

21/2 CS Fundamentals Exam

③ $24_s \rightarrow 7 = \underline{\underline{14}}$

5¹ 5⁰

5 1 $(2 \times 5) + 4 = 14$

2 4

~~Ex~~

$14_{(10)} \rightarrow 7$

$14 / 7 = 2 \text{ R } 0 = 27_{(7)}$

⑥

A B 1

B A 3

A C 2

C D S

= B B A

A Z C = 10

C S D

~~Q 2 S 7 X 0 R G S~~

~~2 S 7~~

① 257 XOR 65

$$\begin{array}{r} 257 / 2 = 128 \text{ R } 1 \\ 128 / 2 = 64 \text{ R } 0 \\ 64 / 2 = 32 \text{ R } 0 \\ 32 / 2 = 16 \text{ R } 0 \\ 16 / 2 = 8 \text{ R } 0 \\ 8 / 2 = 4 \text{ R } 0 \\ 4 / 2 = 2 \text{ R } 0 \\ 2 / 2 = 1 \text{ R } 0 \end{array} = 100000001$$

$$65 / 2 = 32 \text{ R } 1$$

$$32 / 2 = 16 \text{ R } 0$$

$$16 / 2 = 8 \text{ R } 0 \quad 10000001$$

$$8 / 2 = 4 \text{ R } 0 =$$

$$4 / 2 = 2 \text{ R } 0$$

$$2 / 2 = 1 \text{ R } 0$$

$$\begin{array}{r} 1000001 \\ 000001 \\ \hline 10100,0000 \end{array}$$

Next =

$$2^8 2^7 2^6 2^5 2^4 2^3 2^2 2^1 2^0$$

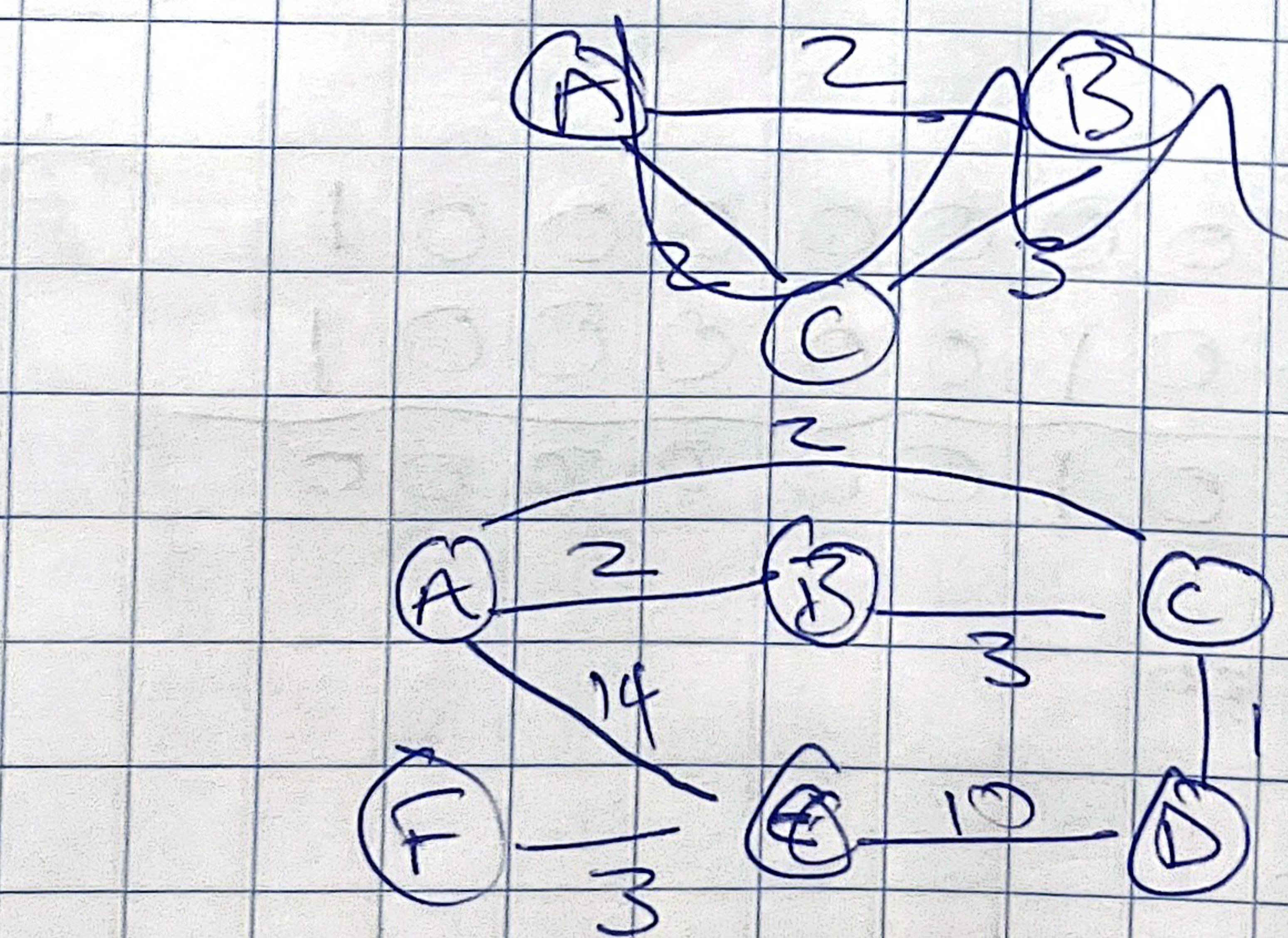
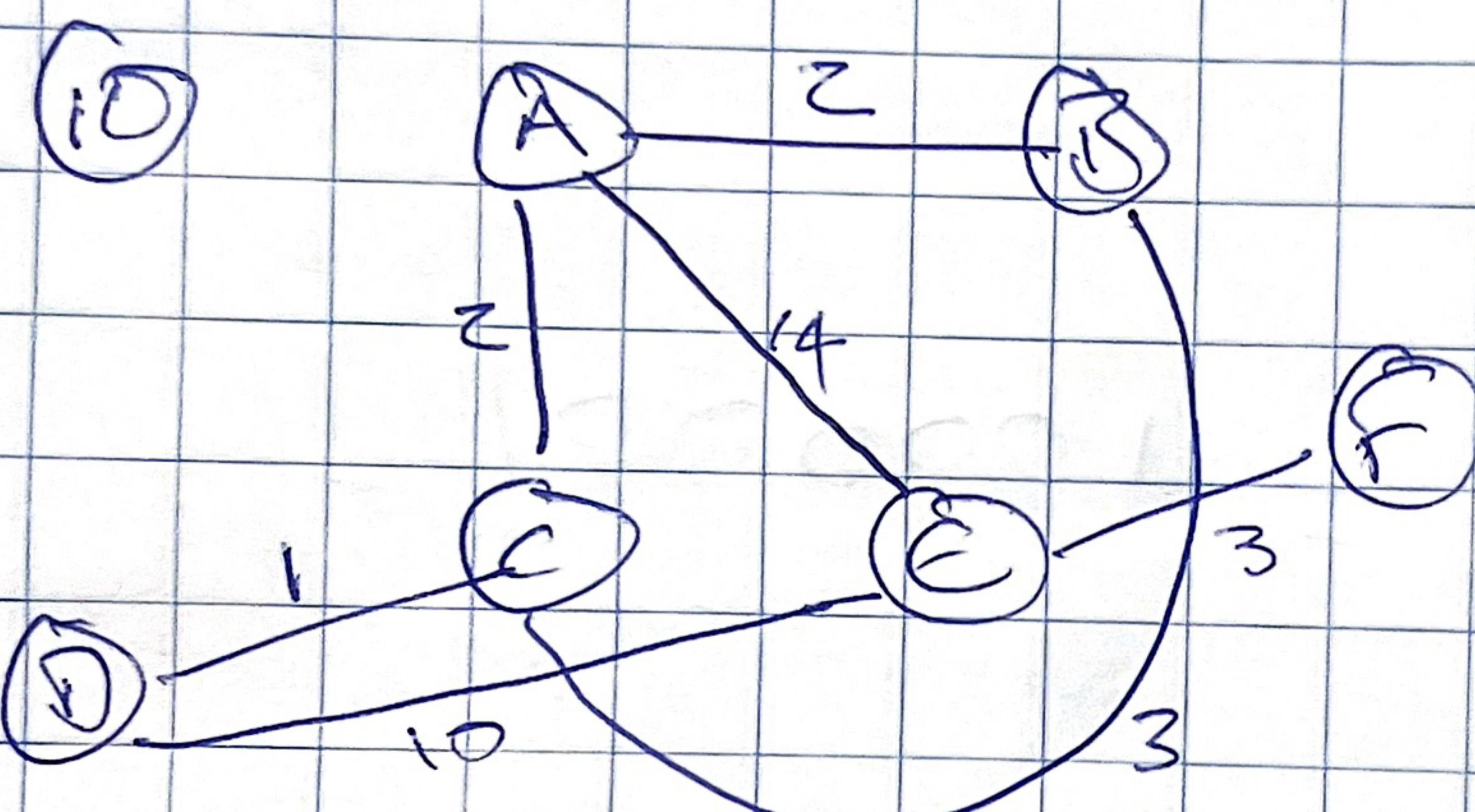
$$256 128 64 32 16 8 4 2 1$$

