

Indian Maritime University
(A Central University, Govt of India)
End Semester Examinations – December 2023
Programme Name: B Tech (ME)
Semester: II
Subject Code: UG11T4203
Subject Name: Basic Electronics

Date: 15.11.2023

Max Marks: 70

Duration: 03 Hrs

Pass Marks: 35

General Instructions

- (i) All Sections (A, B & C) are to be attempted.
- (ii) Options, if any, are specified in respective section.

Section A

Ten MCQs/Fill in the Blanks of 01 Mark each – Choose the correct answer as applicable.

1. The electrical resistance of the depletion region is large because
 - a) It has no charge carriers
 - b) It has a large number of charge carriers
 - c) It contains electrons as charge carriers
 - d) It has holes as charge carriers
2. The doped region in a transistor is
 - a) Emitter and Collector
 - b) Emitter and Base
 - c) Collector and Base
 - d) Emitter, Collector and Base
3. What is the full form of SCR?
 - a) Silicon controlled rectifier
 - b) Silicate controlled rectifier
 - c) Silicon controlled rectification
 - d) Silicon controlling rectification
4. Which gate will a NAND gate be equivalent to when two inputs of NAND gates are shorted?
 - a) AND gate
 - b) OR gate

- c) NAND gate
 - d) NOT gate
5. Which is the major functioning responsibility of the multiplexing combinational circuit?
- a) Decoding the binary information
 - b) Generation of all min terms in an output function with OR-gate
 - c) Generation of selected path between multiple sources and a single destination
 - d) Encoding of binary information
6. Which of the following is correct for microprocessor Intel 8085?
- a) 8 bit microprocessor
 - b) 16 bit microprocessor
 - c) 4 bit microprocessor
 - d) 32 bit microprocessor
7. In an ideal op-amp, which is not true?
- a) Open loop voltage gain is infinite
 - b) Input resistance is infinite
 - c) Slew rate is infinite
 - d) CMRR is zero
8. Which of the following terminals does not belong to the MOSFET?
- a) Drain
 - b) Gate
 - c) Base
 - d) Source
9. Actual instructions in flowcharting are represented in _____
- a) Circles
 - b) Boxes
 - c) Arrows
 - d) Lines
10. Typically oscilloscope represents _____
- a) current and time
 - b) resistance and time
 - c) voltage and time
 - d) power and time

Section B

Five Questions of 02 Marks each

11. Define intrinsic semiconductor.
12. Write one applications of counter, register.
13. Define slew rate in OP-AMP
14. Which configuration is commonly used in amplifiers why?
15. Explain the need of voltage regulator

Section C

Seven Questions of 10 Marks each of which any 05 questions to be answered.

16. a) What is filter circuit in rectifier?. Explain Capacitor filter in detail. [5]
b) What is clipper? Explain working of positive diode clipper with neat circuit diagram and waveform. [5]
- 17.a) What is a summing amplifier? Draw the OPAMP based circuit diagram and deduce the expression for output of a summing amplifier with N inputs V_1, V_2, \dots, V_N and output V_o . [5]
17.b) Explain working of 1 to 4 demultiplexer with truth table. [5]
- 18.a) Draw the circuit diagram and explain the working of IC 555 as Astable Multivibrator. [5]
b) Write a program to add two 8-bit number using 8085 microprocessor. [5]
- 19.a) Explain Automation Control and Monitoring System (IACMS) with block diagram [5]
b) Differentiate Relay logic system & PLC control system. [5]
- 20.a) Explain Single Stage Transistor Amplifier CE configuration [5]
b) Explain Design of 2X4 decoder. What are the applications of decoder? [5]
21. a) Explain Modes of operation and characteristics of SCR. [5]
b) Draw and explain integrator circuit using operational amplifier. [5]

22.a) Simplify the following using K map.

$$f(A,B,C,D) = \sum m(7,8,9) + \sum d(10,11,12,13,14,15)$$

[5]

22.b) Explain working of ADC with neat diagram.

[5]

