



Subject Code: R16MDE101

M.Tech - I Semester Regular and Supplementary Examinations, Dec-2018.  
DIGITAL SYSTEM DESIGN

(DECS)

Time: 3 hours

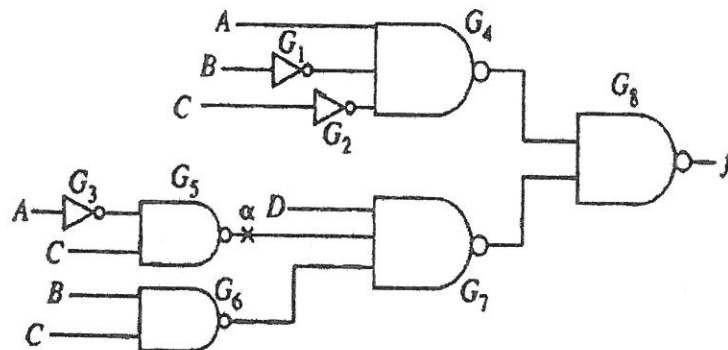
Max Marks: 60

Answer any FIVE questions.

All questions carry EQUAL marks of 12.

\*\*\*\*\*

- 1 (a) Explain the advantages and disadvantages of QM algorithm 6M  
(b) Determine the minimal sum-of-product form for the expression and give the tabular method for  $f(w,x,y,z) = \sum m(0,2,4,9,11,13,15,15) + \sum \Phi(1,5,7,10)$  6M
- 2 (a) Summarize the cube based operations that can be used in cube based minimization algorithm and analyze them with an example. 6M  
(b) Apply CAMP algorithm to minimize the given 4 variable Boolean function 6M  
 $f(A,B,C,D) = \sum m(1, 3, 5, 7, 9, 10, 13, 14, 15)$
- 3 (a) Memorize the steps to be considered for PLA folding algorithm. 6M  
(b) Realize  $F_1$  and  $F_2$  using PLA. Give the PLA table and internal connection diagram for the PLA 6M  
 $F_1(a,b,c,d) = \sum m(1,2,4,5,6,8,10,12,14)$   
 $F_2(a,b,c,d) = \sum m(2,4,6,10,11,12,14,15)$
- 4 (a) Design a combinational circuit using a ROM. The circuit accepts a 3 bit number and generates an output binary number equal to the square of the input number. 6M  
(b) Summarize how a sequential circuit can be designed using FPGA. 6M
- 5 (a) Analyze various faults present in digital combinational circuits and explain how a fault can be characterized by its parameters. 6M  
(b) Analyze the path sensitization method to detect the test generation for the combinational circuit with  $\alpha$  s-a-1: 6M



- 6 (a) Explain the scan-path technique for testable sequential circuit design. 6M  
(b) Perform design checking experiment to find Homing tree and Distinguishing tree for the following state table: 6M

Present state	Input	
	$x = 0$	$x = 1$
<i>A</i>	<i>C,1</i>	<i>D,0</i>
<i>B</i>	<i>D,0</i>	<i>B,1</i>
<i>C</i>	<i>B,0</i>	<i>C,1</i>
<i>D</i>	<i>C,0</i>	<i>A,0</i>

Next state, output

- 7 (a) Define the terms Controllability and Observability in the view of Fault detection 6M  
 (b) Memorize the Bridging and Delay faults in digital circuits
- 8 (a) Explain how to test a PLA circuits?  
 (b) Minimize the following function by the IISC algorithm  
 $f = 001210+001121+00100 +001011+011122+011221+101000+101010$

\*\*\*\*\*



Narasaraopeta Engineering College (Autonomous)  
Kotappakonda Road, Yellamanda (P.O), Narasaraopet- 522601, Guntur District, AP.

