FIJI NATIONAL UNIVERSITY

College of Engineering, Science and Technology
School of Electrical and Electronics Engineering

Certificate IV in Biomedical Engineering

BMT471 – Biomedical Materials and Devices

Trimester 2, 2016

Date: As per Timetable Time: As per Timetable
Duration – 3 h 10 min (Including 10 min reading time)

Total Marks – 100

Instructions to candidates:

1) You are allowed 10 minutes extra reading time during which you are NOT allowed to write.
2) Begin each answer on a fresh page and use both sides of the sheet.
3) Write your candidate number at the top of each attached sheet.
4) Insert all written full-scapes, graph paper, drawing paper etc. in their correct sequence and secure with string.
5) For all sheets of paper on which rough/ draft work has been done, cross it through and you must attach all of them to your answer scripts.
6) Write clearly the number(s) of the questions(s) attempted on the top of each sheet.
7) There are two sections – both are compulsory.
8) There are alternative sub-questions within some questions.
9) Start your answer for a new question on new page.
10) Use of mobile phones or other programmable electronic gadget/storage device is NOT ALLOWED

- *Total Number of pages – 03 (Three) including this cover page*

SECTION A – SHORT ANSWER QUESTIONS

[Section A - Total 50 Marks]
Note: All questions in this section are compulsory.

Q.1. Define the following terms in detail **[5 Marks]**

i) Biomaterials [1Mark]
ii) Bio-compatibility [1Mark]
iii) Haemo-compatibility [1Mark]
iv) Biomedical sensor-Transducer [2Marks]

Q.2. Distinguish between natural and artificial implants with suitable example.

[5 Marks]

Q.3. List the types of Ceramic biomaterials used in various biomedical applications

[5 Marks]

Q.4. What are Soft and Hard tissues? What is a tissue response to the implants?

[5 Marks]

Q.5. Write brief description of Carcinogenicity and Toxicity . **[5 Marks]**

Q.6. Draw the sketch of three Dental implants with appropriate labels. **[5Marks]**

Q.7. Explain PMMA (Polymethyl-methacrylate) with its chemical formulae, composition and applications.

[5 Marks]

Q.8. Specify the list of equipment used in Clinical laboratory and Analytical measurements.

[5 Marks]

Q.9. State the concept of medical device Quality assurance and Management System.

[5 Marks]

Q.10. What are Corrosion and Haemo-compatibility tests? Specify the test methods.

[5 Marks]

****** End of Section A ******

SECTION B – LONG ANSWER QUESTIONS

[Section B - Total 50 Marks]
Note: Attempt any FIVE out of the following SEVEN questions from this section.

Q.11. Specify various types of Orthopedic implants. With the help of schematic draw minimum three orthopedic implants or support device.

[10 Marks]

Q.12. Draw a suitable diagram and explain Operation theater (OT) set-up.

[10 Marks]

Q.13. What is the need of Sterilization? Explain the process and equipment used in sterilization.

[10 Marks]

Q.14. Discuss mechanical, chemical and photo-acoustic properties of biomaterial in details.

[10 Marks]

Q.15. Draw and explain minimum three Soft tissue implants with suitable diagrams.

[10 Marks]

Q.16. Describe desirable and undesirable biological performance factors of biomaterials.

[10 Marks]

Q.17. Explain Ti-based and SS(Stainless Steel)-based alloys with its composition, properties and brief applications.

[10 Marks]

***** End of Section B *****

******* The End *******