Òco †Zvgvi cÖf‚i bv‡g whwb †Zvgv‡K m„wó K‡i‡QÓ

**Number System And MAC Address**

**Abdur Razzak**

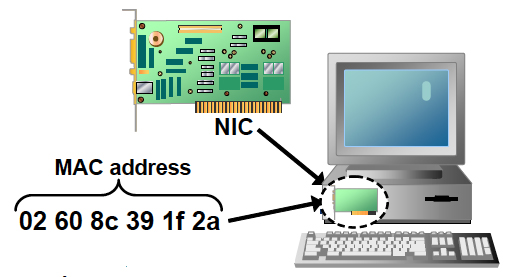
**MCSA**

**IT Professional Diploma in Networking Technologies**

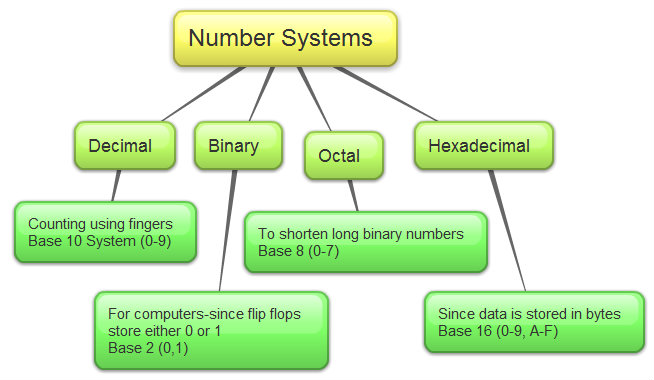
**BSc (Hon’s) & MSc in Mathematics (Both 1st Class)**

**Mobile: 01723090660, 01535114660**

**Email: a.razzak660@gamil.com  
Website: selftics.net**



|  |  |  |  |
| --- | --- | --- | --- |
| **INDEX** | | | |
| **Article** | **Topic** | | **page** |
| 1.0 | **Number System** | | 1 |
| 1.1 |  | Type of Number System | 1 |
| 1.2 |  | Decimal Number System | 2 |
| 1.3 |  | Binary Number System | 2 |
| 1.4 |  | Octal Number System | 3 |
| 1.5 |  | Hexadecimal Number System | 3 |
| 2.0 | **Number Conversions** | | 4 |
| 2.1 |  | Decimal to Binary Conversion | 4 |
| 2.2 |  | Decimal to Octal Conversion | 6 |
| 2.3 |  | Decimal to Hexadecimal Conversion | 6 |
| 2.4 |  | Binary to Decimal Conversion | 7 |
| 2.5 |  | Octal to Decimal Conversion | 7 |
| 2.6 |  | Hexadecimal to Decimal Conversion | 7 |
| 2.7 |  | Octal to Binary Conversion | 8 |
| 2.8 |  | Hexadecimal to Binary Conversion | 8 |
| 2.9 |  | Octal to Hexadecimal Conversion |  |
| 2.10 |  | Hexadecimal to Octal Conversion |  |
| 3.0 | **MAC Address** | |  |
| 3.1 |  |  |  |
| 3.2 |  |  |  |

****

**msL¨v c×wZ (Number System)t**

mvs‡KwZK wPý ev eY© cvkvcvwk †i‡L †Kvb msL¨v †jLv I cÖKv‡ki c×wZ‡KB msL¨v c×wZ e‡j| msL¨v c×wZi mvnv‡h¨ mn‡RB †Kvb wKQzi msL¨v MYbv I cÖKvk Kiv hvq|

**AsK (Digit)t**

†Kvb msL¨v c×wZ wj‡L cÖKvk Kivi Rb¨ †h mg¯Í mvs‡KwZK wPý ev †gŠwjK wPý e¨envi Kiv nq Zv‡K AsK ev digit e‡j| A\_©vr msL¨v ˆZwii ÿz`ªZg cÖZxKB n‡”Q AsK| †hgb t 132 msL¨vwU 1, 3 I 2 Avjv`v wZbwU As‡Ki Øviv MwVZ n‡q‡Q| msL¨v c×wZ‡Z wKQz wb`©wó AsK‡K wbqg gZ mvwR‡q wewfbœ msL¨v cvIqv hvq|

**i¨vwW· c‡q›U (Radix Point) = `kwgK c‡q›U / evBbvwi c‡q›U/A±¨vj c‡q›U/ †n·v†Wwmg¨vj c‡q›Ut**

i¨vwW· c‡q›U cÖwZwU msL¨v c×wZi †ÿ‡Î H msL¨v c×wZi bv‡g cwiwPwZ jvf K‡i| †hgb- evBbvwii †ÿ‡Î evBbvwi c‡q›U| i¨vwW· c‡q‡›Ui evg w`‡Ki Ask‡K c~Y©vsk (Integer) Ges Wvb w`‡Ki Ask‡K fMœvsk (Fraction)-e‡j | cwRkbvj msL¨v c×wZ‡Z i¨vwW· c‡q›U e¨eüZ nq|

|  |  |  |
| --- | --- | --- |
| MSB (Most Significant Bit)  me‡P‡q ¸iæZ¡evnx b¤^i | 125.469 | LSB (Lest Significant Bit)  me‡P‡q Kg ¸iæ‡Z¡i b¤^i |
|  | Radix Point |  |

