PEOPLE'S UNIVERSITY, BHOPAL
(Applicable for Admitted from Academic Session 2019-20 onwards)

Programme: Diploma in Engineering   **Semester –III**

Subject Code	Subject Title	Credit			Theory			Practical		
		L	T	P	External (70)	Internal (30)	Total (100)	External (Nil)	Internal (Nil)	Total
DEC1301	Electronics Engineering Components & Materials	3	1	-			Min: 40 (D Grade)			Min: Nil

Duration of Theory (Externals): 3 Hours

Theory Internal- Max Marks: 30	Best of Two Mid Semester Test – Max Marks: 15	Assignment/Quiz/Attendance – Max. Marks: 15
Practical Internal Max Marks: Nil	Lab work & Sessional – Max Marks: Nil	Assignment/ Quiz/Attendance – Max. Marks: Nil

Pre-Requisite	Basic Knowledge of Electrical & Electronic Components	
Course Outcome	1.	Ability to understand basic properties of various components.
	2.	Properties and applications of various conducting Materials.
	3.	Properties and applications of various special Materials.

Unit	Contents (Theory)	Marks Weightage
I	**Passive Components** : Resistors – Color Code Theory – Series & Parallel Combination of Resistors –Capacitor & Capacitance – Principles of a Capacitor – Series & Parallel Combination of Capacitors – Inductors & Inductance, Principles of a Inductor – Series & Parallel Combination of Inductor. Ohms law: Current, voltage, resistance and related problems.	14
II	**Transformer**: Working principle of a Transformer, Transformer construction, Types of cores used. Specifications of a transformer, Step-up, Step down with applications. Different type of losses in Transformers, active and reactive power, power factor and its importance in the industry. Calculations related to transformers, turns ratio, voltage ratio, current ratio & efficiency.	14
III	**Classification:** Classification of materials into conducting, semiconducting and insulating materials with reference to their atomic structure and energy bands. **Conducting Materials:** Resistivity and factors affecting resistivity, such as temperature, alloying.Super conductivity and super conducting material. Low resistivity materials e.g. copper, aluminum and steel, their general properties as conductor e.g. resistivity, temperature co-efficient, mechanical properties, corrosion, solar ability, contact resistance and practical application. High resistivity materials: manganin, carbon, tungsten, their practical applications.	14
IV	**Insulating Materials :** Properties of insulating material:- Electrical properties, Mechanical properties, Physical properties, Thermal properties, Chemical properties, Insulating materials and their application-Definition and classification of Thermo setting materials e.g. Phenol Formaldehyde, Resins, Thermoplastic materials e.g. Polyvinyl Chloride (P.V.C.),Natural Insulating Materials- Mica and Asbestos, Gaseous Materials e.g. Air, Hydrogen.	14
V	**Semiconductor Materials:** Introduction, Intrinsic & Extrinsic materials, P type & N type semiconductor materials. Various types of semiconductor materials like Silicon, Germanium etc.their properties and applications in various fields.	14

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Text Book/References Books/ Websites

1. Bhattacharya SK*; Electrical and Electronics Engineering Materials*; Khanna Publishers, New Delhi.

2. Grover and Jamwal*; Electronics Components and Materials*; Dhampat Rai and Co. New Delhi.

3**.** Dhir; *Electrical Engineering Materials*; Tata Mc Graw Hill, New Delhi.

4. Kapoor PL; Electrical Engineering Materials; Khanna Publishers; New Delhi.

5. S.P.Seth; *Electrical Engineering Materials;* Dhampat Rai Publications, New Delhi.

   Suggested List of Laboratory Experiments :- (Expandable): Nil

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Subject Code	Subject Title	Credit			Theory			Practical		
		L	**T**	**P**	**External (70)**	**Internal (30)**	**Total (100)**	**External (35)**	**Internal (15)**	**Total (50)**
DEC1302	**Digital Electronics-I**	3	1	1	**External (70)**	**Internal (30)**	Min: 40 (D Grade)	**External (35)**	**Internal (15)**	Min: 20 (D Grade)

Duration of Theory (Externals): 3 Hours

Theory Internal- Max Marks: 30	Best of Two Mid Semester Test – Max Marks: 15	Assignment/Quiz/Attendance – Max. Marks: 15
Practical Internal Max Marks: 15	Lab work & Sessional – Max Marks: 10	Assignment/ Quiz/Attendance – Max. Marks: 05

Pre-Requisite	Basic Knowledge of analog & Digital Signals.	
Course Outcome	1.	Ability to understand basics of Number system.
	2.	Properties and applications of various logic Gates.
	3.	Properties and applications of Combinational Logic Circuits.

