

## **CHECKLIST FOR COURSE FILE PREPARATION**

1. Vision & Mission of the Institute
2. Vision & Mission of the Department
3. Program Educational Objectives (PEOs)
4. Program Outcomes (POs)
5. Program Specific Outcomes (PSO)
6. Course Objective and Course Outcomes (COs)
7. CO mapping with POs and PSOs with justification.
8. Class Time Table & Faculty Time Table
9. Syllabus
10. Course handouts/Lesson Plan (include the list of additional topics to meet the outcomes, if required?)
11. Attendance register (Yellow file)
12. Assignments (Five assignment question papers with solutions)
13. Quiz, Surprise Tests, Class tests, Mid Semester Exam, and End semester exam question papers with solutions
14. Lecture notes (Handwritten/typed)
15. Consolidated attendance statement of students
16. Sample copies of evaluated answer scripts of Class tests, Assignments, Quiz, Surprise Tests, Lab records, and Mid-semester exams (Highest, average, and marginal pass)
17. Record of Guest Lecture/Seminar conducted (if any)
18. List of Slow Learners and Advanced Learners
19. Record of Remedial classes for Slow Learners and SWAYAM-NPTEL courses for Advanced Learners.
20. Course exit survey
21. Consolidated semester grades of students
22. Result analysis (Normal distribution curves/Bell curves)
23. CO attainment (with Gap analysis and action taken for continuous improvement)
24. PO/PSO attainment

|                 |            |                                    |       |        |
|-----------------|------------|------------------------------------|-------|--------|
| 2 <sup>nd</sup> | 22BTTES204 | <b><u>ENGINEERINGMECHANICS</u></b> | L-T-P | Credit |
|-----------------|------------|------------------------------------|-------|--------|

|                 |  |  |              |          |
|-----------------|--|--|--------------|----------|
| <b>Semester</b> |  |  | <b>3-1-0</b> | <b>3</b> |
|-----------------|--|--|--------------|----------|

**Prerequisites:** Mathematics, Physics

**Course Objectives:**

1. To learn basic concepts and system of forces.
2. To enable students to understand the relationship of physical processes, kinetics, and kinematics.
3. To develop skills to use the basic principles of mechanics in engineering applications.

**EVALUATION SCHEME**

| <b>Teacher's Assessment</b> |                         |                      | <b>Written Assessment</b> |                 | <b>Total</b> |
|-----------------------------|-------------------------|----------------------|---------------------------|-----------------|--------------|
| <b>Quiz</b>                 | <b>Surprise Test(s)</b> | <b>Assignment(s)</b> | <b>Mid-Term</b>           | <b>End-Term</b> |              |
| <b>5</b>                    | <b>5</b>                | <b>5</b>             | <b>25</b>                 | <b>60</b>       | <b>100</b>   |

**SYLLABUS**

**Module I [8 hours]**

Introduction: Basic Concepts of Force, Concurrent forces on a plane: Composition and resolution of forces, Equilibrium of concurrent coplanar forces, Method of Projections, Method of moments, Friction: Problems involving dry friction, Ladder and Wedge Friction.

**Module II [8 hours]**

Plane Trusses: Internal forces in Members of Plane Trusses, Method of joints and Method of Sections; Analysis of Frames (Method of Members), Principle of virtual work –equilibrium of ideal systems.

**Module III [8 hours]**

Parallel forces in a plane- Two parallel forces, General case of parallel forces in a plane, Center of parallel forces and Center of Gravity, Centroids of composite plane figures and curves, Distributed force in a plane, Moments of Inertia of plane figures with respect to an axis in its plane and perpendicular to the plane, Parallel-axis Theorem, Moments of inertia of material bodies.

**Module IV [8 hours]**

Rectilinear Translation- Kinematics, Principles of Dynamics, Differential Equation of Rectilinear Motion, Motion of a Particle Acted upon by a Constant Force, Force as a Function of Time, Simple Harmonic Motion, D'Alembert's Principle, Momentum and Impulse, Work and Energy, Impact.

**Module V [8 hours]**

Curvilinear Translation- Kinematics, Differential Equations of Curvilinear Motion, Projectile Motion, D'Alembert's Principle in Curvilinear Motion, Moment of Momentum, Work and Energy in Curvilinear Motion. Rotation of a Rigid Body About a Fixed Axis- Kinematics of Rotation, Equation of Motion for a Rigid Body Rotating About a Fixed Axis, Rotation Under the Action of a Constant Moment.

**TextBook:**

1. Engineering Mechanics: S. P. Timoshenko, D. H. Young, and J. V. Rao, Tata-McGraw Hill

**ReferenceBooks:**

1. Fundamental of Engineering mechanics (2nd Edition): S Rajesekharan&GShankara Subramaniam;VikasPub.HousePvtLtd.
2. Engineering mechanics: K. L. Kumar; Tata MC Graw Hill.
3. R. C. Hibbeler, *Engineering Mechanics (Statics and Dynamics)*, Pearson Education Asia Pvt. Ltd
4. F. P. Beer and E. R. Johnston, *Mechanics for Engineers (Static & Dynamics)*, McGraw Hill
5. J. L. Meriam and L.G. Kraige, *Engineering Mechanics (Static & Dynamics)*, John Wiley

