AC – 28/03/2025 Item No. – 6.3 (N) (6ab) Sem. III & IV

As Per NEP 2020

Aniversity of Mumbai



Syllabus for Minor Vertical 2 (Scheme-III)

Faculty of Science

Board of Studies in Physics

Second Year Programme in Minor (Physics)

| Semester | III & IV | |
|--|----------|-----------------|
| Title of Paper | Sem. | Total Credits 4 |
| I) Mechanics | 111 | 2 |
| II) Physics Minor Practical Course – USPHMNP1 | 111 | 2 |
| Title of Paper | | Credits |
| I) Sound | IV | 2 |
| II) Physics Minor Practical Course – USPHMNP2 | IV | 2 |
| From the Academic Year | | 2025-26 |

SEM. - III

Syllabus of Scheme III S. Y. B. Sc. Physics Minor (Semester- III)

Name of the Course: Physics Minor Course 1 Mechanics (2 Credits)

| Sr. No. | Heading | | Particulars | |
|--|---|---|---|--|
| 1. | Descripti (Includin | on the course: g but not limited to) | Introduction, relevance, Usefulness, Application, interest, connection with other courses, demand in the industry, job prospects etc. | |
| 2. | Vertical: | | Major / <u>Minor</u> / Open Elective / Skill Enhancement / Ability Enhancement / Indian Knowledge System | |
| 3. | Type: | | Theory | |
| 4. | Credit: | | 2 credits (1 credit = 15 Hours for Theory or 30 Hours of Practical work in a semester) | |
| 5. | Hours Al | lotted: | 30 Hours | |
| 6. | Marks A | llotted: | 50 Marks | |
| | Course O | bjectives: The students a | are expected to: | |
| | CO 1 | understanding of kineti | c energy, conservative and non - conservative forces | |
| 7. | CO 2 | to explore concept of potential energy. | Collision (Elastic and Inelastic collision) and Gravitational | |
| | CO 3 | demonstration of Mech | anical systems | |
| | Course Outcomes: On successful completion of this course students will be able to: | | completion of this course students will be able to: | |
| | OC 1 understand the concepts of mechanics & properties of matter & to apply them to a probleme | | s of mechanics & properties of matter & to apply them to solve | |
| 8. | OC 2 | comprehend work and energy equivalence and its applications through suitable numerical. | | |
| | OC 3 | demonstrate quantitativ | e problem-solving skills in all the topics covered | |
| | Modules | / Units: - There will be (| One module / Unit Per Credit | |
| | Module / | Unit - I: Mechanics of | Energy and forces (15 Lectures) | |
| | i) Work energy Conse by Nor Conse | done by constant force, w theorem, Power, Pote rvative Forces and Poten nconservative Forces, Re rvation of Energy in Gen | work done by variable force, Kinetic energy and work-kinetic ential energy, conservative and non - conservative forces, atial Energy, Conservation of Mechanical Energy, Work Done elationship Between Conservative Forces and Potential Energy, heral, Mass–Energy Equivalence, Quantization of Energy | |
| | ii) Equiva | alence of Shear strain to | compression and extension strains, Relations between elastic | |
| 9. | consta | nts, Energy stored in a st | rained body, couple for twist in cylinder. | |
| Module / Unit-II: Mechanics of Collisions, Elasticity & Gravitation 15 | | | Collisions, Elasticity & Gravitation 15 Lectures) | |
| | i) Centre | e of mass, Motion of syste | em of particles, Conservation of Momentum for a Two-Particle | |
| | system | n, Angular momentum of | a rotating rigid body, angular momentum conservation | |
| | ii) Impuls | se and momentum, Collis | sions, Elastic and Non- elastic collisions in one dimension | |
| | iii) Gravitational potential energy, gravitational potential, calculation of gravitational potential calculation of gravitational field, inertial and gravitational mass. | | | |

