

Chhattisgarh Swami Vivekanand Technical University, Bhilai

SCHEME OF TEACHING & EXAMINATION B.E. III SEMESTER ELECTRICAL & ELECTRONICS ENGINEERING.

S.No.	Board of Study	Subject Code	Subject	Periods per week			Scheme of Exam			Total Marks	Credit L+ (T+P) / 2
				L	T	P	Theory/Practical				
							ESE	CT	TA		
1	Appl. Mathematics	324311 (14)	Mathematics-III	4	1	-	80	20	20	120	5
2	Appl. Mathematics	328312 (14)	Numerical Analysis	3	1		80	20	20	120	4
3	Electronics & Telecom. Engg.	328313 (28)	Basic Electronics	3	1		80	20	20	120	4
4	Electrical & Electronics Engg.	325311 (25)	Basic Electrical Machines	4	-		80	20	20	120	4
5	Electrical Engg.	324316 (24)	Electrical Power Generation	3	1	-	80	20	20	120	4
6	Electrical Engg.	324314 (24)	Electric Circuits	3	1		80	20	20	120	4
7	Electrical & Electronics Engg.	325321 (25)	Basic Electrical Machines Lab			3	40		20	60	2
8	Electronics & Telecom. Engg.	328322 (28)	Basic Electronics Lab			3	40		20	60	2
9	Electrical Engg.	324323 (24)	Electric Circuits Lab			3	40		20	60	2
10	Electrical & Electronics Engg.	325322 (25)	Programming with C Lab			3	40		20	60	2
11	Humanities	300325(46)	Value Education			2			40	40	1
12			Library			1					
			Total	20	5	15	640	120	240	1000	34

L- Lecture T- Tutorial
P- Practical , ESE- End Semester Exam
CT- Class Test TA- Teacher's Assessment

Note (1) : Duration of all theory papers will be of **Three Hours**.

**CHHATTISGARH SWAMI VIVEKANAD TECHNICAL UNIVERSITY,
BHILAI (C.G.)**

Semester: **B.E. 3 Sem.**

Branch: **Electrical, Electrical & Electronics**

Subject : **MATHEMATICS-III**

Code : 324311 (14)

Total Theory Periods: **40**

Total Tutorial Periods: **10**

Total Marks in End Semester Exam. : **80**

Minimum number of class test to be conducted: **02**

UNIT - 1 FOURIER SERIES

(No. of periods 8+2)

Euler's Formula, Functions having points of discontinuity, Change of interval, Even & Odd functions, Half range series, Harmonic analysis.

UNIT - 2 LAPLACE TRANSFORM

(No. of periods 8+2)

Definition, Transform of elementary functions, Properties of Laplace transform, Transform of derivatives & integrals, Multiplication by t^n , Division by t , Evaluation of integrals, Inverse Laplace Transform, Convolution theorem, Unit step function, Unit impulse function, Periodic function, Application to solution of ordinary differential equations.

UNIT - 3 PARTIAL DIFFERENTIAL EQUATION

(No. of periods 8+2)

Formation, Solution by direct integration method, Linear equation of first order, Homogeneous linear equation with constant coefficients, Non-homogeneous linear equations, Method of separation of variables.

UNIT - 4 COMPLEX VARIABLES

(No. of periods 8+2)

Derivative, Cauchy-Riemann equations, Analytic functions, Harmonic functions, Flow problems, Complex integration, Cauchy theorem, Cauchy integral formula, Taylor & Laurent series, Singularity, Residue, Evaluation of real definite integrals.

UNIT - 5 Z-TRANSFORM

(No. of periods 8+2)

Definition, Properties, Initial value & final value theorems, Inverse Ztransform, Convolution theorem, Partial fraction, Residue method & Applications to solution of difference equations.

TEXT BOOKS: -

1. Higher Engg. Mathematics by Dr. B.S. Grewal– Khanna Publishers.
2. Advanced Engg. Mathematics by Erwin Kreyszig – John Wiley & Sons.

