

Q1] Convert from Decimal System to Binary System

81

| | | Reminder |
|----|---|----------|
| 81 | 2 | 1 |
| 40 | 2 | 0 |
| 20 | 2 | 0 |
| 10 | 2 | 0 |
| 5 | 2 | 1 |
| 2 | 2 | 0 |
| 1 | 2 | 1 |



(1010001)

وبنضيف الصفر في الشمال لو ما كانش مجموعات متماثلة علشان
الشكل كدة :

(0101 0001)₂

72

| | | Reminder |
|----|---|----------|
| 72 | 2 | 0 |
| 36 | 2 | 0 |
| 18 | 2 | 0 |
| 9 | 2 | 1 |
| 4 | 2 | 0 |
| 2 | 2 | 0 |
| 1 | 2 | |

↑
(1001000)₂

وبنضيف الصفر في الشمال لو ما
كانش مجموعات متماثلة علشان
الشكل كدة :

(0100 1000)₂

34

| | | Reminder |
|----|---|----------|
| 34 | 2 | 0 |
| 17 | 2 | 1 |
| 8 | 2 | 0 |
| 4 | 2 | 0 |
| 2 | 2 | 0 |
| 1 | 2 | 1 |

↑
(100010)₂

وبنضيف الصفر في الشمال لو ما كانش
مجموعات متماثلة علشان الشكل كدة :

(0010 0010)₂

Q2] Convert from Binary System to Decimal System

$(100110)_2$

Answer

| | | | | | |
|---|---|---|---|---|---|
| 1 | 0 | 0 | 1 | 1 | 0 |
|---|---|---|---|---|---|

| | | | | | | | | | | |
|----------------|---|----------------|---|----------------|---|----------------|---|----------------|---|----------------|
| 1×2^5 | + | 0×2^4 | + | 0×2^3 | + | 1×2^2 | + | 1×2^1 | + | 0×2^0 |
|----------------|---|----------------|---|----------------|---|----------------|---|----------------|---|----------------|

| | | | | | | | | | | |
|----|---|---|---|---|---|---|---|---|---|---|
| 32 | + | 0 | + | 0 | + | 4 | + | 2 | + | 0 |
|----|---|---|---|---|---|---|---|---|---|---|

$(38)_{10} =$

$(1110111)_2$

Answer

| | | | | | | |
|---|---|---|---|---|---|---|
| 1 | 1 | 1 | 0 | 1 | 1 | 1 |
|---|---|---|---|---|---|---|

| | | | | | | | | | | | | |
|----------------|---|----------------|---|----------------|---|----------------|---|----------------|---|----------------|---|----------------|
| 1×2^6 | + | 1×2^5 | + | 1×2^4 | + | 0×2^3 | + | 1×2^2 | + | 1×2^1 | + | 1×2^0 |
|----------------|---|----------------|---|----------------|---|----------------|---|----------------|---|----------------|---|----------------|

| | | | | | | | | | | | | |
|----|---|----|---|----|---|---|---|---|---|---|---|---|
| 64 | + | 32 | + | 16 | + | 0 | + | 4 | + | 2 | + | 1 |
|----|---|----|---|----|---|---|---|---|---|---|---|---|

$(119)_{10} =$

$(11100001)_2$

Answer

| | | | | | | | | | | | | | | |
|----------------|---|----------------|---|----------------|---|----------------|---|----------------|---|----------------|---|----------------|---|----------------|
| 1 | 1 | 1 | 0 | 0 | 0 | 0 | 1 | | | | | | | |
| 1×2^7 | + | 1×2^6 | + | 1×2^5 | + | 0×2^4 | + | 0×2^3 | + | 0×2^2 | + | 0×2^1 | + | 1×2^0 |
| 128 | + | 64 | + | 32 | + | 0 | + | 0 | + | 0 | + | 0 | + | 1 |

$(225)_{10} =$

Q3] Convert from Binary System to Hexa Decimal System

$(100101111)_2$

1- نقسم الرقم لمجموعات مكونة من 4 خانات ونضيف اصفار من اليسار لو احتجنا

| | | | | | | |
|----------------|----------------|----------------|----------------|---|---|---|
| 0 | 0 | 0 | 1 | | | |
| 0×2^3 | 0×2^2 | 0×2^1 | 1×2^0 | | | |
| 0 | + | 0 | + | 0 | + | 1 |
| 1 = | | | | | | |

| | | | | | | |
|----------------|----------------|----------------|----------------|---|---|---|
| 0 | 0 | 1 | 0 | | | |
| 0×2^3 | 0×2^2 | 1×2^1 | 0×2^0 | | | |
| 0 | + | 0 | + | 2 | + | 0 |
| 2 = | | | | | | |

| | | | | | | |
|----------------|----------------|----------------|----------------|---|---|---|
| 1 | 1 | 1 | 1 | | | |
| 1×2^3 | 1×2^2 | 1×2^1 | 1×2^0 | | | |
| 8 | + | 4 | + | 2 | + | 1 |
| F = 15 = | | | | | | |

