[LN 0818] AUGUST 2018 **Sub. Code: 2456**

BACHELOR IN PROSTHETICS AND ORTHOTICS

FIRST YEAR

PAPER VI – BASIC ELECTRONICS

Q.P. Code: 802456

Time: Three Hours **Maximum : 100 Marks**

Answer All questions

I. Elaborate on: **(3 x 10 = 30)**

1. DC Circuits and AC Circuits.
2. Transducers for Temperature, Light, Pressure and Sound.
3. Electrical Safety and Safety Procedure for servicing equipment.

II. Write notes on: **(8 x 5 = 40)**

1. Find the value of Current if the voltage is 20 V and Two Resistances 5 ohms and 10 ohms are connected in parallel.
2. Working Principle of Transformer.
3. Semiconductors.
4. Ideal Characteristics of Operational Amplifier.
5. Advantages of Electronic Measuring Instruments.
6. Types of Electrodes.
7. Pin Connection and Color Codes in electrical wiring.
8. How does a prosthetic robotic arm work?

III. Short answers on: **(10 x 3 = 30)**

1. Potential Difference.
2. RMS Value.
3. Resistors.
4. Transformer.
5. Extrinsic Semiconductor.
6. Conduction Band.
7. Amplifier.
8. Feedback.
9. MCB.
10. Bioelectricity.

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[LO 0219] FEBRUARY 2019 **Sub. Code: 2456**

BACHELOR IN PROSTHETICS AND ORTHOTICS

FIRST YEAR

PAPER VI – BASIC ELECTRONICS

Q.P. Code: 802456

Time: Three Hours **Maximum : 100 Marks**

Answer All questions

I. Elaborate on: **(3 x 10 = 30)**

1. Resistors, Color Code of Resistors, Resistors in series and in parallel.
2. Single Phase and Three Phase Supply System.
3. Bio-Electricity and its application in the field of P and O.

II. Write notes on: **(8 x 5 = 40)**

1. Sine Wave, Frequency, Period, Phase and RMS Value.
2. A transformer has 100 turns of the primary winding and 10 turns of the secondary winding. Find out the secondary voltage for the given primary voltage 200 V.
3. Energy Band diagram of Semiconductor.
4. Insulators with examples.
5. Transducer.
6. Implanted Electrodes and Surface Electrodes.
7. Uses of Microprocessor in the field of P and O.
8. Earth leakage detectors.

III. Short answers on: **(10 x 3 = 30)**

1. Units for Voltage, Current, Resistance, Charge, Power and Frequency.
2. Microprocessor.
3. Doping.
4. Valence Band.
5. Operational Amplifier.
6. Measuring Instruments.
7. Sensors.
8. Line, Neutral and Earth.
9. Fuse.
10. EMG.

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[LP 0819] AUGUST 2019 **Sub. Code: 2456**

BACHELOR IN PROSTHETICS AND ORTHOTICS

FIRST YEAR

PAPER VI – BASIC ELECTRONICS

Q.P. Code: 802456

Time: Three Hours **Maximum : 100 Marks**

Answer All questions

I. Elaborate on: **(3 x 10 = 30)**

1. Transformer and its types.
2. Single Phase and Three Phase Supply System.
3. Myo-electrodes and its application in the field of P and O.

II. Write notes on: **(8 x 5 = 40)**

1. Voltage, Current, Resistance, Charge and Power.
2. Calculate the total resistance for the 4 resistors value of 10 ohms each are connected in parallel.
3. A transformer has 200 turns of the secondary winding and 10 turns of the Primary winding. Find out the secondary voltage for the given primary voltage 150 V.
4. Energy Band diagram of Semiconductor.
5. Voltage Gain and Current Gain in Amplifier.
6. Negative feedback and Positive feedback
7. Fuse.
8. Muscle Action Potential.

III. Short answers on: **(10 x 3 = 30)**

1. Ohm’s Law.
2. Sine Wave.
3. Frequency.
4. Voltage Ratio in Transformer.
5. Intrinsic Semiconductor.
6. Insulators.
7. Transducer.
8. Microprocessor.
9. Surface Electrodes.
10. Myo-electricity.

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THE TAMIL NADU DR. M.G.R. MEDICAL UNIVERSITY

[AHS 0321] **MARCH 2021** **Sub. Code: 2456**

(AUGUST 2020 EXAM SESSION)

BACHELOR IN PROSTHETICS AND ORTHOTICS

FIRST YEAR (Regulation 2017-2018)

PAPER VI – BASIC ELECTRONICS

Q.P. Code : 802456

Time: Three hours **Answer ALL Questions** **Maximum: 100 Marks**

I. Elaborate on: **(3 x 10 = 30)**

1. 3 Resistors are in Series and Parallel.
2. Transducers.
3. Bio-Electricity.

