

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

R-15

Code: 5G366

III B.Tech. II Semester Supplementary Examinations October 2020

Radar Engineering

(Electronics and Communication Engineering)

Max. Marks: 70

Time: 3 Hours

Answer all five units by choosing one question from each unit (5 x 14 = 70 Marks)

UNIT-I

- 1. a) Derive the radar equation in terms of minimum detectable power and gains of transmitting and receiving antenna. 7M
- b) Draw the block diagram of a basic radar system and explain the function of each block. 7M

OR

- 2. a) Discuss about the integration of radar pulses in detail. 7M
- b) What is multiple-time around echoes? How they can be distinguished from unambiguous echoes? 7M

UNIT-II

- 3. a) With the help of block diagram Explain the operation of CW radar with non-zero IF receiver. 7M
- b) List and explain the applications of CW radar. 7M

OR

- 4. a) Draw and explain the operation FM-CW Altimeter. 7M
- b) Describe the operation of multiple frequency CW radar. 7M

UNIT-III

- 5. a) Sketch the block diagram of MTI Radar with power amplifier transmitter. 7M
- b) List out the differences between CW Radar and Pulse Doppler radar. 7M

OR

- 6. a) Write about the Range Gated Doppler Filters of MTI radar 7M
- b) Define Blind Speed and interpret the use of delay line cancellor. 7M

UNIT-IV

- 7. a) Draw and explain the wave front phase relationships in phase comparison monopulse radar 7M
- b) Distinguish between search radar and tracking radar. 7M

OR

- 8. a) Analyze the automatic tracking of a target through range gating technique 7M
- b) Write a brief note on acquisition and scanning patterns 7M

UNIT-V

- 9. 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

OR

- 10. a) Outline the noise figure derivation when two networks in cascade. 7M
- b) Construct Branch type duplexer and explain its operation. 7M

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

R-15

Code: 5G361

III B.Tech. II Semester Supplementary Examinations October 2020

VLSI Design

(Electronics and Communication Engineering)

Max. Marks: 70

Time: 3 Hours

Answer all five units by choosing one question from each unit (5 x 14 = 70 Marks)

UNIT-I

- 1. a) Explain CMOS fabrication using N-well process with neat diagrams. 8M
- b) Explain about lithography process to pattern the oxide layer. 6M

OR

- 2. a) Determine the Pull-up to Pull-down ratio for an nMOS inverter driven by another nMOS inverter? 8M
- b) Draw the Bi-CMOS inverter with no static current flow and give its advantages. 6M

UNIT-II

- 3. a) Explain various regions of CMOS inverter transfer characteristics? 7M
- b) Design a layout diagram for PMOS logic $Y=(AB+CD)'$? 7M

OR

- 4. a) Design a stick diagram for three input NOR gate using NMOS logic? 7M
- b) Explain latch-up problem in CMOS circuits? 7M

UNIT-III

- 5. a) Explain about nmos inverter pair delay and minimum size cmos inverter pair delay in detail. 7M
- b) Calculate the area capacitances for $L=20$, $W=3$ in metal 1, polysilicon, and n type diffusion (relative capacitance for metal 1 is 0.075, polysilicon is 0.1 and n type diffusion is 0.25.) 7M

OR

- 6. Describe the three sources OF wiring capacitance. Explain the effect of wiring capacitance on the performance of a VLSI circuit? 14M

UNIT-IV

- 7. a) Write a short notes on Zero/one detector? 7M
- b) Design a magnitude comparator based on the data path operator? 7M

OR

- 8. a) Implement a JK flip-flop using PLA? 7M
- b) Write briefly about channeled gate array? 7M

UNIT-V

- 9. a) What is simulation? Explain different levels of simulation? 7M
- b) What are the design strategies for test the circuit? 7M

OR

- 10. Explain about system level test techniques? 14M

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

R-15

Code: 5G363

III B.Tech. II Semester Supplementary Examinations October 2020

Microprocessors and Interfacing

(Electronics and Communication Engineering)