REFERENCE BOOKS: -

1. Advanced Engg. Mathematics by R.K. Jain and S.R.K. Iyengar – Narosa Publishing House.
2. Applied Mathematics by P.N. Wartikar & J.N. Wartikar. Vol- II– Pune Vidyarthi Griha Prakashan, Pune.
3. Applied Mathematics for Engineers & Physicists by Louis A. Pipes- TMH.

**CHHATTISGARH SWAMI VIVEKANAND TECHNICAL UNIVERSITY,
BHILAI (C. G.)**

Semester: B.E. 3 Sem.	Branch: Electrical & Electronics Engg.
Subject: Numerical Analysis	Code: 328312 (14)
Total Theory Periods: 30	Total Tutorial Periods: 10
Total Marks in End Semester Exam: 80	
Minimum number of class tests to be conducted: 02	

UNIT- 1 NUMERICAL SOLUTIONS OF ALGEBRAIC AND TRANSCENDENTAL EQUATIONS

(No. of periods 6+2)

Bisection Method, Regula-Falsi Method, Newton-Raphson Method, Secant Method, Birge-Vieta Method, Bairstow's Method.

UNIT – 2 NUMERICAL SOLUTIONS OF SIMULTANEOUS LINEAR EQUATIONS

(No. of periods 6+2)

Direct Methods - Gauss Elimination, Gauss-Jordan & Crout's Triangularisation Method.
Iterative Methods - Jacobi's, Gauss-Siedal & Successive Over Relaxation Method.

UNIT – 3 NUMERICAL DIFFERENTIATION AND INTEGRATION (No. of periods 6+2)

Finite Differences, Derivatives using Forward, Backward and Central Difference Formulae.
Newton-Cote's quadrature formula, Trapezoidal rule, Simpson's rules, Weddle's rule.

UNIT – 4 NUMERICAL SOLUTION OF ORDINARY DIFFERENTIAL EQUATIONS

(No. of periods 6+2)

Picards Method, Taylor's Series Method, Euler's Method, Euler's Modified Method, Range-Kutta Methods, Predictor-corrector Methods- Milne's Method, Adams-Bashforth Method.

UNIT – 5 CURVE FITTING AND METHOD OF LEAST SQUARES (No. of periods 6+2)

Method of Least Squares, Fitting of a Straight Line, Parabola, Curves of the form $y = ab^x$ and $y = ax^b$.

TEXT BOOKS:

1. Numerical Methods in Engineering and Science by Dr. B.S. Grewal, Khanna Publishers.
2. Numerical Methods for Scientific and Engineering Computation by M .K. Jain, S. R. K. Iyengar & R. K. Jain, Wiley Eastern Limited.

REFERENCE BOOKS.

1. Numerical Methods, by Noble ben, New York, International Publications New York 1964.
2. Numerical Methods for Scientists and Engineers by K. Shankar Rao, Prentice Hall of India.
3. Numerical Methods with C++ Programming, by Somasundaram & Chandrasekaran, Prentice Hall of India.
4. Numerical Methods, by S. S. Shastri, Prentice Hall Inc. India 1998.

**CHHATTISGARH SWAMI VIVEKANAND TECHNICAL UNIVERSITY
BHILAI (C.G.)**

Semester : **III**

Branch: **Electrical & Electronics Engg.**

Subject: **Basic Electronics**

Code: **328313 (28)**

Total Theory Periods: **40**

Total Tutorial Periods: **10**

Total Marks in End Semester Examination: **80**

Minimum number of Class tests to be conducted: **Two**

Unit – I

Introduction, Transport Phenomena in semiconductor, Formation of P-N Junction, Properties of PN Junction, PN Junction Diodes; Semiconductor Diodes, VI Characteristics, Effect of Temperature on VI Characteristics, Ideal Diode, Diode equation, Diode Resistance, Diode Capacitance: Transition and Diffusion Capacitance.

