

BIRLA INSTITUTE OF TECHNOLOGY, MESRA, RANCHI  
(END SEMESTER EXAMINATION)

CLASS: MSC  
BRANCH: CHEMISTRY

SEMESTER : III  
SESSION : MO/19

SUBJECT: CH502 SOLID STATE AND NUCLEAR CHEMISTRY

TIME: 3 HOURS

FULL MARKS: 50

**INSTRUCTIONS:**

1. The question paper contains 5 questions each of 10 marks and total 50 marks.
  2. Attempt all questions.
  3. The missing data, if any, may be assumed suitably.
  4. Before attempting the question paper, be sure that you have got the correct question paper.
  5. Tables/Data hand book/Graph paper etc. to be supplied to the candidates in the examination hall.
- 

- Q.1(a) What is nuclear stability? Draw a band of stability representing stable nuclides, alpha and Beta emission? [5]  
Q.1(b) Explain the types of radioactive decay and possibility to predict a type of radioactive decay? What are transmutation reactions? [5]
- Q.2(a) Write the basic postulates of liquid drop model. [5]  
Q.2(b) Write short note on nuclear shell model. [5]
- Q.3(a) What are nuclear fusion and fission reactions? Explain their applications and limitations? [5]  
Q.3(b) What are Transuranic elements? Explain Induced radioactivity. [5]
- Q.4(a) Explain radius - ratio with example. Calculate limiting radius ratio value for Coordination no. 3. [5]  
Q.4(b) Differentiate between stoichiometric and non stoichiometric defects. Explain Burger vector. [5]
- Q.5(a) Explain type-II solid state reaction with example [5]  
Q.5(b) Discuss Burger's classification briefly [5]

:::::02/12/2019:::::M