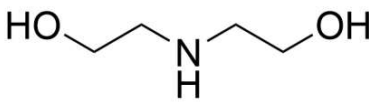
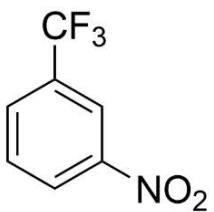



4 This question is about the synthesis of Addyi

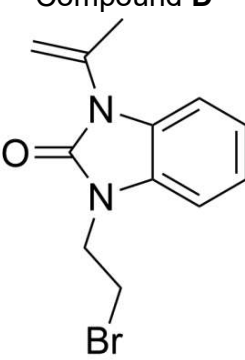
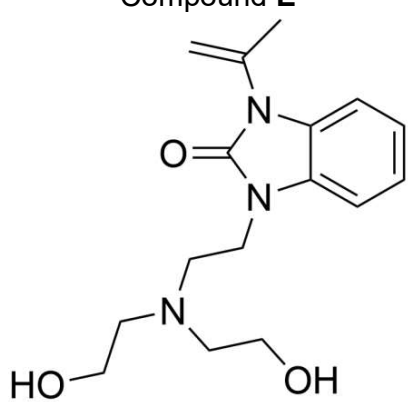
- (a) Carbon: $45.70/12.01 = 3.805$
 Hydrogen $10.55/1.008 = 10.47$
 Nitrogen $13.32/14.01 = 0.951$
 Oxygen $30.43/15.99 = 1.90$
 Simplest whole number ratio = 4:11:1:2
 Empirical formula = $C_4H_{11}O_2N$

2

If oxygen is forgotten then can award 1 mark if calculation is done correctly.

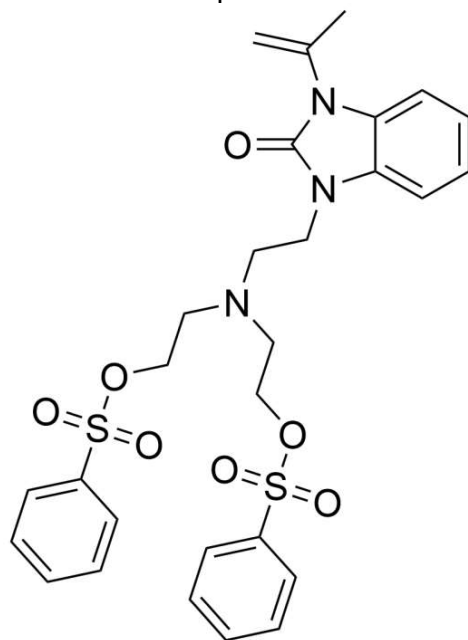
<p>Compound A</p>  <p>1 mark</p> <p><i>No carry forward if they propose a structure that matches their incorrect empirical formula in (a).</i></p>	<p>Compound B</p>  <p>1 mark</p> <p><i>Wrong isomer 0 marks.</i></p>	<p>Compound C</p>  <p>1 mark</p> <p><i>Allow error carried forward if wrong isomer is drawn for B and same wrong isomer is drawn for C but functional group change is correct.</i></p>
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3

<p>Compound D</p>  <p>2 marks</p>	<p>Compound E</p>  <p>2 marks</p>
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4

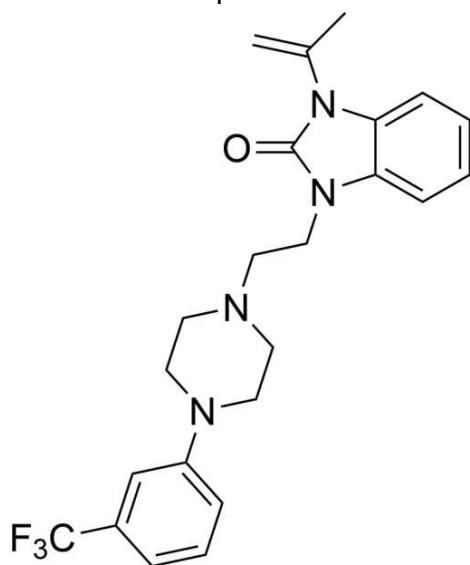
Compound F



2

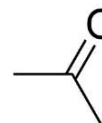
2 marks

Compound G



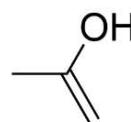
2 marks

By-Product H



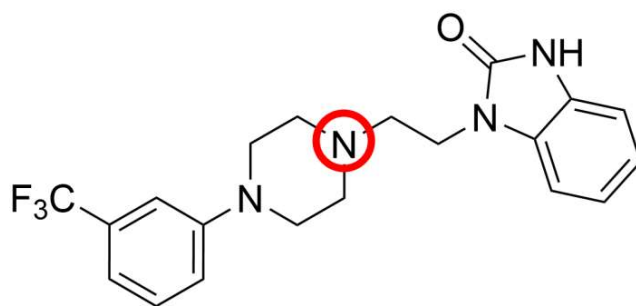
2 marks

Accept the following alternative for 1 mark.



4

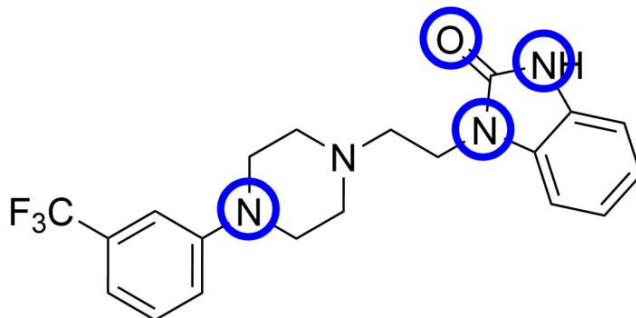
(d)



2

2 marks

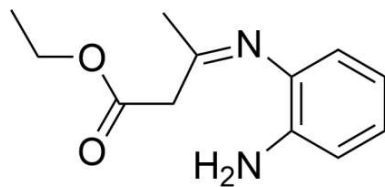
Accept any one of the following for 1 mark.



If more than one atom circled then no marks are awarded.

(e)

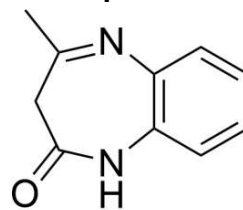
Intermediate X



2 marks

Give full credit to the *E* isomer of the imine.

Compound Y



4

2 marks

Question Total 21