Comprehensive Final Exam, Testing Center portion

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.**

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

1/1p.	6+5-7/8/9	(A) -92	(B) -48	(C) -18	(D) -16	(E) -11	(F) 0	(G) 1	(H) 6
2/1p.	5*3+6==2<2	(A) -68	(B) 0	(C) 1	(D) 5	(E) 20	(F) 25	(G) 52	(H) 73
3/1p.	4%6*9/3-6	(A) -80	(B) -70	(C) -12	(D) -5	(E) -2	(F) 6	(G) 15	(H) 34
4/1p.	1/1!=3||6-9	(A) -66	(B) -24	(C) -8	(D) -1	(E) 1	(F) 7	(G) 30	(H) 58
5/1p.	5*3*2+6%5	(A) 10	(B) 14	(C) 20	(D) 31	(E) 35	(F) 36	(G) 45	(H) 51
6/1p.	4*3-5/9%2	(A) -41	(B) -33	(C) -8	(D) 0	(E) 4	(F) 7	(G) 12	(H) 25
7/1p.	6-7+1*8-3	(A) -55	(B) -34	(C) -19	(D) -12	(E) -10	(F) -6	(G) -3	(H) 4
8/1p.	9*7<0||7*8	(A) -87	(B) -28	(C) -23	(D) 0	(E) 1	(F) 8	(G) 72	(H) 75
9/1p.	1+3*3%5%7	(A) -43	(B) -18	(C) 0	(D) 2	(E) 3	(F) 5	(G) 10	(H) 49
10/1p.	7+0*0%1-8	(A) -56	(B) -50	(C) -16	(D) -1	(E) 7	(F) 18	(G) 26	(H) 35
11/1p.	9+6<=9>4-8	(A) -91	(B) -57	(C) -27	(D) -7	(E) 0	(F) 9	(G) 10	(H) 12
12/1p.	8+1%7-7+2	(A) -69	(B) -41	(C) -7	(D) -1	(E) 0	(F) 1	(G) 7	(H) 9
13/1p.	0-4/2*4+9	(A) -35	(B) -26	(C) -19	(D) -17	(E) -9	(F) -1	(G) 0	(H) 9
14/1p.	6<=8>=6-5-6	(A) -65	(B) -57	(C) -7	(D) -6	(E) -5	(F) 0	(G) 72	(H) 90
15/1p.	9%6-4/5%3	(A) -87	(B) -58	(C) -6	(D) -1	(E) 0	(F) 1	(G) 2	(H) 85
16/1p.	0-8-5+6%4	(A) -56	(B) -36	(C) -33	(D) -15	(E) -11	(F) -5	(G) 3	(H) 52
17/1p.	0-8+6%3%5	(A) -8	(B) -3	(C) -2	(D) 2	(E) 3	(F) 5	(G) 10	(H) 74
18/1p.	1&&2&&2-2+3	(A) -37	(B) -32	(C) -4	(D) -3	(E) 3	(F) 4	(G) 31	(H) 88
19/1p.	7+3*5/8-1	(A) -1	(B) 0	(C) 1	(D) 3	(E) 4	(F) 5	(G) 7	(H) 9
20/1p.	2*9%1-9-4	(A) -29	(B) -26	(C) -22	(D) -18	(E) -13	(F) -6	(G) -5	(H) -2
21/1p.	8-0%7-4%9	(A) -99	(B) -3	(C) 2	(D) 6	(E) 8	(F) 12	(G) 53	(H) 65
22/1p.	8/2<=3!=0*7	(A) -56	(B) -13	(C) -11	(D) -9	(E) 0	(F) 1	(G) 8	(H) 56
23/1p.	5/9-1-4-4	(A) -43	(B) -8	(C) -4	(D) -3	(E) -1	(F) 7	(G) 45	(H) 71
24/1p.	9/1-0/1+6	(A) -98	(B) 1	(C) 3	(D) 9	(E) 15	(F) 44	(G) 47	(H) 92
25/1p.	6/8*5-6%8	(A) -74	(B) -54	(C) -1	(D) 0	(E) 2	(F) 3	(G) 7	(H) 23
