Do NOT write on this test. Record all answers on the bubble sheet. **Closed book. No notes.** Work strictly from memory. **No calculators. No time limit. Scratch paper okay.**

UNIX: Which unix shell commands have what meaning? (If no match mark J.)

(A) `cat` (B) `df` (C) `exit` (D) `full` (E) `list` (F) `quit` (G) `top` (H) `type` (I) `volume`

1/8p. see how full the disks are
2/8p. see what is running
3/8p. type out a text file
4/8p. log out

UNIX: Which unix shell commands have what meaning? (If no match mark J.)

(A) `cap` (B) `du` (C) `fg` (D) `gcc` (E) `mv` (F) `ren` (G) `rename` (H) `rmdir` (I) `space`

5/8p. compile a program
6/8p. return from shell-out
7/8p. see how much disk space you are using
8/8p. rename a file

UNIX: Which unix shell commands have what meaning? (If no match mark J.)

(A) `cat` (B) `emacs` (C) `md` (D) `mkdir` (E) `rd` (F) `rm` (G) `rmdir` (H) `w` (I) `who`

9/8p. see who is logged in
10/8p. delete a directory
11/8p. create a directory
12/8p. edit a file

UNIX: Which unix shell commands have what meaning? (If no match mark J.)

(A) `cat` (B) `cwd` (C) `del` (D) `delete` (E) `dir` (F) `pass` (G) `passwd` (H) `pwd` (I) `rm`

13/8p. change your password
14/8p. show the contents of the directory
15/8p. delete a file
16/8p. tell what directory you are in

EMACS: Which emacs commands have what meaning? (If no match mark J.)

(A) `C-` (C) `C-f` (E) `C-k` (G) `C-p` (I) `C-t`
(B) `C-c` (D) `C-h t` (F) `C-n` (H) `C-r`

17/5p. cut to end of line
18/5p. hold down CTRL
19/5p. paste back what was deleted
20/5p. show the tutorial
21/5p. go to next character (right 1)

EMACS: Which emacs commands have what meaning? (If no match mark J.)

(A) `C-a` (C) `C-l` (E) `C-x 0` (G) `C-x 2` (I) `C-x o`
(B) `C-b` (D) `C-p` (F) `C-x 1` (H) `C-x n`

22/5p. jump to next window
23/5p. open a second window
24/5p. go to start of line
25/5p. go to previous character (left 1)
26/5p. close all but current window

EMACS: Which emacs commands have what meaning? (If no match mark J.)

(A) `C-b` (C) `C-n` (E) `C-x C-f` (G) `C-x o` (I) `M-`
(B) `C-d` (D) `C-u` (F) `C-x C-l` (H) `ESC-`

27/5p. press ESC first
28/5p. go to previous line (up 1)
29/5p. load a new file
30/5p. go to next line (down 1)

EMACS: Which emacs commands have what meaning? (If no match mark J.)

(A) `C-e` (C) `C-s` (E) `C-x C-i` (G) `C-x i` (I) `C-z`
(B) `C-r` (D) `C-x C-c` (F) `C-x C-q` (H) `C-x o`

31/5p. exit/quit
32/5p. shell out
33/5p. insert a file
34/5p. center and redraw screen

EMACS: Which emacs commands have what meaning? (If no match mark J.)

(A) `C-` (C) `C-delete` (E) `C-n` (G) `C-x C-s` (I) `C-y`
(B) `C-_` (D) `C-k` (F) `C-u` (H) `C-x C-w`

35/5p. save current buffer, same filename
36/5p. save-as current buffer, specify filename
37/5p. undo last change
38/5p. delete current character

EMACS: Which emacs commands have what meaning? (If no match mark J.)

(A) `C-c` (C) `C-g` (E) `C-x` (G) `C-z` (I) `M-x rmail`
(B) `C-e` (D) `C-s` (F) `C-x C-f` (H) `ESC-x rmail`

39/5p. cancel the command in progress
40/5p. start incremental search
41/5p. go to end of line
42/5p. run mail

Precedence: What is the value of each expression? Mark (I) for error, (J) for none of the above.