Unit	Contents (Theory)	Marks Weightage
I	**Number Systems-**Introduction of Analog & Digital Signal. Difference between analog & Digital signal. Introduction of Number system. Binary, Hexadecimal, Octal, Decimal and their inter conversion. Perform binary addition, subtraction, Multiplication and Division. Write 1's complement and 2's complement numbers for a given binary number. Perform subtraction of binary numbers in 2's complement method.	**14**
II	**Binary Codes:** Weighted and Non-weighted code and their use. 8421 code, BCD code, XS-3 code, Gray code. Write Binary equivalent number for a number in 8421, Excess-3 and Gray Code and vice-versa. Parity bit and its importance in error detecting.	**14**
III	**Boolean Algebra:** Law of Boolean Algebra. Explain standard representations for logical functions (SOP and POS form). De Morgan's theorem and its proof. Introduction of Logic Gates with truth table, Introduction of Universal gates and special gates (EX-OR & EX-NOR) with truth table, derivation of all basic gates using universal gates.	**14**
IV	**K-Map Simplification**: Simplification of Boolean functions with Karnaugh Map method. Simplification of Boolean equation using K-Map (up to four variables).	**14**
V	**Combinational logic circuits:** Draw the Half adder circuit and verify its functionality using truth table. Draw the full adder circuit and explain its operation with truth table. Realize full-adder using two Half-adders and an OR gate and write truth table. Brief introduction of Multiplexer, De Multiplexer, Encoder & Decoder.	**14**

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Text Book/References Books/ Websites

1. Morris Mano; Computer System Architecture; PHI.

2. Gaonkar; Microprocessor Architecture, Programming, Applications with 8085; Penram Int.

3. William Stallings; Computer Organization and Architecture; PHI.

4. Carter; Computer Architecture (Schaum); TMH.

5. Tanenbaum; Structured Computer Organization; Pearson Education.

Suggested List of Laboratory Experiments :- (Expandable):

1. To study of Basic Logic Gates- AND, OR & NOT.

2. To study of Universal Gates-NAND, NOR.

3. Implementation of Basic Gates with the help of Universal gates.

4. Study of BCD to Grey code Conversion.

5. Implementation of De Morgan's Theorem.

6. Study of Half Adder & Full Adder.

7. Study of Encoder.

8. Study of Decoder.

9. Study of Multiplexer.

10. Study of Demultiplexer.

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Subject Code	Subject Title	Credit			Theory			Practical		
		L	**T**	**P**			**Total (100)**			**Total (50)**
DEC1303	**Electronic Devices**	3	1	1	**External (70)**	**Internal (30)**	Min: 40 (D Grade)	**External (35)**	**Internal (15)**	Min: 20 (D Grade)

Duration of Theory (Externals): 3 Hours

Theory Internal- Max Marks: 30	Best of Two Mid Semester Test – Max Marks: 15	Assignment/Quiz/Attendance – Max. Marks: 15
Practical Internal Max Marks: 15	Lab work & Sessional – Max Marks: 10	Assignment/ Quiz/Attendance – Max. Marks: 05

Pre-Requisite	Basic Knowledge of Semiconductor Physics.
Course Outcome	1. Ability to understand basics of Semiconductors.
	2. Properties and applications of various Types of diodes.
	3. Properties and applications of Transistor.

Unit	Contents (Theory)	Marks Weightage
I	**Semiconductor:** Difference between conductor and semiconductor. Intrinsic and extrinsic, doping, types of material used in doping, p-type and n-type semiconductors. Energy band diagrams, effect of temperature on semiconductor, majority and minority carrier, generation and recombination of charges, process of diffusion, diffusion and drift currents. Properties of silicon and germanium.	**14**
II	**P-N junction**: depletion layer, potential barrier, working of PN Junction diode with no bias, forward bias and reverse Bias, current components in p-n diode, current equation, V-I characteristics, reverse saturation current, cut in voltages of Si and Ge diode.	**14**
III	**Applications of Diodes: Introduction** of Rectifier circuit. Working principle of Diode as a half wave, full wave & bridge rectifier with waveforms. Introduction of zener diode. Function of Zener diode as a regulator in a power supply.	**14**
IV	**Various diodes construction and working**: Working Principle of Varactor diode, Schottky diode, PIN diode, LED, photodiodes, solar cell.	**14**
V	**Bipolar junction transistor:** Formation of PNP & NPN Transistor & their symbolic representation. Different transistor configuration and their performance characteristics. Modes of operation of transistor in active, cut-off and saturation mode.	**14**

