

# School of Aeronautics (Neemrana)

Question Paper For Internal Assessment Examination (Theory) - Old Scheme i.e 2012 Syllabus

## Instructions For Students / Faculty

### Mid Term I (Total 40 Marks, 1 Hr. & 30 Min, Syllabus From Beginning of The Session)

Total number of questions to be given are 8, each carrying 10 marks and it is compulsory to attend 2 questions from each part i.e. Part A and B. There is a choice of two questions out of four in each part. Part A will be theoretical or derivation type (**Not More Than 70 Words For Question**). Part B will be fully numerically oriented questions (**Not More Than 70 Words For Question**), except for the list of subjects given below. No objective type or fill in the blanks shall be given, but subpart of question can be given for both Part A & B.

### Mid Term II (Total 50 Marks, 1 Hr. & 45 Min, Syllabus From Beginning of The Session)

Total number of questions to be given are 8, each carrying 10 marks and it is compulsory to attend 2 questions from Part A and three questions from Part B. There is a choice of two questions out of four in part A and 3 questions out of 4 in Part B. Part A will be theoretical or derivation type (**Not More Than 70 Words For Question**). Part B will be fully numerically oriented questions (**Not More Than 70 Words For Question**), except for the list of subjects given below. No objective type or fill in the blanks shall be given, but subpart of question can be given for both Part A & B.

### Mid Term III (Total 60 Marks, 2 Hrs, Syllabus From Beginning of The Session)

Total number of questions to be given are 10, each carrying 10 marks and it is compulsory to attend 2 questions from Part A and 4 questions from Part B. There is a choice of two questions out of four in part A and 4 questions out of 6 in Part B. Part A will be theoretical or derivation type (**Not More Than 70 Words For Question**). Part B will be fully numerically oriented questions (**Not More Than 70 Words For Question**), except for the list of subjects given below. No objective type or fill in the blanks shall be given, but subpart of question can be given for both Part A & B.

\* **LIST OF ELABORATIVE THEORY QUESTION SUBJECTS:** Aircraft Materials, Aircraft System, Aircraft Rules & Regulation-I, Mechanics of Composite Materials, Aircraft Design, Aircraft Rules & Regulation-II, Avionics-I, Helicopter Theory, Maintenance of Airframe and System Design, Avionics-II, Airlines and Airport Management, Maintenance of Power Plant & Systems

**FACULTY MEMBERS, PLEASE ENSURE EXCEPT ABOVE LISTED SUBJECTS, NO THEORITICAL ELABORATIVE QUESTION SHOULD BE GIVEN IN PART 'B' OF QUESTION PAPER**

**STUDENT IS ALLOWED TO ENTER DATE NOT MORE THAN 15 MIN AFTER STARTING OF**

STUDENT IS ALLOWED TO ENTER LATE NOT MORE THAN 15 MIN AFTER STARTING OF EXAM, AND MAY LEAVE THE EXAM HALL ON EXPIRY OF ATLEAST OF 1 Hr FROM THE STARTING TIME OF EXAMINATION

## Question Paper & Student Details

Mid Term*	Mid Term 1	Date of Submission of QP	30/08/2019
Name of Faculty*	RAVIRAJ SRIKRISHNA	Date of Examination*	07/09/2019
Subject*	7MH2 - Medical Electronics (Old)	Course*	B.Tech (Mechatronics Engine...
Batch	Second (2)	Semest...	Semester : 7
Email Id of Faculty:*	ravirajsrikrishna@gmail.com	Phone Number of Faculty*	820 917 0726

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Student Name		Student Reg No.	
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## Part A

Question : 1\*

What do you mean by Resting potential ? Explain it with proper circuit diagram.

Lesson Plan\*

1

Topic\*

Concept of resting poter

Source\*

BIO MEDICAL INST

Question : 2\*

What do you mean by Action potential? Explain it with proper diagram.

Lesson Plan\*

2

Topic\*

Basics of Action potentia

Source\*

BIO MEDICAL INST

Question : 3\*

Explain the working principle of an optical fiber? Also explain the types of Optical fiber.

Lesson Plan\*

9

Topic\*

Operation of optical fiber

Source\*

BIO MEDICAL INST

Question : 4\*

What do you understand by Bio electric potential? Also explain its physical significance.

