

**B. VOC**

**In**

**ELECTRONIC MANUFACTURING  
SERVICES  
(UGC)**

**Program Outcomes:**

- Diagnose and repair all major electronics system
- Document repairs of electronic goods accurately and descriptive of concern cause and correction
- Effectively locate and utilize technical information required for the repair of electronic gadgets
- Work safely and responsibly within shop standards and environmental guidelines

# **B. VOC**

## **In**

# **ELECTRONIC MANUFACTURING SERVICES**

## **(UGC)**

### **Course Relevance:**

The Indian electronics industry is one of the largest and fastest - growing industries in the world. Electronics manufacturing industry in India needs to grow at a much faster pace due to the ever - growing demand for consumer electronics, IT and telecom goods. This demand is expected to grow to US\$ 400 billion by 2020, according to some estimates.

India is an attractive hub for foreign investments in the manufacturing sector as well. Several mobile phones, luxury and automobile brands, among others, have set up or are looking to establish their manufacturing bases in the country.

The manufacturing sector of India has the potential to reach US\$ 1 trillion by 2025 and India is expected to rank amongst the top three growth economies and manufacturing destination of the world by the year 2020.

Here rises the demand for skilled professional Electronics Manufacturing Service providers. B. Voc in Electronic Manufacturing Services is specifically designed for students to gain skills & knowledge of Electronic Manufacturing Services so that they can relate themselves to the expected surge in Electronic Manufacturing industry.

**Maulana Abul Kalam Azad University of Technology, West Bengal**  
(Formerly West Bengal University of Technology)

**B.Voc. in Electronic Manufacturing Services (UGC)**  
**(Effective for Academic Session 2018-2019)**

**Year - 1 - Diploma (SEMESTER - I)**

Course	Component	Theory / Practical	Internal (Theory)	External (Theory)	Internal (Practical)	External (Practical)	Credit		
							L	T	P
UGEN - 101 ENGLISH LANGUAGE AND COMMUNICATIVE SKILLS	Generic	Theory & Practical	10	40	10	40	2	1	3
UGEN - 102 COMPUTER FUNDAMENTALS & IT	Generic	Theory & Practical	10	40	10	40	2	1	3
UEMSV - 103 FUNDAMENTAL OF ELECTRICAL	Skill	Theory & Practical	10	40	10	40	2	1	3
UEMSV - 104 PRINCIPLE OF ELECTRONICS	Skill	Theory & Practical	10	40	10	40	2	1	3
UEMSV - 191 IDENTIFICATION OF COMPONENTS, TOOLS, EQUIPMENT, SOLDERING & DE - SOLDERING TECHNIQUES (PRACTICAL)	Skill	Practical	-	-	20	80	-	-	6
<b>All Generic Components common to all B. Voc. courses.</b> <b>Industrial Training of 5 - 6 weeks of 6 credits in each year followed by report writing and Viva Voce.</b> <b>These credits will be evaluated in semester 6</b>									

**Year - 1 - Diploma (SEMESTER -II)**

Course	Component	Theory / Practical	Internal (Theory)	External (Theory)	Internal (Practical)	External (Practical)	Credit		
							L	T	P
UGEN - 201 SOFT SKILL & PERSONALITY DEVELOPMENT	Generic	Theory & Practical	10	40	10	40	2	1	3
UGEN - 202 BUSINESS ANALYSIS: ENVIRONMENT, SALES & MARKETING	Generic	Theory & Practical	10	40	10	40	2	1	3
UEMSV - 203 ELCTRONICS DEVICES & CIRCUITS	Skill	Theory & Practical	10	40	10	40	2	1	3
UEMSV - 204 DIGITAL ELCTRONICS	Skill	Theory & Practical	10	40	10	40	2	1	3
UEMSV - 205 ELECTRONIC MEASUREMENT & INSTRUMENTATION	Skill	Theory & Practical	10	40	10	40	2	1	3
<b>All Generic Components common to all B. Voc. courses.</b> <b>Industrial Training of 5 - 6 weeks of 6 credits in each year followed by report writing and Viva Voce.</b> <b>These credits will be evaluated in semester 6</b>									

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**Year - 2-Advanced Diploma (SEMESTER -III)**

Course	Component	Theory / Practical	Internal (Theory)	External (Theory)	Internal (Practical)	External (Practical)	Credit		
							L	T	P
UGEN - 301 VALUE EDUCATION & HUMAN RIGHTS	Generic	Theory & Practical	10	40	10	40	2	1	3
UGEN - 302 BASIC ACCOUNTING	Generic	Theory & Practical	10	40	10	40	2	1	3
UEMSV - 303 MICROPROCESSOR	Skill	Theory & Practical	10	40	10	40	2	1	3
UEMSV - 304 AUDIO& VIDEO ENGINEERING	Skill	Theory & Practical	10	40	10	40	2	1	3
UEMSV - 305 FUNDAMENTAL OF TROUBLESHOOTING ELECTRONIC EQUIPMENT	Skill	Theory & Practical	10	40	10	40	2	1	3
<b>All Generic Components common to all B. Voc. courses.</b> <b>Industrial Training of 5 - 6 weeks of 6 credits in each year followed by report writing and Viva Voce.</b> <b>These credits will be evaluated in semester 6</b>									

**Year - 2 -Advanced Diploma (SEMESTER - IV)**

Course	Component	Theory / Practical	Internal (Theory)	External (Theory)	Internal (Practical)	External (Practical)	Credit		
							L	T	P
UGEN - 401 ENVIRONMENTAL STUDIES	Generic	Theory & Practical	10	40	10	40	2	1	3
UGEN - 402 QUALITY MANAGEMENT	Generic	Theory & Practical	10	40	10	40	2	1	3
UEMSV - 403 PC SOFTWARE	Skill	Theory & Practical	10	40	10	40	2	1	3
UEMSV - 404 MOBILE & SMART PHONE	Skill	Theory & Practical	10	40	10	40	2	1	3
UEMSV - 405 TROUBLESHOOTING & MAINTENANCE OF ELECTRONIC EQUIPMENT - I	Skill	Theory & Practical	10	40	10	40	2	1	3
<b>All Generic Components common to all B. Voc. courses.</b> <b>Industrial Training of 5 - 6 weeks of 6 credits in each year followed by report writing and Viva Voce.</b> <b>These credits will be evaluated in semester 6</b>									

