Quality Checkers Only way to fulfill your dreams	XI-SCI : Chemistry Nuclear Chemistry and Radioactivity,	**DATE:** **TIME: 1 hour 30 minutes** **MARKS: 25**
	SEAT NO:	

Note:-

1. All Questions are compulsory.
2. Numbers on the right indicate full marks.

Section A

Q.1 Select and write the correct answer. **(4)**

1. ..... is used to convert atomic energy to electricity.

   A) turbines B) nuclear reactor

   C) boilers D) all of the above

2. $^{60}_{27}CO$ decays with half-life of 5.27 years to produce $^{60}_{28}Ni$. What is the decay constant for such radioactive disintegration?

   A) ^{60}CO B) ^{226}Ra

   C) ^{32}P D) ^{226}I

3. Heavy water is

   A) water containing Calcium salts B) water containing Mg salts

   C) D_2O D) H_3O^+

4. Choose the correct option for the reaction, $^{234}_{90}Th + ^{4}_{2}He + \gamma$

   A) $^{238}_{92}U$ B) $^{238}_{93}Th$

   C) $^{241}_{94}Th$ D) $^{226}_{88}Th$

Q.2 Answer the following. **(3)**

1. How small is the nucleus as compared to rest of the atom?
2. Balance the nuclear reaction.
   $^{118}_{54}Xe \rightarrow ? + ^{118}_{54}I$
3. Which is the most common type of carbon isotope?

Section B
Attempt any Four

Q.3 What are the similarities between structure of an atom and the solar system? **(2)**

Q.4 Write a note on : β-decay. **(2)**

Q.5 How does the atom remain stable even though it has large amount of coulombic repulsion within it? **(2)**

Q.6 Write examples of destructive and peaceful uses of nuclear energy. **(2)**

Q.7 Explain classification of nuclides on the basis of nuclear stability. **(2)**

Q.8 How many α and β particles are emitted in the trasmutation $^{232}_{90}Th \rightarrow ^{208}_{82}Pb$? **(2)**

Section C
Attempt any Two

Q.9 Explain the general equations of α, β and γ-decay **(3)**

Q.10 Write the classification of nuclides on the basis of number of nucleons. **(3)**

Q.11 A 3/4 of the original amount of radioisotope decays in 60 minutes. What is its half life? **(3)**

Section D
Attempt any One

Q.12 Explain in detail about nuclear reactor. **(4)**

Q.13 Derive the expression for decay constant. **(4)**