$$1010000000$$

$$= 256 + 64 = 320$$

⑨ x must divide exactly by 3
AND be less than 200 and bigger than

18
15
12
9
6
3



$$\begin{array}{r}
 ACZ \\
 CDI \\
 DEIO \\
 EF3 \\
 \hline
 16
 \end{array}$$

$$\textcircled{11} \quad \begin{array}{r} 0101 \\ 0011 \\ \hline 0001 \end{array}$$

$$\textcircled{12} \quad \begin{bmatrix} 4 & 2 \\ 1 & 7 \end{bmatrix} \cdot \begin{bmatrix} 6 & 2 \\ 3 & 0 \end{bmatrix} = 2 \times 2$$

$$(4 \times 6) + (2 \times 3) = 30$$

$$(4 \times 2) + (2 \times 0) = \cancel{8} 8$$

$$(1 \times 6) + (7 \times 3) = 27$$

$$(1 \times 2) + (7 \times 0) = 2$$

$$= \begin{bmatrix} 30 & 8 \\ 27 & 2 \end{bmatrix}$$

~~101101011~~

$$\textcircled{13} \quad 2^7 2^6 2^5 2^4 2^3 2^2 2^1 2^0$$

$$256 128 64 32 16 8 4 2 = 128 + 64 + 16 + 4 + 2$$

$$01101011 = \underline{\underline{214}}$$

$$\textcircled{14} \quad 3 \times 4 = 12 \quad 3 \times 2 = 6$$

$$3 \times 1 = 3 \quad 3 \times 7 = 21$$

$$\textcircled{17} \quad \bar{B} = \begin{bmatrix} 6 & 3 \\ 2 & 0 \end{bmatrix} \text{ so } \begin{bmatrix} 4 & 2 \\ 1 & 7 \end{bmatrix} \times \begin{bmatrix} 6 & 3 \\ 2 & 0 \end{bmatrix} \\ 2 \times 2 \times 2 \times 2 = 2 \times 2$$

$$(4 \times 6) + (2 \times 2) = 28,$$

$$(4 \times 3) + (2 \times 0) = 12$$

R2

$$(1 \times 6) + (7 \times 2) = 20,$$

$$(1 \times 3) + (7 \times 0) = 3$$

$$= \begin{bmatrix} 28 & 12 \\ 20 & 3 \end{bmatrix}$$

$$\textcircled{18} \quad 1011 = B = AB$$

$$1010 = A$$

$$\textcircled{20} \quad \# 45A7CS$$

$$A \# S \quad 16' 16''$$

$$16 \# 1 \quad (16 \times 4) + S = 69$$

$$+ S$$

$$A 7 = 167 \quad (A \times 16) + 7$$

$$CS = (12 \times 16) + S = 192$$

1
12

$$\textcircled{24} \quad \begin{bmatrix} 4 & 2 \\ 1 & 7 \end{bmatrix} - \begin{bmatrix} 6 & 2 \\ 3 & 0 \end{bmatrix} = \begin{bmatrix} -2 & 0 \\ -2 & 7 \end{bmatrix}$$

