

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) fg (D) full (E) list (F) ls (G) mkdir (H) type (I) volume

1/8p. see what is running

2/8p. return from shell-out

3/8p. type out a text file

4/8p. see how full the disks are

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

(A) cat (B) dir (C) ls (D) mv (E) rd (F) ren (G) rename (H) w (I) who

5/8p. see who is logged in

6/8p. show the contents of the directory

7/8p. delete a directory

8/8p. rename a file

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

(A) cap (B) emacs (C) gcc (D) md (E) mkdir (F) pass (G) passwd (H) pwd (I) quit

9/8p. log out

10/8p. change your password

11/8p. compile a program

12/8p. create a directory

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

(A) cd (B) cwd (C) del (D) delete (E) du (F) emacs (G) pwd (H) rm (I) space

13/8p. delete a file

14/8p. see how much disk space you are using

15/8p. tell what directory you are in

16/8p. edit a file

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

- (A) C-b (C) C-p (E) C-x C-f (G) C-x C-s (I) M-x rmail  
(B) C-h t (D) C-t (F) C-x C-l (H) ESC-x rmail

- 17/5p. run mail  
18/5p. load a new file  
19/5p. show the tutorial  
20/5p. save current buffer, same filename  
21/5p. go to previous character (left 1)

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

- (A) C-c (C) C-f (E) C-n (G) C-s (I) C-y  
(B) C-d (D) C-k (F) C-p (H) C-x C-w

- 22/5p. save-as current buffer, specify filename  
23/5p. start incremental search  
24/5p. cut to end of line  
25/5p. go to next line (down 1)  
26/5p. paste back what was deleted

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

- (A) C- (C) C-l (E) C-r (G) C-x n (I) M-x rmail  
(B) C-k (D) C-p (F) C-u (H) C-x o

- 27/5p. hold down CTRL  
28/5p. go to previous line (up 1)  
29/5p. jump to next window  
30/5p. center and redraw screen

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

- (A) C-a (C) C-delete (E) C-s (G) C-x 1 (I) C-z  
(B) C-d (D) C-l (F) C-x 0 (H) C-x 2

- 31/5p. open a second window  
32/5p. shell out  
33/5p. close all but current window  
34/5p. delete current character

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

- (A) C-\_ (C) C-e (E) C-n (G) C-x (I) C-z  
(B) C-c (D) C-g (F) C-u (H) C-x C-q

- 35/5p. go to end of line  
36/5p. exit/quit  
37/5p. undo last change  
38/5p. cancel the command in progress

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

- (A) C-a (C) C-g (E) C-r (G) C-x i (I) M-  
(B) C-f (D) C-n (F) C-x C-i (H) ESC-

- 39/5p. go to next character (right 1)  
40/5p. insert a file  
41/5p. go to start of line  
42/5p. press ESC first

