program to display an image using assets
4. Login Page with Form Validation & Styling

    Task: Create a Flutter login page with a form containing email and password fields.

    a.Implement validation (e.g., email format, password length).

    b.Style the text fields with curved borders.

    c.Add a styled login button.

5. List of Fruits with Detail Screen

    Task: Create a Flutter app that displays a list of fruits, each with an image and name.

    a.Clicking on a fruit should navigate to a new screen displaying the same fruit's details.

    b.Use a ListView.builder() to display the list dynamically.

6. Firebase Authentication (Basic)

    Task: Create a Flutter app that integrates Firebase Authentication.

    a.Allow users to sign up and log in with email and password.

    b.Display a welcome message after a successful login.

7. Fetch Data from API & Handle Errors

    Task: Use the https://jsonplaceholder.typicode.com/ API to fetch and display data in a Flutter app.

    a.Show a list of users/posts in a ListView.

    b.Implement error handling for failed API calls (e.g., show an error message).

8. UI Clone Task

    Task: Choose a simple UI design and replicate it in Flutter.

    It can be a login page, profile page, or any basic screen with proper layout and styling.

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SECOND SEMESTER EXAMINATION

(2024 ADMISSION ONWARDS)

MG2MDCECT100 - IoT based smart farming

Duration: 1½ hours Maximum Marks: 35

Practical Examination – Model Question Paper

Instructions:

- Demonstrate the given task(Any one of the tasks listed below)
- Viva session (Minimum 5 questions from the Practical Module)
- Lab Report/ Case study & field visit Report

Evaluation Criteria:

- Demonstration (Lab/ Presentation: 15 marks)
- Case Study& field visit report/ Lab report: 10 marks
- Viva: 10 marks

CHOOSE ANY ONE

1. Prepare a case study report /field visit report based on a simple hydroponic system using readily available materials.
2. Conduct a case study report/field visit report growth rate of plants in soil and a hydroponic system over two weeks and document your observations.
3. Furnish a case study report/field visit report on data collection from a soil moisture sensor in an agriculture farm.
4. Prepare a case study report/field visit report on automated drip irrigation using a soil moisture sensordata.
5. Conduct a case study report/field visit report crop monitoring system using a web cam / ESP 32 cam in a controlled environment and report the findings.
6. Prepare a case study report/ field visit report on any three advancedtechnologies used in the smart farm you visited.
7. Furnish a case study report/field visit report on the productivity and efficiency of a smart farm versus a conventional farm.
8. Conduct a case study report/field visit report on key advantages and challenges of implementing vertical farming in urban areas compared to traditional farming.
9. Prepare a case study report/field visit report on aquaponics integrating plant and fish farming to create a self-sustaining system, and what are the economic implications?
10. Furnish a case study report/field visit report on IoT-based UV bug trap function, and what are its advantages over conventional pest control methods?

11. Conduct a case study report/ field visit report on the challenges in implementing IoT-based UV bug traps in large-scale farming operations?
12. Write an Arduino program to blink an LED at a 1-second interval.
13. Develop an Arduino program to adjust the LED blink rate to 100 milliseconds on time and 1000 milliseconds off time.
14. Write an Arduino program to create an LED chaser effect with 6 LED.
15. Write an Arduino chaser program to reverse the direction of movement every 5 seconds.
16. Develop an Arduino program to blink an LED on when a push button is pressed and off when released.
17. Write an Arduino program to fade an LED state with a button press.
18. Write an Arduino program to blink an LED 15 times with a 1-second delay.
19. Write an Arduino program to cycle through red, green, and blue colors on an RGB LED.
20. Develop an Arduino program to mix colours and display purple, yellow, and cyan using RGB LED.
21. Write an ESP 32 program to increase the LED blink rate when a button is pressed remotely.
22. Write an ESP 32 program to toggle the LED state with a button press.
23. Write an ESP 32 program to simulate a basic traffic light system using an RGB LED remotely.
24. Develop an ESP 32 program to simulate a basic traffic light system using an RGB LED, including a pedestrian crossing delay by a wait button.
25. Write an ESP 32 program to send a notification on when an object is detected by an IR sensor.
26. Write an Arduino program to turn off the LED automatically after 5 seconds if no object is detected.