(12F)₁₆

$$(111010000011)_2$$

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|----------------|----------------|----------------|---|---|---|--|--|----------------|----------------|----------------|----------------|--|--|--|--|---|---|---|---|---|---|---|--|--|--|--|--|--|--|------------|--|--|--|--|--|--|--|---|---|---|---|--|--|--|--|----------------|----------------|----------------|----------------|--|--|--|--|---|---|---|---|---|---|---|--|--|--|--|--|--|--|-------|--|--|--|--|--|--|--|---|---|---|---|--|--|--|--|----------------|----------------|----------------|----------------|--|--|--|--|---|---|---|---|---|---|---|--|--|--|--|--|--|--|-------|--|--|--|--|--|--|
| <table><tr><td>1</td><td>1</td><td>1</td><td>0</td></tr><tr><td colspan="4"></td></tr><tr><td>1×2^3</td><td>1×2^2</td><td>1×2^1</td><td>0×2^0</td></tr><tr><td colspan="4"></td></tr><tr><td>8</td><td>+</td><td>4</td><td>+</td><td>2</td><td>+</td><td>0</td></tr><tr><td colspan="7"></td></tr><tr><td colspan="7">$E = 14 =$</td></tr></table> | 1 | 1 | 1 | 0 | | | | | 1×2^3 | 1×2^2 | 1×2^1 | 0×2^0 | | | | | 8 | + | 4 | + | 2 | + | 0 | | | | | | | | $E = 14 =$ | | | | | | | <table><tr><td>1</td><td>0</td><td>0</td><td>0</td></tr><tr><td colspan="4"></td></tr><tr><td>1×2^3</td><td>0×2^2</td><td>0×2^1</td><td>0×2^0</td></tr><tr><td colspan="4"></td></tr><tr><td>8</td><td>+</td><td>0</td><td>+</td><td>0</td><td>+</td><td>0</td></tr><tr><td colspan="7"></td></tr><tr><td colspan="7">$8 =$</td></tr></table> | 1 | 0 | 0 | 0 | | | | | 1×2^3 | 0×2^2 | 0×2^1 | 0×2^0 | | | | | 8 | + | 0 | + | 0 | + | 0 | | | | | | | | $8 =$ | | | | | | | <table><tr><td>0</td><td>0</td><td>1</td><td>1</td></tr><tr><td colspan="4"></td></tr><tr><td>0×2^3</td><td>0×2^2</td><td>1×2^1</td><td>1×2^0</td></tr><tr><td colspan="4"></td></tr><tr><td>0</td><td>+</td><td>0</td><td>+</td><td>2</td><td>+</td><td>1</td></tr><tr><td colspan="7"></td></tr><tr><td colspan="7">$3 =$</td></tr></table> | 0 | 0 | 1 | 1 | | | | | 0×2^3 | 0×2^2 | 1×2^1 | 1×2^0 | | | | | 0 | + | 0 | + | 2 | + | 1 | | | | | | | | $3 =$ | | | | | | |
| 1 | 1 | 1 | 0 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1×2^3 | 1×2^2 | 1×2^1 | 0×2^0 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 8 | + | 4 | + | 2 | + | 0 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| $E = 14 =$ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1 | 0 | 0 | 0 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1×2^3 | 0×2^2 | 0×2^1 | 0×2^0 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 8 | + | 0 | + | 0 | + | 0 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| $8 =$ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 0 | 0 | 1 | 1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 0×2^3 | 0×2^2 | 1×2^1 | 1×2^0 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 0 | + | 0 | + | 2 | + | 1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| $3 =$ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <div>$(E83)_{16}$</div> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

$$(111001111001)_2$$

| | | | | | | |
|----------------|----------------|----------------|----------------|---|---|---|
| 1 | 1 | 1 | 0 | | | |
| | | | | | | |
| 1×2^3 | 1×2^2 | 1×2^1 | 0×2^0 | | | |
| | | | | | | |
| 8 | + | 4 | + | 2 | + | 0 |
| E = 14 = | | | | | | |

| | | | | | | |
|----------------|----------------|----------------|----------------|---|---|---|
| 0 | 1 | 1 | 1 | | | |
| | | | | | | |
| 0×2^3 | 1×2^2 | 1×2^1 | 1×2^0 | | | |
| | | | | | | |
| 0 | + | 4 | + | 2 | + | 1 |
| 7 = | | | | | | |

| | | | | | | |
|----------------|----------------|----------------|----------------|---|---|---|
| 1 | 0 | 0 | 1 | | | |
| | | | | | | |
| 1×2^3 | 0×2^2 | 0×2^1 | 1×2^0 | | | |
| | | | | | | |
| 8 | + | 0 | + | 0 | + | 1 |
| 9 = | | | | | | |

