

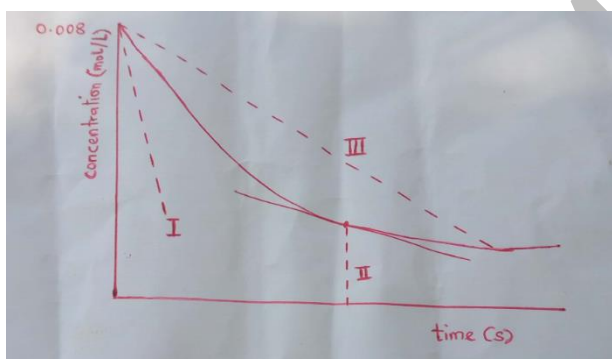
BRAINSTORM GROUP (BSG) CHM111 TEST 2 (2021/22)

ANSWER ALL QUESTIONS

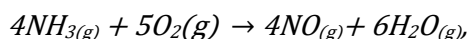
- Which of the following emissions has equivalent velocity of $3.8 \times 10^8 \text{ ms}^{-1}$
A. α B. β C. γ D. n
- Henrich Hertz was further corroborated with Albert Einstein on
A. Compton Effect B. Photoelectric Effect
C. Pair production process D. Atomic Fusion
- Which of the following is not associated with Compton effect
A. when energy exceeds 1.2 MeV
B. energy of γ rays become less
C. operation within the ray of 0.6MeV and 4MeV of energy
D. It does not result to low secondary energy radiation.
- The positron and neutron was discovered by _____ and _____ respectively.
A. David Carl Anderson and J. J. Thomson
B. Henrich Hertz and Ernest Rutherford
C. David Carl Anderson and James Chadwick
D. Ernest Rutherford and Henrich Hertz
- What does p and q represent in the following expression? ${}_{33}^{75}\text{As}(p, q){}_{35}^{78}\text{Br}$
A. n, e B. α , β
C. α , n D. β , γ
- Calculate the decay constant for the element D which has a half-life of 20days.
A. 0.035hr^{-1} B. 0.84hr^{-1}
C. 0.04hr^{-1} D. 16.8hr^{-1}
- In writing and balancing nuclear equations, one of the major rules followed is that of
A. Hess' law B. Le Chatelier's law
C. Millikan-Flecher D. Rutherford-Soddy
- _____ found out that photographic negative of object could be made by using a crystal of uranium which fluoresced in sunlight.
A. Rutherford B. J. J. Thompson
C. Albert Einstein D. Henri Becquerel
- Which of the following represent the tangential slope of concentration plotted against time?
A. Initial rate B. Instantaneous rate
C. Average rate D. Reduction rate
- Isotopes/nuclides with high neutron to proton ratio (n/p) gets stabilized by
A. electron capture B. particle emission
C. proton emission D. position capture.
- Isotopes whose neutron to proton ratio equals unity are said to be
A. stable B. unstable
C. partially stable D. partially unstable.
- In 1899, Rutherford bombarded nitrogen by _____ to produce oxygen and _____
A. alpha and proton respectively
B. beta and proton respectively
C. alpha and neutron
D. beta and position
- An Italian scientist who pioneer the building of nuclear reaction was _____ in the year.
A. Stressmann in 1938
B. Hann in 1945
C. Enrico Fermi in 1942
D. Enrico Fermi in 1945
- Based on neutron to proton ratio.
A. ${}_{83}^{209}\text{Bi}$ is stable B. ${}_{6}^{12}\text{C}$ is unstable
C. ${}_{10}^{20}\text{Ne}$ is unstable D. ${}_{26}^{56}\text{Fe}$ is stable.
- _____ pioneered the work of ionizing effect of radioactivity which lead to discovery of α , β and γ .
A. Henri Becquerel in 1886
B. Ernest Rutherford in 1900
C. Marie Curie and Pierre Curie in 1898
D. Henri Becquerel in 1900.
- The particle which travels few centimetre in air is
A. β particle B. α particle
C. positron D. gamma
- In which of the following equation is the daughter nuclide greater than parent nuclide.
A. ${}_{92}^{238}\text{U} \rightarrow {}_{90}^{234}\text{Th} + {}_2^4\text{He}$
B. ${}_{6}^{14}\text{C} \rightarrow {}_{7}^{14}\text{N} + {}_{-1}^0\text{e}$
C. ${}_{7}^{14}\text{N} + {}_2^4\text{He} \rightarrow {}_{8}^{17}\text{O} + {}_1^1\text{H}$
D. ${}_{27}^{54}\text{Co} \rightarrow {}_{26}^{56}\text{Fe} + {}_0^1\text{n}$
- The electron was discovered by
A. R. A. Millikan B. J. J. Thompson in 1897
C. David Anderson in 1933
D. Ernest Rutherford in 1909
- Atomic fission was discovered by _____ and _____ in year _____ when they bombarded uranium with neutron.
A. Hann and Stressman in 1938
B. Hann and Stressman in 1942
C. Enrico Fermi and Hann in 1938
D. Hann and Hertz in 1942
- The first atomic bomb was dropped at Hiroshima and Nagasaki in
A. Japan 1945 B. Nigeria 1843
C. Iraq in 1938 D. China in 1986
- It was observed that increase in concentration of a specie had no effect on the reaction rate, the reaction is _____ order with respect to the specie.