Unit – II

Rectifying circuits and DC Power Supplies: Load line analysis of diode circuit, Half wave rectifier: Voltage regulation, Ripple factor, ratio of rectification, Transformer Utilization factor. Full wave rectifier, Bridge rectifier. Filter circuits for power supply: Inductor filter, Capacitor filter, LC filter, Multiple LC filter, CLC or ? filter. Zener diode: Break down mechanism, Characteristics, Specifications, Voltage regulator circuit using zener diode.

Unit - III

Transistor: Introduction, Construction, Types: npn and pnp, Current components. Transistor as an amplifier, Transistor Characteristics, Transistor Circuit Configuration: Common Base (CB) Configuration, Common Emitter (CE) Configuration, Common Collector Configuration (CC), Early Effect. Ebers-Moll Model, Maximum Voltage Ratings.

Unit – IV

Transistor Biasing and Thermal stabilization: The operating point, Bias stability, Stability factor, Emitter bias, Collector – to – base bias, Voltage divider bias with emitter bias, Emitter bypass capacitor. Bias compensation.

Unit – V

Field Effect Transistor (FET): Introduction, Construction, Operation, V-I Characteristics, Transfer Characteristics, Drain Characteristics, Small-Signal Model.

Metal Oxide Semiconductor Field Effect Transistor (MOSFET): Introduction, Construction, Operation and characteristics, Depletion MOSFET, Enhancement MOSFET.

Name of Text Books:

1. Integrated Electronics: Analog & Digital Circuit Systems – Jacob Millman & Halkias, TMH.
2. Electronic Devices & Circuits – Allen Mottershead, PHI.

Name of Reference Books:

1. Electronic Devices and Circuit Theory – Boylestad & Nashelsky, 8th Ed. PHI.
2. Electronic Devices & Circuit Analysis – K. Lal Kishore, BS Publications

**CHHATTISGARH SWAMI VIVEKANAND TECHNICAL UNIVERSITY
BHILAI (C.G.)**

Semester : **III**

Subject: **Basic Electrical Machines**

Total Theory Periods: **40**

Total Marks in End Semester Examination: **80**

Minimum number of Class tests to be conducted: **Two**

Branch: **Electrical & Electronics Engg.**

Code: **325311 (25)**

Total Tutorial Periods: **10**

Unit –1 Analysis of Transformers

Revision of transformer fundamentals, Excitation phenomenon in transformers, switching transients, autotransformers, equivalent circuit, phasor diagram, three phase transformers, phase groups, different connections, three winding transformers, equivalent circuit.

Unit-2 Operation of Transformers

Parallel operation of transformers, connection from three phase to two phase, single phase and six phases, open delta operation, back to back test, separation of losses, on load tap changing.

Unit-3 Principles of DC Machines

Construction of DC machine, B_{lv} and B_{li} concepts, voltage and torque productions in DC generator and DC motor, generated emf equation, generated torque equation, armature reaction in generator and motor, flux and mmf distribution, effect of brush shift, compensating winding commutation, methods of attaining linear commutation.

Unit-4 Principles of DC Machines

Types of DC generator, conditions of self-excitation, operating characteristics of DC generators, types of DC motors, characteristics of DC motors, starters of DC shunt and series motors, methods of speed control, losses and efficiency of DC machines.

Unit-5 Testing of DC Machines

Swinburns test, Hopkinsons test, retardation test, field test, separation of losses, plugging, dynamic breaking, regenerative breaking, DC machine applications, parallel operation of DC shunt and series generators.

Text Books for DC Machines

1. Electric Machines-I.J. Nagrath D.P. Kothari
2. Performance and design of DC machines-A.E. Claytor and Hancock

Text Book for Transformers

1. Performance and Design of AC Machines – M.G. Say
2. Electric Machines-I.J. Nagrath D.P. Kothari

Reference Books :

1. Electrical Machinery – Dr. P.S. Bhimbhara
2. Electrical Machines – P.K. Mukharjee & Chakravarti
3. Electrical Machines - J.B. Gupta

**CHHATISGARH SWAMI VIVEKANAND TECHNICAL UNIVERSITY,
BHILAI (C.G.)**

Semester: 3rd
Subject: Electrical Power Generation
Total Theory Periods: 40
Total Marks in End Semester Exam: 80
Minimum number of Class tests to be conducted: 2

Branch: EE/EEE
Code: 324316 (24)
Total Tut Periods: 12

UNIT I:

Prediction of Load: Definition of connected load, maximum load, maximum demand, demand factor, load factor, diversity factor, plant capacity factor, plant utilization factor, load duration curve, mass curve.
Choice of Power station and units: Types of power station, choice of type of generation, choice of size of generator units and number of units.

UNIT II

Steam Power station: Main parts and working of a steam station, characteristics of steam turbines, characteristics of turbo alternators, steam station auxiliaries, steam station layout, super pressure steam stations.

UNIT III

Hydro power stations: Hydrology, hydrographs, flow duration curve, mass curve, types of dam, principle of working of a hydro electric plant, tidal power plant, power to be developed, types of turbine and their characteristics, characteristics of generators, power station structure and layout.

UNIT IV

(A) Nuclear power stations: main parts of nuclear power station principle of nuclear energy, main parts of reactor, types of power reactor, location of nuclear power plant, layout of power station, reactor control, nuclear waste disposal.

(B) MHD generation: history of MHD generation, principle of MHD generation, MHD cycles and working fluids, open cycle MHD system, closed cycle MHD system, advantage of MHD generation.

UNIT V

(A) New Energy Sources: Solar radiation, Solar energy collectors, Conversion of solar energy into electric energy, Solar hydrogen energy cycle, Wind mills, Tidal power generation schemes, Tidal barrage, Environmental aspects of new and old electric energy generation.

(B) Economic operation of power systems: Criteria for distribution of load between units of a plant and between plants, transmission loss as a function of plant generation, loss formula coefficients, brief aspects of load dispatching.

Text Books:

1. Generation of Electrical Energy by B.R. Gupta, S.Chand Pbs.
2. Car, T.H., Electric Power Station, Chappman & Hall

Reference Books:

1. Elements of Electric Power Station Design by M.V. Deshpande
2. A Course in Electrical Power by Soni Gupta Bhatnagar, Dhanpat Rai
3. A Course in Electrical Power by J.B.Gupta, Kataria Pbs.

**CHHATISGARH SWAMI VIVEKANAND TECHNICAL UNIVERSITY,
BHILAI (C.G.)**

Semester: 3RD

Subject: Electric Circuits

Total Theory Periods: 40

Total Marks in End Semester Exam: 80

Minimum number of Class tests to be conducted: 2

Branch: Electrical & Electronics Engg.

Code: 324314 (24)

Total Tut Periods: 12

UNIT – I

Development Of Circuit Concepts:

The relationship of field and circuit concept for parameters, lumped, linear and bilateral elements, voltage and current sources, duality of simple circuit, network topology: graph tree, branch link, tie set, cutset, loop and nodal analysis, equilibrium equations.

UNIT – II

Network Solution And Reduction:

Solution of network equation of determination method of network reductions, nodal analysis, mesh analysis, super node, super mesh network theorems, superposition theorem, reciprocity theorem, Thevenin's theorem, Norton's theorem, star delta transformation theorem, Tellegen's theorem.

UNIT – III

Network Solution And Reduction:

Electrostatic and electromagnetic coupling, self-inductance, mutual inductance, coupling coefficient, complete network with conductive and inductive coupling, Series and parallel resonance, quality factor, band width, selectivity, half power frequencies, circle diagram of simple series and parallel circuits, inversion of circle and straight line impedance and admittance loci.