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**Year - 3- Degree (SEMESTER -V)**

Course	Component	Theory / Practical	Internal (Theory)	External (Theory)	Internal (Practical)	External (Practical)	Credit		
							L	T	P
UGEN - 501 INDIAN ECONOMY & SOCIAL CHANGES	Generic	Theory & Practical	10	40	10	40	2	1	3
UGEN - 502 RESEARCH METHODOLOGY	Generic	Theory & Practical	10	40	10	40	2	1	3
UEMSV - 503 GOOD MANUFACTURING CONCEPT & PRACTICES	Skill	Theory & Practical	10	40	10	40	2	1	3
UEMSV - 504 TROUBLESHOOTING & MAINTENANCE OF ELECTRONIC EQUIPMENT – II	Skill	Theory & Practical	10	40	10	40	2	1	3
UEMSV – 591 PROJECT	Skill	Practical	-	-	20	80	-	-	6
<b>All Generic Components common to all B. Voc. courses.</b> <b>Industrial Training of 5 - 6 weeks of 6 credits in each year followed by report writing and Viva Voce.</b> <b>These credits will be evaluated in semester 6</b>									

**Year - 3 - Degree (SEMESTER - VI)**

Course	Component	Theory / Practical	Internal (Theory)	External (Theory)	Internal (Practical)	External (Practical)	Credit		
							L	T	P
UGEN - 601 GENERAL HUMAN PSYCHOLOGY & HR MANAGEMENT	Generic	Theory & Practical	10	40	10	40	2	1	3
UGEN - 602 ENTREPRENEURSHIP DEVELOPMENT PROGRAMME	Generic	Theory & Practical	10	40	10	40	2	1	3
UEMSV - 681 INDUSTRIAL TRAINING	Skill	Practical	-	-	-	300			18
<b>All Generic Components common to all B. Voc. courses.</b> <b>Industrial Training of 5 - 6 weeks of 6 credits in each year followed by report writing and Viva Voce.</b> <b>These credits will be evaluated in semester 6</b>									

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**Year - 1 Diploma (SEMESTER - I)**

**Paper Title: UGEN – 101: ENGLISH LANGUAGE AND COMMUNICATIVE SKILLS**

**Theory: 40**  
**Internal Assessment: 10**  
**Total Marks: 50**  
**Time: 3 hours**

**Objective:** The objective of this paper is to familiarize the students with the importance of Communication and its associated components in the hard core corporate sector.

**Instructions:**

- The syllabus of this paper has been divided into FOUR units.
- Examiner will set a total of **NINE** questions comprising two questions from each unit, including Question No. 1 (compulsory) of short answer type covering the whole syllabus.
- The students are required to attempt one question from each unit and the entire Compulsory Question No. 1.
- All questions carry equal marks.

**UNIT - I**

The Sentence and Its Structure - How to Write Effective Sentences - Phrases - What Are They? - The Noun Clauses - The Adverb Clause - The Relative Clause - How the Clauses Are Conjoined - Word - Classes and Related Topics - Understanding the Verb - Understanding the Auxiliary Verb - Understanding the Adverbs - Understanding the Pronoun - Prepositions.

**UNIT - II**

Spelling and Pronunciation - Pronunciation, The Tense and Related Topics - Presentness and Present Tenses - The Presentness of a Past Action - Interrogatives and Negatives - Negatives - How to Frame Questions - What's What? - Polite Expressions - Some Time Expressions - In Conversation – Letter Writing - Academic Assignments.

**UNIT - III**

Self - Assessment; Identifying Strength & Limitations; Habits, Will - Power and Drives, Developing Self - Esteem and Building Self - Confidence, Significance of Self - Discipline, Understanding Perceptions, Attitudes, and Personality Types, Mind - Set: Growth and Fixed, Values and Beliefs, Motivation and Achieving Excellence; Self - Actualization Need; Goal Setting, Life and Career Planning , Constructive Thinking, Communicating Clearly: Understanding and Overcoming barriers.

**UNIT - IV**

Active Listening, Persuasive Speaking and Presentation Skills, Conducting Meetings, Writing Minutes, Sending Memos and Notices; etiquette: Effective E - mail Communication; Telephone Etiquette, Body Language in Group Discussion and Interview.

**Practical based on UGEN - 101**

**Practical: 40**  
**Internal Assessment: 10**  
**Total Marks: 50**  
**Time: 3 hours**

**Instructions:**

- Examiner will set total of four questions covering the whole syllabus.
- Student will attempt any three question
- Each question carries 5 marks.
- Practical file carries 5 marks and 20 marks for practical work and viva - voce.
- Practical paper will be conducted by the college and marks will be submitted to University.

**Planning for Practical session:**

- Conversation classes on contemporary issues
- Writing of corporate CVs
- PPT presentation on selected issues
- Group discussion
- Tips to face the interviews and mock sessions

**Books Recommended:**

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- Dorch, Patricia. What Are Soft Skills? New York: Execu Dress Publisher, 2013.
- Kamin, Maxine. Soft Skills Revolution: A Guide for Connecting with Compassion for Trainers, Teams, and Leaders. Washington, DC: Pfeiffer & Company, 2013.
- Klaus, Peggy, Jane Rohman & Molly Hamaker. The Hard Truth about Soft Skills. London: HarperCollins E - books, 2007.
- Petes S. J. , Francis. Soft Skills and Professional Communication. New Delhi: Tata McGraw - Hill Education, 2011.
- Stein, Steven J. & Howard E. Book. The EQ Edge: Emotional Intelligence and Your Success. Canada: Wiley & Sons, 2006.