Subject Code: R16MEC102

**M.Tech - I Semester Regular and Supplementary Examinations, Dec-2018.**

**VLSI TECHNOLOGY AND DESIGN**

**(Common to DECS and DSCE)**

**Time: 3 hours**

**Max Marks: 60**

**Answer any FIVE questions.  
All questions carry EQUAL marks**

\*\*\*\*\*

- |   |                                                                                                |    |
|---|------------------------------------------------------------------------------------------------|----|
| 1 | (a) Discuss in detail about VLSI design rules and process parameters.                          | 6M |
|   | (b) Briefly discuss about top-down design and bottom-up design.                                | 6M |
| 2 | (a) Explain the fabrication process of CMOS technology.                                        | 6M |
|   | (b) Compare BiCMOS technology with other techniques.                                           | 6M |
| 3 | (a) Briefly discuss about cell based design and array based design.                            | 6M |
|   | (b) What is testing and fault coverage?                                                        | 6M |
| 4 | (a) Derive basic electrical parameters of MOS transistor.                                      | 6M |
|   | (b) Determine the pull up to pull down ratio of nmos inverter driven by another nmos inverter. | 6M |
| 5 | (a) Draw and explain CMOS NAND gate with functional table.                                     | 6M |
|   | (b) With a neat sketch explain four line gray code to binary code converter.                   | 6M |
| 6 | (a) Define floor planning and explain floor planning methods in VLSI design.                   | 6M |
|   | (b) Define synthesis and explain high level synthesis in VLSI.                                 | 6M |
| 7 | (a) With neat sketches describe various design layout methods.                                 | 6M |
|   | (b) Explain in detail about IC production process.                                             | 6M |
| 8 | (a) Draw the basic building block of VLSI and explain its operation.                           | 6M |
|   | (b) Discuss about communication interface and mixed signal interface.                          | 6M |

\*\*\*\*\*





Subject Code: R16MEC103

**M.Tech - I Semester Regular Examinations, Dec - 2018**

**DIGITAL DATA COMMUNICATIONS**

**(Common to DECS and DSCE)**

**Time: 3 hours**

**Max Marks: 60**

**Answer any FIVE questions.**

**All questions carry EQUAL marks**

\*\*\*\*\*

- 1 (a) Discuss coherent QPSK transmission and reception with truth table and constellation diagram. [6]
- (b) Analyze the DPSK modulation and demodulation with an example. [6]
- 2 (a) Draw and explain the TCP/IP model. [6]
- (b) Differentiate the parallel and serial digital data transmissions. [6]
- 3 (a) Write a short note on various types of errors observed in data communication. [6]
- (b) Determine the Single-Precision checksum for the following five character ASCII message "HELLO" [6]
- 4 (a) Illustrate the following line discipline mechanisms-ENQ/ACK, poll/select. [6]
- (b) Summarize the character oriented protocol and bit-oriented protocol. [6]
- 5 (a) Describe the token bus networking. [6]
- (b) Compare the circuit switching and packet switching. [6]
- 6 (a) With a neat illustration explain CDMA. [6]
- (b) Elaborate the concept of OFDM in detail. [6]
- 7 (a) Write a short note on "IEEE 802.6". [6]
- (b) Explain the "Slotted ALOHA". [6]
- 8 (a) Explain various network topologies in data communication. [6]
- (b) Summarize the importance of routers in data communication. [6]

\*\*\*\*\*





Narasaraopeta Engineering College (Autonomous)  
Kotappakonda Road, Yellamanda (P.O), Narasaraopet- 522601, Guntur District, AP.

Subject Code: R16MEC104

M.Tech - I Semester Regular and Supplementary Examinations, Dec-2018.