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

43/10p.	$9-0>=2==0-7$	(A) -61	(B) -6	(C) 0	(D) 1	(E) 8	(F) 9	(G) 15	(H) 69
44/10p.	$3-2/1*3-2$	(A) -2	(B) -1	(C) 1	(D) 4	(E) 5	(F) 29	(G) 41	(H) 73
45/10p.	$9/8/3-0+7$	(A) -7	(B) -5	(C) -2	(D) -1	(E) 0	(F) 1	(G) 7	(H) 11
46/10p.	$9+3<9  0\%7$	(A) -93	(B) -87	(C) 1	(D) 2	(E) 3	(F) 10	(G) 15	(H) 42
47/10p.	$4>=6\&\&9-7-1$	(A) -21	(B) -8	(C) -7	(D) -6	(E) -1	(F) 0	(G) 1	(H) 99
48/10p.	$9\%9-1/5-5$	(A) -72	(B) -6	(C) -3	(D) 1	(E) 5	(F) 9	(G) 34	(H) 40
49/10p.	$7+2\&\&7>5\%4$	(A) -77	(B) -26	(C) -24	(D) 0	(E) 1	(F) 8	(G) 12	(H) 29
50/10p.	$3-6/3*1+5$	(A) -60	(B) -6	(C) -4	(D) -1	(E) 3	(F) 4	(G) 28	(H) 57
51/10p.	$1\%6\%3-7-4$	(A) -77	(B) -67	(C) -10	(D) -7	(E) -5	(F) -2	(G) -1	(H) 42
52/10p.	$6-7*8-3-7$	(A) -78	(B) -54	(C) -40	(D) -36	(E) -18	(F) -12	(G) -4	(H) 20
53/10p.	$7+4  2!=5*4$	(A) -66	(B) -37	(C) -36	(D) 1	(E) 8	(F) 11	(G) 28	(H) 32
54/10p.	$7/0!=9>7-1$	(A) -94	(B) -76	(C) -40	(D) -7	(E) -1	(F) 6	(G) 13	(H) 21
55/10p.	$9==2  1-2-7$	(A) -89	(B) -8	(C) -7	(D) -6	(E) 0	(F) 5	(G) 6	(H) 66
56/10p.	$6*4\%6*3\%5$	(A) -63	(B) 0	(C) 1	(D) 4	(E) 6	(F) 12	(G) 24	(H) 37
57/10p.	$9*2  8\&\&0+4$	(A) -81	(B) 1	(C) 5	(D) 9	(E) 13	(F) 36	(G) 45	(H) 70
58/10p.	$8/6/9+3+8$	(A) -47	(B) -20	(C) -7	(D) 0	(E) 8	(F) 10	(G) 11	(H) 86
59/10p.	$0/8-7/6-6$	(A) -67	(B) -36	(C) -8	(D) -7	(E) -6	(F) -5	(G) 5	(H) 74
60/10p.	$2-2\%9*0+5$	(A) -42	(B) -41	(C) -3	(D) 0	(E) 5	(F) 7	(G) 11	(H) 27
61/10p.	$8/4+0<=2==5$	(A) -23	(B) 0	(C) 1	(D) 2	(E) 3	(F) 8	(G) 16	(H) 48
62/10p.	$4\%6+5*8+2$	(A) -32	(B) 4	(C) 6	(D) 40	(E) 46	(F) 54	(G) 64	(H) 74
63/10p.	$9+2\%9-4\%5$	(A) 1	(B) 2	(C) 7	(D) 11	(E) 12	(F) 53	(G) 66	(H) 69
64/10p.	$5!=9!=7-6+4$	(A) -78	(B) -9	(C) -1	(D) 0	(E) 1	(F) 4	(G) 5	(H) 56
65/10p.	$2+4*3<=7>=0$	(A) -95	(B) -65	(C) 0	(D) 1	(E) 2	(F) 6	(G) 10	(H) 99
66/10p.	$3*3>=4  2-5$	(A) -74	(B) -12	(C) -6	(D) -4	(E) 1	(F) 3	(G) 49	(H) 97
67/10p.	$2-7*7-5-4$	(A) -48	(B) -46	(C) -40	(D) -36	(E) -30	(F) -16	(G) -8	(H) 16

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

- 68/10p. `int d; for( d=-8; d<=-4; d++ ) body;`
- 69/10p. `int n=2; while( n++ < 8 ) body;`
- 70/10p. `int u=3; while( --u >= 3 ) body;`
- 71/10p. `int t; for( t=-8; t!=-15; t-- ) body;`
- 72/10p. `int p=8; while( ++p <= 9 ) body;`
- 73/10p. `int m=10; while( m-- >= 10 ) body;`
- 74/10p. `int v=-10; do body; while( v-- != -15 );`
- 75/10p. `int k=-7; do body; while( k++ < -3 );`
- 76/10p. `int q=-10; while( --q > -17 ) body;`
- 77/10p. `int d=8; do body; while( --d > 1 );`
- 78/10p. `int u=6; do body; while( u++ != 10 );`
- 79/10p. `int x; for( x=3; x<10; x++ ) body;`
- 80/10p. `int b=-5; while( b++ < -3 ) body;`
- 81/10p. `int f; for( f=-1; f>-6; f++ ) body;`
- 82/10p. `int p; for( p=2; p!=8; --p ) body;`
- 83/10p. `int s; for( s=-4; s>=-6; s-- ) body;`
- 84/10p. `int h=-6; do body; while( h++ < -3 );`
- 85/10p. `int h=4; do body; while( h-- > 1 );`
- 86/10p. `int n=4; while( --n != -3 ) body;`
- 87/10p. `int z=-7; do body; while( z++ != -6 );`
- 88/10p. `int d=-9; do body; while( d++ < -6 );`
- 89/10p. `int a=3; do body; while( ++a >= -1 );`
- 90/10p. `int n; for( n=-8; n!=-11; ++n ) body;`
- 91/10p. `int u; for( u=-6; u>-11; u-- ) body;`
- 92/10p. `int e=-10; do body; while( ++e < -2 );`

