Homework 2

1.

a)

0 7	Header 8 bytes
8 1024	Unallocated 1016 bytes

b)

0 7	Header 8 bytes
8 28	malloc(20) 20 bytes
29 1024	Unallocated 1016 bytes

c)

0 7	Header 8 bytes
8 28	malloc(20) 20 bytes
29 149	malloc(120) 120 bytes
29 1024	Unallocated 1016 bytes

d)

0 7	Header 8 bytes
8 28	Unallocated 20 bytes
29 149	malloc(120) 120 bytes
29 1024	Unallocated 1016 bytes

2.

0B 100k	Reserved
100k 200k	P1 100kB
200k 300k	P2 100kB
300k 325k	P3 25kB
325k 525k	P4 200kB
525k 725k	P5 200kB
725k 800k	P6 75kB
800k 900k	P7 100kB
900k 1000k	Unallocated 100kB

a) First-Fit Policy

0B 100k	Reserved
100k 200k	P1 100kB
200k 225k	P9 25k
225k 275k	P10 50k
275k 300k	P11 25k
300k 325k	P3 25kB
325k 475k	P8 150k
475k 525k	Unallocated 50k
525k 725k	P5 200kB
725k 800k	Unallocated 75kB
800k 900k	P7 100kB
900k 1000k	Unallocated 100kB

b) Best-Fit Policy

0B 100k	Reserved
100k 200k	P1 100kB
200k 300k	Unallocated 100kB
300k 325k	P3 25kB
325k 475k	P8 150k
475k 500k	P9 25k
500k 525k	P11 25k
525k 725k	P5 200kB
725k 775k	P10 50kB
775k 800k	Unallocated 25kB
800k 900k	P7 100kB
900k 1000k	Unallocated 100kB

c) Worst-Fit Policy

0B 100k	Reserved
100k 200k	P1 100kB
200k 225k	P9 25kB
225k 250k	P11 25kB
250k 300k	Unallocated 50kB
300k 325k	P3 25kB
325k 475k	P8 150kB
475k 525k	Unallocated 50kB
525k 725k	P5 200kB
725k 800k	Unallocated 75kB
800k 900k	P7 100kB
900k 950k	P10 50k
950k 1000k	Unallocated 50kB

3.

1) P1 – 101000
2) P8 – 326000
3) P9 – Segmentation Fault

4.

1) VA
2^m = 4kB
log(4kB) = 12
Virtual Address = 12 bits

PA
2^m = 64kB
log(64kB) = 16
Physical Address = 16 bits

2) PO
2^m = 1kB
log(1kB) = 10
Page Offset = 10 bits

VPN
2^(12-10) = 2^2
Virtual Page Number = 2 bits

3) Frame Offset = 10 bits

PFN
2^(16-10) = 2^6
Physical Frame Number = 6 bits

4)

a) 0: Page 0 → Frame 3
(3 x 1024) + 0 = 3072

b) 1024: Page 1 → Frame 4
(4 x 1024) + 0 = 4096

c) 2000: Page 1 → Frame 4
(4 x 1024) + (2000 – 1024) = 5072

d) Does not exist in table – Out Of Bounds