**msL¨v c×wZi †em ev wfZt**

†Kvb msL¨v c×wZ‡K wj‡L cÖKvk Kivi Rb¨ hZ¸‡jv †gŠwjK wPý ev AsK e¨envi Kiv nq Zvi mgwó‡K †em ev wfZ e‡j| †hgb - `kwgK msL¨v c×wZi †em 10| ‡Kbbv G c×wZ‡Z ‡gvU 10wU †gŠwjK wPý Av‡Q| h\_v- 0, 1, 2, 3, 4, 5, 6, 7, 8, 9|

**msL¨v c×wZi cÖKvi†f` (Type of Number System)t**

msL¨v c×wZi †em ev wf‡Zi Dci wbf©i K‡i MwY‡Z †gvU Pvi ai‡Yi msL¨v c×wZi cÖPjb Av‡Q| hv wWwRUvj mvwK©‡U cÖvqB e¨eüZ nq| †hgb-

1| `kwgK msL¨v c×wZ (Decimal Number System)

2| evBbvwi msL¨v c×wZ (Binary Number System)

3| AKU¨vj msL¨v c×wZ (Octal Number System)

4| †n·v†Wwmg¨vj msL¨v c×wZ (Hexadecimal Number System)

**`kwgK msL¨v c×wZ (Decimal Number System)t**

gvbyl ˆ`bw›`b Rxe‡b MYbv Ges wnmve wbKv‡ki Rb¨ †h msL¨v c×wZ e¨envi K‡i Zv‡KB `kwgK msL¨v c×wZ e‡j| GB c×wZi †em ev wfZ n‡”Q 10| KviY GB c×wZ‡Z `kwU †gŠwjK wPý e¨envi Kiv nq| h\_v- 0, 1, 2, 3, 4, 5, 6, 7, 8, 9|

**evBbvwi msL¨v c×wZ (Binary Number System)t**

GwU GKwU mijZg c×wZ| Kw¤úDUv‡ii Avf¨šÍixY KvR evBbvwi msL¨v c×wZ‡Z m¤úbœ nq| G c×wZ‡Z 0 Ges 1 GB `yBwU gvÎ AsK e¨eüZ nq| G Rb¨ GB c×wZ‡K wØwgwZK msL¨v c×wZI ejv nq| G msL¨v c×wZi †em ev wfZ 2| GB c×wZi 0 Ges 1 GB AsK `ywU‡K ms‡ÿ‡c weU (**Binary** †\_‡K **Bi** Ges **Digit** †\_‡K **t** wb‡q **Bit**) ejv nq| 0 I 1-‡K wewfbœ fv‡e mvwR‡q †h ‡Kvb msL¨v †jLv m¤¢e| †hgb - `kwgK msL¨v c×wZi 127 evBbvwi msL¨v c×wZ‡Z 10000011|

|  |  |  |
| --- | --- | --- |
|  | B1 | B0 |
| 0 | 0 | 0 |
| 1 | 0 | 1 |
| 2 | 1 | 0 |
| 3 | 1 | 1 |

* evBbvwi GK weU `yBwU Ae¯’v cÖKvk K‡i -0, 1
* `yB weU PviwU Ae¯’v cÖKvk K‡i ;
* 2🞨2=22=4
* Max Decimal = 22 – 1 = 3

|  |  |  |  |
| --- | --- | --- | --- |
|  | B2 | B1 | B0 |
| 0 | 0 | 0 | 0 |
| 1 | 0 | 0 | 1 |
| 2 | 0 | 1 | 0 |
| 3 | 0 | 1 | 1 |
| 4 | 1 | 0 | 0 |
| 5 | 1 | 0 | 1 |
| 6 | 1 | 1 | 0 |
| 7 | 1 | 1 | 1 |

* n weU Øviv 2n Ae¯’v cÖKvk Kiv hvq|
* wZbwU weU Øviv AvUwU Ae¯’v cÖKvk Kiv hvq|
* 2🞨2🞨2 = 23 = 8
* Max Decimal = 23 -1 = 7

