

Hall Ticket Number :

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R-17

Code: 7G362

III B.Tech. II Semester Regular Examinations Nov/Dec 2020

Microwave Engineering

(Electronics and Communication Engineering)

Max. Marks: 70

Time: 3 Hours

Answer any five questions from the following (5 x 14 = 70 Marks)

	Marks	CO	Blooms Level
1. a) Derive the expressions for Cut-off frequency, Propagation constant and Characteristic Wave Impedance for TE Mode in rectangular waveguide.	7M		IV
b) What inner radius do you need for an air-filled cylindrical pipe to propagate TE ₁₁ wave at 6 GHz with operating frequency 20% above f_c . What is guide wavelength?	7M		III
2. a) Derive expressions for Phase Velocity, Group Velocity, Guide Wavelength, and Wave Impedance in Circular Waveguides	7M		IV
b) Calculate resonant frequency for a circular waveguide resonator having dia of 6cm and length = 1.62 cm for the modes TM ₀₁₁ , TE ₀₁₁ , TE ₀₁₂ .	7M		III
3. a) Derive the Cut-off Wavelength in Circular Waveguide, Dominant and Degenerate Modes	7M		III
b) In a circular cavity, its resonant frequency for TE ₁₀₁ mode is 5 GHz, if $d = 2a$. Find its dimensions.	7M		II
4. a) What is a scattering matrix? What are various properties of S matrix?	7M		I
b) Explain why H-Plane Tee Junction is called Current Junction along with power flow directions.	7M		II
5. a) What are the Properties of Ferrites and explain how different phase shift of left and right circularly polarized waves (LCPW and RCPW) occurs due Faraday rotation.	7M		III
b) With a neat schematic diagram explain why 180° phase shift occurs in forward direction and zero in the backward direction only in two-port Gyrator.	7M		III
6. a) With neat schematic diagram explain the Two-cavity klystron amplifier. Derive the expressions beam coupling coefficient depth of velocity modulation	7M		IV
b) A TWT operates with beam voltage (V_0) = 3000 V, beam current (I_0) = 30 mA, characteristic impedance of helix (Z_0) = 10 Ω , frequency = 10 GHz, number of helix = 50. Find gain parameter (g) output power in dB and the velocity of beam electrons.	7M		IV
7. a) A two-cavity klystron operates at 5 GHz with beam voltage (V_0) of 10 kV and gap of cavity = 2 mm. For a given RF voltage, the cavity gap voltage (V_1) = 100 V (maximum). Calculate the minimum and maximum velocity of electron	7M		III
b) Explain the working of Cylindrical Magnetron in detail	7M		III
8. a) Using microwave test bench setup ,Explain the measurement of i) Power ii) Q-factor	7M		III
b) In Gunn diode's transit domain mode, the domain velocity is equal to the carrier drift velocity and is about 10^7 cm/sec. Determine the drift length of a diode at a frequency of 8 GHz	7M		IV

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III B.Tech. II Semester Regular Examinations Nov/Dec 2020

Microprocessors and Interfacing

(Electronics and Communication Engineering)

Max. Marks: 70

Time: 3 Hours

Answer any five questions from the following (5 x 14 = 70 Marks)

	Marks	CO	Blooms Level
1. a) Explain the Register Organization of 8086 with the function of various registers present in brief.	10M	1	L2
b) Calculate physical address for MOV BX, [437A H] when DS = 2000 H.	4M	1	L6
2. a) What are the types of 8086 Instructions and explain each type with at least one example.	7M	1	L1
b) Draw and explain Pin diagram of 8086 with its Flag features.	7M	1	L5
3. a) Elaborate the concept of Memory Segmentation with its key advantages for 8086.	7M	2	L6
b) Compare between I/O Interfacing Methods.	7M	2	L2
4. a) What are the internal devices and operating modes of 8255?	7M	3	L1
b) Discuss Interrupt Structure with their features in 8086.	7M	3	L6
5. a) Show and explain the ADC interfacing with 8086 Microprocessor.	7M	3	L5
b) List some of the features and various functions of 8259 controller.	7M	3	L1
6. a) What are the different operating modes of 8253?	7M	4	L1
b) Draw and explain USART architecture.	7M	4	L2
7. a) Write features and application of RS-232C.	7M	4	L1
b) Distinguish between synchronous and asynchronous data transfer schemes.	7M	4	L4
8. a) List out the features of 80386?	7M	5	L2
b) Write a short note on Pentium processor.	7M	5	L1

