

SHRIMATHI DEVKUNVAR NANALAL BHATT VAISHNAV COLLEGE FOR WOMEN  
(AUTONOMOUS)

(Affiliated to the University of Madras and Re-accredited with 'A+' Grade by NAAC)

Chromepet, Chennai - 600 044.

B.Sc.Physics - END SEMESTER EXAMINATIONS - APRIL 2025

SEMESTER - VI

**22UPHCT6014 - Integrated Electronics**

Total Duration : 2 Hrs.30 Mins.

Total Marks : 60

### Section B

Answer any **SIX** questions ( $6 \times 5 = 30$  Marks)

1. (a) What is the binary equivalent of  $15_d$  ?  
(b) What is the decimal equivalent of the binary number  $100101_b$  ?  
(c) Convert  $3FC.8_H$  into decimal.  
(d) Convert  $(1101011.10111_b)$  into octal number.  
(e) Convert  $(1101011.10111_b)$  into hexadecimal number.
2. Describe the working of an octal to binary encoder.
3. Explain the operations of R-S flip-flop with necessary logic circuits.
4. Solve the following simultaneous equations using OP-AMP.  
 $2x + y = 3$  and  $x - y = 3$ .
5. Explain D/A conversion by binary weighted resistor method.
6. Construct and explain the working of a 4x1 MUX with AND & OR gates.
7. State and prove DeMorgan's theorem.
8. Draw the circuit diagram of an inverting operational amplifier and explain its operation. Derive an expression for its voltage gain.

### Section C

Answer any **THREE** questions ( $3 \times 10 = 30$  Marks)

9. Show that both NAND gate and NOR gates are universal gates.
10. Draw a neat diagram for a 4-bit adder/subtractor circuit with mode control. Also explain its working.
11. Explain the working of  $BCD$  counter with a neat diagram.
12. Explain how an op-amp can be used as Integrator and Differentiator.
13. Explain successive approximation  $A/D$  converter.

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