Indian Maritime University

(A Central University, Govt. Of India)

B. Tech. (Marine Engineering)

Semester II

End Semester Examination June 2022

Basic Electronics
(UG11T4203)

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

Date: 22/06/2022 **Pass Marks: 35**

Part – A (Compulsory)

Q.1 Answer the following (10x2=20 Marks)

(I) The electrical resistance of the depletion layer is large because

a) It has no change carriers
b) It has a large number of charge carriers
c)It contains electrons as charge carriers
d)It has holes as charge carriers

(II) The doped region in a transistor is
a) Emitter and Collector
b) Emitter and Base
c) Collector and Base
d) Emitter, Collector and Base

(III) What is the full form of SCR?
a) Silicon controlled rectifier
b) Silicate controlled rectifier
c) Silicon controlled rectification
d) Silicon controlling rectification

(IV) 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

(V) 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

(VI) Which of the following is not a condition flag?
a) Trap flag
b) Auxiliary carry flag
c) Parity flag
d) Zero flag

(VII) . A multivibrator is an electronic circuit used to implement _____
a) Oscillator
b) Timer
c) Flip-flop
d) All of the Mentioned

(VIII) 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

(IX) . The _____ symbol is used to represent decision in flowchart.
a) Circle
b) Rectangle
c) Diamond
d)None of these

(X) . Which of the following terminals does not belong to the MOSFET?
a) Drain
b) Gate
c) Base
d) Source

Part – B (Compulsory)

(5 x 2= 10 marks)

Q.2 Answer the following

(I) . What is the function of relay?

(II) . What is a Flowchart?

(III). Define ripple factor.

(IV) Define slew rate in OP-AMP.

(V). Why CE configuration is commonly used?

Part C – Answer any 5 out of 7 Questions
(05 X 10 Marks)

Q.3a) An Astable 555 Oscillator is constructed using the following components, R1 = 1kΩ, R2 = 2kΩ and capacitor C = 10uF. Calculate the output frequency from the 555 oscillator and the duty cycle of the output waveform. (5 M)

Q.3b) Define drain resistance (rd), transconductance (gm), and amplification factor (μ) of a FET and derive relation among them. (5 M)

Q.4a) Explain the addressing modes of 8085 microprocessor with examples. (5 M)

Q.4b) Write a program of 8085 microprocessor to add the contents of memory locations 4000H and 4001H and place the result in memory location 4002H. (5 M)

Q.5a) Draw block diagram of PLC and explain each block in brief. (5 M)

Q.5b) Draw and explain one-bit half adder. (5 M)

Q.6a) Simplify the following using K map. f (A, B, C, D) = Σ m (7,8,9) +Σ d (10,11,12,13,14,15) (5 M)

Q.6b) Draw the circuit diagram of an OP-AMP summing circuit to provide $V_{out}= -V_1+3V_2-5V_3$ where V_1, V_2 and V_3 are positive inputs. (5 M)

Q.7a) Draw and explain V/I characteristic of SCR. (5 M)

Q.7b) Explain Integrated Automation Control and Monitoring System (IACMS)with block diagram. (5 M)

Q.8a) Explain Block diagram, operation of single slope type ADC. (5 M)

Q.8b) Explain the principle and working of Frequency meter. (5 M)

Q.9a) What is Clamper? Draw diagram and explain working of negative clamper? (5 M)

Q.9b) Draw the typical frequency response curve of a CE amplifier. How do you find out the bandwidth of amplifier? (5 M)