

24U207

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Name : .....

Reg. No : .....

**SECOND SEMESTER UG DEGREE EXAMINATION, APRIL 2025**

(FYUGP)

**CC24UPHY2CJ101 - ELECTRONICS - I**

(Physics - Major Course)

(2024 Admission - Regular)

Time: 2.0 Hours

Maximum: 70 Marks

Credit: 4

**Part A** (Short answer questions)

Answer *all* questions. Each question carries 3 marks.

1. Describe the behaviour of a PN junction under forward and reverse bias. [Level:2] [CO2]
2. Discuss the effect of temperature on the conductivity of a semiconductor. [Level:2] [CO1]
3. Discuss the advantages and disadvantages of full wave bridge rectifier. [Level:2] [CO3]
4. Explain the working of pi filter. [Level:2] [CO3]
5. Define transistor action and explain its significance. [Level:1] [CO4]
6. Explain the relationship between current gain, voltage gain and power gain in transistor amplifier. [Level:2] [CO4]
7. Define an analog signal and a digital signal. [Level:1] [CO6]
8. Define the term "Binary-Coded Decimal (BCD)." [Level:1] [CO6]
9. Convert the decimal number 25 into binary. [Level:1] [CO6]
10. Recall the binary equivalent of the decimal number 8. [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. An LED operates at a forward voltage of 2.2 V and a current of 20 mA. If the LED emits light with an efficiency of 60 percentage, calculate the total power consumed by the LED and the power converted into light. [Level:2] [CO2]
13. Analyze the voltage stabilising action of zener diode by increasing input voltages. [Level:4] [CO3]

14. Analyze the current flow paths in a half-wave voltage doubler circuit. [Level:4] [CO3]
15. Discuss the biasing with collector feedback circuit. [Level:2] [CO4]
16. Illustrate the concept of transistor stabilization with an example. [Level:2] [CO4]
17. Discuss and deduce the expression for collector-emitter voltage (VCE) in the voltage divider bias method. [Level:2] [CO4]
18. Write the hexadecimal form of 204. Then, explain how you would convert this hexadecimal number back into decimal. [Level:1] [CO6]

**(Ceiling: 36 Marks)**

**Part C (Essay questions)**

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

19. Dissect the internal operation of a half-wave rectifier and obtain an expression for efficiency [Level:4] [CO3]
20. Explain the Common Emitter connection arrangement in transistor with suitable diagram. Also discuss the important characteristics of CE arrangement. [Level:2] [CO4]

**(1 × 10 = 10 Marks)**

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