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Code: 7G16D

III B.Tech. II Semester Regular Examinations Nov/Dec 2020

Object Oriented Programming Concepts

(Common to EEE & ECE)

Max. Marks: 70

Time: 3 Hours

Answer any five questions from the following (5 x 14 = 70 Marks)

	Marks	CO	Blooms Level
1. a) Define OOP and what are the merits and demerits of object oriented methodology?	7M	CO1	L1
b) Define recursion and write a C++ program for finding factorial of a given number.	7M	CO1	L1
2. a) Define data type and explain the different data types in C++.	7M	CO1	L1
b) Define destructor and write a C++ program to implement destructor.	7M	CO1	L3
3. a) What is meant by overloading? Explain about function overloading with an example.	7M	CO2	L2
b) Define inheritance and explain about multiple inheritance with an example.	7M	CO2	L3
4. a) What is friend function and what are the merits and demerits of using friend functions.	7M	CO2	L2
b) Explain about virtual base class with suitable program.	7M	CO2	L3
5. a) Define a class? What is the general form of a class? How objects are declared explain with example.	7M	CO3	L3
b) Write a java program for checking Armstrong number.	7M	CO3	L2
6. a) What are the differences between packages and inheritance?	7M	CO4	L2
b) Discuss the adding class to a package with an example.	7M	CO4	L2
7. a) What is multithreading and what are the advantages of multithreading?	7M	CO4	L3
b) How to create multiple threads explain with an example?	7M	CO4	L2
8. a) Define applet and explain the life cycle of an applet.	7M	CO4	L2
b) What are applications and uses of an applet?	7M	CO4	L2

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III B.Tech. II Semester Regular Examinations Nov/Dec 2020

Radar Engineering

(Electronics and Communication Engineering)

Max. Marks: 70

Time: 3 Hours

Answer any five questions from the following (5 x 14 = 70 Marks)

	Marks	CO	Blooms Level
1. a) Derive the Radar range equation which is influenced by integration of Radar pulses	10M	CO1	III
b) What is mean by false alarm	4M	CO1	I
2. a) List the applications of Radar	7M	CO1	I
b) For the given transmitted power is 170 KW, cross sectional area of the target is 25 sq. m, the minimum power received is 1mw, power gain of the antenna 950, operating frequency of 1.5GHz, find the maximum range.	7M	CO1	III
3. a) Compose the operation of FMCW radar with block diagram.	8M	CO2	II
b) Compare CW and FMCW radar systems.	6M	CO2	II
4. a) Describe the principle of Staggered PRF in MTI radar.	6M	CO3	I
b) Develop the block diagram of range gated Doppler filters and explain.	8M	CO3	III
5. a) Construct the MTI Radar with Power amplifier transmitter.	8M	CO3	VI
b) Find the 3 lowest blind speeds of MTI radar operates at 5 GHz with PRF of 1000 PPs.	6M	CO3	I
6. a) Explain the basic principle of continuous angle tracking.	7M	CO4	II
b) Compare Monopulse tracker and Conical scan tracker.	7M	CO4	IV
7. a) Explain the amplitude comparison monopulse with simple block diagram.	10M	CO4	II
b) List the types of tracking Radar systems.	4M	CO4	I
8. a) Write note on Radar Displays.	7M	CO5	III
b) Distinguish between the matched and non-matched filters.	7M	CO5	IV

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III B.Tech. II Semester Regular Examinations Nov/Dec 2020

VLSI Design

(Electronics and Communication Engineering)

Max. Marks: 70

Time: 3 Hours

Answer any five questions from the following (5 x 14 = 70 Marks)

	Marks	CO	Blooms Level
1. a) Apply fabrication principles to pMOS process with neat diagrams.	7M	1	L3
b) Explain the steps of VLSI design flow.	7M	1	L1
2. a) Describe $I_{ds}-V_{ds}$ relationships of MOS circuits.	7M	1	L2
b) Design Bi-Cmos inverter with analysis.	7M	1	L4
3. a) Explain CMOS design rules for wires, contacts and transistors layout diagrams for CMOS inverters.	7M	2	L1
b) Describe scaling of MOS circuits with limitations of scaling.	7M	2	L2
4. a) Explain the layers NMOS.	7M	2	L1
b) What is stick diagram and explain about different symbols used for components in stick diagram during pmos process	7M	2	L2
5. a) Calculate nMOS transistors area of capacitance.	6M	3	L4
b) Explain Inverter delays and driving large capacitive loads	8M	3	L1
6. a) With neat diagram explain any one form of shifters(rotate right)	7M	4	L1
b) Explain architecture Field Programmable Gate Arrays with benefits.	7M	4	L2
7. a) Write short note on Complex Programmable Logic Devices	7M	4	L1
b) Design an array multiplier and discuss the merits and demerits with an example.	7M	4	L3
8. a) Explain the concept of design verification and design capture tools used in VHDLsynthesis.	10M	5	L1
b) Explain Need for testing,	4M	5	L1

