(1) Use Glushkov construction to convert the regular expression **b* a* b? a*** (the answer for Part (i) of Exercise 3.3.5 of Lab 2) into an NFA Next, convert the NFA obtained into a DFA using the subset construction.
We add position to the regular expression:
b*a*b?a*
to give
b1*a2*b3?a4*

NFA for b1*

	a	b
<- -> s	-	q1
<-- q1	-	q1

NFA for a2*

	a	b
<- -> s	q2	-
<-- q2	q2	-

NFA for b1*a2*

	a	b
<- -> s	q2	q1
<-- q1	q2	q1
<-- q2	q2	-

NFA for b3?

	a	b
--> s	-	q3
<-- q3	-	-

NFA for (b1*a2*b3?)

	a	b
<--> s	q2	q1,q3
<-- q1	q2	q1,q3
<-- q2	q2	q3

<-- q3	-	-

NFA for a4*

	a	b
<- -> s	q4	-
<-- q4	q4	-

NFA for (b1*a2*b3?a4*)

	a	b
<--> s	q2,q4	q1,q3
<-- q1	q2,q4	q1,q3
<-- q2	q2,q4	q3
<-- q3	q4	-
<-- q4	q4	-

Converting the above NFA to DFA gives:

	a	b
<- -> {s}	{q2,q4}	{q1,q3}
<-- {q2,q4}	{q2,q4}	{q3}
<-- {q1,q3}	{q2,q4}	{q1,q3}
<-- {q3}	{q4}	{}
<-- {q4}	{q4}	-

(2) Use Glushkov construction to convert the regular expression **b* | b* a+ (b a+)* b?** (the answer for Part (i') of Exercise 3.3.5 of Lab 2) into an NFA Next, convert the NFA obtained into a DFA using the subset construction.
We add position to the regular expression:
b* | b* a+ (b a+)* b?
to give
b1* | b2* a3+ (b4 a5+)* b6?

NFA for b1*

	a	b
<--> s	-	q1
<-- q1	-	q1

NFA for b2*

	a	b
<--> s	-	q2
<-- q2	-	q2

NFA for a3+

	a	b
--> s	q3	-
<-- q3	q3	-

NFA for (b2*a3+)

	a	b
<--> s	q3	q2
<-- q2	q3	q2
<-- q3	q3	-

NFA for b4

	a	b
--> s	-	q4
<-- q4	-	-

NFA for a5+

	a	b
--> s	q5	-
<-- q5	q5	-

NFA for (b4a5+)

	a	b
<--> s	-	q4
q4	q5	-
<-- q5	q5	-

NFA for (b2*a3+(b4a5+)*)

	a	b
<--> s	q3	q2
q2	q3	q2
<-- q3	q3	q4
q4	q5	-
<-- q5	q5	q4

NFA for b6?

	a	b
<--> s	-	q6
<-- q6	-	-

NFA for (b2*a3+(b4a5+)*b6?)

	a	b
<--> s	q3	q2
q2	q3	q2
<-- q3	q3	q4
q4	q5	-
<-- q5	q5	q4,q6
<-- q6	-	-

NFA for (b1* | (b2*a3+(b4a5+)*b6?))

	a	b
<--> s	q3	q1,q2
<-- q1	-	q1
q2	q3	q2
<-- q3	q3	q4,q6
q4	q5	-
<-- q5	q5	q4,q6
<-- q6	-	-

Converting the above NFA to DFA gives:

	a	b
<- -> {s}	{q3}	{q1,q2}
<-- {q3}	{q3}	{q4,q6}
<-- {q1,q2}	{q3}	{q1,q2}
<-- {q4,q6}	{q5}	{}
<-- {q5}	{q5}	{q4,q6}

(3) Use Glushkov construction to convert the regular expression **(a | bb)* (b a*)?** . Next, convert the NFA obtained into a DFA using the subset construction.
We add position to the regular expression:
(a | bb)* (b a*)? .
to give
(a1 | b2b3)* (b4 a5*)? .

NFA for a1

	a	b
--> s	q1	-
<-- q1	-	-

NFA for b2

	a	b

--> s	-	q2
<-- q2	-	-

NFA for b3

	a	b
--> s	-	q3
<-- q3	-	-

NFA for b2b3

	a	b
--> s	-	q2
q2	-	q3
<-- q3	-	-

NFA for (a1|b2b3)*

	a	b
<--> s	q1	q2
<-- q1	q1	q2
q2	-	q3
<-- q3	q1	-

NFA for b4

	a	b
--> s	-	q4
<-- q4	-	-

NFA for (a5)*

	a	b
<--> s	q5	-
<-- q5	q5	-

NFA for (b4a5*)?

	a	b
<--> s	-	q4
<-- q4	q5	-
<-- q5	q5	-

NFA for (a1|b2b3)*(b4a5*)?

	a	b
<--> s	q1	q2,q4
<-- q1	q1	q2,q4
q2	-	q3
<-- q3	q1	q2,q4
<-- q4	q5	-
<-- q5	q5	-

Converting the above NFA to DFA gives:

	a	b
<- -> {s}	{q1}	{q2,q4}
<-- {q1}	{q1}	{q2,q4}
<-- {q2,q4}	{q5}	{q3}
<-- {q5}	{q5}	{}
<-- {q3}	{q1}	{q2,q4}