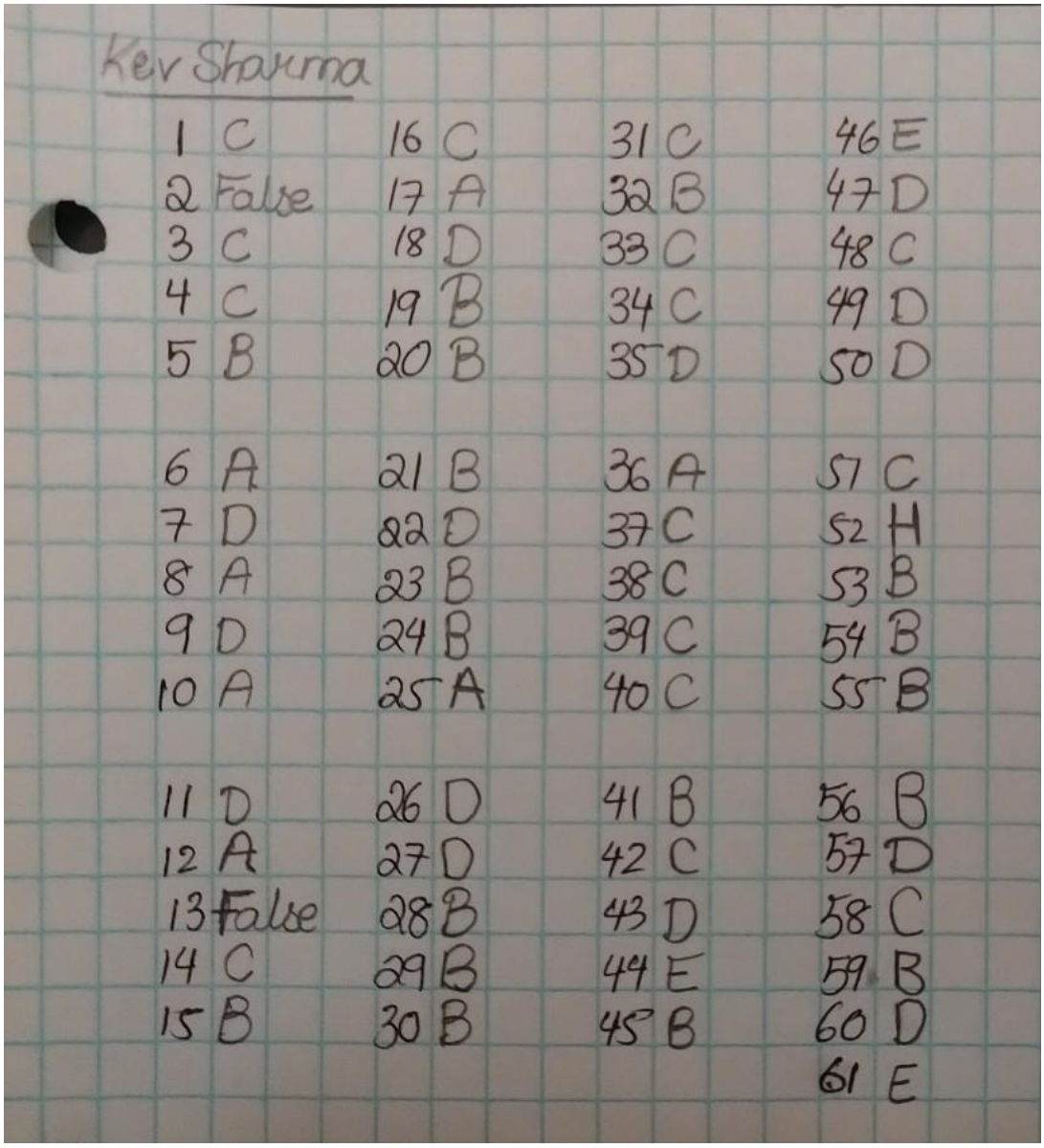
I attached my answers to the multiple choice questions here.
I put some sample work afterwards but I know it's not required so I only put the ones where I wrote down a lot.



