# Dr. SNS RAJALAKSHMI COLLEGE OF ARTS & SCIENCE (Autonomous)
**Coimbatore -641049**

Accredited by NAAC(Cycle–III) with 'A+' Grade
(Recognized by UGC, Approved by AICTE, New Delhi and
Affiliated to Bharathiar University, Coimbatore)

## DEPARTMENT OF GRAPHIC & CREATIVE DESIGN AND DATA ANALYTICS

## COURSE NAME : Computer SYSTEM Architecture (23UCU402)

I YEAR /I SEMESTER

Unit I- Data Representation

Topic 5 : Number system : HEXA DECIMAL

# Hexadecimal Number System

- Uses 10 digits and 6 letters, 0,1,2,3,4,5,6,7,8,9,A,B,C,D,E,F.
- Letters represents numbers starting from 10. A = 10, B = 11, C = 12, D = 13, E = 14, F = 15.
- Also called base 16 number system.
- Each position in a hexadecimal number represents a 0 power of the base (16). Example $16^0$.
- Last position in a hexadecimal number represents an x power of the base (16). Example $16^x$ where x represents the last position - 1.

# Hexadecimal Number System

| DECIMAL | HEX | BINARY |
|---|---|---|
| 0 | 0 | 0000 |
| 1 | 1 | 0001 |
| 2 | 2 | 0010 |
| 3 | 3 | 0011 |
| 4 | 4 | 0100 |
| 5 | 5 | 0101 |
| 6 | 6 | 0110 |
| 7 | 7 | 0111 |
| 8 | 8 | 1000 |
| 9 | 9 | 1001 |
| 10 | A | 1010 |
| 11 | B | 1011 |
| 12 | C | 1100 |
| 13 | D | 1101 |
| 14 | E | 1110 |
| 15 | F | 1111 |

# Hexa Number System

Example

Decimal Number – $12570_{10}$

Calculating Hexa decimal Equivalent –


$$(12570)_{10} = (311A)_{16}$$

# Hexadecimal Number System

Example −
Hexadecimal Number: $19FDE_{16}$
Calculating Decimal Equivalent −
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| Step | Hexadecimal Number | Decimal Number |
|---|---|---|
| Step 1 | $19FDE_{16}$ | $((1 \times 16^4) + (9 \times 16^3) + (F \times 16^2) + (D \times 16^1) + (E \times 16^0))_{10}$ |
| Step 2 | $19FDE_{16}$ | $((1 \times 16^4) + (9 \times 16^3) + (15 \times 16^2) + (13 \times 16^1) + (14 \times 16^0))_{10}$ |
| Step 3 | $19FDE_{16}$ | $(65536 + 36864 + 3840 + 208 + 14)_{10}$ |
| Step 4 | $19FDE_{16}$ | $106462_{10}$ |

# Assessment - Questions

1. Convert 1770 Decimal number to Hexa decimal number
2. Convert A12E Hexa decimal to Decimal number
3. Convert 1202.34 Decimal number to hexa number

# Assessment - Answer

## 1. Convert 1770 Decimal number to Hexa decimal number



$(1770)_{10} = (AE6)_{16}$

# Assessment - Answer

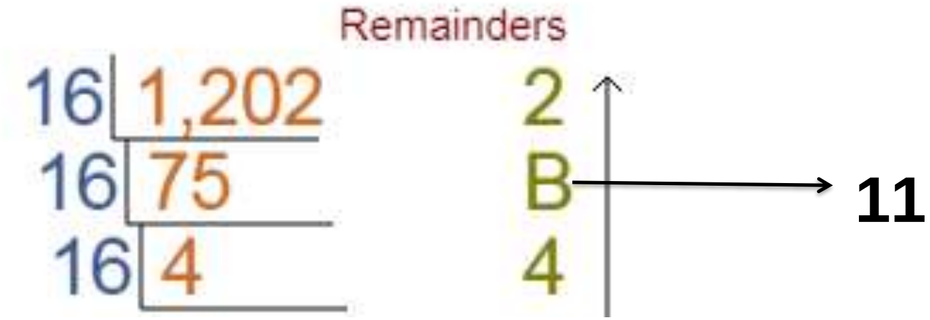
## 2. Convert A12E Hexa decimal to Decimal number

$$(A12E)_{16} = (10 \times 16^3) + (1 \times 16^2) + (2 \times 16^1) + (14 \times 16^0)$$
$$= 40960 + 256 + 32 + 14$$
$$= (41262)_{10}$$

$$((A12E)_{16} = (41262)_{10}$$

# Assessment - Answer

1. **Convert 1202.34 Decimal number to hexa number**




$0.34 \times 16 = 5.44$

$0.44 \times 16 = 7.04$

$0.04 \times 16 = 0.64$

$0.64 \times 16 = 10.24$

$0.24 \times 16 = 3.84$

$0.84 \times 16 = 13.44$

$0.44 \times 16 = 7.04$

$0.04 \times 16 = 0.64$


$$(1202.34)_{10} = (4B2.570A3D70...)_{16}$$

# References


1.M.Morris Mano, “Computer System Architecture” 3rd Edition, Prentice Hall of India ,2000, ISBN-10: 0131663631

2. V.K. Puri, —DIGITAL ELECTRONICS CIRCUITS AND SYSTEMS” McGraw Hill Education (1 July 2017). ISBN-10: 9780074633175 , ISBN-13: 978-0074633175

3.William Stallings, “Computer Organization and Architecture, Designing for Performance” PHI/ Pearson Education North Asia Ltd., 10th Edition 2016, ISBN 978-0- 13-410161-3 — ISBN 0-13-410161-8.


# Thank You