S–3133	Sub. Code
	23MEL1C1

M.Sc. DEGREE EXAMINATION, APRIL 2024

First Semester

Electronics

EMBEDDED SYSTEMS DESIGN WITH PIC

(CBCS – 2023 onwards)

Time : 3 Hours Maximum : 75 Marks

Part A (10 × 2 = 20)

Answer **all** questions.

1. Write short note on status register.
2. What is the difference between C and embedded C?
3. What do you mean by Port?
4. Draw the interfacing of seven segment display with PIC.
5. What is meant by ADC?
6. What is PWM programming?
7. What is Timer in PIC microcontroller?
8. What is Interrupt I/O?
9. What is UART?
10. Define Serial communication using PIC.

Part B (5 × 5 = 25)

Answer **all** questions, choosing either (a) or (b).

11. (a) Comment on PIC 18 Architecture.

Or

(b) Briefly explain about EEPROM data memory.

12. (a) Write LED blinking program.

Or

(b) Briefly explain about Seven segment display interfacing with PIC.

13. (a) Describe PIC18F ADC registers in detail.

Or

(b) Write short note on PWM for DC motor speed control.

14. (a) Explain Timer register configuration.

Or

(b) Briefly explain about PIC 18 Interrupts.

15. (a) Illustrate the PIC SPI module.

Or

(b) Write short note on PIC Bluetooth module interfacing with PIC.

Part C

$(3 \times 10 = 30)$

Answer any **three** questions.

16. Explain the embedded C programming data types in MikroC pro for PIC.

17. With neat diagram explain the 16 × 2 LCD interfacing with PIC.

18. Elaborate the PWM Duty cycle and PWM programming.

19. Describe about the working of PIC microcontroller timers.

20. Discuss about GPS module interfacing with PIC.

———————

S–3134	Sub. Code
	23MEL1C2

M.Sc. DEGREE EXAMINATION, APRIL 2024

First Semester

Electronics

DIGITAL COMMUNICATION SYSTEMS

(CBCS – 2023 onwards)

Time : 3 Hours Maximum : 75 Marks

Part A (10 × 2 = 20)

Answer **all** the questions.

1. What is Shannon Fano Coding?

2. Define Huffman Coding.

3. Write short note on Unipolar Line Coding.

4. Illustrate the Line Codes of Power Spectral Density.

5. Outline about Pulse Shaping network in communication system.

6. What is Nyquist Criterion?

7. What is the Theoretical Equation of Bit Error Rate?

8. Write a short note on Demodulation.

9. Summarize the Function of Cyclic Code.

10. How one can Encode the signal?

Part B (5 × 5 = 25)

Answer **all** the questions, choosing either (a) or (b).

11. (a) Describe the Operation of Discrete Memory less Channels.

Or

(b) Discuss the Digital Communication System with Suitable Illustration.

12. (a) What are the Properties of Linear Predicative Coding? Explain.

Or

(b) Illustrate the Adaptive Differential Pulse Code Modulation Waveform Coding.

13. (a) Explain the Operation of Eye Pattern in Baseband Transmission.

Or

(b) Differentiate the Receiving and Matching Filters Baseband Transmission.

14. (a) Explain the Geometric Representation of Signals.

Or

(b) Evaluate the principle of Differential Phase Shift Keying.

15. (a) Examine the Function of Hamming Codes with Examples.

Or

(b) With neat schematic explain Viterbi Decoder.

Part C

$(3 \times 10 = 30)$

Answer any **three** questions.

16. Explain the Function of Source Coding Theorem in Information Theory.

17. Examine the Transmitter and Receiver function of Adaptive Delta Modulation.

18. Describe the of Baseband Correlation Receiver Transmission Function.

19. Evaluate the Generation and Detection Function of Binary Phase Shift Keying.

20. With neat diagram, Inspect the Error Control Coding of Convolutional Codes with Relevant Examples.

———————

S–3135	Sub. Code
	23MEL1E1

M.Sc. DEGREE EXAMINATION, APRIL 2024

First Semester

Electronics

Elective – DIGITAL SIGNAL PROCESSING

(CBCS – 2023 onwards)

Time : 3 Hours Maximum : 75 Marks

Part A (10 × 2 = 20)

Answer **all** questions.

