Q1

(a) Values after DCT transformation are

1016.249	215.439	−6.492	−27.541	29.72	−21.35	−10.587
35.579	52.413	−93.492	−7.103	33.93	−18.89	−11.18 10.5
−45.419	−49.110	14.114	53.771	10.99	−2.484	−6.06 8.3
8.431	38.078	47.839	15.488	−17.907	−10.77	4.18 3.6
−0.812	−5.964	−1.226	−4.690	0.811	6.606	4.83 0.2
−4.958	−1.170	3.332	8.110	6.985	6.107	−0.17 1.1
−2.385	−2.136	0.886	−1.465	0	−3.38	−0.9 −1.2
−1.407	−3.372	−0.631	−1.804	−4.277	−1.22	2.32 1.6

Quantization using K1 table is

64	26	−1	−2	1	0	0
11	4	−7	0	1	0	0
−3	−4	1	2	0	0	0
1	2	2	1	0	0	0
0	0	0	0	0	0	0
0	0	0	0	0	0	0
0	0	0	0	0	0	0
0	0	0	0	0	0	0

(4) 20 11 -3 4 -1 -2 -7 -4 | 0 2 1 0 1 -1 1 2 2

0, 0, 0, 0, 0, 1, 0, 0, ...

For AC

(c)

<Runlength, size>	<Amplitude>		
<0, 5>	<20>	11010	10100
<0, 4>	<11>	1011	1011
<0, 2>	<-3>	01	00
<0, 3>	<4>	100	100
<0, 1>	<-1>	00	0
<0, 2>	<-2>	01	01
<0, 3>	<-7>	100	000 4,
<0, 3>	<-4>	100	01)
<0, 1>	<1>	00	1
<1, 2>	<2>	11011	10
<0, 1>	<1>	00	1
<1, 1>	<1>	1100	1
<0, 1>	<-1>	00	0
<0, 1>	<1>	00	1
<0, 2>	<2>	01	10
<0, 2>	<2>	01	10
<5, 1>	<1>	1111010	10
EOB		1010	

~~For DC~~

~~<size> <Amplitude> <7> <64>~~

(d) 11010 10100 1011 1011 01 00 100100
00 0 01 01 100 000 100 011 00 1
11011 10 00 1 1100 1 00 0 001 01 10
01 10 111010 1 1010

(e) Compression Ratio = $\frac{8 \times 8 \times 8}{91}$

$= \underline{\underline{5.62}}$