**COURSE OUTCOMES**

Upon completion of the subject, the students will be able to:

| CO No. | Course Outcome                                                                                        |
|--------|-------------------------------------------------------------------------------------------------------|
| CO1    | To analyze the forces and moments developed in structural members using the principle of equilibrium. |
| CO2    | To introduce the techniques for analyzing internal member forces acting on trusses and frames         |
| CO3    | To solve basic problems on centroid, moments of inertia, and the principle of virtual work.           |
| CO4    | To apply Newton's law, D'Alembert's Principle for rectilinear and curvilinear motion.                 |
| CO5    | To apply the Kinematics of rotation, Equation of motion of a Rotating rigid body.                     |

| <b>VISION and MISSION of the Institute</b> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|--------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Vision of the institute</b>             | To foster prosperity through technological advancement by promoting education, innovation, and collaborative research, and to emerge as a globally renowned premier technical institution.                                                                                                                                                                                                                                                                                                                                                                                                            |
| <b>Mission of the institute</b>            | <ol style="list-style-type: none"> <li>1. To impart high-quality professional education to students worldwide, fostering innovation, technological advancement, discipline, effective communication skills, and strong moral values.</li> <li>2. To provide a broad-based education that ensures the holistic development of students.</li> <li>3. To leverage expertise in science, technology, and management to deliver comprehensive training in visualizing, synthesizing, and executing projects.</li> <li>4. To nurture a spirit of entrepreneurship and innovation among students.</li> </ol> |

|                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|---------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                             | <p>5. To undertake sponsored research and offer consultancy services in industrial, educational, and other socially relevant domains.</p> <p>6. To promote healthy practices such as community service, outreach initiatives, and innovative projects for societal benefit.</p>                                                                                                                                                                                                                                        |
| <b>VISION and MISSION of the Department</b> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| <b>Vision of the Department</b>             | The Mechanical Engineering Department strives to be recognized globally for outstanding education and research as well as produce well-qualified engineers, who are innovative, entrepreneurial and successful in advanced fields of engineering and research.                                                                                                                                                                                                                                                         |
| <b>Mission of the Department</b>            | <p>1. Imparting quality education to the students and enhancing their skills to make them globally competitive mechanical engineers.</p> <p>2. Maintaining vital, state-of-the-art research facilities to be provided to the students and faculty with opportunities to create, interpret, apply and disseminate knowledge.</p> <p>3. To develop linkages with R&amp;D organizations, enterprises and educational institutions in India and abroad for excellence in teaching, research and consultancy practices.</p> |

### **Program Educational Objectives (PEOs)**

| <b>PEO</b> | <b>Program Educational Objectives Statements</b>                                                                                                                                                                                                        |
|------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| PEO1       | To provide a solid foundation in Basic Sciences, analytical skills and engineering fundamentals required to succeed in engineering field and to pursue research endeavours.                                                                             |
| PEO2       | To nurture students with good scientific and practical engineering application skills to comprehend, analyse, design and create novel engineering products and provide sustainable solution for complex inter disciplinary problems using modern tools. |
| PEO3       | To train students to successfully function in multi-disciplinary teams, able to communicate well with others to share the ideas, thus establishing the leadership to manage the organization effectively.                                               |
| PEO4       | To prepare students to respond to societal needs through an understanding of the Rural ethos, Indian Culture and plurality of ethnic and religious communities in the country at large.                                                                 |

|      |                                                                                                                                                |
|------|------------------------------------------------------------------------------------------------------------------------------------------------|
| PEO5 | To encourage students to develop lifelong learning skills, entrepreneurship abilities and ethical values for a successful professional career. |
|------|------------------------------------------------------------------------------------------------------------------------------------------------|

## PROGRAM OUTCOMES

### Engineering Graduates will be able to:

**PO1: Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

**PO2: Problem analysis:** Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

**PO3: Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

**PO4: Conduct investigations of complex problems:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

**PO5: Modern tool usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

**PO6: The engineer and society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

**PO7: Environment and sustainability:** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

**PO8: Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

**PO9: Individual and team work:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

**PO10: Communication:** Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write

effective reports and design documentation, make effective presentations, and give and receive clear instructions.

**PO11: Project management and finance:** Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

**PO12: Life-long learning:** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

### PROGRAMSPECIFICOUTCOMES(PSOs)

**PSO1:**To empowerthe studentsto applypractical skills,and knowledge inmajor streamssuch asthermal, design, manufacturing,and industrialengineering

**PSO2:**To enablethe studentsto take upcareers inindustries orto pursuehigher studiesin mechanicaland interdisciplinaryprograms

**PSO3:**To motivatethe studentsto becomesuccessfulentrepreneurs withhigh regardfor ethicalvalues, environmentaland socialissues

Mapping of COs with POs:

| Course Outcome | PO1         | PO2         | PO3         | PO4         | PO5         | PO6         | PO7         | PO8      | PO9      | PO10     | PO11        | PO12        |
|----------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|----------|----------|----------|-------------|-------------|
| CO1            | 3           | 3           | 3           | 3           | 3           | 2           | 2           | -        | -        | -        | 2           | 2           |
| CO2            | 3           | 3           | 3           | 3           | 3           | 2           | 1           | -        | -        | -        | 2           | 2           |
| CO3            | 2           | 2           | 2           | 2           | 2           | -           | -           | -        | -        | -        | 1           | 1           |
| CO4            | 3           | 3           | 3           | 2           | 2           | 1           | 1           | -        | -        | -        | 1           | 1           |
| CO5            | 3           | 2           | 2           | 2           | -           | -           | -           | -        | -        | -        | -           | -           |
| <b>Average</b> | <b>2.80</b> | <b>2.60</b> | <b>2.60</b> | <b>2.20</b> | <b>2.25</b> | <b>1.67</b> | <b>1.33</b> | <b>-</b> | <b>-</b> | <b>-</b> | <b>1.50</b> | <b>1.50</b> |

Mapping of COs with PSOs:

| Course Outcome | PSO1        | PSO2        | PSO3     |
|----------------|-------------|-------------|----------|
| CO1            | 3           | 3           | -        |
| CO2            | 3           | 3           | -        |
| CO3            | 2           | 3           | -        |
| CO4            | 2           | 2           | -        |
| CO5            | 1           | 1           | -        |
| <b>Average</b> | <b>2.20</b> | <b>2.40</b> | <b>-</b> |

Note:Enter correlation levels 1, 2 or 3 as defined below:

1: Slight (Low)

