K26FY1389 Pages: 2 Reg No:.....
Name:.....

Second Semester FYUGP Degree (Reg) Examination April 2026

KU2DSCPHY125 - DIGITAL ELECTRONICS

2024 Admission onwards

Time : 1.5 hours Maximum Marks : 50

Section A

Answer any 6 questions. Each carry 2 marks.

1. Implement X= (A+B)(C+D) using NOR Gates.
2. Express A+ B using three NAND gates.
3. Convert the binary number 11101 to decimal.
4. What is the binary equivalent of the hexadecimal number $F7A9_{16}$.
5. What is associative law of Boolean algebra?
6. Convert the Boolean Expression to POS form.

$$AB + B(CD + EF)$$

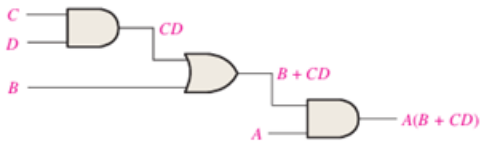
7. How is the decimal number 25 represented in BCD?
8. Mention any two applications of AND gate.

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Section B

Answer any 4 questions. Each carry 6 marks.

9. Prove (A+B) (A+C) = A+BC?
10. Construct the truth table for the given logic circuit?



11. Determine the truth table for the following standard POS expressions:
    a) $(A + B + C)(A + \bar{B} + C)(A + \bar{B} + \bar{C})(\bar{A} + B + \bar{C})(\bar{A} + \bar{B} + C)$

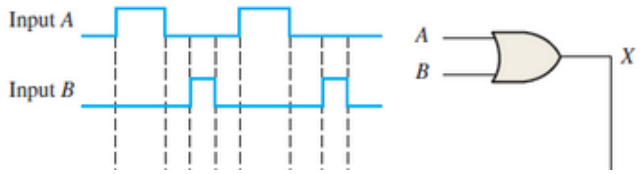
    b) $(A + \bar{B} + C)(A + B + \bar{C})(\bar{A} + \bar{B} + \bar{C})$

12. Describe the basic process of converting an analog signal into a digital signal.

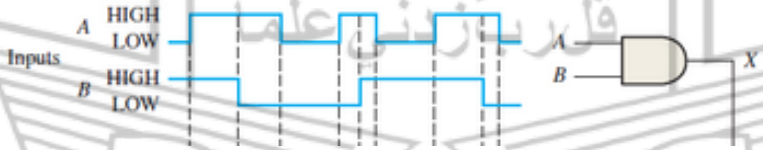
13. Write a brief note on the working of NAND gate. Sketch the gate operation with waveform inputs.

14. .If the two input waveforms, A and B, in figure are applied to the following gates, what is the resulting output waveform?

a)



b)



Section C

Answer any 1 questions. Each carry 14 marks.

15. (a) Consider the logic expressions
1) X =(A+B).(C+D) 2) X= AB + CD
Construct the logic diagrams of 1 & 2 with
a)NAND gates only
b) NOR gates only

(b) Explain the working of 4bit comparator with logic symbol

16. (a) Convert $(235)_{10}$ and $(146)_{10}$ into 8-bit binary numbers and perform their binary addition. Check for overflow and justify your answer.

(b) Perform binary subtraction using 2's complement method: $(1101011)_2 - (1000110)_2$ and verify by converting the result to decimal.

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