

INDIAN MARITIME UNIVERSITY
(A CENTRAL UNIVERSITY, GOVT OF INDIA)
END SEMESTER EXAMINATIONS – DECEMBER 2022
Programme Name: B. Tech (NAOE)
Semester: FIFTH
Subject Code: UG12T2505
Subject Name: BASIC ELECTRONICS ENGINEERING

Date: 16.12.2022

Max Marks: 70

Duration: 03 Hrs

Pass Marks: 35

PART-A: Multiple choice Questions (10X01=10 MARKS)

- 1) When a PN junction is Forward biased,
 - a) Minority carriers are not affected
 - b) Depletion region decreases
 - c) Holes and electrons move away from junction
 - d) All the above

- 2) Which among the following is a current controlled device
 - a) MOSFET
 - b) IGBT
 - c) BJT
 - d) JFET

- 3) A BJT transistor works as a variable resistance when?
 - a) Emitter junction is forward biased & collector junction is reverse biased
 - b) Emitter junction is reverse biased & collector junction is forward biased
 - c) Emitter junction & collector junction is reverse biased
 - d) Emitter junction & collector junction is reverse biased

- 4) In LC transistor oscillators the active component is used as
 - a) Inductor
 - b) Capacitor
 - c) Resistor
 - d) Transistor

(P.T.O)

- 5) Calculate the value of I_E in a transistor for which $\beta = 50$, $I_B = 20\mu A$
- 1.02mA
 - 1.5mA
 - 2 mA
 - 3mA
- 6) Which of the following optical detector is used when high sensitivity and bandwidth are required
- PIN diode
 - Avalanche photodiode
 - Photo multiplier tube
 - Photo transistor
- 7) The magnitude of current through a Zener diode in a Zener voltage regulator under full-load condition is
- Maximum
 - Zero
 - Remains constant irrespective of load
 - Minimum
- 8) Which of the following device has single input and multiple outputs
- Multiplexer
 - Demultiplexer
 - Counter
 - Flip flop
- 9) A counter type A/D converter contains a 4-bit binary ladder and a counter driven by a 2 MHz clock. Then conversion time is
- 8 μ sec
 - 10 μ sec
 - 2 μ sec
 - 5 μ sec
- 10) What is the total resistance of a voltmeter on the 10 V range when the meter movement is rated for 50 μA of full-scale current
- 10 k Ω
 - 20 k Ω
 - 200 k Ω
 - 30 k Ω

PART-B: Short Answer Questions (5X02=10 MARKS)

- 11) What is an Ionization potential and its value for Hydrogen atom
(P.T.O)

- 12) What are the three different types of configurations in transistor.
- 13) Why gain bandwidth product remains constant with the introduction of negative feedback.
- 14) What are the characteristics of complementary metal oxide semiconductor (CMOS).
- 15) Difference between Thermocouple, RTD and Thermistor.

PART-C: Long Answer Questions -Answer any 5 (5X10=50 MARKS)

- 16) (a) Explain V-I characteristics of Zener diode and the two breakdown conditions occurred in Zener diode. (5 Marks)
(b) Explain the reason for consideration of Diode as a circuit element. (5 Marks)
- 17) Explain the working principle of MOSFET and construction of Enhancement and Depletion type MOSFET with circuit diagram. (10 Marks)
- 18) Explain the functioning of Wien-bridge oscillator with neat circuit diagram. (10 Marks)
- 19) Define shift register and explain the following two types of shift register with clock diagrams
(a) Serial-in serial out (SISO)
(b) Parallel-in serial out (PISO) (10 Marks)
- 20) Explain about Cathode Ray Oscilloscope with neat Schematic diagram. (10 Marks)
- 21) A transistor has $I_B = 100\mu A$ and $I_c = 2\mu A$,
Find (a) β of the transistor, (b) α of the transistor, (c) Emitter current I_E , (d) If I_B changes by $+ 25\mu A$ & I_c changes by $+ 0.6mA$, Find the new value of β ? (10 Marks)
- 22) State and explain Open-Loop Operational Amplifier configurations and its limitations. (10 Marks)

*****THE END*****

