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# Fourth Semester FYUGP Degree (Reg) Examination April 2026

## KU4DSCPHY204 - ELECTRONICS I

2024 Admission onwards

Time : 1.5 hours Maximum Marks : 50

### Section A

**Answer any 6 questions. Each carry 2 marks.**

1. What is a hole in a semiconductor?
2. What is meant by an n-type semiconductor?
3. Covert 0.347 to binary using repeated multiplication by 2.
4. Convert 0.0981 to binary using sum of weights method.
5. What is the $\beta_{DC}$ of a transistor if $I_C = 20.3\,\text{mA}$ and $I_E = 20.5\,\text{mA}$?
6. Differentiate between E-MOSFET and D-MOSFET.
7. Write the truth table and Boolean expression for a 2-input NAND gate.
8. Simplify $Y = ABC + AB\overline{C} + A\overline{B}C$

### Section B

**Answer any 4 questions. Each carry 6 marks.**

9. Draw a voltage divider circuit. Explain the loading effects in voltage-divider bias
10. A fixed bias transistor has $V_{CC} = 10\,\text{V}$ and $R_C = 1\,\text{k}\Omega$. If $V_{CE} = 4\,\text{V}$, find the $I_C$.
11. Discuss breakdown in a JFET.
12. Apply De Morgan's theorem to the expression and simplify
    (a) $\overline{AB\,\overline{B}(C + \overline{D})}$
    (b) $\overline{AB(CD + EF)}$
13. Implement the Boolean function $Y = \overline{A} + B$ using only NAND gates
14. Design a circuit to implement the Boolean expression $Y = \overline{AB + CD}$ using only NAND gates

### Section C

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**Answer any 1 questions. Each carry 14 marks.**

15. Explain with neat diagram the V-I characteristics of forward and reverse characteristics of a pn juction diode. Also explain the non linear property of the diode.
16. What is Binary Coded Decimal?Explain with suitable example the steps involved in adding two BCD numbers.