26/1p.	5+9&&1<=9-9	(A) -71	(B) -62	(C) -30	(D) -8	(E) -3	(F) 0	(G) 5	(H) 6
27/1p.	4-5/4%3+8	(A) -9	(B) -5	(C) -1	(D) 3	(E) 7	(F) 8	(G) 10	(H) 11
28/1p.	2+2*4%5-2	(A) -13	(B) -2	(C) -1	(D) 1	(E) 3	(F) 6	(G) 8	(H) 14
29/1p.	3-4*0+8%3	(A) -95	(B) -26	(C) -2	(D) 2	(E) 5	(F) 15	(G) 20	(H) 68
30/1p.	9%1<=7||5-8	(A) -11	(B) -8	(C) -7	(D) -5	(E) 0	(F) 4	(G) 28	(H) 82
31/1p.	7-7*4-4/2	(A) -23	(B) -19	(C) -9	(D) -7	(E) -5	(F) -2	(G) 0	(H) 7
32/1p.	8*4>2!=6*7	(A) -83	(B) -34	(C) 0	(D) 1	(E) 8	(F) 47	(G) 56	(H) 62
33/1p.	0*5+1-3%6	(A) -57	(B) -34	(C) -2	(D) 0	(E) 3	(F) 4	(G) 16	(H) 54

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

```
34/1p.   int w; for( w=-1; w>=-4; w-- ) body;

35/1p.   int g=-8; do body; while( g++ <= -2 );

36/1p.   int c=1; while( c-- != -6 ) body;

37/1p.   int n=-10; do body; while( n++ != -10 );

38/1p.   int g=-6; do body; while( g++ != -1 );

39/1p.   int f; for( f=-1; f>=-2; f-- ) body;

40/1p.   int g; for( g=4; g!=-3; g-- ) body;

41/1p.   int g=0; do body; while( g-- >= -3 );

42/1p.   int d=2; do body; while( d++ != -3 );

43/1p.   int j=3; do body; while( j-- >= -2 );

44/1p.   int f=-2; while( f++ <= 4 ) body;

45/1p.   int c=-9; do body; while( c-- < -2 );

46/1p.   int h=3; do body; while( h++ < 5 );

47/1p.   int j=-8; do body; while( ++j <= -8 );

48/1p.   int i; for( i=5; i!=1; i-- ) body;

49/1p.   int w; for( w=-8; w<=-8; w++ ) body;

50/1p.   int w=-8; while( w++ != -5 ) body;

51/1p.   int t=-2; do body; while( ++t <= 5 );

52/1p.   int q=-4; do body; while( --q > -6 );

53/1p.   int t=-9; while( t-- != -13 ) body;

54/1p.   int a=-3; do body; while( a-- >= -7 );

55/1p.   int j=9; while( --j != 4 ) body;

56/1p.   int q; for( q=0; q<6; q++ ) body;

57/1p.   int y=-2; do body; while( ++y < 2 );

58/1p.   int j=2; do body; while( --j < 9 );

59/1p.   int r=9; while( r-- > 2 ) body;

60/1p.   int v=-6; while( v-- >= -12 ) body;

61/1p.   int i=4; while( --i != -1 ) body;