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Programme: **Diploma in Engineering**   **Semester –III**

Text Book/References Books/ Websites

1. V.K.Mehta; Principle of Electronics, S.CHAND Publications.

2. Dr.R.S.Sedha; Electronic Devices & Circuits, S.CHAND Publications.

3. Sanjeev Gupta; Electronic Devices & Circuits, Dhampat Rai Publications.

4. Sendra and Smith; Microelectronics, Oxford Press.

Suggested List of Laboratory Experiments :- (Expandable):

1. To Study the V-I Characteristics of Silicon Diode.

2. To Study the V-I Characteristics of Germanium Diode.

3. To Study the V-I Characteristics of Zener Diode.

4. To Study the V-I Characteristics of Light Emitting Diode (LED).

5. To Study of Varector Diode.

6. To Study of Half Wave Rectifier.

7. To Study of Full Wave Rectifier.

8. To Study of Full Wave Bridge Rectifier.

9. To Study the V-I Characteristics of PNP Transistor.

10. To Study the V-I Characteristics of NPN Transistor.

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Programme: **Diploma in Engineering**   **Semester –III**

Subject Code	Subject Title	Credit			Theory			Practical		
		L	**T**	**P**	**External (70)**	**Internal (30)**	**Total (100)**	**External (35)**	**Internal (15)**	**Total (50)**
DEC1304	**Electronic Instrumentation**	3	1	1	**External (70)**	**Internal (30)**	Min: 40 (D Grade)	**External (35)**	**Internal (15)**	Min: 20 (D Grade)

Duration of Theory (Externals): 3 Hours

Theory Internal- Max Marks: 30	Best of Two Mid Semester Test – Max Marks: 15	Assignment/Quiz/Attendance – Max. Marks: 15
Practical Internal Max Marks: 15	Lab work & Sessional – Max Marks: 10	Assignment/ Quiz/Attendance – Max. Marks: 05

Pre-Requisite	Basic Knowledge of Measuring Instruments.
Course Outcome	1. Ability to understand basic Parameters of Measurements.
	2. Properties and applications of various Types of bridges.
	3. Properties and applications of Transducer.

Unit	Contents (Theory)	Marks Weightage
I	**Principles of Measurement and Instrumentation:** Basic Objectives of measurements, analog versus digital measurements Parameters of Measuring devices, Accuracy, Precision, Error (Gross, Systematic & Random), Linearity, Hysteresis, Resolution, Measurement of current, voltage, Resistance and power, Introduction of Multimeter.	**14**
II	**Electrical Bridges :** Measurement of inductance, capacitance and resistance using Bridge Introduction about AC bridge, Maxwell's (inductance and capacitance) Bridge, Anderson's bridge, Hay's Bridge, Schering Bridge, Wheatstone Bridge, Q-meter.	**14**
III	**Signal generators & Analyzer:** Introduction about generators, Sine wave generator, function generator, square and pulse wave generator, sweep frequency generator, wave analyzer, frequency selective wave analyzer & Heterodyne wave analyzer.	**14**
IV	**Cathode Ray Oscilloscope :** Introduction to C.R.O, Construction, Block Diagram of a general Purpose C.R.O.,Cathode Ray Tube (C.R.T.), Time Base Generator, Applications of C.R.O. to Measure: Voltage, Current, Frequency, Phase Difference, Special Purpose C.R.O.: Dual Beam Oscilloscope, Dual Trace Oscilloscope.	**14**
V	**Transducers:** Introduction of Transducers, Analog and digital transducers, displacement transducer (LVDT & RVDT), Temperature Transducers: Thermocouple, Thermistors, and Optical Transducers: Photoconductive Cells, Photo Voltaic Cell.	**14**

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Text Book/References Books/ Websites

1. H. S. Kalsi; Electronics Instrumentation; TMH.
2. A.K. Sawhney; Instrumentation and Measurements; Dhanpat Rai and Co.
3. Helfric and Cooper; Modern Electronic Instrumentation and Measurement Techniques; Pearson.

