

R17

Code No: 5421AJ

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

M. Tech I Semester Examinations, June/July - 2018

ADVANCED MATERIALS FOR THERMAL SYSTEMS

(Thermal Engineering)

Max.Marks:75

Time: 3hrs

Note: This question paper contains two parts A and B.

Part A is compulsory which carries 25 marks. Answer all questions in Part A.

Part B consists of 5 Units. Answer any one full question from each unit. Each question carries 10 marks and may have a, b, c as sub questions.

PART - A

5 × 5 Marks = 25

- 1.a) What are the important mechanical properties of materials? Define them. [5]
- b) How does an ideal shielding should be done in a nuclear reactor? [5]
- c) What are the materials used for fuel cells? [5]
- d) What is the machinery required for thermal power generation? [5]
- e) Explain the ways to dispose nuclear wastes safely. [5]

PART - B

5 × 10 Marks = 50

- 2.a) Explain tensile test. [5+5]
  - b) Mention the applications of stress-strain diagram. [5+5]
- OR
- 3.a) What are the design considerations for weld ability of steel? [5+5]
  - b) What are the micro structural features of fracture in composites and glasses? Explain. [5+5]
4. What are the materials used for building a) Breeder reactor and b) Pressurized reactor? Mention their properties. [5+5]
- OR
5. What are the effects of radioactive waves on electrical, magnetic behavior of metals, alloys and polymers? [10]
6. What are the materials used as electro catalysts for low temperature fuel cells? How do they affect the process? [10]
- OR
7. Write a note on the usage of nano materials in photo voltaic cell. [10]
8. What are the materials used for sensors? What is importance of sensors in a thermal power plant? [10]
- OR
9. What is the importance of a) Fly ash b) TBC c) Hydrogen membrane and d) Super alloys. [10]
10. What is artificial photosynthesis? Explain its importance in energy storage. [10]
- OR
11. Write a note on a) biological fuel cell technologies and b) bio fuel production. [5+5]