62/1p.   int e; for( e=10; e>=7; --e ) body;

63/1p.   int i; for( i=-6; i<0; i++ ) body;

64/1p.   int n; for( n=-9; n>-14; ++n ) body;

65/1p.   int c=-3; while( c-- >= -6 ) body;

66/1p.   int i; for( i=2; i>=2; i-- ) body;

67/1p.   int c=-4; while( --c >= -6 ) body;

68/1p.   int x; for( x=-10; x<=-6; ++x ) 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("␣␣␣␣␣%d␣␣␣",x);   (D) printf("␣␣␣%0␣5d␣",x);   (G) printf("␣%06d␣␣",x);
(B) printf("␣␣␣␣%04d␣",x);   (E) printf("␣␣%-␣5d␣␣",x);   (H) printf("%-9d",x);
(C) printf("␣␣␣%+-5d␣",x);   (F) printf("␣␣%2d␣␣␣␣␣",x);   (I) printf("%0+9d",x);

inputs:	4	-2	1544314416	-1647867604
69/1p.	␣␣␣+4␣␣␣␣	␣␣␣-2␣␣␣␣	␣␣␣+1544314416␣	␣␣␣-1647867604␣
70/1p.	␣␣␣4␣␣␣␣␣	␣␣-2␣␣␣␣␣	␣␣1544314416␣␣␣␣␣	␣␣-1647867604␣␣␣␣␣
71/1p.	␣␣␣4␣␣␣␣␣	␣␣-2␣␣␣␣␣	␣␣␣1544314416␣␣	␣␣-1647867604␣␣
72/1p.	␣␣␣␣0004␣	␣␣␣␣-002␣	␣␣␣␣␣1544314416␣	␣␣␣␣-1647867604␣

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

(A) printf("␣␣␣␣%d␣␣␣␣␣",x);   (D) printf("␣␣%-␣6d␣␣",x);   (G) printf("%␣8d␣␣",x);
(B) printf("␣␣␣%␣3d␣␣␣␣",x);   (E) printf("␣␣%2d␣␣␣␣␣␣",x);   (H) printf("%0+10d",x);
(C) printf("␣␣%+-3d␣␣␣␣␣",x);   (F) printf("␣%-+7d␣␣",x);   (I) printf("%10d",x);

inputs:	8	-4	1462218375	-1243404756
73/1p.	␣␣␣␣␣8␣␣␣␣␣	␣␣␣␣-4␣␣␣␣␣	␣␣␣␣␣1462218375␣␣␣␣␣	␣␣␣␣-1243404756␣␣␣␣␣
74/1p.	␣␣␣8␣␣␣␣␣␣	␣␣-4␣␣␣␣␣␣	␣␣1462218375␣␣␣␣␣␣	␣␣-1243404756␣␣␣␣␣␣
75/1p.	␣␣␣␣␣␣␣8␣␣	␣␣␣␣␣␣-4␣␣	␣1462218375␣␣	-1243404756␣␣
76/1p.	␣␣␣8␣␣␣␣␣␣	␣␣-4␣␣␣␣␣␣	␣␣␣1462218375␣␣	␣␣-1243404756␣␣

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

(A) printf("␣␣%␣05d␣␣",x);   (D) printf("␣%␣4d␣␣␣",x);   (G) printf("%+-7d␣",x);
(B) printf("␣␣%+-6d",x);   (E) printf("␣%+7d",x);   (H) printf("%+05d␣␣␣",x);
(C) printf("␣␣%-4d␣␣",x);   (F) printf("␣%07d",x);   (I) printf("%-8d",x);

inputs:	3	-3	1980796415	-2052201267
77/1p.	␣␣␣0003␣	␣␣-0003␣	␣␣␣1980796415␣	␣␣-2052201267␣
78/1p.	␣␣+3␣␣␣␣	␣␣-3␣␣␣␣	␣␣+1980796415	␣␣-2052201267
79/1p.	␣␣␣␣␣␣+3	␣␣␣␣␣␣-3	␣+1980796415	␣-2052201267