**evBbvwi msL¨v †jLvi wbqgt**

1. GK‡Ki N‡i wjL‡Z n‡e- Dci †\_‡K wb‡Pi w`‡K hv‡e- 0, 1, 0, 1, 0, 1, 0, 1, 0, 1, 0, 1, 0, 1, 0, 1, ….|
2. `k‡Ki N‡i wjL‡Z n‡e- Dci †\_‡K wb‡Pi w`‡K hv‡e- 0, 0, 1, 1, 0, 0, 1, 1, 0, 0, 1, 1, 0, 0, 1, 1, ….|
3. kZ‡Ki N‡i wjL‡Z n‡e- Dci †\_‡K wb‡Pi w`‡K hv‡e- 0, 0, 0, 0, 1, 1, 1, 1, 0, 0, 0, 0, 1, 1, 1, 1, ….|

- G fv‡e wjL‡j fyj n‡e bv|

|  |  |  |  |
| --- | --- | --- | --- |
| we‡Rvo | | ‡Rvo | |
| `kwgK msL¨v | evBbvwi msL¨v | `kwgK msL¨v | evBbvwi msL¨v |
|  |  | 0 | 0 |
| 1 | 01 | 2 | 10 |
| 3 | 11 | 4 | 100 |
| 5 | 101 | 6 | 110 |
| 7 | 111 | 8 | 1000 |
| 9 | 1001 | 10 | 1010 |
| 11 | 1011 | 12 | 1100 |
| 13 | 1101 | 14 | 1110 |
| 15 | 1111 | 16 | 10000 |
| 17 | 10001 |  |  |

**AKU¨vj msL¨v c×wZ (Octal Number System**)t

‡h msL¨v c×wZi wfZ 8 Zv‡K AKU¨vj msL¨v c×wZ e‡j| AKU¨vj msL¨v c×wZ‡Z AvUwU AsK e¨envi Kiv nq| h\_v- 0, 1, 2, 3, 4, 5, 6, 7| AvaywbK wWwRUvj Kw¤úDUv‡i AKU¨vj msL¨v c×wZ e¨envi n‡”Q| G msL¨v c×wZ mvaviY gvby‡li Kv‡Q cwiwPZ bq|

**†n·v†Wwmg¨vj msL¨v c×wZ (Hexadecimal Number System)t**

‡h msL¨v c×wZi wfZ 16 Zv‡K †n·v†Wwmg¨vj msL¨v c×wZ e‡j| †n·v†Wwmg¨vj msL¨v c×wZ‡Z †lvjwU AsK e¨envi Kiv nq| h\_v- 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, A, B, C, D, E, F| eY© I msL¨v Df‡qi e¨envi \_vKvi Kvi‡Y †n·v†Wwmg¨vj msL¨v c×wZi Avi GK bvg AvjdvwbD‡gwiK msL¨v c×wZ| AvaywbK †QvU-eo wWwRUvj Kw¤úDUv‡i (mycvi Kw¤úDUvi, †gBb †d«g Kw¤úDUvi BZ¨vw`) †n·v†Wwmg¨vj msL¨v c×wZ e¨envi n‡”Q| G msL¨v c×wZ mvaviY gvby‡li Kv‡Q cwiwPZ bq|

**wewfbœ msL¨v c×wZ‡Z wewfbœ msL¨vi gvbt**

| **Decimal (`kwgK)** | **Binary (wØwgK)** | **Octal** | **Hexadecimal** |
| --- | --- | --- | --- |
| 0 | 0 | 0 | 0 |
| 1 | 1 | 1 | 1 |
| 2 | 10 | 2 | 2 |
| 3 | 11 | 3 | 3 |
| 4 | 100 | 4 | 4 |
| 5 | 101 | 5 | 5 |
| 6 | 110 | 6 | 6 |
| 7 | 111 | 7 | 7 |
| 8 | 1000 | 10 | 8 |
| 9 | 1001 | 11 | 9 |
| 10 | 1010 | 12 | A |
| 11 | 1011 | 13 | B |
| 12 | 1100 | 14 | C |
| 13 | 1101 | 15 | D |
| 14 | 1110 | 16 | E |
| 15 | 1111 | 17 | F |
| 16 | 10000 | 20 | 10 |
| 17 | 10001 | 21 | 12 |
| 18 | 10010 | 22 | 13 |
| 19 | 10011 | 23 | 14 |
| 20 | 10100 | 24 | 15 |
| .... | …. | …. | …. |

**ciewZ© msL¨v †jLvi wbqgt**

* †h †Kvb msL¨v c×wZi †gŠwjK AsK¸‡jvi mv‡\_ 1 †hvM Ki‡j ciewZ© msL¨v cvIqv hvq| ‡hgb- 3+1 = 4|
* `kwgK msL¨vq 9 Gi c‡i Avi †Kvb msL¨v bv \_vKvq 9+1=10, 99+1=100, 999 +1=1000 wjwL| Z`&iæc Ab¨vb¨ msL¨v c×wZi †ÿ‡Î wbgœiæc †jLv nq-

|  |  |  |  |
| --- | --- | --- | --- |
| `kwg‡Ki †ÿ‡Î | evBbvwii †ÿ‡Î | AKU¨v‡ji †ÿ‡Î | †n·v‡Wwmgv‡ji †ÿ‡Î |
| 0+1 = 1 | 0+1 = 1 | 0+1 = 1 | 0+1 = 1 |
| 9+1=10 | 1+1 = 10 | 7+1 = 10 | F+1 = 10 |
| 99+1=100 | 11+1 = 100 | 17+1 = 20 | 1F+1 = 20 |
| 999+1=1000 | 111+1 = 1000 | 27+1 = 30 | 2F+1 = 30 |

