VIVEKANANDA COLLEGE
College with Potential for Excellence
(Residential & Autonomous-A Gurkula Institute of Life-Training)
(Affiliated to Madurai Kamaraj University)
Re-accredited with ‘A’ Grade (CGPA 3.59 out of 4.00) by NAAC

TIRUVEDAKAM WEST
MADURAI DISTRICT – 625 234

DEPARTMENT OF PHYSICS

B.Sc. PHYSICS

SYLLABUS

Choice Based Credit System
(For those who joined in June 2016 and after)

(2017-2020 Batch)
ABOUT THE COLLEGE

Vivekananda College was started by Founder-President Swamiji Chidbhavanandhaji Maharaj of Sri Ramakrishna Tapovanam, Tirupparaithurai, Trichy in 1971 on the banks of the river Vaigai which is blissfully free from the noise and hurry, the crowds and distraction of the city.

Vivekananda College is a residential college functioning under Gurukula pattern. It is Man-making education that is imparted in this institution, Culture, character and curriculum are the three facets of ideal education that make man a better man. This is possible only when the teacher and taught live together, The Gurukula system of Training is therefore a humble and systematic attempt in reviving the age old GURUGRIHAVASA for wholesome education, Attention to physical culture, devotion to duty, obedience to teachers, hospitality to guests, zest for life, love for the nation, and above all, humility and faith in the presence of God etc. are the values sought to be inculcated. All steps are taken to ensure the required atmosphere for the ideal life training.

Vivekananda College, Tiruvedakam West, Madurai District-625 234 is an aided college established in 1971 and offers UG and PG courses. This College is affiliated to the Madurai Kamaraj University, Madurai. The College was reaccredited with ‘A’ grade (CGPA 3.59 out of 4.00) by NAAC in September 2015. The college was awarded College with Potential for Excellence by UGC in 2016.

VISION AND MISSION

Our Vision: To raise an army of neo-graduates steeped in the hoary culture of the motherland and dedicated to serving her as potential leaders in the manifold spheres of national effort.

Our Mission: A harmonious enrichment of physical, emotional and intellectual facets of a student’s personality to bring out his inherent PERFECTION.

OBJECTIVES OF THE INSTITUTION

1. To inculcate spiritual, ethical, moral and social values in all disciplines of study.
2. Simultaneous education of the Hand, Heart and Head. Only a sound body can hold a sound mind.
3. Provide opportunities for all round development of the students and excellence in higher education, research and extension in different disciplines.
4. Disseminate the findings of research to the community to facilitate its development.
5. To provide society citizens of sterling character.
6. To cater to the needs of the educationally backward people – the most backward, scheduled caste and tribe.
I Eligibility for Admission

Admission to B.Sc. – Physics Programme is open to candidates with +2 pass with Maths, Physics, Chemistry, Biology as major subjects.

For B.Sc.- Physics course offered in the college, a pass in the Higher Secondary Examination conducted by the Government of Tamil Nadu or an examination accepted as equivalent there to by the Syndicate of the MKU, subject to such conditions as may be prescribed therefore.

II Duration

The course is for a period of three years. Each academic year shall comprise of two semesters viz. Odd and Even semesters. Odd semesters shall be from June to November and Even Semesters shall be from December to April. There shall be not less than 90 working days which shall comprise 450 teaching clock hours for each semester (Exclusive of the days for the conduct of university end-semester examinations) for each semester.

III CBCS System

All Programmes offered in the college are run on Choice Based Credit System (CBCS). It is an instructional package developed to suit the needs of students to keep pace with developments in higher education and the quality assurance expected of it in the light of liberalization and globalization in higher education.

IV Semesters:

An academic year is divided into two semesters. In each semester, courses are offered in 15 teaching weeks. Each week has 30 working hours spread over 6 days a week.

V Credits:

The term 'Credit' refers to the weightage given to a course, usually in relation to the instructional hours assigned to it. The total minimum credits, required for completing the B.Sc. Programme is 140. The details of credits for individual components and individual courses are given in the above table.

VI Course:

Each Course is to be designed variously under lectures / laboratory / seminar / practical training / assignments to meet effective teaching and learning needs.

VII Examinations:

i). There shall be examinations at the end of each semester, for odd semesters in the month of October / November; for even semesters in April/May. A candidate who does not pass the examination in any course(s) shall be permitted to appear in such failed course(s) in the subsequent examinations to be held in October / November or April/May.

   ii). A candidate should get registered for the first semester examination. If registration is not possible owing to shortage of attendance beyond condonation limit / regulations prescribed or belated joining or on medical grounds, the candidates are permitted to move to the next semester. Such candidates shall re-do the missed semester after the completion of the programme.

VIII Condonation

Students must have 75% of attendance in each paper for appearing the examination. Students who have 65% to 74% of attendance shall apply for condonation in the prescribed form with the prescribed fee. Students who have 50% to 64% of attendance shall apply for condonation in prescribed form with the prescribed
fee along with the Medical Certificate. Students who have below 50% of attendance are not eligible to appear for the examination. They shall compensate the shortage after the completion of the programme.

**IX Question Paper Pattern**

Time: 3 Hours
Maximum Marks: 75

**SECTION-A (10 X 1 =10 Marks)**

Answer All Questions
(1-5) Multiple Choice
(6-10) Fill in the blanks
Two questions from each unit

**SECTION-B (5 X 7 = 35 Marks)**

Answer All Questions
(11-15) Questions shall be in the format of either (a) or (b)
One question from each unit

**SECTION-C (3 X 10 = 30 Marks)**

Answer any THREE Questions
(16-20) One question from each unit.

**X Evaluation:**

Performance of the students are evaluated objectively. Evaluation is done both internally and externally. They will be assessed continuously through Internal Assessment System and finally through summative (end) semester examination. To assess internally, there will be three examinations conducted centrally with a duration of two hours for each paper. In addition to continuous evaluation, the summative semester examination, which will be a written examination of three hours duration, would also form an integral component of the evaluation. The ratio of marks to be allotted to continuous internal assessment and to end semester examination is 25 : 75.

The pattern of internal valuation shall be:

Test: 20 Marks (the average of best two tests out of three tests)
Assignment: 5 marks
Total: 25 marks.

In respect of practical papers, the ratio of marks to be allotted to internal assessment and to summative (end) semester examination is 40 : 60. The internal marks will be calculated on the basis of marks secured at the model examination and marks awarded for the preparation of practical note book. The external marks will be calculated on the basis of the marks awarded by the internal examiner and the external examiner at the summative semester examination.

**XI Passing Minimum**

There is no passing minimum for Internal Assessment. The passing minimum for external Examinations shall be 27 out of 75 marks and passing minimum for a paper is 40%.

**XII Classification of Students**

Candidates who have secured not less than 40% of marks in each paper shall be declared to have passed in that paper. Candidates who obtain 40% and above but below 50% shall be declared to have passed in Third Class. Candidates who obtain
50% and above but below 60% of the aggregate marks in Part-III shall be declared to have passed in Second Class and those who obtain 60% of marks and above shall be placed in the First Class. Candidates who obtain 75% and above shall be declared to have passed in Distinction provided he has not re-appeared for any paper during the course of the study.

**XIII Failed Candidates**

A candidate who has arrears in any paper in a semester examination will be permitted to proceed to the next semester classes. A candidate who has arrears may appear again in these failed papers at the November/April examinations. The internal assessment marks already obtained by him shall be carried over for the subsequent appearance also.

**XIV Improvement of Internal Marks**

The student desirous of improving the internal assessment marks may request the Head of the Department. After obtaining permission from the Staff Council Meeting by the Head, the student may write improvement examinations in consultation with the course teacher. The marks obtained (when it is more than the previous marks) will be submitted to the Controller of Examinations for further adoption.

**XV Study Tour**

Students are expected to participate in the field visit and the study tours organized by the department. Though study tour/field trip carries no credit, it is compulsory for the students to attend whereby the students can get an opportunity to gain practical knowledge. As such, observational visit to selected social welfare organizations, industries, trade centres, exhibitions, places of historical importance and the like will be considered as extra-curricular activities.

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**VISION AND MISSION OF PHYSICS DEPARTMENT**

**VISION**

Inculcating the basic and up to date knowledge in physical science to the first generation students from rural areas – by student centered learning methods and a mixture of traditional, current, and integrative pedagogical techniques.

The department has dedicated itself for lifelong learning through academicals and social programs.

**MISSION**

Prepare the student in assets of physics and the principles of analytical methods required for the competitive physical tests in the competitive world.

Kindle the knowledge of students to pursue higher studies and research programs. Making the students self employable with the Physics knowledge gained during their degree course of study.
To provide the tools and skills for advancing our knowledge of the universe and for providing solutions to challenges we face as individuals, communities, and societies.

**A Brief History of the Department of Physics**

At the time of inception of the college to Madurai University in the year 1971 Prof. R. Murugeshan was the first staff appointed in Physics department as a demonstrator to teach Physics for PUC. Three year B.Sc., Physics Major Course was introduced in the academic years 1973-1974. After the induction of Physics major course Prof. M. Muthusamy and Prof. K. S. Srinivasanambirajan were appointed as Assistant Professors. Prof. M. Muthusamy leads the department as head of the department till to his retirement 31-05-2003. Prof. K. S. Srinivasanambirajan also retired from his service in the same academic on 31-05-2003. After that Prof. R. Murugeshan leads the department as head of the department of Physics till to his retirement on 31-05-2004. During his service Prof. R. Murugeshan published several books on different topics of Physics. His book on “Modern Physics” is very popular throughout our nation and is being prescribed as a text book in majority of the Indian Universities for under graduate course. Prof. A. P. Selvarajah acted as HOD from 01-06-2004 to 31-05-2014. Dr. P. K. Veeran acted as HOD from 01-06-2014 to 30.11.2015. Sri. P. Jeyasankar has taken over the charge as HOD of Physics from 01-12-2015 to till date. The department take special interest in teaching medical instrumentation, house hold electrical appliances and house wiring (Certificate Course) which are much useful for self employment. The department took special interest in teaching ideas, concepts and physical laws which is very useful to get through in the competitive examinations for appointments and to get admission in higher studies. Thursday meet is a unique programme conducted in our department which is organised, conducted and participated by our department students by taking seminars on current topics, conducting Science quiz and having a good academic discussion on current topics in the presence of faculty members which is not only useful to enhance their subject skill but to enrich their communicative skills also. Lab on wheel and Science exhibition are other programmes which are very useful for school students in nearby villages. Seminars, Guest lectures are frequently conducted inviting subject experts from Higher Academic Centres like IIT, ISRO, IIAP, etc.,
### SCHEME OF EXAMINATION
(For those who joined in 2016 and after)

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### SIXTH SEMESTER

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PART-I: Language Tamil Subject

| Subject Title: தமிழ் தாளம் கணினியம் - காலம்:1 |
|-----------------|-----------------|
| Subject Code: PILT11 | Hours per week: 6 | Credit: 3 |
| Seasonal Marks: 25 | Summative marks: 75 | Total Marks: 100 |

பாப்பாரின் எளியுருக்கிய பேச்சு

| அங்கு: 1 | சொல்லிச் செயல்பாடு : பாப்பாரின் எளியுருக்கிய பேச்சு பாப்பாரின் எளியுருக்கிய பேச்சு |
|------------|-----------------|-----------------|
| அங்கு: 2 | சொல்லிச் செயல்பாடு : பாப்பாரின் எளியுருக்கிய பேச்சு பாப்பாரின் எளியுருக்கிய பேச்சு |
| அங்கு: 3 | சொல்லிச் செயல்பாடு : பாப்பாரின் எளியுருக்கிய பேச்சு பாப்பாரின் எளியுருக்கிய பேச்சு |
| அங்கு: 4 | சொல்லிச் செயல்பாடு : பாப்பாரின் எளியுருக்கிய பேச்சு பாப்பாரின் எளியுருக்கிய பேச்சு |
| அங்கு: 5 | சொல்லிச் செயல்பாடு : பாப்பாரின் எளியுருக்கிய பேச்சு பாப்பாரின் எளியுருக்கிய பேச்சு |