80/1p.	␣␣␣␣3␣␣␣	␣␣␣-3␣␣␣	␣␣1980796415␣␣␣	␣-2052201267␣␣␣

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

(A) printf("␣␣␣␣%-2d␣␣␣␣",x);   (D) printf("␣%␣-8d␣",x);   (G) printf("␣%-8d␣",x);
(B) printf("␣␣␣␣%-5d␣",x);   (E) printf("␣%␣-9d",x);   (H) printf("%+6d␣␣␣␣␣",x);
(C) printf("␣␣%␣04d␣␣␣␣",x);   (F) printf("␣%+-4d␣␣␣␣␣",x);   (I) printf("%010d",x);

inputs:	8	-2	1690623330	-1882256042
81/1p.	␣␣␣␣8␣␣␣␣␣	␣␣␣␣-2␣␣␣␣	␣␣␣␣1690623330␣	␣␣␣␣-1882256042␣
82/1p.	␣␣8␣␣␣␣␣␣␣	␣-2␣␣␣␣␣␣␣	␣␣1690623330	␣-1882256042
83/1p.	␣␣␣008␣␣␣␣	␣␣-002␣␣␣␣	␣␣␣1690623330␣␣␣␣	␣␣-1882256042␣␣␣␣
84/1p.	␣␣␣␣+8␣␣␣␣	␣␣␣␣-2␣␣␣␣	+1690623330␣␣␣␣	-1882256042␣␣␣␣

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

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

inputs:	""	"q"	"hp"	"kbzq"	"gwwwbh"	"vwxhzbfw"
85/1p.	␣␣␣␣␣␣␣	␣␣␣␣␣q␣	␣␣␣␣hp␣	␣␣␣␣kbzq␣	␣␣␣␣gwwwbh␣	␣␣␣␣vwxhzbfw␣
86/1p.	␣␣␣␣␣␣␣	␣␣␣␣␣␣q	␣␣␣␣␣hp	␣␣␣kbzq	␣gwwwbh	␣vwxhzbfw
87/1p.	␣␣␣␣␣␣␣	␣␣␣␣q␣␣	␣␣␣hp␣␣	␣kbzq␣␣	␣gwwwbh␣␣	␣vwxhzbfw␣␣
88/1p.	␣␣␣␣␣␣␣	␣␣␣␣␣␣q	␣␣␣␣␣hp	␣␣␣kbzq	␣gwwwbh	vwxhzbfw

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

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

inputs:	""	"p"	"xw"	"jpfv"	"hzdhcd"	"hlwkdpbl"
89/1p.	␣␣␣␣␣␣␣	␣␣␣␣p␣␣	␣␣␣␣xw␣␣	␣␣␣␣jpfv␣␣	␣␣␣␣hzdhcd␣␣	␣␣␣␣hlwkdpbl␣␣
90/1p.	␣␣␣␣␣␣␣	␣␣p␣␣␣␣␣	␣␣xw␣␣␣␣␣	␣␣jpfv␣␣␣␣␣	␣␣hzdhcd␣␣␣␣␣	␣␣hlwkdpbl␣␣␣␣␣
91/1p.	␣␣␣␣␣␣␣	␣␣␣␣␣␣p	␣␣␣␣␣xw	␣␣␣jpfv	␣hzdhcd	hlwkdpbl
92/1p.	␣␣␣␣␣␣␣	␣␣␣␣␣p␣	␣␣␣␣xw␣	␣␣jpfv␣	hzdhcd␣	hlwkdpbl␣

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

(A) `printf("␣␣␣%11.2f",x);`   (D) `printf("␣%+12.2f␣",x);`   (G) `printf("%+14.0f",x);`
(B) `printf("␣␣%+10f␣␣",x);`   (E) `printf("␣%12.6f␣",x);`   (H) `printf("%+14.2f",x);`
(C) `printf("␣␣%+11.6f␣",x);`   (F) `printf("%+12f␣␣",x);`   (I) `printf("%013.4f␣",x);`

inputs:	2	5.25	-3.0566	-45587.876250
93/1p.	␣␣␣+2.000000␣␣	␣␣␣+5.250000␣␣	␣␣␣-3.056600␣␣	-45587.876250␣␣
94/1p.	␣␣␣+2.000000␣␣	␣␣␣+5.250000␣␣	␣␣␣-3.056600␣␣	␣␣-45587.876250␣␣