- A. zero B. first C. second D. third
22. _____ give the number of molecule of reactant which take part in a chemical reaction.
A. Order B. Molecularity C. Rate D. Order.
23. If doubling the concentration of a reaction doubles the rate of reaction, the reaction is said to be _____ order with respect to the specie.
A. zero B. first C. second D. third
24. The rate expression in terms of oxygen for the reaction: $2\text{H}_{2(g)} + \frac{1}{2}\text{O}_{2(g)} \rightarrow 2\text{H}_2\text{O}_{(g)}$ is
A. $r = -\frac{\Delta[\text{O}]}{\Delta t}$ B. $r = \frac{\Delta[\text{O}_2]}{\Delta t}$
C. $r = -\frac{1}{2} \frac{\Delta[\text{O}]}{\Delta t}$ D. $r = -\frac{2\Delta[\text{O}_2]}{\Delta t}$
25. Which of the following may not be determined experimentally.
A. Rate constant B. Rate expression
C. Molecularity D. Order.
26. The rate expression of a reaction is $-\frac{\Delta P}{\Delta t} = r$, the negative sign implies.
A. P is the product B. P is decreasing
C. P is adding D. P is increasing.

Use the following graph to answer Q27-29



27. The average rate of the reaction is
A. I B. II C. III D. IV
28. The instantaneous rate of the reaction can be found at
A. III B. II C. IV D. I
29. The initial rate is
A. I B. II C. III D. IV
30. Given the reaction:



the rate expression is.

- A. $4\Delta\text{NH}_3 + 5\Delta\text{O}_2$
B. $R = k[\text{NH}_3]^m[\text{O}_2]^n$
C. $-\frac{1}{4} \frac{\Delta[\text{NH}_3]}{\Delta t} = -\frac{1}{5} \frac{\Delta[\text{O}_2]}{\Delta t} = \frac{1}{4} \frac{\Delta[\text{NO}]}{\Delta t} = \frac{1}{6} \frac{\Delta[\text{H}_2\text{O}]}{\Delta t}$
D. $\frac{1}{4} \frac{\Delta[\text{NH}_3]}{\Delta t} = \frac{1}{5} \frac{\Delta[\text{O}_2]}{\Delta t} = -\frac{1}{4} \frac{\Delta[\text{NO}]}{\Delta t} = -\frac{1}{6} \frac{\Delta[\text{H}_2\text{O}]}{\Delta t}$

31. _____ is the index/exponential to which the concentration of a reaction must be raised in a reaction.
A. Molecularity B. Rate constant
C. Rate law D. Reaction order.
32. All the following will increase the rate of chemical reaction except
A. increase in pressure
B. increase in temperature
C. use of powdery form of Mg instead of lump
D. increase in activation energy
33. The minimum amount of energy that a colliding molecules must possess for their collision to be effective is
A. effective energy B. collision energy
C. thermal energy D. activation energy.
34. Considering the table below, it can be deduced that doubling the concentration of A, increases the rate of reaction by a factor of

[A] mol/dm ³	[B] mol/dm ³	Initial rate mol/dm ³
0.001	0.001	3.0×10^{-3}
0.002	0.001	1.2×10^{-2}

- A. 2 B. 3 C. 11 D. 4
35. A test tube cold to touch, the process taken place is
A. exothermic B. endothermic
C. adiabatic D. isochoric
36. The energy involved when a substance melts is
A. Heat of fusion B. Heat of fission
C. Heat of vaporization D. Activation energy
37. A process in which no change in pressure occur is called
A. reversible process B. adiabatic
C. isochoric D. isobaric
38. The measure of degree of disorderliness of a system is _____
A. enthalpy B. free energy
C. entropy D. activation energy
39. _____ law of thermodynamics state that if two bodies are individually in equilibrium with a separate body, then the first two bodies are in thermal equilibrium with each other.
A. Zero B. First C. Second D. Third
40. _____ law explained conversion of mechanical energy into electrical .
A. First B. Second C. Third D. Zero

ANSWERS							
1	C	11	A	21	A	31	D
2	B	12	A	22	B	32	D
3	A	13	C	23	B	33	D
4	C	14	D	24	D	34	D
5	C	15	B	25	C	35	B
6	A	16	B	26	B	36	A
7	D	17	B	27	C	37	D
8	D	18	D	28	B	38	C
9	B	19	A	29	A	39	A
10	B	20	A	30	C	40	A