1. Write is sampling theorem?
2. What is discrete time systems?
3. Write short note on linear convolution.
4. Write about Radix-2 Inverse FFT.
5. Define Inverse Z Transform.
6. What is digital filters?
7. Write the properties of linear phase FIR filters.
8. Write about design of low pass Chebyshev filters.
9. Define Noise cancellation in DSP.
10. What is Adaptive system identification?

Part B (5 × 5 = 25)

Answer **all** questions, choosing either (a) or (b).

11. (a) Explain Anti aliasing filter.

Or

(b) Explain the LTI Invariant system.

12. (a) Describe about properties of DFT.

Or

(b) Write a short note on power and energy spectral density.

13. (a) Explain about Z transform.

Or

(b) Write about elements of digital filters.

14. (a) Illustrate about FIR filter structure.

Or

(b) Write a short note on design of low pass Chebyshev filters.

15. (a) Discuss about Adaptive prediction.

Or

(b) Write a short note on Adaptive Noise canceller.

Part C

$(3 \times 10 = 30)$

Answer any **three** questions.

16. With neat sketch explain DT deconvolution and correlation.

17. Explain about circular convolution and its implementation.

18. Explain about Transfer functions of a difference equation.

19. Discuss about design of low pass IIR Butterworth filters.

20. Explain about LMS Adaptive algorithm.

———————

S–3136	Sub. Code
	23MEL1E2

M.Sc. DEGREE EXAMINATION, APRIL 2024

First Semester

Electronics

Elective – DIGITAL TELEVISION ENGINEERING

(CBCS – 2023 onwards)

Time : 3 Hours Maximum : 75 Marks

Part A (10 × 2 = 20)

Answer **all** the questions.

1. What is TV Transmitter?

2. Summarize the details of Picture Resolution.

3. What are the function of Video Signals for Colours?

4. Write a short note on PAL Encoder Function.

5. Write short note on MPEG2 Transmission Standards.

6. Comment on DVB-T Transmission Standards

7. Discuss System Noise Performance in Digital TV.

8. List out the Basic Transmission Errors in Digital TV.

9. What is Signal Quantization Process in Digital TV.

10. Define Digital System Hardware in Digital TV.

Part B (5 × 5 = 25)

Answer **all** the questions, choosing either (a) or (b).

11. (a) Categories the Image Continuity and Interlaced Scanning Mode of TV pictures.

Or

(b) Explain the Operation of Standard BW Channel Signal Transmission.

12. (a) Describe the Process of Additive Colour Mixing in TV.

Or

(b) Elaborate the formation of Chrominance Signals in Colour TV.

13. (a) Explain ISDB-T Transmission Standards.

Or

(b) Explain Antenna Height and Power in Digital TV Transmission Standards.

14. (a) Analyze the Performance of Error Vector Magnitude in Digital TV.

Or

(b) Differentiate Interference and Co-channel Interference.

15. (a) Find the operation of Direct to Home Satellite Television.

Or

(b) Classify the Various Merits of Digital TV Receivers.

Part C

$(3 \times 10 = 30)$

Answer any **three** questions.

16. Explain the Horizontal and Vertical Signal Synchronization Process.

17. Explain the operation of PAL Colour Receiver with relevant illustrations.

18. Describe the Vestigial Sideband Modulation in Digital TV Transmission Standards.

19. Investigate the Transmitter Requirement of Analog to Digital TV.

20. Examine the Various Types and Operations of Matrix LEDs.

———————

S–3137	Sub. Code
	23MEL1E3

M.Sc. DEGREE EXAMINATION, APRIL 2024

First Semester

Electronics

Elective - FUNDAMENTALS OF PYTHON PROGRAMMING

(CBCS – 2023 onwards)

Time : 3 Hours Maximum : 75 Marks

Part A (10 × 2 = 20)

Answer **all** questions.

