Assignment for

Basic Electronics Engineering (BE01R00111)

B.E. Semester-I

Directorate of Technical Education, Gandhinagar, Gujarat

Government Engineering College, Bhuj

Certificate

This is to certify that Mr./Ms. _____ _____ Enrollment No. _____ of B.E. Semester I _____Engineering of this Institute (GTU Code: 015) has satisfactorily completed the Assignment work for the subject Basic Electronics Engineering (BE01R00111) for the academic year _____

Place: _____

Date: _____

Name and Sign of Faculty member

Head of the Department

Preface

Main motto of any Assignment work is for enhancing required skills as well as creating ability amongst students to solve real time problem by developing relevant competencies in psychomotor domain. By keeping in view, GTU has designed competency focused outcome-based curriculum for engineering degree programs where sufficient weightage is given to Tutorial work. It shows importance of enhancement of skills amongst the students and it pays attention to utilize every second of time allotted for Tutorial amongst students, instructors and faculty members to achieve relevant outcomes by solving Tutorial. It is must for effective implementation of competency focused outcome-based curriculum that every theory is keenly designed to serve as a tool to develop and enhance relevant competency required by the various industry among every student. These psychomotor skills are very difficult to develop through traditional chalk and board content delivery method in the classroom. Accordingly, this tutorial will help the students in problem solving to prove concept and theory.

By using this Assignment students can go through the relevant theory and procedure in advance before the actual examination which creates an interest and students can have basic idea prior to examination. This in turn enhances pre-determined outcomes amongst students. Each tutorial/ Assignment will begins with competency, industry relevant skills, course outcomes as well as practical outcomes (objectives).

Basic Electronics Engineering is the fundamental course which deals with basic of electronics circuits like a diode, BJT, MOSFET.

Assignment – Course Outcome matrix

Course Outcomes (COs):

CO-1 : Understand semiconductor diodes and their applications.

CO-2 : Comprehend working, characteristics and biasing of BJT.

CO-3 : Analyze BJT circuits in small signal domain.

CO-4 : Understand working, characteristics and biasing of FET.

CO-5 : Understand usage of Special Purpose Diodes.

Sr. No.	Assignment	CO 1	CO 2	CO 3	CO 4	CO 5
1.	Assignment -1	√				
2.	Assignment -2		√			
3.	Assignment -3			√		
4.	Assignment -4				√	
5.	Assignment -5					√

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(Progressive Assessment Sheet)

Sr. No.	Objective(s) of Tutorial / Assignment	Page No.	Date of Start	Date of submission	Assessment Marks	Sign. of Teacher with date	Remarks
1.	Assignment -1						
2.	Assignment -2						
3.	Assignment -3						
4.	Assignment -4						
5.	Assignment -5						

ASSIGNMENT-1

1) Explain the working principle of a p-n junction diode with neat diagrams.
2) Derive and explain the DC load line for a diode circuit.
3) Compare ideal, practical, and real diode models.
4) Describe the temperature effect on a diode's characteristics.
5) Write a short note on Zener diodes and their applications.
6) A silicon diode has a forward voltage drop of 0.7 V. Calculate the current through a series circuit with a 10 V source and a 1 kΩ resistor.
7) For a Zener diode with Vz = 5.1 V and load resistance 1 kΩ, calculate the minimum series resistor required for a 12 V input to ensure regulation.
8) Compare half-wave and full-wave rectifiers. Derive efficiency and ripple factor.
9) Explain the operation of Zener diode voltage regulator.
10) Describe RC and LC filters in power supply circuits.
11) Draw and explain clipper and clamper circuits.
12) Design a Zener diode shunt regulator to maintain 5 V across a load of 1k ohm.
13) Write short note on Voltage Multiplier circuits.

Insert the marks according to observations ;

Criteria	Level of Knowledge and Understanding	Quality & Correctness of Write-up and Submission	Total
Obtained Marks			

ASSIGNMENT-2

1. What is a transistor? Explain different configurations of a transistor and their uses.
2. What is bipolar junction transistor?
3. What is power dissipated by transistor in active region?
4. Explain all types of transistor configurations?
5. What are α,β and γ in a transistor ? Derive their values and relations between them.
6. Explain input output characteristics of CE configuration of BJT
7. What is ICBO and ICEO in a transistor what is relation between ICEO,ICBO and ICO?
8. What are the different regions of operation of transistor?
9. What is DC load line? Explain with necessary diagram.
10. Why biasing is important in transistor? Explain voltage divider bias with diagram.
11. What is stability factor? Explain.

Insert the marks according to observations ;

Criteria	Level of Knowledge and Understanding	Quality & Correctness of Write-up and Submission	Total
Obtained Marks			

ASSIGNMENT-3

1. Draw and explain the transistor AC equivalent circuit.
2. Explain coupling and bypass capacitor function in amplifiers.
3. Which are the transistor models for the small signal a.c. analysis? Explain hybrid model for any transistor configuration.
4. What is the a.c. load line in the transistor? Write its significance.
5. Explain common Emitter amplifier.
6. Explain the working of transistor as a switch.
7. Compare CE, CB and CC configurations.

Insert the marks according to observations ;

Criteria	Level of Knowledge and Understanding	Quality & Correctness of Write-up and Submission	Total
Obtained Marks			

ASSIGNMENT-4

1. Explain JFET construction and characteristics.
2. Write short note on E-type MOSFET.
3. What are the advantages of N-channel MOSFET over P-channel MOSFET?
4. Compare BJT, FET and JFET
5. Differentiate between JFET and MOSFET..
6. Explain FET as an amplifier.
7. Define following for FET : a) transconductance b) Pinch-off voltage c) Drain resistance d)Amplification factor e) Power dissipation
8. Write advantages and disadvantages of FET over BJT.
9. What is the different method for biasing the transistor? Explain any two methods with necessary circuit diagram.

Insert the marks according to observations ;

Criteria	Level of Knowledge and Understanding	Quality & Correctness of Write-up and Submission	Total
Obtained Marks			

ASSIGNMENT-5

1. Explain the working principle of an LED and discuss its advantages and limitations in various applications.
2. Explain the working principle of photodiodes.
3. Explain the working principle of solar cell with necessary diagram..
4. Explain the working of PIN diode.
5. Explain the working of Varactor diode.
6. Explain the working of Schottky diode.
7. Explain the working of Tunnel diode.
8. Explain working of seven segment display

Insert the marks according to observations ;

Criteria	Level of Knowledge and Understanding	Quality & Correctness of Write-up and Submission	Total
Obtained Marks			