(E79)₁₆

Q4] Convert from Binary System to Octa System

$(100110)_2$

1- نقسم الرقم لمجموعات مكونة من 3 خانات ونضيف اصفار من اليسار لو احتجنا

| | | |
|----------------|----------------|----------------|
| 1 | 0 | 0 |
| 1×2^2 | 0×2^1 | 0×2^0 |
| 4 | + | 0 |
| + | 0 | |
| 4 = | | |

| | | |
|----------------|----------------|----------------|
| 1 | 1 | 0 |
| 1×2^2 | 1×2^1 | 0×2^0 |
| 4 | + | 2 |
| + | 0 | |
| 6 = | | |

| (46)₈ | | | | | |

$$(1110111)_2$$

| | | | | | | | | | | | | | | | | | |
|--|----------------|----------------|----------------|--|----------------|--|----------------|--|----------------|----------------|----------------|--|---|---|---|---|---|
| <table><tr><td>0</td><td>0</td><td>1</td></tr></table> | 0 | 0 | 1 | <table><tr><td>1</td><td>1</td><td>0</td></tr></table> | 1 | 1 | 0 | <table><tr><td>1</td><td>1</td><td>1</td></tr></table> | 1 | 1 | 1 | | | | | | |
| 0 | 0 | 1 | | | | | | | | | | | | | | | |
| 1 | 1 | 0 | | | | | | | | | | | | | | | |
| 1 | 1 | 1 | | | | | | | | | | | | | | | |
| <table><tr><td>0×2^2</td><td>0×2^1</td><td>1×2^0</td></tr></table> | 0×2^2 | 0×2^1 | 1×2^0 | <table><tr><td>1×2^2</td><td>1×2^1</td><td>0×2^0</td></tr></table> | 1×2^2 | 1×2^1 | 0×2^0 | <table><tr><td>1×2^2</td><td>1×2^1</td><td>1×2^0</td></tr></table> | 1×2^2 | 1×2^1 | 1×2^0 | | | | | | |
| 0×2^2 | 0×2^1 | 1×2^0 | | | | | | | | | | | | | | | |
| 1×2^2 | 1×2^1 | 0×2^0 | | | | | | | | | | | | | | | |
| 1×2^2 | 1×2^1 | 1×2^0 | | | | | | | | | | | | | | | |
| <table><tr><td>0</td><td>+</td><td>0</td><td>+</td><td>1</td></tr></table> | 0 | + | 0 | + | 1 | <table><tr><td>4</td><td>+</td><td>2</td><td>+</td><td>0</td></tr></table> | 4 | + | 2 | + | 0 | <table><tr><td>4</td><td>+</td><td>2</td><td>+</td><td>1</td></tr></table> | 4 | + | 2 | + | 1 |
| 0 | + | 0 | + | 1 | | | | | | | | | | | | | |
| 4 | + | 2 | + | 0 | | | | | | | | | | | | | |
| 4 | + | 2 | + | 1 | | | | | | | | | | | | | |
| 1 = | 6 = | 7 = | | | | | | | | | | | | | | | |

(167)₈

$$(11100001)_2$$

| | | | | |
|----------------|----------------|----------------|---|---|
| 0 | 1 | 1 | | |
| 0×2^2 | 1×2^1 | 1×2^0 | | |
| 0 | + | 2 | + | 1 |
| 3 = | | | | |

| | | | | |
|----------------|----------------|----------------|---|---|
| 1 | 0 | 0 | | |
| 1×2^2 | 0×2^1 | 0×2^0 | | |
| 4 | + | 0 | + | 0 |
| 4 = | | | | |

| | | | | |
|----------------|----------------|----------------|---|---|
| 0 | 0 | 1 | | |
| 0×2^2 | 0×2^1 | 1×2^0 | | |
| 0 | + | 0 | + | 1 |
| 1 = | | | | |

(341)₈

Q5] Convert from Decimal System to Octa System

81

72

34

Q6] Convert from Decimal System to Hexa Decimal System

81

72

34

Q7] Convert from Hexa Decimal System to Binary System

$(A0B1)_{16}$

$(FCD0B1)_{16}$

$(6DC0)_{16}$

Q8] Convert from Hexa Decimal System to Octa System

$(A0B1)_{16}$

$(FCDOB1)_{16}$

$(6DC0)_{16}$

Q9] Convert from Hexa Decimal System to Decimal System

$(A01)_{16}$

$(FB1)_{16}$

$(6D0)_{16}$

Q10] Convert from Octa System to Decimal System

$(730)_8$

$(401)_8$

$(632)_8$