

DAFE MERCY EBELE

ELECT/ELECT ENGINEERING

16/ENG04/014

ENG 282

ANSWERS TO ASSIGNMENT

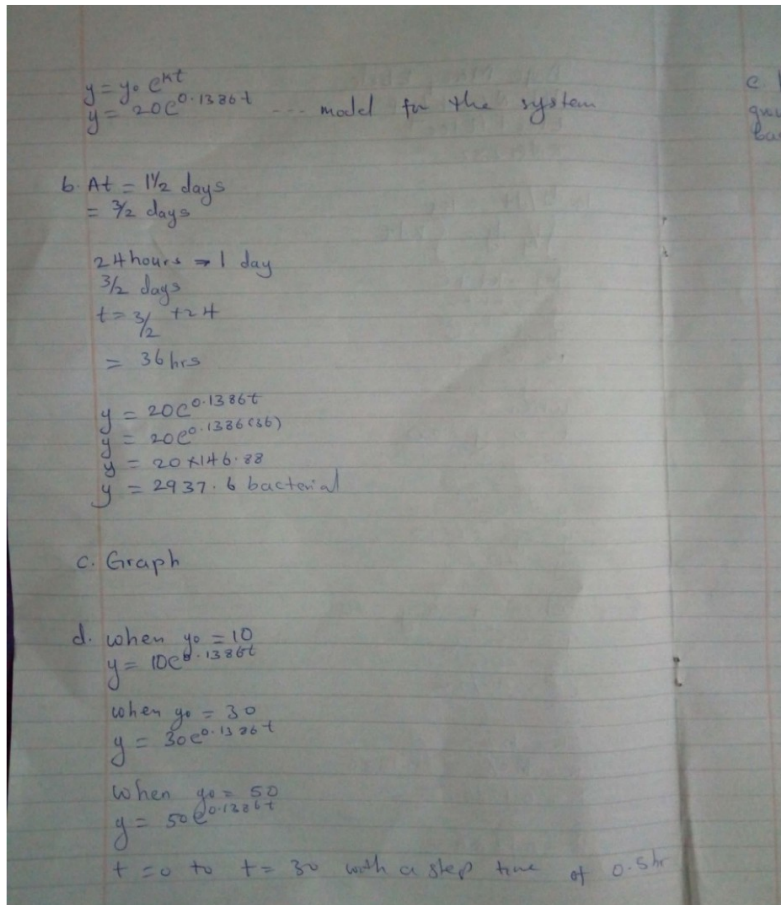
NO 1A and B

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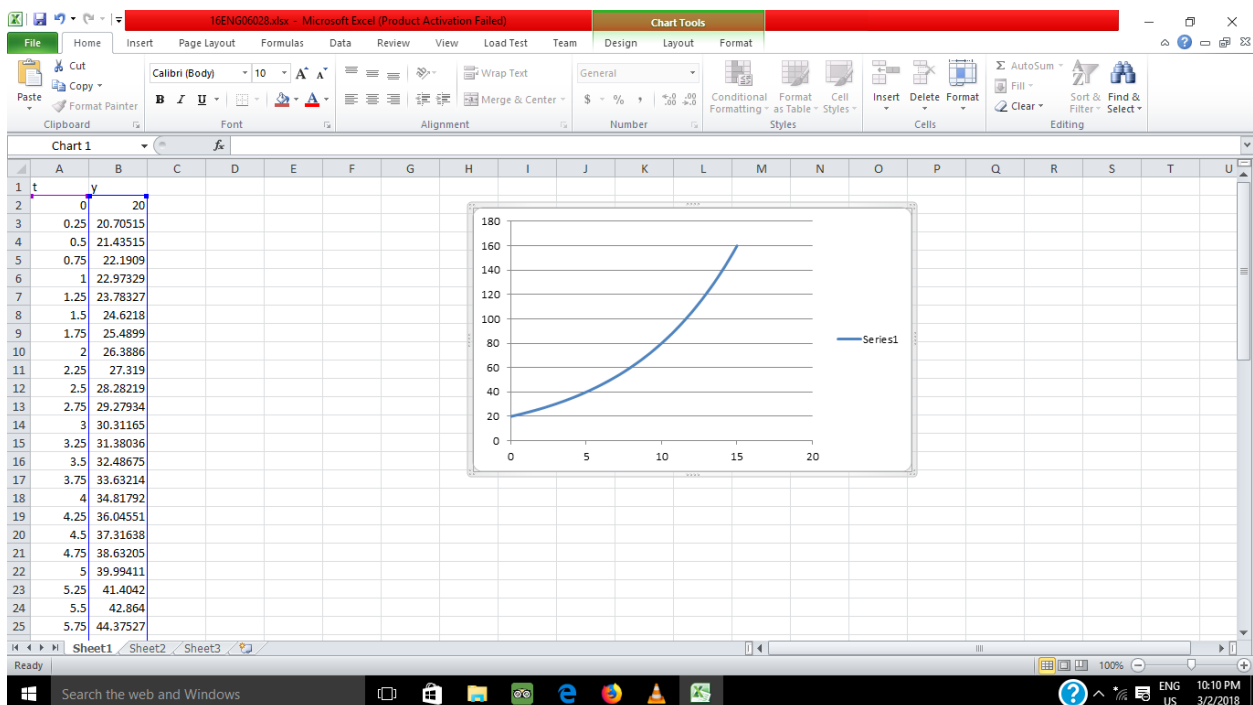
1a $\frac{dy}{dt} = ky$
 $\int \frac{1}{y} dy = \int k dt$
 $\ln y = kt + C$
 $y = e^{kt+C}$
 $y = e^{kt} \cdot e^C$
Let $e^C = y_0$
 $\therefore y = y_0 e^{kt}$
When
 $t = 0, y = 20$
 $20 = y_0 e^{k(0)}$
 $\therefore y_0 = 20$
 $y = 20e^{kt}$
 $y = 40$