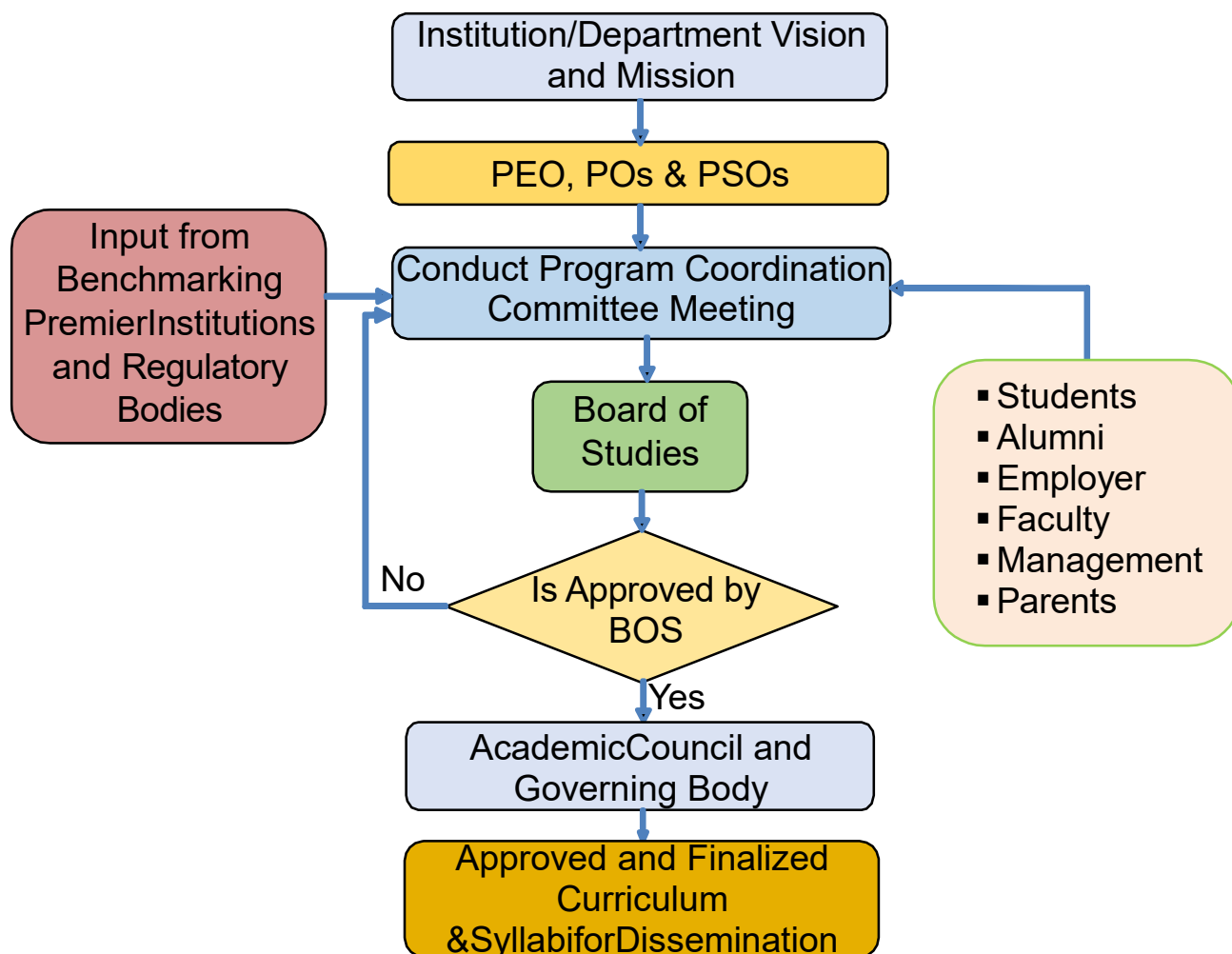
2: Moderate (Medium)

3: Substantial (High)

If there is no correlation, put (“-”)  
 Here in the table, ‘3’ corresponds to a high correlation; ‘2’ corresponds to a medium correlation, and ‘1’ corresponds to a low correlation,between CO and PO/PSO.

### Steps taken for Design of Curriculum and Syllabus

1. Define Institution/Department Vision and Mission.
2. Formulate Program Educational Objectives (PEOs), Program Outcomes (POs) & Program Specific Outcomes (PSOs).
3. Define Course Outcomes (COs) for Each Course, ensuring alignment with POs & PSOs.
4. Collect input from Benchmarking premier institutions, industries and regulatory bodies to ensure the curriculum meets global standards and industry needs.
5. Collect and Analyze Feedback from Stakeholders.
6. Conduct Program Coordination Committee Meeting and prepare draft curriculum.
7. Review and Approve Curriculum in the Board of Studies (BOS).
8. Academic Council and Governing Body Approval.
9. Curriculum and Syllabi are finalized and disseminated for Implementation.