**Paper Title: UGEN – 102: COMPUTER FUNDAMENTALS & IT**

**Theory: 40**  
**Internal Assessment: 10**  
**Total Marks: 50**  
**Time: 3 hours**

**Objectives:** The objective of this course is to familiarize students with Fundamentals of Computer and IT applications. It enables the student to get practical exposure towards MS - Office tools.

**Instructions:**

- The syllabus of this paper has been divided into FOUR units.
- Examiner will set a total of **NINE** questions comprising two questions from each unit, including Question No. 1 (compulsory) of short answer type covering the whole syllabus.
- The students are required to attempt one question from each unit and the entire Compulsory Question No. 1.
- All questions carry equal marks.

**UNIT - I**

**KNOWING COMPUTER:** Introduction, Objectives, Basic Applications of Computer, Components of Computer System: Central Processing Unit, Keyboard, mouse and VDU, Other Input devices, Other Output devices, Computer Memory. Concept of Hardware and Software: Hardware, Software: Application Software, Systems software. Concept of computing, data and information. Bringing computer to life: Connecting keyboard, mouse, monitor and printer to CPU, Checking power supply.

**UNIT - II**

**OPERATING COMPUTER USING GUI BASED OPERATING SYSTEM:** Introduction, Objectives, Basics of Operating System: Operating system, Basics of popular operating system (LINUX, WINDOWS). The User Interface: Task Bar, Icons, Menu, Running an Application. Operating System Simple Setting: Changing System Date And Time, Changing Display Properties, To Add Or Remove A Windows Component, Changing Mouse Properties, Adding and removing Printers. File and Directory Management: Creating and renaming of files and directories, Common utilities.

**UNIT - III**

**INTRODUCTION TO INTERNET, WWW AND WEB BROWSERS:** Introduction, Objectives. Basic of Computer Networks: Local Area Network (LAN), Wide Area Network (WAN). Internet: Concept of Internet, Applications of Internet, Connecting to the Internet, Troubleshooting, World Wide Web (WWW), Web Browsing Software, Popular Web Browsing Software. Search Engines: Popular Search Engines / Search for content, Accessing Web Browser, Using Favorites Folder, Downloading Web Pages, Printing Web Pages. Understanding URL, Surfing the web: Using e - governance website.

**UNIT - IV**

**COMMUNICATIONS AND COLLABORATION:** Introduction, Objectives, Basics of E - mail: What is an Electronic Mail, Email Addressing, Using E - mails: Opening Email account, Mailbox: Inbox and Outbox, Creating and Sending a new E - mail, Replying to an E - mail message, Forwarding an E - mail message, Sorting and Searching emails. Introduction to MS - Office: MS - Word, MS - Excel, MS - Power Point.

**Practical based on UGEN - 102**

**Practical: 40**  
**Internal Assessment: 10**  
**Total Marks: 50**  
**Time: 3 hours**

**Instructions:**

- Examiner will set total of four questions covering the whole syllabus.
- Student will attempt any two question

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- Each question carries 10 marks.
- Practical file carries 10 marks and 10 marks for viva-voce.
- Practical paper will be conducted by the college and marks will be submitted to University.

**List of Experiments:**

- Different components of Taskbar
- Create Desktop icons
- Create Folder and Files on Desktop
- Run Application such as Notepad, MS Paint
- Change Mouse properties in Windows
- Connecting to the Internet
- Applying browsers software such as chrome, Internet Explorer
- Applying software download
- Create E-mail ID in a mail server
- Sending E-mail and working with Inbox
- Create Bio data in word
- Formatting text in Word
- Create excel database, apply auto sum
- Create presentation file with multiple slides
- Apply slide transition

**Books Recommended:**

- Fundamentals of Computers, V. Rajaraman, PHI Publication
- Computer Fundamentals, P. K. Sinha, BPB Publication
- Introduction to Computers with MS - Office 2007, Leon, TMH Publication

**Paper Title: UEMSV – 103: FUNDAMENTAL OF ELECTRICAL**

**Job Role: Electronics Junior Technician**

**Theory: 40**  
**Internal Assessment: 10**  
**Total Marks: 50**  
**Time: 3 hours**

**Objectives:** Fundamental of electrical will enable the students to be equipped with the concepts of current electricity, electric cells, capacitors, electromagnetic effects, A. C Circuits etc, and their implementation, uses, troubleshooting and maintenance.

**Instructions:**

- The syllabus of this paper has been divided into FOUR units.
- Examiner will set a total of **NINE** questions comprising two questions from each unit, including Question No. 1 (compulsory) of short answer type covering the whole syllabus.
- The students are required to attempt one question from each unit and the entire Compulsory Question No. 1.
- All questions carry equal marks.

**UNIT - I**

**Current Electricity:** Definition of Resistance, Voltage, Current, Power, Energy and their units, Relation between electrical, mechanical and thermal units, Temperature variation of resistance, Difference between AC and DC voltage and current.

**D. C. Circuits:** Ohm's Law, Series - parallel resistance circuits, calculation of equivalent resistance, Kirchhoff's Laws and their applications.

**UNIT - II**

**Electric Cells:** Primary cell, wet cell, dry cell, battery, Li - ion battery, series and parallel connections of cells, Secondary cells, Lead Acid Cell, Discharging and recharging of cells, preparation of electrolyte, care and maintenance of secondary cells.

**Lighting Effects of Current:** Lighting effect of electric current, filaments used in lamps, and Tube light, LED, their working and applications.

**UNIT - III**



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**Capacitors:** Capacitor and its capacity, Concept of charging and Discharging of capacitors, Types of Capacitors and their use in circuits, Series and parallel connection of capacitors, Energy stored in a capacitor.

**Electromagnetic Effects:** Permanent magnets and Electromagnets, their construction and use, Polarities of an electromagnet and rules for finding them. Faraday's Laws of Electromagnetic Induction, Dynamically induced e. m. f. , its magnitude and induction, inductance and its unit. Mutually induced e. m. f. , its magnitude and direction, Energy stored in an inductance. Force acting on a current carrying conductor in magnetic field, its magnitude and direction, Principles and construction of dynamo.

