A.G& S.G.SIDDHARTHA DEGREE COLLEGE OF ARTS & SCIENCE

VUYYURU-521165, KRISHNA Dt., A.P.(Autonomous)

Accredited by NAAC with "A" Grade

2021-2022

DEPARTMENT OF PHYSICS

MINUTES OF BOARD OF STUDIES

EVEN SEMESTER

30-03-2022

Minutes of the meeting of Board of studies in Physics for the Autonomous course of A.G. & S.G. Siddhartha Degree College of Arts & Science, Vuyyuru held at 10.30 A.M on 30 – 03 - 2022 in the Department of Physics.

Sri J.Hareesh Chandra — Presiding

Members Present:

1) (Sri J. Hareesh Chandra)	Chairman	Head, Department of physics(I/C) A.G. & S.G.S. Degree College of Arts&science, Vuyyuru - 521165
2) (Dr. M. Rami Reddy)	University Nominee	Registrar Krishna University, Machilipatnam.
3) (Dr. T. Srinivasa Krishna)	Academic Council Nominee	Associate Professor, H.O.D, Dept. of Physics, P.B.Siddhartha college of arts & science,vijayawada Vijayawada.
4) (Sri P.V. Ramana)	Academic Council Nominee	H.O.D, Dept. of Physics, A.J. Kalasala, Machilipatnam.
5) (Sri I. Chittibabu)	Representative from Industry	Sub Divisional Engineer, BSNL Vijayawada.
6) (Sri B. Dileep Kumar)	Alumini	Lecturer in Physics, Dept. of Physics, IIIT, Nuzivid.
7) (Sri U.Ram prasad)	Member	Lecturer in Physics, A.G. & S.G.S. Degree College of Arts & Science, Vuyyuru - 521165.
8) (Sri M. Sateesh)	Member	Lecturer in Physics, A.G. & S.G.S.Degree College of Arts & Science, Vuyyuru - 521165.

9).....M. Purna Durga Parimala..... **Member** **Lecturer in Physics,**
A.G. & S.G.S.Degree College of Arts & Science, Vuyyuru - 521165.

(Smt. M.P.D. Parimala)

10).....J. Dileep..... **Member** **Lecturer in Physics,**

(Sri J. Dileep)

A.G. & S.G.S. Degree College of Arts & Science, Vuyyuru - 521165.

Agenda for B.O.S Meeting

1 .To recommend the syllabi and model papers for II semester of I Degree B.Sc., Physics for the Academic year 2021-2022.

2. To recommend the syllabi and model papers for IV semester of II Degree B.Sc., Physics for the Academic year 2021-2022.

3. To recommend the syllabi and model papers for VI semester of III Degree B.Sc. Physics for the Academic year 2021-2022.

4. To recommend the Blue print of question papers for II, IV & VI semesters of B.Sc. Physics for the Academic year 2021-2022.

5. To recommend the Guidelines to be followed by the question paper setters in Physics for II, IV & VI Semester – end exams.

6. To recommend the teaching and evaluation methods to be followed under Autonomous status.

7. Any suggestions regarding seminars, workshops, Guest lecture to be organized.

8. Recommend the panel of paper setters and Examiners to the controller of Examinations of autonomous Courses of A.G. & S.G.S.Degree colleges of Arts & Science, Vuyyuru.

9. Any other matter.

T. Harichandra
Chairman.

RESOLUTIONS

1) It is resolved to follow the **changed syllabi and model papers for II semester of I B.Sc.** as per APSCHE guidelines from the Academic year 2020-2021.
2) It is resolved to follow the **changed syllabi and model papers for IV semester of II B.Sc.** as per APSCHE guidelines from the Academic year 2020-21.
3) It is resolved to follow
   a) The same **syllabi and model papers** for elective paper "Analog and Digital Electronics" (PHY-601GE) under Choice Based Credit System (CBCS) for **VI semester of III B.Sc.**
   b) The **same syllabi and model papers** for Cluster paper "Introduction to Microprocessor and Microcontroller" (PHY-602 CE) under Choice Based Credit System (CBCS) for **VI semester of III B.Sc.**
   c) The same **syllabi and model papers** for Cluster paper "Computational Methods and Programming" (PHY-603 CE) under Choice Based Credit System (CBCS) for **VI semester of III B.Sc.**
   d) The **same syllabi and model papers** for Cluster paper "Electronics Instrumentation" (PHY-604 CE) under Choice Based Credit System (CBCS) and Project work is introduced instead of Practical for 50 marks, for **VI semester of III B.Sc.**
4) It is resolved to follow the **changed Blue print** of II semester of Degree I B.Sc. for the Academic year 2021-2022.

- It is resolved to follow the **changed Blue print** of IV semester of Degree II B.Sc. for the Academic year 2021-2022.
- It is resolved to follow the **same Blue print** of VI semester of Degree III B.Sc. for the Academic year 2021-2022.

5) It is resolved to follow the **changed Guidelines** of II semester of Degree I B.Sc. for the Academic year 2021-2022.

- It is resolved to follow the **changed Guidelines** of IV semester of II Degree B.Sc. for the Academic year 2021-2022.
- It is resolved to follow the **same Guidelines** of VI semester of Degree III B.Sc. for the Academic year 2021-2022.

6) It is resolved to continue the following teaching and evolution methods for Academic year 2021-2022.

Teaching Methods:

Besides the conventional methods of teaching, we use modern technology i.e. using of LCD projector, U boards, virtual lab etc, for better understanding of concepts.

Evaluation of a student is done by the following procedure:

➢ **Internal Assessment Examinations:**

- For I B.Sc (sem II), out of 100 marks in each paper, 25 marks shall be allocated for internal assessment.
- For II B.Sc (sem IV) and III B.Sc (sem VI) out of 100 marks in each paper, 30 marks shall be allocated for internal assessment
- Out of these 25 marks, **20 marks are allocated for announced tests (i.e. IA-1 & IA-2).** Two announced tests will be conducted and average of these two tests shall be deemed as the marks obtained by the student, **5 marks** are allocated for **assignment / class room seminars for II nd semester .**
- Out of these 30 marks, **20 marks are allocated for announced tests (i.e. IA-1 & IA-2).** Two announced tests will be conducted and average of these two tests shall be deemed as the marks obtained by the student, **5 marks** are allocated on the basis of candidate's **percentage of attendance, 5 marks** are allocated for **assignment / class room seminars for IV and VI Semesters.**

➢ **Semester – End Examination:**

The maximum marks for I B.SC, II Semester – End examination shall be 75 marks and duration of the examination shall be 3 hours.

