S–3279

Sub. Code
23MEL4C1

M.Sc. DEGREE EXAMINATION, APRIL 2026

Fourth Semester

Electronics

NANO ELECTRONICS

(CBCS – 2023 onwards)

Time : 3 Hours Maximum : 75 Marks

Part A (10 × 2 = 20)

Answer **all** questions.

1. Write a note on NANO ELECTRONICS.
2. What is mean by eigenvalues?
3. Write about bond?
4. List out the application of carbon nanomaterial.
5. Define the term crystal growth.
6. Define the word laser ablation.
7. Write the merits of quantum dots.
8. What is length scale?
9. What is resonant?
10. Justify the word Nano electromechanical.

Part B (5 × 5 = 25)

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

11. (a) Explain the top-down approach.

Or

(b) Write about independent Schardinger's equation and justify it.

12. (a) Describe the indirect band gap of semiconductor.

Or

(b) Explain about carbon nanotubes in detail.

13. (a) Explain about epitaxy growth.

Or

(b) With examples, explain self-assembly of nanostructures.

14. (a) Write a detailed note on electron transport in nanostructure.

Or

(b) Describe quantum well.

15. (a) Write a detailed note on single electron transistor.

Or

(b) Explain about nano electrochemical system devices.

Part C

(3 × 10 = 30)

Answer any **three** questions.

16. With neat sketch, write about Eigen functions.

17. Derive the band structure of semiconductor.

18. Discuss the CVD method with diagrams.

19. Explain about electronic quantum wires with examples.

20. Illustrate the tunnel diode construction and its advantages.

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S–3280

Sub. Code
23MEL4C2

M.Sc. DEGREE EXAMINATION, APRIL 2026

Fourth Semester

Electronics

WIRELESS COMMUNICATION SYSTEMS

(CBCS – 2023 onwards)

Time : 3 Hours Maximum : 75 Marks

Part A (10 × 2 = 20)

Answer **all** questions.

1. Define Wireless Communication Systems.

2. Mention two advantages of using WLL over Wired Local Loops.

3. What is frequency reuse?

4. What is the role of the Mobile Switching Center (MSC)?

5. What are the effects of Reflection in Cellular Communication?

6. Define Link Budget.

7. Define Multipath Channel.

8. What is Small Scale fading in Wireless Channels?

9. Mention the advantages of FHMA.

10. Define Cellular CDMA.

Part B (5 × 5 = 25)

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

11. (a) Describe the operation of Cordless Telephone Systems.

Or

(b) Discuss about the advantages of 3G Wireless Network.

12. (a) Illustrate about different Hand off strategies.

Or

(b) Discuss about Trunking and Grade of Service.

13. (a) Describe about Scattering in Cellular Communication.

Or

(b) Describe the concept and structure of Indoor Propagation models.

14. (a) Inspect about Impulse Response Model of Multipath Channel.

Or

(b) Examine about Rayleigh Distribution.

15. (a) Discuss about the features of Reservation ALOHA.

Or

(b) Analyze the Capacity of CDMA with multiple cells.

Part C

(3 × 10 = 30)

Answer any **three** questions.

16. Explain the architecture of Cellular Telephone Systems.

17. Elucidate about Interference and System Capacity.

18. Examine about Ray Tracing and Site Specific Modeling.

19. Describe about Small Scale Multipath Measurement.

20. Analyze the architecture and functions of CSMA with diagram.

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S–3281

Sub. Code
23 MEL4E1

M.Sc. DEGREE EXAMINATION, APRIL 2026

Fourth Semester

Electronics

Elective — BIOMEDICAL SIGNAL AND IMAGE PROCESSING

(CBCS – 2023 onwards)

Time : 3 Hours Maximum : 75 Marks

Part A (10 × 2 = 20)

Answer **all** questions.

1. Define the word ECG signal.

2. What is the use of frequency domain?

3. Write about BCI.

4. What is the use of wavelet transformation?

5. What is preprocessing of CT?

6. Write about GOBAR filter.

7. List out the image enhancement methods.

8. What is dilation?

9. Write about histogram.

10. Write the disadvantages of finger print.

Part B (5 × 5 = 25)

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

11. (a) Analysis about ECG electrode placement.

Or

(b) Explain the frequency domain analysis in detail.

12. (a) Explain the EEG signal acquition.

Or

(b) Describe the EEG signal preprocessing using adaptive filtering.

13. (a) Explain the operation of CT detector with diagrams.

Or

(b) Describe about BLOB analysis.

14. (a) Write the advantages and disadvantages of diffusion filter.

Or

(b) Describe the term threshold with bounding box.

15. (a) Write a note on finger print recognition.

Or

(b) Explain about finger print extraction.

Part C

(3 × 10 = 30)

Answer any **three** questions.

16. Illustrate the ECG time domain analysis in detail.

17. Discuss about signal extraction using FFT.

18. Explain the functional block diagram of CT scanner.

19. Explain the MRI preprocessing using Gaussian filter.

20. With examples explain about finger print segmentation.

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S–3282

Sub. Code
23MEL4S1

M.Sc. DEGREE EXAMINATION, APRIL 2026

Fourth Semester

Electronics

BIOMEDICAL SENSORS

(CBCS – 2023 onwards)

Time : 3 Hours Maximum : 75 Marks

Part A (10 × 2 = 20)

Answer **all** questions.

1. What is sensor?

2. Illustrate the classifications of sensors?

3. Write a note on resistance sensor?

4. What is thermo electric sensor?

5. Write the principle of chemical sensor?

6. What is chemical sensor network?

7. Justify the term resolution?

8. Define the image sensor.

9. Write about WSN.

10. Write the application of sensor fusion.

Part B (5 × 5 = 25)

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

11. (a) Explain the characteristics of biomedical sensors.

Or

(b) Describe the biocompatibility design of sensors.

12. (a) Write about capacitive sensor.

Or

(b) Explain about magneto electric sensor in detail.

13. (a) Describe ion sensor.

Or

(b) With diagrams, explain the gas sensor.

14. (a) Write the parameters used for direction, position and speed sensing.

Or

(b) Discuss the line encoder with diagrams.

15. (a) Write a detailed note on advantages and application of WSN.

Or

(b) Explain the energy management in WSN.

Part C

(3 × 10 = 30)

Answer any **three** questions.

16. With examples, explain the micro fabrication of biomedical sensors.

17. Discuss the piezo electric sensor in detail.

18. With neat sketch, write about humidity sensor and its advantages.

19. Design a Hall Effect sensor with parameters.

20. Discuss the MEMS material and fabrication.

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