

Roll.No.

22UPHCT6014

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 - NOVEMBER 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. Convert the following
(i) $(1020)_{10}$ into hexadecimal number. (ii) $(E9)_{16}$ into decimal number.
2. Describe the working of a full adder circuit with a neat diagram.
3. Apply the concept of a JK master-slave flip-flop to explain how it overcomes the race-around condition.
4. Illustrate the pin configuration of an Op-Amp and its characteristics.
5. Explain the internal block diagram and working of a 555 timer.
6. Simplify the following Boolean equation using a Karnaugh map and draw the simplified circuit: $F(A, B, C, D) = \sum(0, 1, 3, 5, 7, 8, 9, 11, 12, 13, 14, 15)$.
7. Solve a synchronous 4-bit up counter problem using a K-map design.
8. Justify how a Wien bridge oscillator can be used to generate a sine wave.

Section C

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

9. Show that NAND and NOR gates can be used as universal logic gates.
10. Design a 4-to-1 multiplexer (MUX) and explain its operation.
11. Compare and contrast asynchronous and synchronous counters, highlighting their key differences.
12. Evaluate the performance of square and triangle wave generators using Op-Amps.
13. Appraise the successive approximation method for an Analog to Digital (A/D) converter.