**UNIT - IV**

**A. C Circuits:** Generation of A. C. voltage, its generation and wave shape. Cycle, frequency, peak value, R. M. S. value, form factor, crest factor, Phase difference, power and power factor, A. C. Series Circuits with (i) resistance and inductance (ii) resistance and capacitance and (iii) resistance inductance and capacitance, Q factor of R. L. C. series circuits.

**Single Phase Transformer:** Construction, principle, e. m. f equation, transformation ratio, various losses in transformation, testing of transformer with polarity testing, equivalent Ckt.

**Measurements:** Voltage, current & power measurements, Ammeter, Voltmeter, Watt meter, connection diagram & uses, 2 wattmeter methods.

**Practical based on UEMSV - 103**

**Practical: 40**  
**Internal Assessment: 10**  
**Total Marks: 50**  
**Time: 3 hours**

**Instructions:**

- Examiner will set total of four questions covering the whole syllabus.
- Student will attempt any two question
- Each question carries 10 marks.
- Practical file carries 10 marks and 10 marks for viva-voce.
- Practical paper will be conducted by the college and marks will be submitted to University.

**List of Experiments:**

- Introduction to Multimeter (Analog & Digital) and its use as Voltmeter (For AC & DC), Ammeter (For AC & DC) and Ohmmeter.
- Measurement of resistor and capacitor by using color code.
- Idea of variable resistance, project board & power supply.
- Measurement of resistance by voltage drops method.
- Series & Parallel combination of resistances.
- Practical on Ohm's Law.
- Practical on KVL
- Practical on KCL.
- Transformer:
  - Turns ratio measurement.
  - Voltage ratio measurement.
  - Resistance ratio measurement of 1 ry & 2 ry.
  - Loss measurement (Transformer test).
- Characteristics of Transformer

**Books Recommended:**

- Fundamentals of Electrical Engg. & Electronics, B. L. Theraja
- Electrical Science, Vandana Singhal
- Principle of Electrical Engineering, B. R. Gupta

**Paper Title: UEMSV – 104: PRINCIPLE OF ELECTRONICS**

**Job Role: Electronics Junior Technician**

**Theory: 40**  
**Internal Assessment: 10**  
**Total Marks: 50**  
**Time: 3 hours**

**Objectives:** The course encapsulates the basics and the advanced forms of Analog electronics technologies, their implementation, uses, circuit tracing, troubleshooting and maintenance.

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**Instructions:**

- The syllabus of this paper has been divided into FOUR units.
- Examiner will set a total of **NINE** questions comprising two questions from each unit, including Question No. 1 (compulsory) of short answer type covering the whole syllabus.
- The students are required to attempt one question from each unit and the entire Compulsory Question No. 1.
- All questions carry equal marks.

**UNIT - I**

**Overview of Atom:** Sub - Atomic Particles and CRO, Brief History of Electronics. Atom and its elements, Electron, Force, Field intensity, Potential, Energy, current. Electric field, Magnetic field, Motion of charged particles in electric and magnetic field.

**Voltage and Current:** Resistance, Ohm's law, V - I Characteristics, Resistors, Capacitors, Inductors. Voltage and Current sources, Symbols and Graphical representation. Overview of AC, DC, Cells and Batteries, Energy and Power.

**UNIT - II**

**Basics of Semiconductor:** Semiconductor materials, Metals and Semiconductors and Photo - electric emission. N - type and P - type semiconductor, Effects of temperature on Conductivity of semiconductor. PN junction diode, depletion layer, Forward & Reverse bias, V - I Characteristic, Effects of temperature, Zener diode, Photo diode, LED, Tunnel Diode, Varactors Diodes, Schottky Diodes, Types and applications of diode. Diode as a rectifier, Half wave and full wave rectification, Zener diode Regulator. Introduction to Filters, Clippers, Clampers

**UNIT - III**

**Bipolar Transistor:** Transistor construction & operation of N - P - N & P - N - P. Common base (CB), common emitter (CE), common collector (CC) configurations. Biasing of transistors, V - I characteristics of CB, CE & CC, comparison of CB, CE & CC. Configuration with respect to I/P & O/P dynamic resistance, current gain and leakage current.  $\alpha$ ,  $\beta$ ,  $\gamma$  relation. Application of CB, CE & CC configurations. Transistor as an amplifier (simple form), Transistor D. C load line.

**Field Effect Transistor:** JFET construction, principle and operation. MOSFET construction, principle and operation. Characteristics of JFET & MOSFET, relation between them. Definition of drain resistance, transconductance, amplification factor. JFET as a switch, typical application of JFET & MOSFET.

**Uni - junction Transistor:** Construction, principles of operation & characteristics of UJT. Equivalent circuit. Comparison between FET and UJT. Typical application of UJT.

**UNIT - IV**

**Transistor Amplifier and Applications:** Introduction, Single and Multi - stage amplifiers, Introduction to Oscillators: Thyristor Construction, principle of operation & characteristics of SCR, DIAC, TRIAC & their uses.

**Opto Electronics:** Elementary idea of LDR, LED, Photo Diode, Photo Transistor, Solar cell & Opto Coupler.

**Practical based on UEMSV - 104**

**Practical: 40**  
**Internal Assessment: 10**  
**Total Marks: 50**  
**Time: 3 hours**

**Instructions:**

- Examiner will set total of four questions covering the whole syllabus.
- Student will attempt any two question
- Each question carries 10 marks.
- Practical file carries 10 marks and 10 marks for viva-voce.
- Practical paper will be conducted by the college and marks will be submitted to University.