UNIT – IV

Poly Phase Circuits:

Examples of two, three, four-loop circuits and their solutions, unbalanced poly phase circuits, determination of phase sequence, star/delta connections, and power measurement in poly phase circuits.

UNIT – V

Non – sinusoidal Ideal Wave Forms:

Common non-sinusoidal waveforms, Fourier series, analytical evaluation of Fourier coefficients, exponential form of Fourier series, frequency spectra of periodic waveforms, semi graphical method of analysis, effective value and equivalent power factor solution of circuits with non sinusoidal currents and voltages, harmonic resonance and harmonics in poly phase circuits.

Text Books: 1. “*Electric Circuit Analysis*”, Hayt, Kemmerly, Durbin, TMH Pbs.
2. “*AC Circuits*”, Kerchner and Cocoran

Reference Books: 1. “*Fundamentals of Electric Circuits*” Alexander & Sadiku, TMH Pbs.
2. “*Basic Circuit Theory*”, Desoer and Kuh, Mc Graw Hill Pbs.

**CHHATTISGARH SWAMI VIVEKANAND TECHNICAL UNIVERSITY
BHILAI (C.G.)**

Semester : **III**

Branch: **Electrical & Electronics Engg.**

Subject: **Basic Electrical Machines Lab**

Code: **325321 (25)**

Total Practical Periods: **36**

Total Marks in End Semester Examination: **40**

EXPERIMENTS TO BE PERFORMED (minimum 10 experiments)

1. To draw equivalent circuit of 1 phase transformer and calculate the regulation and efficiency at different load condition.
2. Sumpner's test on single-phase transformers.
3. parallel operation of two single-phase transformers.
4. Parallel operation of three-phase transformer.
5. Scott connection of two single-phase transformers.
6. To study various types of connections of three phase transformers & verification of vector groups.
7. Load test of DC shunt generator & determination of voltage regulation at different loads.
8. Speed control of DC shunt motor.
9. To determine characteristics of DC series motor.
10. To determine characteristics of DC series motor.
11. To draw magnetization characteristics of a DC shunt generator & determine EMF induced at no load & critical resistance.
12. Speed control of DC shunt motor using ward lenard method.

LIST OF EQUIPMENT/MACHINE REQUIRED:

Single Phase Transformer	4 Nos.
Three Phase Transformer	2 Nos.
Three Phase Auto Transformer	2 Nos.
DC Shunt Generator	1 Nos.
Three Phase Induction Motor	1 Nos.
DC Shunt Motor	2 Nos.
DC series Motor	1 Nos.

INSTRUMENTS REQUIRED:

1. Ammeters (AC & DC)
2. Voltmeter (AC & DC)
3. Wattmeter
4. Tachometer

RECOMMENDED BOOKS:

1. Laboratory courses in electrical engineering by s.G. Tarnekar & P.K. Kharbanda

**CHHATTISGARH SWAMI VIVEKANAND TECHNICAL UNIVERSITY
BHILAI (C.G.)**

Semester : **III**

Branch: **Electrical & Electronics Engg.**

Subject: **Basic Electronics Lab**

Code: **328322 (28)**

Total Practical Periods: **36**

Total Marks in End Semester Examination: **40**

Experiments to be performed (minimum 10 experiments)

1. To draw the characteristics of a semi conductor diode and to find cut-in voltage, reverse resistance, static resistance and dynamic resistance.
2. To draw the characteristics of a zener diode
3. To design a half wave rectifier and to determine its efficiency and ripple factor.
4. To design a- full wave rectifier and determine the ripple factor and efficiency with filter.
5. To design a- full wave rectifier and determine the ripple factor and efficiency without filter.
6. To draw the characteristics of FET using BFW – 10
7. To draw the characteristics of CE configuration of a transistor amplifier.
8. To draw the characteristics of CB configuration of a transistor amplifier.
9. To draw the characteristics of CC configuration of a transistor amplifier.
10. To design a Zener regulator circuit and to find the regulation characteristics.
11. To draw the load line of a transistor amplifier under CE configuration.
12. To design and verify the self bias circuit operation.
13. To design and verify the voltage divider biasing circuit.
14. To verify the effect of emitter bypass capacitor.
15. To design a regulator circuit using Zener diode.