43/10p.	`1+4>1<1-3`	(A) -68	(B) -10	(C) -3	(D) -2	(E) -1	(F) 0	(G) 1	(H) 2
44/10p.	`8+4%3%7+2`	(A) 0	(B) 2	(C) 4	(D) 9	(E) 11	(F) 64	(G) 74	(H) 75
45/10p.	`6+7*6%5*2`	(A) -65	(B) -61	(C) 6	(D) 10	(E) 20	(F) 26	(G) 48	(H) 78
46/10p.	`9-7<5>=0*2`	(A) -73	(B) -23	(C) 0	(D) 1	(E) 7	(F) 8	(G) 9	(H) 18
47/10p.	`5/5-0-1-8`	(A) -8	(B) -7	(C) -6	(D) -2	(E) 0	(F) 8	(G) 10	(H) 76
48/10p.	`7-3/1-5*8`	(A) -63	(B) -36	(C) -8	(D) -1	(E) 15	(F) 23	(G) 44	(H) 72
49/10p.	`9/5%2/9-5`	(A) -83	(B) -50	(C) -4	(D) -2	(E) 0	(F) 2	(G) 13	(H) 73
50/10p.	`4/7>=1!=5+7`	(A) 0	(B) 1	(C) 7	(D) 8	(E) 10	(F) 50	(G) 94	(H) 95
51/10p.	`1/9-8-1+1`	(A) -65	(B) -10	(C) -8	(D) -6	(E) -1	(F) 0	(G) 48	(H) 92
52/10p.	`1+1&&4!=1+9`	(A) -68	(B) 1	(C) 2	(D) 9	(E) 10	(F) 11	(G) 25	(H) 56
53/10p.	`4*6+7%4+7`	(A) 7	(B) 8	(C) 9	(D) 31	(E) 32	(F) 34	(G) 43	(H) 64
54/10p.	`2%7>6>=4-3`	(A) -3	(B) -2	(C) -1	(D) 0	(E) 1	(F) 23	(G) 40	(H) 71
55/10p.	`5%4/3+9-1`	(A) -96	(B) -34	(C) -9	(D) -1	(E) 4	(F) 5	(G) 8	(H) 40
56/10p.	`4/7||9==8-8`	(A) -48	(B) -8	(C) -4	(D) -1	(E) 1	(F) 4	(G) 64	(H) 75
57/10p.	`6-0/2%7-7`	(A) -88	(B) -4	(C) -2	(D) -1	(E) 13	(F) 43	(G) 67	(H) 95
58/10p.	`1+4!=0>=0*7`	(A) 1	(B) 2	(C) 7	(D) 8	(E) 14	(F) 50	(G) 54	(H) 94
59/10p.	`1==6||5-4-9`	(A) -89	(B) -12	(C) -8	(D) 0	(E) 2	(F) 6	(G) 39	(H) 97
60/10p.	`4/9/2-7%3`	(A) -70	(B) -4	(C) -1	(D) 0	(E) 1	(F) 2	(G) 25	(H) 89
61/10p.	`8*9<8||4-6`	(A) -40	(B) -6	(C) -5	(D) 0	(E) 1	(F) 2	(G) 8	(H) 30
62/10p.	`3>9&&4*8+4`	(A) -23	(B) 0	(C) 1	(D) 5	(E) 9	(F) 12	(G) 37	(H) 76
63/10p.	`3/8<=4||8-4`	(A) -7	(B) -3	(C) 0	(D) 1	(E) 3	(F) 41	(G) 67	(H) 87
64/10p.	`4/9<0<3*7`	(A) -91	(B) -35	(C) 1	(D) 4	(E) 6	(F) 7	(G) 28	(H) 40
65/10p.	`7-8/3%6*3`	(A) -46	(B) -3	(C) 1	(D) 5	(E) 7	(F) 15	(G) 17	(H) 20
66/10p.	`3/1-6/4*7`	(A) -14	(B) -7	(C) -4	(D) -3	(E) -1	(F) 14	(G) 60	(H) 61
67/10p.	`8-4%4-4-3`	(A) -7	(B) -2	(C) -1	(D) 1	(E) 7	(F) 9	(G) 10	(H) 15

How many times does the body of the loop execute? (Mark 9 if 9 or more.)

