F–1955

Sub. Code
7MEL2C1

M.Sc. DEGREE EXAMINATION, APRIL 2019

Second Semester

Electronics

DISCRETE TIME SYSTEMS AND SIGNAL PROCESSING

(CBCS – 2017 onwards)

Time : 3 Hours Maximum : 75 Marks

Part A (10 × 2 = 20)

Answer **all** questions.

1. Give the classification of signals and explain each.

2. What are symmetric and non-symmetric signals?

3. Define DFT of a discrete time sequence.

4. Find the Z-transform of a
   (a) digital impulse
   (b) digital step.

5. What is meant by periodic sampling?

6. What is aliasing?

7. What is meant by radix-2 FFT?

8. What is meant by discrete cosine transform?

9. What are the types of digital filter according to their impulse response?

10. What are advantages of FIR filter?

Part B $(5 \times 5 = 25)$

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

11. (a) Explain about unit step and unit ramp sequence with example.

Or

(b) Write down the properties of convolution.

12. (a) List the properties of Discrete time Fourier transform.

Or

(b) Find the Z-transform of the following sequences:

$x(n) = (0.5)^n u(n) + u(n-1)$

$x(n) = \delta(n-5)$.

13. (a) Explain about changing the sampling rate using discrete time processing.

Or

(b) Explain the process of reconstruction of a signal from its sample.

14. (a) Compute linear convolution of the two sequences $x_1(n) = \{1, 2, 4\}$ and $x_2(n) = \{1, 2\}$ using DFT and IDFT.

Or

(b) Explain the implementation of DFT using convolution in detail.

15. (a) Write a brief note on high pass filter and band pass filter.

Or

(b) Design a digital low pass filter using Bilinear transformation, Given that $Ha(s) = \frac{1}{(s+1)(s+1.732\,s+1)}$. Assume sampling frequency of 100 rad/sec.

Part C (3 × 10 = 30)

Answer any **three** questions.

16. What is recurrence equation? Discuss the input-output behavior of discrete time processors in time domain.

17. Give the analysis of LTI discrete time systems using discrete time Fourier transform with an example.

18. Describe about continuous time processing of discrete time signals with example.

19. Explain about Fast Fourier transform with an example.

20. Describe the method of discrete time IIR filter design from continuous time filters.

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F–1956

Sub. Code
7MEL2C2

M.Sc. DEGREE EXAMINATION, APRIL 2019

Second Semester

Electronics

VLSI Design

(CBCS – 2017 onwards)

Time : 3 Hours Maximum : 75 Marks

Part A (10 × 2 = 20)

Answer **all** questions.

1. What are the advantages of CMOS process?
2. What are the Non ideal I-V effects?
3. Why does interconnect increase the circuit delay?
4. Define the power Dissipation.
5. Enumerate the features of synchronizers.
6. What is the difference between channeled gate array and channel less gate array?
7. What do you meant by text fixtures?
8. Mention the levels at which testing of a chip can be done?
9. In Behavioral modeling specify the two most basic statements.
10. Write a verilog module for half adder.

Part B (5 × 5 = 25)

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

11. (a) Explain various CAD tool sets.

Or

(b) Explain briefly CMOS process enhancements.

12. (a) Explain about rc delay model.

Or

(b) Write short notes on scaling and device models.

13. (a) Explain the problem of metastability with neat diagram and expressions.

Or

(b) Design a transistor level schematic of the one bit full adder circuit and explain.

14. (a) Explain the boundary scan techniques.

Or

(b) Explain Silicon debug principles.

15. (a) Explain Gate level modelling with a Suitable example.

Or

(b) Write a data-flow model verilog HDL program for the two input comparator circuit.

Part C (3 × 10 = 30)

Answer any **three** questions.

16. Discuss the steps involved in IC fabrication process.

17. Explain static and dynamic CMOS designs.

18. Explain detail circuit design for latches.

19. With the help of IEEE1 1149 BSA and TAPA explain the system level test technique.

20. Design and develop a HDL project in structural model to realize the Priority encoder.

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F–1957

Sub. Code
7MEL2C3

M.Sc. DEGREE EXAMINATION, APRIL 2019

Second Semester

Electronics

AVR MICROCONTROLLER AND EMBEDDED SYSTEM

(CBCS – 2017 onwards)

Time : 3 Hours Maximum : 75 Marks

Part A (10 × 2 = 20)

Answer **all** questions.

1. Write instructions to add the values 0x16 and 0xCD. Place the result in R19 register.

2. What is scratchpad?

3. What is union?

4. Give the block diagram of control flow.

5. What is prescaler? How is it used?

6. What is programming timer interrupts?

7. What is asynchronous serial transmission?

8. What is the difference between single duplex and full duplex serial communication system?

9. What is a stepper motor?

10. What do you meant by optoisolator?

Part B $(5 \times 5 = 25)$

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

11. (a) Explain the structure of AVR assembly language program with an example.

Or

(b) Write notes on I/O port programming.

12. (a) Write short notes on time delays in C.

Or

(b) Explain about data conversion program in C.

13. (a) Explain about interrupt priority.

Or

(b) How will generate wave using timer 1? Explain.

14. (a) Explain basic of serial communication in detail.

Or

(b) Explain about 12C Bus protocol with an illustration.

15. (a) Explain about DAC interfacing with AVR.

Or

(b) Explain the DC motor control using PWM.

Part C (3 × 10 = 30)

Answer any **three** questions.

16. Discuss the features of RISC architecture.

17. Discuss about Data serialization and memory allocation in C.

18. Discuss about PWM modes in 8 bit timers.

19. Discuss about AVR serial port programming in C using interrupts.

20. Describe MAX7221 interfacing and programming with neat diagram.

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