**List of Experiments:**

- Knowledge of electronics components- different types of R, L and C.
- Practical on Characteristic of P.N junction diode.
- Practical on Characteristic of Zener diode.
- Practical on half wave rectifier ckt (Ripple factor determination).
- Practical on Full wave rectifier ckt (Ripple factor determination).
- Practical on Characteristic of transistor (CB /CE /CC) type.
- Practical on Characteristic of JFET.
- Practical on Characteristic of MOS-FET.
- Practical on Characteristic of UJT.

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- Practical on Characteristic of LED
- Practical on Characteristic of Opto-Coupler

**Books Recommended:**

- Principle of Electronics, V. K. Mehata.
- Fundamentals of Electronics, D. Chattopadhyay / P. C Rakshit

**Paper Title: UEMSV – 191: IDENTIFICATION OF COMPONENTS, TOOLS, EQUIPMENT, SOLDERING & DE - SOLDERING TECHNIQUES (PRACTICAL)**

**Job Role: Electronics Junior Technician**

**Internal Assessment: 20**

**Total Marks: 100**

**Time: 3 hours**

**Objectives:** This subject will aid the students to gain a sharp insight into the different components, tools, equipment, soldering and de - soldering techniques.

**Instructions:**

- Examiner will set total of four questions covering the whole syllabus.
- Student will attempt any three question
- Each question carries 10 marks.
- Practical file carries 10 marks and 40 marks for practical work and viva - voce.
- Practical paper will be conducted by the college and marks will be submitted to University.

**UNIT - I**

**Main components & modules/ sub - assemblies of electronic equipment:** Control Panel (System Controller), Keypads, Door and Window Contacts, Motion Detectors, Glass Break Detection, Smoke Detectors, Heat Sensors, Carbon Monoxide Detectors, Water Detectors (or Water Bug), Temperature Sensors, Capacitance switches / control push buttons & rotary switches

**UNIT - II**

**Introduction to wireless communication:** Signal Converters, Tools & their Uses, Use of tester to monitor AC Power, Skin the electrical wires/cables using the wire stripper and cutter, Main cable for control & electronic circuit wires, Crimping tools and buses

**Introduction to measuring equipment's:** Signal generator's, CRO, Function Generators, LCRQ Meter.

**UNIT - III**

**Soldering & De Soldering of Basic Components:** Soldering Tools, Different types of Soldering Guns related to Temperature and wattages, types of tips, Solder materials and their grading, Soldering and De Soldering Stations and their Specifications, Preparing Component for Soldering, PCB Applications, Types of PCB, Soldering Basic Components on PCB, De soldering Basic Components, Safety precautions while Soldering & De soldering, Check for cold continuity of PCB, Identification of loose/dry solder, broken tracks on printed wire assemblies & discrete components mounted circuit boards, Join the broken PCB track and test, De soldering using Pump and wick, Introduction of SMD Components.

**UNIT - IV**

**Introduction to SMD Components:** Identification of 2, 3, 4 terminal SMD components, Soldering the SMD components on the PCB, Make the necessary settings on SMD soldering station to solder various ICs of different packages by choosing proper clamping tools, Identify various connections and the setup required for SMD soldering station, De solder the SMD components from the given PCB, Make the necessary settings on SMD soldering station to de solder various ICs of different packages by choosing proper clamping tools, Make a panel board using different types of switches for a given application, Identification of crimping tools for various IC packages, Reliable Soldering Practices

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**Year - 1 Diploma (SEMESTER - II)**

**Paper Title: UGEN – 201: SOFT SKILL & PERSONALITY DEVELOPMENT**

**Theory: 40**  
**Internal Assessment: 10**  
**Total Marks: 50**  
**Time: 3 hours**

**Objective:** On completion of the course, the students will be able to listen to lectures, public announcements, news on TV, radio and engage in telephonic conversation to communicate effectively and accurately in English used as spoken language for various purposes.

**Instructions:**

- The syllabus of this paper has been divided into FOUR units.
- Examiner will set a total of **NINE** questions comprising two questions from each unit, including Question No. 1 (compulsory) of short answer type covering the whole syllabus.
- The students are required to attempt one question from each unit and the entire Compulsory Question No. 1.
- All questions carry equal marks.

**UNIT - I**

**Listening Skills:** Barriers to listening; effective listening skills; feedback skills. Attending telephone calls; note taking. Activities: Listening exercises - Listening to conversation, News and TV reports. Taking notes on a speech / lecture.

**UNIT - II**

**Speaking and Conversational Skills:** Components of a meaningful and easy conversation; understanding the cue and making appropriate responses; forms of polite speech; asking and providing information on general topics. The study of sounds of English, stress and intonation. Situation based Conversation in English.

**UNIT - III**

**Essentials of Spoken English:** Activities, Making conversation and taking turns, Oral description or explanation of a common object, situation or concept, giving interviews.

**UNIT - IV**

Oral Presentation with / without audio visual aids. Group Discussion. Listening to any recorded or live material and asking oral questions for listening comprehension.

**Practical based on UGEN - 201**

**Practical: 40**  
**Internal Assessment: 10**  
**Total Marks: 50**  
**Time: 3 hours**

**Instructions:**

- Examiner will set total of four questions covering the whole syllabus.
- Student will attempt any three question
- Each question carries 5 marks.
- Practical file carries 5 marks and 20 marks for practical work and viva - voce.
- Practical paper will be conducted by the college and marks will be submitted to University.

**Planning for Practical session:**

- Classroom technique to improve the soft skills
- Surprise writing on current issues
- General grooming sessions to face the interview
- Group discussions
- Motivational classes to improve communication and confidence power

**Books Recommended:**

- Soft skills Training - A workbook to develop skills for employment by Fredrick H. Wentz
- Personality Development and Soft skills, Oxford University Press by Barun K. Mitra

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**Paper Title: UGEN – 202: BUSINESS ANALYSIS: ENVIRONMENT, SALES & MARKETING**

**Theory: 40**  
**Internal Assessment: 10**  
**Total Marks: 50**  
**Time: 3 hours**

**Objective:** The course will enable the students to understand, assimilate and apply the various dimensions of business and its associated affairs in the socio economic, socio cultural and socio political ambience.