- The maximum marks for II B.SC and III B.SC. Semesters – End examination shall be 70 marks and duration of the examination shall be 3 hours.
- **Semester – End examinations** in theory papers and **practical Examinations** shall be conducted at the end of every semester **II, IV & VI** and Project work for Cluster paper PHY-604 CE instead of Practical, **for I, II & III B.Sc.**

7) Discussed and recommended for organizing **seminars, Guest lecturers, workshops** to upgrade the knowledge of students, for the approval of the academic council.

8) Discussed and empowered the Head of the department of Physics to suggest the panel of paper setters and examiners to the controller of examinations.

9) Nil.

V. Hareechandra
Chairman.

DEPARTMENT OF PHYSICS

A.G. & S.G.SIDDHARTHA DEGREE COLLEGE OF ARTS & SCIENCE (AUTONOMOUS) , VUYYURU – 521 165

I B.Sc. 2nd Semester (2021-2022**)**

Paper II: Waves Optics **II SEMESTER**

Work load: 60 hrs per semester credits - 3 **4 hrs/week**

Course outcomes :

On successful completion of this course, the student will be able to:

- Understand the phenomenon of interference of light and its formation in (i) Lloyd's single mirror due to division of wave front and (ii) Thin films, Newton's rings and Michelson interferometer due to division of amplitude.
- Distinguish between Fresnel's diffraction and Fraunhoffer diffraction and observe the diffraction patterns in the case of single slit and the diffraction grating.
- Describe the construction and working of zone plate and make the comparison of zone plate with convex lens.
- Explain the various methods of production of plane, circularly and polarized light and their detection and the concept of optical activity..
- Comprehend the basic principle of laser, the working of He-Ne laser and Ruby lasers and their applications in different fields.
- Explain about the different aberrations in lenses and discuss the methods of minimizing them.
- Understand the basic principles of fiber optic communication and explore the field of Holography and Nonlinear optics and their applications.

UNIT-I **Interference of light: (12hrs)**

Division of Wave front: Introduction, Conditions for interference of light, Interference of light by division of wave front and amplitude, Phase change on reflection- Stokes' treatment, Fresnel's Bi-Prism-Determination of Wavelength of Light.

Division of Amplitude: Cosine law - colors in thin films, Newton's rings in reflected light-Theory and experiment - Determination of wavelength of monochromatic light, Michelson interferometer and determination of wavelength.

UNIT-II **Diffraction of light: (12hrs)**

Fraunhofer Class: Distinction between Fresnel and Fraunhoffer diffraction,Fraunhoffer diffraction at a single slit, Double slit and N-slits(No Derivation for N-Slits), Determination of wavelength of light using diffraction grating, Resolving power of grating,

Fresnel's Class: Fresnel's half period zones, Zone plate, comparison of zone plate with convexlens.

UNIT-III **Polarisation of light: (12hrs)**

Polarized light: Methods of production of plane polarized light -Polarisation by reflection (Brewster's law), Malus law,Double refraction, Nicol prism, Nicol prism as polarizer and analyzer

Types and production of polarized Light: Quarter wave plate, Half wave plate, Plane, Circularly and Elliptically polarized light-Production and detection, Optical activity, Laurent's half shade polarimeter: determination of specific rotation

UNIT-IV **(12hrs)**

Aberrations: Monochromatic aberrations - Spherical aberration, Methods of minimizing spherical aberration, Coma& Astigmatism -minimization methods, Chromatic aberration-the achromatic doublet; Achromatism for two lenses (i) in contact and (ii) separated by adistance.

FibreOptics: Fibre optics: Introduction to Fibers, different types of fibers, rays and modes in an optical fiber, Principles of fiber communication (qualitative treatment only), Advantages of fiber opticcommunication.

UNIT-V **Lasers and Holography: (12hrs)**

Lasers: Introduction, Spontaneous emission, stimulated emission, Population Inversion, Laser principle, Einstein coefficients, Types of lasers-He-Ne laser, Ruby laser, Applications of lasers;

Holography: Basic principle of holography, Applications of holography

REFERENCE BOOKS:

- BSc Physics, Vol.2, Telugu Akademy, Hyderabad
- A Text Book of Optics-N Subramanyam, L Brijlal, S.Chand&Co.
- Optics-Murugeshan, S.Chand&Co.
- Unified Physics Vol.IIOptics, Jai PrakashNath&Co.Ltd.,Meerut
- Optics,F.A. Jenkins and H.G.White,McGraw-Hill
- Optics,AjoyGhatak,TataMcGraw-Hill.
- Introduction of Lasers – Avadhanulu, S.Chand&Co.
- Principles of Optics- BK Mathur, Gopala Printing Press,1995

Practical Course II : Wave Optics

Workload:30hrs **2 hrs/week**

Course outcomes (Practicals) :

On successful completion of this practical course the student will be able to,

1. Gain hands-on experience of using various optical instruments like spectrometer, polarimeterand making finer measurements of wavelength of light using Newton Ringsexperiment, diffraction gratingetc.
2. Understand the principle of working of polarimeter and the measurement of specific rotatory power of sugarsolution
3. Know the techniques involved in measuring the resolving power of telescope and dispersive power of the material of theprism.
4. Be familiar with the determination of refractive index of liquid by Boy's methodand the determination of thickness of a thin wire by wedgemethod.

Minimum of 6 experiments to be done and recorded

1. Determination of radius of curvature of a given convex lens-Newton'srings.
2. Resolving power ofgrating.
3. Study of optical rotation–polarimeter.
4. Dispersive power of aprism.
5. Determination of wavelength of light using diffraction grating-minimum deviation method.
6. Determination of wavelength of light using diffraction grating-normal incidence method.
7. Resolving power of atelescope.
8. Refractive index of a liquid-hallowprism
9. Determination of thickness of a thin wire by wedgemethod
10. Determination of refractive index of liquid-Boy'smethod.

RECOMMENDED CO-CURRICULAR ACTIVITIES:

MEASURABLE

Assignments (in writing and doing forms on the aspects of syllabus content and outside the syllabus content. Shall be individual andchallenging)

Student seminars (on topics of the syllabus and related aspects (individualactivity)

Quiz (on topics where the content can be compiled by smaller aspects and data (Individuals or groups asteams)

Study projects (by very small groups of students on selected local real-time problems pertaining to syllabus or related areas. The individual participation and contribution of students shall be ensured (team activity)

GENERAL

GroupDiscussion

Visit to Research Stations/laboratories and related industries

RECOMMENDED ASSESSMENT METHODS

Some of the following suggested assessment methodologies could be adopted;

The oral and written examinations (Scheduled and surprisetests),

Practical assignments and laboratoryreports,

Efficient delivery using seminarpresentations,

Viva voceinterviews.

