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## Fifth Semester B.E. Degree Examination, Jan./Feb. 2021

### Clinical Instrumentation

Time: 3 hrs.

Max. Marks: 100

*Note: Answer any FIVE full questions, choosing ONE full question from each module.*

#### Module-1

- 1 a. Illustrate with a neat diagram the events of cardiac cycle for left ventricular function, showing changes in left atrial pressure, left ventricular pressure, aortic pressure, ventricular volume, the electro cardiogram and the phonocardiogram. (10 Marks)
- b. Explain the relation of the monophasic action potential of ventricular muscle to the QRS and T waves in the normal electrocardiogram. (10 Marks)

**OR**

- 2 a. Explain what is first degree block and second degree block in the human heart. (10 Marks)
- b. Discuss about the pre mature contractions in the human heart. (10 Marks)

#### Module-2

- 3 a. Explain the role of AZTEC Algorithm in the compression and processing of the ECG signal. (10 Marks)
- b. With a flow chart, explain the pressure signal processing in the Cath.Lab. (10 Marks)

**OR**

- 4 a. With a neat block diagram, explain the Foetal ECG processing circuit for Heart Rate Measurement. (10 Marks)
- b. Define oxygen saturation of blood. Illustrate the principle of reflection oximeter with a neat schematic diagram. (10 Marks)

#### Module-3

- 5 a. With a neat sketch, explain the gross anatomy of the human eye. (10 Marks)
- b. Explain the main mechanisms involved in the physiology of the vision. (10 Marks)

**OR**

- 6 a. Discuss about the Primary Open Angle Glaucoma (POAG). (10 Marks)
- b. Define strabismus. Describe the evaluation and the treatment of the concomitant strabismus. (10 Marks)

#### Module-4

- 7 a. Enumerate the common causes of redness of eyes. (05 Marks)
- b. List the types of Tonometers. Explain the method of estimating the visual fields. (10 Marks)
- c. Explain the components of normal Electro Retio Gram (ERG). (05 Marks)

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.  
2. Any revealing of identification, appeal to evaluator and /or equations written eg. 42+8 = 50, will be treated as malpractice.

**OR**

- 8 a. What is the wavelength of visible spectrum? Which light rays are absorbed by the cornea and crystalline lens of the eye? (04 Marks)  
b. What is the refractive power of the eye ball of the cornea and the crystalline lens? (06 Marks)  
c. What is distant direct ophthalmoscopy? What are the applications of distant direct ophthalmoscopy? (10 Marks)

**Module-5**

- 9 a. List the causes of vitreous Haemorrhage and mention the treatment for the same. (10 Marks)  
b. Discuss about the various techniques in vitrectomy. (10 Marks)

**OR**

- 10 a. Explain the applications of LASER based on the photocoagulation mechanism in ophthalmology. (10 Marks)  
b. Mention the modes of action of cryotherapy and also its users in opthalmology. (10 Marks)

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