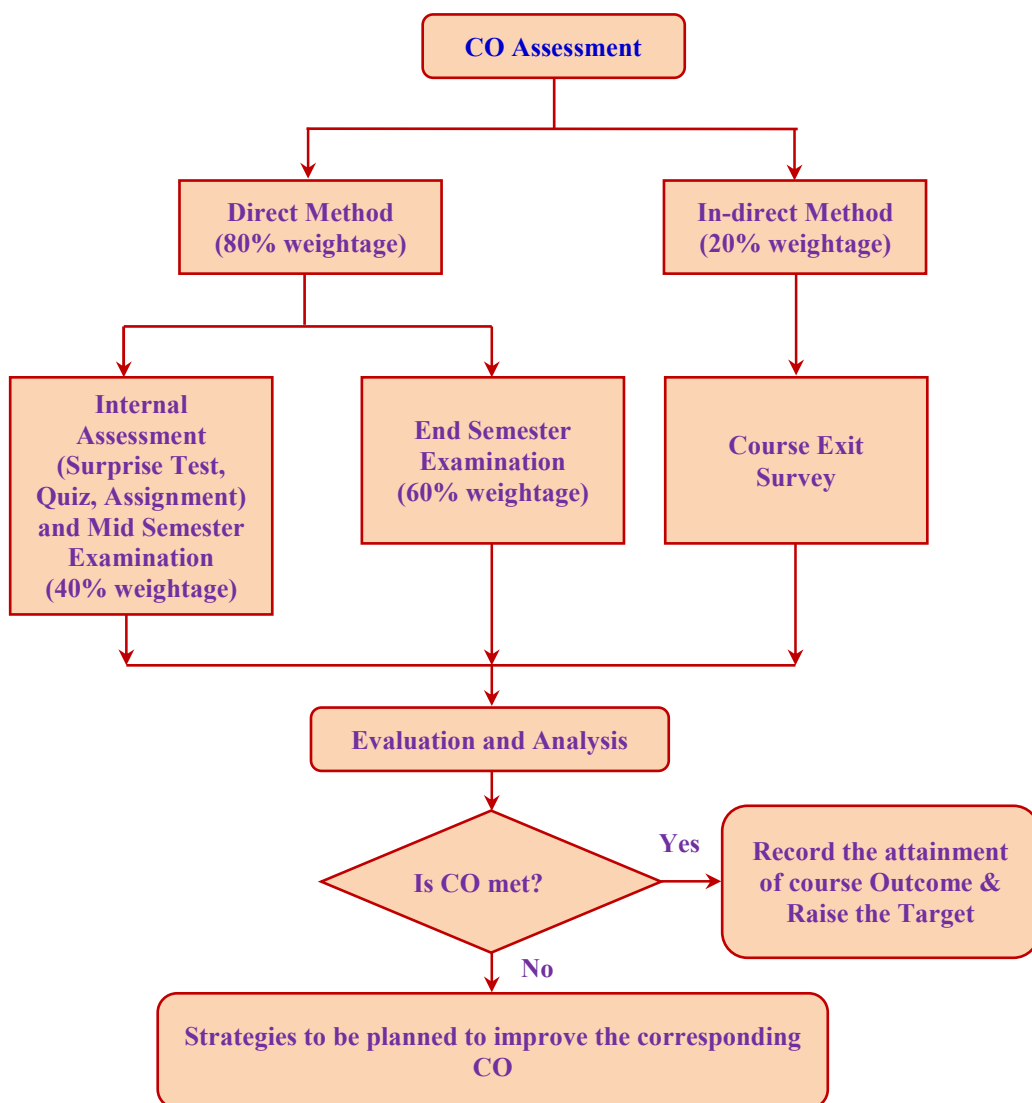
**Fig.1 Design of curriculum and Syllabus**

### Attainment of COs (Direct and Indirect Assessment Models)

Student learning outcomes are assessed through Attainment of Course Outcomes and Program outcomes.

#### **Assessment of attainment of Course Outcome (CO):**

Course Outcome is based on both direct and indirect assessments where the weightages are 80% and 20% respectively. The assessment process for CO attainment is shown in Fig.1. The indirect CO assessment is based on feedback collected from the students for each Course at the end of every semester.



## Fig.2 Course Attainment Process

### Attainment of POs (Direct and Indirect Assessment Models)

#### **Direct method**

**Continuous Assessment:** It is based on the theory and sessional work and consists of internal assessments, quality assessments, term paper presentation, seminars, subject-related projects, etc. Continuous assessment marks will be awarded based on the continuous assessment made during the semester as per the guidelines issued from time to time by the common curriculum development cell.

**End Semester:** The Institute conducts End Semester examinations in all subjects during the last fortnight of each semester in December (Odd Semester) and May (Even Semester) every year.

#### **Indirect Method**

The HoD conducts class committee meetings twice a semester with the representatives of each class. Feedback is collected from students regarding the teaching, and the orientation towards the attainment of COs. Deficiencies/ Deviations indicated by the students are communicated to the faculty for necessary corrective actions. At the end of the semester, a Course exit survey is conducted to assess the satisfaction level of the students towards the attainment of course outcomes.

Indirect assessment is carried out by conducting surveys among Graduates, Employers, Parents and Alumni.

#### **Program exit survey**

Program exit survey is conducted and the feedback is collected from the graduates at the time of completion of the Program.

#### **Alumni survey**

The feedback from the Alumni is collected through a set of questionnaires.

#### **Employers survey**

Employers provide their feedback on the skills, knowledge, and values of the employees (graduates) through a survey.

#### **Parent's Feedback**

The feedback from the Parents are collected during Parent's meet and also through the mentor-parent discussion.

The results of the direct assessment and indirect assessment are combined and the final level of attainment of course outcome is obtained for each subject. Based on the attainment of the Course Outcomes, the accreditation committee suggests suitable modifications to be incorporated in the level of question paper setting, valuation of answer sheets and direct assessment methods.