68/10p. `int q=-8; do body; while( --q != -12 );`

69/10p. `int x; for( x=7; x!=3; ++x ) body;`

70/10p. `int z; for( z=-9; z!=-15; --z ) body;`

71/10p. `int h=-9; while( h++ != -1 ) body;`

72/10p. `int n; for( n=4; n!=8; n++ ) body;`

73/10p. `int z; for( z=-2; z>=-1; z-- ) body;`

74/10p. `int q=2; while( ++q != 8 ) body;`

75/10p. `int x; for( x=5; x!=5; --x ) body;`

76/10p. `int r=-8; do body; while( r++ <= -5 );`

77/10p. `int t=-3; do body; while( t-- >= -5 );`

78/10p. `int z; for( z=-3; z!=-3; ++z ) body;`

79/10p. `int b; for( b=4; b!=11; ++b ) body;`

80/10p. `int h=10; do body; while( ++h != 4 );`

81/10p. `int w=-10; do body; while( ++w < -5 );`

82/10p. `int d=2; while( ++d >= -1 ) body;`

83/10p. `int i; for( i=1; i<3; i++ ) body;`

84/10p. `int f; for( f=1; f!=7; ++f ) body;`

85/10p. `int d; for( d=-1; d>-6; d++ ) body;`

86/10p. `int e; for( e=0; e<=0; ++e ) body;`

87/10p. `int d=-3; do body; while( --d != 3 );`

88/10p. `int v; for( v=-2; v!=2; v++ ) body;`

89/10p. `int a=-7; while( ++a < -2 ) body;`

90/10p. `int z=-5; while( z-- != -7 ) body;`

91/10p. `int h; for( h=-3; h<2; ++h ) body;`

92/10p. `int v=5; while( v-- > -2 ) body;`

On the following printf questions you are given a list of inputs. For each problem line determine which printf statement created the accompanying outputs. (␣ means space.)

Which of these printf statements created the outputs shown for each problem below? (`x` is `int x;`)

(A) `printf("␣␣␣␣␣%02d␣␣␣",x);` (D) `printf("␣%+-5d␣␣␣␣",x);` (G) `printf("%+-9d␣",x);`
(B) `printf("␣␣%-␣4d␣␣␣␣",x);` (E) `printf("␣%0␣6d␣␣␣",x);` (H) `printf("%010d",x);`
(C) `printf("␣␣%-5d␣␣␣",x);` (F) `printf("%␣-10d",x);` (I) `printf("%04d␣␣␣␣␣␣",x);`

inputs:	3	-5	1312563190	-1735124666
93/6p.	␣␣00003␣␣␣	␣-00005␣␣␣	␣␣1312563190␣␣␣	␣-1735124666␣␣␣
94/6p.	␣3␣␣␣␣␣␣␣	-5␣␣␣␣␣␣␣␣	␣1312563190	-1735124666
95/6p.	␣␣␣3␣␣␣␣␣␣	␣␣-5␣␣␣␣␣␣	␣␣␣1312563190␣␣␣␣	␣␣-1735124666␣␣␣␣
96/6p.	0003␣␣␣␣␣␣	-005␣␣␣␣␣␣	1312563190␣␣␣␣␣␣	-1735124666␣␣␣␣␣␣
97/6p.	␣␣␣␣␣03␣␣␣	␣␣␣␣␣-5␣␣␣	␣␣␣␣␣1312563190␣␣␣	␣␣␣␣␣-1735124666␣␣␣

Which of these printf statements created the outputs shown for each problem below? (`x` is `int x;`)