II. Write notes on: **(8 x 5 = 40)**

1. RMS Value.
2. Semiconductors.
3. Voltage and Current Gain.
4. Oscillators.
5. Surface Electrodes.
6. MCB.
7. Integrated Circuit.
8. Safety Procedure to be followed while servicing the equipment.

III. Short answers on: **(10 x 3 = 30)**

1. Voltage.
2. Ohm’s Law.
3. Direct Current.
4. Sine wave.
5. Frequency.
6. Transformer.
7. Doping.
8. Insulators.
9. Amplifier.
10. Voltage Regulators.

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THE TAMIL NADU DR. M.G.R. MEDICAL UNIVERSITY

[AHS 0422] APRIL 2022 Sub. Code: 2456

(FEBRUARY 2021 & AUGUST 2021 EXAM SESSIONS)

BACHELOR IN PROSTHETICS AND ORTHOTICS

FIRST YEAR (Regulations 2017-2018)

PAPER VI – BASIC ELECTRONICS

Q.P NO. 802456

Time: Three Hours **Answer All questions** **Maximum : 100 Marks**

I. Elaborate on : (3X10=30)

1. Explain the working principle of Transformer.
2. What is semiconductor? Explain in detail about intrinsic semiconductor.
3. Single Phase and Three Phase Supply System.

II. Write Notes on : (8X5=40)

1. Derive RMS value of current and voltage.
2. Explain in detail about electromyography.
3. Transducers.
4. Safety Procedure to be followed while servicing the equipment.
5. Negative feedback and Positive feedback
6. What is sensor? Explain types of sensors.
7. A Transformer has a primary coil and a secondary coil with the number of loops are 500and 5000. Input voltage is 220 V. What is the output Voltage?
8. What is resistor? Difference between resistor in series and parallel.

III. Short Answers on : (10X3=30)

1. What is muscle action potential?
2. What is Ohm’s Law?
3. What is the meaning of Doping?
4. Define frequency and its unit.
5. What is voltage regulator?
6. Write down names of Electronic Measuring Instrument.
7. What is MCB?
8. Explain Electro motive force.
9. Define Power factor.
10. What is Oscillator and its use?

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THE TAMIL NADU DR. M.G.R. MEDICAL UNIVERSITY

[AHS 0423] **APRIL 2023** **Sub. Code: 2456**

BACHELOR IN PROSTHETICS & ORTHOTICS
FIRST YEAR (Regulation 2017-2018 onwards)
PAPER VI – BASIC ELECTRONICS
Q. P. Code: 802456

Time: Three Hours **Answer All questions** **Maximum : 100 Marks**

I. Elaborate on : **(3 X 10 = 30)**

1. Explain Transformer and its types.
2. Explain in detail the simple safety procedure to be taken when servicing equipment.
3. What do you understand by integrated circuit? Explain briefly about its applications and types.

II. Write Notes on : **(8X5=40)**

1. Explain difference between intrinsic and extrinsic semiconductor.
2. Explain the difference between AC and DC circuit.
3. Voltage regulators Integrated circuits.
4. Total Resistance equations for 3 resistors connected in series and in Parallel.
5. Voltage Gain, Current Gain, Power Gain in Amplifier.
6. Describe the purpose and working principle of fuse and MCB.
7. Single phase and Three Phase supply system.
8. What is sensor and explain about its types and application?

III. Short Answers on : **(10 X 3 = 30)**

1. What is the definition and function of an amplifier?
2. What is Bioelectricity?
3. What is Electromyography?
4. Define Voltage and its unit.
5. What are the current practice in pin connection and colour codes?
6. What is insulator?
7. Define microprocessor and its application in prosthetic field.
8. Write down the SI unit of Potential difference, Frequency and current.
9. Define transformer ratio.
10. What is Conduction band?

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THE TAMIL NADU DR. M.G.R. MEDICAL UNIVERSITY

[AHS 1123] **NOVEMBER 2023** **Sub. Code: 2456**

BACHELOR IN PROSTHETICS & ORTHOTICS
FIRST YEAR (Regulation 2017-2018 onwards)
PAPER VI – BASIC ELECTRONICS
Q. P. Code: 802456

Time: Three Hours **Answer All questions** **Maximum : 100 Marks**

I. Elaborate on : **(3 X 10 = 30)**

1. Bio-Electricity and its application in the field of P and O.
2. Explain operational amplifier and their ideal characteristics.
3. Explain different types of Semiconductors.

II. Write Notes on : **(8 X 5 = 40)**

1. Explain different types of Electrodes.
2. Explain about the function of line, neutral and Earth in single phase system.
3. Current practice in pin connection and colour code.
4. Explain about different types of resistors.
5. Myoelectrodes and its application in P and O.
6. Transducers for temperature and pressure and its application in P and O.
7. Total Resistance equations for 4 resistors connected in series and in Parallel.
8. Digital and Analogue instruments.