**‡gŠwjK AsK, †em ev wfZ, D`vniY Ges Zv‡`I mgZzj¨ gvb cÖ`wk©Z njt**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| msL¨v c×wZ | †gŠwjK AsKmg~n | †em ev wfZ | D`vniY | `kwgK mgZzj¨ gvb |
| `kwgK | 0, 1, 2, 3, 4, 5, 6, 7, 8, 9 | 10 | 12710 | 127 |
| evBbvwi | 0, 1 | 2 | 1102 | 13 |
| AKU¨vj | 0, 1, 2, 3, 4, 5, 6, 7 | 8 | 258 | 21 |
| †n·v‡Wwmgvj | 0, 1, 2, 3, 4,5, 6, 7, 8, 9 A, B, C, D, E, F | 16 | 1A 16 | 26 |

msL¨v iæcvšÍi **(Number Conversions)**

evBbvwi, AKU¨vj,`kwgK I †n·v‡Wwmgvj †gvU Pvi ai‡bi msL¨v c×wZi g‡a¨ GK msL¨v c×wZi msL¨v†K Ab¨ Avi GK msL¨v c×wZ‡Z iæcvšÍi Kiv n‡q \_v‡K| G iæcvšÍi cÖwµqv ‡gvU evi ai‡bi n‡Z cv‡i| †hgb-

1. `kwgK msL¨v c×wZ †\_‡K evBbvwi msL¨v c×wZ‡Z iæcvšÍi
2. `kwgK msL¨v c×wZ †\_‡K AKU¨vj msL¨v c×wZ†Z iæcvšÍi
3. `kwgK msL¨v c×wZ †\_‡K †n·v‡Wwmgvj msL¨v c×wZ‡Z iæcvšÍi
4. evBbvwi msL¨v c×wZ †\_‡K `kwgK msL¨v c×wZ‡Z iæcvšÍi
5. AKU¨vj msL¨v c×wZ †\_‡K `kwgK msL¨v c×wZ‡Z iæcvšÍi
6. †n·v‡Wwmgvj msL¨v c×wZ †\_‡K `kwgK msL¨v c×wZ‡Z iæcvšÍi
7. AKU¨vj msL¨v c×wZ †\_‡K evBbvwi msL¨v c×wZ‡Z iæcvšÍi
8. †n·v‡Wwmgvj msL¨v c×wZ †\_‡K evBbvwi msL¨v c×wZ‡Z iæcvšÍi
9. evBbvwi msL¨v c×wZ †\_‡K AKU¨vj msL¨v c×wZ‡Z iæcvšÍi
10. evBbvwi msL¨v c×wZ †\_‡K †n·v‡Wwmgvj msL¨v c×wZ‡Z iæcvšÍi
11. AKU¨vj msL¨v c×wZ †\_‡K †n·v‡Wwmgvj msL¨v c×wZ‡Z iæcvšÍi
12. †n·v‡Wwmgvj msL¨v c×wZ †\_‡K AKU¨vj msL¨v c×wZ‡Z iæcvšÍi

**`kwgK msL¨v c×wZ †\_‡K †h †Kvb msL¨v c×wZ‡Z iæcvšÍ‡ii mvaviY wbqgt**

**c~Y©vs‡ki †ÿ‡Î-**

1. `kwgK msL¨v†K KvswLZ msL¨v c×wZi †em ev wfZ Øviv fvM Ki‡Z n‡e Ges fvM‡klwU msiÿY Ki‡Z n‡e|
2. fvMdj‡K cybivq †em ev wfZ Øviv fvM Ki‡Z n‡e Ges fvM‡klwU msiÿY Ki‡Z n‡e|
3. G c×wZi cybive„wË Ki‡Z n‡e hZÿY bv fvR¨ 0 nq|
4. cÖvß fvM†kl ¸‡jv‡K ( †k‡l cÖvß fvM†k†li w`K †\_‡K ïiæ‡Z cÖvß fvM†k†li w`†K) avivevwnKfv‡e mvwR‡q wjL‡jB iæcvšÍwiZ msL¨vi c~Yv©sk cvIqv hv‡e|

