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

**IP Addressing IPv6**



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**Number System and Conversions**

**†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 gvb**

|  |  |  |  |
| --- | --- | --- | --- |
| **`kwgK msL¨v** | **evBbvwi**  **msL¨v** | **AKU¨vj**  **msL¨v** | **‡n·v†Wwmg¨vj msL¨v** |
| **= 0** | **0=0** | **0=0** | **0=0** |
| **0+1=1** | **1=0+1=1** | **1=0+1=1** | **1=0+1=1** |
| **1+1=2** | **2=1+1=10** | **2=1+1=2** | **2=1+1=2** |
| **2+1=3** | **3=10+1=11** | **3=2+1=3** | **3=2+1=3** |
| **3+1=4** | **4=11+1=100** | **4=3+1=4** | **4=3+1=4** |
| **4+1=5** | **5=100+1=101** | **5=4+1=5** | **5=4+1=5** |
| **5+1=6** | **6=101+1=110** | **6=5+1=6** | **6=5+1=6** |
| **6+1=7** | **7=110+1=111** | **7=6+1=7** | **7=6+1=7** |
| **7+1=8** | **8=111+1=1000** | **8=7+1=10** | **8=7+1=8** |
| **8+1=9** | **9=1000+1=1001** | **9=10+1=11** | **9=8+1=9** |
| **9+1=10** | **10=1001+1=1010** | **10=11+1=12** | **10=9+1=**A |
| **10+1=11** | **11=1010+1=1011** | **11=12+1=13** | **11=** A **+1=**B |
| **11+1=12** | **12=1011+1=1100** | **12=13+1=14** | **12=** B **+1=**C |
| **12+1=13** | **13=1100+1=1101** | **13=14+1=15** | **13=** C **+1=**D |
| **13+1=14** | **14=1101+1=1110** | **14=15+1=16** | **14=** D **+1=**E |
| **14+1=15** | **15=1110+1=1111** | **15=16+1=17** | **15=** E **+1=**F |
| **15+1=16** | **16=1111+1=10000** | **16=17+1=20** | **16=** F **+1=10** |
| **16+1=17** | **17=10000+1=10001** | **17=20+1=21** | **17=10 +1=11** |
| **17+1=18** | **18=10001+1=10010** | **18=21+1=22** | **18=11+1=12** |
| **18+1=19** | **19=10010+1=10011** | **19=22+1=23** | **19=12+1=13** |
| **19+1=20** | **20=10011+1=10100** | **20=23+1=24** | **20=13+1=14** |
| **20+1=21** | **21=10100+1=10101** | **21=24+1=25** | **21=14+1=15** |
| **21+1=22** | **22=10101+1=10110** | **22=25+1=26** | **22=15+1=16** |
| **22+1=23** | **23=10110+1=10111** | **23=26+1=27** | **23=16+1=17** |
| **23+1=24** | **24=10111+1=11000** | **24=27+1=30** | **24=17+1=18** |
| **24+1=25** | **25=11000+1=11001** | **25=30+1=31** | **25=18+1=19** |
| **25+1=26** | **26=11001+1=11010** | **26=31+1=32** | **26=19+1=1** A |
| **26+1=27** | **27=11010+1=11011** | **27=32+1=33** | **27=1** A **+1=1** B |
| **27+1=28** | **28=11011+1=11100** | **28=33+1=34** | **28=1** B **+1=1** C |
| **28+1=29** | **29=11100+1=11101** | **29=34+1=35** | **29=1** C **+1=1** D |
| **29+1=30** | **30=11101+1=11110** | **30=35+1=36** | **30=1** D **+1=1** E |
| **30+1=31** | **31=11110+1=11111** | **31=36+1=37** | **31=1** E **+1=1** F |
| **31+1=32** | **32=11111+1=100000** | **32=37+1=40** | **32=1** F **+1=20** |
| **32+1=33** | **33=100000+1=100001** | **33=40+1=41** | **33=20+1=21** |
| **33+1=34** | **34=100001+1=100010** | **34=41+1=42** | **34=21+1=22** |
| **34+1=35** | **35=100010+1=100011** | **35=42+1=43** | **35=22+1=23** |
| **35+1=36** | **36=100011+1=100100** | **36=43+1=44** | **36=23+1=24** |
| **36+1=37** | **37=100100+1=100101** | **37=44+1=45** | **37=24+1=25** |
| **37+1=38** | **38=100101+1=100110** | **38=45+1=46** | **38=25+1=26** |
| **38+1=39** | **39=100110+1=100111** | **39=46+1=47** | **39=26+1=27** |
| **39+1=40** | **40=100111+1=101000** | **40=47+1=50** | **40=27+1=28** |
| **40+1=41** | **41=101000+1=101001** | **41=50+1=51** | **41=28+1=29** |
| **41+1=42** | **42=101001+1=101010** | **42=51+1=52** | **42=29+1=2** A |
| **42+1=43** | **43=101010+1=101011** | **43=52+1=53** | **43=2** A **+1=2** B |
| **43+1=44** | **44=101011+1=101100** | **44=53+1=54** | **44=2** B **+1=2** C |
| **44+1=45** | **45=101100+1=101101** | **45=54+1=55** | **45=2** C **+1=2** D |
| **45+1=46** | **46=101101+1=101110** | **46=55+1=56** | **46=2** D **+1=2** E |
| **46+1=47** | **47=101110+1=101111** | **47=56+1=57** | **47=2** E **+1=2** F |
| **47+1=48** | **48=101111+1=110000** | **48=57+1=60** | **48=2** F **+1=30** |
| **48+1=49** | **49=110000+1=110001** | **49=60+1=61** | **49=30+1=31** |
| **49+1=50** | **50=110001+1=110010** | **50=61+1=62** | **50=31+1=32** |
| **50+1=51** | **51=110010+1=110011** | **51=62+1=63** | **51=32+1=33** |