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DEPARTMENT OF PHYSICS
A.G. & S.G.SIDDHARTHA DEGREE COLLEGE OF ARTS & SCIENCE
(AUTONOMOUS) , VUYYURU – 521 165
II B.Sc. 4th Semester (2021-22)

Paper IV: ELECTRICITY, MAGNETISM AND ELECTRONICS

Work load:60 hrs per semester credits - 3 **4 hrs/week**

Course outcomes & Objectives :

On successful completion of this course, the students will be able to:

- Understand the Gauss law and its application to obtain electric field in different cases and formulate the relationship between electric displacement vector, electric polarization, Susceptibility, Permittivity and Dielectric constant.
- Distinguish between the magnetic effect of electric current and electromagnetic induction and apply the related laws in appropriate circumstances.
- Understand Biot and Savart's law and Ampere's circuital law to describe and explain the generation of magnetic fields by electrical currents.
- Develop an understanding on the unification of electric and magnetic fields and Maxwell's equations governing electromagnetic waves.
- Phenomenon of resonance in LCR AC-circuits, sharpness of resonance,Q factor,Power factor and the comparative study of series and parallel resonant circuits.
- Describe the operation of p-n junction diodes, zener diodes, light emitting diodes and transistors
- Understand the operation of basic logic gates and universal gates and their truth tables.

UNIT-I

Electrostatics: (6hrs)

Gauss's law-Statement and its proof, Electric field intensity due to (i) uniformly charged solid sphere and (ii) an infinite conducting sheet of charge, Deduction of Coulomb's law from Gauss law, Electrical potential–Equipotential surfaces, Potential due to a (i)point charge (ii)uniformly charged sphere

Dielectrics: (6 hrs)

Dielectrics-Polar and Non-polar dielectrics- Electric displacement D, electric polarization P,Relation between D, E and P, Dielectric constant and electric susceptibility.

UNIT-II

Magnetostatics: (6 hrs)

Biot-Savart's law and its applications: (i) calculation of B due to long straight wire and (ii) solenoid, Ampere's Circuital Law and its application to Solenoid,Hall effect, determination of Hall coefficient and applications.

Electromagnetic Induction: (6 hrs) Faraday's laws of electromagnetic induction, Lenz's law, Self-induction and Mutual induction, Self-inductance of a long solenoid, Mutual inductance of two coils, Energy stored in magnetic field, Eddy currents and Electromagnetic damping

UNIT-III

Alternating currents: (6 hrs) Alternating current - Relation between current and voltage in LR and CR circuits, Phasor and Vector diagrams, LCR series and parallel resonant circuit, Q –factor, Power in ac circuits, Power factor.

Electromagnetic waves-Maxwell's equations: (6 hrs) Idea of displacement current,Maxwell's Equations-Derivation, Maxwell's wave equation (with derivation), Transverse nature of electromagnetic waves, Poynting theorem (Statement and proof)

UNIT-IV

Basic Electronic devices: (12 hrs)

Diodes: PN junction diode, Zener diode andLight Emitting Diode (LED) and their I-V characteristics, Zener diode as a regulator

Transistors: Transistors and its operation, CB, CE and CC configurations, Input and output characteristicsofa transistor in CE mode, Relation between alpha, beta and gamma; Hybrid parameters, Determination of hybrid parameters from transistor characteristics; Transistor as an amplifier.

UNIT-V :

Digital Electronics : (12 hrs)

Number systems, Conversion of binary to decimal system and vice versa, Binary addition & Binary subtraction (1's and 2's complement methods), Laws of Boolean algebra, Basic logic gates, DeMorgan's laws-Statements and Proofs, NAND and NOR as universal gates, Exclusive-OR gate, Half adder and Full adder circuits.

REFERENCE BOOKS

- BSc Physics, Vol.3, Telugu Akademy, Hyderabad.
- Electricity and Magnetism, D.N. Vasudeva. S. Chand & Co.
- Electricity and Magnetism, B.D.Duggal and C.L.Chhabra. Shobanlal& Co.
- Electricity, Magnetism with Electronics, K.K.Tewari, R.Chand& Co.,

- Electricity and Magnetism, R.Murugeshan, S. Chand & Co.
- Principles of Electronics, V.K. Mehta, S.Chand& Co.,
- Digital Principles and Applications, A.P. Malvino and D.P.Leach, McGrawHill Edition.

PAPER TITLE: Electricity, Magnetism and Electronics

Paper- V Semester – V Maximum marks: 70 marks Duration: 3Hours
Weightage for the question paper

Syllabus	Section-A (Short answer questions)	Section-B (essay questions)
Unit-1 (25 Marks)	**T**	**2**
Unit-2 (20 Marks)	**T+P**	**1**
Unit-3 (30Marks)	**T+P**	**2**
Unit-4 (20 Marks)	**T+T**	**1**
Unit-5 (25 Marks)	**T**	**2**

Note: **T** means one theory question, **P** means one problem

- **Section-A** contains **6** short questions and **2** problems out of these **8** questions, the student has to answer any **4**, each question carries **5** marks.
- **Section –B** contains **8** essay questions, the student has to answer any **5** questions, each question carries **10** marks.
- The Question papers setters are requested to cover all the topics in the syllabus as per the weightage given by us.

SEMESTER – V	COURSE CODE : PHY-501 C
PAPER TITLE : Electricity, Magnetism and Electronics	

Duration : 3Hours Maximum marks : 70 Pass marks : 28 marks

MODEL PAPER

A.G. & S.G.SIDDHARTHA DEGREE COLLEGE OF ARTS & SCIENCE
(AUTONOMOUS), VUYYURU – 521 165

III B.Sc. (PHYSICS)- V SEMESTER

ELECTRICITY,MAGNETISM AND ELECTRONICS

TIME: 3 Hrs PHY – 501 C MAX MARKS: 70 PASS MARK : 28

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SECTION – A

ANSWER ANY FOUR OF THE FOLLOWING **(4 X 5 = 25 M)**

1) Write a short note on equi - potential surfaces
2) obtain an expression for energy stored in a magnetic field
3) Derive expression for power in ac circuit
4) Explain CE configuration of a transisitor
5) Explain briefly how a transisitor works as an amplifier
6) Explain about half adder circuit with truth table.
7) Calculate the intensity of the magnetic field at the center of a circular coil of radius 20 cm and 40 turns having a current of 2A in it.
8) In a series RLC circuit R = 100 ohm, L = 0.5H and C = 0.4 μF. calculate resonant frequency

SECTION – B

ANSWER ANY FIVE OF THE FOLLOWING QUESTIONS (5 X 10 = 50 M)

9) Derive an expression for the electric field due to uniformly charged sphere using Gauss law?
10) Define D, E and P derive the relation between them
11) Calculate the magnetic induction due to a long straight wire using Biot- savart's law
12) State and prove pointing theorem
13) Explain the growth and decay of charge in LR- circuit
14) Describe the construction and working of Zener diode.
15) State and prove De Morgan's theorem with examples.
16) Explain about basic logic gates with truth tables.