முதல்கால வகுப்புப் போர்த்தொன்றானது

அமங்க: 1 சொல்லிச் செயல்பாடு : பாப்பாரின் எளியுருக்கிய பேச்சு

1. பாப்பாரின் காலகாலங்கள்
   1. சொல் (காலகால (பாப்பாரின் எளியுருக்கிய பேச்சு))
   2. பாப்பாரின் காலகாலங்கள் (காலகால (பாப்பாரின் எளியுருக்கிய பேச்சு))

2. பாப்பாரின் காலகாலங்கள்
   1. சொல் (காலகால (பாப்பாரின் எளியுருக்கிய பேச்சு))
   2. பாப்பாரின் காலகாலங்கள் (காலகால (பாப்பாரின் எளியுருக்கிய பேச்சு))

3. காலகால தோற்றங்கள்
   காலகால தோற்றங்கள் (காலகால தோற்றங்கள்)

4. தொல்லியல் அளிப்பான
   தொல்லியல் அளிப்பான (தொல்லியல் அளிப்பான)

5. முதல் கலாசார்ய வரலாறு
   முதல் கலாசார்ய வரலாறு

அமங்க: 2 சொல்லிச் செயல்பாடு : பாப்பாரின் எளியுருக்கிய பேச்சு

1. காலகால - காலகால காலகாலங்கள்
2. சொல் தொல்லியல் தொல்லியல் - காலகால காலகாலங்கள் (சொல் தொல்லியல் தொல்லியல்)
3. குறுகிய குறுகிய குறுகிய - அரச அரச குறுகிய (குறுகிய குறுகிய)
4. பாப்பாரின் எளியுருக்கிய பேச்சு பாப்பாரின் எளியுருக்கிய பேச்சு
5  தமிழ் திறனை பைர - தமிழார்வாய் (அர்த்தம் அல்முதல் அடிப்பகுதியானது)
6  தரைப்பக்கான பொருளைன் - தொழில் கருவகாய் (அர்த்தமாக்கல்)
7  அலுவலக எதிர்காலம் - தொழிலாளர்கள்

அக்காலம்: 3 தமிழ் திறனை மக்களைக் - தலையும் திறனாளர்களான்

(மறுமொழியாகும் கல்விகள்)

அக்காலம்: 4 தமிழ் திறனை மக்களை கருவகாய்
1. தொழில் கருவகாய்
2. தொழிலாளர்கள்
3. தொழில் கருவகாய்
4. தொழில் கருவகாய்
5. அலுவலக எதிர்காலம்
6. அலுவலக எதிர்காலம்

அக்காலம்: 5 தமிழ் திறனை மக்களை மக்களை மக்களை

(1) 1. பொருளைகள் தமிழார்வாய் (அர்த்தமாக்கல்)
2. பொருளைகள் தமிழார்வாய் (அர்த்தமாக்கல்)

(2) பொருளைகள் தமிழார்வாய் - அலுவலக எதிர்காலம் தமிழார்வாய் - பொருளைகள் தமிழார்வாய் - கருவகாய் ஆராய்ச்சி - கருவகாய் ஆராய்ச்சி - கருவகாய் ஆராய்ச்சி - கருவகாய் ஆராய்ச்சி - கருவகாய் ஆராய்ச்சி - கருவகாய் ஆராய்ச்

மாணவர்களை
1. முன்னணி மாணவர் முன்னணி (மறுமொழியாகும் கல்விகள்)
2. முன்னணி மாணவர்கள் முன்னணி (மறுமொழியாகும் கல்விகள்)

மாணவர் முழுநாட்டுகளை
1. முன்னணி காலநடைகள் (முன்னணி பொருளாயம்)
2. முன்னணி காலநடைகள் (முன்னணி பொருளாயம்)
3. முன்னணி மாணவர் முன்னணி - முன்னணி, பொருளாயம்
4. முன்னணி மாணவர் முன்னணி - முன்னணி, பொருளாயம்
DEPARTMENT OF SANSKRIT
B.A. / B.Sc. PART-I –LANGUAGE SANSKRIT SYLLABUS: SEMESTER – I:
PAPER – I
(For those who join in June 2017 and After)

<table>
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<th>PART-I Sanskrit Paper I</th>
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<tr>
<td>Subject Title: <strong>Fundamental Grammar &amp; History of Sanskrit Literature – I</strong></td>
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**FUNDAMENTAL GRAMMAR & HISTORY OF SANSKRIT LITERATURE -I**

Following portions for Grammar:

Declension of the following nouns and pronouns:

UNIT-I  Akārānta Mascular, Ākārānta Feminine & Akārānta Neuter.
Asmad and Yuṣmad śabdās
Conjugation of the following verbs in present, past & future tense
Bhav, paṭh, Vad, Gacch, Vas, Driś (Paś), Krīḍ Đhāv

UNIT-II & III History of Sanskrit Literature:

a) Vedas and Purāṇās
b) Itihāsa
c) Court Epics – Mahākāvyas

UNIT –IV
Translation:

a) From Sanskrit to English:
Passages exercises 2, 3 and 4 from the prescribed texts.

b) From English to Sanskrit:
Passages exercises 1, 2 and 3 from the prescribed texts.
UNIT – V. Transliteration
a)Devanaagari to IPS. b) IPS to Devanaagari

Prescribed text: “SĀHITYA RASAKANĀḤ”
(Published by A.M.G. Publications, Madurai – 625 016)

A short history of Sanskrit Literature (Published by A.M.G. Publications, Madurai – 625 016) year of publication- 1996
B.Sc. Physics CBCS Syllabus (Part II English) - SEMESTER I
(For those who joined in June 2017 and after)

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**Objectives:**
- To develop listening and speaking skills
- To increase the vocabulary of students
- To improve reading skills
- To develop competency in grammar
- To develop continuous writing

**Unit – I - Listening, Speaking and Reading Components**
15 Hrs
1. Rabindranath Tagore – Cabuliwallah
2. Khushwant Singh – Karma
3. R.K. Narayan – Sweets for Angels
4. K.A.Abbas – Sparrows

**Unit – II**
15 Hrs
- Sentences, Clauses, and Phrases
- Pronouns
- Adjectives
- Some Common Adjectives and Adverbs
- Parts of Speech
- Determiners
- Verbs
- Nouns
- Articles
- Adverbs

**Unit – III Composition**
15 Hrs
- Letter writing – Formal Letters & Informal Letters
- Descriptive Writing – General topics (Paragraph)

**Unit – IV - Extensive Reading: Short Stories**
15 Hrs
- Young Naren - by Brahamachari Amal.
  [From “A Simple life of Swami Vivekananda”
   Advaita Ashrama, Kolkata]
- A Story of Initiation - by Sri Aurobindo Society.
  From “Stories and Anecdotes from the Mother”
- Glory At Twilight - Bhabani Bhattacharya
- The Martyr’s Corner - R.K. Narayan

**Unit – V - Translation**
15 Hrs
Translation of Sentences and Stories from Tamil to English / English to Tamil
(Passages will be supplied)

**Reference Book:**
**PART III: Core Subject Theory**

<table>
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<th>Subject Code: 06CT11</th>
<th>Hours per week: 4</th>
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**Objectives:**

- To enable the students in order to learn the basic principles, theory and concepts of mechanics.
- To gain knowledge by the students in order to learn motion of bodies.
- To inspire interest for the knowledge of concepts in fluid dynamics.

**UNIT I: MOTION IN ONE DIMENSION AND NEWTON’S LAWS**


**UNIT II: MOTION IN TWO AND THREE DIMENSIONS**

Motion in Three Dimensions with Constant Acceleration - Newton’s Laws in Three Dimensional Vector form - Projectile Motion - Uniform Circular Motion - Frictional forces - The Dynamics of Uniform Circular Motion.

**UNIT III: MOMENTUM AND SYSTEM OF PARTICLES**


**UNIT IV: ANGULAR MOMENTUM AND WORK AND KINETIC ENERGY**


**UNIT V: FLUID STATICS AND FLUID DYNAMICS**

Fluids and Solids - Pressure and Density - Variation of Pressure in Fluid at Rest - Measurement of Pressure - General Concepts of Fluid flow - Streamlines and Equation of Continuity - Bernoulli’s Equation - Applications of Bernoulli’s Equation and Equation of Continuity.
Text Book: Physics, Volume 1, DAVID HALLIDAY, ROBERT RESNICK,& KENNETH S. KRANE 2002, fifth edition, John Wiley & Sons, INC.

Unit I: 2-4, 2-5, 2-6, 3 - 2, 3 - 3, 3 - 4, 3 - 5, 3- 6, 3 - 7
Unit II: 4 -1, 4 -2, 4 - 3, 4 – 5, 5 - 3, 5 - 4
Unit III: 6-1, 6-2, 6-3, 6-4, 6-5, 7 -3, 7-4, 7-5
Unit IV: 10-1, 10-2, 10-3, 10-4, 11-1, 11-2, 11-3, 11-4, 11-6, 11-7

Reference Books:

B.Sc. Physics CBCS Syllabus - SEMESTER – I
(For those who joined in June 2016 and after)

PART – III : Core Subject Theory

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<td>Summative Marks: 75</td>
<td>Total Marks: 100</td>
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Objectives: To gain knowledge about the electrical energies in order to
- learn motion of charges
- acquire basic knowledge of magnetic properties
- know about the alternating current and its circuits
- get a depth of knowledge in electricity and magnetism

UNIT I: CHARGE AND FIELDS

Basic concepts - Coulomb’s law - Super position Principle - Electric Field - Electric Field due to a point charge - Electric Dipole - Potential Energy of a Dipole in uniform Electric field - Electric field due to an Electric Dipole at an axial point - Electric field at a point on the equatorial line - Electric field due to an Electric dipole at any point - Lines of force - Gauss’s law - Differential form of Gauss law - An Insulated conductor - Electric field due to a uniformly charged sphere - Coulomb’s theorem

UNIT II: ELECTRIC POTENTIAL AND CAPACITORS

Potential Difference - Electric Potential as line Integral of Electric Field - Potential at a point due to a point charge - Relation between Electric field and Electric Potential. Capacitance of a spherical capacitor (outer and inner sphere earthed) - Capacitance of a cylindrical capacitor. Parallel plate capacitor - Capacitors in series and parallel - Energy stored in a charged capacitor - Change in energy of a parallel plate capacitor - Loss of energy on sharing of charges between two capacitors - Force of attraction between plates of a charged parallel plate capacitor - Types of capacitors

UNIT III: CURRENT AND RESISTANCE MEASUREMENTS

Current and current density - Expression for current density - Equation of continuity-Ohm’s law and Electrical conductivity-Carey Foster bridge - Potentiometer - measurement of low resistance (Kelvin Double Bridge method) comparison of capacitances of two capacitors - capacitance of capacitor (Kelvin’s null method)

UNIT IV: MAGNETIC EFFECT OF ELECTRIC CURRENT

Introduction - The Biot - Savat Law - Magnetic induction at a point due to straight conductor, circular coil carrying current - Hemholtz Tangent Galvanometer - Magnetic Induction at any point on the axis of a solenoid - moving coil Ballistic Galvanometer - current and voltage sensitivities of moving coil galvanometer measurement of charge sensitiveness - absolute capacitance of a capacitor -
comparison of two capacitance using B.G - Ampere’s circuital law - Differential form of Ampere’s law – Divergence of magnetic field vector B – Magnetic field inside a long seleniod

**UNIT V: AC CURRENT, AC & DC MOTORS**


**Text Book:**

Electricity and Magnetism by R. Murugeshan, S.Chand & Company Ltd., New Delhi (Fifth Edition - 2003)

Unit - I: Chapter 1 & 2 (1.1 - 1.11, 2.2 - 2.5, 2.11)

Unit - II: Chapter 3 & 4 (3.1 - 3.4, 4.2 - 4.5, 4.8 - 4.13)

Unit - III: Chapter 6 & 7 (6.1 - 6.4, 7.1 - 7.5)

Unit - IV: Chapter 10 (10.1 - 10.6, 10.11-10.15, 10.17-10.20)


**Reference Books:**

1. Electricity and magnetism by Brijlal and Subramaniam Ratan Prakashan Educational & University Publishers.
B.Sc. Physics (Allied Chemistry) CBCS Syllabus - SEMESTER – I
(For those who join in June 2014 and after)

| PART III – Allied Course Theory – I |
|-----------------|----------|----------------|----------------|
| Subject Title:  Inorganic, Organic and Physical Chemistry – I |
| Subject Code:   07AT01 | Hours per week: 4 | Credit: 4 |
| Sessional Marks: 25 | Summative Marks: 75 | Total Marks: 100 |

Objectives:

To enable the students

- To learn the basic Principles of Titrimetry
- To gain basic knowledge about Chemical Bonding
- To understand the theory of Nuclear Chemistry
- To be familiar with Selected Organic Compounds

UNIT I: PRINCIPLES OF TITRIMETRY 12 Hrs


UNIT II: CHEMICAL BONDING – I 12 Hrs

V.B. Theory – postulates of V.B. Theory – application to the formation of simple molecules like H₂ and O₂ – Overlap of atomic orbitals – s-s, s-p and p-p overlap – principle of hybridization – sp, sp² and sp³ hybridisation.

