

Roll No.

Total Pages : 3

752104

January 2023
M.Sc. (PHYSICS) I SEMESTER
Electronic Device (MPH-104)

Time : 3 Hours]

[Max. Marks : 75

Instructions :

1. *It is compulsory to answer all the questions (1.5 marks each) of Part-A in short.*
2. *Answer any four questions from Part-B in detail.*
3. *Different sub-parts of a question are to be attempted adjacent to each other.*

PART-A

1. (a) Convert $(1011.11)_2$ to decimal. (1.5)
- (b) Convert $(261)_8$ into binary. (1.5)
- (c) Define combinational and sequential logic circuits. (1.5)
- (d) Define common mode rejection ratio. (1.5)
- (e) What is slew rate? Write its unit also. (1.5)
- (f) Define contact potential. (1.5)
- (g) Define linear and digital IC. (1.5)

- (h) In a common base connection current amplification factor is 0.9 . If the emitter current is 1 miliampere, determine the value of base current. (1.5)
- (i) A JFET has a drain current of 5 miliampere. If $I_{DSS} = 10$ miliampere and $V_{gs(off)} = -6V$ the value of V_{gs} and V_p . (1.5)
- (j) Define ionization potential of a metal. (1.5)

PART-B

2. (a) How will you determine the input and output characteristic of CE connection experimentally? Explain its various gains also. (10)
- (b) In common base connection $\alpha = 0.95$. The voltage drop across 2 k ohm resistance which is connected in the collector is 2 V. Find the base current. (5)
3. (a) What is the shift register? What are the different configuration of shift register? (10)
- (b) Convert a JK flip-flop into a SR flip-flop. (5)
4. Explain the construction and working of MOSFET (both D&E). Also write its advantages over JFET. (15)

5. (a) Define OP-AMP. Explain its construction and working. Also explain its Negative and positive scalar. (5)
- (b) How OP-AMP is used as a Integrator and Differentiators. (5)
6. (a) What is a MUX? Explain MUX function and its application. (10)
- (b) How diode and Transistor are fabricated on a IC chip? (5)
7. Write notes on : (15)
- (a) JFET.
- (b) 555 Timer.
- (c) Counter.