**Instructions:**

- The syllabus of this paper has been divided into FOUR units.
- Examiner will set a total of **NINE** questions comprising two questions from each unit, including Question No. 1 (compulsory) of short answer type covering the whole syllabus.
- The students are required to attempt one question from each unit and the entire Compulsory Question No. 1.
- All questions carry equal marks.

**UNIT - I**

Business Environment - Introduction, Concept of Business, Levels of the Business Environment, Understanding the Environment, Economic Environment of Business, The Global Economic Environment, Economic Policies, Business and Economic Policies, Socio Cultural Environment, Business and Society, Business and Culture , Indian Business Culture, Culture and Organizational Behavior. Introduction to Political Environment, Political Environment and the Economic system, Types of Political Systems, Indian Constitution and Business, Changing Profile of Indian Economy , Business Risks Posed by the Indian Political System, Economic Systems, Financial Environment: Introduction, An Overview of the Financial System, Components of Financial System, Financial Institutions and their Roles, Financial Institutions in India, Role of Foreign Direct Investment

**UNIT - II**

Introduction to Legal Environment, Laws Impacting Industry in India, Intellectual Property Rights, Major Regulations Pertaining to Business, Regulatory Role of Government, Promotional Role of Government, Participatory Role of Government, Conciliatory and Judicial Role of Government , Impact of India's Industrial Policy on Economic Reforms, New Economic Policy, Globalization. India, WTO and Trading Blocs, Levels of Economic Integration/Trading Blocs, Effects of Economic Integration, Major Regional Trading Blocs, Commodity Agreement, World Trade Organization, WTO and India, Corporate Social Responsibility: Introduction, Meaning and Definition, Need for social responsibility of business, Social responsibility of business towards different groups, Barriers to social responsibility, Social responsibility of business in India, Public, Private, Joint and Cooperative Sectors

**UNIT – III**

Traditional and Modern Concepts of Marketing; Selling vs. Marketing; Marketing mix; Marketing Environment. Market Segmentation & its implication. Concept of Product, Product Planning and Development; Packaging: Role and Functions; Brand name and Trade mark; Product Life Cycle Concept; Distributions Channels and Physical Distribution. Price: Importance of Price in the Marketing Mix; Factors affecting Price of a Product/Service; Discounts and Rebates. Methods of Promotion; Advertising Media; Characteristics of an effective Advertisement

**UNIT – IV**

Salesmanship and Qualities of Salesman; Product knowledge; Customer knowledge: Buying Motives and Selling Points. Scientific Selling; Approach and Presentation: Methods of Approaching a Customer; Presentation Process and Styles; Presentation planning. Objection Handling: Types of objections; Handling customer objections. Closing Sales and Follow up: Methods of closing sale; Executing sales order; Follow-up; Sales Promotion Schemes: Sampling; Coupon; Price Off; Premium Plan; Consumer Contests and Sweeps Takes; POP Displays; Demonstration; Trade Fairs and Exhibitions; Sales Promotion Techniques and Sales Force.

**Practical based on UGEN - 202**

**Practical: 40**  
**Internal Assessment: 10**  
**Total Marks: 50**  
**Time: 3 hours**

**Instructions:**

- Examiner will set total of four questions covering the whole syllabus.
- Student will attempt any three question

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- Each question carries 5 marks.
- Practical file carries 5 marks and 20 marks for practical work and viva - voce.
- Practical paper will be conducted by the college and marks will be submitted to University.

**Planning for Practical session:**

- Study of international organization (WTO, WORLD BANK, IMF, AMA)
- Case studies on the recent Business Environment, Marketing, & Sales Promotion
- PPT presentation on selected issues
- Survey to collect the samples for project work

**Books Recommended:**

- Business Environment; By T. R. Jain, Mukesh Trehan, Ranju Trehan, VK Global Publications.
- Business Environment; By Vishwajeet Prasad, Gyan Publishing House.
- Business Environment; By Saleem, Pearson Education India.
- BUSINESS ENVIRONMENT; By VEENA KESHAV PAILWAR, PHI Learning Pvt. Ltd.
- Business Environment, by Suresh Bedi, Excel Books
- BUSINESS ENVIRONMENT: INDIAN AND GLOBAL PERSPECTIVE; FAISAL AHMED, M. ABSAR ALAMM, PHI Learning Pvt. Ltd.
- PRINCIPLES OF MARKETING; Kotlar Philip and Armstrong Gary, Pearson Education
- MARKETING MANAGEMENT; Ramaswamy, V.S. and S. Namakumari: Macmillian
- SALES MANAGEMENT; Condiff, Still and Govani et.al: Prentice Hall of India
- SALES MANAGEMENT; Text; Cases & Readings: Vaccaro J.P: Prentice Hall of India
- ADVERTISING & SALES PROMOTION; Kazmi & Batra: Excel Books

**Paper Title: UEMSV – 203: ELCTRONICS DEVICES & CIRCUITS**

**Job Role: Electronics Junior Technician**

**Theory: 40**  
**Internal Assessment: 10**  
**Total Marks: 50**  
**Time: 3 hours**

**Objectives:** This subject will enable the students to learn about Regulated Power Supply, Amplifiers, Oscillators & Multivibrators, OP - AMP etc.

**Instructions:**

- The syllabus of this paper has been divided into FOUR units.
- Examiner will set a total of **NINE** questions comprising two questions from each unit, including Question No. 1 (compulsory) of short answer type covering the whole syllabus.
- The students are required to attempt one question from each unit and the entire Compulsory Question No. 1.
- All questions carry equal marks.

**UNIT - I**

**Rectifier & Regulated Power Supply:** Half wave, full wave rectifier, different types of filters (C, CR, LC &  $\pi$ ), ripple factor, peak inverse voltage, transformer utilization factor and regulation, expression for rectifier efficiency and ripple factor, voltage doubler and tripler, voltage limiter. Regulated power supplies - D. C. voltage stabilizer using Zener diode, D. C. series voltage regulator, IC regulator.