UNIT III: CHEMICAL BONDING – II 12 Hrs

Valence shell electron pair repulsion theory (VSEPR theory).
M.O. Theory: Formation of Molecular orbitals – bonding, anti-bonding and non-bonding molecular orbitals – Molecular orbital diagrams for H₂, He₂ and O₂

UNIT IV: NUCLEAR CHEMISTRY 12 Hrs

3. Nuclear fission: Definition – application of fission – the principle of atom bomb.
5. Applications of radioactivity – In medicine, agriculture, industry and analytical fields – carbon dating.
UNIT V: SOME SELECTED ORGANIC COMPOUNDS 12 Hrs

Preparation, properties and uses of TNT, BHC, Aspirin, Phenolphthalein, Malachite green, Crown Ethers and Lithium Aluminium hydride

Text Book:

1. Ancillary chemistry Dr. K.Ratinamuthu (Study material will be provided) Semester I and II

Reference Books:

B.Sc. Physics CBCS Syllabus - SEMESTER – I
(For those who joined in June 2016 and after)

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</tr>
</tbody>
</table>

Objectives:

- To enable the students in order to learn the concepts of Solar System
- To acquire basic knowledge of communication
- To understand the satellite launching

UNIT I:


UNIT II:


UNIT III:

Communication system - Information – Transmitter – Channel – Noise - Receiver

UNIT IV:


UNIT V:

Satellite and Launching - Multistage Rocket – Pay load – Geo stationary Satellites – Fuel used in satellites – Launching

Text Books:

3. The History of Science from 1946 to the 1990’s,Ray Spangenburg and Diane K.Moser, The Universities Press Book

Reference Books:

2. Encyclopedia of space, Heather couper, Niqel henbest Publisher: Dorling Kindersley,2009
PART-I: Language Tamil Subject

Subject Title: ஆண்டு-நாள் சிற்றியாளர் நடனாள் கோட்டைப்புறம் - நான்கு

Subject Code: PILT21

Seasonal Marks: 25  Summative marks: 75  Total Marks: 100

மாணவர்கள்

நுண்வீழ்ச்சியின் பார்வைகள்

அதை: 1 தமிழ்நாட்டின் விளையாட்டு விளையாட்டு

அதை: 2 தமிழ் நாடு விளையாட்டு

அதை: 3 நாட்கள் விளையாட்டு

அதை: 4 தமிழ்நாட்டின் - விளையாட்டு

அதை: 5 தமிழ்நாட்டின் விளையாட்டு மாண்பாட்டு செயல்பாடுகளின்

மாண்பாட்டுச் சான்றானால்

அதை : 1 தமிழ்நாட்டின் விளையாட்டு - ப. பொதுமக்கள் (சு.சத்யானன்)

அதை : 2 தமிழ் நாடு விளையாட்டு - நாட்கள் புகழ் பாடல் (த.சு.சாமுநாதன்)

அதை : 3 நாட்கள் விளையாட்டு - பாண்டுசின்னான

1. செய்ய வேண்டிய விளையாட்டு விளையாட்டுகள்
2. வெளிநாட்டு விளையாட்டு விளையாட்டு விளையாட்டுகள்
3. வெளிநாட்டு விளையாட்டு விளையாட்டு விளையாட்டுகள்
4. வெளிநாட்டு விளையாட்டு விளையாட்டு விளையாட்டு விளையாட்டு விளையாட்டு

அதை : 4 தமிழ்நாட்டின் - விளையாட்டு

1. நடனாள் விளையாட்டு விளையாட்டு
2. விளையாட்டு - நாட்கள் விளையாட்டு
3. விளையாட்டு விளையாட்டு
4. விளையாட்டு (சு.சத்யானன், சு.சாமுநாதன், சு.சாமுநாதன், 

அதை : 5 தமிழ்நாட்டின் விளையாட்டு மாண்பாட்டு செயல்பாடுகளின்

(1) 1. செய்ய வேண்டிய விளையாட்டு விளையாட்டு
2. வெளிநாட்டு விளையாட்டு விளையாட்டு

ஆதாரம்:

1. சிற்றியாள் - ப. பொதுமக்கள் (சு.சத்யானன்)
2. நாட்கள் - நாட்கள் புகழ் பாடல் (த.சு.சாமுநாதன்)
3. மேலும்வரை (ளவுங்கள் முன்னாளுக்கு)
4. தமிழ்நாட்டின் விளையாட்டு (த.சத்யானன், சு.சாமுநாதன்)

மாணவர் பண்பாடுகள்

1. நாட்கள் விளையாட்டு சிற்றியாள்ள அறிவுச் சான்று (ளவுங்கள் முன்னாளுக்கு)
2. மேலும்வரை (ளவுங்கள் முன்னாளுக்கு)
3. மேலும்வரை (ளவுங்கள் முன்னாளுக்கு)
4. மேலும்வரை (ளவுங்கள் முன்னாளுக்கு)
DEPARTMENT OF SANSKRIT
B.A. / B.Sc. PART-I –LANGUAGE SANSKRIT SYLLABUS: SEMESTER – II:
PAPER – II
(For those who join in June 2017 and After)

<table>
<thead>
<tr>
<th>PART – I Sanskrit Paper II</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Subject Title:</td>
<td>Poetry Grammar &amp; History of Sanskrit Literature – II</td>
<td></td>
</tr>
<tr>
<td>Subject Code:</td>
<td>PILS21</td>
<td>Hours per week: 6</td>
</tr>
<tr>
<td>Sessional Marks:</td>
<td>25</td>
<td>Summative Marks: 75</td>
</tr>
<tr>
<td>Credit:</td>
<td>3</td>
<td>Total Marks: 100</td>
</tr>
</tbody>
</table>

POETRY

Selected portions from the prescribed text: Kaliviḍāmbanam & Sabhāraṅjanaśatakam - Published by SADGUNA PUBLICATIONS

Kalividambanam
Cidambaram (TN)

Unit I. scholars and Teachers Verse No. 1-10,

Unit II. Astrologers & Physicians V. 14-30

Unit III. Relatives & Pseudo monks Vv. 41-50, 84-93.

Sabhāraṅjanaśatakam

Unit IV Wisdom and it’s acquisition Vv. 1-12


Prescribed text:
LYRICS & CHAMPU KAVYAS
A short history of Sanskrit Literature
(Published by A.M.G. Publications, Madurai – 625 016 Page No. 51 – 60, 42 – 45)
year of publication- 1996

Kaliviḍāmbanam & Sabhāraṅjanaśatakam
Published by SADGUNA PUBLICATIONS
B.Sc. Physics CBCS Syllabus (Part II English) - SEMESTER – II
(For those who join in June 2015 onwards)

<table>
<thead>
<tr>
<th>PART II – Paper I</th>
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<tbody>
<tr>
<td>Subject Title: Functional English</td>
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<tr>
<td>Subject Code: P2LE21</td>
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<tr>
<td>Sessional Marks: 25</td>
</tr>
</tbody>
</table>

Objectives:
- Total number of hours per semester: 75 Hrs
  - To develop listening, speaking and reading skills
  - To develop Information and Communication Technology (ICT) skills
  - To develop presentation skills
  - To develop competency in grammar

Unit – I Listening, Speaking and Reading Components 15 Hrs

Prose
1. My Visions for India - A.P.J. Abdul Kalam
2. Mahatma Gandhi - V.S. Srinivasasastri
3. The Secret of Work - Swami Vivekananda
4. The Golden Age of Cricket - Neville Cardus
5. Tree Speaks - C. Rajagopalachari

Unit – II Language Study 15 Hrs

- Tenses and Their Uses
- Concord or Agreement
- Conditional Sentences
- Active and Passive Voice
- Preposition


Unit – III Composition 15 Hrs

- Letter writing – Informal Letters
- Hints Development
- Descriptive Writing

Unit – IV Extensive Reading: Short Stories 15 Hrs

Extensive Reading
1. Upper Division Love - Manohar Malgonkar
2. The Tiger in the Tunnel - Ruskin Bond
3. A Devoted Son - Anitha Desai
4. The Lost Child - Mulk Raj Anand
5. The Cask of Amantilado - Edgar Allan Poe

Unit – V Translation 15 Hrs

- Translation of Sentences and Stories from Tamil to English/English to Tamil (Passages will be supplied)
B.Sc. Physics CBCS Syllabus - SEMESTER – II
(For those who joined in June 2016 and after)

PART – III : Core Subject Theory

<table>
<thead>
<tr>
<th>Subject Title</th>
<th>THERMODYNAMICS AND STATISTICAL MECHANICS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Subject Code</td>
<td>06CT21</td>
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<tr>
<td>Hours per week</td>
<td>4</td>
</tr>
<tr>
<td>Credit</td>
<td>4</td>
</tr>
<tr>
<td>Sessional Marks</td>
<td>25</td>
</tr>
<tr>
<td>Summative Marks</td>
<td>75</td>
</tr>
<tr>
<td>Total Marks</td>
<td>100</td>
</tr>
</tbody>
</table>

Objectives:

- The aims is to provide the students to understand the basic principle and laws of thermodynamics
- To understand the concepts of entropy
- To enable the students in order to learn the basic principles, theory and concepts of Statistical mechanics

UNIT I: TRANSMISSION OF HEAT


UNIT II: BEHAVIOUR OF REAL GASES


UNIT III: THERMODYNAMICS FIRST LAW AND SECOND LAW

Thermodynamic system - Zeroth law of thermodynamics - work a path Dependent function - First law of thermodynamics- applications - Isothermal process - Adiabatic process - Isochoric process - Isobaric process - work done during an isothermal process and adiabatic process

Reversible and Irreversible process –Heat engines-Carnot’s Ideal Heat engine- Carnot’s Cycle- Carnot’s engine and refrigerator - Second law of thermodynamics- Carnot’s theorem

UNIT IV: STATISTICAL BASIS OF THERMODYNAMICS

UNIT V: QUANTUM STATISTICS


Units: Unit - I: Chapter – 15&8 (15.1, 15.9, 15.11, 15.13, 15.14, 15.19, 8.12, 8.13, 8.21, 8.26)
        Unit - II: Chapter - 2&7 (2.1, 2.8, 2.10, 2.12, 2.21, 2.24, 7.8, 7.19)
        Unit - III: Chapter - 4 (4.1, 4.2, 4.5, 4.7, 4.10, 4.10.7, 4.10.4, 4.10.2, 4.10.3, 4.12, 4.13, 4.20, 4.21, 4.23, 4.24, 4.26, 4.28, 4.29)
        Unit - IV:Chapter – 9,10&11 (9.1,9.2,9.5,10.1,10.4,10.15,10.18,11.3,11.4,11.6)
        Unit - V: Chapter- 12 (12.1, 12.5, 12.6, 12.8, 12.10, 12.15)

Reference Books:

B.Sc. Physics CBCS Syllabus - SEMESTER – II
(For those who joined in June 2016 and after)

PART – III : Core Subject Theory

<table>
<thead>
<tr>
<th>Subject Code: 06CT22</th>
<th>Hours per week: 4</th>
<th>Credit: 4</th>
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<tbody>
<tr>
<td>Sessional Marks: 25</td>
<td>Summative Marks: 75</td>
<td>Total Marks: 100</td>
</tr>
</tbody>
</table>

Objectives:

- To provide a good foundation in optics
- To provide a knowledge of the behaviour of light
- To inspire interest for the knowledge of concepts is physical and geometrical optics
- To gain knowledge by the students in order to learn sound waves

UNIT I: INTERFERENCE

Total Internal Reflection - The Doppler Effect for Light - Two - Source Interference - Double Slit Interference - Coherence Intensity in Double Slit interference - Michelson’s interferometer.