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III B.Tech. II Semester Regular Examinations Nov/Dec 2020

Data Mining and Data Warehousing

(Computer Science and Engineering)

Max. Marks: 70

Time: 3 Hours

Answer any five questions from the following (5 x 14 = 70 Marks)

	Marks	CO	Blooms Level
1. a) What is a KDD? Explain the steps involved in KDD.	7M	CO1	L1
b) What is a noise? What are the various data smoothing techniques?	7M	CO1	L1
2. a) What is data Reduction? Explain various strategies for data reduction.	8M	CO1	L2
b) What are the applications of Data Mining?	6M	CO1	L1
3. a) Explain multi-dimensional data model of data warehouse.	7M	CO2	L2
b) How to compute Support and Confidence? Explain with suitable examples.	7M	CO2	L2
4. a) Describe Rule based Classification with an example.	8M	CO3	L1
b) How prediction is different from classification with examples.	6M	CO3	L1
5. a) Explain classification by back propagation.	7M	CO3	L2
b) Why is tree pruning useful in decision tree induction? What is a drawback of using a separate set of tuples to evaluate pruning?	7M	CO3	L1
6. a) Differentiate Agglomerative and Divisive clustering.	6M	CO4	L4
b) What are the major advantages of DENCLUE algorithm in comparison with other clustering methods?	8M	CO4	L4
7. a) Explain three different types of techniques of web mining.	7M	CO5	L2
b) Describe types of dimensions and measures in Spatial data cube.	7M	CO5	L1
8. a) What are the challenges for effective resource and knowledge discovery in mining WWW?	7M	CO5	L1
b) Explain multimedia databases.	7M	CO5	L2

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III B.Tech. II Semester Regular Examinations Nov/Dec 2020

Digital Signal Processing

(Electronics and Communication Engineering)

Max. Marks: 70

Time: 3 Hours

Answer any five questions from the following (5 x 14 = 70 Marks)

		Marks	CO	Blooms Level
1.	a) Determine the response of a relaxed system characterized by the impulse response $h(n)=(1/2)^n u(n)$ to the input signal $x(n) = u(-n)$.	8M		
	b) State and prove frequency shifting and conjugate properties of DFT.	6M		
2.	a) Compute 8-point DFT of the discrete time signal $x(n) = \{1,2,1,2,1,3,1,3\}$ using radix-2 DIT FFT algorithm.	8M		
	b) Develop a Radix – 2, DIF FFT algorithm for an 8-Point sequence.	6M		
3.	a) Find the inverse DFT of $X(K) = \{1,2,3,4,5,6,7,8\}$ using FFT algorithm.	8M		
	b) Give the steps involved in implementing Radix-4, DIT FFT algorithm.	6M		
4.	a) Design a Butterworth filter using bilinear transformation method for the following Specifications			
	$\begin{matrix} 0.8 & H(e^{j\omega}) & 1 & 0 & 0.2 \\ & H(e^{j\omega}) & 0.2 & 0.6 & \end{matrix}$	8M		
	b) Show that Chebyshev poles lies on an ellipse and also compare the Digital Butterworth and Chebyshev filters.	6M		
5.	a) Obtain the direct form II and cascade form realization for the following system. $y(n) = -0.1y(n-1)+0.2y(n-2)+3x(n)+3.6x(n-1)+0.6x(n-2)$.	6M		
	b) Design a linear phase FIR Band Pass Filter to pass frequencies in the range 0.35π to 0.48π rad/sample by taking 5 samples of rectangular window sequence.	8M		
6.	a) Explain Decimation by a factor D.	8M		
	b) Explain about the sampling rate conversion by a rational factor I/D.	6M		
7.	a) Compare stationary and non-stationary signals.	7M		
	b) Explain about Musical sound processing.	7M		
8.	a) Mention various signal compression methods.	7M		
	b) Discuss about oversampling D/A converter in signal processing.	7M		