**fMœvs‡ki †ÿ‡Î-**

1. `kwgK msL¨v†K KvswLZ msL¨v c×wZi †em ev wfZ Øviv MyY Ki‡Z n‡e Ges cÖvß ¸Yd‡ji c~Y©vskwU‡K msiÿY Ki‡Z n‡e|
2. ¸Yd‡ji fMœvsk‡K (c~Y©vskwU‡K bq) Avevi KvswLZ msL¨v c×wZi †em ev wfZ Øviv MyY Ki‡Z n‡e Ges cÖvß ¸Yd‡ji c~Y©vskwU‡K msiÿY Ki‡Z n‡e|
3. G c×wZi cybive„wË Ki‡Z n‡e hZÿY bv ¸Ydj 0 nq|
4. i¨vwW· c‡q‡›Ui c‡i cÖvß ¸Yd‡ji c~Y©vsk¸‡jv‡K ( ïiæ‡Z cÖvß c~Y©vs‡ki w`K †\_‡K ‡k‡l cÖvß c~Y©vs‡ki w`‡K) avivevwnKfv‡e mvwR‡q wjL‡jB iæcvšÍwiZ msL¨vi fMœvsk cvIqv hv‡e|

**wet `ªt**

†Kvb msL¨v hw` c~Y©vsk I fMœvsk hy³ nq,†m‡ÿ‡Î c~Y© Ask‡K Avjv`v K‡i c~Y© msL¨vi wbq‡g Ges fMœvsk‡K fMœvsk msL¨vi wbq‡g KvswLZ msL¨vq cwiYZ Ki‡Z nq| c‡i GKwÎZ K‡i Dc¯’vcb Ki‡Z nq| Z‡e fMœvs‡ki Rb¨ Pvi/cuvP evi ¸Y Kivi ciI 1 bv n‡j Zv Avmbœ gvb wnmv‡e ivLv †h‡Z cv‡i|

**`kwgK msL¨v c×wZ †\_‡K evBbvwi msL¨v c×wZ‡Z iæcvšÍit**

1. (75.375)10 †K evBbvwi msL¨vq iæcvšÍi Ki|

**c~Y©vs‡ki †ÿ‡Î-**

|  |  |  |
| --- | --- | --- |
| fvRK | fvR¨/fvMdj | fvM‡kl/Ae‡kl |
| 2 | 75 | - LSB |
| 2 | 37 | 1 |
| 2 | 18 | 1 |
| 2 | 9 | 0 |
| 2 | 4 | 1 |
| 2 | 2 | 0 |
| 2 | 1 | 0 |
| 2 | 0 | 1 MSB |

(75)10 = (1001011)2

**fMœvs‡ki †ÿ‡Î-**

|  |  |
| --- | --- |
| c~Y©vsk | fMœvsk |
|  | .375  🞨2 |
| MSB 0 | .75  🞨2 |
| 1 | .50  🞨2 |
| LSB 1 | .0 |

(.375)10 = (.011)2

(75.375)10 =(1001011.011)2

A\_ev

1. 37.12510-‡K evBbvwi msL¨vq iæcvšÍi Ki|

cÖ\_‡g KvM‡R wb‡Pi g‡Zv K‡i wjL‡Z n‡e-

64 32 16 8 4 2 1. .50 .25 .125

Wvb w`K †\_‡K †h mKj msL¨vi †hvMdj Øviv `kwgK msL¨v cÖKvk Kiv hvq Zvi wb‡P 1 wj‡L Ab¨¸‡jv 0 Øviv c~iY Ki‡Z n‡e-

37.125=32+4+1+.125

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 64 | 32 | 16 | 8 | 4 | 2 | 1 | . | .50 | .25 | .125 |
| 0 | 1 | 0 | 0 | 1 | 0 | 1 | . | 0 | 0 | 1 |

37.12510- Gi evBbvwi msL¨v = 100101.0012

Gfv‡e †h †Kvb `kwgK msL¨vi mgZzj¨ evBbvwi msL¨v `ªæZ wbY©q Kiv hvq|

1. 10510 -†K evBbvwi msL¨vq iæcvšÍi Ki|

|  |  |  |  |
| --- | --- | --- | --- |
| fMœvsk🞨wfZ | ¸Ydj | fMœvsk | c~Y©vsk |
| .105🞨2 | .21 | .21 | 0 MSB |
| .21🞨2 | .42 | .42 | 0 |
| .42🞨2 | .84 | .84 | 0 |
| .84🞨2 | 1.68 | .68 | 1 |
| .68🞨2 | 1.36 | .36 | 1 |
| .36🞨2 | 0.72 | .72 | 0 |
| .72🞨2 | 1.44 | .44 | 1 LSB |

.10510 = (.0001101....)2 (Avmbœ)

**`kwgK msL¨v c×wZ †\_‡K AKU¨vj msL¨v c×wZ†Z iæcvšÍit**

560.10510  †K AKU¨vj msL¨vq iæcvšÍi Ki|

**c~Y©vs‡ki †ÿ‡Î-**

|  |  |  |
| --- | --- | --- |
| fvRK | fvR¨/fvMdj | fvM‡kl/ Ae‡kl |
| 8 | 560 | LSB |
| 8 | 70 | 0 |
| 8 | 8 | 6 |
| 8 | 1 | 0 |
|  | 0 | 1 MSB |