UNIT II – DIFFRACTION


UNIT III: POLARIZATION

Polarization of Electromagnetic waves - Polarizing Sheets - Polarization by Reflections - Double Refraction - Circular polarization - Polarization by Scattering.

UNIT IV: OSCILLATIONS

Oscillating systems - The Simple Harmonic Oscillator - Simple Harmonic Motion - Energy in Simple Harmonic Motion - Applications of Simple Harmonic Motion - Simple Harmonic Motion and Uniform Circular motion - Damped Harmonic Motion - Forced Oscillations and Resonance - Two body Oscillations.

UNIT V: SOUND WAVES

Properties of Sound Waves - Travelling Sound Waves - The Speed of Sound - Power and Intensity of Sound Waves - Interference of Sound Waves - Standing longitudinal Waves - Vibrating Systems and Sources of Sound.

Text Books:
1. Physics, Volume 1, David Halliday - Robert Resnick, Kenneth S. Krane 2002,  
   Unit IV: Chapter 17:17.1 - 17.9 Units V: Chapters 19: 19.1 - 19.7.  
   Unit I: Chapter 39:39.5, 39.6  Unit I: Chapters 41: 41.1 - 41.4, 41.6  
   Unit II: Chapter 42: 42.1 - 42.3, 42.5 Unit II: Chapter 43: 43.1 - 43.5  
   Unit III: Chapter 44:44.1, 44.2, 44.3, 44.4, 44.5, 44.6.  


Reference Books:  
1. Physics for Scientists and Engineers with Modern Physics, Raymond A. Serway,  
3. Optics, Sanjay Yadav, Krishna Nandan Kumar, Choice International publisher,  
   2007.  
5. A Text book of sound – N. Subrahmanyam and Brijlal,Vikas Publishing  
   House,2009.

B.Sc. Physics CBCS Syllabus - SEMESTER – II  
(For those who joined in June 2016 and after)

<table>
<thead>
<tr>
<th>PART – III : Core Subject Practical</th>
<th>Subject Title : MAJOR PRACTICAL – I</th>
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</thead>
<tbody>
<tr>
<td>Subject Code: 06CP23</td>
<td>Hours per week: 2 Credit: 2</td>
</tr>
<tr>
<td>Sessional Marks: 40</td>
<td>Summative Marks: 60 Total Marks: 100</td>
</tr>
</tbody>
</table>

Objectives:  
❖ To develop the practical skills by applying the laws and concepts in physics  
   experiments  
   (Any fourteen experiments)

1. Compound Pendulum  
2. Bifilar Pendulum  
3. Torsional Pendulum  
4. Surface Tension & Interfacial Surface Tension by drops  
5. Viscocity – Stokes method  
6. Helmholtz Resonator  
7. Sonometer – Frequency of fork & Verification of Laws  
8. Sonometer – Frequency of A.C.  
9. Meld’s Strings – Frequency of Electrically tuning fork  
10. Lee’s Disc – Thermal Conductivity of a Bad conductor  
11. Spectrometer – A & D  
12. Spectrometer – i-d Curve  
13. Spectrometer – Dispersive power of prism  
14. Spectrometer – Grating -Normal incidence
15. Air wedge
16. Newton’s Rings

B.Sc. Physics (Allied Chemistry) CBCS Syllabus - SEMESTER – II
(For those who join in June 2014 and after)

<table>
<thead>
<tr>
<th>PART III – Allied Course Theory – II</th>
</tr>
</thead>
<tbody>
<tr>
<td>Subject Title: Inorganic, Organic &amp; Physical Chemistry - II</td>
</tr>
<tr>
<td>Subject Code: 07AT02</td>
</tr>
<tr>
<td>Sessonal Marks: 25</td>
</tr>
</tbody>
</table>

Objectives:

To enable the students
- To be familiar with fundamentals of periodic properties
- To gain basic knowledge about Photochemistry
- To understand the theory of Solid State
- To be familiar with Electrochemistry
- To gain basic knowledge about chromatography techniques

UNIT I: PERIODIC PROPERTIES AND CHEMICAL BONDING 12 Hrs


UNIT II: PHOTOCHEMISTRY 12 Hrs


UNIT III: SOLID STATE 12 Hrs


UNIT IV: ELECTROCHEMISTRY 12 Hrs


UNIT V: CHROMATOGRAPHY TECHNIQUES 12 Hrs

**Text Book:**

1. Ancillary chemistry Dr. K.Ratinamuthu (Study material will be provided) Semester I and II.

**Reference Books:**

B.Sc. Physics CBCS Syllabus - SEMESTER – II
(For those who joined in June 2016 and after)

PART – IV : Non Major Elective

<table>
<thead>
<tr>
<th>Subject Code: 06NE21</th>
<th>Hours per week: 2</th>
<th>Credit: 2</th>
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<tbody>
<tr>
<td>Sessional Marks: 25</td>
<td>Summative Marks: 75</td>
<td>Total Marks: 100</td>
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</table>

Objectives:

- To enable the students in order to learn the basic principles, theory and concepts of power supplies
- To gain knowledge by the students in order to learn electric lamps and applicances

UNIT I:


UNIT II:

Difference between A.C. and D.C.- Stabilized power supply – A.C. adopter – Transformer – Types – Choke – Uses

UNIT III:

Electric lamps – Incandescent lamp – Fluorescent lamp – Mercury and Sodium vapour lamp – Halogen lamps – Different colours – CFL (Compact Fluorescent Lamp) – LED – Seven segment display

UNIT IV:

Electric heaters – Water heaters – Gaiser heater – Instant water heater – Immersion rod heater

UNIT V:

Mixi – Grinder – Electric iron box – Electric fan (Table and Ceiling fans) – Speed control using regulators in fan

Text Book:

PART-I: Language Tamil Subject

<table>
<thead>
<tr>
<th>Subject Title: தமிழ் பாடசாலையில் பிள்ளைகளுக்கு பாட்டு வகையில் அனுப்பப்படும் கற்பாடு</th>
<th>தொகை: 3</th>
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<tbody>
<tr>
<td>Subject Code: P1LT31</td>
<td>Hours per week: 6</td>
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<td>Seasonal Marks: 25</td>
<td>Credit: 3</td>
</tr>
<tr>
<td>Summative marks: 75</td>
<td>Total Marks: 100</td>
</tr>
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_part הכל

| அக்டோர்: 1 | முன்னணி காலையில் பிள்ளைநூற்றாண்டு அகமகை. |
| அக்டோர்: 2 | முன்னணி பாதுகாப்பு பிள்ளைநூற்றாண்டு அகமப்போனை. |
| அக்டோர்: 3 | முன்னணி இன்றிக்கை (இந்தோலோகம் குரூக்கை) |
| அக்டோர்: 4 | முன்னணி குறிப்பிட்டு (பழுதேனை) |
| அக்டோர்: 5 | முன்னணி திட்டாமை அறிவியல் பெரியாற்றும் பாடத்துறை. |

1. பிரிவுகள் - பிரிவுகள் இயல் அகமப்போனை (பிரிவுகள் பாதுகாப்பு) |
2. பிரிவுகள் - பிரிவுகள் இயல் அகமாப்போனை (பிரிவுகள் பாதுகாப்பு) |
3. பிரிவுகள் - பிரிவுகள் (10 பாதுகாப்பு) |
4. பிரிவுகள் - பிரிவுகள் (10 பாதுகாப்பு பாதுகாப்பு நாய் பாதுகாப்பு) |
5. பிரிவுகள் - பிரிவுகள் (10 பாதுகாப்பு பாதுகாப்பு நாய் பாதுகாப்பு) |

1. குறிப்பிட்டு வாட்டும் நேரங்கள் (குறிப்பிட்டுக்கொடுக்கு வந்தோல்வி)
2. பல்வேறு வகைகளில் வார்த்தை அமைப்பு (பல்வேறு பாறையதுக்குறை).

2009 செப்டம்பர்
1. குறிப்பிட்டு விளக்கம் அறிவு (செயல்வாய் பராமரிப்பிட்டு)
2. குறிப்பிட்டு விளக்கம் அறிவு (செயல்வாய் பராமரிப்பிட்டு)

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DEPARTMENT OF SANSKRIT
B.A. / B.Sc. PART-I – LANGUAGE SANSKRIT SYLLABUS: SEMESTER – III:
PAPER – III
(For those who join in June 2017 and After)

<table>
<thead>
<tr>
<th>PART – I Sanskrit Paper III</th>
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<tbody>
<tr>
<td>Subject</td>
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<tr>
<td>Subject Code: PILS31</td>
</tr>
<tr>
<td>Sessional Marks: 25</td>
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</tbody>
</table>

PROSE
Following portions from the prescribed text: ‘SAHITYA RASA KANA’
- Published by J.M. Publications, Madurai.

UNIT I & II
1. Gurubhakti
2. Mātaṅgacaritam
3. Samsargajādoṣagunā bhavanti
4. Akarnahrudayo gardabhaḥ
5. Śukanāsopadcāḥ

POETICS

UNIT III & IV
ALĀṆKĀRA (POETICS) FROM THE TEXT BOOK: SĀHITYA RASAKANĀḤ:-

UPAMĀ, ANANVAYA, UTPREKṢĀ, ATIŚAYOKTI, ULEKHĀ, VYATIREKA, SAMĀSOKTI, ŚLEṢA, ARTHĀNTARANYĀSA.

HISTORY OF LITERATURE

UNIT V
Prose Romance,
Historical Kavyas, Popular Tales.

Prescribed text:
A short history of Sanskrit Literature
(Published by A.M.G. Publications, Madurai – 625 016, Page No. 35 – 40, 40 – 44, 45 - 50) year of publication- 1996
B.Sc. Physics CBCS Syllabus (Part II English) - SEMESTER III
(For those who join in June 2017 and after)

<table>
<thead>
<tr>
<th>PART II – Paper I</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Subject Title</strong>: English through Drama &amp; Poetry</td>
</tr>
<tr>
<td>Subject Code: P2LE31</td>
</tr>
<tr>
<td>Sessional Marks: 25</td>
</tr>
</tbody>
</table>

**Objectives:**

- To make students read and appreciate English Plays
- To make students appreciate English poetry
- To motivate students to face Competitive Examinations
- To develop continuous writing in English
- To make students read extensively

**Unit I – One Act Plays**

1. The First and the Last - John Galsworthy
2. Remember Caesar - G.Devoit
3. The Sheriff’s Kitchen - Ronald Gow
4. The Boatswain’s Mate - W.W.Jacobs and H.C. Sargent

**Unit II – Poems**

1. Githanjali (Poem 50) - Rabindranath Tagore
2. The Earthen Goblet - Harindranath Chattopadhyaya
3. La Belle Dame sans Mercy - John Keats
4. Fidelity - William Wordsworth
5. The Tiger and the Deer - Sri Aurobindo

**Unit III – Objective English**

- Comprehension
- Spotting the Errors
- Sentence rearrangement
- Sentence Fillers
- Cloze test or Numbered Gaps


**Unit IV Composition**

- Dialogue Writing
- Paragraph Writing

**Unit V Intensive Reading (Great Speeches)**

Swami Vivekananda – Addresses at the Parliament of Religions

1. Response to Welcome,
2. Why We Disagree,
3. Religion Not the Crying Need of India,
4. Paper on Hinduism,
5. Address at the Final Session

Text: Swami Vivekananda’s Chicago Address, Ramakrishna Tapovanam Printing School.

