

Printed Pages : 3



EBM-022

(Following Paper ID and Roll No. to be filled in your Answer Book)

PAPER ID : 101755

Roll No.

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B. Tech.(SEM. VII) (ODD SEM.) THEORY
EXAMINATION, 2014-15**ARTIFICIAL ORGANS & REHABILITATION
ENGINEERING**

Time : 3 Hours]

[Total Marks : 100

- Note :**
- (1) Attempt **all** questions.
 - (2) The questions are UNIT wise, and in each question the choice is 2/3 ratio.

1 Answer any two parts : 10×2=20

- (a) Define the term biomaterial. Discuss the properties of biomaterials used in artificial organs for designing of orthoses and prostheses
- (b) Discuss the Rheological properties of blood with emphasis on effect of shear rate, hematocrit, temperature and protein contents.
- (c) Explain Casson equation for blood flow properties through the vessels. What are the various problems associated with extracorporeal blood flow?

2 Answer any **four** parts : **5×4=20**

- (a) Discuss the structure and functioning of an artificial kidney. What are the different methods of artificial waste removal?
- (b) With the help of neat diagrams explain the different types of Hemodialysers. Give their advantages, disadvantages and applications.
- (c) Discuss the process for the separation of antigens from blood in ESRD patients.
- (d) Explain the analysis of mass transfer in dialyzers with reference to cross current and co-current flow.
- (e) How is regeneration of dialysate done? What is the required membrane configuration?
- (f) Discuss the functioning of wearable artificial kidney machine.

3 Answer any **two** parts : **10×2=20**

- (a) With the help of neat diagrams explain the functioning of artificial heart-lung machine.
- (b) With the help of neat diagrams explain the different types of Oxygenators. Give their advantages, disadvantages and applications.
- (c) Discuss in brief the development of artificial pancreas, blood and skin.

4 Answer any **two** parts : **10×2=20**

- (a) What is audiometry? What are its different types? Explain the working of an audiometer.
- (b) Explain the different type of Hearing aids giving their advantages and disadvantages.
- (c) Explain the principle and functioning of ophthalmoscope and retinoscope. What is I.A.B.P principle? Give its applications.

5 Answer any **two** parts : **10×2=20**

- (a) Discuss the applications of Rehabilitation Engineering for improvement of impairments, disabilities and handicaps.
- (b) With help of neat diagrams discuss the different externally powered controlled orthotics and prosthetics devices.
- (c) Discuss with suitable diagrams, the different types of rehabilitation devices for locomotion, visual, speech, hearing and spinal rehabilitation.