Suggested List of Laboratory Experiments :- (Expandable):

1. To study CRO.
2. To study Voltage Measurement on CRO.
3. To study Current Measurement on CRO.
4. To study Frequency Measurement on CRO.
5. To study Phase difference Measurement on CRO.
6. To Study of AC Inductance bridges.
7. To Study of AC Capacitance bridges.
8. To Study of Signal Generator.
9. To Study of Wave Analyzer.
10. To Study to Study of LVDT.

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Programme: **Diploma in Engineering**   **Semester –III**

Subject Code	Subject Title	Credit			Theory			Practical		
		L	**T**	**P**	**External (70)**	**Internal (30)**	**Total (100)**	**External (35)**	**Internal (15)**	**Total (50)**
DEC1305	**Network Analysis**	3	1	1	**External (70)**	**Internal (30)**	Min: 40 (D Grade)	**External (35)**	**Internal (15)**	Min: 20 (D Grade)

Duration of Theory (Externals): 3 Hours

Theory Internal- Max Marks: 30	Best of Two Mid Semester Test – Max Marks: 15	Assignment/Quiz/Attendance – Max. Marks: 15
Practical Internal Max Marks: 15	Lab work & Sessional – Max Marks: 10	Assignment/ Quiz/Attendance – Max. Marks: 05

Pre-Requisite	Basic Knowledge of AC & DC Parameters.
Course Outcome	1. Ability to understand KCL & KVL.
	2. Properties and applications of various Network Theorems.
	3. Properties and applications of Two Port Parameters.

Unit	Contents (Theory)	Marks Weightage
I	**Circuit theory concepts** : Active & Passive elements, dependent and independent sources ,KCL, KVL, Ohms law ,transformation of source, Active and Passive circuits - Junction, branch and loop in circuits -Insufficiency of Ohm's law to solve complex circuits, Kirchhoff's laws KCL & KVL, Star - Delta configurations, star delta transformations .	**14**
II	**Network Theorems**: Ideal Voltage, Ideal current source - Source transformation technique-Super position theorem- Thevenin's Theorem -Norton's Theorem- Maximum power transfer theorem with reference to D.C.-Problems on the above.	**14**
III	**Response of RLC Circuits:** Formulation of integro differential equations in RLC networks, duality, Initial conditions. Response of RL, RC, RLC networks subjected to internal energy. Response of networks to impulse, step, ramp, exponential and sinusoidal excitations. Transient and steady state response.	**14**
IV	**Resonance:** Series & parallel resonance, Bandwidth, Q-factor. Coupled circuit -Analysis of circuits with mutual inductance. Three phase circuits. Generation of 3 phase voltages star - delta connections, solution of 3 phase balanced circuits. Power measured by two wattmeter method.	**14**
V	**Two port parameters:** Impedance, Admittance, transmission & Hybrid parameters of two port passive networks. Their inter relationships. Terminated two ports. Inter connection of two ports.	**14**

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Text Book/References Books/ Websites

1. M.E. Van Valkenburg; Network Analysis; PHI.
3. Mithal GK; Network Analysis; Khanna Publisher.
3. Hayt W.H. & J.E. Kemmerly; Engineering Circuit Analysis; TMH.
4. Roy Choudhary D; Network and systems; New Age Publication.
5. A.Chakraborti; Circuit theory; Dhanpat Rai Publication.

Suggested List of Laboratory Experiments :- (Expandable):

1. Determine the loop currents (KVL) in any DC network
2. Determine the node voltages (KCL) in any DC network
3. Verification of principle of superposition with DC sources.
4. Verification of Thevenin, theorems in DC circuits
5. Verification of Norton theorems in DC circuits
6. Verification of Maximum power transfer theorems in DC circuits
7. Study of RLC series resonance
8. Study of RLC Parallel resonance.
9. Study of Transmission Parameters.
10. Study of Hybrid Parameters.