**B.Sc. Physics CBCS Syllabus - SEMESTER – III**
(For those who joined in June 2016 and after)

PART – III : Core Subject

<table>
<thead>
<tr>
<th>Subject Title</th>
<th>PRINCIPLES OF ELECTRIC CIRCUITS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Subject Code</td>
<td>06CT31</td>
</tr>
<tr>
<td>Hours per week</td>
<td>4</td>
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<tr>
<td>Credit</td>
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<tr>
<td>Sessional Marks</td>
<td>25</td>
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<td>Summative Marks</td>
<td>75</td>
</tr>
<tr>
<td>Total Marks</td>
<td>100</td>
</tr>
</tbody>
</table>

Objectives:

- To understand the fundamentals of different combinations of resistive circuits
- To familiarize of network conversion
- To study the applications of circuit theorems in electric circuits both in dc and ac
- To study the phasors and complex numbers in ac circuit
- To analyze the RC and RL networks for sine waves

UNIT I: SERIES PARALLEL COMBINATIONS AND CIRCUIT THEOREMS CONVERSIONS

UNIT II: AC CHARACTERISTICS AND ANALYSIS
Introduction to phasors – The complex number system – Rectangular and Polar forms of complex numbers – Mathematical operation of complex numbers – Non sinusoidal waveforms – Harmonics

UNIT III: RC CIRCUIT ANALYSIS

UNIT IV: RL CIRCUIT ANALYSIS

UNIT V: CIRCUIT THEOREMS IN AC ANALYSIS AND FILTERS


Reference Books:


B.Sc. Physics CBCS Syllabus - SEMESTER – III

(For those who joined in June 2016 and after)

<table>
<thead>
<tr>
<th>Subject Code: O6CT32</th>
<th>Hours per week: 5</th>
<th>Credit: 5</th>
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<tbody>
<tr>
<td>Sessional Marks: 25</td>
<td>Summative Marks: 75</td>
<td>Total Marks: 100</td>
</tr>
</tbody>
</table>

Objectives:
- To understand the developments leading to various atom models.
- To explain the role of different quantum number and electron spin in atomic phenomena.
- To enable students to learn microwave spectroscopy.
- To familiarize the basic concept of IR spectroscopy.
- To acquire the knowledge of Raman spectroscopy.

UNIT I: ATOM MODELS


UNIT II: QUANTUM NUMBERS AND COUPLING SCHEMES

Quantum numbers associated with the Vector atom model-Coupling schemes- The Pauli exclusion principle-Magnetic dipole moment due to orbital motion of the electron- Magnetic dipole moment due to Spin-The Stern and Gerlach experiment-Spin Orbit coupling – Optical spectra-Zeeman effect –Larmor’s theorem-Anomalous Zeeman effect-Stark effect.

UNIT III: MICROWAVE SPECTROSCOPY

The Rotation of Molecules-Rotational Spectra-The Rigid Diatomic Molecule- The Intensities of Spectral Lines-Linear Molecules-Symmetric Top Molecule- Asymmetric Top Molecules-Techniques and Instrumentation-Chemical Analysis By Microwave Spectroscopy-The Microwave oven.

UNIT IV: INFRA-RED SPECTROSCOPY

The Energy of a Diatomic Molecule-The Simple Harmonic Oscillator-The Anharmonic Oscillator-The Diatomic Vibrating Rotator-Techniques and Instrumentation-(Outline, Double and Single Beam Operation only).
UNIT V: RAMAN SPECTROSCOPY


Text Books:

   UNIT-I -Chapter 6: 6.1 to 6.10, 6.12
   UNIT-II-Chapter 6: 6.13 to 6.15,6.18 to 6.24 and 6.26 to 6.28

2. FUNDAMENTALS OF MOLECULAR SPECTROSCOPY, N.BANWELL and M.McCASH,Tata McGRAW HILL Publishing Company, New Delhi, 2007
   UNIT-III-Chapter 2: (2.1,2.2,2.3.1,2.4.1,2.4.2,2.4.3,2.5,2.6,2.7)
   UNIT-IV-Chapter 3: (3.1.1,3.1.2,3.1.3,3.2,3.8.1,3.8.2)
   UNIT-V-Chapter 4: (4.1.1,4.1.2,4.2.1,4.2.2,4.2.3,4.6)

Reference Books:

1) Atomic Physics, J.B. Rajam, S.Chand & Company Ltd, New Delhi, 2008.
B.Sc. Physics (Allied Mathematics) CBCS Syllabus - SEMESTER – III
(For those who joined in June 2013 and After)

<table>
<thead>
<tr>
<th>PART – III : Allied Subject Theory</th>
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<tbody>
<tr>
<td>Subject Title : MATHEMATICS – I</td>
</tr>
<tr>
<td>Subject Code: 05AT01</td>
</tr>
<tr>
<td>Sessional Marks: 25</td>
</tr>
</tbody>
</table>

Objective

- To develop the skill of solving problems.

Unit – I:
Trigonometry – expression for \( \sin n\theta, \cos n\theta \) and \( \tan n\theta \) – expression for \( \sin^n \theta \) and \( \cos^n \theta \) – expansion of \( \sin\theta, \cos\theta \) and \( \tan\theta \) as a series in ascending powers of \( \theta \) – hyperbolic functions and inverse hyperbolic functions.

Unit – II:
Differential calculus – differentiation methods – successive differentiation (up to second order derivative only, omit Leibnitz theorem).

Unit – III:
Integral calculus – properties of definite integrals – reduction formula for \( \int \sin^n x \, dx \), \( \int \cos^n x \, dx \) and \( \int \sin^m x \cos^n x \, dx \) only – double and triple integrals (simple problems).

Unit IV:

Unit V:
Line and surface integrals – Green’s theorem, Stoke’s theorem and Gauss’ divergence theorem (statements only) – verifications (simple problems).

Text Book:
- Ancillary Mathematics by Dr.S.Arumugam & Issac. Vol I – IV (Relevant Chapters), New Gamma Publishing House, Palayamkottai

Reference Book:
B.Sc. Physics CBCS Syllabus - SEMESTER – III
(For those who joined in June 2016 and after)

PART – IV : Skill Based Subject
Subject Title : Solar Energy

<table>
<thead>
<tr>
<th>Subject Code: 06SB31</th>
<th>Hours per week: 2</th>
<th>Credit: 2</th>
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<tbody>
<tr>
<td>Sessional Marks: 25</td>
<td>Summative Marks: 75</td>
<td>Total Marks: 100</td>
</tr>
</tbody>
</table>

Objectives:

- To familiarize the solar radiation and importance
- To study the different solar collectors
- To enable knowledge about air heater
- To develop the solar energy storing devices

UNIT I:

The structure of the sun – The solar constant – Solar radiation outside the Earth’s atmosphere - Solar energy measuring equipments – Pyranometers – Sunshine recorder

UNIT II:

General description of flat-plate collectors – Effect of dust and shading – Selection of materials for flat-plate collectors

UNIT III:

Solar collectors – Focusing type – Introduction – solar concentrators and Receiver Geometries

UNIT IV:

Solar cell modules – Advantages and Disadvantages of Photovoltaic Solar energy conversion – Applications of Solar Photovoltaic system – PV Technology in India.

UNIT V:

Some additional methods of solar energy utilization – solar furnaces-solar cooking – application of solar energy in space

Text Book:


Unit I: 3.1, 3.2, 3.4, 4.1, 4.3, 4.4 Unit II : 5.3, 5.11, 5.12
Unit III: 7.1, 7.3. Unit IV: 15.6, 15.7, 15.10, 15.14 Unit V: 16.1, 16.5, 16.8

PART-I: Language Tamil Subject

<table>
<thead>
<tr>
<th>Subject Title:</th>
<th>தமிழ் மொழி பாண்டியம் என்னும் பாண்டியம் - தமிழ்</th>
<th>2017-2018 கட்டாண்டு பதிகங்கள்</th>
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<tbody>
<tr>
<td>Subject Code:</td>
<td>PILT41</td>
<td>Hours per week: 6</td>
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<tr>
<td>Seasonal Marks:</td>
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<td>Summative marks: 75</td>
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<td>Total Marks:</td>
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பாட்டைகள்

1. கல்லறைக் கால தமிழ்நாட்டு (பருவத்தைத் தொடர்)
2. கல்லறைக் கால தமிழ்நாட்டு (நடு/சுற்றுச்சூழல்)
3. கல்லறை தமிழ்நாட்டு
4. பருள்முறை
5. கல்லறை தமிழ் மாபாலாயம் பாண்டியத்தில்.

பாட்டைகள் எழுப்பிவிளக்கம்

1. கல்லறை கால தமிழ்நாட்டு (பருவத்தைத் தொடர்)
   பருவத்தைத் தொடர் (அதிகாரம் - 11)
   காலைத்தொடர் (அதிகாரம் - 49)
   நடு/சுற்றுச்சூழல் (அதிகாரம் - 71)
   1. பொது பாணாரங்க (கல்வி அதிகாரம் பொதுநிலைமுறை)
   2. மாநிலம் பாணாரங்க (தொடர் 10 பாணாரங்க)
   3. மாநிலம் (தொடர் 10 பாணாரங்க)

2. கல்லறை தமிழ்நாட்டு (நடு/சுற்று)
   1. மாநில நாட்டு - மாநிலசாரா நாட்டு (முதல் தொடர் பெரும்பாடும்)
   2. பொருளியல் - பொருள்முறைமுறை (இணைய முதல் பொருளியல் முறை முதல் 12 பொருளியல் முறை)
3. பொருளியல் - பொருள் நாட்டு - பொருள்முறை - பொருள்முறை - தொடர்முறை நூற்றாண்டு

3. கல்லறை தமிழ்நாட்டு மாபாலாயம் பாண்டியத்தில்

4. கல்லறை தமிழ்நாட்டு மாபாலாயம்
5. கல்லறை தமிழ்நாட்டு மாபாலாயம்
6. கல்லறை தமிழ்நாட்டு மாபாலாயம்

பாட்டைகள்

1. கல்லறை தமிழ்நாட்டு மாபாலாயம் (கல்லறைக் காலைத்தொடர்)

பாட்டைகள் சுருக்கம்
DEPARTMENT OF SANSKRIT
B.A. / B.Sc. PART-I – LANGUAGE SANSKRIT SYLLABUS: SEMESTER – IV:
PAPER – IV
(For those who join in June 2017 and After)

<table>
<thead>
<tr>
<th>PART - I Sanskrit Paper IV</th>
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<tbody>
<tr>
<td>Subject Code: PILS41</td>
<td>Hours per week: 4</td>
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<tr>
<td>Subject Title: Drama And History of Sanskrit Literature – IV</td>
<td>Credit: 2</td>
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<tr>
<td>Sessional Marks: 25</td>
<td>Summative Marks: 75</td>
</tr>
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<td>Total Marks: 100</td>
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</table>

60 hours to Drama, 30 hours to Spoken Sanskrit.

DRAMA

Following portions from the prescribed text: ‘SĀHITYA RASAKANĀḻı’
- Published by J.M. Publications, Madurai.

Unit I, II, III
1. Karṇabhāra of Bhāsa

Unit IV
History of Drama Literature
A short history of Sanskrit Literature
(Published by A.M.G. Publications, Madurai – 625 016
Page No. 59 – 75) year of publication- 1996

Unit V
30 HOURS OF ORAL TRAINING DEVELOPING THE
COMMUNICATION SKILLS THROUGH THE SANSKRIT LANGUAGE.
OBJECTIVES:

- To motivate students to read and understand English prose
- To make students appreciate English poetry
- To enable students to face Competitive Examinations in English
- To develop continuous writing of the students
- To make students read extensively.

Unit I - Prose

1. Building Self Confidence - by Norman Vincent Peale (Personality Development)
   From, English for Enrichment, Edited by Prof. K. Chellappan.

2. Sport- A Modern Hunting Ritual - by Desmond Morris (Essay),
   From, English for Enrichment, Edited by Prof. K. Chellappan.

3. The Soft Thunder of Lumbini - by Hugh and Colleen,
   (A travelogue Feature in a Newspaper)
   From, English for Enrichment, Edited by Prof. K. Chellappan.

