

Name : .....

Roll No. : .....

Invigilator's Signature : .....

**CS/M.Tech(BME)/SEM-2/MBMI-204-C/2012**

**2012**

**ARTIFICIAL DEVICES FOR CARDIOVASCULAR  
AND RENAL ABNORMALITIES**

Time Allotted : 3 Hours

Full Marks : 70

*The figures in the margin indicate full marks.*

*Candidates are required to give their answers in their own words  
as far as practicable.*

Answer any five questions.

5 × 14 = 70

1. What do you understand by artificial heart valves ?  
Differentiate between mechanical and bio-engineered heart  
valves. While designing an artificial heart valve what are the  
factors responsible for the effectiveness of the heart valve.

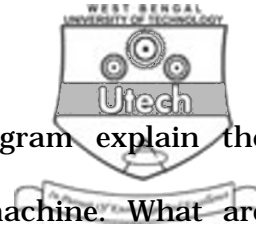
4 + 5 + 5

2. With the help of a neat sketch, describe the functioning of a  
homodialyzer. What is CRRT ? What are the different  
parameters to be monitored during the functioning of a  
Hemodialyzer. How do you measure the effectiveness of a  
hemodialysis machine ?

4 + 3 + 5 + 2

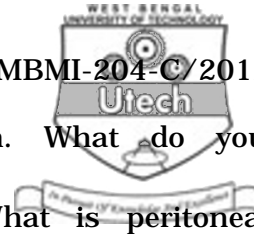
30160 ( M.Tech )

[ Turn over



3. With the help of a neatly labelled diagram explain the functioning of an Artificial Heart-Lung machine. What are bubble oxygenators and how do they function ? Between bubble and membrane oxygenators which one is functionally more effective and why ? 4 + 5 + 5
4. How do you measure Arterial Pump Flow Rate ? What are Priming Fluids and why are they essential ? What are the factors essential for the selection of priming fluids. How do the composition of the priming fluids vary depending on their functionalities ? 3 + 4 + 3 + 4
5. Describe the anatomy of the kidney. What are Renal Function Tests. Discuss the complications arising from chronic renal failure and the possible measures to overcome them. 5 + 5 + 4
6. What are the different abnormalities which may arise due to loss in the rhythmicity of the heart and interpret their recordings in the ECG. What is vector cardiography and what are cardiac vectors ? Explain. 8 + 3 + 3

CS/M.Tech(BME)/SEM-2/MBMI-204-C/2012



7. Discuss the physiology of micturition. What do you understand by Renal Ultrafiltration. What is peritoneal dialysis and when is it used ?

8 + 4 + 2

