6. Use your knowledge of kinetics to answer the following questions. Justify your answers.

(a)

NO Catalyst

E_A

Catalyst

Lower Energy of Activation
Easier For Rxn To Occur

Potential Energy

Reaction Coordinate
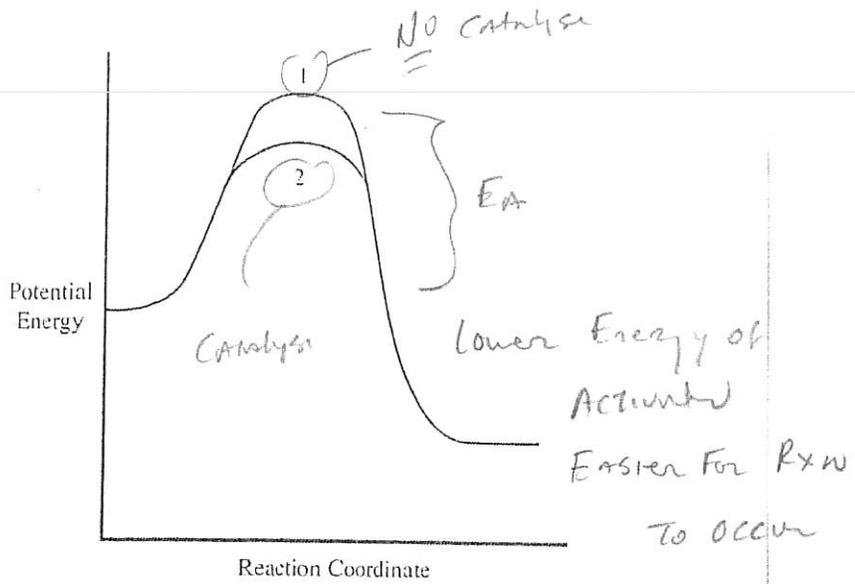
The two lines in the diagram above show different reaction pathways for the same reaction. Which of the two lines shows the reaction when a catalyst has been added?

(b)

↓ TEMP

More molecules with more Kinetic Energy
(Ake come to Energy

↑ TEMP

Fractions of Molecules

E_A

→ More Rxns
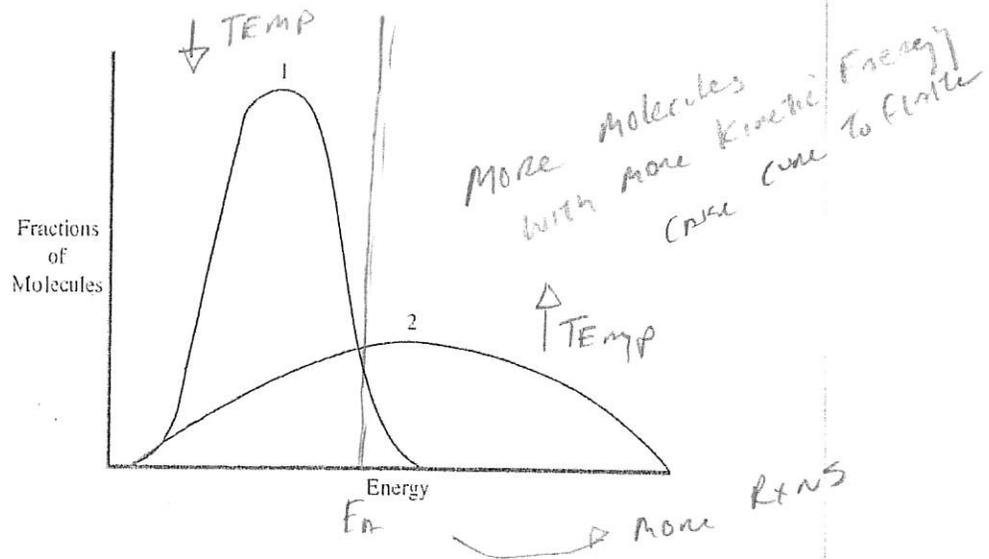
Energy

Which of the two lines in the energy distribution diagram shows the conditions at a higher temperature?

(c)

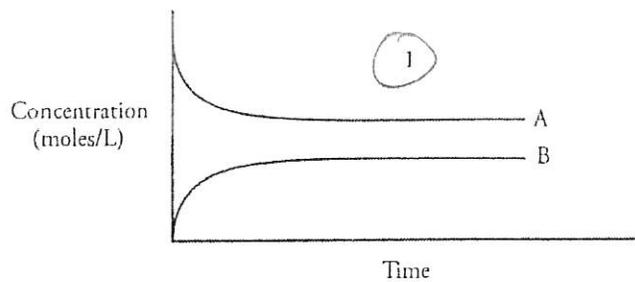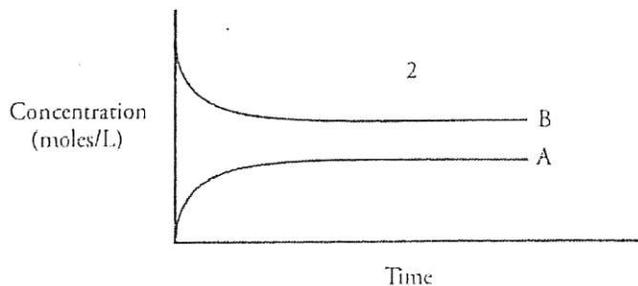$$\ln[A]_t = -kt + \ln[A_o]$$

