Q1

Find $(1000011000001001010100)_2$

in octal system

ans

وضع 8 من اليمين الى اليسار ~~~~

$(\underset{2}{010}\ \ \underset{0}{000}\ \ \underset{6}{110}\ \ \underset{0}{000}\ \ \underset{2}{010}\ \ \underset{2}{010}\ \ \underset{4}{100})$

$(2060224)_8$

ans (D)

Q2

Convert $(5401)_8 = (---)_{16}$

ans

$= 5*8^3 + 4*8^2 + 0*8^1 + 1*8^0$

$= (2817)_{10}$

$= (B01)_{16}$

1	2817
0	176
B	11

Q3 minimize :

$$f(A,B,C,D) = \overline{A}\overline{B}\overline{C}\overline{D} + \overline{A}\overline{B}C\overline{D}$$
$$+ \overline{A}B\overline{C}D + \overline{A}BCD + A\overline{B}\overline{C}\overline{D} + A\overline{B}C\overline{D}$$
$$+ AB\overline{C}D + ABCD$$

ans

$$f = \overline{A}\overline{B}\overline{D}(\overline{C}+C) + \overline{A}BD(\overline{C}+C)$$
$$+ A\overline{B}\overline{D}(\overline{C}+C) + ABD(\overline{C}+C)$$

$$= \overline{A}\overline{B}\overline{D} + \overline{A}BD + A\overline{B}\overline{D} + ABD$$

$$= \overline{B}\overline{D}(\overline{A}+A) + BD(\overline{A}+A)$$

$$= BD + \overline{B}\overline{D}$$

\#

خلي بالك ممكن تلاقي الاختيار

$$(B \odot D)$$
$$\overline{(B \oplus D)}$$

Qu minmize:

$$f(A,B,C,D) = \bar{A}\bar{B}\bar{C}D + \bar{A}\bar{B}CD$$

$$+ \bar{A}B\bar{C}\bar{D} + \bar{A}BC\bar{D} + A\bar{B}\bar{C}D + A\bar{B}CD$$

$$+ AB\bar{C}\bar{D} + ABC\bar{D}$$

ans

$$f = \bar{A}\bar{B}D(\bar{C}+c) + \bar{A}B\bar{D}(\bar{C}+c)$$

$$+ A\bar{B}D(\bar{C}+c) + AB\bar{D}(\bar{C}+c)$$

$$f = \bar{B}D(\bar{A}+A) + B\bar{D}(\bar{A}+A)$$

$$= \bar{B}D + B\bar{D} \quad = B \oplus D$$

\#

5 What is the maximum
Value of a single digit
in an octal sys

any single digit can have

a Value $0 \leq \square \leq 2^n - 1$

$0 \leq \square \leq 2^3 - 1$

$0 \leq \square \leq 7$

6 $X + \bar{y}z = ----$ if $X = 1$ $y = 1$

$z = 0$

$\bar{y}z = 0 \cdot 0 = 0$

$\therefore X + \bar{y}z = 1 + 0 = 1$

7) the Value of

$$\overline{(X + \overline{y}z)}$$

ans

De' morgan

$$\overline{X} \cdot \overline{(\overline{y}z)} = \overline{X} \cdot \left(\overline{\overline{y}} + \overline{z}\right)$$

$$= \overline{X} y + \overline{X}\overline{z}$$

8) $f = \overline{A}\overline{B}C\overline{D} + \overline{A}BCD + A\overline{B}\overline{C}D$
$$+ A\overline{B}CD + AB\overline{C}D$$

the sum of minterms

ans $\boxed{\overline{\square}} \longrightarrow 0 \quad , \quad \boxed{\square} \longrightarrow 1$

$$f = 0010 + 0111 + 1001 + 1011 + 1101$$

$$= \sum (2, 7, 9, 11, 13)$$

9 | Which is false?

(a) $X\bar{X} = 1$

(b) $X + \bar{X} = 1$

(c) $X + y = y + X$

(d) $Xy = yX$

$X\bar{X} = 0$ not 1

ans (a)

10

$(13)_{13} = (---)_{12}$

$(13)_{13} = 1 * 13^1 + 3 * 13^0$

$= (16)_{10}$

u	16
1	1

$= (14)_{12}$ #

قسمت محرب ب الاحتيار السـ

$1 * 12^1 + u * 12^0 = 16 \Rightarrow$ the same

11 $(2020)_9 = (897)_X$

find x

حـل الطرف الأيسر Dec

$$2*9^3 + 0*9^2 + 2*9^1 + 0*9^0$$

$$= 8*X^2 + 9*X^1 + 7*X^0$$

$$8X^2 + 9X + 7 = 1476$$

$$X = 13 \qquad X = -ve \text{ (rejected)}$$

---

12 which gate gives (1) only if all inputs are (1) ?