**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-

1. evBbvwi †ÿ‡Î

1+1=10

11+1=100

111+1=1000

2. AKU¨K†ji †ÿ‡Î

7+1=10

17+1=20

27+1=30

3. †n·v‡Wwmgv†ji †ÿ‡Î

F +1=10

1 F +1=20

2 F +1=30

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

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| 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¨Kvj | 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 | 1 A 16 | 26 |

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

evBbvwi, AKU¨Kvj,`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|

**1.`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 | - Least Significant Bit (LSB) |
| 2 | 37 | 1 |
| 2 | 18 | 1 |
| 2 | 9 | 0 |
| 2 | 4 | 1 |
| 2 | 2 | 0 |
| 2 | 1 | 0 |
| 2 | 0 | 1 Most Significant Bit (MSB) |

**75 = 1001011**

**fMœvs‡ki †ÿ‡Î-**

|  |  |
| --- | --- |
| c~Y©vsk | fMœvsk |
| Most Significant Bit (MSB)- | .375  🞨2 |
| 0 | .750  🞨2 |
| 1 | .500  🞨2 |
| Least Significant Bit (LSB) 1 | 0 |

.375 = .011

(75.375)10 =1001011.0112

A\_ev

2. 37.12510-‡K evBbvwi msL¨vq iæcvšÍi Ki|

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

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

2. 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)- Most Significant Bit |
| .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)- Least Significant Bit |

.10510 = (.0001101....)2 (Avmbœ)

**2.`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 | - Least Significant Bit (LSB) |
| 8 | 70 | 0 |
| 8 | 8 | 6 |
| 8 | 1 | 0 |
|  | 0 | 1 Most Significant Bit (MSB) |

**56010 = 10608**

**fMœvs‡ki †ÿ‡Î-**

|  |  |
| --- | --- |
| c~Y©vsk | fMœvsk |
| Most Significant Bit (MSB)- | .105  🞨8 |
| 0 | .840  🞨8 |
| 6 | .72  🞨 |
| Least Significant Bit (LSB) 5 | .76 |

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

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

**3.`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 |
| Most Significant Bit (MSB)- | .105  🞨16 |
| 1 | .68  🞨16 |
| 10 | .88  🞨16 |
| Least Significant Bit (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-**

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

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

evBbvwi msL¨vi cÖwZwU 1 Gi ¯’vbxq gvb †ei ‡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

=+.50+0+.125

= 0.62510

**5. 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

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

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

**7. 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

= 010011000

2308 =0100110002

**8.†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|

14B

0001 0100 1011

14B16= 0001010010112

**9.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

**10.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

**11.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

= 001010101

†n·v‡Wwmgvj msL¨v†Z eycvšÍi

= 001010101

= 0000 0101 0101

= 0 5 5

= 55

1258 =5516

**12.†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

= 000100100101

AKU¨vj msL¨v†Z eycvšÍi

= 000100100101

= 000 100 100 101

= 0 4 4 5

= 445

12516 =4458

**IPv6**

**IPv6:** Internet Protocol version 6 (IPv6) is the sixth version of the Internet Protocol (IP). IPv6 addressing is not like IPv4 addressing. IPv6 addressing has much more address space and is 128 bits long, represented in hexadecimal.

**Why we need IPv6?**

**Ans:** Without IPv6, the world would soon be depleted of IP addresses.

**IPv6 Address Types?**

**Ans:**

**Unicast:** Packets addressed to a unicast address are delivered to a single interface, same as in IPv4.

**Global unicast addresses:** These are typical publicly routable addresses, and they’re used the same way globally unique addresses are in IPv4.

**Link-local addresses:** Link-local is like an IPv4 private IP address, but it can’t be routed at all, not even in an organization.

**Unique local addresses:** Unique local address is like a private IP address in IPv4 and cannot be routed to the Internet. Unique local address can be routed within an organization or company.

**Multicast:** These are packets sent from a single source and transmitted to many devices on different networks. Referred to as *one-to-many*.

**Anycast:** An anycast address identifis multiple interfaces but The anycast packet is delivered to only one address. We could call them one-to-one-of-many addresses.

**Special Addresses of IPv6?**

**Ans:**

**2000::/3 -** The global unicast address range.  
**FC00::/7 -** The unique local unicast range.  
**FE80::/10 -** The link-local unicast range.  
**FF00::/8 -** The multicast range.  
**3FFF:FFFF::/32 -** Reserved for examples and documentation.  
**2001:0DB8::/32 -** Also reserved for examples and documentation.  
**2002::/16 -** Used with 6to4, which is the transition system.

What are the benefits of IPv6?

**Troubleshooting IP Addressing**

**Packet InterNet Groper (ping)** 🡪 Uses an Internet Control Message Protocol (ICMP) echo request and replies to test if a host IP stack is initialized and alive on the network.  
  
**traceroute** 🡪 Displays the list of routers on a path to a network destination by using Time to Live (TTL) time-outs and ICMP error messages. This command will work on a router, MAC, or Linux box but not from a Windows command prompt.  
  
**tracert** 🡪 Same command as traceroute, but it’s a Microsoft Windows command and will not work on other devices, like a Cisco router or Unix box.  
 **arp -a** 🡪 Displays IP-to-MAC-address mappings on a Windows PC.  
 **ipconfig /all** 🡪 Used only from a DOS prompt. Shows you the PC network configuration.

**Quiz:**

1. **Write the types methods of IP Address?**

**Ans:** IP address using one of three methods:

* Dotted-decimal, as in 172.16.30.56
* Binary, as in 10101100.00010000.00011110.00111000
* Hexadecimal, as in AC.10.1E.38

1. What is

Ans: