Hall Ticket No | | | | | | | | | | | Question Paper Code: AECB01

INSTITUTE OF AERONAUTICAL ENGINEERING

(Autonomous)
Dundigal, Hyderabad - 500 043

MODEL QUESTION PAPER-II

B.Tech V Semester End Examinations, November - 2019
Regulation: IARE-R18
BASIC ELECTRONICS ENGINEERING
(Civil Engineering)

Time: 3 Hours **Max Marks: 70**

Answer any ONE question from each Module
All questions carry equal marks
All parts of the question must be answered in one place only

MODULE – I

1	a)	With neat diagram explain the working of a half wave rectifier.	[7M]
	b)	Determine the values of forward current in the case of P-N junction diode, with Io=10 μA Vf=0.8V at T=3000K.Assume silicon diode?	[7M]
2	a)	Explain with neat sketches how a zener diode is used a regulator?	[7M]
	b)	Explain with neat sketches how avalanche breakdown occurs in a pn diode.	[7M]

MODULE – II

3	a)	Explain how FET behaves as a voltage variable resistor	[7M]
	b)	Draw the circuit diagram of a fixed bias and derive expression for Stability factor.	[7M]
4	a)	Enumerate the differences between BJT and FET.	[7M]
	b)	The reverse leakage current of the transistor when connected in CB configuration is 0.2 μA while it is 18 μA when the same transistor is connected in CE configuration. Determine α and β of the transistor?	[7M]

MODULE – III

5	a)	With circuit and waveforms explain the application of OPAMP as Differentiator and write the advantages of practical differentiator	[7M]
	b)	The input signal to an op-amp is 0.03sin(1.5×105)t. calculate maximum gain of an op-amp with the slew rate of 0.4V/μ sec.	[7M]
6	a)	Explain the Voltage Follower with neat diagram	[7M]
	b)	Describe the following terms in an OP-AMP. 1. Input Bias current 2. Input offset voltage 3. Input offset current	[7M]

MODULE – IV

7	a)	Explain each block of the functional block diagram of 555 timer and list the advantages of 555 timer.	[7M]
	b)	Define resolution. How many levels are possible in a two bit DAC what is its resolution if the output range is 0 to 3V.	[7M]
8	a)	Discuss about the flash type converter with a neat block diagram	[7M]

b) What is DAC? Calculate the values of the LSB,MSB and full scale output for an 8 bit DAC for the 0 to 10V range. [7M]

MODULE – V

9 a) Explain the gray to binary and binary- to- gray conversion with examples [7M]

b) Give the Boolean expressions, symbols and truth tables for following gates i) AND ii) NOR iii) EX-OR iv) OR v) EX-NOR. [7M]

10 a) Simplify using postulates and theorems of Boolean algebra [7M]
i) (X+Y'+XY)(X+Y')X'Y ii) (AB+C+D)(C'+D)(C'+D+E)

b) Convert $(4085)_{10}$ into base-4 and obtain its 9"s complement. [7M]

INSTITUTE OF AERONAUTICAL ENGINEERING

(Autonomous)

Dundigal, Hyderabad - 500 043

COURSE OBJECTIVES:

The course should enable the students to:	
I	Introduce components such as diodes, BJTs and FETs.
II	Know the applications of components.
III	Understand common forms of number representation in logic circuits.
IV	Be acquainted to principles and characteristics of op-amp and apply the techniques for the design of comparators, instrumentation amplifier, integrator, differentiator.

COURSE OUTCOMES (COs):

CO 1	Describe the concept of diode and its applications.
CO 2	Describe the operation of various transistors, FETs and their biasing methods.
CO 3	Understand the concept of operational amplifier with analysis of applications.
CO 4	Analysis of 555 timer IC for multivibrators and op-amp data converters.
CO 5	Explore the digital number systems and various digital logic circuits.

