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$$\textcircled{1} (3VF, 2D)_A = (8)_r = (8)_{14}$$

$$\begin{aligned}
 & \left(\begin{array}{|c|c|c|c|c|c|c|c|c|c|} \hline \cdot & + & + & + & + & + & + & + & + & + \\ \hline \end{array} \right) / \left(\begin{array}{|c|c|c|c|c|c|} \hline \cdot & + & \cdot & \cdot & + & \cdot \\ \hline \end{array} \right) \\
 &= \left(\begin{array}{|c|c|c|c|c|c|} \hline 11 & 111 & 12 & \cdot & \cdot & \cdot \\ \hline \end{array} \right) / \left(\begin{array}{|c|c|c|c|c|c|} \hline \cdot & + & \cdot & + & \cdot & \cdot \\ \hline \end{array} \right) \\
 &= (E \ C \ / \ D \ - \ F)_{14}
 \end{aligned}$$

$$\textcircled{2} 11 \cdot 11 \cdot 1 + 1 \cdot 1 \cdot 11 = 11 \cdot 11 \cdot 1 \rightarrow 19$$

$$1 \cdot 1 \cdot 1 \cdot 1 \rightarrow 14$$

$$(1 \cdot \cdot \cdot 11 \cdot \cdot \cdot)_r = 1x2^4 + 1x2^6 + 1x2^8 = 16 + 64 + 256 = 320$$

$$1 \cdot 1 \cdot 1 \cdot 1 - 11 \cdot 111 = 1 \cdot 1 \cdot 1 \cdot 1 \rightarrow \wedge D$$

$$- 11 \cdot 111 \rightarrow \Delta D$$

$$(0 \cdot 1111 \cdot)_r = 1x2^6 + 1x2^7 + 1x2^8 + 1x2^9 = 64 + 128 + 256 + 512 = 960$$

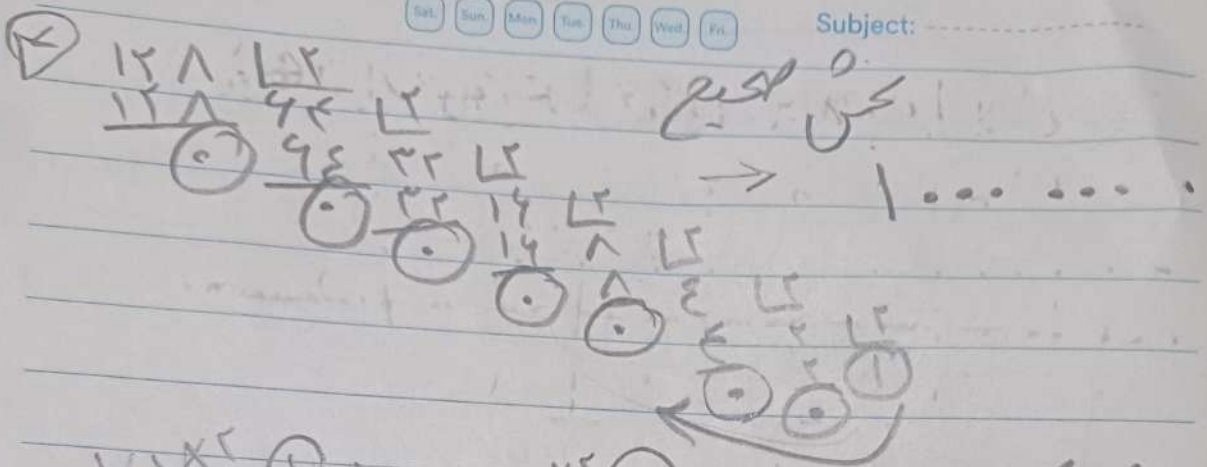
$$\begin{aligned}
 \textcircled{3} F(A, B, C) &= A'B'C + A'BC + AB'C + ABC \\
 &= (A'C(B' + B) + A(CB' + CB) - A'C(B' + B) \\
 &\quad + A(CB' + CB) = A'C + AC = C(A' + A) = C
 \end{aligned}$$