Kev Sharma

1 C	16 C	31 C	46 E
2 False	17 A	32 B	47 D
3 C	18 D	33 C	48 C
4 C	19 B	34 C	49 D
5 B	20 B	35 D	50 D
6 A	21 B	36 A	51 C
7 D	22 D	37 C	52 H
8 A	23 B	38 C	53 B
9 D	24 B	39 C	54 B
10 A	25 A	40 C	55 B
11 D	26 D	41 B	56 B
12 A	27 D	42 C	57 D
13 False	28 B	43 D	58 C
14 C	29 B	44 E	59 B
15 B	30 B	45 B	60 D
			61 E

45 & 46

$R = ABCDEFG$

$F = \{A.B \to C, C \to A, BC \to D, \cancel{C \to B}, ACD \to B, D \to E, D \to G, BE \to C, CG \to B, CG \to D, CE \to A, CE \to G\}$

#46 LHS rem

$AB \to C, C \to A, BC \to D, CD \to B, D \to E, D \to G, BE \to C, CG \to B, CG \to D, CE \to A, CE \to G$

	~~AB→C~~	AB	keep
	C→A	C	keep
	BC→D	BCA	keep
✗	CD→B	CDABEG(B)	remove
	D→E		keep
	D→G		keep
	BE→C	BE	keep
	CG→B	CGDEA	keep
✗	CG→D	CGBAD	remove
✗	CE→A	CEA	remove
	CE→G	CAE	keep.

#45

$F_{mm} = \{AB \to C, C \to A, BC \to D, D \to EG, BE \to C, CG \to B, CE \to G\}$

#49 Redundant:

$CD \to B$, → matches
$CG \to D$, → ∃ } on rhs
$CE \to A$, → ∃ }

48.

ln	b	r
~~A~~	B	g
F	A	
	C	
	D	
	E	

candidate key must include F.

$(BCF)^+$ = ABCDEFg

DEF^+ = DEFg

---

47 R=(ABCDE) F = A→BC, B→C, D→E

candi key

ln	b	r
AD	B	E
	C	

$(AD)^+$ = ABCDE

F_{min} = ① A→B, A→C, B→C, D→E

②

③

A→B	AC	keep
A→C	ABC	remove
B→C	B	keep
D→E	D	keep

$F_{min} = \{A \to B, B \to C, D \to E\}$

$R_1 = AB$

$R_2 = BC$

$R_3 = DE$

AD missing

$\therefore R_4 = AD$

Q8

$R = (A\ B\ C\ D\ E)$
$F = \{ D \to BE,\ C \to D,\ AB \to C \}$

Viol = $\exists x \to y \in F$ s.t
y non prime
& x ! superkey

candidate keys.

lh	b	r
A	D	E
	B	
	C	

AD^+ ✓
ABCDE

AC^+ ✓
DBE

AB^+ ✓
CDE

prime = A B C D
non prime = E.

$D \to E$ violation since
D is not ~~the~~ a superkey

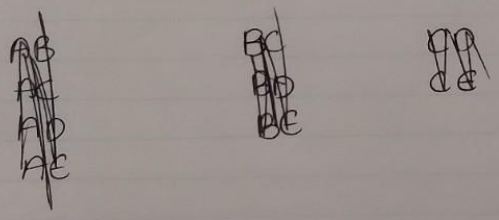
#b). ans = E.

39. $R = A\ B\ C\ D\ E$

$\Sigma = \{D \to BE,\ C \to D,\ AB \to C\}$

$F^+ =$ $D \to B$, $D \to E$, $C \to D$, $AB \to C$, $AB \to D$, $AB \to E$, $C \to B$, $C \to E$ (transitively) $=$ $\{AB \to CDE,\ C \to BDE,\ D \to BE\}$ (A) subset.

~~ABCDE~~



A. $ABE \to CD$ ✓

B. $DE \to C$ no.

~~$D \to BE,\ E \to \phi$~~

C. $BCD \to E$ ✓ since $D \to E$

D. $ACE \to BD$ ✓

$C \to d$ ✓

$d \to b$ ✓

E. $CDE \to B$

$D \to B$ ✓.

So Cons = B

$DE \to C$.