



AJEENKYA

D Y PATIL UNIVERSITY

End Term Examinations (APRIL 2019)

School: School of Engineering **Program:** M.Tech Bioengineering (Biomedical Engineering)

Course: Advances in Tissue Engineering

Course Code: BEN517

Semester: II

Max Marks: 50

Duration (mins): 120

Note:

- A. Answer the following questions and cite relevant examples.
- B. Explain with diagrams where required
- C. All questions are compulsory

Q.1 Describe the concept of Tissue Engineering and its applications as a potential technology in human healthcare? 10

OR

Short Note:

- (a) The Vacanti Mouse
- (b) PLGA
- (c) Biocompatibility
- (d) Bulk properties of materials

Q.2 What do we mean by the term ECM? Describe various components of the ECM and its role in tissue repair and engineering. 10

OR

Short Note:

- (a) Polymeric 3D Scaffolds
- (b) Biomaterials–tissue interactions
- (c) Biodegradable Polymers
- (d) Designing Non-fouling surfaces

Q.3 Mention the biomaterials used in cardiovascular applications and explain the various strategies used to reduce the thrombogenicity of biomaterials? 10

OR

Short Note:

- (a) Describe the strategies applied to promote cell adhesion on 3D scaffolds.
- (b) Explain the role of protein adsorption on biomaterials and strategies employed in controlling protein adsorption.

Q.4 What is meant by surface modification of biomaterials? Explain with relevant examples the application of surface modification of biomaterials in tissue engineering. 10

OR

- (a) Liposomal drug delivery
- (b) Controlled drug delivery
- (c) Cell-material interactions
- (d) Stem cells in tissue engineering

Q.5 Illustrate the principles of the techniques ESCA and contact angle and their relevance in tissue engineering. 10

OR

- (a) Active drug targeting
- (b) Hydrogels in tissue repair