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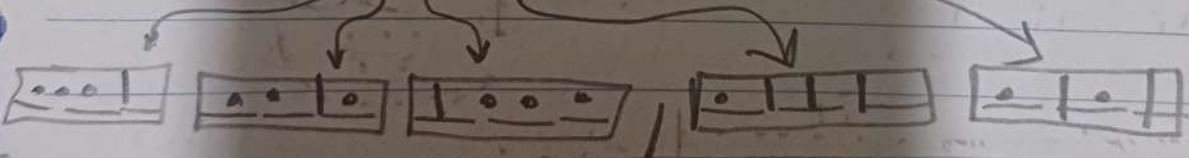
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Handwritten text: $\delta \rightarrow \delta \rightarrow \delta \rightarrow \delta \rightarrow \delta \rightarrow \delta \rightarrow \delta \rightarrow \delta$

$$\rightarrow 12 \wedge 12 = (1 \dots 1) \dots (1 \dots 1) \dots$$

BCD: $(12 \wedge 12)$



$$\textcircled{a} F(A, B, C) = (A + B' + C')(A' + B + C)(A' + B' + C) \\ = (A + B' + C)(A + B' + C')(A + B + C)(A + B + C')(A' + B + C) \\ (A' + B' + C)$$

(POS)

$$F(A, B, C) = (A + B')(B + C)(A' + C) =$$

$$= (A(B + C) + B'(B + C))(A' + C)$$

$$= (AB + AC + B'B + B'C)(A' + C) = \cancel{AA'B} + \cancel{AA'C} + A'B'C +$$

$$\cancel{C'AC} + \cancel{CA'B} + \cancel{C'B'C} = A'B'C + A'BC' \quad (\text{SOP})$$

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$$\gamma \vdash \Delta \xrightarrow{x} \odot, \gamma \vdash \Delta \xrightarrow{x} \ominus, \delta \rightarrow \gamma, \delta \rightarrow \odot$$

جواب: (11.0%) ✓

$$\rightarrow (K_V, K_V \Delta)_{1.} = (\underbrace{1.111}_{\text{K}_V}, \underbrace{0.11}_{\text{K}_V \Delta})$$
$$= \left(\frac{1}{2}, \frac{1}{2}, \frac{1}{2} \right)$$

BCD:

0	1	2	3
---	---	---	---

4	5	6	7
---	---	---	---

A μ ν Δ

$$= \frac{1}{2} \left(1 + \frac{1}{2} + \frac{1}{4} + \frac{1}{8} + \frac{1}{16} + \frac{1}{32} + \frac{1}{64} + \frac{1}{128} + \frac{1}{256} + \frac{1}{512} + \frac{1}{1024} + \frac{1}{2048} + \frac{1}{4096} + \frac{1}{8192} + \frac{1}{16384} + \frac{1}{32768} + \frac{1}{65536} + \frac{1}{131072} + \frac{1}{262144} + \frac{1}{524288} + \frac{1}{1048576} + \frac{1}{2097152} + \frac{1}{4194304} + \frac{1}{8388608} + \frac{1}{16777216} + \frac{1}{33554432} + \frac{1}{67108864} + \frac{1}{134217728} + \frac{1}{268435456} + \frac{1}{536870912} + \frac{1}{1073741824} + \frac{1}{2147483648} + \frac{1}{4294967296} + \frac{1}{8589934592} + \frac{1}{17179869184} + \frac{1}{34359738368} + \frac{1}{68719476736} + \frac{1}{137438953472} + \frac{1}{274877906944} + \frac{1}{549755813888} + \frac{1}{1099511627776} + \frac{1}{2199023255552} + \frac{1}{4398046511104} + \frac{1}{8796093022208} + \frac{1}{17592186044416} + \frac{1}{35184372088832} + \frac{1}{70368744177664} + \frac{1}{140737488355328} + \frac{1}{281474976710656} + \frac{1}{562949953421312} + \frac{1}{1125899906842624} + \frac{1}{2251799813685248} + \frac{1}{4503599627370496} + \frac{1}{9007199254740992} + \frac{1}{18014398509481984} + \frac{1}{36028797018963968} + \frac{1}{72057594037927936} + \frac{1}{144115188075855872} + \frac{1}{288230376151711744} + \frac{1}{576460752303423488} + \frac{1}{1152921504606846976} + \frac{1}{2305843009213693952} + \frac{1}{4611686018427387904} + \frac{1}{9223372036854775808} + \frac{1}{18446744073709551616} + \frac{1}{36893488147419103232} + \frac{1}{73786976294838206464} + \frac{1}{147573952589676412928} + \frac{1}{295147905179352825856} + \frac{1}{590295810358705651712} + \frac{1}{1180591620717411303424} + \frac{1}{2361183241434822606848} + \frac{1}{4722366482869645213696} + \frac{1}{9444732965739290427392} + \frac{1}{18889465931478580854784} + \frac{1}{37778931862957161709568} + \frac{1}{75557863725914323419136} + \frac{1}{151115727451828646838272} + \frac{1}{302231454903657293676544} + \frac{1}{604462909807314587353088} + \frac{1}{1208925819614629174706176} + \frac{1}{2417851639229258349412352} + \frac{1}{4835703278458516698824704} + \frac{1}{9671406556917033397649408} + \frac{1}{19342813113834066795298816} + \frac{1}{38685626227668133590597632} + \frac{1}{77371252455336267181195264} + \frac{1}{154742504910672534362390528} + \frac{1}{309485009821345068724781056} + \frac{1}{618970019642690137449562112} + \frac{1}{1237940039285380274899124224} + \frac{1}{2475880078570760549798248448} + \frac{1}{4951760157141521099596496896} + \frac{1}{9903520314283042199192993792} + \frac{1}{19807040628566084398385987584} + \frac{1}{39614081257132168796771975168} + \frac{1}{79228162514264337593543950336} + \frac{1}{158456325028528675187087900672} + \frac{1}{316912650057057350374175801344} + \frac{1}{633825300114114700748351602688} + \frac{1}{1267650600228229401496703205376} + \frac{1}{2535301200456458802993406410752} + \frac{1}{5070602400912917605986812821504} + \frac{1}{10141204801825835211973625643008} + \frac{1}{20282409603651670423947251286016} + \frac{1}{40564819207303340847894502572032} + \frac{1}{81129638414606681695789005144064} + \frac{1}{162259276829213363391578010288128} + \frac{1}{324518553658426726783156020576256} + \frac{1}{649037107316853453566312041152512} + \frac{1}{1298074214633706907132624082305024} + \frac{1}{2596148429267413814265248164610048} + \frac{1}{5192296858534827628530496329220096} + \frac{1}{10384593717069655257060992658440192} + \frac{1}{20769187434139310514121985316880384} + \frac{1}{41538374868278621028243970633760768} + \frac{1}{83076749736557242056487941267521536} + \frac{1}{166153499473114484112975882535043072} + \frac{1}{332306998946228968225951765070086144} + \frac{1}{664613997892457936451903530140172288} + \frac{1}{1329227995784915872903807060280344576} + \frac{1}{2658455991569831745807614120560689152} + \frac{1}{5316911983139663491615228241121378304} + \frac{1}{10633823966279326983230456482242756608} + \frac{1}{21267647932558653966460912964485513216} + \frac{1}{42535295865117307932921825928971026432} + \frac{1}{85070591730234615865843651857942052864} + \frac{1}{170141183460469231731687303715884105728} + \frac{1}{340282366920938463463374607431768211456} + \frac{1}{680564733841876926926749214863536422912} + \frac{1}{1361129467683753853853498429727072845824} + \frac{1}{2722258935367507707706996859454145691648} + \frac{1}{5444517870735015415413993718908291383296} + \frac{1}{10889035741470030830827987437816582766592} + \frac{1}{21778071482940061661655974875633165533184} + \frac{1}{43556142965880123323311949751266331066368} + \frac{1}{87112285931760246646623899502532662132736} + \frac{1}{174224571863520493293247799005065324265472} + \frac{1}{348449143727040986586495598010130648530944} + \frac{1}{696898287454081973172991196020261297061888} + \frac{1}{1393796574908163946345982392040522594123776} + \frac{1}{2787593149816327892691964784081045188247552} + \frac{1$$