| r | | | | |
|---|---|---|---|----------------|
| 10. | Reference Books: 1. HRW: Fundamental of Physics Halliday, Resnick and Walker and Krane 9th Edition 2. HCV: H.C. Verma, Concepts of Physics-Part I (Second Reprint of 2020) Bharati Bhavan Publishers and Distributers 3. HP: H. S. Hans and S. P. Puri, Mechanics, 2nd ed, Tata McGraw Hill. | | | |
| 1. Theoretical Mechanics, M.R. Spiegel, 2006, Tata McGraw Hill. | | | | |
| | 2. Mechanics, D.S. Mathur | , S. Chand and Comp | any Limited, 2000 | |
| 11. | Individual Passing in Inter | mal and External Ex | kamination | |
| | Internal Continuous Assessment (40%) (20 Marks) (30 Marks) | | | |
| 12. | Continuous Evaluation the Quizzes, Class Tests, presen play, creative writing, assign 3) | rough: tation, project, role nment etc. (at least | Evaluation: through Exam at Semester / Term. | the End of the |
| | Format of Question Paper | for Physics Minor 7 | Term End Examination for 30 | Marks: |
| | Duration of the Term End | Examination: One | Hour | |
| | | Q.1 A) Attempt any i) Theory ii) Theory | 7 Two | 10 Marks |
| | Unit - I (15 Marks) | iii) Theory | | |
| | | 1V) Theory P) Attempt ony One | | 05 Mortes |
| | | i) Problem / T | , heory | 05 WIAIKS |
| 13. | | ii) Problem | licory | |
| | | Q.2 A) Attempt any | y Two | 10 Marks |
| | | i) Theory | | |
| | | ii) Theory | | |
| | Unit – II (15 Marks) | iii) Theory | | |
| | | B) Attempt any One | <u>م</u> | 05 Marks |
| | | i) Problem / T | heory | 05 Warks |
| | | ii) Problem | J | |

Name of the course: Physics Minor Practical Course –USPHMNP1 (MN - I)

| Sr. No. | Heading | Particulars | |
|------------|---|---|--|
| 1. | Description the course: (Including but not limited to) | Introduction, Relevance, Usefulness, Application, Interest, Connection with other courses, Demand in the Industry, Job Prospects etc. | |
| 2. | 2. Vertical: Major / <u>Minor</u> / Open Elective / Skill Enhanc / Ability Enhancement / Indian Knowledge Sy | | |
| 3. | Туре: | Practical | |
| 4. | Credits: | 2 credits (1 credit = 15 Hours for Theory or 30 Hours of Practical work in a Semester) | |
| 5. | Hours | 60 Hours | |
| 6. | Marks Allotted: | 50 Marks | |
| 7 | Course Objectives (CO): The stude | ents are expected to: | |
| /. | CO 1 learn the skills while performing experiments. | | |

| | CO 2 know how to use the apparatus without fear & hesitation. |
|----|---|
| | CO 3 learn the concepts of physics theory concepts and their practical application. |
| | CO 4 learn the errors and their estimation. |
| | Course outcomes (OC): After successful completion of this course, the students will be |
| | able to: |
| • | OC 1 understand & practice the skills while performing experiments. |
| 8. | OC 2 understand the use of apparatus and their use without fear & hesitation. |
| | OC 3 correlate the physics theory concepts to practical application. |
| | OC 4 understand the concept of errors and their estimation. |
| | List of Experiments |
| | |
| | 1. To determine modulus of rigidity η using Flat spiral spring |
| | 2. To determine wavelength of light using cylindrical obstacle |
| | 3. Determination of Dispersive power of prism using spectrometer |
| | 4. To determine Young's modulus Y using Flat spiral spring |
| | 5. Determination of acceleration due to gravity g using Kater's pendulum |
| | 6. Log Decrement using Simple pendulum |
| | 7. Figure of merit of a mirror galvanometer |
| | 8. Determination of R.I. of liquid by laser |
| | 9. LCR series resonance |
| | 10. LCR Parallel resonance |
| | 11. Passive (RC) low pass filter |
| | 12. Passive (RC) High pass Filter |
| | 13. Passive (RC) Band pass |
| | 14. To determine the surface tension of a liquid using capillary rise method |
| 9. | Skill experiments: (Winnmum Four Experiments) will be conducted, for example To find least count of different types of optical instruments To calculate and measure values of passive components To find percentage tolerance of different types of passive components To demonstrate an experiment and explain principles of Physics To prepare chart for and explain the devices /components used for experiments. Execute a short experiment which will showcase either innovation and / or different methods to the satisfaction of teacher in-charge of practical. Any other skill experiment related to syllabus |
| | Note: Teacher should follow the above guidelines to conduct skill experiment |
| | Reference Books |
| | 1. Advanced course in Practical Physics D. Chattopadhya, P. C. Rakshit & B |
| | Saha. (6th Edition)Book and Allied Pvt. Ltd. |
| | 2. B. Sc. PRACTICAL Physics – Harnam Singh S. Chand & Co. Ld. 2001 |
| | 3. B.Sc. Practical Physics – C. L Arora (1st Edition) -2001 S. Chand and Co Ltd. |
| | Additional Reference Books: |
| | 1. A test book of advanced practical PHYSICS SAMIR Kumar Ghosh, New |
| | Central BookAgency (3rd edition) |
| | 2. Practical Physics CL Squires (3rd Edition) Cambridge University |
| | 3. University Practical Physics – DC Tayal. Himalaya Publication |
| | 4. Advanced Practical Physics – Worsnop & Flint. |
| | • Minimum 10 experiments from the list of experiments and minimum 04 ski |
| | experiments must be completed and reported in the journal, in the Third Semester |
| | Certified Journal is a must, to be eligible to appear for the semester end practica |
| | examination. |