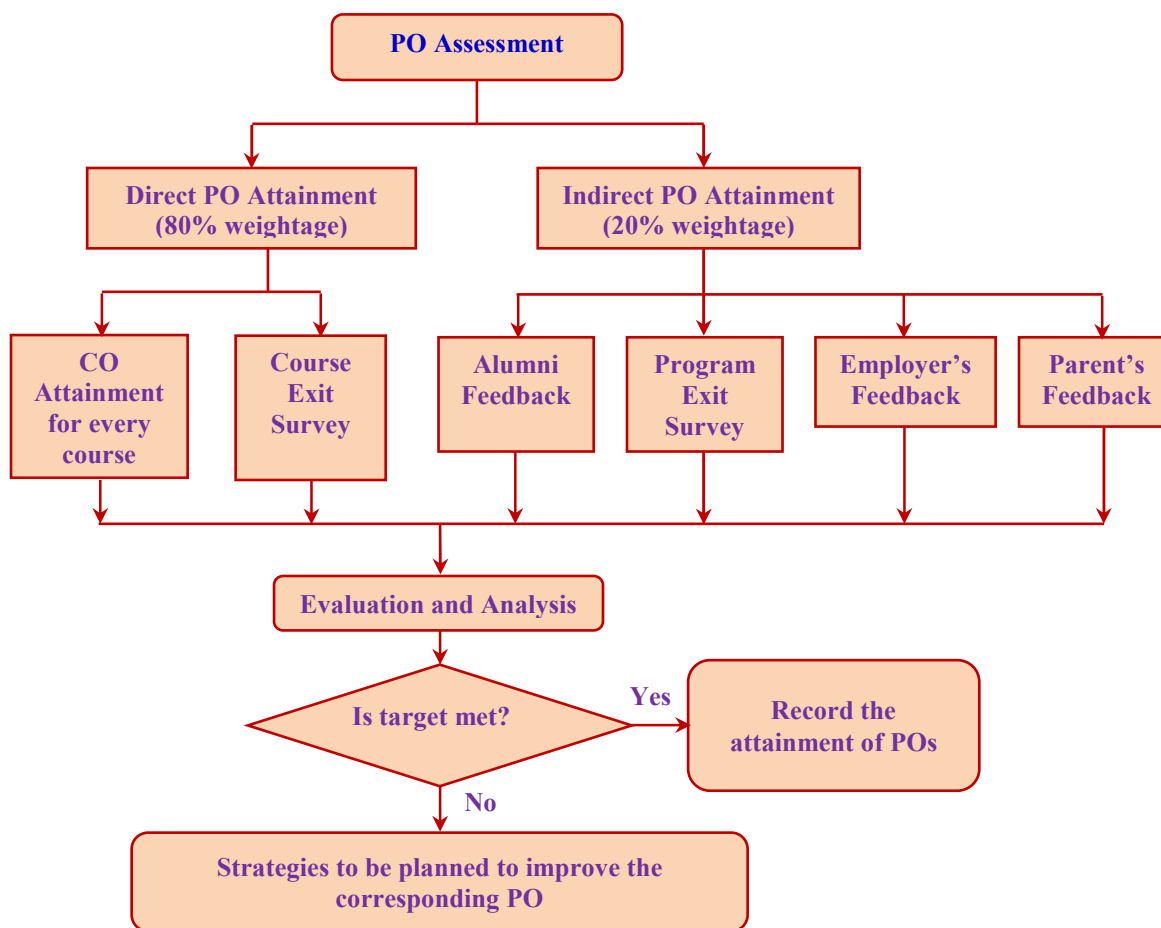
#### **Assessment of attainment of Program Outcome (PO)**

The assessment of attainment of PO is effectively carried out and PO attainment process is shown in Fig.2. This process is carried out at the end of each semester. The final attainment of POs and

for a particular batch of students is done at the end of 4 years. It includes two components, i) direct attainment and ii) indirect attainment. The direct attainment is obtained from the attainment of COs of each course, while indirect attainment is obtained from the survey reports which consists of the following four components: i) Exit survey from graduates during the time of graduation, ii) Alumni feedback, iii) Employers' feedback, and iv) Parents' feedback.

Based on the assessment to enhance the attainment of POs, the Course Outcomes are revisited, brainstormed and rephrased focusing on their improvement for the subsequent batches. The revisions are documented and presented in the Curriculum Development Cell, Board of studies and Academic Council meetings.

### Attainment of POs (Direct and Indirect Assessment Models)



**Fig.3 PO Attainment process**

The POs are evaluated based on the targets set for direct and indirect methods of assessment and attainment is recorded as shown in Fig. 3.

|                                           |                               |
|-------------------------------------------|-------------------------------|
| <b>Course Name: Engineering Mechanics</b> | <b>Course Code: 22BTES204</b> |
|-------------------------------------------|-------------------------------|

| CO No. | Course Outcome                                                                                       | Highest Cognitive Level | POs                         | PSOs |
|--------|------------------------------------------------------------------------------------------------------|-------------------------|-----------------------------|------|
| CO1    | To analyze the forces and moments developed in structural members using the principle of equilibrium | K4                      | 1, 2, 3, 4, 5, 6, 7, 11, 12 | 1, 2 |
| CO2    | To introduce the techniques for analyzing internal member forces acting on trusses and frames        | K4                      | 1, 2, 3, 4, 5, 6, 7, 11, 12 | 1, 2 |
| CO3    | To solve basic problems on centroid, moments of inertia, and the principle of virtual work           | K3                      | 1, 2, 3, 4, 5, 11, 12       | 1, 2 |
| CO4    | To apply Newton's law, D'Alembert's principle for rectilinear and curvilinear motion.                | K3                      | 1, 2, 3, 4, 5, 6, 7, 11, 12 | 1, 2 |
| CO5    | To apply the kinematics of rotation, Equation of motion of a rotating body                           | K3                      | 1, 2, 3, 4                  | 1, 2 |

| CO No.                                                                                                                                                                                                                                         | CO Mapping with PO |      |      |      |      |      |      |     |     |      |      |      | CO-PSO Mapping |      |      |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|------|------|------|------|------|------|-----|-----|------|------|------|----------------|------|------|
| CO No.                                                                                                                                                                                                                                         | PO1                | PO2  | PO3  | PO4  | PO5  | PO6  | PO7  | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1           | PSO2 | PSO3 |
| CO1                                                                                                                                                                                                                                            | 3                  | 3    | 3    | 3    | 3    | 2    | 2    | -   | -   | -    | 2    | 2    | 3              | 3    | -    |
| CO2                                                                                                                                                                                                                                            | 3                  | 3    | 3    | 3    | 3    | 2    | 1    | -   | -   | -    | 2    | 2    | 3              | 3    | -    |
| CO3                                                                                                                                                                                                                                            | 2                  | 2    | 2    | 2    | 1    | -    | -    | -   | -   | -    | 1    | 1    | 2              | 3    | -    |
| CO4                                                                                                                                                                                                                                            | 3                  | 3    | 3    | 2    | 2    | 1    | 1    | -   | -   | -    | 1    | 1    | 2              | 2    | -    |
| CO5                                                                                                                                                                                                                                            | 3                  | 2    | 2    | 1    | -    | -    | -    | -   | -   | -    | -    | -    | 1              | 1    | -    |
| AVERAGE                                                                                                                                                                                                                                        | 2.80               | 2.60 | 2.60 | 2.20 | 2.25 | 1.67 | 1.33 | -   | -   | -    | 1.50 | 1.50 | 2.20           | 2.40 | -    |
| <b>3-High,                      2-Medium,                      1-Low</b><br>Here in the table, '3' corresponds to a high correlation, '2' corresponds to a medium correlation, and '1' corresponds to a low correlation between CO and PO/PSO. |                    |      |      |      |      |      |      |     |     |      |      |      |                |      |      |
|                                                                                                                                                                                                                                                | PO Attainment      |      |      |      |      |      |      |     |     |      |      |      | PSO Attainment |      |      |
|                                                                                                                                                                                                                                                | PO1                | PO2  | PO3  | PO4  | PO5  | PO6  | PO7  | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1           | PSO2 | PSO3 |
| Average PO Mapping (M)                                                                                                                                                                                                                         | 2.80               | 2.60 | 2.60 | 2.20 | 2.25 | 1.67 | 1.33 | -   | -   | -    | 1.50 | 1.50 | 2.20           | 2.40 | -    |
| PO Attainment                                                                                                                                                                                                                                  | 2.36               | 2.19 | 2.19 | 1.86 | 1.90 | 1.41 | 1.12 | -   | -   | -    | 1.27 | 1.27 | 1.86           | 2.02 | -    |