List of Equipments/Machine Required:

Circuit components, Breadboard, Hook-up wire, Power supply, CRO, Function generator

Recommended Books:

1. Laboratory Manual for Electronic Devices and Circuits, 4th Ed., David A. Bell, PHI

**CHHATISGAH SWAMI VIVEKANAND TECHNICAL UNIVERSITY,
BHILAI (C.G.)**

Semester: 3rd

Subject: ELECTRIC CIRCUITS LAB

Total practical periods: 36

Total Marks in end Semester Exam: 40

Branch: Electrical & Electronics Engg.

Code: 324323 (24)

List of Experiments (minimum 10 experiments)

1. To verify Reciprocity theorem.
2. To verify Superposition theorem.
3. To verify Thevenins theorem.
4. To verify Norton's theorem.
5. To verify Max. Power transfer theorem.
6. To study the charging and discharging of a capacitor through resistor.
7. To measure the voltage current, and resistance with the help of electronic multimeter.
8. To plot voltage vs resistance characteristics of Incandescent lamp.
9. To connect a tube light and study its min. operating voltage, current , power and power factor.
10. To verify the voltage and current relation in star and delta connected system.
11. To measure three phase power using Two-watt meter method.
12. To verify the effect of resistance and condenser connected in series in an a.c. circuit.
13. To verify the effect of resistance and condenser connected in parallel in an a.c. circuit.
14. To verify Kirchoff's law. (a) Kirchoff's current law.(b) Kirchoff's voltage law.
15. To verify effect of unbalanced load in star connection.

List of apparatus required:

1. Voltmeter, ammeter, Wattmeter
2. Power factor meter
3. Resistors
4. Capacitors
5. Lamp load
6. DC supply
7. Three-phase autotransformer
8. Multimeter

Reference books:

1. Experiments in basic electrical engineering, S.K.Bhattacharya.
2. Basic shop practical, Mehta & Gupta
3. Practical in electrical engineering, Dr. N.K.Jain

**CHHATISGAH SWAMI VIVEKANAND TECHNICAL UNIVERSITY,
BHILAI (C.G.)**

Semester: 3rd

Subject: Computer Programming with C

Total practical periods: 36

Total Marks in end Semester Exam: 40

Branch: Electrical & Electronics Engg.

Code: 325322 (25)

Unit-1 Introduction of C Programming

The C character set, constants, variables and keywords, type of C constant, type of C variable, C key words, C instruction, type declaration instruction, arithmetic instruction, integer and float conversion, type conversion in assignment, hierarchy of operation.

Unit 2 Control Structure

Control structure in C: The decision control structure, if, multiple statements within if, if-else, nested if-else, decision using switch, logical operators, break statement, continue statement, conditional operators.

Loops: while, do-while, for.

Unit-3 Functions and Pointers

What is function, why use function, passing values between function, scope rule of function, advanced feature of function, function declaration and prototype, call by value, call by reference, call by address.

Introduction to pointer, pointer notation arithmetic function call using pointer, recursion of function.

Unit 4 Arrays and Strings

What are Arrays, Array Initialization, bound checking, passing array element to a function, pointer and arrays, passing entire array to a function, two dimensional array, Initializing 2-D array, memory representation of 2-D array., Strings: what are strings, standard library function, two dimensional arrays of characters, array of pointer to string and its limitations.

Unit 5 Structure and File I/O

Introduction to structure, declaring a structure, accessing structure, array of structure, additional features, uses of structure.

File I/O: types of I/O, console I/O function: Formatted & un-formatted, file opening modes, file copy, using argc and argv, text mode versus binary mode, detecting errors in reading & writing.

Introduction to interrupt.