| | • All the measurements and readings should be written with proper units in SI system only. | | | | |
|-----|--|--|---|--|--|
| | After completing the required number of experiments in the semester and recording them in journal, student will have to get their journal certified and produce the certified journal at the time of practical examination to be eligible to appear in the Semester End Practical Examination. | | | | |
| | General | Instructions: | | | |
| | • For p | practical examinations, the learner will be examined in One e | xperiment from the | | |
| | • Eval | uation in viva voce will be based on regular experiments and s | skill experiments. | | |
| | A ca if the seme the c as pe | ndidate will be allowed to appear for the semester end practical e candidate submits a certified journal at the time of practical ester or a certificate from the Head of the Department / Institu andidate has completed the practical course of that semester of er the minimum requirement. | al examination only examination of the ite to the effect that f S.Y.B. Sc. Physics | | |
| | Note: | | | | |
| | • The | questions on slips for the same should be framed in such a way | v that candidate will | | |
| | be at | ble to complete the task within the specified time. | | | |
| | • white obset | rvations, tabular representation, experimental skills, procedure | e, graph, calculation | | |
| | and | result. | , grup, care analisi | | |
| | • The | skill of doing the experiment and understanding physics conce | epts should be more | | |
| | 1mpc Passing | ortant than the accuracy of final result. | | | |
| 10. | • I | ndividual Passing in Internal and External Examination | | | |
| | Scheme | of Examination: | | | |
| | Semeste | r End Practical Examination: | | | |
| | The duration of Each Experiment in Semester End External Practical Examination will | | | | |
| | be of | Two hours. | | | |
| | • The | Semester End External Practical Examination will be for 30 |) marks as per the | | |
| | mark | ing scheme given below: | | | |
| | Sr. No. | Activity | Total 30 Marks | | |
| | 1 | One Experiment | 20 Marks | | |
| 11. | 2 | Certified Journal | 05 Marks | | |
| | 3 | Viva | 05 Marks | | |
| | Interna | Practical Examination: | | | |
| | • The | duration of Internal Practical Examination per experiment will | be of Two hours . | | |
| | • The | Internal Practical Examination Pattern for 20 marks (During | the Semester), will | | |
| | be as | A of truity | Total 20 Marka | | |
| | 1 | Skill testing related any one Experiment | 10 Marks | | |
| | $\frac{1}{2}$ | Overall performance | 10 Walks 05 Marks | | |
| | $\frac{2}{3}$ | Vive-Voce | 05 Warks | | |
| 1 | 5 | | 0.5 WIAIKS | | |

SEM. - IV

Syllabus of Scheme III S. Y. B. Sc. Physics (Semester- IV)

Name of the Course: Physics Minor Course 2 Sound (2 Credits)