COURSE LEARNING OUTCOMES (CLOs):

AECB01.01	Understand the basic concept of PN junction diode.
AECB01.02	Analyze the characteristics of diode for ideal and practical conditions.
AECB01.03	Understand the applications of diode in rectifiers with and without filters.
AECB01.04	Understand the concept of breakdown mechanism in diodes with applications of Zener breakdown diodes.
AECB01.05	Describe the classification family table of various transistors.
AECB01.06	Describe the concept of Bipolar Junction transistor with various modes of operation.
AECB01.07	Understand the concept of transistor biasing with voltage divider bias.
AECB01.08	Understand the construction and working of Field Effect Transistor(FET).
AECB01.09	Understand the concept of Metal Oxide Semiconductor FET.
AECB01.10	Illustrate the basic CMOS circuits.
AECB01.11	Understand the basic concepts of operational amplifiers.
AECB01.12	Analyze the parameters of practical and ideal op-amps.
AECB01.13	Understand the concept of virtual ground in op-amps.
AECB01.14	Perform basic arithmetic operations on voltages using opamps.
AECB01.15	Examine the working of op-amp as differentiator, integrator, comparator and buffer.
AECB01.16	Understand the internal block diagram of 555 timer IC.
AECB01.17	Examine the working of 555 timer as astable and monostablemultivibrator.
AECB01.18	Understand the principle of data conversions with terminology.
AECB01.19	Analyze the A/D converters.
AECB01.20	Analyze the resistor ladder D/A converters.
AECB01.21	Perform calculations in different number systems.

AECB01.22	Understand the basic concepts of Boolean algebra and combinational logic circuits.
AECB01.23	Understand the basic sequential logic circuits.
AECB01.24	Understand counters, registers.

MAPPING OF SEMESTER END EXAMINATION - COURSE OUTCOMES

SEE Question No		Course Learning Outcomes		Course Outcomes	Blooms Taxonomy Level
1	a	AECB01.01	Understand the basic concept of PN junction diode.	CO 1	Understand
	b	AECB01.01	Understand the basic concept of PN junction diode.	CO 1	Apply
2	a	AECB01.04	Understand the concept of breakdown mechanism in diodes with applications of Zener breakdown diodes.	CO 1	Understand
	b	AECB01.02	Understand the applications of diode in rectifiers with and without filters.	CO 1	Understand
3	a	AECB01.09	Understand the concept of Metal Oxide Semiconductor FET.	CO 2	Understand
	b	AECB01.08	Understand the construction and working of Field Effect Transistor(FET).	CO 2	Remember
4	a	AECB01.10	Illustrate the basic CMOS circuits	CO 2	Understand
	b	AECB01.07	Understand the concept of transistor biasing with voltage divider bias.	CO 2	Understand
5	a	AECB01.13	Understand the concept of virtual ground in op-amps.	CO 3	Understand
	b	AECB01.11	Understand the basic concepts of operational amplifiers.	CO 3	Apply
6	a	AECB01.12	Analyze the parameters of practical and ideal op-amps.	CO 3	Understand
	b	AECB01.14	Perform basic arithmetic operations on voltages using opamps.	CO 3	Remember
7	a	AECB01.17	Examine the working of 555 timer as astable and monostablemultivibrator.	CO 4	Understand
	b	AECB01.17	Examine the working of 555 timer as astable and monostable multivibrator.	CO 4	Apply
8	a	AECB01.19	Analyze the A/D converters.	CO 4	Understand
	b	AECB01.18	Understand the principle of data conversions with terminology.	CO 4	Apply
9	a	AECB01.22	Understand the basic concepts of Boolean algebra and combinational logic circuits.	CO 5	Understand
	b	AECB01.22	Understand the basic concepts of Boolean algebra and combinational logic circuits.	CO 5	Understand
10	a	AECB01.22	Understand the basic concepts of Boolean algebra and combinational logic circuits.	CO 5	Understand
	b	AECB01.21	Perform calculations in different number systems.	CO 5	Apply

Signature of Course Coordinator **HOD, ECE**