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("␣␣␣␣␣%+d␣␣␣",x);` (D) `printf("␣␣␣␣%05d",x);` (G) `printf("%0+3d␣␣␣␣␣",x);`  
 (B) `printf("␣␣␣␣␣%02d␣␣",x);` (E) `printf("␣␣␣␣%+06d",x);` (H) `printf("%07d␣␣",x);`  
 (C) `printf("␣␣␣␣%␣5d",x);` (F) `printf("␣%␣-8d",x);` (I) `printf("%08d␣",x);`

inputs:	<u>7</u>	<u>-5</u>	<u>1567605380</u>	<u>-1361547848</u>
93/6p.	␣␣␣␣␣+7␣␣␣	␣␣␣␣␣-5␣␣␣	␣␣␣␣␣+1567605380␣␣␣	␣␣␣␣␣-1361547848␣␣␣
94/6p.	␣␣␣␣00007	␣␣␣␣-0005	␣␣␣␣1567605380	␣␣␣␣-1361547848
95/6p.	␣␣␣␣␣07␣␣	␣␣␣␣␣-5␣␣	␣␣␣␣␣1567605380␣␣	␣␣␣␣␣-1361547848␣␣
96/6p.	␣7␣␣␣␣␣␣␣␣	␣-5␣␣␣␣␣␣␣	␣1567605380	␣-1361547848
97/6p.	00000007␣	-00000005␣	1567605380␣	-1361547848␣

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

- (A) `printf("␣␣␣␣␣%+d␣␣␣",x);` (D) `printf("␣␣%␣4d␣␣␣␣",x);` (G) `printf("␣␣%08d",x);`  
 (B) `printf("␣␣␣␣␣%d␣␣␣␣",x);` (E) `printf("␣␣%05d␣␣␣",x);` (H) `printf("␣%␣09d",x);`  
 (C) `printf("␣␣␣␣%␣-4d␣␣␣",x);` (F) `printf("␣␣%07d␣",x);` (I) `printf("%␣9d␣",x);`

inputs:	<u>6</u>	<u>-6</u>	<u>1961238811</u>	<u>-1636371563</u>
98/6p.	␣␣␣␣␣+6␣␣␣	␣␣␣␣␣-6␣␣␣	␣␣␣␣␣+1961238811␣␣␣	␣␣␣␣␣-1636371563␣␣␣
99/6p.	␣␣␣␣␣␣␣6␣	␣␣␣␣␣␣␣-6␣	␣1961238811␣	-1636371563␣
100/6p.	␣␣␣6␣␣␣␣␣␣	␣␣␣-6␣␣␣␣␣␣	␣␣␣1961238811␣␣␣	␣␣␣-1636371563␣␣␣
101/6p.	␣␣00000006	␣␣-00000006	␣␣1961238811	␣␣-1636371563
102/6p.	␣␣00000006	␣␣-00000006	␣␣1961238811	␣␣-1636371563

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

- (A) `printf("␣␣␣␣%+-5d",x);` (D) `printf("␣%␣d␣␣␣␣␣␣␣",x);` (G) `printf("%+9d",x);`  
 (B) `printf("␣␣␣␣%␣-4d␣␣",x);` (E) `printf("␣%␣+06d␣␣",x);` (H) `printf("%␣-8d␣",x);`  
 (C) `printf("␣␣%0␣6d␣",x);` (F) `printf("%␣08d␣",x);` (I) `printf("%09d",x);`

inputs:	<u>9</u>	<u>-1</u>	<u>1533800138</u>	<u>-1389554688</u>
103/6p.	␣␣␣00009␣	␣␣-00001␣	␣␣␣1533800138␣	␣␣-1389554688␣
104/6p.	␣9␣␣␣␣␣␣␣	␣-1␣␣␣␣␣␣␣	␣1533800138␣	-1389554688␣
105/6p.	␣0000009␣	-0000001␣	␣1533800138␣	-1389554688␣
106/6p.	␣␣␣+9␣␣␣	␣␣␣-1␣␣␣	␣␣␣+1533800138	␣␣␣-1389554688
107/6p.	␣␣9␣␣␣␣␣␣	␣-1␣␣␣␣␣␣	␣␣1533800138␣␣␣␣␣	␣-1389554688␣␣␣␣␣

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

- (A) `printf("␣␣%+d␣␣␣",x);` (D) `printf("␣%␣+05d␣",x);` (G) `printf("␣%5d␣",x);`  
 (B) `printf("␣%␣-5d␣",x);` (E) `printf("␣%0+4d␣",x);` (H) `printf("%+03d␣␣␣",x);`  
 (C) `printf("␣%␣6d",x);` (F) `printf("␣%2d␣␣␣",x);` (I) `printf("%0␣7d",x);`

inputs:	<u>7</u>	<u>-1</u>	<u>1335216022</u>	<u>-1475577925</u>
108/6p.	␣␣7␣␣␣␣	␣-1␣␣␣␣	␣␣1335216022␣	␣-1475577925␣
109/6p.	␣␣+7␣␣␣␣	␣␣-1␣␣␣␣	␣␣+1335216022␣␣␣	␣␣-1475577925␣␣␣
110/6p.	+07␣␣␣␣	-01␣␣␣␣	+1335216022␣␣␣	-1475577925␣␣␣
111/6p.	␣␣7␣␣␣␣	␣-1␣␣␣␣	␣1335216022␣␣␣	␣-1475577925␣␣␣
112/6p.	␣+0007␣	␣-0001␣	␣+1335216022␣	␣-1475577925␣