(A) `printf("␣␣␣%+d␣␣␣",x);` (D) `printf("␣␣%0+3d␣␣",x);` (G) `printf("%␣-7d",x);`
(B) `printf("␣␣%+-3d␣␣",x);` (E) `printf("␣%-␣6d",x);` (H) `printf("%␣7d",x);`
(C) `printf("␣␣%-4d␣",x);` (F) `printf("␣%-+4d␣␣",x);` (I) `printf("%07d",x);`

inputs:	6	-3	2114484915	-1844112055
98/6p.	␣␣6␣␣␣␣	␣-3␣␣␣␣	␣␣2114484915	␣-1844112055
99/6p.	0000006	-000003	2114484915	-1844112055
100/6p.	␣␣+06␣␣	␣␣-03␣␣	␣␣+2114484915␣␣	␣␣-1844112055␣␣
101/6p.	␣␣␣+6␣␣␣	␣␣␣-3␣␣␣	␣␣␣+2114484915␣␣␣	␣␣␣-1844112055␣␣␣
102/6p.	␣␣+6␣␣␣	␣␣-3␣␣␣	␣␣+2114484915␣␣	␣␣-1844112055␣␣

Which of these printf statements created the outputs shown for each problem below? (`x` is `int x;`)

(A) `printf("␣␣␣␣␣%-3d␣",x);` (D) `printf("␣␣␣␣%-4d␣␣",x);` (G) `printf("␣%05d␣␣␣",x);`
(B) `printf("␣␣␣␣%02d␣␣␣",x);` (E) `printf("␣␣␣␣%04d␣␣",x);` (H) `printf("␣%7d␣",x);`
(C) `printf("␣␣␣%-␣4d␣␣",x);` (F) `printf("␣␣%+07d",x);` (I) `printf("%+7d␣␣",x);`

inputs:	6	-3	1921062524	-1937115465
103/6p.	␣␣␣6␣␣␣␣␣	␣␣␣␣-3␣␣␣␣	␣␣␣1921062524␣␣	␣␣␣-1937115465␣␣
104/6p.	␣␣␣␣␣+6␣␣	␣␣␣␣␣-3␣␣	+1921062524␣␣	-1937115465␣␣
105/6p.	␣␣+000006	␣␣-000003	␣␣+1921062524	␣␣-1937115465
106/6p.	␣␣␣␣6␣␣␣␣	␣␣␣␣-3␣␣␣␣	␣␣␣␣1921062524␣␣	␣␣␣-1937115465␣␣
107/6p.	␣00006␣␣␣	␣-0003␣␣␣	␣1921062524␣␣␣	␣-1937115465␣␣␣

Which of these printf statements created the outputs shown for each problem below? (`x` is `int x;`)

(A) `printf("␣␣␣␣␣%␣3d␣␣",x);` (D) `printf("␣%␣-3d␣␣␣␣␣␣",x);` (G) `printf("␣%+9d",x);`
(B) `printf("␣␣%␣6d␣␣",x);` (E) `printf("␣%+-6d␣␣␣",x);` (H) `printf("%-␣10d",x);`
(C) `printf("␣␣%-7d␣",x);` (F) `printf("␣%+09d",x);` (I) `printf("%-␣9d␣",x);`

inputs:	8	-4	1990711264	-2040697292
108/6p.	␣␣8␣␣␣␣␣␣	␣-4␣␣␣␣␣␣␣	␣␣1990711264␣␣␣␣␣␣	␣-2040697292␣␣␣␣␣␣
109/6p.	␣+8␣␣␣␣␣␣␣	␣-4␣␣␣␣␣␣␣	␣+1990711264␣␣␣	␣-2040697292␣␣␣
110/6p.	␣8␣␣␣␣␣␣␣␣	-4␣␣␣␣␣␣␣␣	␣1990711264␣	-2040697292␣
111/6p.	␣␣␣␣␣␣␣␣+8	␣␣␣␣␣␣␣␣-4	␣+1990711264	␣-2040697292
112/6p.	␣␣␣␣␣␣␣8␣␣	␣␣␣␣␣␣␣-4␣␣	␣␣␣1990711264␣␣	␣␣-2040697292␣␣

Which of these printf statements created the outputs shown for each problem below? (x is `char * x;`)