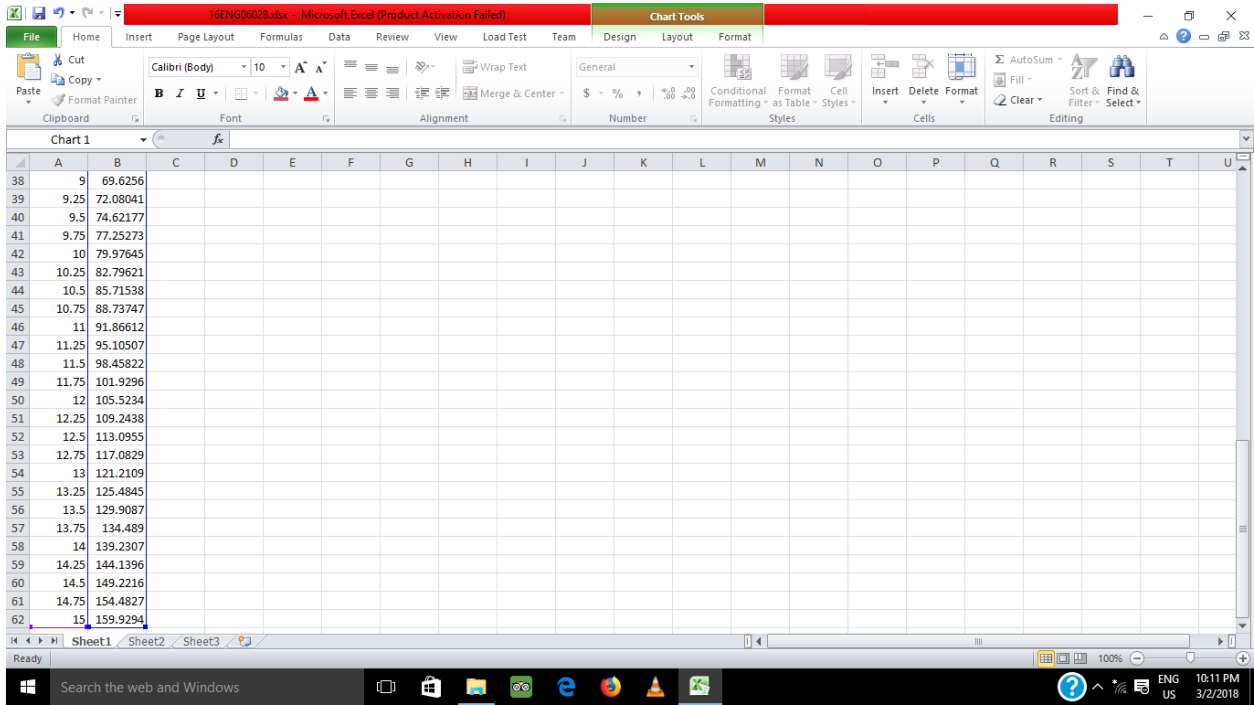
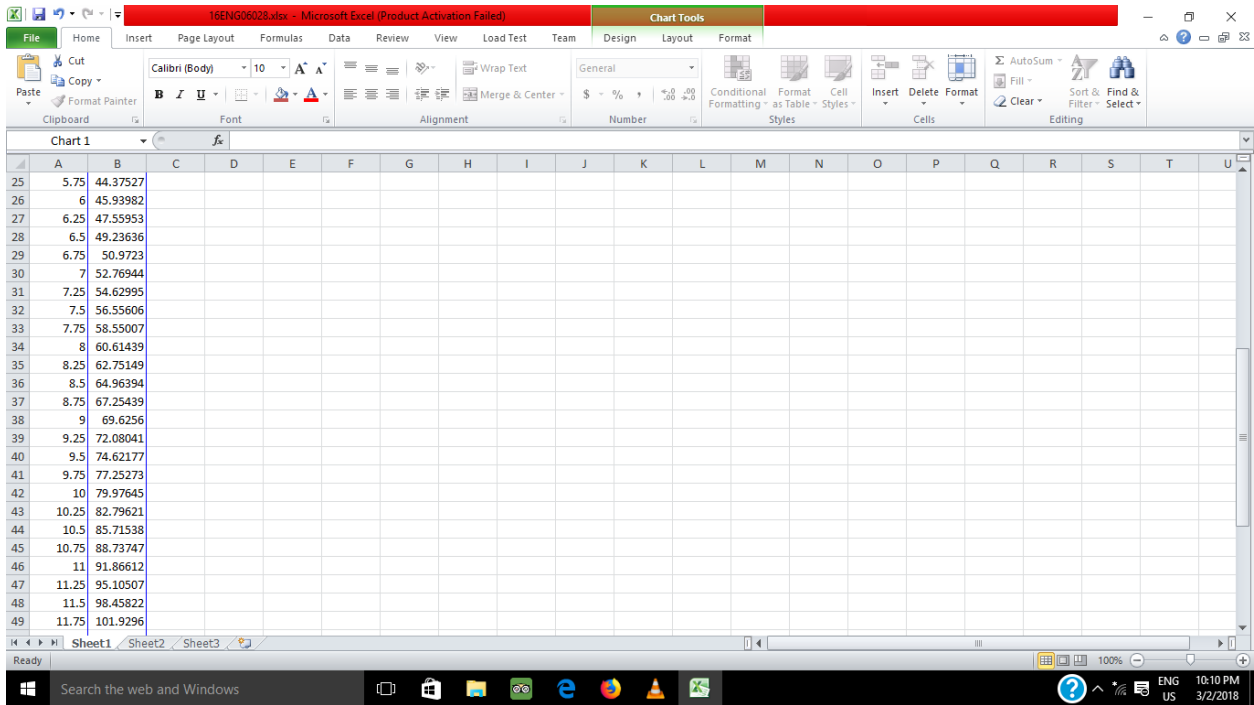
When $t = 5, y = 40$
 $40 = 20e^{5k}$
 $e^{5k} = 40/20$
 $e^{5k} = 2$
 $5k = \ln 2$
 $k = \ln 2 / 5 = 0.1386$
 $k = 0.1386$