Practical CourseIV:Electricity, Magnetism and Electronics

Work load: 30 hrs 2 hrs/week Course outcomes (Practicals):

On successful completion of this practical course the student will be able to;

- Measure the current sensitivity and figure of merit of a moving coil galvanometer.Observe the resonance condition in LCR series and parallel circuit
- Learn how a sonometer can be used to determine the frequency of AC-supply.
- Observe the variation of magnetic field along the axis of a circular coil carrying current using Stewart and Gee's apparatus.
- Understand the operation of PN junction diode, Zener diode and a transistor and their V-I characteristics.
- Construct the basic logic gates, half adder and full adder and verify their truth tables. Further, the student will understand how NAND and NOR gates can be used as universal building blocks.

Minimum of 6 experiments to be done and recorded

1. LCR circuit series -resonance, Q factor.
2. LCR parallel circuit - resonance, Q factor.
3. Determination of ac-frequency –Sonometer.
4. Verification of Kirchoff's laws
5. Field along the axis of a circular coil carrying current-Stewart & Gee's apparatus.
6. PN Junction Diode V-I Characteristics
7. Zener Diode –V-I Characteristics
8. Logic Gates- OR, AND, NOT and NAND gates. Verification of Truth Tables.

9. Verification of De Morgan's Theorems.

10. Construction of Half adder and Full adders-Verification of truth tables

11. Zener Diode as a voltage regulator

12. Transistor CE Characteristics- Determination of hybrid parameters

13. Figure of merit of a moving coil galvanometer.

RECOMMENDED CO-CURRICULAR ACTIVITIES:

MEASURABLE

- Assignments (in writing and doing forms on the aspects of syllabus content and outside the syllabus content. Shall be individual and challenging)
- Student seminars (on topics of the syllabus and related aspects (individual activity))
- Quiz (on topics where the content can be compiled by smaller aspects and data (Individuals or groups as teams)
- Field studies (individual observations and recordings as per syllabus content and related areas (Individual or team activity)
- Study projects (by very small groups of students on selected local real-time problems pertaining to syllabus or related areas. The individual participation and contribution of students shall be ensured (team activity)

GENERAL

- Group Discussion
- Visit to Research Stations/laboratories and related industries
- Others

RECOMMENDED ASSESSMENT METHODS

Some of the following suggested assessment methodologies could be adoptee

- The oral and written examinations (Scheduled and surprise tests),
- Practical assignments and laboratory reports,
- Observation of practical skills,
- Efficient delivery using seminar presentations,

Viva voce interviews

DEPARTMENT OF PHYSICS
A.G. & S.G.SIDDHARTHA DEGREE COLLEGE OF ARTS & SCIENCE
(AUTONOMOUS) , VUYYURU – 521 165
II B.Sc. 4th Semester (2020-21)

Paper IV: MODERN PHYSICS

Work load:60 hrs per semester credits - 3 **4 hrs/week**

- Course Description: students would know about the basic principles in the development of modern physics. The topics covered in the course build a basic foundation of undergraduate physics students to study the advance branches: quantum physics, nuclear physics and particle physics. The course contains the study of atomic models, spectroscopy, matter waves, Schrodinger wave equations, brief idea of nuclear physics, and superconductivity. The students have the opportunity to use the basic principles of condensed matter physics in frontier areas of research and development in the field of material science, nanoscience and nanotechnology.
- Course Objectives:
- 1. To learn the concepts in Atomic Physics.
- 2. Review the experiments that led development of quantum theory
- 3. Understand the underlying foundations and basic principles of quantum mechanics
- 4. impart knowledge of the nuclear processes that yield nuclear energy
- 5. Acquire the knowledge of Nano materials
- Course outcomes: On successful completion of this course, the students will be able to:

- CO1 Remember the different atomic models and basic knowledge of spectroscopy CO2 Understand the theory and application of microwave, infrared and Raman spectroscopy
- CO3 Apply non- relativistic Schrödinger wave mechanics to a variety of potentials in one and three dimensions.
- CO4 Analyse the prerequisite in a molecule towards its Rotational and vibrational activity
- CO5 Examine the basic properties of nuclei, characteristics of Nuclear forces, salient features
- **SYLLABUS**
- **UNIT-I**
- A. Atomic Physics: (07 hrs) Vector atom model and Stern-Gerlach experiment, Quantum numbers associated with it, Angular momentum of the atom, Coupling schemes, Selection rules, Intensity rules, Spectral terms and spectral notations, Fine structure of Sodium D-lines, Zeeman effect, Experimental study of Zeeman effect B. Molecular Physics (05 hrs) Raman effect, Characteristics of Raman effect, Experimental study of Raman effect, Quantum theory of Raman effect, Applications of Raman effect.
- UNIT-II
- A. Matter waves & de-Broglie's hypothesis (06 hrs) Failures of Classical Mechanics, Matter waves – de-Broglie's hypothesis, Derivation for de-Broglie wave length of matter waves, Properties of matter waves, Davisson and Germer's experiment, Phase and group velocities (Qualitative),
- B. Uncertainty Principle and Quantization (06 hrs) Heisenberg's uncertainty principle for position and momentum (x and p), & energy and time (E and t), Illustration of uncertainty principle using diffraction of beam of electrons

(Diffraction by a single slit) and photons (Gamma ray microscope), Bohr's principle of complementarily.

- UNIT-III
- Quantum (Wave) Mechanics:(12 hrs) Basic postulates of quantum mechanics, Schrodinger time independent and time dependent wave equations - Derivations, Physical interpretation of wave function, Eigen functions, Eigen values, Application of Schrodinger wave 12 equation to one dimensional potential box of infinite height (Infinite Potential Well)
- UNIT-IV
- A. Structure of Nuclei and Nuclear Models: (06 hrs) Nuclear Structure: General Properties of Nuclei, Mass defect, Binding energy; Nuclear forces, Characteristics of nuclear forces, Yukawa's meson theory (Qualitative), Nuclear Models: Liquid drop model, Shell model, Magic numbers.
- B. Elementary Particle Physics (06 hrs) Elementary Particles and their classification, Fundamental Interactions – gravitational, electromagnetic, strong & week; Properties of Leptons, Mesons and Baryons
- UNIT-V
- A. Nano materials: (07hrs) Origin of Nano materials - Quantum confinement, Size effect, Surface to volume ratio, Classification of nano materials - (0D, 1D, 2D); Nano wires, Fullerene, CNT, Graphene (Mention of structures and properties), Distinct properties of nano materials (Mention-mechanical, optical, electrical, and magnetic properties); Applications of nano materials: (Fuel cells, Phosphors for HD TV, Sensors)
- B. Superconductivity: (05 hrs) Introduction – Properties of superconductors - critical temperature (Tc), critical magnetic field (Tm), Meissner effect, Isotope

effect, Type I and Type II superconductors, BCS theory (Qualitative), High Tc superconductors, Applications of superconductors.