1. List few features of Python.
2. What are the data types available in python?
3. How do you access list in python?
4. What is slicing?
5. What is Frozenset in python?
6. Mention common python dictionary methods.
7. Define Scope of variable in python function.
8. Differentiate Python array and list.
9. Write short note on object in python.
10. What is Inheritance?

Part B (5 × 5 = 25)

Answer **all** questions, choosing either (a) or (b).

11. (a) Mention few applications of Python.

Or

(b) Briefly explain about File handling.

12. (a) What are the advantages of tuples in python? Explain.

Or

(b) Differentiate list and tuple in python.

13. (a) Explain about python ordered set.

Or

(b) Explain about loop through dictionary in python.

14. (a) Describe about functions in python.

Or

(b) Explain the operations of arrays in python.

15. (a) What is polymorphism in python? Explain.

Or

(b) Briefly explain about Python abstract class.

Part C (3 × 10 = 30)

Answer any **three** questions.

16. Elaborate data types and types of operators in python.

17. Explain about Tuple methods and advantages in python.

18. Describe about Set operations with example.

19. Illustrate about Loop structures in python.

20. Explain about Python Inheritance and its types.

———————

S–3138	Sub. Code
	23MEL1E4

M.Sc. DEGREE EXAMINATION, APRIL 2024

First Semester

Electronics

Elective – INSTRUMENTATION CONTROL TECHNIQUES

(CBCS – 2023 onwards)

Time : 3 Hours Maximum : 75 Marks

Part A (10 × 2 = 20)

Answer **all** the questions.

1. What are the Types of Errors Instrument Performance Characteristics?

2. Infer the Precision in Measurement.

3. What Hall Effect sensor does?

4. Write about Encoder.

5. What do you mean by data conversion?

6. List the different types of Amplifier.

7. List the types of DC Motor.

8. Write short note on AC Current.

9. What is Open Loop Control?

10. Define Control System.

Part B (5 × 5 = 25)

Answer **all** the questions, choosing either (a) or (b).

11. (a) Differentiate the Performance Characteristics of Instruments.

Or

(b) Examine the Dynamic Characteristics of measurement.

12. (a) Discuss the Performance of Hall Effect Sensor.

Or

(b) Discuss the Operation of Ultrasonic Sensors.

13. (a) Explain the Various Functions of Multiplexers.

Or

(b) Elucidate the process of Data Conversion for Data Acquisition.

14. (a) Describe the Basic Motor Construction with suitable illustration.

Or

(b) Discuss about Motor Breaking Functions.

15. (a) Give your comment on the Operation of Pressure Control System.

Or

(b) Classify the ways for tuning the Controllers for Process Control.

Part C

$(3 \times 10 = 30)$

Answer any **three** questions.

16. Explain the Following:
    (a) Accuracy
    (b) Resolution
    (c) Precision
    (d) Error

17. Distinguish the Inductive and Capacitive Proximity Switches in their operations.

18. Explain Instrumentation Amplifiers with examples.

19. Describe the construction of Permanent Magnet Stepper Motor.

20. Examine the process of Open and Closed Loop Controls.

———————

S–3139

Sub. Code
23MEL2C1

M.Sc. DEGREE EXAMINATION, APRIL 2024.

Second Semester

Electronics

EMBEDDED SYSTEM DESIGN WITH AVR

(CBCS – 2023 onwards)

Time : 3 Hours Maximum : 75 Marks

Part A (10 × 2 = 20)

Answer **all** questions.