$k = 0.1386$
 $y_0 = 20$

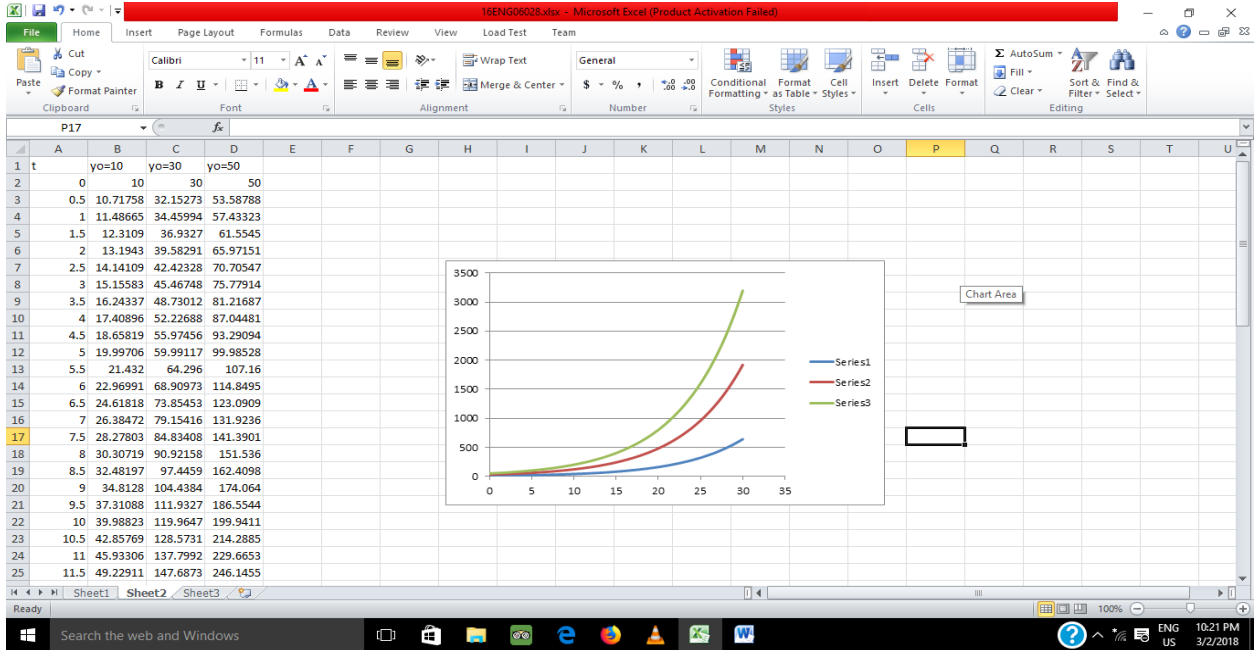


NO 1(C)