TEXT BOOKS

- 1. BSc Physics, Vol.4, Telugu Akademy, Hyderabad
- 2. Modern Physics by R. Murugeshan and Kiruthiga Siva Prasath. S. Chand & Co.

3. Nano materials, A K Bandopadhyay, New Age International Pvt Ltd (2007)

REFERENCE BOOKS:

- 1. Atomic Physics by J.B. Rajam; S. Chand& Co.,
- 2. Concepts of Modern Physics by Arthur Beiser. Tata McGraw-Hill Edition.
- 3. Nuclear Physics, D.C. Tayal, Himalaya Publishing House.
- 4. S.K. Kulkarni, Nanotechnology: Principles & Practices (Capital Publ.Co.)
- 5. K. K. Chattopadhyay & A.N. Banerjee, Introd.to Nanoscience and Technology (PHI Learning Priv. Limited).

5. Textbook of Nanoscience and Nanotechnology, BS Murthy, P Shankar, Baldev Raj, BB Rath and J Murday-Universities Press-IIM

PAPER TITLE: Modern Physics

Paper- VI Semester – V Maximum marks: 70 marks Duration: 3Hours
Weightage for the question paper

Syllabus	Section-A (Short answer questions)	Section-B (Essay questions)
Unit-1 (25 Marks)	**T**	**2**
Unit-2 (20 Marks)	**T+P**	**1**
Unit-3 (25Marks)	**T**	**2**
Unit-4 (20 Marks)	**T+T**	**1**
Unit-5 (30 Marks)	**T+P**	**2**

Note: **T** means one theory question, **P** means one problem

- **Section-A** contains **6** short questions and **2** problems out of these **8** questions, the student has to answer any **4**, each question carries

5 marks.

- **Section – B** contains **8** essay questions; the student has to answer any 5 questions. Each question carries **10** marks.

The Question papers setters are requested to cover all the topics in the syllabus as per the weightage given by us.

SEMESTER – V	COURSE CODE : PHY-502
PAPER TITLE : Modern Physics (Model Paper)	

Duration : 3Hours Maximum marks : 70 Pass marks : 28 marks

III B.Sc. Physics – V Semester – Paper –VI (2020 – 2021)
Modern Physics

Paper Code : PHY 502C **SECTION-A**

Answer any **FOUR** questions **(4x5=20M)**

1. Write the Draw backs of Bohr's atomic model.
2. Explain deBroglie concept of matter waves.
3. Explain Geiger-Nuttal law.
4 Write a note on liquid drop model.
5. Explain Meissner effect in super conductivity.
6. State postulates of Quantum Mechanics.
7. In a crystal lattice plane cuts intercepts 2a, 3b and 6c along the three axes where a,b and c are primitive vectors of the unit cell. Determine the miller indices of the given plane.
8. If the uncertainty in position of an electron is $4x10^{-10}$m and uncertainty in its momentum is $1.65x10^{-24}$kg m/sec.

SECTION-B

Answer any **FIVE** questions : **(5x10=50M)**

9. Describe Stern and Gerlach experiment and discuss the importance of the results obtained

10. What is Raman Effect? Write the Experimental setup to study Raman Effect.
11. Describe Davisson and Germer Experiment on electron diffraction. Discuss the results of the Experiment.
12. Derive Time independent Schrodinger wave equation.
13. Calculate the energy of a particle in one dimensional box using Schrodinger equation.
14. Mention the Basic Properties of Nucleus with reference to Size, Charge, Mass, Nuclear spin and Electric Quadra pole Moment.
15. Describe X-Ray diffraction by Laue's method.
16. Explain Type-I and Type-II Superconductors.

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- LIBRARY ACTIVITY Student visit library to refer and gather information regarding seminar topics and assignments.
- Course Delivery method: Face-to-face / Blended
- Course has focus on: Foundation & Employability
- Course has focus on: Employability Websites of Interest:
- Co-curricular Activities: 1. Assignments
- 2. Student seminars
- 3.quiz

DEPARTMENT OF PHYSICS
A.G. & S.G.SIDDHARTHA DEGREE COLLEGE OF ARTS & SCIENCE
(AUTONOMOUS), VUYYURU – 521 165

III B.Sc. Physics – VI Semester – Paper –VII (2021-2022**)**

Elective VII (A): **Course Code: PHY – 601GE**

SEMISTER-VI credits - 3 **4 hrs/week**

ELECTIVE PAPER –VII-A: ANALOG AND DIGITAL ELECTRONICS

UNIT- I (14 hours) Total Lectures: 60 hours

1. **FET** Construction ,Working ,Characteristics and uses; MOSEFT-enhancement MOSEFT,Depletion MOSEFT, Construction and Working, drain Characteristics of MOSEFT, applications of MOSEFT.
2. Photo electric devices: structure and operation, Characteristics and applications of LED and LCD.

UNIT- II (10hours)

3. Operational amplifier: Characteristics of ideal and practical OP-amp (IC-741),Basic differential OP-amp supply voltage, IC identification, internal blocks of OP-amp, its parameter off set voltages and currents, CMRR, slew rate, Concept of Virtual ground.

UNIT- III (10hours)

4. Applications of OP-amp: OP-amp as voltage amplifier, inverting amplifier, Non- inverting amplifier, Voltage follower, summing amplifier, difference amplifier, comparator, Integrator, Differentiator.

UNIT- IV (14hours)

5. Data processing circuits: Multiplexers, De –Multiplexers, encoders, decoders, Characteristics

6.For Digital IC's –RTL, DTL,TTL, CMOS (NAND&NOR Gates).

UNIT- V (12hours)

1. Sequential digital circuits: Flip-flops, RS, clocked SR, JK, D, T, Master-Slave Flip-flops .
2. Counters: Asynchronous counters-modulo 4counter-modulo 16 ripple counter, Decade counter, Synchronous counter.

REFERENCE BOOKS :

1. Digital Electronics by G.K.Kharate Oxford University Press.
2. Unified Electronics by Agarwal and Agarwal.
3. OP-Amp and Linear ICs by Ramakanth A Gayekward, 4th edition PHI
4. Digital Principles and Applications by Malvino and Leach, TMH, 1996, 4th edition.
5. Digital Circuit design by Moris Mano, PHI.
6. Switching theory and Logic design by A.Anand kumar, PHI
7. Operations amplifier by S.V.Subramanyam.