4. She is Dancing Back in Life - by Deborah Cowley (A True Life Story)
   From, English for Enrichment, Edited by Prof. K. Chellappan.

5. Within Without - Rabindranath Tagore.

Unit II – Poems

1. Kali the Mother – Swami Vivekananda
2. Lochinvar – Walter Scott
3. Yossouf – James Russell Lowell
4. The Daffodils – William Wordsworth
5. Much Madness – Emily Dickinson
6. The Woman Who is ……(XCII) – Kabir Das
7. Stopping by Woods on a Snowy Evening – Robert Frost
Unit III - Objective English

- Sentence Completion
- Synonyms
- Antonyms
- Idioms and Phrases
- Substitution


Unit IV - Composition

- Descriptive writing - Topics on Personal Experience
- Resume Preparation
- SMS and E-Mail Preparation and sending.

Unit V Extensive Reading: Four Scenes from Shakespeare’s plays.

1. **The Merchant of Venice.** Act IV – Scene I – Portia’s Speech.
2. **Julius Caesar.** Act III – Scene II – Mark Antony and Brutus Speech.
4. **Othello.** Act V – Scene II – A Bedchamber in the Castle.
B.Sc. Physics CBCS Syllabus - SEMESTER – IV  
(For those who joined in June 2016 and after)

<table>
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<tr>
<th>PART – III : Core Subject Theory</th>
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<tbody>
<tr>
<td>Subject Title: ANALOG ELECTRONICS</td>
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<tr>
<td>Subject Code: 06CT41</td>
</tr>
<tr>
<td>Sessional Marks: 25</td>
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</tbody>
</table>

Objectives:

- To study the characteristics of diodes and their applications
- To familiarize bipolar and unipolar transistor and applications
- To enable knowledge about different transistor amplifier circuits
- To study the different communication systems

UNIT I:


UNIT II:


UNIT III:


UNIT IV:


UNIT V:


Text Books:

1) **Principles of Electronics**, V.K.Mehta & Rohit Mehta-S.Chand & Company Ltd, 2014

   **Chapters:** UNIT 1: 9.7 to 9.23
   
   UNIT 2: 11.15 – 11.25, 22.1 – 22.17
   
   
   UNIT 4: 17.5 – 17.7, 17.10 – 17.20
   
   UNIT 5: 19.1 – 19.18

2) **Basic Electronics (Solid State)**, B.L Theraja, S.Chand & Company Ltd.,


Reference Books:

1) Electronic Principles – Albert Paul Malvino (Sixth Edition), Sixth Reprint 2013.
2) Electronic Devices and Circuits – Jacob Millman Christos C. Halkias,1999
PART – III : Core Subject Theory

| Subje ct Title : MATHEMATICAL PHYSICS |
|-----------------|-----------------|-----------------|
| Subject Code: 06CT42 | Hours per week: 4 | Credit: 4 |
| Sessional Marks: 25    | Summative Marks: 75 | Total Marks: 100 |

Objectives:

- To become familiar with vectors and matrices
- To find the roots of transcendental equations by different methods
- To learn the solutions of linear algebraic equations
- To understand the importance of interpolation in different fields
- To become familiar with the numerical differentiation and integration by various methods


UNIT 3: Solutions of Simultaneous Linear Algebraic Equations: Gauss elimination method – Gauss seidel method of iteration

UNIT 4: Interpolation, Central Difference Interpolation Formulae: Gregory-Newton forward interpolation formula – Gregory-Newton backward interpolation formula – Gauss’s forward interpolation formula – Gauss’s backward interpolation formula

UNIT 5: Newton’s forward difference formula to get the derivative – Newton’s backward difference formula to compute the derivative – Trapezoidal rule – Simpson’s one third rule

Text Books:

Chapters: Unit 1: 1.1(a) to 1.1(d), 1.2, 2.5, 2.31, 2.32

   Chapters: Unit 2: 3.1.1, 3.2 to 3.4
   Unit 3: 4.2, 4.9
   Unit 4: 6.2, 6.3, 7.3, 7.4
   Unit 5: 9.2, 9.3, 9.9, 9.13

Reference Books:

PART III : Core Subject Practical

Subject Title : Major Practical - II

Subject Code: 06CP43  Hours per week: 2  Credit: 2
Sessional Marks: 40  Summative Marks: 60  Total Marks:

(Any fourteen experiments)

1. Potentiometer – Ammeter calibration
2. Potentiometer- Calibration of high range voltmeter
3. Carey Foster Bridge- measurement of low resistance
4. Self Inductance – by Anderson’s bridge
5. Quantity sensitiveness of Ballistic Galvanometer
6. Internal resistance of a battery using B.G
7. M1/M2 deflection magnetometer – Tan A, Tan B
8. M & BH – Deflection Magnetometer
9. Field along the axis of circular coil – deflection methods
10. Grating – minimum deviation – dispersive power
11. Spectrometer- small angled prism
12. $i-i'$ curve – prism-spectrometer
13. Superposition theorem
14. Maximum power transfer theorem
15. LCR series resonance circuit
16. LCR Parallel resonance circuit
17. Comparision of EMF’s – Using spot deflection galvanometer
18. Comparision of Capacitances - Using spot deflection galvanometer
B.Sc. Physics (Allied Mathematics) CBCS Syllabus - SEMESTER – IV
(For those who joined in June 2013 and After)

PART – III : Allied Subject Theory

Subject Title : MATHEMATICS - II

<table>
<thead>
<tr>
<th>Subject Code: 05AT02</th>
<th>Hours per week: 6</th>
<th>Credit: 5</th>
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<tbody>
<tr>
<td>Sessional Marks: 25</td>
<td>Summative Marks: 75</td>
<td>Total Marks: 100</td>
</tr>
</tbody>
</table>

Objective:

❖ To develop the skill of Knowledge in Mathematics and Solving problems

UNIT I:

UNIT II:
Second order linear differential equations with constant coefficients – methods of finding particular integrals for the funtions of the type $e^{ax}$, $\cos ax$, $\sin ax$, $x^m$, $e^{ax}V$ – second order linear differential equations with variable coefficients.

UNIT III:

UNIT IV:

UNIT V:
Fourier series – Fourier series for even and odd funtions – half range Fourier cosine and sine series.

Text Book:
✓ Ancillary Mathematics by Dr.S.Arumugam & Issac. Vol I – IV (Relevant Chapters ), New Gamma Publishing House, Palayamkottai

Reference Book:
B.Sc. Physics CBCS Syllabus - SEMESTER – IV
(For those who joined in June 2016 and after)

<table>
<thead>
<tr>
<th>PART – IV : Skill Based Subject</th>
<th>Subject Title : ASTROPHYSICS</th>
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<tbody>
<tr>
<td>Subject Code: 06SB41</td>
<td>Hours per week: 2</td>
</tr>
<tr>
<td>Sessional Marks: 25</td>
<td>Summative Marks: 75</td>
</tr>
</tbody>
</table>

Objectives:
- To be familiar with Astronomical instruments, stellar motions
- To study about sun and other stars
- To know basic ideas about galaxy and cosmology


Text Book:

Chapters: Unit 1: 1.1 to 1.5
Unit 2: 2.5, 2.6, 3.9, 3.10
Unit 3: 5.1 to 5.3, 5.5, 5.6, 5.8
Unit 4: 7.1, 7.2, 7.5, 8.1, 9.1 to 9.7
Unit 5: 16.1, 16.2, 16.10, 21.1, 21.2

**Reference Books:**

B.Sc. Physics CBCS Syllabus (Part-II English) - SEMESTER V
(For those who join in June 2015 onwards)

<table>
<thead>
<tr>
<th>PART II – Paper I</th>
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<tbody>
<tr>
<td>Subject Title:</td>
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<td>Credit:</td>
</tr>
<tr>
<td>Sessional Marks:</td>
</tr>
<tr>
<td>Total Marks:</td>
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</tbody>
</table>

Objectives:
- To make students face Competitive Examinations with confidence
- To train students in writing book reviews
- To make them write reports, resolutions, minutes
- To make them prepare agenda for meeting.

Unit I
- Comprehension

Unit II
- Spotting the Errors
- Sentence Improvement
- Voice
- Preposition
- Cloze Test or Numbered Gaps

Text Book: Objective English for Competitive Examinations, Hari Mohan Prasad

Unit III
- Book Reviews

Unit IV
- Report-Writing
- Preparation of Agenda, Resolutions, Minutes
Objectives:

This course aims at study of crystal structure and crystal planes, imperfections in crystals, dielectric and thermal properties, magnetic properties and super conductivity

UNIT I: CRYSTAL STRUCTURE AND CRYSTAL PLANES

Introduction – Space lattice - Stacking sequences in metallic crystal structures - Directions in Crystals - Planes in crystals - Miller indices - Distances of separation between successive (hkl) planes.

UNIT II: IMPERFECTIONS IN CRYSTALS


UNIT III: DIELECTRIC AND THERMAL PROPERTIES

Introduction - Various polarization processes - Internal field - Frequency dependence of dielectric constant - Dielectric breakdown - Ferro and Piezo electricity- Phonons of mono atomic and dimensional lattice-Specific heat of solids (classical theory, Einstein’s theory of the specific heat, Debye’s theory of the specific heat).

UNIT IV: MAGNETIC PROPERTIES


UNIT V: SUPER CONDUCTIVITY

Introduction - Effect of magnetic field - Effect of current - Type I and Type II - Super conductors - Thermal properties - Isotope effect - London equations - BCS

**Text Books:**


<table>
<thead>
<tr>
<th>Unit I</th>
<th>2.1 - 2.3, 3.1 - 3.4</th>
<th>Unit II</th>
<th>3.5, 3.6, 4.1- 4.8</th>
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<tr>
<td>Unit III</td>
<td>7.1 - 7.6 &amp; (7.2, 7.3 – 2006 edition)</td>
<td>Unit IV</td>
<td>8.1 - 8.10</td>
</tr>
<tr>
<td>Unit V</td>
<td>10.1 - 10.12</td>
<td></td>
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</tbody>
</table>

**Reference Books:**


Objectives:

- To learn the Digital Electronic fundamentals and circuits such as Number system and Codes, Combinational circuits and Data Processing circuits
- To know more about Arithmetic circuits, Clocks and Timing circuits
- To gain in-depth knowledge about Flip-flops, Registers and Counters, A/D and D/A convertors
- To gain knowledge about Communication systems and Types of Modulation
- To learn about Microprocessor, Arithmetic operators like Addition and Subtraction

UNIT I: DIGITAL LOGIC, COMBINATIONAL LOGIC CIRCUITS, DATA PROCESSING CIRCUITS AND NUMBER SYSTEMS AND CODES

Basic gates – Universal logic gates - (NOR, NAND) – AND, OR and INVERT gates - Boolean Laws and Theorems - Multiplexers - Demultiplexers - 1 of 16 decoder - BCD to Decimal decoders - Seven segment Decoders - Encoders - Exclusive OR gates - Binary to Decimal conversion - Decimal to Binary conversion - Octal numbers - Hexadecimal numbers - The ASCII code - The excess 3 code - The gray code.