Lesson Plan\*

2

Topic\*

Introduction of Bio elect

Source\*

BIO MEDICAL INST

## Part B

Question : 1\*

Explain the Construction & Function of ECG in detail.

Lesson Plan\*

5

Topic\*

Constructional details of

Source\*

BIO MEDICAL INST

Question : 2\*

Explain the following:  
i single mode optical fiber  
ii Multimode optical fiber

Lesson Plan\*

8

Topic\*

Classification of optical f

Source\*

BIO MEDICAL INST

Question : 3\*

Explain the principle & working of EEG with a neat diagram.

Lesson Plan\*

Topic\*

Source\*

Question : 4\*

Write down the advantages & disadvantages of an optical fiber

Lesson Plan\*

Topic\*

Source\*

Question : 5

Lesson Plan

Topic

Source

Question : 6

Lesson Plan

Topic

Source

Upload Scanned Document In Case of Numerical or Diagram for any of the above question

Mention question number with relevant fig / numerical / equations. Max 150 KB

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I have scrutinized the question paper. There is no spelling mistake or any type of irrelevant question.

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Answer Sheet Details	
Mid Term	Mid Term 1
Name of Faculty	Mr.RavirajSrikrishna
Subject	7MH2 - Medical Electronics (Old)
Date of Submission of QP	15/09/2019
Batch	Second (2)
Email Id of Faculty:	ravirajsrikrishna@gmail.com
Date of Examination	07/09/2019
Course	B.Tech (Mechatronics Engineering)
Semester	Semester : 7
Phone Number of Faculty	820-917-0726

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### Part A

#### Question : 1

Resting potential, the imbalance of electrical charge that exists between the interior of electrically excitable neurons (nerve cells) and their surroundings.

The resting potential of electrically excitable cells lies in the range of  $-60$  to  $-95$  millivolts ( $1$  millivolt =  $0.001$  volt), with the inside of the cell negatively charged. If the inside of a cell becomes more electronegative (i.e., if the potential is made greater than the resting potential), the membrane or the cell is said to be hyperpolarized.

If the inside of the cell becomes less negative (i.e., the potential decreases below the resting potential), the process is called depolarization.

#### Question : 2

Action potential, the brief (about one-thousandth of a second) reversal of electric polarization of the membrane of a nerve cell (neuron) or muscle cell. In the neuron an action potential produces the nerve impulse, and in the muscle cell

It produces the contraction required for all movement. Sometimes called a propagated potential because a wave of excitation is actively transmitted along the nerve or muscle fibre, an action potential is conducted at speeds that range from  $1$  to  $100$  metres ( $3$  to  $300$  feet) per second, depending on the properties of the fibre and its environment.

The resulting resting potential usually measures about  $-75$  millivolts (mV), or  $-0.075$  volt, the minus sign indicating a negative charge inside

**Question : 3**

Fiber optics, also spelled fibre optics, the science of transmitting data, voice, and images by the passage of light through thin, transparent fibers. In telecommunications, fiber optic technology has virtually replaced copper wire in long-distance telephone lines, and it is used to link computers within local area networks. Fiber optics is also the basis of the fiber scopes used in examining internal parts of the body (endoscopy) or inspecting the interiors of manufactured structural products.

The basic medium of fiber optics is a hair-thin fiber that is sometimes made of plastic but most often of glass. A typical glass optical fiber has a diameter of 125 micro metres ( $\mu\text{m}$ ). This is actually the diameter of the cladding, or outer reflecting layer. The core, or inner transmitting cylinder, may have a diameter as small as 10  $\mu\text{m}$ . Through a process known as total internal reflection, light rays beamed into the fiber can propagate within the core for great distances with remarkably little attenuation, or reduction in intensity. The degree of attenuation over distance varies according to the wavelength of the light and to the composition of the fiber.

Types of fiber: 1. Single mode step index  
2. Multimode step index

**Question : 4**

Bioelectricity, electric potentials and currents produced by or occurring within living organisms. Bioelectric potentials are generated by a variety of biological processes and generally range in strength from one to a few hundred millivolts. In the electric eel, however, currents of one ampere at 600 to 1,000 volts are generated.