The Guidelines to be followed by the question paper setters in Physics for the VI Semester - end exams

PAPER TITLE: (ELECTIVE PAPER –VII-A): ANALOG AND DIGITAL ELECTRONICS

Paper- VII-A Semester – VI Maximum marks: 70 marks
Duration: 3Hours

Weightage for the question paper

Syllabus	Section-A (Short answer questions)	Section-B (Essay questions)
Unit-1 (24 Marks)	**T**	**2**
Unit-2 (18 Marks)	**T+P**	**1**
Unit-3 (28Marks)	**T+P**	**2**
Unit-4 (18Marks)	**T+T**	**1**
Unit-5 (24Marks)	**T**	**2**

Note: **T** means one theory question, **P** means one problem

- **Section-A** contains **6** short questions and **2** problems out of these **8** questions, the student has to answer any **5**, each question carries **4** marks.
- **Section – B** contains **8** essay questions, the student has to answer any 5 questions. Each question carries **10** marks.

The Question papers setters are requested to cover all the topics in the syllabus as per the weightage given by us.

SEMESTER – V	COURSE CODE : PHY-601 GE
PAPER TITLE : ELECTIVE PAPER –VII-A: ANALOG AND DIGITAL ELECTRONICS	

Duration : 3Hours Maximum marks : 70 Pass marks : 28 marks

Model paper –VII(A) Elective (Electronics)

Semester -VI

Elective Paper –VII-(A): Analog and Digital Electronics

SECTION-A

Time:3hr **Max.marks:70**

Answer any five of the following questions: **5x4=20M**

1. Discuss the advantages of FET over BJT.
2. Explain the concept of Virtual Ground.
3. Describe the concept of OP-amp Summing amplifier.
4. The summing amplifier as Ro=10K, R1=10K, R2=5K R3=6K.If V1=6V, V2= -3V, V3= -0.8V. Calculate V0?
5. Explain the Working of Demultiplexer with circuit diagram.
6. Explain the working of TTL logic.
7. Explain the working of RS Flip flop .Write its Truth Table.
8. Find the gain of inverting amplifier with given data. R_1= 5000Ω, R_f= 60 KΩ.

SECTION-B

Answer any five of the following questions: **10x5=50M**

9. Explain the construction , Working and V-I Characteristics of JFET.
10. Describe Construction and Working Of LED. Mention its application.
11. What are the Characteristics of an ideal OP-amp .Draw the block diagram of OP-amp. Define the term CMRR and Slew rate.
12. Derive the Expression per Closed loop Gain of an inverting Amplifier. Explain how OP-amp acts as an Integrator.
13. Explain the working of Integrator, Differentiator.
14. What is a Multiplexer? Explain its Working and Analogy.
15. Describe the Working of Master Slave JK Flip flop. Give its Truth Table.
16. Explain Asynchronous counter and Synchronous counter.

ELECTIVE PAPER –VII PRACTICAL: ANALOG AND DIGITAL ELECTRONICS credits – 2 2 Hours per week

Minimum of 6 experiments to be done and recorded

1. Characteristics of FET
2. Characteristics of MOSEFT
3. Characteristics of LDR
4. Characteristics of OP-amp.(IC-741)
5. OP-amp as amplifier/inverting amplifier
6. OP-amp as integrator/differentiator
7. OP-amp as summing amplifier /difference amplifier
8. Master-Slave Flip-flop
9. JK Flip-flop

DEPARTMENT OF PHYSICS

A.G. & S.G.SIDDHARTHA DEGREE COLLEGE OF ARTS & SCIENCE

(AUTONOMOUS), VUYYURU – 521 165

III B.Sc. Physics – VI Semester – Paper –VIII (2020-21**)**

SEMISTER-VI Course Code: PHY -602 CE credits - 3

4 hrs/week

CLUSTER ELECTIVES VIII-A

PAPER-VIII-A-1: INTRODUCTION TO MICROPROCESSOR AND MICROCONTROLLER

UNIT- I (10hours)

MICROPROCESSOR:

General architecture of microprocessor, architecture of 8085 microprocessor, 8085 pin diagram, Concept of data bus, address bus, and control bus, 8085 programming instruction classification.

UNIT-II: (10hours)

8085 Interfacing Memory

Introduction-Memory structure and its requirements-basic concepts in memory interfacing. Address Decoding-Interfacing circuit. Port-mapped I/O or Direct I/O interface (8-bit Addressing)-Memory Indirect I/O mapped Interfaces (16-bit Addressing)-Port mapped versus Memory mapped I/O. I/O Device Interfacing.

UNIT-III (15hours)

8085 Microprocessor Applications

Introduction-Programmed data transfer scheme. Direct Memory Access (DMA) –Types. 8255A PPI-Block diagram. 8259A PIC-Pin diagram and functional description. 8257 Programmable DMA controller-Block diagram and Pin description.

UNIT-IV: (13hours)

8051 Architecture-I:

Types of microcontrollers- microcontroller architecture, CISC, RISC, operation of microcontroller, basic building blocks of microcontroller, comparison of microcontroller and microprocessor- block diagram of 8051-I/o pins and ports.

Microcontroller Resources.

UNIT-V: (12hours)

8051 Architecture-II:

8051 Flag bits and PSW register and DPTR register- Memory Organization-Special function registers- PSW register-Counters and Timers-Serial I/O-8051 Microcontroller Interrupts.

REFERENCE BOOKS:

1. Unified Electronics – VI(A), Micro controllers and applications
2. THE 8051 micro controller and embedded systems using assembly and C, M.A. Mazidi, J.G.Mazidi and R.D.McKInlay second Ed.,2007 Pearson education India.
3. Unified Electronics – V(A),Microprocesser (Intel 8085)
4. Micro controllers in practice, I susena and Mitescu, 2005, Springer.

The Guidelines to be followed by the question paper setters in Physics for the VI Semester - end exams

CLUSTER ELECTIVES VIII-A

PAPER-VIII-A-1: INTRODUCTION TO MICROPROCESSOR AND MICROCONTROLLER

Paper- VIII-A-1 Semester – VI Maximum marks:70 Duration: 3Hours

Weightage for the question paper

Syllabus	Section-A (Short answer questions)	Section-B (Essay questions)
Unit-1 (28 Marks)	**T+T**	**2**
Unit-2 (14Marks)	**T**	**1**
Unit-3 (28Marks)	**T+T**	**2**
Unit-4 (24Marks)	**T**	**2**
Unit-5 (18 Marks)	**T+T**	**1**

Note: **T** means one theory question.

- **Section-A** contains **8** short questions, out of these **8** questions, the student has to answer any **5**, each question carries **4** marks.
- **Section – B** contains **8** essay questions, the student has to answer any 5 questions. Each question carries **10** marks.

The Question papers setters are requested to cover all the topics in the syllabus as per the weightage given by us.

