

SECTION – II

- Q-4 Attempt the Following questions (07)**
- a. What is the difference between liquid drop and nucleus? **01**
 - b. List out the magic numbers. **01**
 - c. Find spin and parity of S^{31} . **01**
 - d. Mesons and Baryons made of how many quarks? **01**
 - e. Find spin and parity of N^{13} . **01**
 - f. List out the members of Hadrons. **01**
 - g. Define CPT theorem. **01**

- Q-5 Attempt all questions (14)**
- a Write a note on Odd mass parabola in detail with necessary diagram. **07**
 - b Write a note on quarks and explain in brief four fundamental forces of nature. **07**

OR

- Q-5 Attempt all questions**
- a Classify the elementary particles and define Baryon numbers and lepton numbers. **07**
 - b Derive SEMF and obtain equation of Binding Energy. **07**

- Q-6 Attempt all questions (14)**
- a Write a note on main assumptions of the single particle shell model. **06**
 - b List out the evidence leads to the shell model **08**

OR

- Q-6 Check the nuclear reaction is allowed or not with detail description? 14**

1. $\Sigma^+ + n \rightarrow \Sigma^- + p$
2. $\pi^+ + n \rightarrow K^+ + \Sigma^0$
3. $\Lambda^0 \rightarrow \Sigma^+ + \pi^-$
4. $\Lambda^0 + n \rightarrow \Sigma^- + p$
5. $K^+ \rightarrow \pi^+ + \pi^0 + \pi^0$
6. $K^+ \rightarrow \pi^- + \pi^0$
7. $K^- + p \rightarrow K^0 + n$