56010 = 10608

**fMœvs‡ki †ÿ‡Î-**

|  |  |
| --- | --- |
| c~Y©vsk | fMœvsk |
|  | .105  🞨8 |
| MSB 0 | .84  🞨8 |
| 6 | .72  🞨8 |
| LSB 5 | .76 |

.10510 =( .065......)8

(560.105)10 =(1060.065......)8

**`kwgK msL¨v c×wZ †\_‡K †n·v‡Wwmgj msL¨v c×wZ‡Z iæcvšÍi**

880.10510 †K †n·v‡Wwmgvj msL¨vq iæcvšÍi Ki|

**c~Y©vs‡ki †ÿ‡Î-**

|  |  |  |
| --- | --- | --- |
| fvRK | fvR¨/fvMdj | fvM‡kl/Ae‡kl |
| 16 | 880 | - Least Significant Bit (LSB) |
| 16 | 55 | 0 |
| 16 | 3 | 7 |
|  | 0 | 3 Most Significant Bit (MSB) |

88010 = 37016

**fMœvs‡ki †ÿ‡Î-**

|  |  |
| --- | --- |
| c~Y©vsk | fMœvsk |
|  | .105  🞨16 |
| MSB 1 | .68  🞨16 |
| 10 | .88  🞨16 |
| LSB 14 | .08 |

.10510 = ( .1AE......)16

(880.105)10 =( 370.1AE......)16 {†n·v‡Wwmgv‡j A=10,E=14}

**†h †Kvb msL¨v c×wZ †\_‡K `kwgK msL¨v c×wZ‡Z iæcvšÍ‡ii mvaviY wbqg**

**c~Y©vsk I fMœvs‡ki †ÿ‡Î GKB wbqg-**

* cÖ`Ë msL¨vwUi †em mbv³ K‡i msL¨vwUi AšÍ©MZ cÖ‡ZK¨wU As‡Ki ¯’vbxq gvb †ei Ki‡Z n‡e|
* msL¨vwUi AšÍ©MZ cÖ‡ZK¨wU As‡Ki wbR¯^ gvb‡K Zvi ¯’vbxq gvb w`‡q ¸Y Ki‡Z n‡e|
* ¸Y¸‡jvi †hvMdjKB n‡e mgZzj¨ `kwgK msL¨v|

**evBbvwi msL¨v c×wZ †\_‡K `kwgK msL¨v c×wZ‡Z iæcvšÍi**

evBbvwi msL¨vi cÖwZwU 1 Gi ¯’vbxq gvb †ei K‡i, ‡hvM K‡i msL¨vwUi mgKÿ `kwgK gvb wbY©q Kiv hvq|

101.1012 =? 10

**c~Y©vs‡ki †ÿ‡Î-**

1012= 1🞨22 +0🞨21 +1🞨20

= 1🞨4+0🞨2+1🞨1

= 4+0+1

= 510

**fMœvs‡ki †ÿ‡Î-**

0.1012 =1🞨2-1 +0🞨2-2+1🞨2-3

=1🞨(1/2)+0🞨(1/4)+1🞨(1/8)

=0.50+0+.125

= 0.62510

∴ 101.1012 = 5.62510

**AKU¨vj msL¨v c×wZ †\_‡K `kwgK msL¨v c×wZ‡Z iæcvšÍi**

AKU¨vj msL¨vi cÖwZwU AsK‡K Zvi wbR¯^ ¯’vbxq gvb Øviv ¸Y K‡i cvÖß ¸Ydj‡K ‡hvM K‡i msL¨vwUi mgKÿ `kwgK gvb wbY©q Kiv hvq|

327.8908 =? 10

**c~Y©vs‡ki †ÿ‡Î-**

3278=3🞨82+2🞨81 +7🞨80

=3🞨64+2🞨8+7🞨1

=192+16+7

= 21510

**fMœvs‡ki †ÿ‡Î-**

0.8908 = 8🞨8-1 + 9🞨8-2 +0🞨8-3

= 8🞨(1/8)+9🞨(1/64)+0🞨(1/512)

= 1+.1406+0

= 1.140610

∴ 327.8908 = 21510 +1.140610 = 216.140610

**†n·v‡Wwmgvj msL¨v c×wZ †\_‡K `kwgK msL¨v c×wZ‡Z iæcvbÍi**

G‡ÿ‡Î cÖ`Ë msL¨vi cÖwZwU AsK‡K Dnvi wbR¯^ ¯’vbxq gvb w`‡q ¸Y Ki‡Z n‡e| c‡i H mg¯Í ¸Ydj‡K †hvM K‡i †n·v‡Wwmgvj msL¨vwUi mgKÿ `kwgK msL¨vi gvb ‡ei Kiv hvq|