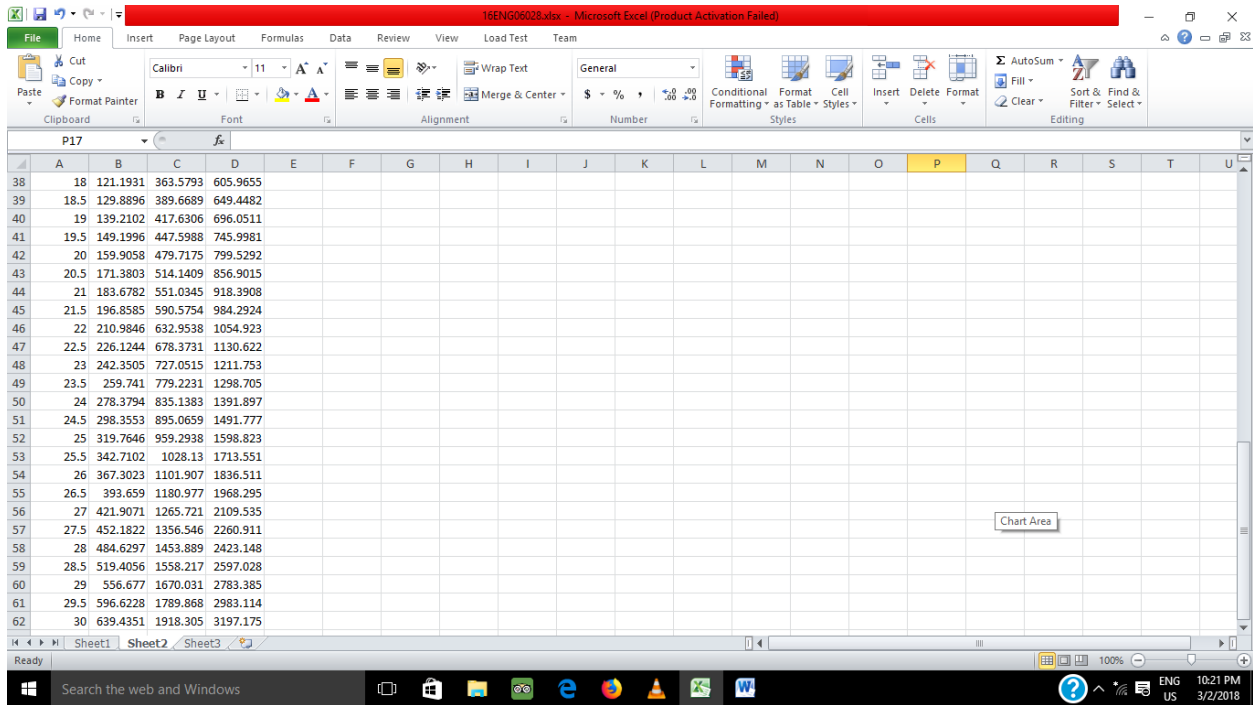


NO1(D)



16ENG06028.xlsx - Microsoft Excel (Product Activation Failed)

	A	B	C	D
25	11.5	49.22911	147.6873	246.1455
26	12	52.76168	158.285	263.8084
27	12.5	56.54773	169.6432	282.7387
28	13	60.60547	181.8164	303.0273
29	13.5	64.95437	194.8631	324.7719
30	14	69.61535	208.8461	348.0768
31	14.5	74.61079	223.8324	373.0539
32	15	79.96468	239.8941	399.8234
33	15.5	85.70277	257.1083	428.5138
34	16	91.8526	275.5578	459.263
35	16.5	98.44373	295.3312	492.2186
36	17	105.5078	316.5235	527.5391
37	17.5	113.0788	339.2365	565.3941
38	18	121.1931	363.5793	605.9655
39	18.5	129.8896	389.6689	649.4482
40	19	139.2102	417.6306	696.0511
41	19.5	149.1996	447.5988	745.9981
42	20	159.9058	479.7175	799.5292
43	20.5	171.3803	514.1409	856.9015
44	21	183.6782	551.0345	918.3908
45	21.5	196.8585	590.5754	984.2924
46	22	210.9846	632.9538	1054.923
47	22.5	226.1244	678.3731	1130.622
48	23	242.3505	727.0515	1211.753
49	23.5	259.741	779.2231	1298.705



NO 1(E)

Increase in time lead to an exponential growth(increase) in the population of the bacteria in the growth medium.