95/1p.	␣␣␣␣␣2.000000␣	␣␣␣␣␣5.250000␣	␣␣␣␣␣-3.056600␣	␣-45587.876250␣
96/1p.	00000002.0000␣	00000005.2500␣	-0000003.0566␣	-0045587.8763␣

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

(A) `printf("␣␣␣␣%+10.0f",x);`   (D) `printf("␣␣%10.6f␣␣",x);`   (G) `printf("␣%0+13.4f",x);`
(B) `printf("␣␣%+12.6f",x);`   (E) `printf("␣%+11f␣␣",x);`   (H) `printf("%+14.2f",x);`
(C) `printf("␣␣%0+10.4f␣␣",x);`   (F) `printf("␣%+13.4f",x);`   (I) `printf("%014.0f",x);`

inputs:	8	8.38	-2.6531	-124246.782666
97/1p.	␣␣␣␣␣␣␣␣␣␣␣+8	␣␣␣␣␣␣␣␣␣␣␣+8	␣␣␣␣␣␣␣␣␣␣␣-3	␣␣␣␣␣␣␣-124247
98/1p.	␣␣+0008.0000␣␣	␣␣+0008.3800␣␣	␣␣-0002.6531␣␣	␣␣-124246.7827␣␣
99/1p.	␣␣␣␣␣␣␣+8.0000	␣␣␣␣␣␣␣+8.3800	␣␣␣␣␣␣␣-2.6531	␣␣-124246.7827
100/1p.	␣␣␣␣␣+8.000000	␣␣␣␣␣+8.380000	␣␣␣␣␣-2.653100	␣␣-124246.782666

Total points 100.

Answer Key (points per line)

1 (1).	J (11)	35 (1).	8	69 (1).	C
2 (1).	B (0)	36 (1).	7	70 (1).	F
3 (1).	F (6)	37 (1).	1	71 (1).	E
4 (1).	E (1)	38 (1).	6	72 (1).	B
5 (1).	D (31)	39 (1).	2	73 (1).	A
6 (1).	G (12)	40 (1).	7	74 (1).	E
7 (1).	H (4)	41 (1).	5	75 (1).	G
8 (1).	E (1)	42 (1).	9	76 (1).	D
9 (1).	F (5)	43 (1).	7	77 (1).	A
10 (1).	D (-1)	44 (1).	7	78 (1).	B
11 (1).	J (1)	45 (1).	9	79 (1).	E
12 (1).	J (4)	46 (1).	3	80 (1).	D
13 (1).	J (1)	47 (1).	1	81 (1).	B
14 (1).	J (1)	48 (1).	4	82 (1).	E
15 (1).	J (3)	49 (1).	1	83 (1).	C
16 (1).	E (-11)	50 (1).	3	84 (1).	H
17 (1).	A (-8)	51 (1).	8	85 (1).	B
18 (1).	J (1)	52 (1).	2	86 (1).	H
19 (1).	G (7)	53 (1).	4	87 (1).	G
20 (1).	E (-13)	54 (1).	6	88 (1).	I
21 (1).	J (4)	55 (1).	4	89 (1).	A
22 (1).	E (0)	56 (1).	6	90 (1).	D
23 (1).	J (-9)	57 (1).	4	91 (1).	I
24 (1).	E (15)	58 (1).	9	92 (1).	H
25 (1).	J (-6)	59 (1).	7	93 (1).	F
26 (1).	F (0)	60 (1).	7	94 (1).	B
27 (1).	H (11)	61 (1).	4	95 (1).	E
28 (1).	E (3)	62 (1).	4	96 (1).	I
29 (1).	E (5)	63 (1).	6	97 (1).	A
30 (1).	J (1)	64 (1).	9	98 (1).	C
31 (1).	A (-23)	65 (1).	4	99 (1).	F
32 (1).	D (1)	66 (1).	1	100 (1).	B
33 (1).	C (-2)	67 (1).	2		
34 (1).	4	68 (1).	5		

Total points 100.