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

- (A) printf("\_\_\_\_\_%1s",x); (D) printf("\_% -4s",x); (G) printf("%-7s",x);  
 (B) printf("\_\_\_\_%-3s",x); (E) printf("\_% -5s",x); (H) printf("%6s",x);  
 (C) printf("\_\_\_\_-2s",x); (F) printf("\_%s",x); (I) printf("%7s",x);

inputs:	“”	“j”	“jk”	“jjqd”	“bxcwbh”	“wdxvbxcp”
113/6p.	_____	_____j	_____jk	_____jjqd	_____bxcwbh	_____wdxvbxcp
114/6p.	_____	____j_____	____jk_____	____jjqd_____	____bxcwbh_____	____wdxvbxcp_____
115/6p.	_____	_____j	_____jk	_____jjqd	_____bxcwbh	_____wdxvbxcp
116/6p.	_____	____j_____	____jk_____	____jjqd_____	____bxcwbh_____	____wdxvbxcp_____
117/6p.	_____	____j_____	____jk_____	____jjqd_____	_____bxcwbh	_____wdxvbxcp

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

- (A) printf("\_\_\_\_%1s",x); (D) printf("\_%1s",x); (G) printf("\_% -4s",x);  
 (B) printf("\_\_\_\_%-2s",x); (E) printf("\_%3s",x); (H) printf("%-5s",x);  
 (C) printf("\_\_\_\_%s",x); (F) printf("\_% -3s",x); (I) printf("%5s",x);

inputs:	“”	“p”	“xj”	“xxwc”	“zxxgbj”	“hcflwypp”
118/6p.	_____	_____p	_____xj	_____xxwc	_____zxxgbj	_____hcflwypp
119/6p.	_____	____p_____	____xj_____	____xxwc_____	____zxxgbj_____	____hcflwypp_____
120/6p.	_____	_____p	_____xj	_____xxwc	_____zxxgbj	_____hcflwypp
121/6p.	_____	_____p	_____xj	_____xxwc	_____zxxgbj	_____hcflwypp
122/6p.	_____	____p_____	____xj_____	____xxwc_____	____zxxgbj_____	____hcflwypp_____

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

- (A) printf("\_\_\_\_%+10.6f",x); (D) printf("\_% +12.0f",x); (G) printf("\_%012.4f",x);  
 (B) printf("\_\_\_\_%+010f",x); (E) printf("\_%0+11.0f",x); (H) printf("\_%013.4f",x);  
 (C) printf("\_\_\_\_%+11.0f",x); (F) printf("\_% +11.6f",x); (I) printf("%+14.2f",x);

inputs:	<u>8</u>	<u>2.13</u>	<u>4.9082</u>	<u>-207027.856433</u>
123/6p.	_____+8	_____+2	_____+5	_____ -207028
124/6p.	____+8.000000	____+2.130000	____+4.908200	____-207027.856433
125/6p.	____+0000000008	____+0000000002	____+0000000005	____-0000207028
126/6p.	____00000008.0000	____00000002.1300	____00000004.9082	____-0207027.8564
127/6p.	_____+8	_____+2	_____+5	_____ -207028

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

- (A) printf("\_\_\_\_%010.6f",x); (D) printf("\_%013.6f",x); (G) printf("%014.0f",x);  
 (B) printf("\_\_\_\_%+10.2f",x); (E) printf("\_%13.6f",x); (H) printf("%014f",x);  
 (C) printf("\_\_\_\_%12.0f",x); (F) printf("%+014.2f",x); (I) printf("%14.4f",x);

inputs:	<u>1</u>	<u>2.34</u>	<u>3.0730</u>	<u>-36736.213209</u>
128/6p.	_____1	_____2	_____3	_____ -36736
129/6p.	0000001.000000	0000002.340000	0000003.073000	-036736.213209
130/6p.	00000000000001	00000000000002	00000000000003	-0000000036736
131/6p.	_____+1.00	_____+2.34	_____+3.07	_____ -36736.21
132/6p.	____000001.000000	____000002.340000	____000003.073000	____-36736.213209

Total points 998.

## Answer Key (points per line)

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

Total points 998.