

SECOND SEMESTER UG DEGREE EXAMINATION, APRIL 2026

(FYUGP)

(Regular/Supplementary/Improvement)

CC24UPHY2CJ101 - ELECTRONICS - I

(Physics - Major Course)

(2024 Admission onwards)

Time: 2.0 Hours

Maximum: 70 Marks

Credit: 4

Part A (Short answer questions)Answer *all* questions. Each question carries 3 marks.

1. Discuss any two applications of LED and Photodiode. [Level:2] [CO2]
2. Describe the behaviour of a PN junction under forward and reverse bias. [Level:2] [CO2]
3. Define ripple factor. Find the ripple factor of fulwave rectifier. [Level:4] [CO3]
4. Explain how zener diode maintains constant voltage across the load. [Level:2] [CO3]
5. Define the operating point of a transistor. [Level:1] [CO4]
6. Define an analog signal and a digital signal. [Level:2] [CO4]
7. Recognize whether 1010 0110 is a valid BCD representation. [Level:1] [CO6]
8. Recall the main characteristic that distinguishes an analog signal from a digital signal. [Level:1] [CO6]
9. Write the binary equivalent of the decimal number 45. [Level:1] [CO6]
10. Convert the decimal number 25 into hexadecimal. [Level:1] [CO6]

(Ceiling: 24 Marks)**Part B** (Paragraph questions/Problem)Answer *all* questions. Each question carries 6 marks.

11. A silicon PN junction diode has a breakdown voltage of 75V and operates in a reverse-biased condition. Calculate the maximum current it can handle safely if its power dissipation is limited to 0.5W. [Level:2] [CO2]
12. The reverse saturation current (I_s) of a PN junction diode is 5 nA at room temperature. [Level:2] [CO1]
If the thermal voltage (V_T) is 26 mV, calculate the forward current (I_f) when the diode is forward biased with 0.3 V.

13. Analyze how input frequency affects the output frequency and ripple in half-wave rectifiers [Level:4] [CO3]
14. Examine the impact of using non-sinusoidal input signals on the frequency characteristics. [Level:4] [CO3]
15. Explain the roles of the emitter, collector, and base in a transistor. [Level:2] [CO4]
16. Explain why the voltage divider bias method provides good thermal stability. [Level:2] [CO4]
17. Explain the input resistance of a CE circuit with a CB circuit. [Level:2] [CO4]
18. Convert the decimal number 63 into binary. Then, recognize if this binary value is less than 10000000. [Level:1] [CO6]

(Ceiling: 36 Marks)

Part C (Essay questions)

Answer any *one* question. The question carries 10 marks.

19. Explain the working and construction of voltage doubler. Give its advantages and disadvantages. [Level:2] [CO3]
20. Explain the concept of faithful amplification in a transistor and analyse its importance in transistor biasing. Illustrate how improper biasing affects faithful amplification. [Level:2] [CO4]

(1 × 10 = 10 Marks)