WIRELESS COMMUNICATIONS AND NETWORKS

(Common to DECS and DSCE)

Time: 3 hours

Max Marks: 60

Answer any FIVE questions.  
All questions carry EQUAL marks

\*\*\*\*\*

1. (a) Explain about Frequency Reuse Concept. [6M]  
(b) Explain cell splitting in detail and mention the various advantages of cell splitting concept? [6M]
2. Define diffraction & explain briefly about different diffraction models. [12M]
3. (a) Discuss any one outdoor propagation models with case study? [6M]  
(b) Discuss any one indoor propagation models with case study? [6M]
4. (a) Describe the factors that influence small scale fading. [6M]  
(b) Write short notes on Fading effects due to Doppler spread? [6M]
5. (a) a) Explain briefly about RAKE Receiver. [7M]  
(b) Explain about Scanning Diversity. [5 M]
6. (a) Explain the architecture of 802.11 and also list out the services of 802.11? [6M]  
(b) Explain briefly about Wireless Local Loop (WLL). [6M]
7. (a) Write short notes on Reflection from Dielectrics. [6M]  
(b) Explain briefly about Hata Model. [6M]
8. Write short notes on the following  
(a) Trunking and Grade of Service. [4M]  
(b) Brewster Angle. [4M]  
(c) Frequency Diversity. [4M]

\*\*\*\*\*







Subject Code: R16MDE105

**M.Tech - I Semester Regular and Supplementary Examinations, Dec-2018.**  
**EMBEDDED REAL TIME OPERATING SYSTEMS**  
**(DECS)**

Time: 3 hours

Max Marks: 60

**Answer any FIVE questions.**  
**All questions carry EQUAL marks of 12.**

\*\*\*\*\*

- 1 (a) Explain the memory management in RTOS. [6]  
(b) Discuss various interrupt routine rules for RTOS. [6]
- 2 (a) Elaborate the concept of Round Robin Time Slicing Scheduling algorithm. [6]  
(b) Summarize the numerous OS security functions and their issues in RTOS. [6]
- 3 (a) List and explain the various time delay and memory allocation related functions of mCOS-II in RTOS. [6]  
(b) Describe the windows CE features in RTOS. [6]
- 4 (a) Explain all the specifications of software architecture of ACVM. [6]  
(b) Tabulate the features needed in the OS for a smart card. [6]
- 5 (a) Discuss the Off-the-shelf operating system. [6]  
(b) Difference between the RT Linux and RT Linux API? [6]
- 6 (a) Give the overview of RT Linux. [6]  
(b) Write a program to display a message periodically in RT Linux? [6]
- 7 (a) Explain the goals and services of OS. [6]  
(b) How do you create, remove, open, close, read, write and IO control a device using RTOS functions? Take an example of a pipe delivering an IO stream from a network device? [6]
- 8 Describe the hardware architecture and software layers in software architecture of a camera system with neat schematics. [12]

\*\*\*\*\*





Narasaraopeta Engineering College (Autonomous)  
Kotappakonda Road, Yellamanda (P.O), Narasaraopet- 522601, Guntur District, AP.

Subject Code: R16MDE107

M.Tech - I Semester Regular and Supplementary Examinations, Dec - 2018.

OPTICAL COMMUNICATION TECHNOLOGY

(DECS)

Time: 3 hours

Max Marks: 60

Answer any FIVE questions.

All questions carry EQUAL marks of 12.

\*\*\*\*\*

1. (a) Discuss various approaches related to propagation of light in OFC? [6M]  
(b) Write about nonlinear effects in OFC? [6M]
2. (a) Write about principle of operation of Fabry-Perot Filters? [6M]  
(b) Explain optical sources with their structures? [6M]
3. Discuss in detail about optical modulation schemes? [12M]
4. Derive the expression for Bit Error Rate (BER) in Ideal receivers and also calculate the BER in Practical receiver with different noise impairments. [12M]
5. Discuss the following related to Dispersions:
  - i. Chromatic Dispersion
  - ii. Polarization mode Dispersion
  - iii. Compensation Techniques [3\*4M]
6. Discuss and explain various Scattering techniques in OFC? [12M]
7. (a) Explain the principle of solitons [6M]  
(b) Discuss subcarrier modulation and multiplexing? [6M]
8. (a) Explain the principle of operation of a Circulator. [6M]  
(b) Explain Reed-Solomon Codes for Error Detection and Correction [6M]

\*\*\*\*\*