| CO Attainment |             |                    |                      |                     |
|---------------|-------------|--------------------|----------------------|---------------------|
| S. No.        | CO's Number | Direct Attainm ent | Indirect Attainm ent | Overall Attainm ent |
| 1             | CO1         | 2.44               | 2.75                 | 2.50                |
| 2             | CO2         | 2.55               | 2.68                 | 2.58                |
| 3             | CO3         | 2.54               | 2.48                 | 2.52                |
| 4             | CO4         | 2.58               | 2.77                 | 2.62                |
| 5             | CO5         | 2.42               | 2.53                 | 2.44                |
|               |             |                    | Average              | 2.53                |

Signature of Faculty

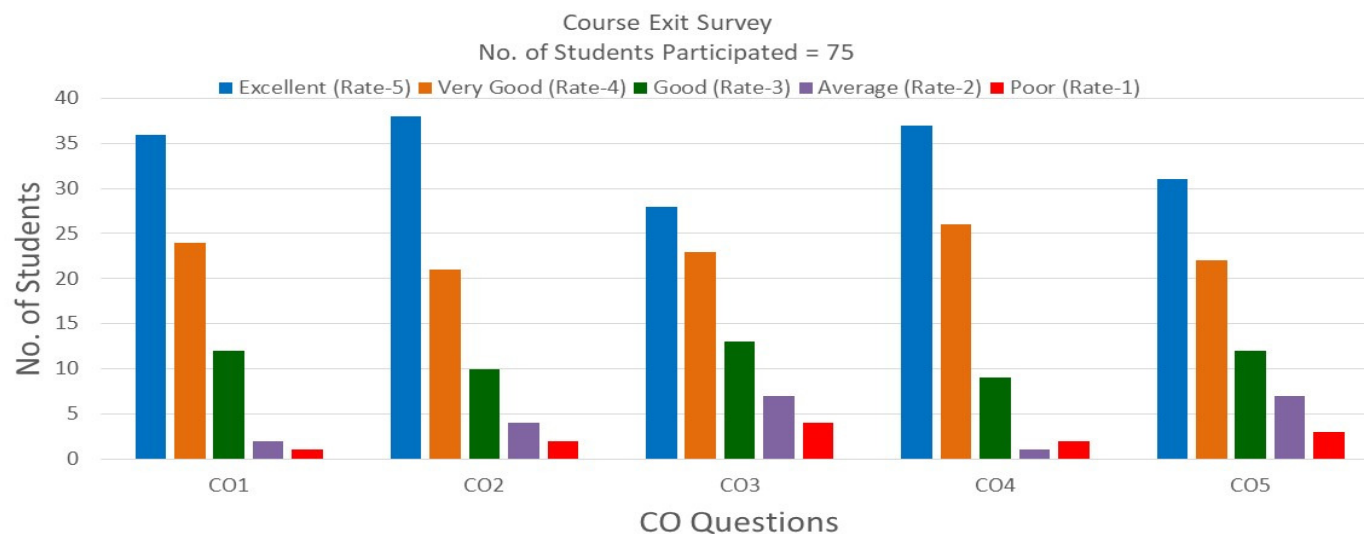
Signature of HoD

Signature of Principal

### Summary of Course Exit Survey

| CO No. | Course Outcome Question                                                                                                                   | No. of Students Rated and Rating Percentage                 |       |    |       |    |       |   |      |   |      | Average % | CO Attainment |
|--------|-------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------|-------|----|-------|----|-------|---|------|---|------|-----------|---------------|
|        |                                                                                                                                           | 5                                                           | %     | 4  | %     | 3  | %     | 2 | %    | 1 | %    |           |               |
|        |                                                                                                                                           | Total number of students participated in Course Exit Survey |       |    |       |    |       |   |      |   |      |           |               |
| CO1    | Rate yourself based on your ability to analyze the forces and moments developed in structural members using the principle of equilibrium. | 36                                                          | 48.00 | 24 | 32.00 | 12 | 16.00 | 2 | 2.67 | 1 | 1.33 | 84.53     | 2.75          |
| CO2    | Rate yourself based on your ability to introduce the techniques for analyzing internal member forces acting on trusses and frames         | 38                                                          | 50.67 | 21 | 28.00 | 10 | 13.33 | 4 | 5.33 | 2 | 2.67 | 83.73     | 2.68          |
| CO3    | Rate yourself based on your ability to solve basic problems on centroid, moments of inertia, and the principle of virtual work.           | 28                                                          | 37.33 | 23 | 30.67 | 13 | 40.89 | 7 | 9.33 | 4 | 5.33 | 77.07     | 2.48          |
| CO4    | Rate yourself based on your ability to apply Newton's law, D'Alembert's Principle for rectilinear and curvilinear motion.                 | 37                                                          | 49.33 | 26 | 34.67 | 9  | 12.00 | 1 | 1.33 | 2 | 2.67 | 85.33     | 2.77          |
| CO5    | Rate yourself based on your ability to Evaluate Kinematics of rotation, Equation of motion of a Rotating rigid body.                      | 31                                                          | 41.33 | 22 | 29.33 | 12 | 16.00 | 7 | 9.33 | 3 | 4.00 | 78.93     | 2.53          |