| Sr. No. | Headi | ng | Particulars | |
|------------|---|--|---|--|
| 1. | Descri (Inclue | ption the course: ling but not limited to) | Introduction, relevance, Usefulness, Application, interest, connection with other courses, demand in the industry, job prospects etc. | |
| 2. | Vertical: | | Major / <u>Minor</u> / Open Elective / Skill Enhancement / Ability Enhancement / Indian Knowledge System | |
| 3. | Type: | | Theory | |
| 4. | Credit | : | 2 credits (1 credit = 15 Hours for Theory or 30 Hours of Practical work in a semester) | |
| 5. | Hours | Allotted: | 30 Hours | |
| 6. | Marks | Allotted: | 50 Marks | |
| | Course | e Objectives: The students | s are expected to: | |
| 7 | CO 1 | gain knowledge of basic | concepts in sound | |
| /. | CO 2 | to understand the fundan | nental principles of sound | |
| | CO 3 | to develop practical know | wledge of sound measurement and analysis. | |
| | Course | e Outcomes: After success | sful completion of the course, the students will be able to: | |
| 8. | OC 1 | understand basic concept of sound | | |
| 0. | OC 2 | understand the basic con | cept how sound is produced | |
| | OC 3 apply knowledge to develop sound modulations | | elop sound modulations | |
| | Modules / Units: - There will be One module / Unit Per Credit | | | |
| | | | | |
| | Modul | e / Unit I: Wave Motion | (15 Hours) | |
| | Modul Wave | e / Unit I: Wave Motion motion, characteristic of | (15 Hours) wave motion, transverse wave, longitudinal wave, relation | |
| | Modul Wave betwee | e / Unit I: Wave Motion motion, characteristic of n frequency and waveleng | (15 Hours) wave motion, transverse wave, longitudinal wave, relation th, equation of Simple Harmonic Wave, particle velocity and | |
| | Modul Wave betwee wave v | e / Unit I: Wave Motion motion, characteristic of n frequency and waveleng elocity, energy of a progre | (15 Hours) wave motion, transverse wave, longitudinal wave, relation with, equation of Simple Harmonic Wave, particle velocity and essive wave. | |
| | Modul Wave betwee wave v | e / Unit I: Wave Motion motion, characteristic of n frequency and waveleng elocity, energy of a progree | (15 Hours) wave motion, transverse wave, longitudinal wave, relation of Simple Harmonic Wave, particle velocity and essive wave. | |
| | Modul Wave betwee wave v Velocit temper | e / Unit I: Wave Motion motion, characteristic of n frequency and waveleng elocity, energy of a progree ty of Sound: ty of longitudinal waves ature, effect of pressure, v | (15 Hours) wave motion, transverse wave, longitudinal wave, relation of Simple Harmonic Wave, particle velocity and essive wave. | |
| | Modul Wave betwee wave v Velocit temper Modul | e / Unit I: Wave Motion motion, characteristic of n frequency and waveleng elocity, energy of a progree ty of Sound: ty of longitudinal waves ature, effect of pressure, v e / Unit II: Phenomena o | (15 Hours)wave motion, transverse wave, longitudinal wave, relation of simple Harmonic Wave, particle velocity and essive wave.in gases, newton's formula for velocity of sound, effect of elocity of sound in water, velocity of sound in air.f Sound(15 Hours) | |
| 9. | Modul Wave betwee wave v Velocit temper Modul Station Interfer Introdu | e / Unit I: Wave Motion motion, characteristic of n frequency and waveleng elocity, energy of a progree ty of Sound: ty of longitudinal waves ature, effect of pressure, v e / Unit II: Phenomena of ary waves, properties of rence of sound waves, suction to beats. | (15 Hours)wave motion, transverse wave, longitudinal wave, relation of simple Harmonic Wave, particle velocity and essive wave.in gases, newton's formula for velocity of sound, effect of elocity of sound in water, velocity of sound in air.f Sound(15 Hours)stationary longitudinal waves, energy of stationary wave, pecial cases, Conditions for Interference of sound waves, | |
| 9. | Modul Wave betwee wave v Velocit temper Modul Station Interfer Introdu Velocit the law musica | e / Unit I: Wave Motion motion, characteristic of n frequency and waveleng elocity, energy of a progree ty of Sound: ty of longitudinal waves ature, effect of pressure, v e / Unit II: Phenomena of ary waves, properties of rence of sound waves, suction to beats. ty of transverse waves aloue transverse vibration of stu- l sound. | (15 Hours)wave motion, transverse wave, longitudinal wave, relation of simple Harmonic Wave, particle velocity and essive wave.in gases, newton's formula for velocity of sound, effect of elocity of sound in water, velocity of sound in air.f Sound (15 Hours)stationary longitudinal waves, energy of stationary wave, pecial cases, Conditions for Interference of sound waves,ng a stretched string, laws of transverse wave, verification of rings, Kundts tube, Musical sound and noise, characteristic of | |