**A 9F.6916 = ? 10**

**c~Y©vs‡ki †ÿ‡Î-**

A 9F16= A🞨162 + 9🞨161 + F🞨16 0

= 10 🞨256 + 9 🞨16 +15 🞨1

= 2560+144+15

= 271910

**fMœvs‡ki †ÿ‡Î-**

0.6916 = 6🞨16-1+ 9🞨16-2

= 6🞨(1/16) +9🞨(1/256)

= 0.375+0.0351

= 0.410110

∴ A 9F.6916 = 2719.4101 10

**AKU¨vj msL¨v c×wZ †\_‡K evBbvwi msL¨v c×wZ‡Z iæcvšÍi**

* AKU¨vj msL¨v 0-7 ch©šÍ wZb weU evBbvwi msL¨v Øviv cÖKvk Kiv hvq| ZvB G†ÿ‡Î -
* AKU¨v‡ji cÖwZwU AsK‡K wZb weU evBbvwi msL¨v Øviv cÖKvk Ki‡jB KvswLZ evBbvwi msL¨vwU cvIqv hvq|
* wZb weU evBbvwi msL¨v Kivi Rb¨ cÖ‡qvR‡b ev‡g 0 emv‡Z n‡e|

2308 =? 2

230

010011000

2308 =0100110002

**†n·v‡Wwmgvj msL¨v c×wZ †\_‡K evBbvwi msL¨v c×wZ‡Z iæcvšÍi**

* †n·v‡Wwmgvj msL¨v 0- F ch©šÍ Pvi weU evBbvwi msL¨v Øviv cÖKvk Kiv hvq| ZvB G†ÿ‡Î -
* ‡n·v‡Wwmgvj msL¨vi cÖwZwU AsK‡K Pvi weU evBbvwi msL¨v Øviv cÖKvk Ki‡jB KvswLZ evBbvwi msL¨vwU cvIqv hvq|
* Pvi weU evBbvwi msL¨v Kivi Rb¨ cÖ‡qvR‡b ev‡g 0 emv‡Z n‡e|

14B16 = ?2

14B

0001 0100 1011

14B16= 0001010010112

**evBbvwi msL¨v c×wZ †\_‡K AKU¨vj msL¨v c×wZ‡Z iæcvšÍi**

**c~Y©vs‡ki †ÿ‡Î-**

* AKU¨vj msL¨v 0-7 ch©šÍ wZb weU evBbvwi msL¨v Øviv cÖKvk Kiv hvq| ZvB G†ÿ‡Î -
* Wvb w`K †\_‡K cÖwZ wZbwU weU GK m‡½ wb‡q †QvU †QvU fvM Ki‡Z n‡e|
* cÖ‡qvR‡b †kl evg fv‡M wZb weU Kivi Rb¨ k~b¨ emv‡Z n‡e|
* cÖwZwU fv‡M AKU¨vj msL¨v emv‡jB AKU¨vj msL¨v cvIqv hv‡e|

**fMœvs‡ki †ÿ‡Î-**

* evBbvwi we›`yi evg w`K †\_‡K cÖwZ wZbwU weU GK m‡½ wb‡q †QvU †QvU fvM Ki‡Z n‡e|
* me©Wv‡bi fv‡M cÖ‡qvR‡b wZb weU Kivi Rb¨ k~b¨ emv‡Z n‡e|
* cÖwZwU fv‡M AKU¨vj msL¨v emv‡jB AKU¨vj msL¨v cvIqv hv‡e|

**1011111100.11010112=?** 8

001 011 111 100 . 110 101 100

1 3 7 4 6 5 4

(1011111100.1101011)2=(1374.654) 8

**evBbvwi msL¨v c×wZ †\_‡K †n·v‡Wwmgvj msL¨v c×wZ‡Z iæcvšÍi**

**c~Y©vs‡ki †ÿ‡Î-**

* †n·v‡Wwmgvj msL¨v 0- F ch©šÍ Pvi weU evBbvwi msL¨v Øviv cÖKvk Kiv hvq| ZvB G†ÿ‡Î -
* Wvb w`K †\_‡K cÖwZ Pvi weU GK m‡½ wb‡q †QvU †QvU fvM Ki‡Z n‡e|
* cÖ‡qvR‡b †kl evg fv‡M Pvi weU Kivi Rb¨ k~b¨ emv‡Z n‡e|
* cÖwZwU fv‡M †n·v‡Wwmgvj msL¨v emv‡jB †n·v‡Wwmgvj msL¨v cvIqv hv‡e|

**fMœvs‡ki †ÿ‡Î-**

* evBbvwi we›`yi evg w`K †\_‡K cÖwZ PviwU weU GK m‡½ wb‡q †QvU †QvU fvM Ki‡Z n‡e|
* me©Wv‡bi fv‡M cÖ‡qvR‡b Pvi weU Kivi Rb¨ k~b¨ emv‡Z n‡e|
* cÖwZwU fv‡M †n·v‡Wwmgvj msL¨v emv‡jB †n·v‡Wwmgvj msL¨v cvIqv hv‡e|