| Course Outcome | Excellent (Rate-5) | Very Good (Rate-4) | Good (Rate-3) | Average (Rate-2) | Poor (Rate-1) | Total |
|----------------|--------------------|--------------------|---------------|------------------|---------------|-------|
| CO1            | 36                 | 24                 | 12            | 2                | 1             | 75    |
| CO2            | 38                 | 21                 | 10            | 4                | 2             | 75    |
| CO3            | 28                 | 23                 | 13            | 7                | 4             | 75    |
| CO4            | 37                 | 26                 | 9             | 1                | 2             | 75    |
| CO5            | 31                 | 22                 | 12            | 7                | 3             | 75    |



| Sl No | Roll No. | Regd No    | CO1 | CO2 | CO3 | CO4 | CO5 |
|-------|----------|------------|-----|-----|-----|-----|-----|
| 1     | 2202001  | 2201287001 | 3   | 2   | 3   | 3   | 1   |
| 2     | 2202002  | 2201287002 | 3   | 3   | 2   | 3   | 3   |
| 3     | 2202003  | 2201287003 | 2   | 3   | 3   | 2   | 3   |
| 4     | 2202004  | 2201287004 | 3   | 3   | 3   | 3   | 3   |
| 5     | 2202005  | 2201287005 | 3   | 1   | 3   | 2   | 1   |
| 6     | 2202006  | 2201287007 | 2   | 3   | 3   | 3   | 2   |
| 7     | 2202007  | 2201287009 | 3   | 3   | 2   | 2   | 3   |
| 8     | 2202008  | 2201287010 | 3   | 3   | 3   | 0   | 3   |
| 9     | 2202009  | 2201287011 | 3   | 3   | 3   | 3   | 2   |
| 10    | 2202010  | 2201287012 | 3   | 3   | 1   | 3   | 3   |
| 11    | 2202012  | 2201287014 | 3   | 3   | 3   | 2   | 1   |
| 12    | 2202013  | 2201287015 | 3   | 2   | 0   | 3   | 3   |
| 13    | 2202014  | 2201287016 | 3   | 3   | 3   | 3   | 3   |
| 14    | 2202015  | 2201287017 | 3   | 0   | 3   | 3   | 2   |
| 15    | 2202016  | 2201287019 | 3   | 2   | 2   | 3   | 3   |
| 16    | 2202017  | 2201287020 | 2   | 3   | 3   | 3   | 3   |
| 17    | 2202018  | 2201287021 | 3   | 2   | 1   | 3   | 2   |
| 18    | 2202019  | 2201287023 | 3   | 3   | 3   | 0   | 2   |
| 19    | 2202020  | 2201287022 | 3   | 3   | 2   | 2   | 3   |
| 20    | 2202021  | 2201287024 | 3   | 3   | 2   | 1   | 3   |
| 21    | 2202022  | 2201287025 | 3   | 3   | 1   | 3   | 1   |
| 22    | 2202023  | 2201287026 | 1   | 3   | 3   | 3   | 3   |
| 23    | 2202024  | 2201287027 | 2   | 2   | 3   | 3   | 3   |

| Rubrics |      |
|---------|------|
| Rate-5  | 3.00 |
| Rate-4  | 3.00 |
| Rate-3  | 2.00 |
| Rate-2  | 1.00 |
| Rate-1  | 0.00 |

|    |         |            |   |   |   |   |   |
|----|---------|------------|---|---|---|---|---|
| 24 | 2202025 | 2201287029 | 3 | 3 | 3 | 3 | 3 |
| 25 | 2202026 | 2201287030 | 3 | 3 | 0 | 3 | 3 |
| 26 | 2202027 | 2201287031 | 3 | 3 | 2 | 3 | 0 |
| 27 | 2202028 | 2201287032 | 3 | 3 | 3 | 3 | 3 |
| 28 | 2202029 | 2201287033 | 3 | 3 | 3 | 3 | 1 |
| 29 | 2202030 | 2201287034 | 3 | 3 | 3 | 3 | 3 |
| 30 | 2202031 | 2201287035 | 3 | 3 | 3 | 3 | 3 |
| 31 | 2202032 | 2201287036 | 3 | 3 | 2 | 3 | 3 |
| 32 | 2202034 | 2201287037 | 1 | 3 | 2 | 3 | 3 |
| 33 | 2202035 | 2201287039 | 3 | 3 | 3 | 2 | 3 |
| 34 | 2202037 | 2201287041 | 3 | 3 | 3 | 3 | 3 |
| 35 | 2202038 | 2201287042 | 2 | 3 | 3 | 3 | 3 |
| 36 | 2202039 | 2201287043 | 3 | 3 | 1 | 3 | 2 |
| 37 | 2202040 | 2201287044 | 3 | 3 | 3 | 3 | 3 |
| 38 | 2202041 | 2201287045 | 3 | 3 | 2 | 3 | 2 |
| 39 | 2202042 | 2201287046 | 2 | 3 | 3 | 2 | 3 |
| 40 | 2202043 | 2201287047 | 3 | 3 | 3 | 3 | 3 |
| 41 | 2202044 | 2201287048 | 3 | 2 | 3 | 3 | 3 |
| 42 | 2202045 | 2201287049 | 2 | 3 | 2 | 3 | 3 |
| 43 | 2202046 | 2201287050 | 3 | 3 | 3 | 3 | 2 |
| 44 | 2202047 | 2201287051 | 3 | 3 | 3 | 3 | 3 |
| 45 | 2202048 | 2201287052 | 3 | 0 | 2 | 3 | 3 |
| 46 | 2202049 | 2201287053 | 3 | 3 | 3 | 3 | 3 |
| 47 | 2202050 | 2201287054 | 3 | 3 | 3 | 3 | 2 |
| 48 | 2202051 | 2201287055 | 3 | 3 | 3 | 3 | 3 |
| 49 | 2202052 | 2201287056 | 3 | 3 | 0 | 3 | 3 |
| 50 | 2202053 | 2201287057 | 3 | 3 | 3 | 2 | 3 |
| 51 | 2202054 | 2201287058 | 0 | 3 | 2 | 3 | 3 |
| 52 | 2202055 | 2201287059 | 3 | 2 | 3 | 3 | 3 |
| 53 | 2202056 | 2201287060 | 3 | 3 | 3 | 3 | 3 |
| 54 | 2202057 | 2201287061 | 3 | 2 | 3 | 3 | 3 |
| 55 | 2202058 | 2201287062 | 2 | 3 | 1 | 3 | 0 |
| 56 | 2202059 | 2201287063 | 3 | 3 | 3 | 3 | 3 |
| 57 | 2202060 | 2201287064 | 3 | 3 | 3 | 3 | 3 |
| 58 | 2202061 | 2201287065 | 3 | 3 | 1 | 3 | 2 |
| 59 | 2202062 | 2201287066 | 3 | 3 | 3 | 3 | 2 |
| 60 | 2202063 | 2201287067 | 2 | 1 | 3 | 2 | 3 |
| 61 | 2202064 | 2201287068 | 3 | 1 | 3 | 3 | 3 |
| 62 | 2202065 | 2201287069 | 3 | 3 | 3 | 3 | 3 |
| 63 | 2202066 | 2201287070 | 3 | 3 | 3 | 3 | 0 |
| 64 | 2202067 | 2201287071 | 3 | 1 | 3 | 3 | 3 |
| 65 | 2202068 | 2201287072 | 3 | 3 | 2 | 3 | 3 |
| 66 | 2202069 | 2201287073 | 2 | 3 | 3 | 3 | 1 |
| 67 | 2202070 | 2201287074 | 3 | 3 | 3 | 3 | 3 |
| 68 | 2202071 | 2201287075 | 3 | 2 | 3 | 3 | 3 |
| 69 | 2202072 | 2201287076 | 2 | 3 | 3 | 3 | 2 |