Max. Marks: 70

Time: 3 Hours

Answer *all five* units by choosing one question from each unit (5 x 14 = 70 Marks)

UNIT-I

- 1. a) List the salient features of 8086 microprocessor. 7M
- b) Draw the internal block diagram of 8086 microprocessor and explain in detail. 7M

OR

- 2. a) Explain any five addressing modes of 8086 microprocessor with example. 7M
- b) Write short notes on string manipulation instructions. 7M

UNIT-II

- 3. a) Differentiate I/O interfacing methods of 8086 microprocessor. 7M
- b) Interface two 4K X 8 EPROMs and two 4K X 8 RAM chips with 8086 microprocessor. Select suitable maps. 7M

OR

- 4. a) Describe the operating modes of 8255 PPI. 7M
- b) Write a program to display a message "ECE" using three seven segment displays. 7M

UNIT-III

- 5. a) What are the key differences between NMI and other external hardware interrupts? 7M
- b) Discuss the internal architecture of 8259A with the help of block diagram 7M

OR

- 6. a) Discuss the different modes of operation of 8253. 7M
- b) Develop a programmable timer using 8253 and 8086. Interface 8253 at an address 0040H for counter 0 and write ALP to generate a square wave of period 1ms. The 8086 and 8253 7M

UNIT-IV

- 7. a) List the differences between synchronous and asynchronous data transfer schemes. 7M
- b) What is USART? Briefly explain 8251 USART architecture. 7M

OR

- 8. a) Name serial communication standards and draw TTL to RS232 & RS232 to TTL conversion circuits. 7M
- b) Write a program to transmit 100 bytes of serial data. 7M

UNIT-V

- 9. List the salient features of 80386 microprocessor 14M

OR

- 10. Compare the Pentium and Pentium pro processors 14M

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

R-15

Code: 5G362

III B.Tech. II Semester Supplementary Examinations October 2020

Microwave Engineering

(Electronics and Communication Engineering)

Max. Marks: 70

Time: 3 Hours

Answer all five units by choosing one question from each unit (5 x 14 = 70 Marks)

UNIT-I

1. a) What is microwave frequency band? Explain the applications of microwaves at various frequency bands. 6M
b) Explain the TE wave propagation in Rectangular waveguide 8M

OR

2. a) Derive the equation for cut-off frequency of a Rectangular waveguide 7M
b) A 6GHz signal is to be propagated in a waveguide with $b=7.5\text{cms}$. calculate characteristic wave impedance of the Rectangular waveguide for dominant mode 7M

UNIT-II

3. Derive the expression for the field components due to TM wave in circular waveguide 14M

OR

4. a) What is cavity resonator? Derive the equation for resonant frequency of circular cavity resonator 7M
b) A circular cavity is operating at 10GHz with a radius of 3cms. Determine the distance between two end plates for TM_{011} mode. 7M

UNIT-III

5. a) What is meant by Microwave Attenuator? Explain the functioning of flap and vane Attenuators. 9M
b) Explain Coupling factor, Directivity and Isolation using Directional coupler 5M

OR

6. a) What are the properties of S matrix? Derive the scattering matrix for a 3 port circulator? 7M
b) Derive the scattering matrix of H-plane Tee? 7M

UNIT-IV

7. Define velocity modulation process in two cavity klystron and derive the expression for beam coupling coefficient. 14M

OR

8. a) List various methods of beam focusing in TWT's. Explain? 6M
b) With a neat diagram explain the Magnetron and derive the expression for Hull cut-off voltage. 8M

UNIT-V

9. a) The helical TWT has diameter of 2 mm with 50 turns per cm. Calculate axial phase velocity and a node voltage at which the TWT can be operated for useful gain. 7M
b) What is meant by Avalanche Transit Time Devices? Explain the operation, construction and application of IMPATT. 7M

OR

10. a) Explain the construction of GUNN diode using RWH theory 7M
b) What is TRAPATT diode and explain the principle of operation? 7M