SEMESTER – VI	COURSE CODE : PHY-602 CE
PAPER TITLE : CLUSTER ELECTIVES VIII-A PAPER-VIII-A-1: INTRODUCTION TO MICROPROCESSOR AND MICROCONTROLLER	

Duration : 3Hours Maximum marks : 70 Pass marks : 28 marks

Model Paper- Sem VI

III B.Sc - PHYSICS (cluster) – VI SEMESTER

INTRODUCTION TO MICROPROCESSOR AND MICROCONTROLLERS

PHY- 602 CE **Max marks : 70**

SECTION-A

Answer any FIVE of the following questions : **(5x4=20M)**

1) Define data bus and address bus.
2) Define Address Decoding.
3) Write a short note on asynchronous data transfer scheme.
4) What is direct access memory?
5) Write about CISC.
6) Write about operation of microcontroller.
7) Write about program memory.
8) Write about memory expansion.

SECTION – B

Answer any FIVE of the following questions : (5x10 = 50 M)

9) Describe the general architecture of Microprocessor.
10) Draw the 8085 Microprocessor pin diagram and explain about different pins.
11) Discuss about Direct I/O interface of 8-bit?
12) Give the functional description of 8259A.
13) Describe the Block diagram of 8255A.
14) Draw the pin diagram of 8051and briefly describe the pins.
15) Write the basic building blocks of microcontroller.
16) Write short notes on
    a) R-registers
    b) Program status word register
    c) Data Pointer register.

PAPER-VIII-A-1: Practical: INTRODUCTION TO MICROPROCESSOR AND MICROCONTROLLER credits – 2 2 Hours per week

Minimum of 6 experiments to be done and recorded

1. To find that the given number is prime or not.

2. To find the factorial of a number.

3. Write a program to make the two numbers equal by increasing the smallest number and decreasing the largest number.

4. Use one of the four parts of 8051 for O/P interfaced to eight LED's simulate binary counter (8 bit) on LED's.

5. Program to glow first four LED then next four using TIMER application.

6. Program to rotate the contents of the accumulator first right and then left.

7. Program to run a count down from 9-0 in the 7 segment LED display.

8. To interface 7 segment LED display with 8051 Microcontroller and display 'HELP' in the 7 segment LED display.

9. To toggle '1234' as '1324' in the 7 segment LED.

10. Interface stepper motor with 8051 and write a Program to move the motor through a given angle in clock wise or counter clock wise direction.

11. Application of Embedded system: Temperature measurement, some information on LCD display, interfacing a key board.

A.G. & S.G.SIDDHARTHA DEGREE COLLEGE OF ARTS & SCIENCE

III B.Sc. 6th Semester (2020-21**)**

COURSE CODE : PHY-603 CE credits - 3

Cluster Elective Paper – VIII- A-2 : Computational Methods and Programming

No. of Hours per week : 04 Total Lectures : 60

UNIT – I (12 hrs)

1. Fundamentals of C language: C character set – Identifiers and keywords – structure of c program. Constants- variables- Data types- Declarations of variables – Declaration of storage class – Defining symbolic constants – Assignment statement.
2. Operators : Arithmetic operators- Relational operators – Logic operators – Assignment operators – Increment and decrement operators – Conditional operators.

UNIT –II (12 hrs)

3. Expressions and I/O statements : Arithmetic expressions – precedence of arithmetic operators – Type converters in expressions – Mathematical (Library) functions – Data input and output – The getchar and putchar functions – Scanf – Printf simple programs.
4. Control statements: IF – ELSE statements – Switch statements – The operators – GO TO- while, DO-While, FOR statements – BREAK and CONTINUE statements.

UNIT – III (12 hrs)

5. Arrays: One dimensional and two dimensional arrays – Initialization –Type declaration – Inputting and outputting of data for arrays – Programs of matrices addition, subtraction and multiplication.
6. User defined functions: The form of C functions – Return values and their types – Calling a function – Category of functions. Nesting of functions. Recursion. ANSI C functions – Function declaration. Scope and life of variables in functions.

UNIT – IV (12 hrs)

7. Linear and Non-Linear equations: Solution of Algebra and transcendental equations – Bisection, Falsi position and Newton – Rhapson methods – Basic principles – Formulae – algorithms.
8. Simultaneous equations: Solutions of simultaneous linear equations – Guass elimination and Gauss seidel iterative methods – Basic principles – Formulae- Algorithms.

UNIT – V (12 hrs)

Interpolations : Concept of linear interpolation – Finite differences – Newton's and Lagrange's interpolation formulae – principles and Algorithms.

9. Numerical differentiation and integration : Numerical differentiation –

algorithm for evaluation of first order derivatives using formulae based on Taylor's series – Numerical integration – Trapezodal and Simpson's 1/3 rule – Algorithms.

REFERENCE BOOKS :

1.Introductory methods of Numerical Analysis : SASTRY

2. Numerical Methods : Balaguruswamy

3. Programming in ANSI C (TMH) : Balaguruswamy

4.Programming with 'C' – Byron Gottafried, Tata Mc Graw Hill

The Guidelines to be followed by the question paper setters in Physics for the VI Semester - end exams

Cluster Elective Paper – **VIII- A-2** : Computational Methods and Programming

Paper- VIII-A-2 Semester – VI Maximum marks: 70 marks Duration: 3Hours

Weightage for the question paper

Syllabus	Section-A (Short answer questions)	Section-B (Essay questions)
Unit-1 (28Marks)	**T+T**	**2**
Unit-2 (28Marks)	**T+T**	**2**
Unit-3 (28Marks)	**T+T**	**2**
Unit-4 (14Marks)	**T**	**1**
Unit-5 (14 Marks)	**T**	**1**

Note: **T** means one theory question.

- **Section-A** contains **8** short questions, out of these **8** questions, the student has to answer any **5**, each question carries **4** marks.
- **Section – B** contains **8** essay questions, the student has to answer any 5 questions. Each question carries **10** marks.

The Question papers setters are requested to cover all the topics in the syllabus as per the weightage given by us.

SEMESTER – VI	COURSE CODE : PHY-603 CE

PAPER TITLE : Cluster Elective Paper – **VIII- A-2** : Computational Methods and Programming

Duration : 3Hours Maximum marks : 70 Pass marks : 28 marks

Model Paper :Sem VI
III B.Sc - PHYSICS (cluster) – VI Semester

COMPUTATIONAL METHODS AND PROGRAMMING

Paper Code : PHY 603 CE **Max.Marks : 70**

SECTION-A

Answer any FIVE of the following questions : **(5x4=20M)**

1) Write different data types in C with Examples.
2) Structure of C program with Examples.
3) Explain about Putchar & getchar.
4) Explain about IF-Else Statement.
5) Define 2D array in C with example
6) Define Function with Examples.
7) Write the false position algorithm
8) Describe the Trapezoidal rule

SECTION-B

Answer any FIVE of the following questions : **(5x10=50M)**

9) Explain about storage classes in C
10) Explain different operators available in C
11) Explain about iterative statements in C.
12) Explain about Print f() & Scan f() function with examples.
13) Write a program for matrix multiplication
14) Explain about Recursion with example programme.
15) Explain about nesting of functions with example
16) Write the algoritm and flowchart of Newton Raphson formula.