| 10. | Reference Books:1.SB: Waves and2.RK: Properties3.RS: Fundament | Oscillations by Subran of Matter and Acoustic als of Physics by Resn | nanian and Brijlal second revised edition s. R Murugesham and K Shivaprasath.S ick and Halliday | |
|-----|---|---|---|--|
| 11. | Individual Passing in | Internal and Externa | l Examination | |
| | Internal Continuous Assessment: 40% (20 Marks) | | External, Semester End Examination:60% (30 Marks) | |
| 12. | Continuous Evaluatio Quizzes, Class Tests, p role play, creative writi (at least 3) | n through: resentation, project, ng, assignment etc. | Evaluation: through Exam at the End of the Semester / Term. | |
| | Format of Question P Duration of the Term | Paper for Physics Minor Term End Examination for 30 Marks: m End Examination: One Hour | | |
| | Unit - I (15 Marks) | Q.1 A) Attempt any i) Theory ii) Theory iii) Theory iv) Theory | Two 10 Marks | |
| 13. | | B) Attempt any One i) Problem / Th ii) Problem | 05 Marks | |
| | Unit – II (15 Marks) | Q.2 A) Attempt any i) Theory ii) Theory iii) Theory iy) Theory | Two 10 Marks | |
| | | B) Attempt any One i) Problem / Th ii) Problem | 05 Marks | |

Name of the Course: Physics Minor Practical Course USPHMNP2 (MN - II)

| Sr. No. | Heading | Particulars | | |
|------------|--|---|--|--|
| 1. | Description the course: | Introduction, Relevance, Usefulness, Application, Interest, Connection with other courses, Demand in | | |
| | (Including but not limited to) | the Industry, Job Prospects etc. | | |
| 2. | Vertical: | Major / <u>Minor</u> / Open Elective / Skill Enhancement / Ability Enhancement / Indian Knowledge System | | |
| 3. | Туре: | Practical | | |
| 1 | Credita | 2 credits (1 credit = 15 Hours for Theory or 30 | | |
| 4. | Creans: | Hours of Practical work in a Semester) | | |
| 5. | Hours | 60 Hours | | |
| 6. | Marks Allotted: | 50 Marks | | |
| | Course Objectives (CO): The stude | ents are expected to: | | |
| _ | CO 1 study the skills while perform | ming experiments. | | |
| 7. | CO 2 know how to use the appara | tus without fear & hesitation. | | |
| | CO 3 learn the concepts of physics | s theory concepts and their practical application. | | |
| | CO 4 learn the errors and their est | imation. | | |
| | Course outcomes (OC): After succ | essful completion of this course, the students will be | | |
| | able to: | | | |
| 8. | OC 1 understand & practice the skills while performing experiments. | | | |
| | OC 2 understand the use of appara | itus and their use without fear & nesitation. | | |
| | OC 3 correlate the physics theory concepts to practical application. | | | |
| | UC 4 understand the concept of er | tors and their estimation. | | |
| 9. | Brewster's law: determinat G By shunting using Movi Determination of Absolute Determination of angle of 4 Determine wavelength of To determine wavelength of Optical lever: determination I-V Characteristics of Sola Verification of Stefans law To determine the load resis To verify the relation betw frequency of the note emitted To determine coefficient of To determine the value of method Note: BB indicates that prase Advanced course in Practical (6thEdition) Bookand Allied 1 B. Sc. Practical Physics-Hart A test book of advanced prace | tion of μ ng Coil Galvanometer capacitance using BG diffraction using grating (I st order only) of monochromatic light by using biprism. on of μ r cell with different intensity of light v (Electrical Method) stance value using maximum power transfer theorem. veen the volume of the resonating air column and the ted using a volume resonator frequency by Lissajous pattern wave using CRO eristics of thermistor f viscosity of a liquid using Poiseuille's method f the mechanical equivalent of heat (J) by electrical actical should be performed using breadboard (BB) Physics D. Chattopadhya, P. C. Rakshit & B. Saha Pvt. Ltd. nam Singh S. Chand & Co. Ltd. 2001 tical Physics - SAMIR Kumar Ghosh, New Central | | |

- **4.** B. Sc. Practical Physics –C. L. Arora (1stEdition) 2001 S. Chand and Co. Ltd.
- 5. Practical Physics C. L. Squires (3rd Edition) Cambridge University

- 6. University Practical Physics D. C. Tayal. Himalaya Publication
- 7. Advanced Practical Physics–Worsnop& Flint.