$$\textcircled{24} \quad A \cup B = \{1, 2, 3, 4, 5\}$$

$$A \cap B = \{2, 3\}$$

$$\therefore A \cup B - A \cap B = 1, 3, 4, 5$$

\textcircled{25} function dec_to_bin

let bin = []

let qwr = math.floor(num / 2)

bin.push(qwr % 2)

while (qwr > 1) {

bin.unshift(qwr % 2)

qwr = math.floor(qwr / 2)

}
bin.unshift(qwr % 2)

return bin.join("")

}

Defining function -

specify array -

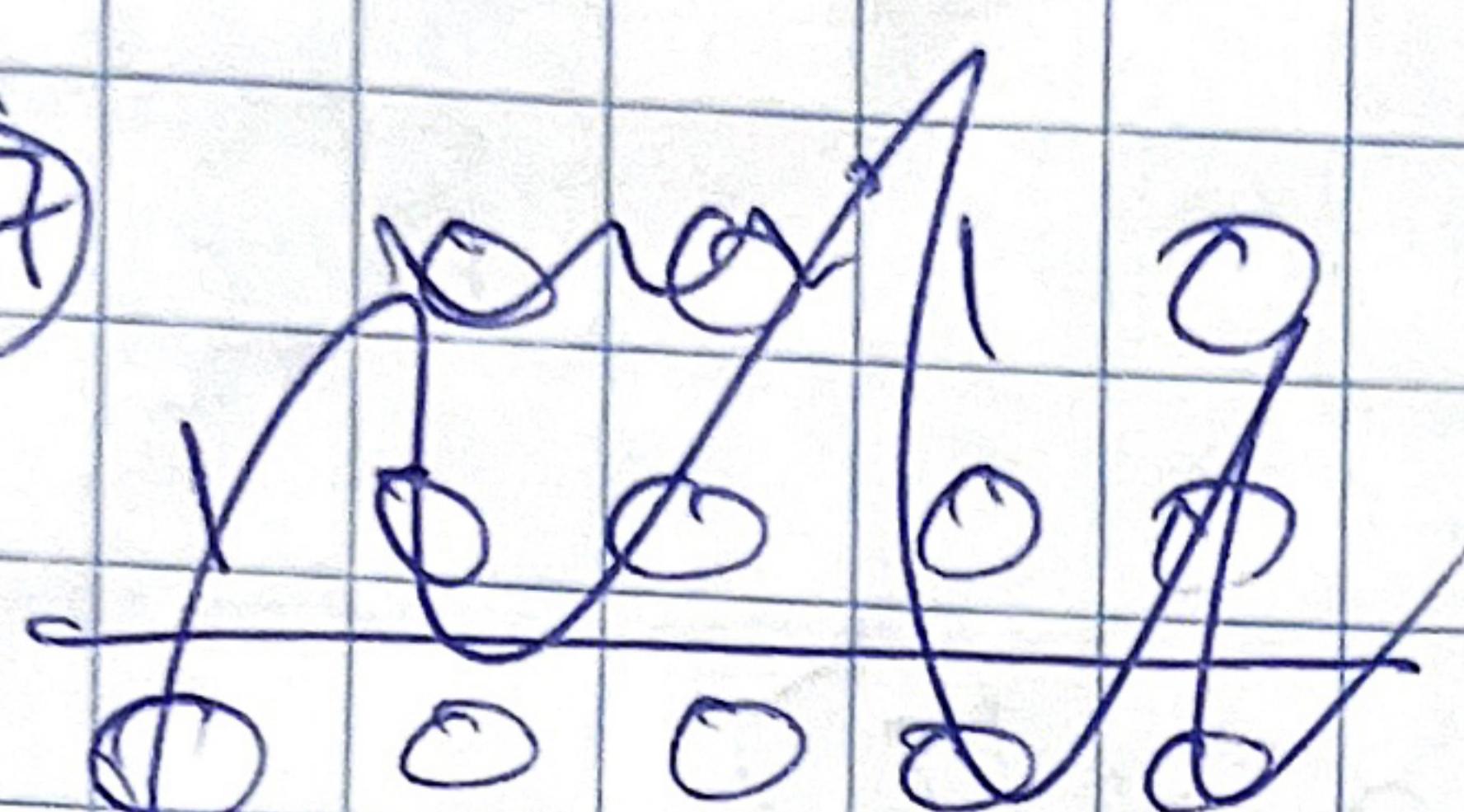