ans

$$1+1 = 1$$
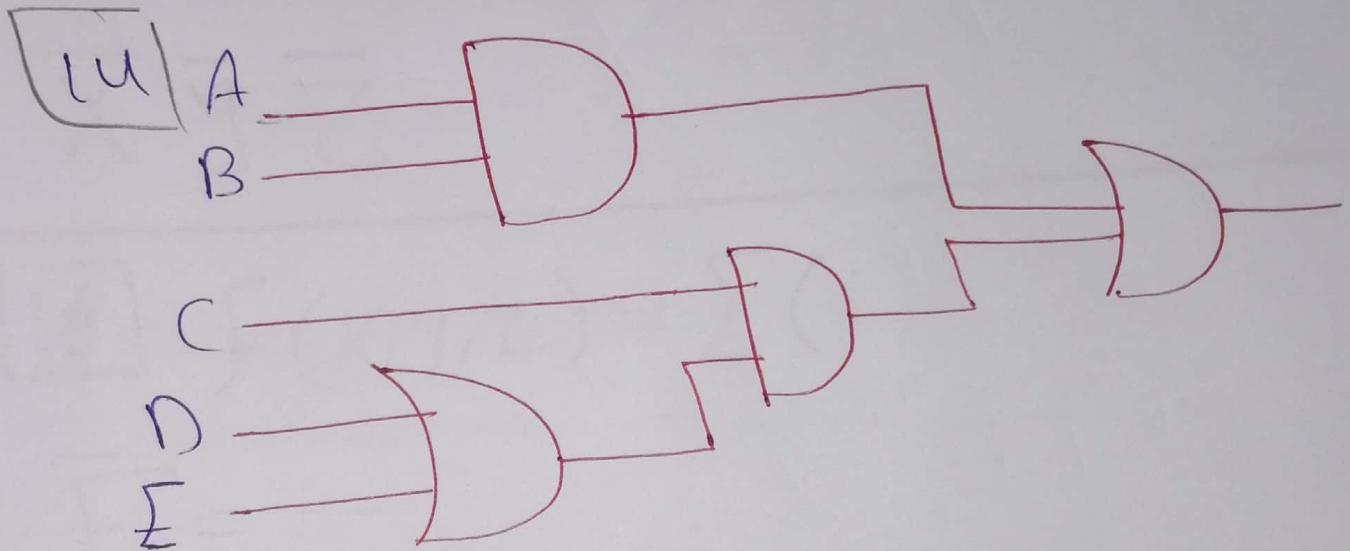
$$\begin{array}{l} 0+1 \\ 0+0 \\ 1+0 \end{array} = 0$$

AND

13 $(0.101)_2 = (---)_{10}$

ans

$0 . \left(1 \ast 2^{-1} + 0 \ast 2^{-2} + 1 \ast 2^{-3}\right)$

$= 0.625$

14

A
B

C

D
E

find f =

$AB + C(D+E)$

$\therefore f = AB + C(D+E)$

(15) the minterm Corresponding
to $X=0, y=0, Z=0$

$$\boxed{} \longrightarrow 0$$

$$\boxed{} \longrightarrow 1$$

$$\overline{X}\,\overline{Y}\,\overline{Z}$$

16 $f(X,Y,Z) = \sum(1)$

$\overline{F} = --$

$f = \sum (نعمل عند أرقام)$

$\overline{f} = \sum (باقي الأرقام)$

$\therefore \overline{f} = \sum (0,2,3,4,5,6,7)$

| 17 | which gate gives (0) when both of its inputs are (1)

ans

XOR (hates twins)

$$1 \oplus 1 = 0 \qquad 0 \oplus 0 = 0$$
$$1 \oplus 0 = 1 \qquad 0 \oplus 1 = 1$$

| 18 | ABC is valid in Base 12

ans

False

أقصى، ثم يمكن استخدامه في

Base 12 حد 11

لأن (C=12) قيمة أكبر فيتعدى

19 $(00101)_2$ Find two's Comp

نَزِّل اوّل (1) واقلب
الباقي

$$(11011)_2$$

20 Using 2's comp Find
$$(10011)_2 - (00101)_2$$ including
the overflow bit

$$\begin{array}{r} 10011 \\ 11011\ + \\ \hline 101110 \end{array}$$

$$(101110)_2$$

السبب زى ما قولنا وشايلها أمر جمع

21 Using 2's Comp

$$(00101)_2 - (10011)_2$$

including the overflow.

$$
\begin{array}{r}
1\,1\,1 \\
0\,0\,1\,0\,1 \\
0\,1\,1\,0\,1 \; + \\
\hline
0\,1\,0\,0\,1\,0 \quad \#
\end{array}
$$