**Transistor biasing & operating point of stabilization:** Selection of operating point, need for bias stabilization, biasing methods battery bias, fixed bias, collector to base bias, self bias, stability and bias compensation. Thermal runaway and its prevention, heat sinks.

**UNIT - II**

**Small signal transistor & special purpose Amplifiers:** Transistor amplifier circuit operation using D. C. & A. C. load line. Transistor amplifier circuits : - two port and hybrid (h) parameters, amplifier analysis for current, voltage and power gain, I/P and O/P impedance, comparison of CB, CE and CC amplifier configurations, Miller's theorem. Darlington emitter follower. JFET amplifiers - JFET parameters, small signal models for low and high frequency operations. Common - source, common drain and common gate (CS, CD and CG) configurations. Biasing of JFET and enhancement MOSFET, JFET as voltage dependent resistor.

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**Multistage amplifiers:** Cascading of amplifiers (Direct Coupled, RC coupled, transformer coupled), their gain, frequency response, input and output impedance, gain - bandwidth characteristics.

**Distortion:** Non - linear, frequency and phase shift in amplifiers.

**UNIT - III**

**Feed back & Tuned Amplifier:** Feed back in amplifiers, feed back networks, effect of negative feed back on gain, input and output resistance, distortion, frequency response, band width and noise performance of amplifiers. Typical amplifier circuits using feed back.

Tuned amplifiers - Classification (narrow band and broad band single, double, stagger and tuned amplifiers). Quality factor and parallel response single and double tuned amplifiers.

**Large signal Amplifiers:** Class A, B, AB and C operation. Class A power amplifier, harmonic distortion. Transformer coupled audio amplifier, impedance matching, maximum power output and efficiency. Push pull amplifiers, merits and drawbacks of push - pull operation, class B and AB operation. Push - pull amplifier without output transformer. I. C. driver stage for power amplifier.

**UNIT - IV**

**Oscillators & Multivibrators:** Classification of oscillators. Use of positive feed back, negative resistance for generation of oscillations. Barkhausen criterions for oscillators. Different oscillator circuits i. e. tuned collector, tuned base, Hartley, colpitts, RC phase shift, wien bridge, crystal and negative resistance (tuned diode) oscillators. General idea of different wave shapes, diode clipping and clamping circuits. Astable, mono - stable and bi - stable multivibrators. Using IC 555 in multivibrators. Schmitt trigger. Square wave and triangular wave generators.

**Differential Amplifier:** Introduction, Operation in detail, different modes of operation, advantages & typical application.

**OP - AMP:** OP - AMP characteristics, inverting & non - inverting OP - Amps. Different OP - AMP, CMRR, OP - AMP as an adder, subtractor, scale changer, phase shifter. Voltage follower, integrator, differentiator, voltage to current & current to voltage converters. OP - AMP active filter, low pass, high pass and band pass filters.

**Practical based on UEMSV - 203**

**Practical: 40**  
**Internal Assessment: 10**  
**Total Marks: 50**  
**Time: 3 hours**

**Instructions:**

- Examiner will set total of four questions covering the whole syllabus.
- Student will attempt any two question
- Each question carries 10 marks.
- Practical file carries 10 marks and 10 marks for viva-voce.
- Practical paper will be conducted by the college and marks will be submitted to University.

**List of Experiments:**

- Transistor biasing
- Single Stage transistor amplifier
- UJT as a Relaxation oscillator
- Inverting Amplifier and adder using Op-amp IC 741
- Subtractor and Comparator using Op-amp IC 741
- Differentiator and integrator using Op-amp IC 741
- Series resonance circuit
- Parallel resonance circuit
- Hartley oscillator circuit
- Colpitt oscillator circuit
- Low pass active filter
- High pass Active filter
- Calculation of efficiency of a class A amplifier
- R-C coupled transistor amplifier

**Books Recommended:**

- Integrated Electronics. J. Mill man & Haking

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- Electronics Device & Circuits, Mottershed
- Electronics Principles, Devices & Circuits, M. L. Anand

**Paper Title: UEMSV – 204: DIGITAL ELCTRONICS**

**Job Role: Electronics Junior Technician**

**Theory: 40**  
**Internal Assessment: 10**  
**Total Marks: 50**  
**Time: 3 hours**

**Objectives:** The course is designed to enable the students learn about the Digital electronics technologies, their implementation and uses.

**Instructions:**

- The syllabus of this paper has been divided into FOUR units.
- Examiner will set a total of **NINE** questions comprising two questions from each unit, including Question No. 1 (compulsory) of short answer type covering the whole syllabus.
- The students are required to attempt one question from each unit and the entire Compulsory Question No. 1.
- All questions carry equal marks.

**UNIT - I**

**Number System:** Binary, Decimal, Octal, Hexadecimal conversion from one Number System to another, Binary addition, subtraction, One's and Two's Compliment no. subtraction using 1's & 2's Compliment no. BCD Arithmetic, Codes: BCD, Excess - 3, Gray, ASCII, Error Code.

**Logic Gate:** Standard logic Gates (NOT/OR/AND/XOR/XNOR) it's characteristic. Universal logic gate (NAND/NOR).

**UNIT - II**

**Boolean Algebra & Logic Family:** Relation of Boolean algebra to switching elements and operation of logic gates. Obtaining a Boolean expression from a truth table. Definition of combination logic K - map method and its use. Graphical description of Boolean function. Brief idea (Fan in, Fan out, Propagation delay time, Voice margins) about: RTL, DTL, TTL, CMOS, Introduction of Logic gate IC's (TTL & CMOS).

**Function of Logic ckt:** Half adder, Full adder, Half Subtractor, Full Subtractor. Decoder & Encoder. Code converter. Multiplexer & De - multiplexer. Parity checkers / generator, comparator.

**UNIT - III**

**Flip - Flops:** Flip - Flop using basic gate. Construction of different ckts. a) R - S flip flop, b) T - flip flop, c) J - K flip flop, d) D - flip flop, e) Master Slave JK - flip flop.