|         |         |            |      |      |      |      |      |
|---------|---------|------------|------|------|------|------|------|
| 70      | 2202073 | 2201287077 | 3    | 3    | 0    | 3    | 3    |
| 71      | 2202076 | 2201287080 | 3    | 3    | 3    | 3    | 3    |
| 72      | 2202077 | 2201287081 | 3    | 3    | 1    | 3    | 3    |
| 73      | 2202078 | 2201287083 | 3    | 2    | 3    | 3    | 3    |
| 74      | 2202079 | 2201287084 | 3    | 3    | 3    | 3    | 3    |
| 75      | 2202080 | 2201287085 | 2    | 3    | 3    | 3    | 1    |
| Average |         |            | 2.75 | 2.68 | 2.48 | 2.77 | 2.53 |

| CO Attainment |             |                   |                     |                    |
|---------------|-------------|-------------------|---------------------|--------------------|
| S. No.        | CO's Number | Direct Attainment | Indirect Attainment | Overall Attainment |
| 1             | CO1         | 2.44              | 2.75                | 2.50               |
| 2             | CO2         | 2.55              | 2.68                | 2.58               |
| 3             | CO3         | 2.54              | 2.48                | 2.52               |
| 4             | CO4         | 2.58              | 2.77                | 2.62               |
| 5             | CO5         | 2.42              | 2.53                | 2.44               |
|               |             |                   | Average             | 2.53               |

Signature of Faculty

Signature of HoD

Signature of Principal

GITA Autonomous College, Bhubaneswar  
Department of Mechanical Engineering  
Course Assessment  
Course Name: Engineering Mechanics  
Course Code: 22BTTES104  
Faculty Name: Dr. Mamatha Kumar Roul

|      |          |            | Surprise Test (Weightage=5) |   |   |   |   |   |   |   |   |    | Quiz (Weightage=5) |   |   |   |   |   |   |   |   |   | Assignment (Weightage=5) |       |   |   |   |   |   |   |   |   | Internal Examination-2 (Weightage=25) |    |       |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | End Semester Exam |    |    | Attainment from End Semester Exam |       |                |                 |            |                  |                  |                  |                  |                  |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
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| S.No | Roll No. | REGD. NO   | Surprise Test (Weightage=5) |   |   |   |   |   |   |   |   |    | Quiz (Weightage=5) |   |   |   |   |   |   |   |   |   | Assignment (Weightage=5) |       |   |   |   |   |   |   |   |   | Internal Examination-2 (Weightage=25) |    |       |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | End Semester Exam |    |    | Attainment from End Semester Exam |       |                |                 |            |                  |                  |                  |                  |                  |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|      |          |            | 1                           | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | TOTAL              | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10                       | TOTAL | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9                                     | 10 | TOTAL | 1a | 1b | 1c | 1d | 1e | 1f | 1g | 1h | 1i | 1j | 1k | 1l | 1m | 1n | 1o | 1p | 1q | 1r | 1s | 1t | 1u | 1v | 1w                | 1x | 1y | 1z                                | TOTAL | External GRADE | Equivalent Mark | Percentage | CO-1 Attain ment | CO-2 Attain ment | CO-3 Attain ment | CO-4 Attain ment | CO-5 Attain ment |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|      |          |            | Maximum Marks               |   |   |   |   |   |   |   |   |    |                    |   |   |   |   |   |   |   |   |   |                          |       |   |   |   |   |   |   |   |   | 37                                    |    |       |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |                   |    |    |                                   |       | 37             |                 |            |                  |                  |                  |                  |                  |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|      |          |            | CO                          |   |   |   |   |   |   |   |   |    |                    |   |   |   |   |   |   |   |   |   |                          |       |   |   |   |   |   |   |   |   | Max=25                                |    |       |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |                   |    |    |                                   |       |                |                 |            |                  |                  |                  |                  |                  |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
| 1    | 2202001  | 2201287001 | A SNEHA                     | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2  | 3                  | 3 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2                        | 2     | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5                                     | 5  | 5     | 2  | 2  | 2  | 2  | 2  | 2  | 2  | 2  | 2  | 2  | 2  | 2  | 2  | 2  | 2  | 2  | 2  | 2  | 2  | 2  | 2  | 2  | 2                 | 2  | 2  | 2                                 | 2     | 2              | 2               | 2          | 2                | 2                | 2                | 2                | 2                | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |

