

Hall Ticket Number :

**R-17**

**Code: 7G16D**

III B.Tech. II Semester Supplementary Examinations May/June 2022

**Object Oriented Programming Concepts**

(Common to EEE & ECE)

Max. Marks: 70

Time: 3 Hours

Answer any five full questions by choosing one question from each unit (5x14 = 70 Marks)

\*\*\*\*\*

Marks

**UNIT-I**

1. Explain the following Concepts with suitable syntaxes & examples. 14M  
i. Class ii. Object iii. Pointer iv. Array v. Destructor

**OR**

2. a) What is an array? How arrays are declared and initialized? Explain with examples. 7M  
b) Explain the features of Object Oriented Programming and mention the benefits of OOP over structured programming. 7M

**UNIT-II**

3. a) Write short notes on followings. 8M  
i. friend Function ii. virtual function  
b) What is operator overloading? Write a program to overload the + operator. 6M

**OR**

4. a) Explain the conditional statements in detail. 8M  
b) Explain 'this' pointer with an example program. 6M

**UNIT-III**

5. a) Define Class & Object in Java? Explain with suitable example. 7M  
b) Write a java program to print first N Fibonacci Series using While loop. 7M

**OR**

6. a) Write the structure of java program. 6M  
b) Mention the five types of tokens in Java. Explain the derived data types in Java. 8M

**UNIT-IV**

7. a) What are exceptions in Java? Write about the common exceptions that occur in Java. 7M  
b) What is meant by inheritance? How can you achieve multiple-inheritance in Java 7M

**OR**

8. a) Discuss the process of throwing own exceptions in java. 8M  
b) Explain the various access specifiers are used in java. 6M

**UNIT-V**

9. a) Define Applet. Write a java program to create simple Applet in java. 7M  
b) What is multithreading? Explain the process of creation of a thread in java. 7M

**OR**

10. a) What are the stages in Thread life cycle? Explain them in detail. 8M  
b) Write short note on Streams in java. 6M

\*\*\*

Hall Ticket Number :										
----------------------	--	--	--	--	--	--	--	--	--	--

<b>R-17</b>
-------------

**Code: 7G365**

III B.Tech. II Semester Supplementary Examinations May/June 2022

**Radar Engineering**

(Electronics and Communication Engineering)

Max. Marks: 70

Time: 3 Hours

Answer any five full questions by choosing one question from each unit (5x14 = 70 Marks)

\*\*\*\*\*

Marks

**UNIT-I**

1. Derive the radar equation in terms of minimum detectable power and gains of transmitting and receiving antenna. 14M

**OR**

2. a) Discuss about the integration of radar pulses in detail 7M  
b) List major applications of radar 7M

**UNIT-II**

3. a) Explain the block diagram of sinusoid ally modulated FMCW radar and explain the function of each block 8M  
b) List and explain the applications of CW radar 6M

**OR**

4. a) Calculate the Doppler frequency of stationary CW radar transmitting at 6 MHz frequency when a moving target approaches the radar with a radial velocity of 100 kmph 8M  
b) List out the possible errors for measurement of altitudes accurately using a FM- CW altimeter. 6M

**UNIT-III**

5. a) Define Blind Speed and what the use of delay line cancellor 7M  
b) Describe the method of staggering pulse repetition frequency to reduce the effect of blind speeds in an MTI system 7M

**OR**

6. a) Compare MTI and pulse Doppler radar. 7M  
b) Discuss the factors limiting the performance of an MTI system 7M

**UNIT-IV**

7. a) Explain about acquisition and scanning patterns 7M  
b) Why does a tracking radar have poor accuracy at low elevation angles? Explain 7M

**OR**

8. a) Describe the operation of conical scan with the help of neat block diagram 8M  
b) Compare and contrast conical scan and sequential lobing type tracking techniques. 6M

**UNIT-V**

9. Define Noise figure, Noise temperature. How is noise figure measured? Derive an expression for the noise figure of a network in cascade. 14M

**OR**

10. a) Arrange the block diagram of Cross-correlation receiver and explain. 7M  
b) Derive the frequency response function of matched filter with nonwhite noise 7M

\*\*\*

Hall Ticket Number :										
----------------------	--	--	--	--	--	--	--	--	--	--

<b>R-17</b>
-------------

**Code: 7G361**

III B.Tech. II Semester Supplementary Examinations May/June 2022

**VLSI Design**

(Electronics and Communication Engineering)

Max. Marks: 70

Time: 3 Hours

Answer any five full questions by choosing one question from each unit (5x14 = 70 Marks )

\*\*\*\*\*

Marks

**UNIT-I**

- 1. a) Explain the processing steps used in IC fabrication process. 8M
- b) List the differences among nMOS, CMOS and BiCMOS. 6M

**OR**

- 2. a) Explain the MOS Transistor operation with the help of neat sketches in the Depletion mode. 7M
- b) Derive the expression for the threshold voltage of MOSFET 7M

**UNIT-II**

- 3. Explain the steps of VLSI design flow. 14M

**OR**

- 4. Design the three input NAND gate layout for NMOS and CMOS logic and compare. 14M

**UNIT-III**

- 5. Discuss about area capacitances of MOS layers and give area capacitance calculations with suitable examples. 14M

**OR**

- 6. a) Explain briefly about Resistive inter-connect delay and RC Tree delay. 8M
- b) Explain about switch logic 6M

**UNIT-IV**

- 7. Design an array multiplier. Discuss the merits and demerits with an example. 14M

**OR**

- 8. Explain the architecture of FPGA and CPLD. 14M

**UNIT-V**

- 9. Explain the importance of design verification and design capture tools used for VHDL synthesis. 14M

**OR**

- 10. a) Compare Two phase clocking system with single phase clocking system. 6M
- b) What is meant by Signal Skew and Clock Skew for Sequential Machine explain. 8M

\*\*\*

Hall Ticket Number :										
----------------------	--	--	--	--	--	--	--	--	--	--

<b>R-17</b>
-------------

**Code: 7G364**

III B.Tech. II Semester Supplementary Examinations May / June 2022

**Digital Signal Processing**

(Electronics and Communication Engineering)

Max. Marks: 70

Time: 3 Hours

Answer any five full questions by choosing one question from each unit (5x14 = 70 Marks)

\*\*\*\*\*

Marks

**UNIT-I**

- 1. a) Determine the impulse response  $h(n)$  for the system described by the second order difference equation  $y(n) - 4y(n-1) + 4y(n-2) = x(n-1)$  7M
- b) Find the magnitude and phase response for the system characterized by the difference equation  $y(n) = \frac{1}{2}x(n) + x(n-1) + \frac{1}{2}x(n-2)$  7M

**OR**

- 2. a) Discuss the concept of stability and causality with examples. 7M
- b) Explain the properties of DFT 7M

**UNIT-II**

- 3. a) Compute 4-point DFT of a sequence  $x(n) = \{0, 1, 2, 3\}$  using DIT algorithm 7M
- b) Find the IDFT of the sequence using DIF algorithm 7M
- $X(k) = \{10, -2-j2, -2, -2+j2\}$

**OR**

- 4. a) Compute 8-point DFT of a sequence  $x(n) = \{1, 0, 2, 0, 3, 0, 4, 0\}$  using DIT algorithm 10M
- b) Write the steps involved in computing FFT for composite N 4M

**UNIT-III**

- 5. a) List the features of Blackman window spectrum. 7M
- b) Justify the statement IIR filter is less stable and give reason for it. 7M

**OR**

- 6. For the given specifications design an analog Butterworth filter. 14M
- $0.9 \leq |H(j\Omega)| \leq 1$  for  $0 \leq \Omega \leq 0.2\pi$
- $|H(j\Omega)| \leq 0.2$  for  $0.4\pi \leq \Omega \leq \pi$

**UNIT-IV**

- 7. a) Explain interpolation process with an example. 5M
- b) Explain with block diagrams how can sampling rate be converted by a rational factor  $M/L$  both in time domain and frequency domain. 9M

**OR**

- 8. Explain in brief about Multistage implementation of Sampling rate conversion. 14M

**UNIT-V**

- 9. a) Discuss about oversampling of A/D Converter 7M
- b) Explain the process of signal compression and decompression 7M

**OR**

- 10. Explain about various steps followed in signal compression. 14M

\*\*\*

Hall Ticket Number :																			
----------------------	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

<b>R-17</b>
-------------

**Code: 7G363**

III B.Tech. II Semester Supplementary Examinations May/June 2022

**Microprocessors and Interfacing**

(Electronics and Communication Engineering)

Max. Marks: 70

Time: 3 Hours

Answer any five full questions by choosing one question from each unit (5x14 = 70 Marks)

\*\*\*\*\*

Marks

**UNIT-I**

- 1. a) Discuss all the general purpose registers available in 8086 $\mu$ P. 7M
- b) Write an 8086 ALP to perform signed Multiplication of two 8-bit numbers. 7M

**OR**

- 2. a) Describe Intel 8086 Microprocessor Architecture. 7M
- b) Illustrate the following instructions with suitable examples: 7M
  - i) XLAT ii) MUL iii) CWD iv) DAA v) SCASB vi) SHL vii) IN

**UNIT-II**

- 3. a) Draw and explain Pin diagram of 8086 with its Flag features. 7M
- b) Compare between I/O Interfacing Methods. 7M

**OR**

- 4. a) With a diagram, explain about maximum mode operation of 8086. 7M
- b) Discuss about mode control word to program 8257 with an example 7M

**UNIT-III**

- 5. a) What are the internal devices and operating modes of 8255? 7M
- b) List some of the features and various functions of 8259 controller. 7M

**OR**

- 6. a) Interface the stepper motor with 8255 and write an ALP to rotate the stepper motor continuously in clockwise direction. 7M
- b) Demonstrate the initialization command words of 8259A PIC 7M

**UNIT-IV**

- 7. a) Explain about different operating modes of 8253 7M
- b) Draw the interface circuits for data conversion from TTL to RS 232 conversion. 7M

**OR**

- 8. a) Draw the architectural block diagram of 8251A and explain the function of each block 9M
- b) What is current loop? Explain how 20 mA current loop is used to provide serial data communication between 8086 and a peripheral. 5M

**UNIT-V**

- 9. Draw the architecture of a Pentium processor, and list out some salient features of Pentium and Pentium pro processors. 14M

**OR**

- 10. a) Draw and explain architecture of 80286 processor. 7M
- b) Explain Real and protected mode segmentation and paging. 7M

\*\*\*

Hall Ticket Number :										
----------------------	--	--	--	--	--	--	--	--	--	--

<b>R-17</b>
-------------

**Code: 7G366**

III B.Tech. II Semester Supplementary Examinations May/June 2022

### **Nano Electronics**

(Electronics and Communication Engineering)

Max. Marks: 70

Time: 3 Hours

Answer any five full questions by choosing one question from each unit (5x14 = 70 Marks )

\*\*\*\*\*

	Marks
<b>UNIT-I</b>	
1. Discuss about the Nano Electronics and its Historical developments.	14M
<b>OR</b>	
2. a) Illustrate the operation of Secondary Ion Mass Spectrometry (SIMS).	7M
b) Write a short Notes on Focused Ion Beam (FIB) Technique.	7M
<b>UNIT-II</b>	
3. a) Discuss about Transitions and Excitonic Effects.	9M
b) Derive the concept of Nano wire from Quantum Wire in detail.	5M
<b>OR</b>	
4. a) Describe the concept of about colors and associated electromagnetic wavelengths in Nano particles.	7M
b) Demonstrate the process of Nano imprint lithography.	7M
<b>UNIT-III</b>	
5. a) Explain about QCA RS flip-flop.	7M
b) Illustrate the Examples of basic QCA elements.	7M
<b>OR</b>	
6. a) Discuss the Quantum structures with different dimensions.	7M
b) Describe the Electrons in Mesoscopic Structures.	7M
<b>UNIT-IV</b>	
7. a) Describe the Cross-sectional views of the RTD.	7M
b) Write and explain the band diagram for RTD.	7M
<b>OR</b>	
8. a) Compare FET and SET circuit designs.	7M
b) Explain the Performance and technology of SET.	7M
<b>UNIT-V</b>	
9. a) Derive the equation for Debye length.	7M
b) Explain the importance of Thermal Noise in nanoelectronics.	7M
<b>OR</b>	
10. a) Elucidate the process of Nano systems as Functional Blocks.	7M
b) Discuss about Information Processing as Information Modification.	7M

\*\*\*