F–9407	Sub. Code
	7MEL2C1

M.Sc. DEGREE EXAMINATION, APRIL 2023

Second Semester

Electronics

DISCRETE TIME SYSTEMS AND SIGNAL PROCESSING

(CBCS – 2017 onwards)

Time : 3 Hours Maximum : 75 Marks

Part A $(10 \times 2 = 20)$

Answer **all** questions.

1. What are the different types of signal representation?

2. What is an LTI System?

3. Define discrete fourier series.

4. What is region of convergence (ROC)?

5. State sampling theorem.

6. What is aliasing?

7. What is Zero padding?

8. Define DFT.

9. What is an IIR filter?

10. What is the reason that FIR filter is always stable?

Part B (5 × 5 = 25)

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

11. (a) Explain the Energy signal with example.

Or

(b) Explain time variant and time invariant systems with example.

12. (a) Explain any two properties of the discrete fourier series.

Or

(b) Determine the Discrete Fourier transform of the signal. $X(n) = \{1,-2,3,4\}$.

13. (a) Explain the periodic sampling.

Or

(b) Explain the continuous time processing of discrete time signals.

14. (a) Find the IDFT of $X(k) = \{1,0,1,0\}$.

Or

(b) Find the linear convolution of the two sequences $x(n) = (1,1,-1,-1)$ and $h(n) = (1,-1,2,1)$.

15. (a) Explain the design method for kaiser window filter.

Or

(b) Explain the design procedure of IIR filter.

Part C

$(3 \times 10 = 30)$

Answer any **three** questions.

16. Discuss the basic operation on Discrete Time Signal.

17. Explain the Region of convergence.

18. Discuss changing the sampling rate using discrete time processing.

19. Compute a 4–point DFT of the sequence $x(n) = \{0,1,2,3\}$. .

20. Discuss the linear phase FIR low pass filter.

———————

F–9408	Sub. Code
	7MEL2C2

M.Sc. DEGREE EXAMINATION, APRIL 2023

Second Semester

Electronics

VLSI DESIGN

(CBCS – 2017 onwards)

Time : 3 Hours Maximum : 75 Marks

Part A $(10 \times 2 = 20)$

Answer **all** the questions.

1. What are the three regions of operation of a MOS transistor?

2. Define Silicon on Insulator (SOI).

3. Define critical paths in a logic design.

4. Draw the CMOS inverter model for static power dissipation.

5. What is Domino Logic?

6. Define C^2MOS.

7. What are the test fixtures?

8. What is the major challenge in silicon debugging?

9. What is concatenation operator?

10. What are the tri-state primitives?

Part B (5 × 5 = 25)

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

11. (a) What is body effect? How does it influence the threshold voltage of a MOS transistor?

Or

(b) Write a short note on technology–related CAD issues.

12. (a) Discuss the delay in multistage logic networks.

Or

(b) Explain about the constant field scaling.

13. (a) With a neat diagram explain the pseudo–nMOS inverter.

Or

(b) Explain the state retention registers.

14. (a) Explain the need for CMOS testing.

Or

(b) Describe the boundary scan architecture.

15. (a) Write about the initial statement with a suitable example.

Or

(b) Write a note on switch level modeling.

Part C

$(3 \times 10 = 30)$

Answer any **three** questions.

16. Explain the various stages of CMOS technologies in detail.

17. Describe the reliability problems that cause permanent functional issues in CMOS ICs.

18. Explain the static sequencing methods of combinational logic with neat diagrams.

19. Describe the following testing approaches:

    (a) Ad hoc testing (b) Scan–based testing.

20. Write an HDL code for ripple counter using dataflow statements.

———————

F–9409

Sub. Code
7MEL2C3

M.Sc. DEGREE EXAMINATION, APRIL 2023

Second Semester

Electronics

AVR MICROCONTROLLER AND EMBEDDED SYSTEM

(CBCS – 2017 onwards)

Time : 3 Hours Maximum : 75 Marks

Part A $(10 \times 2 = 20)$

Answer **all** questions.

1. Expand AVR microcontroller.
2. Explain status register
3. What is IDE? Explain
4. List the uses of WDR Register.
5. What is the need of timers in Embedded systems?
6. What is the use of interrupts?
7. Name the pins used for SPI bus protocols.
8. Expand I2C.
9. What is the frequency used in DS1307 RTC interfacing?
10. What is the usage of Hex file.'?

Part B (5 × 5 = 25)

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

11. (a) Write short notes on data memory.

Or

(b) List the arithmetic and logic instruction in AVR and explain any four instructions.

12. (a) Give a brief notes on I/O functions in AVR.

Or

(b) Write a delay program to produce 1 sec delay using C program.

13. (a) Discuss interrupts in AVR microcontroller.

Or

(b) Write short notes on PWM modes in 8 bit timers.

14. (a) Discuss briefly on SPI bus protocol.

Or

(b) Explain in detail ATMEGA32 connection with RS232.

15. (a) With neat diagram explain ADC interfacing.

Or

(b) Write an program to control the speed of DC motor using PWM.

Part C

$(3 \times 10 = 30)$

Answer any **three** questions.

16. Draw architecture of AVR microcontroller and explain each block.

17. Explain How AVR studio IDE used for Developing C programs

18. With necessary steps explain delay generation Using timer1 mode register

19. With Timing diagram explain I2C bus protocol

20. Explain keyboard interfacing in AVR microcontroller with appropriate diagram.

———————