UNIT II: ARITHMETIC CIRCUITS AND CLOCKS AND TIMING CIRCUITS


UNIT III: FLIP – FLOPS


Registers and Counters: Types of Registers - Serial In-Serial Out – Serial In-Parallel Out – Asynchronous counters - Synchronous counters

D/A Conversion and A/D Conversion

Variable, Resister Networks - Binary ladders - D/A convertors(Available D/A convertors only) - A/D converter (Simultaneous conversion) – A/D techniques – Dual-slope A/D conversion
UNIT IV: COMMUNICATION SYSTEMS

Theory of Frequency and Phase Modulation – Noise and Frequency Modulation (Effect of Noise on Carrier-Noise Triangle, Pre-emphasis and De-emphasis, Other form of Interference) – Generation of Frequency Modulation – Pulse Modulation

UNIT V: MICROPROCESSOR

Microprocessor - Initiated operations and 8085 Bus Organization - Internal Data operations and the 8085 Registers - The 8085 microprocessor (Pinout and signals diagram only) - The 8085 A microprocessor functional block diagram - The 8085 instruction set - Review of the 8085 operations - Instruction word size - Overview of the 8085 instruction set. Addition of two 8-bit numbers; Sum 8 bits – 8 bit subtraction – Find One’s Complement of an 8 bit number – Find Two’s Complement of an 8 bit number

Text Books:

UNIT I TO UNIT III

UNIT IV:

UNIT V:
1. Microprocessor Architecture, programming and applications with the 8085 Ramesh S. Gaonkar (Fourth Edition), 2006

CHAPTERS:

UNIT I: 2.1 - 2.3, 3.1,4.1 – 4.7, 5.2 -5.8 UNIT II: 6.1 – 6.8, 7.1 – 7.5
UNIT III: 8.1 - 8.3, 8.5 – 8.7, 9.1 – 9.3, 10.1,10.3, 12.1, 12.2, 12.3(Available D/A converters only), 12.5, 12.8, 12.9
UNIT IV: 5.1, 5.2.1, 5.2.2, 5.2.3, 5.3, 13.2
UNIT V: 1) 2.11, 2.12, Figure 3.1, Figure 3.7, 5.21, 5.22, 5.31, 5.5

Reference Books:
PART III : Core Subject Practical

<table>
<thead>
<tr>
<th>Subject Code: 06CP53</th>
<th>Hours per week: 8</th>
<th>Credit: 4</th>
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<tr>
<td>Sessional Marks: 40</td>
<td>Summative Marks: 60</td>
<td>Total Marks: 100</td>
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</table>

(Any fourteen experiments)

1) Semiconductor Diode Characteristics
2) JFET Characteristics
3) H – Parameters of Transistors
4) Measurement of Op-Amp parameters
5) Calculation of RMS value of Sine and Triangular wave form
6) Split Power supply
7) Study of Logic gates – Using discrete components
8) Study of Logic gates – Using ICs(7408, 7400, 7404, 7432)
9) Integrator, Differentiator using discrete components
10) Clipping and Clamping circuits
11) Characteristics of Zener Diode
12) Characteristics of Bipolar Transistors
13) Study of Half adder and Full adder using 7486 and 7408
14) Study of Half Subtracter and Full Subtracter
15) Rectifiers and Filters
16) Characteristics of Photo diode and Photo Transistor
B.Sc. Physics CBCS Syllabus - SEMESTER – V
(For those who joined in June 2016 and after)

<table>
<thead>
<tr>
<th>Subject Title</th>
<th>PART – III : Elective Subject Theory</th>
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<tr>
<td>OBJECT ORIENTED PROGRAMMING WITH C++</td>
<td>Subject Code: <strong>06EP51</strong></td>
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<tr>
<td>Hours per week: <strong>5</strong></td>
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**Objectives:**

- To learn the most widely used OOP language, the need, principles and applications of OOP.
- To know about the basic concepts like Tokens, Expressions, Control structures and Functions in C++.
- To familiarize the concepts such as Classes and Objects.
- To know about Constructors, their types, Destructors, Operator overloading and Type conversions.
- To learn salient features as Inheritance, its types and Virtual Base Class.

**UNIT I:**

**Principles of Object-Oriented Programming:**

Software crisis - Software evolution - A look at procedure oriented programming - object oriented programming paradigm - Basic concepts of object oriented programming - Benefits of OOP - Object oriented languages - Applications of OOP.

**Beginning with C++:**

What is C++? - Applications of C++ - A simple C++ program - More C++ statements - An example with class - Structure of C++ program - More C++ statements - An example with class - Structure of C++ program - Creating the source file - compiling and linking.

**UNIT II:**

**Token, Expressions and Control Structures:**

Introduction - Tokens - Keywords - Identifiers and constants - Basic Data types - User Defined Data Types - Derived Data Types - Symbolic constants - Type compatibility - Declaration of variables - Dynamic initialization of variables - Reference variables - operators in C++ - Scope resolution operator - member Dereferencing operators - Memory management operators - Manipulators - type cast operator - Expressions and their types - Special assignment expressions - Implicit conversions - Operator overloading - Operator precedence - control structures.
Functions in C++:


UNIT III: Classes and Objects:

- Introduction - C structures revisited - specifying a class - Defining member functions - A C++ program with class - Making an outside function inline - Nesting of member functions - private member functions - Arrays within a class - memory allocation for objects - Static Data members - Static member functions - Arrays of objects - Objects as function arguments - Friendly functions.

UNIT IV:

Constructors and Destructors:

- Introduction - Constructors - Parameterised constructors - Multiple constructors in a class - constructors with default arguments - Dynamic initialization of objects - copy constructor - dynamic constructors - destructors.

Operator Overloading and Type conversions:

- Introduction - Defining operator overloading - Overloading unary operators - Overloading Binary operators - Overloading Binary operators using friends - Rules for overloading operators - Type conversions.

Unit V: Inheritance: Extending classes:


Text Book:


Chapters:

- Unit I: 1.1 - 1.8, 2.1 - 2.8
- Unit II: 3.1 - 3.25, 4.1 - 4.12
- Unit III: 5.1 - 5.15
- Unit IV: 6.1 - 6.8, 6.11, 7.1 - 7.5, 7.8, 7.9.
- Unit V: 8.1 - 8.10

Reference Books:

B.Sc. Physics CBCS Syllabus - SEMESTER – V
(For those who joined in June 2016 and after)

**PART – IV : Skill Based Subject**

<table>
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<tr>
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**Subject Title: FIBRE OPTIC COMMUNICATION**

**Objectives:**
- To provide a good foundation in fibre optics
- To enable the students in order to learn the basic principles, theory and concepts of fibre optics.
- To gain knowledge about different fibre optic fabrication process.

**UNIT I: REFRACTIVE INDEX AND VELOCITY OF LIGHT**
Propagation of light in different media – Propagation of light waves in an optical fibre - Basic structure of an optical fibre and propagation of light wave through it – acceptance cone and numerical aperture

**UNIT II: CLASSIFICATION OF OPTICAL FIBRE**
Fibre classification – Stepped index fibre – stepped index multimode fibre – graded indiex multimode fibre – plastic fiber

**UNIT III: FIBRE FABRICATION**
Classification of fibre fabrication-external chemical vapour deposition – axial vapour deposition-internal chemical vapour deposition- multi element glasses- phasil system.

**UNIT IV: LED & SEMICONDUCTOR LASER**
Basic theory of double hetero junction LED (DHLED) - Different LED structures- basic principles of laser action — p n junction photodiode – p-i-n photodiode – p-i-n- avalanche diode – phototransistors.

**UNIT V: OPTICAL FIBRE COMMUNICATION**
Transmitter for Fibre optic communication – digital laser transmitter- analog laser transmitter – Fibre optic receiver- Important applications of integrated optic fibre technology.

**Text Book:**


Unit I: 2.1 to 2.5
Unit II: 3.1 to 3.3, 3.5, 3.6
Unit III: 4.1 to 4.6
Unit IV: 9.2(a), 9.3, 10.6 to 10.9
Unit V: 15.2, 15.7, 15.8, 15.12, 18.2

Reference Books:

B.Sc. Physics CBCS Syllabus - SEMESTER – V
(For those who joined in June 2014 and after)

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Objectives:
- Disseminate information of Environment of national and international issues
- Environmental consciousness creation among the students
- Facilitation of environmental leadership among students

Unit I
- Introduction – Nature, scope and importance of Environmental studies – Natural Resources and conservation – forest, water and energy.

Unit II
- Ecosystem – concept – structure and function, energy flow, food chain, food web and ecological pyramids

Unit III
- Biodiversity – definition, types – values – India, a mega diversity zone – Hotspots – Endangered and endemic species – threat to biodiversity and conservation

Unit IV

Unit V

Text Book:
Environment studies – R.Murugesan (2009), Milleneum Publications. Madurai-16
Department of English (Part-II) - **SEMESTER - VI**  
*For those who join in June 2015 onwards*

**PART II – Paper I**

| Subject Code: **P2LE61, P2CE61** | Hours per week: 1 | Credit: 1 | Sessional Marks: **100** | Total Marks: **100** |

Total number of hours: 15 hours

**Objectives:**

- To make students face Competitive Examinations with confidence
- To prepare students to face interviews
- To make students familiar with books and authors in English literature
- To make students prepare resume
- To motivate students to participate in Group Discussion
- To make students read books on Personality Development

**Unit – I**

- Sentence Completion
- Sentence Fillers
- Synonym
- Antonym
- Idioms and Phrases
- Substitution

**Unit – II**

- Sentence Arrangement
- Jumbled sentences
- Paragraph Reconstruction
- Analogy

**Text Book**

Objective English for Competitive Examinations, Hari Mohan Prasad

**Unit III**

- Interview Skills – mock – interview.
- Debate, Group Discussion, Resume Writing

**Unit IV**

- Books and authors in English literature
B.Sc. Physics CBCS Syllabus - SEMESTER – VI  
(For those who joined in June 2016 and after)  

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Objectives:
- Introduction to Nucleus, its structure, Detectors of nuclear Radiation and Particle Accelerators
- To learn about Radioactivity
- To gain knowledge about Artificial transmutation of elements, Discovery, Properties and Classification of neutron
- To learn more about Nuclear fission and fusion and Nuclear Reactors
- To understand the Elementary particles

UNIT I:

UNIT II:

UNIT III:
The discovery of artificial transmutation – Bohr’s theory of nuclear disintegration – Threshold energy of endoergic reaction – Preparation of Radioelements – Applications of Radioisotope – The discovery of Neutron – Basic properties of neutron – Classification of neutron – Neutron sources – Neutron deduction
UNIT IV:

Nuclear fission – Energy released in fission – Chain reaction – Atom bomb – Nuclear reactors – Nuclear fusion – Source of stellar energy – Pressurized water reactor – Boiling water reactor – Fast Breeder reactor

UNIT V:


Chapters

Unit I: 27.2 – 27.11, 29.3, 29.5, 29.6, 29.7, 30.4, 30.5, 30.6
Unit III: 34.1, 34.2, 34.6, 34.10 – 31.16
Unit IV: 35.2 – 35.7, 36.1– 36.3
Unit V: 38.1 – 38.4, 38.7, 37.12 – 37.15

Reference Books:

B.Sc. Physics CBCS Syllabus - SEMESTER – VI
(For those who joined in June 2016 and after)

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<td>Subject Title : MAJOR PRACTICAL - IV</td>
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<td>Subject Code: 06CP62</td>
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<td>Sessional Marks: 40</td>
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(Any fourteen experiments)

1) Verification of De Morgan’s Theorem using ICs
2) Summing and Difference Amplifiers using IC 741
3) Op-Amp Schmitt trigger circuits
4) Square and Triangular wave generators using IC 741
5) Study of BCD Seven Segment Decoder
6) Study of Counters
7) Shift Registers IC 7495
8) Digital to Analog Converter
9) Sine wave operator – Wien Bridge Oscillator
10) OP-AMP filters
11) Multivibrator using Transistor
12) Bistable Multivibrator using Transistor
13) Square and Triangular wave generators using IC 555
14) Astable Multivibrator using Transistor
15) Single stage Amplifier
16) Hartley Oscillator
17) Colpitt’s Oscillator
18) Assembly Level Programming – Using 8085 Microprocessor Kit (Simple Programs)
B.Sc. Physics CBCS Syllabus - SEMESTER – VI
(For those who joined in June 2016 and after)

PART III : Elective Subject Theory

<table>
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<td>Summative Marks: 75</td>
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<td>Total Marks: 100</td>
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Objectives:

- To learn the basic ideas of Lagrangian Mechanics
- To know about Hamiltonian Mechanics
- To gain idea about Particle Properties, Wave Properties of particles
- To learn basic concepts about Quantum Mechanics
- To know ideas of Theory of Relativity

UNIT I: LAGRANGIAN MECHANICS


UNIT II: HAMILTONIAN MECHANICS


UNIT III: PARTICLE PROPERTIES  Photoelectric effect – Compton effect-

Wave Properties of Particle: De-Broglie waves - waves of prabability - Describing a wave - phase and group velocities - Davisson and Germer experiment - Particle in a Box - Uncertainty Principle - Uncertainty principle and its applications.

