Scheme – G

Sample Test Paper-I

Course Name : Diploma in Medical Electronics

Course Code : MU **17543**

Semester : Fifth

Subject Title : Applications of Biomaterial

Marks : 25 **Times:1 Hour**

Instructions:

1. All questions are compulsory.
2. Illustrate your answers with neat sketches wherever necessary.
3. Figures to the right indicate full marks.
4. Assume suitable data if necessary.
5. Preferably, write the answers in sequential order.

Q1. Attempt any THREE of the following. **09 Marks**

a. State the meaning of anisotropic and give its two types.

b. List three properties of zirconia.

c. State the need for vascular implant and give the material used for the same.

d. State the meaning of sterilization.

Q2. Attempt any TWO of the following. **08 Marks**

a. The rod is 2m long and made of steel with modulus of elasticity 200GPa. Find the change in length (stress applied is $127*10^6$ Pa).

b. State the meaning of elastin and give its two mechanical properties.

c. Draw the structure of lungs and state its functions.

Q3. Attempt any two of the following. **08 Marks**

a. Define terms i) ultimate tensile stress ii) fracture strength and differentiate ductile soft and ductile hard material.

b. Give the biological tolerance of following metals in human body: i) cobalt ii) nickel iii) chromium iv) manganese

c. Draw the diagram showing the relative positions of the heart valves.

Scheme – G

Sample Test Paper-II

Course Name : Diploma in Medical Electronics

Course Code : MU **17543**

Semester : Fifth

Subject Title : Applications of Biomaterial

Marks : 25 **Times:1 Hour**

Instructions:

1. All questions are compulsory.
2. Illustrate your answers with neat sketches wherever necessary.
3. Figures to the right indicate full marks.
4. Assume suitable data if necessary.
5. Preferably, write the answers in sequential order.

Q1. Attempt any THREE of the following. **09 Marks**

a. List three uses of collagen in dentistry.
b. State the cellular events in bone healing.
c. List three mechanical properties of ocular tissue.
d. State three functions of kidney.

Q2. Attempt any TWO of the following. **08 Marks**

a. Draw four types of reimplantation of natural teeth.
b. State the meaning of tendon and cartilage.
c. List four biomedical materials used in total joint replacement.

Q3. Attempt any two of the following. **08 Marks**

a. State the meaning of elastomers and give its one application with an example.
b. State the meaning of temporary fixation device and give its two examples.
c. State the need for cardiac replacement.

Scheme – G

Sample Question Paper

Course Name	**: Diploma in Medical Electronics**	
Course Code	**: MU**	**17543**
Semester	**: Fifth**	
Subject Title	**: Applications of Biomaterial**	
Marks	**: 100**	**Time: 03 Hours**

Instructions:

1. All questions are compulsory
2. Illustrate your answers with neat sketches wherever necessary
3. Figures to the right indicate full marks
4. Assume suitable data if necessary
5. Preferably, write the answers in sequential order

Q1. A) Attempt any THREE **(12 Marks)**

a) Give classification of biomaterials.

b) Give composition and two applications of Ti based alloys.

c) Draw the labeled structure of heart.

d) List four biomaterials used in dental implants.

Q1. B) Attempt any ONE **(06 Marks)**

a) State the material used in filling and restoration in tooth. Give its mechanical properties.

b) List four different biomaterials used in total joint replacement and its applications.

Q2. Attempt any FOUR **(16 Marks)**

a) List four features of surface of material.

b) Draw neat labeled Stress-Strain curve for ductile material.

c) Give composition and two properties of stainless steel.

d) List two properties and three applications of carbon.

e) List four types of prosthetic heart valves and draw two among them.

f) List four biomaterials filled in the deep cavities of tooth.

Q3. Attempt any FOUR **(16 Marks)**

a) State the four techniques used to study the surface of biomaterials.

b) How materials can be protected from corrosion.

c) Give the four applications of acrylic polymers.

d) State different materials used for different parts of cardiac pacemaker.

e) Draw the structure of typical bone composition.

Q4. A) Attempt any THREE **(12 Marks)**

a) Describe contact angle technique used in surface analysis.

b) Give four properties and two applications of alumina.

c) State two types of blood clot formation techniques and differentiate them.

d) Compare four types of bones with respect to their mechanical properties.

Q4. B) Attempt any ONE **(06 Marks)**

a) Write the procedure for testing the reliability of dental implant and list the materials used in porous dental implant.

b) Sketch graphically bone healing assisted by resorbable bone plate and explain it.

Q5. Attempt any FOUR **(16 Marks)**

a) List three imperfections in crystal and sketch any one.

b) Define resorbable ceramics and give its two uses.

c) List four applications of silicon rubber.

d) Comment on electrical stimulation on bone healing.

e) List two properties and two biomedical applications of nitinol.

f) List four types of total hip replacement devices and sketch any one.

Q6. Attempt any FOUR **(16 Marks)**

a) List advantages and disadvantages of PMMA and UHMWPE with reference to total knee replacement.

b) State the function of eye shields and list polymers used for its manufacturing.

c) Classify electromeric lenses and state material used for the same.

d) List different types of dialyzers and draw neat sketch of any one.

e) Draw neat labeled structure of kidney.