Bioelectric potentials are identical with the potentials produced by devices such as batteries or generators. In nearly all cases, however, a bioelectric current consists of a flow of ions (i.e., electrically charged atoms or molecules), whereas the electric current used for lighting, communication, or power is a movement of electrons. If two solutions with different concentrations of an ion are separated by a membrane that blocks the flow of the ions between them, the concentration imbalance gives rise to an electric-potential difference between the solutions. In most solutions, ions of a given electric charge are accompanied by ions of opposite charge, so that the solution itself has no net charge.

**Part B**

**Question : 1**

The electrocardiogram (ECG or EKG) is a diagnostic tool that is routinely used to assess the electrical and muscular functions of the heart. While it is a relatively simple test to perform, the interpretation of the ECG tracing requires significant amounts of training. Numerous textbooks are devoted to the subject.

The heart is a two stage electrical pump and the heart's electrical activity can be measured by electrodes placed on the skin. The electrocardiogram can measure the rate and rhythm of the heartbeat, as well as provide indirect evidence of blood flow to the heart muscle.

A standardized system has been developed for the electrode placement for a routine ECG. Ten electrodes are needed to produce 12 electrical views of the heart. An electrode lead, or patch, is placed on each arm and leg and six are placed across the chest wall. The signals received from each electrode are recorded. The printed view of these recordings is the electrocardiogram.

By comparison, a heart monitor requires only three electrode leads - one each on the right arm, left arm, and left chest. It only measures the rate and rhythm of the heartbeat. This kind of monitoring does not constitute a complete ECG

**Question : 2**

Single mode cables are designed to carry light directly down the fiber. It is a single strand of glass fiber and has a diameter of 8.5-10 microns. Because it has one mode of transmission, it will propagate 1310 or 1550 nm.

Compared to the multimode fiber, the single mode patch cords carry a higher bandwidth, but it requires a light source with a narrow spectral width. The single mode gives a higher transmission and up to 50 times more distance than the multimode. The core from a single mode cable is smaller than one from a multimode.

Single mode is a vital part of broadband networks. It designed to transmit data over long distances, thus making it perfect for cable television networks or college campuses.

Multimode fibers give high bandwidths at high speeds. Light waves are dispersed into numerous paths, or modes, as they travel through the cable's core typically 850 or 1300nm.

Multimode cables are considered to be the "domestic" fiber as they are used for local-area network, as an example, they can be used in FTTH. Multimode can reach up to 100Gbps Ethernet

**Question : 3**

The electroencephalogram (EEG) is a measure of brain waves. It is a readily available test that provides evidence of how the brain functions over time.

The EEG is used in the evaluation of brain disorders. Most commonly it is used to show the type and location of the activity in the brain during a seizure. It also is used to evaluate people who are having problems associated with brain function. These problems might include confusion, coma, tumors, long-term difficulties with thinking or memory, or weakening of specific parts of the body (such as weakness associated with a stroke).

An EEG is also used to determine brain death. It may be used to prove that someone on life-support equipment has no chance of recovery.

Scientists first captured and recorded brain waves in dogs in 1912. By the 1950s the EEG was used commonly throughout the United States.

**Question : 4**

Advantages of optical fiber :

- 1.The optical fibers have greater information carrying capacities than metallic conductors.
- 2.The optical fiber are lighter and smaller.The optical fiber cables are cheaper to transport and easier to install than metal cables.
- 3.The optical fibers and fiber cables are very strong and flexible.
- 4.The optical fibers are so slender that they do not break when wrapped around curves of only a few centimeter radius.
- 5.One of the most important advantage of fibers is that they can carry large amount of information in either digital or analog form.
- 6.Optical fiber is well protected from external interference.
- 7.Radar and other signals cannot introduce any interference in the fiber.

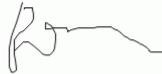
Disadvantage of optical fiber :

- 1.It is a high investment cost or installation is costly.
- 2.It is need more expansive transmitter and receiver equipments.
- 3.More difficult and expensive to splice then wires.
- 4.It cannot carry electrical power to operate terminal devices.
- 5.At higher optical powers, fiber is more prone to fiber flux, so optical fiber may get damaged

**Question : 5****Question : 6**

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**I have scrutinized the answer sheet. There is no spelling mistake or any type of irrelevant answers.**



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