

# ELECTRICITY AND ELECTRONICS (866)

## BIFURCATED SYLLABUS

*(As per the Reduced Syllabus for ISC - Class XII Year 2022 Examination)*

| SEMESTER 1<br>(Marks: 40) |                                                                                                                                                                                                            | SEMESTER 2<br>(Marks: 40) |                                                                                                                                                                                                                                                                                                                                |
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| UNIT NO.                  | NAME OF THE UNIT                                                                                                                                                                                           | UNIT NO.                  | NAME OF THE UNIT                                                                                                                                                                                                                                                                                                               |
| 1.                        | Distribution of electric power. Idea of a simple distribution system. Mention of the local power system should be made.                                                                                    | 6.                        | Power supply for electronic apparatus. Mains transformer. The diode; half wave, full wave and bridge rectifiers, voltage doubler. Filters; RC filters, chokes, bleeder resistance and its functions.                                                                                                                           |
| 2.                        | The D.C. generator and motor. Use of split-ring commutators; constructional features. Shunt series and compound field connections and their characteristics. Starting of D.C. motors. Ideas on back e.m.f. | 7.                        | Vacuum triode. Structure of the vacuum triode valve. The control grid. Triode valve characteristics. Triode parameters; anode resistance, mutual conductance and amplification factors; relationship between the above parameters. Triode as a voltage amplifier. Bias voltage, cathode resistor and cathode bypass capacitor. |
| 3.                        | The A.C. motor. Ideas on A.C. motors (single phase only). The rotating field. Methods of shunting: capacitance start, split phase start. Single-phase induction motor types.                               | 8.                        | Semiconductor Transistors. The junction transistor: PNP and NPN types. Introduction to various methods of construction; their characteristics including handling procedures and precautions.                                                                                                                                   |
| 4.                        | Introduction to electronics. Concept of electron flow. Common components employed in electronic circuits; resistors, capacitors and inductors; their structure, types and uses.                            | 9.                        | Transistor amplifier. Introduction to the common-base, common emitter and common collector amplifiers. Comparison of the voltage, current and power gains and input and output resistances (elementary approach only). Phase relationship. Bias stabilization.                                                                 |
| 5.                        | Diodes. Thermionic diode; semiconductor diode. Structure of vacuum diode and semiconductor diode.                                                                                                          | 10.                       | The amplifier. A typical amplifier voltage and power amplification. Matching of the power output stage to a speaker.                                                                                                                                                                                                           |

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|  |  | 11. | <p>Apparatus for reproducing and recording sounds. Range of hearing, recording and reproducing.</p> <p>Characteristics of microphones; types of microphones: carbon, crystal, moving-coil and ribbon types. The earphone; moving-coil loudspeakers; permanent magnet. Electrostatic speaker.</p> |
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