(A) `printf("␣␣␣%1s",x);` (D) `printf("␣%3s",x);` (G) `printf("%-3s␣",x);`
(B) `printf("␣␣%2s",x);` (E) `printf("␣%s␣␣␣",x);` (H) `printf("%-4s",x);`
(C) `printf("␣%1s␣␣",x);` (F) `printf("%-2s␣␣",x);` (I) `printf("%4s",x);`

inputs:	""	"p"	"zb"	"gjbw"	"clwjxy"	"ffylqfyh"
113/6p.	␣␣␣␣	␣p␣␣	␣zb␣␣	␣gjbw␣␣	␣clwjxy␣␣	␣ffylqfyh␣␣
114/6p.	␣␣␣␣	␣p␣␣␣	␣zb␣␣␣	␣gjbw␣␣␣	␣clwjxy␣␣␣	␣ffylqfyh␣␣␣
115/6p.	␣␣␣␣	p␣␣␣	zb␣␣	gjbw	clwjxy	ffylqfyh
116/6p.	␣␣␣␣	␣␣␣p	␣␣zb	␣␣gjbw	␣␣clwjxy	␣␣ffylqfyh
117/6p.	␣␣␣␣	␣␣␣p	␣␣zb	␣gjbw	␣clwjxy	␣ffylqfyh

Which of these printf statements created the outputs shown for each problem below? (x is `char * x;`)

(A) `printf("␣␣␣␣%s",x);` (D) `printf("␣%-3s",x);` (G) `printf("%1s␣␣␣",x);`
(B) `printf("␣␣␣%s␣",x);` (E) `printf("␣%1s␣␣",x);` (H) `printf("%3s␣",x);`
(C) `printf("␣%-2s␣",x);` (F) `printf("␣%2s␣",x);` (I) `printf("%4s",x);`

inputs:	""	"p"	"yb"	"jwvy"	"xvxchp"	"kkhlxhwp"
118/6p.	␣␣␣␣	␣␣␣p␣	␣␣␣yb␣	␣␣␣jwvy␣	␣␣␣xvxchp␣	␣␣␣kkhlxhwp␣
119/6p.	␣␣␣␣	␣p␣␣	␣yb␣	␣jwvy␣	␣xvxchp␣	␣kkhlxhwp␣
120/6p.	␣␣␣␣	␣p␣␣	␣yb␣	␣jwvy	␣xvxchp	␣kkhlxhwp
121/6p.	␣␣␣␣	␣␣␣␣p	␣␣␣␣yb	␣␣␣␣jwvy	␣␣␣␣xvxchp	␣␣␣␣kkhlxhwp
122/6p.	␣␣␣␣	␣␣p␣	␣yb␣	jwvy␣	xvxchp␣	kkhlxhwp␣

Which of these printf statements created the outputs shown for each problem below? (x is `double x;`)

(A) `printf("␣␣␣␣%10.6f",x);` (D) `printf("␣%+13.2f",x);` (G) `printf("%+014.4f",x);`
(B) `printf("␣␣␣%0+11.0f",x);` (E) `printf("%+013f␣",x);` (H) `printf("%012.4f␣␣",x);`
(C) `printf("␣%+12.2f␣",x);` (F) `printf("%+014.0f",x);` (I) `printf("%14.0f",x);`

inputs:	8	2.66	-1.7192	-436811.995907
123/6p.	␣␣␣␣␣␣␣␣␣␣␣␣␣8	␣␣␣␣␣␣␣␣␣␣␣␣␣3	␣␣␣␣␣␣␣␣␣␣␣␣-2	␣␣␣␣␣␣␣-436812
124/6p.	0000008.0000␣␣	0000002.6600␣␣	-000001.7192␣␣	-436811.9959␣␣
125/6p.	␣␣␣␣␣␣␣␣+8.00␣	␣␣␣␣␣␣␣␣+2.66␣	␣␣␣␣␣␣␣␣-1.72␣	␣␣␣-436812.00␣
126/6p.	␣␣␣+0000000008	␣␣␣+0000000003	␣␣␣-0000000002	␣␣␣-0000436812
127/6p.	␣␣␣␣␣␣␣8.000000	␣␣␣␣␣␣␣2.660000	␣␣␣␣␣␣-1.719200	␣␣␣␣␣-436811.995907

Which of these printf statements created the outputs shown for each problem below? (x is `double x;`)