1. Define Status register.
2. Write about memory allocation in C.
3. What is I/O bit'?
4. Write a note on LCD interfacing?
5. Write the advantages of TIMER 0, 1 and 2.
6. Write a note on interrupt priority.
7. What is RS232?
8. Write about 12C bus.
9. Compare ADC and DAC.
10. Define TWI programming.

Part B (5 × 5 = 25)

Answer **all** questions choosing either (a) or (b).

11. (a) Explain about AVR general purpose registers with diagrams.

Or

(b) Describe the time delay calculation in C.

12. (a) Write a LED blinking program of AVR.

Or

(b) Explain about stepper motor interfacing with AVR.

13. (a) Write about AVR interrupts.

Or

(b) Explain the PWM mode in timer 1 and 2.

14. (a) Write the principles of SN bus protocol.

Or

(b) Discuss the AVR TWI programming in C.

15. (a) Write a detailed note on relays and opto isolators interfacing.

Or

(b) Explain MAX 7221 interfacing and programming.

Part C

$(3 \times 10 = 30)$

Answer any **three** questions.

16. Explain :

    (a) AVR Data types.

    (b) AVR fuse bits.

17. Explain about I/O programming in C.

18. With neat sketch, write an interrupt program in C.

19. Explain the AVR serial port connection and programming.

20. Discuss the procedure of ADC interfacing with AVR.

———————

S–3140

Sub. Code
23MEL2C2

M.Sc. DEGREE EXAMINATION, APRIL 2024

Second Semester

Electronics

CMOS VLSI DESIGN

(CBCS – 2023 onwards)

Time : 3 Hours Maximum : 75 Marks

Part A (10 × 2 = 20)

Answer **all** questions.

1. What is CMOS?

2. Define the term HDL.

3. Write about layout designing rules.

4. Write a note on CMOS related CAD issues.

5. Explain the concepts of power dissipation.

6. Write about scaling.

7. What is low power logic?

8. List out the various debugging principles?

9. What is behavioral modeling?

10. Write about test benches?

Part B (5 × 5 = 25)

Answer **all** questions choosing either (a) or (b).

11. (a) Explain about CMOS logic.

Or

(b) Describe the VLSI design flow.

12. (a) Compare ideal and non-ideal I-V characteristics.

Or

(b) Explain the process enhancements of CMOS.

13. (a) Write about DELAY estimation.

Or

(b) Discuss about design margin.

14. (a) Write about CMOS dynamic circuits.

Or

(b) Describe the silicon debug principles.

15. (a) Write a detailed note on basic constructs.

Or

(b) Describe about structural primitives.

Part C

$(3 \times 10 = 30)$

Answer any **three** questions.

16. Explain the implementing steps in digital system design on FPGA.

17. Discuss about CMOS fabrication and layout rules.

18. What is interconnect, write its merits and demerits in various applications?

19. Explain the CMOS device manufacturing and testing principles.

20. Explain about finite state machines and list out its applications.

———————

S–3141	Sub. Code
	23MEL2E1

M.Sc. DEGREE EXAMINATION, APRIL 2024

Second Semester

Electronics

Elective – DIGITAL SIGNAL PROCESSOR PROGRAMMING AND APPLICATIONS

(CBCS – 2023 onwards)

Time : 3 Hours Maximum : 75 Marks

Part A (10 × 2 = 20)

Answer **all** questions.

1. State digital filters.
2. Identify the role of compensating filter.
3. Recite in detail about bus architecture and memory.
4. Memorize about pipelining.
5. Define CPU.
6. Summarize the interrupts.
7. Visualize the function of the memory interface.
8. Identify the concepts of CODEC.
9. Tell about the DSP support tools.
10. Record the FIR filter implementation.

Part B (5 × 5 = 25)

Answer **all** questions, choosing either (a) or (b).

11. (a) Categorize the purpose of digital signal processing systems.

Or

(b) Describe in detail the D/A conversation errors.

12. (a) Classify the role of the address generation unit.