---

22 On adding two n-bit numbers, the result will @ most need ---

$$n + 1 \longrightarrow$$ في

حالة أن

فيه Carry

[23] for two n-bit numbers
A, B if A > B the result
of A - B will @ most need
--- bits

(n bits)

$$A \not{B} = C$$

has a
carry

remove, +ve

$0\ \underline{0000}$

no
carry

result $= -(2's\ c)$

24 $(\bar{X}+y)(\bar{X}+\bar{y}) + X(\overline{yz})$

$= \cdots$

minimize .

ans

$\bar{X}\bar{X} + \bar{X}\bar{y} + \bar{X}y + y\bar{y} + X(\overline{yz})$

$= \bar{X}(1+\bar{y}+y) + 0 + X(\overline{yz})$

$= \bar{X} + X(\overline{yz})$

$= \bar{X} + (\overline{yz}) = \bar{X} + \bar{y} + \bar{z}$

فى إحاباتس

حيل cre cw c

أمبس

25 A → X — X → random

20 B

C

D
E

ans
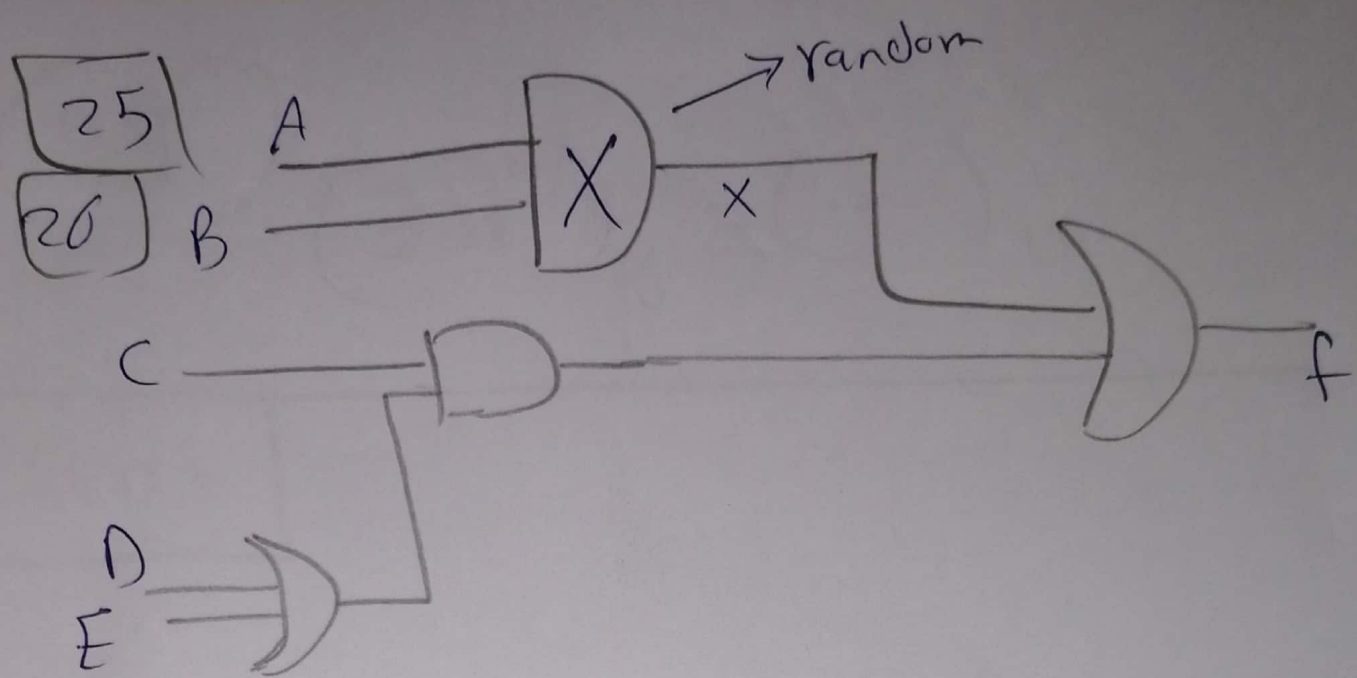
$$f = X + C(D + E)$$

@ $A = 0 \quad C = 1 \quad E = 1$
$\quad B = 0 \quad D = 0$

$$f = X + 1(0 + 1) = X + 1 = 1$$

@ $A = 0 \quad B = 1$
$\quad\quad C = 0 \quad D = 0$
$\quad\quad E = 0$

$$f = X + 0(0 + 0) = X + 0 = X$$

random value

28

$$(33E)_{16} = (\text{---})_{10}$$

ans

$$3 \times 16^2 + 3 \times 16^1 + 14 \times 16^0$$

$$= 830$$

محمد طاهر سالم أحمد أحمد

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