**Counter & Shift Resisters:** Asynchronous counter (Ripple). Synchronous counter (parallel). Up counter, Down Counter, Up - Down Counter, MOD - N - Counter. Presettable counter, Shift Reg. Parallel - in - serial - out (PISO). Shift registers function. Serial - in - serial - out (SISO, Shift Reg. Serial - in—parallel - out (SIPO), Shift Reg. Parallel - in - parallel - out (PIPO), Shift Reg. Shift & Ring counter. Application of Shift Reg.

**UNIT - IV**

**D/A and A/D conversion:** Digital to Analog converter circuit. D/A application. Different method of A/D conversions: - Dual slope counter type, Successive approximation type.

**Memory Organization:** Characters and functions of: Different types of memory as semiconductor and magnetic, Read/Write memory (RAM) - Static & Dynamic Read only Memory (ROM), (PROM) - Fixed & Erasable (EPROM).

**Practical based on UEMSV - 204**

**Practical: 40**  
**Internal Assessment: 10**  
**Total Marks: 50**



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**Time: 3 hours**

**Instructions:**

- Examiner will set total of four questions covering the whole syllabus.
- Student will attempt any two question
- Each question carries 10 marks.
- Practical file carries 10 marks and 10 marks for viva-voce.
- Practical paper will be conducted by the college and marks will be submitted to University.

**List of Experiments:**

- Verification of logic gates
- Practical on half adder/half subtractor
- Practical on full adder/full subtractor
- Practical on multiplexer.
- Practical on De- multiplexer
- Practical on Decoder.
- Practical on Encoder.
- Practical on Flip Flop (RS flip flop, D – Flip Flop, J – K /T – Flip Flop)
- Practical on Shift register.
- Practical on Up – Counter.
- Practical on Down – Counter.
- Practical on Mod – N –Counter.
- Study of the Characteristics BCD to 7-segment decoder.

**Books Recommended:**

- Digital Circuits and Logic Design, S. Salivahanan
- Digital Electronics, S. Salivahanan
- Digital computer electronics, Malvino and Brown

**Paper Title: UEMSV – 205: ELECTRONIC MEASUREMENT & INSTRUMENTATION**

**Job Role: Electronics Junior Technician**

**Theory: 40**  
**Internal Assessment: 10**  
**Total Marks: 50**  
**Time: 3 hours**

**Objectives:** This subject will enable the students to learn about Electronics Measuring Instruments, their implementation, uses, circuit tracing and maintenance.

**Instructions:**

- The syllabus of this paper has been divided into FOUR units.
- Examiner will set a total of **NINE** questions comprising two questions from each unit, including Question No. 1 (compulsory) of short answer type covering the whole syllabus.
- The students are required to attempt one question from each unit and the entire Compulsory Question No. 1.
- All questions carry equal marks.

**UNIT - I**

**Principle of Instrumentation:** Principle of operation of sensor and transducer and their applications. Transducer as a system component. Factors affecting the choice of transducer.

**Measurement of Physical Quantity with Transducer:** Displacement - Potentiometer, L. V. D. T. Strain gauge, Piezoelectric crystal, Velocity - Tachogenerator, Resolution Counter, Pressure -Manometer, elastic type - Bourdon tubes, diaphragm and Bellows. Temperature - RTD. Thermistors & Thermocouple, Flow - positive displacement, Electromagnetic, thermal heat.

**UNIT - II**

**Signal condition:** Signal conditioning requirements for DC & AC Transducer signal, Characteristics and application of bridges signal conditioning element. Specification and characteristics of Instrumentation amplifier.

**Measurement Instruments:** Galvanometer; Moving magnet & Moving coil type; Absolute & Secondary instruments. Operation of PMMC instruments, Construction extension of range -ammeter and voltmeter, Moving iron - Principle of operation types: Construction and operation of Electro dynamic watt meter , Ohmmeter, Megger - description , digital Multimeter - operating principle , types , advantages. Digital voltmeter.

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**UNIT - III**

**Impedance Bridge:** DC Wheatstone bridge and its application , AC bridge - Maxwell's bridge , Hay's bridge , Schering bridge, Q - meter and RLCmeter - operation & construction.

**Cathode Ray Oscilloscope:** Block diagram of CRO, construction of CRT, description of different sections, features of Dual trace and Dual beam Oscilloscope, Digital storage Oscilloscope. Triggered & Non - triggered Oscilloscope; application of CRO - Phase & frequency measurement.

**UNIT - IV**

**Signal Generator:** Block diagram of AF & RF signal Generator, function generator, sweep generator.

**Calibration:** Basic concepts of Calibration, Errors in measurement, Trace ability and standards for Electrical Parameters (Time & Frequency).

**Practical based on UEMSV - 205**

**Practical: 40**  
**Internal Assessment: 10**  
**Total Marks: 50**  
**Time: 3 hours**

**Instructions:**

- Examiner will set total of four questions covering the whole syllabus.
- Student will attempt any two question
- Each question carries 10 marks.
- Practical file carries 10 marks and 10 marks for viva-voce.
- Practical paper will be conducted by the college and marks will be submitted to University.

**List of Experiments:**

- Operational details of CRO
- Measurement of voltage (AC & DC) by using CRO
- Measurement of frequency of AC signal by using CRO
- Measurement of phase of AC signal by using CRO
- Use of PMMC galvanometer as Voltmeter
- Use of PMMC galvanometer as an Ammeter
- Measurement of Power consuming by a load using Wattmeter
- Measurement of unknown resistance using wheatstone bridge
- Identification of different type of Sensors and their functions
- Measurement of R,L,C using RLC meter
- Demonstration of working of Function generator
- Demonstration of different workings of DMM

**Books Recommended:**

- Electronics Measurement & Instrumentation, A. K. Sahani
- Electronic Instrumentation, H. S. Kalsi
- Electronics Measurement & Measurement Technique, Cooper