Or

(b) Interpret the hardware architecture.

13. (a) Establish the working value of the bus structure.

Or

(b) Illustrate the characteristics of memory space organization.

14. (a) Discuss in details the wait states.

Or

(b) Examine the purpose of McBSP.

15. (a) Show the principles of the DSP system design kit.

Or

(b) Focus the role of C/C^{++} compiler.

Part C

$(3 \times 10 = 30)$

Answer any **three** questions.

16. Distinguish the operation of DSP computational errors.

17. Analyze the concepts about features for external interfacing.

18. Categorize the working model of on-chip peripherals.

19. Illustrate the categories of synchronous serial interface.

20. Examine the principle of code composition in studio.

———————

S–3142	Sub. Code
	23MEL2E2

M.Sc. DEGREE EXAMINATION, APRIL 2024

Second Semester

Electronics

Elective — FIBER OPTICS COMMUNICATION

(CBCS – 2023 onwards)

Time : 3 Hours Maximum : 75 Marks

Part A (10 × 2 = 20)

Answer **all** questions.

1. Write the advantages of optical communication?
2. What is graded index?
3. Write about optical materials.
4. What is laser diode?
5. Explain about APD.
6. Write the advantages of digital transmission.
7. Define the term fiber to fiber joints.
8. List out the uses of single mode fiber.
9. What is P-P links?
10. Write about attenuation.

Part B (5 × 5 = 25)

Answer **all** questions, choosing either (a) or (b).

11. (a) Explain about wave guide and its advantages.

Or

(b) Describe the principles of step index fibers.

12. (a) How do you calculate the quantum efficiency? Explain.

Or

(b) Explain the term resonant frequency.

13. (a) Write about detector response tine.

Or

(b) How do you calculate the probability error?

14. (a) Write about the coupling between laser diode and fiber with diagrams.

Or

(b) Describe the various losses in fiber.

15. (a) Write a detailed note on power budget.

Or

(b) Describe about eye pattern.

Part C

$(3 \times 10 = 30)$

Answer any **three** questions.

16. Explain the ray theory transmission in detail.

17. Discuss about various optical sources and its efficiency.

18. What is optical receiver? Explain in detail.

19. Explain about power coupling and power launching with examples.

20. With neat diagrams, explain the line coding in optical links.

———————

S–3143

Sub. Code
23MEL2E3

M.Sc. DEGREE EXAMINATION, APRIL 2024

Second Semester

Electronics

Elective – ARTIFICIAL INTELLIGENCE : MACHINE AND DEEP LEARNING

(CBCS – 2023 onwards)

Time : 3 Hours Maximum : 75 Marks

Section A (10 × 2 = 20)

Answer **all** questions.

1. Define Machine Learning.
2. What are the advantages of Reinforcement Learning?
3. Define Random Forest algorithm.
4. What is the basic concept of K-Means Clustering?
5. What is the primary need for Deep Learning?
6. What is the advantage of Multi layer Perceptron over Single Layer Perceptron?
7. What is the role of Activation function in Neural Networks?
8. What are the features of Feed Forward Neural Networks?
9. Define Recurrent Neural Networks.
10. What are the features of Tensor Flow?

Section B (5 × 5 = 25)

Answer **all** questions choosing either (a) or (b).

11. (a) Describe about Semi supervised Learning.

Or

(b) List the open source datasets for Machine Learning.

12. (a) Describe about Regression in Machine Learning.

Or

(b) Elucidate the function of Support Vector Machine algorithm.

13. (a) Differentiate between Biological Neural Network and Artificial Neural Network.

Or

(b) Describe about Perceptron Neural Network.

14. (a) Describe the features of Artificial Neural Networks.

Or

(b) Illustrate the structure of Back propagation Neural Networks.

15. (a) Evaluate the functions of Convolutional Neural Networks.

Or

(b) Discuss about Image Segmentation methods using Neural Networks.