III. Short Answers on : **(10 X 3 = 30)**

1. What is Sine Wave?
2. What is Transformer?
3. What is voltage regulator?
4. Define turns ratio in transformer.
5. What is the function of ammeter, voltmeter and wattmeter?
6. Define Myo-electricity.
7. Define Voltage and Current relationship.
8. Write down the SI unit of Charge, Current and resistance.
9. What is positive and negative feedback.
10. Define Electromyography.

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THE TAMIL NADU DR. M.G.R. MEDICAL UNIVERSITY

[AHS 0424] **APRIL 2024** **Sub. Code: 2456**

BACHELOR IN PROSTHETICS & ORTHOTICS
FIRST YEAR (Regulation 2017-2018 onwards)
PAPER VI – BASIC ELECTRONICS
Q. P. Code: 802456

Time: Three Hours **Answer All questions** **Maximum : 100 Marks**

I. Elaborate on : **(3 X 10 = 30)**

1. Draw a labeled diagram and discuss in detail the working principles of AC and DC circuits.
2. Define Semiconductors. Write briefly about working and uses of Semiconductors.
3. Discuss in detail about Amplifiers and its functions.

II. Write notes on: **(8 x 5 = 40)**

1. Relationship between Voltage and Current.
2. Core Type and Shell Type Transformer.
3. Pressure Transducer.
4. Surface Electrodes.
5. Sensors.
6. Color Codes and pin connections in electrical wiring.
7. Fuse.
8. Muscle Action Potentials.

III. Short answers on: **(10 x 3 = 30)**

1. Phase.
2. Resistance.
3. Turns Ratio.
4. Insulators.
5. Drift Voltage.
6. Electronic Measuring Instruments.
7. Light Transducer.
8. Micro electrodes.
9. Three Phase Supply System.
10. Bioelectricity.

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THE TAMIL NADU DR. M.G.R. MEDICAL UNIVERSITY

[AHS 1124] **NOVEMBER 2024** **Sub. Code: 2456**

BACHELOR IN PROSTHETICS & ORTHOTICS
FIRST YEAR (Regulation 2017-2018 onwards)
PAPER VI – BASIC ELECTRONICS
Q. P. Code: 802456

Time: Three Hours **Answer All questions** **Maximum : 100 Marks**

I. Elaborate on : **(3 X 10 = 30)**

1. Explain briefly analog and digital instruments and its application and advantage.
2. What are the safety procedure to be taken when servicing equipments?
3. Myo-electrodes and its application in the field of P and O.

II. Write Notes on : **(8 X 5 = 40)**

1. Potential difference, Resistance, Charge and Power.
2. What is meaning of Doping?
3. Negative feedback and positive feedback.
4. Energy Band diagram of Semiconductor.
5. Voltage Gain and Current Gain in Amplifier.
6. Surface Electrodes.
7. Fuse.
8. Muscle Action Potential.

III. Short Answers on : **(10 X 3 = 30)**

1. Derive RMS value of current and voltage.
2. Resistors sensitive to temperature
3. Sine Wave.
4. Frequency.
5. Voltage Ratio in Transformer.
6. Intrinsic Semiconductor.
7. Insulators.
8. Transducer.
9. Microprocessor.
10. Miniature Circuit Breakers (MCB).

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THE TAMIL NADU DR. M.G.R. MEDICAL UNIVERSITY

[AHS 1125] **NOVEMBER 2025** **Sub. Code: 2456**

BACHELOR IN PROSTHETICS & ORTHOTICS
FIRST YEAR (Regulation 2017-2018 onwards)
PAPER VI – BASIC ELECTRONICS
Q. P. Code: 802456

Time: Three Hours **Answer All questions** **Maximum : 100 Marks**

I. Elaborate on : **(3 x 10 = 30)**

1. Electronic measuring instruments and its application in P & O.
2. Explain generation and propagation of Action potential across cell membrane with necessary diagram.
3. Explain Equivalent circuit properties of Needle and Micro-electrodes in detail.

II. Write Notes on : **(8 x 5 = 40)**

1. Describe the formation of P-N junction diode.
2. Explain the color coding of resistors.
3. Enlist various types of electrodes and their applications.
4. What are the importance of continuous monitoring of bioelectric signals?
5. What is gradation of muscular activity?
6. Explain briefly about the various types of bioelectric signal that are found inside the human body.
7. Explain forward bias PN Junction diode with diagram.
8. General Feedback equation.

III. Short Answers on : **(10 x 3 = 30)**

1. Nerve conduction.
2. Electro-Electrolyte Interface.
3. Mention the uses of stepper motor.
4. Define resistance and list the specifications.
5. State the factors affecting the capacitance of capacitor.
6. Classify transformers based on frequency of operation.
7. Define turns ratio, current ratio and voltage ratio of a transformer.
8. State the need of fuse in an electronic equipment.
9. Enlist various sources of bioelectric potentials in the human body.
10. Differentiate between insulator, conductor and semiconductor.

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