maths \rightarrow to get 1000

return it to ISV.

(26)

	sawed	J	I
-2	S		
-1	C		
0	O		
1	Z		
2	S		

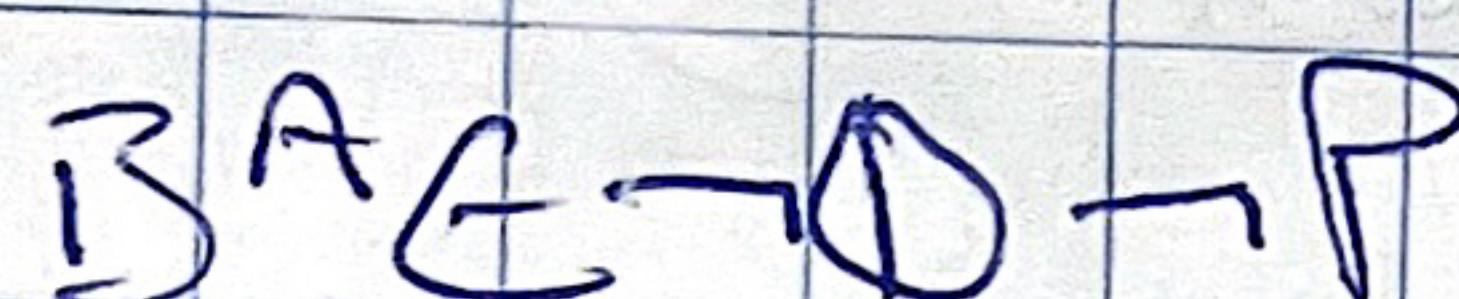
(27)



$$\begin{array}{r} z = 0010 = 0100 \\ 16 = 10000 \quad 0100 \\ \hline 0100 \end{array}$$

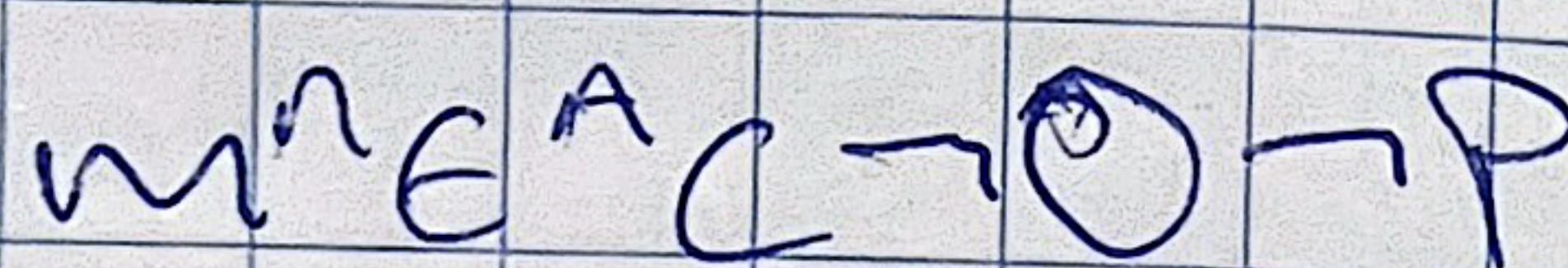
(28)

bacon & eggs



omelette

OR ✓



(29)

$$\begin{array}{r} 0110 \\ 1011 \\ \hline 1101 \end{array} \times \text{or}$$

one or other
true, not both