UNIT IV: QUANTUM MECHANICS

Quantum mechanics - Wave equation - Schrodinger’s equation (Time dependent form and Independent form) - Linearity and superposition - Expectation values - operators particle in a Box - Finite Potential Well - Tunnel effect - Harmonic Oscillator - Schrodinger’s equation for the hydrogen atom - Separation of Variables.
UNIT V: THEORY OF RELATIVITY


Text Books:
   Unit I - Chapter 1: 1.2 to 1.8 Chapter 2: 2.1 to 2.5, 2.9(2.9.1, 2.9.2 & 2.9.10)
   Unit II - Chapter 3: 3.2 to 3.7 & 3.9 (3.9.1, 3.9.2 & 3.9.4)
   Unit - III: Chapter 2: 2.3 & 2.7 Chapter 3: 3.1 to 3.9
   Unit - IV: Chapter 5: 5.1 to 5.11 Chapter 6: 6.1 and 6.2

Unit V: Part I - Relativity - 1.1 to 1.16

Reference Books:
PART IV : Skill Based Subject

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<td>Summative Marks: 75</td>
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**Objectives:**
- To understand the fundamentals of Nanotechnology
- To give a general introduction to crystal growth
- To impart basic knowledge on various synthesis and characterization techniques involved in nanotechnology.

**UNIT I:** Introduction – Nanotechnology – Nanomaterials – Types of nanomaterials – Properties of Nanomaterials

**UNIT II:** Crystal bonding – Crystal growth – Some important Crystal structure – Rock salt – Wurtzite- Fluortie – Rutile – Cristobalite- Spinel.

**UNIT III:** Growth techniques of nanomaterials – Role of Bottom-up and Top-Down approaches in nanotechnology-Sol gel process – Electrodepsotion- Sputtering-Spray pyrolysis.

**UNIT IV:** Characterization tools of nanomaterials – XRD – SEM- -UV-Visible spectroscopy – Photoluminescence Spectroscopy.

**UNIT V:** Carbon nanotubes - Nanocomposite – Types of nanocomposite – Application of nanomaterial’s

**Text Book:**

Unit I: 1.1 to 1.4
Unit II: 2.1 to 2.6
Unit III: 6.1, 6.2, 6.4.2, 6.4.7, 6.4.8
Unit IV: 7.1 to 7.4
Unit V: 8.2 to 8.3

**Reference Book:**
B.Sc. Physics CBCS Syllabus - SEMESTER – VI
(For those who joined in June 2016 and after)

PART – III : Skill Based Subject

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<td>Summative Marks</td>
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Objectives:

- To enable the students to get through in various competitive examinations like Government service, Entrance examinations for higher studies
- Objective type questions are taken from various areas of Physics like Mechanics, Properties of matter, Thermo dynamics, Optics, Sound, Electricity, Magnetism, Electronics and Modern Physics
- To enhance the basic principles and ideas of physical concepts, Reasoning can be improved

UNIT I:

Units of physical quantities and their dimensions – Particle dynamics, projectiles, conservation laws and collision two bodies – Circular motion, Rotating frames of reference, Conical and Foucault’s pendulum – Rotational motion, Centre of mass, moment of inertia – Simple Harmonic motion and Harmonic oscillator – Gravitation, Escape velocity & Artificial satellites – Mechanics of fluids: Surface tension & Viscosity – Elasticity

UNIT II:


UNIT III:


UNIT IV:

Atomic structure and positive rays – X rays and photoelectric effect – Matter waves, uncertainty principle, wave mechanics and special theory of relativity

UNIT V:


Text Book:

1) Objective Physics by Dr. S.L. Kakani, Sultan Chand & Sons, New Delhi, 6th Edition, 1995

CHAPTERS:

<table>
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<tr>
<th>UNIT</th>
<th>Chapters</th>
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<td>Chapters 2 &amp; 3</td>
<td>279 to 471</td>
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<td>III</td>
<td>Chapter 4</td>
<td>472 to 617</td>
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<td>IV</td>
<td>Chapter 4</td>
<td>618 to 759</td>
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<td>V</td>
<td>Chapter 4</td>
<td>760 to 871</td>
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</table>
PART – III : Skill Based Subject

Subject Title: MEDICAL INSTRUMENTATION

Subject Code: 06SB63
Sessional Marks: 25
Summative Marks: 75
Total Marks: 100

Objectives:

- To learn basic design principles of Medical Instruments and their components
- To know about Electrocardiography – Principles, Lead configuration
- To study about Electroencephalography – Brain waves, Placement of Electrodes and Analysis
- To gain knowledge about Operation Theatre Equipments, Surgical diathermy
- To provide in-depth study of Bio-Medical Instrumentation like Lasers, Nuclear Imaging Techniques, Magnetic Resonance Imaging, Positron Emission Tomography

UNIT I:
MEDICAL INSTRUMENTS: Introduction – Design of Medical Instruments – Components of Bio-Medical Instrument system

UNIT II:
ELECTROCARDIOGRAPHY (ECG): Origin of cardiac action potential ECG lead configuration – Block diagram of ECG Recording set up

UNIT III:
ELECTROENCEPHALOGRAPHY (EEG): Origin of EEG – Brain waves - Placement of electrodes – Recording set up – Analysis of EEG

UNIT IV:
OPERATION THEATRE EQUIPMENT: Introduction – Surgical diathermy – Ventilators – Anesthesia machine

UNIT V:

Text Book: Bio-Medical Instrumentation – Dr.M. Arumugam
Anuradha Publications, Kumbakonam – Tenth Reprint-2006

Reference Book: Bio-Medical Electronics & Instrumentation
– Prof. S.K. Venkata Ram

CHAPTERS:

Unit I: 2.1 – 2.3  Unit II: 4.1, 4.3  Unit III: 4.4
Unit IV: 6.1, 6.2, 6.8, 6.9  Unit V: 10.3

(Basic principle of Laser action, Laser instrumentation, Advantages of Laser surgery), 10.6, 10.10.1, 10.10.8, 10.11
UNIT I: The heart of Education

UNIT II: The Value of Body and Life Energy
Introduction – what are the causes for paid, Disease and death? Three Basic needs for all living Beings – Personal Hygiene Five Factors of Balance in Life – The need and benefits of physical Exercise – The value and Base of Life energy – The value and Base of Bio-magnetism - You are your own best caretaker.

UNIT III: Analysis of Thought

UNIT IV: Moralisation of Derive
Introduction – moralization of desire - Analyse your desires – Summary of practice.

Neutralisation of Anger:
Introduction – meaning – characteristics of Anger – Anger is a Destructive emotion – Anger spoils our relationship with others – Some common misconception about anger – will power and method success through awareness – method of neutralisation of anger.

UNIT V: Eradication of Worries
Worry is a mental disease – Nature’s Law of cause and effect – factors beyond our control – How to deal with problems – analyse your problem and eradicate worry

Harmonious Relationships
Introduction – Three angles of life – The value of harmony in personal relations – Love and Compassion – pleasant face and loving words – appreciation and gratitude to parents and teachers – Bringing needed reforms in educational institutions – Why should we serve others? Brotherhood – A scientific Basis for Universal
Brotherhood protection of the environment – non-violence and the five fold moral culture.

Text Book: Value Education for Health, Happiness and Harmony
(Based on the Philosophy and Teachings of Swami Vethanthiri Maharisi)
Published By: Brain Trust, Aliyar A Wing of World Community Service Centre

***********************************************
B.Sc. Physics CBCS Syllabus - SEMESTER – VI
(For those who joined in June 2008 and after)

<table>
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<tr>
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UNIT-I: Community Development-I:
Definition – structure and composition – community based issues – need for awareness – Developmental Programmes.

UNIT – II: Community Development–II:

UNIT – III: Volunteer Empowerment:
Women’s Emancipation – formation of Youth Clubs – Self-Help Groups – Youth and Development

UNIT – IV: Social Analysis:

UNIT – V: Introduction to NSS:

(OR)

Civil Defence – Aid to civil authorities – Disaster management – Leadership – Man management – Adventure activities – Social service

Reference: National Service Scheme Manual (Revised), Ministry of Human Resources Development, government of India.
Department of Physics - SEMESTER – I

Allied Subject Theory for Mathematics & Chemistry Major
(For those who joined in June 2016 and after)

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Objectives:

➢ To learn about acoustics of buildings
➢ To know about elasticity, viscosity and Surface tension
➢ To get a knowledge in electricity and magnetism.
➢ To provide a good foundation in optics.

UNIT I: Waves and Oscillations

Simple Harmonic Motion – Composition of two Simple Harmonic Motions in a straight line- Composition of two Simple Harmonic Motions of equal time periods at right angles- Melde’s Experiment – Ultrasonics- production –application and uses- Reverberation – Absorption coefficient - Acoustics of buildings – factors affecting the acoustics of buildings- Sound distribution in an auditorium

UNIT II: Properties of Matter


Viscosity: Streamline flow and turbulent flow – Coefficient of viscosity - Derivation of Poiseulle’s formula.


UNIT III: Thermal Physics


Unit IV: Electricity and Magnetism

Unit V: Geometrical Optics


Text Book:


Unit I: 1.1 to 1.3, 1.9, 1.11 to 1.19.
Unit II: 2.1 to 2.7, 2.12, 2.14, 2.15, 2.17, 2.24, 2.29
Unit III: 3.15 to 3.21
Unit IV: 4.1, 4.4 to 4.6, 4.15 to 4.20
Unit V: 5.1, 5.2, 5.4, 5.6, 5.14, 5.16, 5.18 to 5.20, 5.22, 5.27

Reference Books:

1. Electricity and Magnetism - R. Murugeshan - Reprint with correction 2008
PART III: Allied Subject

Subject Title: Allied Physics – II

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<td>Summative Marks: 75</td>
<td>Total Marks: 100</td>
</tr>
</tbody>
</table>

Objectives:

- To learn about Atomic and nuclear physics
- To know about elements of relativity
- To get a knowledge in electronics

UNIT I: PHYSICAL OPTICS


UNIT II: ATOMIC PHYSICS

Vector atom model – Quantum numbers associated with the vector atom model – the Pauli’s exclusion principle – magnetic dipole moment due to spin – the stern and gerlach experiment.

UNIT III: NUCLEAR PHYSICS


UNIT IV: ELEMENTS OF RELATIVITY


UNIT V: ELECTRONICS

Light Emitting Diode (LED) – Zener Diode- experiment to study the characteristics of the zener diode – zener diode as voltage regulator – Logic Gates – AND gate – OR gate- the NOT gate – the NAND gate – NAND gate is a universal gate- the NOR gate – NOR gate is universal gate – Boolean algebra – Postulates and theorem of Boolean algebra - De Morgan’s theorem.
Text Book:

Unit I: 6.2 to 6.4, 6.8, 6.10, 6.12, 6.14, 6.19, 6.20
Unit II: 7.1, 7.2, 7.4, 7.7, 7.8
Unit III: 8.1, 8.3, 8.4, 8.6, 8.8, 8.9, 8.12, 8.13, 8.14
Unit IV: 10.1 to 10.4, 10.11 to 10.21
Unit V: 9.1 to 9.7, 9.9

Reference Books:
1. Electricity and Magnetism - R. Murugeshan - Reprint with correction 2008

PART III : Allied Physics Practical
(For those who joined in June 2016 and after)

Subject Code: 06AP03 Hours per week: 2 Credit: 2
Sessional Marks: 40 Summative Marks: 60 Total Marks: 100

(Any fourteen experiments)
1. Non-Uniform Bending – Pin and Microscope
2. Non-Uniform Bending – Optic lever
3. Uniform Bending – Pin and Microscope
4. Uniform Bending – Optic lever
5. Compound Pendulum
6. Torsion Pendulum
7. Sonometer – Verification of Laws (1st law & 2nd law)
8. Viscosity by Stoke’s method
9. Newton’s rings – Determination of Radius of curvature
10. Air wedge – Thickness of a paper
11. Spectrometer – Refractive Index
12. Spectrometer – Grating - Normal incidence
13. Carey Foster Bridge
14. Diode Characteristics
15. Zener Diode Characteristics
16. Logic Gates – AND, OR, NOT