# Syllabus for written test for the MFCP to the post of Technical Assistant (Instruments) A to B

## (Division of Dental Products, Biomedical Technology Wing, SCTIMST)

1. Biomaterials :

    i. Materials and classification: polymers, ceramics, metals and composites

    ii. Processing: Solvent casting, electro spinning and 3D printing

2. Physico- chemical properties of biomaterials :

    Swelling and degradation studies, accelerated ageing, hardness, surface analysis, SEM and stereomicroscopy.

3. Characterization of biomaterials: Principle, instrumentation, sampling and data analysis in

    i. UV-Visible Spectroscopy

    ii. FTIR and FT Raman spectroscopy

    iii. Dynamic Light Scattering

    iv. Micro CT

    v. HPLC and GPC

4. Dental biomaterials

    i. Composites; chemical cure, dual cure, visible light cure and ormocer composites.

    ii. Glass ionomers (GIC), Giomers and resin modified GIC.

    iii Membranes for Periodontal guided tissue regeneration (GTR) ; preparation and characterization.

    iv. Nanobiocomposites; Synthesis and characterization of nanoparticles

    v. Accelerated ageing, Evaluation of Flexural strength/3 point bending test, Diametral tensile (DTS) strength, Compressive strength, tensile/shear bond strength and suture pullout strength of dental materials

A.O Gr-2 (1/c)

**Text Books for Reference**


1. Biomaterials Science - An introduction to Materials in Medicine, Buddy D. Ratner, Allan S. Hoffman, Frederick J. Schoen and Jack E. Lemons, 2nd Ed. Academic Press, London, 2004.
2. Biomaterials: An Introduction, J. Park and RS Lakes, 3rd Edn., Springer Science, New York, 2007.
3. Biomaterials Science: An Introduction to Materials in Medicine, by (Eds) William Wagner, Shelly Sakiyama-Elbert, Guigen Zhang, Michael Yaszemski, Academic Press Inc; 4th Edition, 2020.
4. Text book of Polymer Science, F.W.Billmeyer Jr. III Edn. Wiley Interscience Publishers, Canada 2002.
5. Biomedical Polymers - Designed to degrade systems, Shalaby W. Shalaby, Hanser Publishers, NewYork, 1994.
6. Infrared and Raman Spectroscopic Imaging, Reiner salzer and Heinz W.Siesler, Wiley VCH, 2009.
7. Electron Microscopy: Principles and Fundamentals. S. Amelinckx , Dirk van Dyck, J. van Landuyt,Gustaaf van Tendeloo (Editors), Wiley, Germany, 2008
8. Science of dental materials, Philips, XI Edn by Anusavice K.J., Saunders Publishing Co., USA, 2004.
9. Dental Materials, Foundations and Applications, Editor: John M Powers and John C Wataha; Elsevier2017
10. Dental Materials, properties and manipulation, Editor: Robert G Craig, John M Powers and John C Wataha; Elsevier 2017


AO Gr-I C/C