<u>Skill Experiments</u>: (Minimum Four Experiments) will be conducted, for example

- 1. To find least count of different types of optical instruments
- 2. To calculate and measure values of passive components
- 3. To find percentage tolerance of different types of passive components
- 4. To demonstrate an experiment and explain principles of Physics
- 5. To prepare chart for and explain the devices /components used for experiments.
- **6.** Execute a short experiment which will showcase either innovation and / or different methods to the satisfaction of teacher in-charge of practical.
- 7. Any other skill experiment related to syllabus

Note: Teacher should follow the above guidelines to conduct skill experiment

- Minimum **10 experiments** from the list of experiments and **Four** skill experiments must be completed and reported in the journal, in the **Fourth Semester**. Certified Journal is a must, to be eligible to appear for the semester end practical examination.
- All the measurements and readings should be written with proper units in SI system only.
- After completing the required number of experiments in the semester and recording them in journal, student will have to get their journal certified and produce the certified journal at the time of practical examination to be eligible to appear in the Semester End Practical Examination.

General Instructions:

- For practical examinations, the learner will be examined in **One** experiment from the list of experiments.
- Evaluation in viva voce will be based on experiments and skill experiments.
- A candidate will be allowed to appear for the semester end practical examination only if the candidate submits a certified journal at the time of practical examination of the semester or a certificate from the Head of the Department / Institute to the effect that the candidate has completed the practical course of that semester of S.Y.B. Sc. Physics as per the minimum requirement.

Note:

- The questions on slips for the same should be framed in such a way that candidate will be able to complete the task within the specified time.
- While evaluating practical, weightage should be given to circuit / ray diagram, observations, tabular representation, experimental skills, procedure, graph, calculation and result.
- The skill of doing the experiment and understanding physics concepts should be more important than the accuracy of final result.

10. Passing standards for Practical:

Individual Passing in Internal and External Examination

Scheme of Examination:

Semester End Practical Examination:

- The duration of the Experiment in Semester End External Practical Examination will be of **Two hours**.
- **11.** The Semester End External Practical Examination will be for **30 marks** as per the marking scheme given below:

| Sr. No. | Activity | Total 30 Marks |
|---------|-------------------|----------------|
| 1 | One Experiment | 20 Marks |
| 2 | Certified Journal | 05 Marks |

| 3 | Viva | 05 Marks | | |
|---------------------------------|---|-------------------------------|--|--|
| Internal Practical Examination: | | | | |
| • The | duration of Internal Practical Examination per experiment v | vill be of Two hours . | | |
| • The l | Internal Practical Examination Pattern for 20 marks (Durin | ng the Semester), will | | |
| be as | per the marking scheme given below: | | | |
| Sr. No. | Activity | Total 20 Marks | | |
| 1 | Skill testing related to One Experiment | 10 Marks | | |
| 2 | Overall performance | 05 Marks | | |
| 3 | Viva-Voce | 05 Marks | | |

| Semester GPA/ Programme CGPA Semester / Programme | % of Marks | Alpha-Sign / Letter Grade Result | Grading Point |
|--|---------------|-------------------------------------|------------------|
| 9.00 - 10.00 | 90.0 - 100 | O (Outstanding) | 10 |
| 8.00 - < 9.00 | 80.0 - < 90.0 | A+ (Excellent) | 9 |
| 7.00 - < 8.00 | 70.0 - < 80.0 | A (Very Good) | 8 |
| 6.00 - < 7.00 | 60.0 - < 70.0 | B + (Good) | 7 |
| 5.50 - < 6.00 | 55.0 - < 60.0 | B (Above Average) | 6 |
| 5.00 - < 5.50 | 50.0 - < 55.0 | C (Average) | 5 |
| 4.00 - < 5.00 | 40.0 - < 50.0 | P (Pass) | 4 |
| Below 4.00 | Below 40.0 | F (Fail) | 0 |
| Ab (Absent) | • | Ab (Absent) | 0 |

Sd/-

Sd/-

Sign of the BOS Chairman Dr. T.N. Ghorude Board of Studies in Physics Sign of the Offg. Associate Dean Dr. Madhav R. Rajwade Faculty of Science & Technology Sd/-

Sign of the Offg. Dean Prof. Shivram S. Garje Faculty of Science & Technology