**1011111100.11010112=? 16**

0010 1111 1100 . 1101 0110

= 2 15 12 13 6

= 2 F C D 6

1011111100.11010112= 2FC.D6 16

**AKU¨vj msL¨v c×wZ †\_‡K †n·v‡Wwmgvj msL¨v c×wZ‡Z iæcvšÍi**

* AKU¨vj msL¨v‡K evBbvwi msL¨v‡Z eycvšÍi Ki‡Z n‡e|
* evBbvwi msL¨v‡K †n·v‡Wwmgvj msL¨v†Z eycvšÍi Ki‡Z n‡e|

**1258 = ? 16** evBbvwi msL¨v‡Z eycvšÍi

125

001010101

†n·v‡Wwmgvj msL¨v†Z eycvšÍi

= 001010101

= 0000 0101 0101

= 0 5 5

= 55

1258 =5516

**†n·v‡Wwmgvj msL¨v c×wZ †\_‡K AKU¨vj msL¨v c×wZ‡Z iæcvšÍi**

* †n·v‡Wwmgvj msL¨v‡K evBbvwi msL¨v‡Z eycvšÍi Ki‡Z n‡e|
* evBbvwi msL¨v‡K AKU¨vj msL¨v†Z eycvšÍi Ki‡Z n‡e|

12516 =? 8 evBbvwi msL¨v‡Z eycvšÍi

125

000100100101

AKU¨vj msL¨v†Z eycvšÍi

= 000100100101

= 000 100 100 101

= 0 4 4 5

= 445

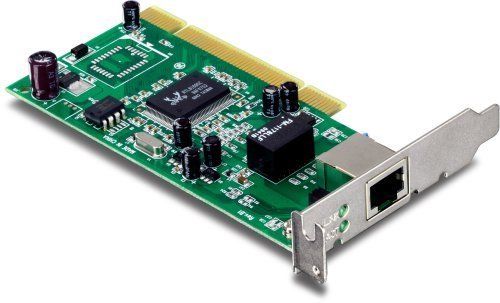
12516 =4458

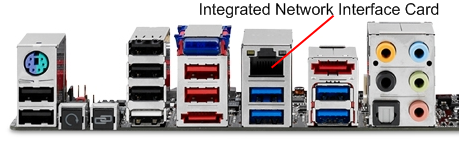
**MAC Address**

**Network Interface Card (NIC):**

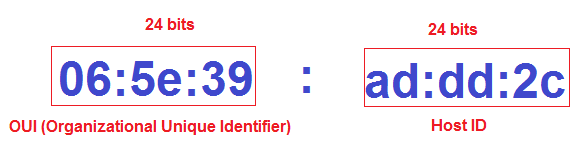
A Network Interface Card (NIC) is installed in your computer to connect, or interface, your computer to the network. It provides the physical, electrical, and electronic connections to the network media.

A NIC either is an expansion card or is built right into the computer’s motherboard. The NIC usually connects to the computer through expansion slots located on the motherboard that allow peripherals to be plugged in directly.





**MAC Address:**



A **media access control address** (**MAC address**) of a computer is a [unique identifier](https://en.wikipedia.org/wiki/Unique_identifier) assigned to [network interfaces](https://en.wikipedia.org/wiki/Network_interface_controller) for communications at the [data link layer](https://en.wikipedia.org/wiki/Data_link_layer) of a network segment. MAC addresses are used as a [network address](https://en.wikipedia.org/wiki/Network_address) for most [IEEE 802](https://en.wikipedia.org/wiki/IEEE_802) network technologies, including [Ethernet](https://en.wikipedia.org/wiki/Ethernet) and [Wi-Fi](https://en.wikipedia.org/wiki/Wi-Fi). Logically, MAC addresses are used in the [media access control](https://en.wikipedia.org/wiki/Media_access_control) protocol sublayer of the [OSI reference model](https://en.wikipedia.org/wiki/OSI_model).

MAC addresses are most often assigned by the manufacturer of a [network interface controller](https://en.wikipedia.org/wiki/Network_interface_controller) (NIC) and are stored in its hardware, such as the card's [read-only memory](https://en.wikipedia.org/wiki/Read-only_memory) or some other [firmware](https://en.wikipedia.org/wiki/Firmware) mechanism. If assigned by the manufacturer, a MAC address usually encodes the manufacturer's registered identification number and may be referred to as the **burned-in address** (**BIA**). It may also be known as an **Ethernet hardware address** (**EHA**), **hardware address** or *physical address* (not to be confused with a [memory physical address](https://en.wikipedia.org/wiki/Physical_address)). This can be contrasted to a programmed address, where the host device issues commands to the NIC to use an arbitrary address.

To show MAC adress of a computer run **ipconfig /all** in cdm:

