Sai Nath University

Assignment For BTECH E&C 8th Sem.

The Assignment will consist of two parts, A and B. Part A will have 5 short answer questions(40-60 words) of 4 marks each. Part B will have 4 long answer questions of 5 marks each.

All questions are compulsory.

These Assignments should be completed and submitted in written form by the student to his/her respective Faculty/ Examiners. Assignment Submission Dates are:

> ➢ **June-18**

List Of Suggested Questions

The list of suggested questions is for students to practice. Although optional, we recommend that students solve these questions, as they will help them in preparing for exams as well as in clearing the important concepts of the subject.

List of Practical and suggested practical's

The list of practical's should be done by the students in their Lab Sessions. These are the basic practical's, which each student should be able to do himself independently. While the list of suggested practicals are optional, but it is recommended that students should perform those practical so as to have a thorough knowledge of the subject

Education Delivery Schedule (EDS)

As per University Semester scheme, the minimum contact hours of each paper has been

Divided into two hours theory and practical class.

The faculty will maintain this attendance paper wise for his/her batch.

Subject Code	Subject Name
BTEC801	VLSI TECHNOLOGY & PROCESS MODELING
BTEC802	SATELLITE COMMUNICATION SYSTEM
BTEC803	SEMICONDUCTOR DEVICES AND MODELING
BTEC804	PROJECT
BTEC805	PRACTICAL

<u>SAI NATH UNIVERSITY</u>

Cover page of Assignment

ID NUMBER ……………………………………

NAME …………………………………. ……

COURSE   BTECH………

STREAM   E&C…………………

SEM 8TH …………………………………

SUBJECT CODE …………………………………

SUBJECT NAME …………………………………

Assignments will be completed by the Student in his/her own handwriting.

SUB.CODE-BTEC801

SUB- VLSI TECHNOLOGY & PROCESS MODELING

Part A

Q1.Explain the operation of a basic CMOS comparator circuit.

Q2. What are the design steps for resistors in sub-micron CMOS technology?

Q3.Explain the operation of a MOSFET in linear and saturation region. How can a MOSFET be used as a Voltage-Variable Resistor (VVR)?

Q4.What are the various design parameters of an op-amp ? Explain each parameter briefly.

Q5.Discuss in brief the issues related to Mixed-Signal Layout.

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Part B

Q6.Write short notes on any two of the following:

 (a) High-Pass Sync Filters (b) Analog Multipliers (c) Process Flow

Q7. Explain the operation of successive approximation Analog-to-Digital Converter (ADC), with the help of a neatly labelled block diagram.

Q8.What is the function of a sample-and-hold circuit ? With the help of a neatly labelled diagram explain the operation of any one example of sample-and-hold circuit.

Q9.What are the advantages and disadvantages of digital discrete-time signals over analog signals ?

SUB.CODE-BTEC802

SUB- SATELLITE COMMUNICATION SYSTEM

Part A

Q1.Draw the frame format and explain the operation of TDMA system.

Q2.explain how cross-polarization interference is produced due to rain in the satellite systems.

Q3. Explain the various performance measures of the satellite link.

Q4.Why is FM preferred to AM for sound signal transmission ? What is a raster and how is it produced on the picture tube screen?

Q5. What do you understand by dark current in vidicon ?

Part B

Q6.Compare the construction and characteristics of image orthicon and vidicon camera tubes with the help of neat sketches.

Q7. What is VSB transmission and why is it used for transmission of TV picture signal ?

Q8.Explain the significance and the process of alignment of TV receivers.

Q9. Explain how carrier is recovered for MPSK system with a suitable block diagram, waveforms and expressions.

SUB- SEMICONDUCTOR DEVICES AND MODELING

Part A

Q1.How is d.c. and transient analysis of the circuit done by using SPICE ? Explain with a suitable example.

Q2. Draw and explain the noise models of bipolar junction transistor.

Q3. Draw and explain the structure of a MOSFET and also derive its drain current equation.

Q4.Using the approximate Boltzmann's diode equation, find the change in forward bias for doubling the forward current of a germanium semiconductor diode at 290°K.

Q5. What are the advantages and disadvantages of heterojunction devices ? Enlist the various application.

Part B

Q6. Write short notes on any two of the following:

(a) DIBL (Drain Induced Barrier Lowering)   (b) HEMT

 (c) Introduction to BSIM Models   (d) High Frequency Model of BJT

Q7. Describe the relationship between the mask channel length (Lmask) and the electrical channel length (L). Are they identical? If not, how would you express L in terms of Lmask and other parameters?

Q8. Why is LEVEL 2 MOSFET model required? Derive the drain current equation and explain the variation of mobility with electric field.

Q9.What is MOS capacitance ? Explain parasitic capacitances, oxide-related capacitances and junction capacitances with suitable diagrams.

SUB.CODE-BTEC804

PROJECT LIST

1.TV Remote Controlled Home Appliances Project

2.Digitally Controlled Home Automation Project

3. Vehicle Sensing Street Lights Project

4.Advanced Wireless Power Transfer System

5.Touch Pad Based Device Project

6.Thyristors Based Dual Converters

7.Circuit Breaker Based On Password

8.Car Overspeeding Detection Project

9.RF Secure Coded Communication System

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SUB. CODE-BTEC805

SUB- VLSI TECHNOLOGY & PROCESS MODELING

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LIST OF EXPERIMENTS

1.Spread spectrum (CDMA/DSSS) setup for wireless communication with bit error measurement

2.Satellite communication setup

3.Frequency hoping spread spectrum setup

4. Laser Fiber optic trainer:

5.Transreceiver trainer with RF Circuit Design Courseware

6.Spectrum Analyzer (price combined with Transreceiver trainer with RF Circuit Design Courseware)

7.RF signal generator Transreceiver trainer with RF Circuit Design Courseware

8.Vector Network Analyzer.