SEMESTER S5

SPECIFICATION TEST LAB

Course Code	PCPOL507	CIE Marks	50
Teaching Hours/Week (L: T:P: R)	0:0:3:0	ESE Marks	50
Credits	2	Exam Hours	2 Hrs. 30 Min.
Prerequisites (if any)	Engineering Chemistry Lab	Course Type	Lab

Course Objectives:

1. To create practical knowledge on specification tests for latex and dry rubber
2. To impart knowledge on properties of latex and dry rubber

Details of Experiment

Expt. No	Experiment
1	Specification tests for field latex Viscosity
2	Specification tests for field latex density
3	Specification tests for field latex pH
4	Specification tests for content of Ammonia preserved latex
5	Specification tests for Magnesium, Copper and manganese content of preserved latex
6	Specification tests for Dry rubber content, Total solid content, KOH number and Volatile fatty acid number of preserved latex
7	Specification tests for Sludge content and Coagulum content of preserved latex
8	Specification tests for Mechanical stability time, Heat stability time and ZnO stability of preserved latex
9	Specification tests for Volatile matter, Ash content and Dirt content of dry rubber
10	Specification tests for Nitrogen content of dry rubber
11	Specification tests for Estimation of Cu and Fe of dry rubber
12	Specification tests for Estimation of Mn, P0, PRI of dry rubber

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Course Assessment Method

(CIE: 50 Marks, ESE 50 Marks)

Continuous Internal Evaluation Marks (CIE):

Attendance	Preparation/Pre-Lab Work, experiments, Viva and Timely completion of Lab Reports / Record. (Continuous Assessment)	Internal Exam	Total
5	25	20	50

End Semester Examination Marks (ESE):

Procedure/ Preparatory work/Design/ Algorithm	Conduct of experiment/ Execution of work/ troubleshooting/ Programming	Result with valid inference/ Quality of Output	Viva voce	Record	Total
10	15	10	10	5	50

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Mandatory requirements for ESE:

- Submission of Record: Students shall be allowed for the end semester examination only upon submitting the duly certified record.
- Endorsement by External Examiner: The external examiner shall endorse the record.

Course Outcomes (COs)

At the end of the course the student will be able to:

Course Outcome		Bloom's Knowledge Level (KL)
CO1	Develop skill to conduct the specification tests for field and preserved latex	**K6**
CO2	Determine the skill on the specification tests for dry rubber	**K5**
CO3	Analyze skills to correlate latex specifications with properties of latex.	**K4**
CO4	Select teamwork skills through group activities	**K1**
CO5	Summarize the practical knowledge on properties of latex and dry rubber	K2

K1- Remember, K2- Understand, K3- Apply, K4- Analyse, K5- Evaluate, K6- Create

CO-PO Mapping Table

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1		3			1							
CO2	2	3			2							
CO3		3		3	2							
CO4	2		2		1							
CO5				3								

1: Slight (Low),2: Moderate (Medium),3: Substantial (High), No Correlation

Text Books				
Sl. No	**Title of the Book**	**Name of the Author/s**	**Name of the Publisher**	**Edition and Year**
1	ASTM and BIS standards			1898
2	Hand book of Natural Rubber Production in India	Bhaskaran Nair V K	RRII, Rubber Board	1980
3	Polymer Latices and Their Applications	K O Calvert	Macmillan	1982

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Reference Books				
Sl. No	**Title of the Book**	**Name of the Author/s**	**Name of the Publisher**	**Edition and Year**
1	Practical Guide to Latex Technology,	Rani Joseph,	Smithers Rapra,	2013
2	Polymer Latices: Science and technology	D.C. Blackley	Springer Science	1997
3	Vanderbuilt Latex Handbook	Mausser	R T Vanderblit	3rd edition,1987
4	Rubber Technologist's Handbook, Vol	S. K. De and J. R. White	Smithers Rapra Publishing,	2001

Video Links (NPTEL, SWAYAM…)	
Sl. No.	**Link ID**
1	https://www.assochem.in/blog-details/specifications-test-procedures-and-significance-of-60-natural-rubber-latex-cl-60-
2	https://byjus.com/chemistry/kjeldahl-method/
3	https://www.testing-instruments.com/blog/how-to-measure-the-presence-of-ash-content-in-rubbers/
4	https://www.scribd.com/document/617652232/ISO-248-Rubber-Raw-Determination-of-Volatile-Matter-Content-6-15-2005

Continuous Assessment (25 Marks)

1. **Preparation and Pre-Lab Work (7 Marks)**

- Pre-Lab Assignments: Assessment of pre-lab assignments or quizzes that test understanding of the upcoming experiment.
- Understanding of Theory: Evaluation based on students' preparation and understanding of the theoretical background related to the experiments.

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2. **Conduct of Experiments (7 Marks)**

- Procedure and Execution: Adherence to correct procedures, accurate execution of experiments, and following safety protocols.
- Skill Proficiency: Proficiency in handling equipment, accuracy in observations, and troubleshooting skills during the experiments.
- Teamwork: Collaboration and participation in group experiments.

3. **Lab Reports and Record Keeping (6 Marks)**

- Quality of Reports: Clarity, completeness and accuracy of lab reports. Proper documentation of experiments, data analysis and conclusions.
- Timely Submission: Adhering to deadlines for submitting lab reports/rough record and maintaining a well-organized fair record.

4. **Viva Voce (5 Marks)**

- Oral Examination: Ability to explain the experiment, results and underlying principles during a viva voce session.

Final Marks Averaging: The final marks for preparation, conduct of experiments, viva, and record are the average of all the specified experiments in the syllabus.

Evaluation Pattern for End Semester Examination (50 Marks)

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1. **Procedure/Preliminary Work/Design/Algorithm (10 Marks)**

- Procedure Understanding and Description: Clarity in explaining the procedure and understanding each step involved.
- Preliminary Work and Planning: Thoroughness in planning and organizing materials/equipment.
- Algorithm Development: Correctness and efficiency of the algorithm related to the experiment.
- Creativity and logic in algorithm or experimental design.

2. **Conduct of Experiment/Execution of Work/Programming (15 Marks)**

- Setup and Execution: Proper setup and accurate execution of the experiment or programming task.

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3. **Result with Valid Inference/Quality of Output (10 Marks)**

- Accuracy of Results: Precision and correctness of the obtained results.
- Analysis and Interpretation: Validity of inferences drawn from the experiment or quality of program output.

4. **Viva Voce (10 Marks)**

- Ability to explain the experiment, procedure results and answer related questions
- Proficiency in answering questions related to theoretical and practical aspects of the subject.

5. **Record (5 Marks)**

- Completeness, clarity, and accuracy of the lab record submitted

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