Cluster Elective Paper – VIII-A-2 : Practical

Computational Methods and Programming

2 hrs/ week credits - 2

Minimum of 6 experiments to be done and recorded

1. Write a program that reads an alphabet from keyboard and display in the reverse order.
2. Write a program to read and display multiplication of tablets.
3. Write a program for converting centigrade to Fahrenhit temperature and Fahrenheit temperature centigrade.
4. Write a program to find the largest element in an array.
5. Write a program based on percentage calculation , the grade by entering the subject marks . (If percentage > 60, I class, if percentage between 50 &60 II class, if percentage between 35 & 50 III class, if percentage below 35 fail)
6. Write a program for generation of even and odd numbers up to 100 using while, do – while and for loop.
7. Write a program to solve the quadratic equation using Bisection method.
8. Write a program for integration of function using Trapezoidal rule.
9. Write a program for solving the differential equation using Simpson's 1/3 rule.

A.G. & S.G.SIDDHARTHA DEGREE COLLEGE OF ARTS & SCIENCE
(AUTONOMOUS) , VUYYURU – 521 165
III B.Sc. 6th Semester (W.E.F 2020-21**)**

COURSE CODE : PHY-604 CE

Cluster Elective Paper – **VIII-A-3**: **Electronic Instrumentation**

No.of Hours per week: 04 Total Lectures: 60

UNIT -1 (12 Hours)

1. Basic of measurements: Instruments accuracy, precision, sensitivity- errors in measurements- Basic meter movement-PMMC (Permanent Magnetic Moving Coil).
2. Measurement of dc current: DC ammeter- multi range ammeters-the ARYTON Shunt or universal Shunt.
3. Measurement of dc voltage: DC Voltmeter – Multi Range Voltmeter- Voltmeter sensitivity.

UNIT – II (10 HOURS)

4. **Analog Multimeter:** Multimeter - as dc ammeter-as dc voltmeter-as ac voltmeter- as ohm meter-Multimeter operating instructions.

5. Digital instruments: Principle and working of digital instruments, characteristics of a digital meter, working principle of digital voltmeter.

UNIT –III (14 HOURS)

6. CRO: Block diagram of basic CRO, construction of CRT, electron gun, electrostatic focusing and acceleration (only explanation), time base operation, synchronization, front panel controls, specifications of CRO and their significance.
7. Applications CRO: Measurement of voltage- dc and ac, frequency, time period. Special features of dual trace CRO. Digital storage oscilloscope: block diagram and principle of working.

UNIT – IV (12 HOURS)

8. Diode as Rectifier – Half wave rectifier, Full wave rectifier – construction, working and efficiency. (no derivation)
9. Feedback in Electronic circuits – Positive and Negative feedback, expressions for gains, advantages of negative feedback, Oscillators, Barkhausen criteria, RC phase shift oscillator (no derivation)

UNIT – V (12 HOURS).

10. Signal Generators: Block diagram, working and specifications of low frequency signal generators, pulse generator, function generator .
11. Bridges: Measurement of resistance by Wheat stone's Bridge- Sensitivity of Wheat stone's Bridge- Applications of Wheat stone's Bridge-Limitations of Wheat stone's Bridge.

REFERENCE BOOKS :

1. A text book in electrical technology by B.L. Thereja (S.Chand & CO)
2. Digital circuits and systems by venugopal 2011 (Tata Mcgraw Hill)
3. Digital Electronics by SubrathaGoshal 2012 (Cengage Learning)
4. Electronic Instrumentation by HS Kalsi (Tata Mcgraw Hill)

The Guidelines to be followed by the question paper setters in Physics for the VI Semester - end exams

Cluster Elective Paper – **VIII-A-3**: **Electronic Instrumentation**

Paper- VIII-A-3 Semester – VI Maximum marks: 70 marks Duration: 3Hours

Weightage for the question paper

Syllabus	Section-A (Short answer questions)	Section-B (Essay questions)
Unit-1 (28Marks)	**T+T**	**2**
Unit-2 (18 Marks)	**T+T**	**1**
Unit-3 (28Marks)	**T+T**	**2**
Unit-4 (14 Marks)	**T**	**1**
Unit-5 (24 Marks)	**T**	**2**

Note: **T** means one theory question

- **Section-A** contains **8** short questions out of these **8** questions, the student has to answer any **5**, each question carries 4 marks.
- **Section – B** contains **8** essay questions, the student has to answer any 5 questions. Each question carries **10** marks.

The Question papers setters are requested to cover all the topics in the syllabus as per the weightage given by us.

SEMESTER – VI	COURSE CODE : PHY-604 CE

PAPER TITLE : Cluster Elective Paper – **VIII-A-3**: **Electronic Instrumentation**

Duration : 3Hours Maximum marks : 70 Pass marks : 28 marks

Model Paper :Sem VI
III B.Sc - PHYSICS (CLUSTER) – VI Semester
ELECTRONIC INSTRUMENTATION

Paper Code : PHY 604 CE **Max.Marks:70**

SECTION-A

Answer any FIVE of the following questions : **(5x4=25M)**

1) Explain the following terms (a) precesion (b) sensitivity.
2) Explain Multirange d.c voltmeter with a circuit diagram.
3) Write briefly the specifications of an electronic voltmeter.
4) Explain the function of various parts of an electronic gun.
5) Explain the time base operation of CRO.
6) Write the characteristics of a digital meter.
7) Explain the working of function generator.
8) What are the Limitations of Wheat stone's Bridge

SECTION-B

Answer any FIVE of the following questions : **(5x10=50M)**

9) Explain different types of errors that occur in measurements.
10) Explain the principles of voltage measurement with a block diagram.
11) Draw the basic block diagram of cathode ray oscilloscope and explain the functions of each block.
12) Explain with a block diagrm the principle and working of digital storage oscilloscope .
13) Explain the working of a Multimeter as micro ammeter- as dc ammeter-as dc voltmeter-as ac voltmeter- as ohm meter
14) Explain the principle and working of digital instruments .
15) Explain the operation of a signal generator with the help of a suitable block diagram .
16) Explain the principle and working of Wheat stone's bridge .

Cluster Elective Paper – VIII-A-3-Practical: Electronic Instrumentation 2hrs/Week.

Paper Title: Project Work Paper code: PHY-604 CE

The students have chosen Physics as cluster elective and "RECTIFIERS AND FILTER CIRCUITS BASED PROJECTS" for this Academic year.

Scheme of valuation

1. External : 25 marks given by the examiner (viva)
2. Internal : 25 marks
   a) Written viva :10 marks
   b) Submission of the Project book : 15 marks
   Total = 50 marks