Section C

$(3 \times 10 = 30)$

Answer any **three** questions.

16. Discuss about gathering datasets for Machine Learning.

17. Elucidate about classification using Decision Tree algorithm.

18. Illustrate the operation of Deep Learning networks with example.

19. Explain the structure of Artificial Neural Networks.

20. Explain about Deep Learning with Tensor Flow using MNIST dataset.

———————

S–3144	Sub. Code
	23MEL2E4

M.Sc. DEGREE EXAMINATION, APRIL 2024.

Second Semester

Electronics

Elective – PC-BASED INSTRUMENTATION

(CBCS – 2023 onwards)

Time : 3 Hours Maximum : 75 Marks

Part A (10 × 2 = 20)

Answer **all** the questions.

1. List out the applications of flow sensor.

2. Write the output voltage expression for inverting amplifier.

3. State accuracy.

4. Define ADC in signal processing.

5. List out the components in Motherboard.

6. Define ISA Bus.

7. Define serial communication and its role in data acquisition.

8. Expand: GPIB, SCPI.

9. State HART features.

10. Write the advantages of using field buses in data acquisition.

Part B (5 × 5 = 25)

Answer **all** questions, choosing either (a) or (b).

11. (a) Discuss the importance of noise reduction techniques in data acquisition.

Or

(b) Analyze the factors influencing the selection of sensors for specific applications.

12. (a) Describe the function of networked data acquisition system.

Or

(b) Illustrate the operation of successive approximation ADC.

13. (a) Illustrate the process of interfacing an ADC board with an IBM PC.

Or

(b) Explain the features and performance of ISA bus.

14. (a) Explain the concept of GPIB handshake protocol.

Or

(b) Evaluate the performance of RS 232 serial interface standard.

15. (a) Discuss about the digital network data communication.

Or

(b) Explain the significance of MODBUS in networked data acquisition.

Part C

$(3 \times 10 = 30)$

Answer any **three** questions.

16. Discuss about the working principle of electrical type pressure sensor.

17. Discuss the role of digital to analog converters in signal processing.

18. Analyze the evolution of PC expansion buses from ISA to PCI.

19. Evaluate the feature and performance of different serial interface standards.

20. Explain the concept of OSI model and their role in data acquisition system.

———————

S–3145

Sub. Code
23MEL2S1

M.Sc. DEGREE EXAMINATION, APRIL 2024

Second Semester

Electronics

DATA SCIENCE FOR RESEARCH WITH PYTHON

(CBCS – 2023 onwards)

Time : 3 Hours Maximum : 75 Marks

Part A (10 × 2 = 20)

Answer **all** the questions.

1. Define Data Science.
2. What are the elements of Structured data?
3. Define Sample bias.
4. What is the advantage of Poisson distribution?
5. Define the term “ANOVA”.
6. State the features of Logistic Regression.
7. State the different scales of Data.
8. Define Data Visualization.
9. Define Precision.
10. What is Supervised data compression?

Part B (5 × 5 = 25)

Answer **all** questions choosing either (a) or (b).

11. (a) Describe about estimates of Location.

Or

(b) Describe about Correlation.

12. (a) Elucidate about Selection Bias.

Or

(b) Illustrate about Exponential Distribution.

13. (a) Describe about Hypothesis tests.

Or

(b) Describe about Chi- Square Test.

14. (a) Describe about Data Representation.

Or

(b) Elucidate about Functional approach of Data Visualization.

15. (a) Differentiate between about Training and Testing Data.

Or

(b) Illustrate the Hierarchical Cluster Analysis method in detail.

Part C $(3 \times 10 = 30)$

Answer any **three** questions.

16. Describe the method of exploring Data distribution.

17. Illustrate about Binomial Distribution method.

18. Explain about Polynomial and Spline Regression.

19. Explain about Data Transformation in detail.

20. Analyze the K-Means Clustering method in detail.

———————