

**2103000205021005**  
**EXAMINATION FEBRUARY-MARCH 2024**  
**BACHELOR OF SCIENCE (FIFTH SEMESTER)**  
**PHYSICS-X (PH-510-ANALOG AND DIGITAL ELECTRONICS)**  
**LEVEL 2**

[Time: As Per Schedule]

[Max. Marks: 50]

**Instructions:**

**1. Fill up strictly the following details on your answer book**

- a. Name of the Examination: **BACHELOR OF SCIENCE (FIFTH SEMESTER)**
  - b. Name of the Subject: **PHYSICS-X (PH-510-ANALOG AND DIGITAL ELECTRONICS) LEVEL 2**
  - c. Subject Code No: **2103000205021005**
2. Sketch neat and labelled diagram wherever necessary.  
3. Figures to the right indicate full marks of the question.  
4. All questions are compulsory.

Seat No:

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Student's Signature

**Q.1 Write short answer.**

**10**

1. What is the element to insulate gate from the channel?
2. Give full form of UJT and SCR?
3. What are the parameter of Op-amps? Give their typical value.
4. Define voltage Buffer.
5. Why IC-741 is called operational amplifier?
6. In a four variable digital system, how many variable are removed for Pair, quad and Octate in a K-map solution?
7. Why is K-map used in Digital system
8. What is Encoder and decoder. Differentiate it from MUX and DEMUX.
9.  $(CBA.B)_{16} = ( \quad )_{10}$
10. What is the output of X-OR gate if the input is equal?

**Q.2 A) Write any one of the following questions**

1. For DC analysis draw a differential amplifier with differential input and single ended output. Tell me how you would calculate the tail current, emitter current and the collector voltage. **6**
2. Explain the construction and working UJT. **6**

**B) Write any one of the following questions**

1. Write short note on 4 to 1 multiplexer **4**
2. Write short note on 1 to 4 De-multiplexer **4**

**Q.3 A) Write any One of the following questions**

1. Explain in detail digital comparator for Single n-bit. **6**
2. Write short note on current mirror circuit. **6**

**B) Write any One of the following questions.**

1. Explain pair of 1's, Quad of 1's and Octate of 1's in k-map. **4**
2. Write short note on 4 variable K-map. **4**

**Q.4 A) Write any One of the following questions**

1. Explain Boolean Laws. **6**
2. Using Truth table prove the De-Morgan's First and second Theorem. **6**

**B) Write any one of the following questions.**

1. Explain NOR Gate Using diode. **4**
2. Explain NAND gate Using transistor **4**

**Q.5 A) Write any One of the following questions**

1. Write short note on Encoder in Digital system. **6**
2. Explain in detail Parity generators and checkers. **6**

**B) Write any One of the following questions**

1. Explain Hexadecimal System with an example **4**
2.  $(110.001)_2 = (\text{_____})_{10}$ ,  $(1011.11)_2 = (\text{_____})_{10}$  **4**

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