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Subject Code	Subject Title	Credit			Theory			Practical		
		L	**T**	**P**			**Total**			**Total (50)**
DEC1306	**Electronics Workshop**	-	-	1	**External (Nil)**	**Internal (Nil)**	Min: Nil	**External (35)**	**Internal (15)**	Min: 20 (D Grade)

Duration of Theory (Externals): Nil

Theory Internal- Max Marks: Nil	Best of Two Mid Semester Test – Max Marks: Nil	Assignment/Quiz/Attendance – Max. Marks: Nil
Practical Internal Max Marks: 15	Lab work & Sessional – Max Marks: 10	Assignment/Quiz/Attendance – Max. Marks: 05

Pre-Requisite	Basic Knowledge of Various electronic components.
Course Outcome	1. Ability to understand various tools & components of electronic workshop.
	2. Ability to understand soldering and desoldring.
	3. Ability to understand PCB layout and circuit.

Unit	Contents (Theory)	Marks Weightage
I	Electronic Workshop Tools: Bread board, Copper clad laminate sheet, Solder iron, solder-stand, solder-wire, flux, flexible wire, hookup wire, cables, relays, switches, connectors, fuses, Cutter, Plier, screwdriver set, wire stripper, desolder pump, De-solder wick, drilling machine Electronic circuit on bread board ,Soldering/Disoldering, electronic circuit on general purpose PCB	50
	Passive & active components: Different types of: resistors, inductors, capacitors, potentiometers, Thermistors, Transformer, auto transformer Diode, Zener diode, Varactor diode, LED, Photo diode, BJT, Photo transistor, FET, LDR, Solar cell, Photocell, Optocoupler.	
	Voltage Sources: DC battery (Pencil cell :1.5V, +9V, Rechargeable Cell, Mobile battery) AC power supply, DC power supply ,Measuring Instruments: Different types of Voltmeters, Ammeters, Watt meters, multimeter, LCR-Q meter, CRO, DSO, Function Generator.	
	Printed circuit boards (PCB), Types, Single sided, Double sided, Design and fabrication of a single sided PCB for a simple circuit with manual etching (Ferric chloride) and drilling Methods.	
	Assembling of electronic circuit/system on general purpose PCB, Solder and de-solder electronic components on different types of PCB. Identify and test electrical/electronic active and passive components, Use basic source and measuring instruments (power supply, function generator, CRO, DMM) Identify and rectify open circuit, and short circuit faults in PCB/System.	

Text Book/References Books/ Websites: Nil

Suggested List of Laboratory Experiments :- (Expandable):

Student should perform & test at least 10 electronic components/instruments related to subjects.

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Subject Code	Subject Title	Credit			Theory			Practical		
		L	T	P	External (Nil)	Internal (Nil)	Total	External (Nil)	Internal (50)	Total (50)
DPE- 307	**Professional Skill**	-	-	1			Min: Nil			Min: 20 (D Grade)

Duration of Theory (Externals): Nil

Theory Internal- Max Marks: Nil	Best of Two Mid Semester Test –Max Marks: Nil	Assignment/Quiz/Attendance – Max. Marks: Nil
Practical Internal Max Marks: 50	Lab work & Sessional – Max Marks: Nil	Assignment / Quiz/ Attendance – Max. Marks: 50

Pre-Requisite	Nil
Course Outcome	Able to solve problems ask in the competitive exams.

Unit	Contents (Theory)	Marks Weightage
I	**Quantitative Aptitude:** Percentages/Profit & Loss, Time and Work, Simple and Compound Interest, Series and Progression.	
II	**Reasoning :** Puzzles and Seating Arrangement, Data Sufficiency, Coding-decoding, Blood Relation, Order and Ranking, Alpha Numeric Symbol Series, Logical Reasoning:	50
III	**English**: free quizzes related to Synonyms, Antonyms, One Word Substitution, Idioms and Phrases, Spelling Correction; Fill in the Blanks and Common Errors in English.	

Text Book/References Books/ Websites
1. R.S. Aggarwal; Quantitative Aptitude for Competitive Examinations.
2. Arihant Publications; Fast Track Objective Arithmetic.
3. R S Aggarwal; Verbal and Nonverbal Reasoning.
4. M K Pandey; Analytical Reasoning.
5. B S Sijwali, Indu Sijwal; A New Approach to Reasoning Verbal and Non-Verbal (English) 1st Edition.
6. SP Bakshi; Objective General English.
7. Wren and martin; English grammar book.
8. Neetu singh; Plinth to paramount English.
9. Norman Lewis; Word power made easy (Mainly for development of vocab)
10. https://www.playquiz2win.com/engquizmenu.html
11. https://www.sawaal.com

Suggested List of Laboratory Experiments :- (Expandable):
    Students should solve various problems and quiz on the above mention topics, and prepare an assignment.

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