Text Books:

1. Let us C Y.P. Kanetkar, BPB
2. Programming in C, E. Balaguruswami

**CHHATISGAH SWAMI VIVEKANAND TECHNICAL UNIVERSITY,
BHILAI (C.G.)**

Semester : B.E. 3rd Sem. Branch : Common to all Branches
Subject : **Value Education** Code : 300325(46)
No. of Periods : 2 pds/week Tutorial Periods : NIL
Total Marks in End Semester Exam. : NIL Teacher's Assessment : 40 Mks
Minimum number of class test to be conducted : Two

Unit – I

?? **STUDY OF BASIC HUMAN OBJECTIVES** : Everlasting solution $\frac{1}{4}$ ek/kku $\frac{1}{4}$ prosperity $\frac{1}{4}$ ef) $\frac{1}{4}$ trust in self and others $\frac{1}{4}$ $\frac{1}{4}$ and coexistence $\frac{1}{4}$ gvflrRo $\frac{1}{2}$ for balance in nature. Need and importance of aforesaid basic human objectives and how to achieve these.

Unit – II

?? **CONCEPT AND UNDERSTANDING OF HUMAN HAPPINESS**

Meaning and concept of "happiness", incessant happiness, its relationship with gaurantee of physical needs, comforts, physical and sensory pleasures with its transient nature, misery; The only method to minimize incessant happiness : gaining right understanding about oneself, one's body, one's relationship with other human beings, Nature and total existence.

Unit – III

?? **PROPER UNDERSTANDING** about the order in Nature $\frac{1}{4}$; oLFkk $\frac{1}{2}$ and co-existence $\frac{1}{4}$ gvflrRo $\frac{1}{2}$ at various levels, such as, I and my body, family, society, Nature and existence.

?? **UNDERSTANDING THE SELF** : Understanding human reality – I and my body, present understanding of the self, physical needs, relation with others and with Nature, gaining proper understanding of the self, discrimination between 'I' and my 'body', characteristics and the needs of 'I', of my 'body' and 'body' & 'I'.

Unit – IV

?? **SYNERGATIC ORDER $\frac{1}{4}$; oLFkk $\frac{1}{2}$ and COEXISTENCE $\frac{1}{4}$ gvflrRo $\frac{1}{2}$ among HUMANS, IN NATURE & IN EXISTENCE :**

- Conceptual understanding of natural relations and consequent values, of family and relation therein, of society and role of engineers therein, 'overall excellence' : concept, its universal parameters and total human behaviour
- Inanimate $\frac{1}{4}$ tM $\frac{1}{2}$ and consciousness $\frac{1}{4}$ oS $\frac{1}{2}$ aspects of Nature, Four distinct synergetic orders in Nature - Padaarth Awastha $\frac{1}{4}$ nkFz voLFkk $\frac{1}{4}$ Pran Awastha $\frac{1}{4}$ k.k voLFkk $\frac{1}{4}$ Jiv Awastha $\frac{1}{4}$ t ho voLFkk $\frac{1}{4}$ and Gyan Awastha $\frac{1}{4}$ ku voLFkk $\frac{1}{4}$ complementary supplementary evolutionary connection amongst above orders, identifying and implementing "Appropriate Technology".
- Synergetic order among interacting entities of Nature operating in all pervading changeless Shunya or Satta, Indivisible interconnectedness of Satta and Prakriti and its implications.

Unit – V

?? IMPLICATIONS OF PROPER UNDERSTANDING

- Awakening of the common goal of all human beings,
- promotion and perseverance of synergetic order and co-existence at all levels leading to incessant happiness.
- Natural manifestation of universal human values and thereby incessant happiness
- Undivided Society and Universal Organised System
- Transition from synergetic disorder to synergetic order
- Evaluation of Understanding, work and behaviour.

REFERENCES

1. Jeevan Vidya Camp notes
2. An Introduction to Jeevan Vidya by Shri A. Nagaraj