$$\begin{aligned} (1) \quad F(A, B, C) &= A'B'C + A'B'C' + AB'C + ABC \\ &= C(A'B' + AB) + C'(AB' + A'B) = C(A \oplus B) \\ &\quad + C'(A \oplus B) = \overline{C(A \oplus B)} + C(A \oplus B) = \\ &\quad A \oplus B \oplus C \end{aligned}$$

$$\begin{aligned} \textcircled{1} F(x, y, z) &= (x+y') \cdot (y \oplus z) = (x+y') (y'z + zy) \\ &= xy'z + xzy + y'^2z + zy'y = \\ &= xy'z + xzy + y'z + 0 = (xy'z + y'z) + xzy \\ &= y'z(x+1) + xzy = y'z + xzy \rightarrow \end{aligned}$$

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این سوال را به روش کاردان برای ما بکنید
 امکان ندارد

⑫ (1011) → 1111
 1011
 0100 ✓
 1111
 1011
 0101 ✓

$$\textcircled{13} F = A(B+C) + B(A+C) = AB + AC + AB + BC$$

$$= (AB + AB) + C(A+B) = AB + AC + BC$$

A	B	C	AB	AC	BC	AB+AC+BC	B+C	A+C	A(B+C)	F
0	0	0	0	0	0	0	0	0	0	0
0	0	1	0	0	0	0	1	1	0	0
0	1	0	0	0	0	0	1	1	0	0
0	1	1	0	0	1	1	1	1	0	0
1	0	0	0	0	0	0	0	1	1	1
1	0	1	0	1	0	1	1	1	1	1
1	1	0	1	0	0	1	1	1	1	1
1	1	1	1	1	1	1	1	1	1	1

درست است
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(13) $F = ABC + A'B + BC = (ABC + BC) + A'B = BC(A + 1) + A'B = BC + A'B = BC + A'B$ ✓

(14) $F = (A + B)(A' + C) + B = AA' + AC + A'B + BC + B = 0 + AC + A'B + BC + 1 = AC + A'B + B = AC + B(A' + 1) = AC + B$ ✓

A	B	C	A'	A+B	A+C	(A+B)(A+C)	F	AC	A'+B
0	0	0	1	0	0	0	0	0	1
0	0	1	1	0	1	0	0	0	1
0	1	0	1	1	0	0	1	0	1
0	1	1	1	1	1	1	1	0	1
1	0	0	0	1	0	0	0	0	0
1	0	1	0	1	1	1	1	0	1
1	1	0	0	1	0	0	1	0	1
1	1	1	0	1	1	1	1	1	1

(15) $F_1 = A + B \quad , \quad F_2 = (A + B)(A' + C) = AA' + AC + BA' + BC \rightarrow$

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A	B	C	A'	B'	C'	A+BC	A'C	BA'	BC	F
0	0	0	1	1	1	0	0	0	0	0
0	0	1	1	1	0	0	0	0	0	0
0	1	0	1	0	1	0	0	1	0	1
0	1	1	1	0	0	0	0	1	1	1
1	0	0	0	1	1	1	0	0	0	0
1	0	1	0	1	0	1	0	0	0	1
1	1	0	0	0	1	1	0	0	0	0
1	1	1	0	0	0	1	0	0	1	0

برابر نیست ✓

$$\textcircled{IV} F = AB + A'C + BC = AB + A'C + (A + A')BC = AB + A'C + ABC + A'BC = (AB + ABC) + (A'C + A'BC) = AB(C + C') + A'C(C + B) = AB + A'C \checkmark$$

نرم استاتس، د:

$$\begin{aligned} & ABC(C + C') + A'C(B + B') + (A + A')BC = \\ & = \underline{ABC} + \underline{ABC'} + \underline{A'CB} + \underline{A'CB'} + \underline{ABC} + \underline{A'BC} \\ & = ABC + ABC' + A'CB + A'CB' \checkmark \end{aligned}$$

$$\textcircled{IV} D_F = (C + B)(BC + A) \quad \text{بله ساده تر است.}$$