

Register No.: Name:

SAINTGITS COLLEGE OF ENGINEERING (AUTONOMOUS)

(AFFILIATED TO APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY, THIRUVANANTHAPURAM)

SECOND SEMESTER M.TECH DEGREE EXAMINATION (Regular), JULY 2022**(2021 Scheme)****Course Code: 21MD205-E****Course Name: Nanomaterials for Engineering Applications****Max. Marks: 60****Duration: 3 Hours****PART A***(Answer all questions. Each question carries 3 marks)*

1. How nanomaterials are defined. What are the key criteria for defining nanomaterials?
2. How the nanomaterials are classified?
3. With suitable example explain the effect of addition of nanoparticles in any heat conduction application?
4. What is a PCM? How it is classified?
5. Explain the agglomeration of nanomaterials?
6. Write short note on organic solar cells?
7. Compare high temperature and low temperature fuel cells?
8. How nanomaterials are used in electrochemical cells? Give an example.

PART B*(Answer one full question from each module, each question carries 6 marks)***MODULE I**

9. Explain in detail the top down approach & bottom up approach in nanotechnology with a neat figure? (6)

OR

10. How quantum confinement affects the properties of nanomaterials? (6)

MODULE II

11. a) Discuss the unique characteristics of nanomaterials? (3)
b) Explain nanowires & its applications? (3)

OR

12. Discuss any two methods of preparation of nanomaterials? (6)

MODULE III

13. List various nanomaterials used in coatings. Discuss their functions and applications? (6)

OR

14. Explain any two relevant criterias considered in selection of nanomaterials? (6)

MODULE IV

15. With an example describe how nanotechnology is used in electrochemical energy storage? (6)

OR

16. Explain why phase change materials are nano-encapsulated in cooling applications? (6)

MODULE V

17. Elucidate quantum dot solar cells? (6)

OR

18. Explain nanotechnology based solar cells? What are its advantages? (6)

MODULE VI

19. What is a fuel cell? How nanotechnology is applied in fuel cell catalysts? (6)

OR

20. Explain the role of nanomaterials in hydrogen production and storage? (6)