(A) `printf("␣␣%+10.0f␣␣",x);` (D) `printf("␣%+10.4f␣␣␣",x);` (G) `printf("␣%010.0f␣␣␣",x);`
(B) `printf("␣␣%012.2f",x);` (E) `printf("␣%+11.6f␣␣",x);` (H) `printf("%+012.6f␣␣",x);`
(C) `printf("␣%+013.2f",x);` (F) `printf("␣%+12.2f␣",x);` (I) `printf("%+14.6f",x);`

inputs:	4	5.49	1.2611	-184067.222395
128/6p.	␣␣␣␣+4.0000␣␣␣	␣␣␣␣+5.4900␣␣␣	␣␣␣␣+1.2611␣␣␣	␣-184067.2224␣␣␣
129/6p.	␣0000000004␣␣␣	␣0000000005␣␣␣	␣0000000001␣␣␣	␣-000184067␣␣␣
130/6p.	␣␣␣␣␣␣␣␣␣␣+4␣␣	␣␣␣␣␣␣␣␣␣␣+5␣␣	␣␣␣␣␣␣␣␣␣␣+1␣␣	␣␣␣␣␣-184067␣␣
131/6p.	␣+000000004.00	␣+000000005.49	␣+000000001.26	␣-000184067.22
132/6p.	␣␣␣␣␣␣␣␣+4.00␣	␣␣␣␣␣␣␣␣+5.49␣	␣␣␣␣␣␣␣␣+1.26␣	␣␣␣-184067.22␣

Total points 998.

Answer Key (points per line)

1 (8). B	45 (10). D (10)	89 (10). 4
2 (8). G	46 (10). D (1)	90 (10). 2
3 (8). A	47 (10). A (-8)	91 (10). 5
4 (8). C	48 (10). B (-36)	92 (10). 7
5 (8). D	49 (10). J (-5)	93 (6). E
6 (8). C	50 (10). B (1)	94 (6). F
7 (8). B	51 (10). C (-8)	95 (6). B
8 (8). E	52 (10). B (1)	96 (6). I
9 (8). H	53 (10). F (34)	97 (6). A
10 (8). G	54 (10). D (0)	98 (6). E
11 (8). D	55 (10). G (8)	99 (6). I
12 (8). B	56 (10). J (0)	100 (6). D
13 (8). G	57 (10). D (-1)	101 (6). A
14 (8). J	58 (10). A (1)	102 (6). B
15 (8). I	59 (10). J (1)	103 (6). D
16 (8). H	60 (10). C (-1)	104 (6). I
17 (5). E	61 (10). E (1)	105 (6). F
18 (5). A	62 (10). B (0)	106 (6). C
19 (5). J	63 (10). D (1)	107 (6). G
20 (5). D	64 (10). C (1)	108 (6). D
21 (5). C	65 (10). C (1)	109 (6). E
22 (5). I	66 (10). C (-4)	110 (6). I
23 (5). G	67 (10). D (1)	111 (6). G
24 (5). A	68 (10). 4	112 (6). B
25 (5). B	69 (10). 9	113 (6). C
26 (5). F	70 (10). 6	114 (6). E
27 (5). I	71 (10). 8	115 (6). H
28 (5). J	72 (10). 4	116 (6). B
29 (5). E	73 (10). 0	117 (6). D
30 (5). C	74 (10). 5	118 (6). B
31 (5). D	75 (10). 0	119 (6). C
32 (5). I	76 (10). 5	120 (6). D
33 (5). G	77 (10). 4	121 (6). A
34 (5). J	78 (10). 0	122 (6). H
35 (5). G	79 (10). 7	123 (6). I
36 (5). H	80 (10). 9	124 (6). H
37 (5). B	81 (10). 5	125 (6). C
38 (5). J	82 (10). 9	126 (6). B
39 (5). C	83 (10). 2	127 (6). A
40 (5). D	84 (10). 6	128 (6). D
41 (5). B	85 (10). 9	129 (6). G
42 (5). I	86 (10). 1	130 (6). A
43 (10). F (0)	87 (10). 9	131 (6). C
44 (10). E (11)	88 (10). 4	132 (6). F

Total points 998.