line $= r^2 \ 0.999$

linear Fdh
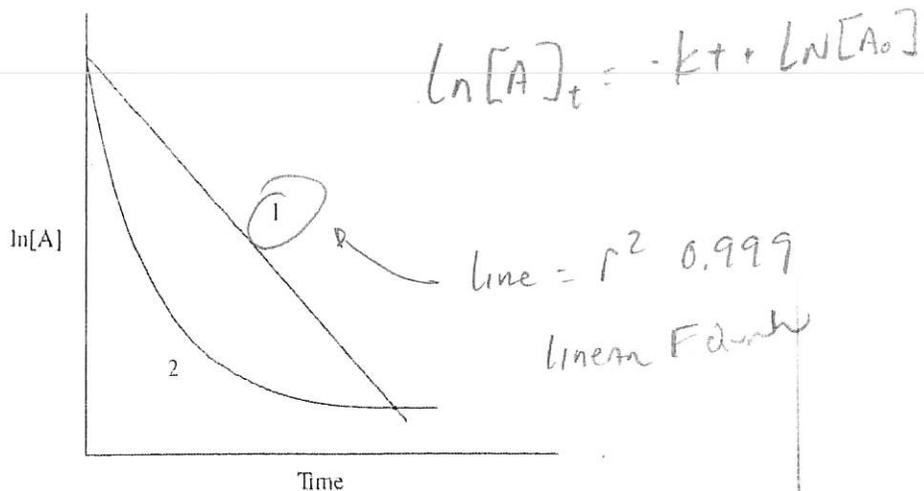
Which of the two lines in the diagram above shows the relationship of $\ln[A]$ to time for a first-order reaction with the following rate law?

$$\text{Rate} = k[A]$$

(d)

A - Dissappear

B - the Appears

Which of the two graphs above shows the changes in concentration over time for the following reaction?

$$A \rightarrow B$$

13. $A + B \rightarrow C$

Based on the following experimental data, what is the rate law for the hypothetical reaction given above?

Experiment	[A] (M)	[B] (M)	Initial Rate of Formation of C (M/sec)
1	0.20	0.10	2.0×10^{-6}
2	0.20	0.20	4.0×10^{-6}
3	0.40	0.40	1.6×10^{-5}

2x

4x

Both [ ][ ] overall 2

(A) Rate = $k[A]$
(B) Rate = $k[A]^2$
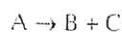(C) Rate = $k[B]$
(D) Rate = $k[A][B]$

14.

Time (Hours)	[A] M
0	0.40
1	0.20
2	0.10
3	0.05

Reactant A underwent a decomposition reaction. The concentration of A was measured periodically and recorded in the chart above. Based on the data in the chart, which of the following is the rate law for the reaction?

(A) Rate = $k[A]$

(B) Rate = $k[A]^2$
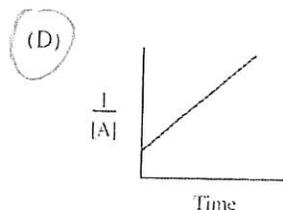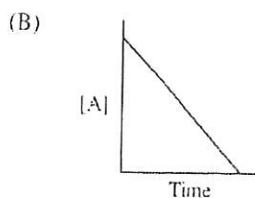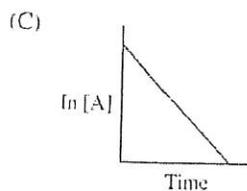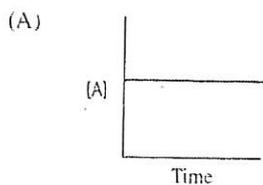
(C) Rate = $2k[A]$

(D) Rate = $\frac{1}{2}k[A]$

Ln 0.40

0   1   2   3
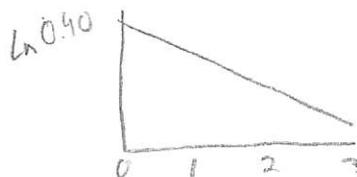
15. $A \rightarrow B + C$ rate = $k[A]^2$

Which of the following graphs may have been created using data gathered from the above reaction?

(A)

[A]

Time

(C)

ln [A]

Time

(B)

[A]

Time

(D)

$\frac{1}{[A]}$

Time

2nd order

16. After 44 minutes, a sample of $^{44}_{19}K$ is found to have decayed to 25 percent of the original amount present. What is the half-life of $^{44}_{19}K$?

(A) 11 minutes
(B) 22 minutes
(C) 44 minutes
(D) 66 minutes

FRQ

1 A - 50 mL Buret

B - Sample 1 - 0.100 M

Sample 2 = 0.0750

Samp 3 = 0.050

Smp 4 = 0.025

C - Fingerprints

D = 4.85 $M^{-1} cm^{-1}$

E   Absorb vs conc

F i = 0.325

  ii = 0.873