

Unique/innovative ideas of the problems are invited from the following areas:

| SI No | Organization | Problem Statement Title | PS Number | Theme |
|-------|--------------|--|-----------|--------------------------------|
| 1 | ONGC | <p>Upscaling biofuel production It involves enhancing the efficiency and sustainability of processes that convert biomass into fuels. There are various lab methods where biofuels have been successfully extracted from organic materials. However, most of the methods prove uneconomical once scale up to industrial level is done. Hence, there is a need for the development of methods which can prove economic viability once they are upscaled to an industrial level.</p> | JECHAC1 | Renewable / Sustainable Energy |
| 2 | ONGC | <p>Instrument development and process engineering for acid digestors it should aim at the development of acid digesters required for the acid hydrolysis or digestion of the biomass to sugars which must have the potential of having great load capacity, less reaction time, least toxin generation, temperature and pressure controllers etc.</p> | JECHAC2 | Renewable / Sustainable Energy |
| 3 | ONGC | <p>Acid recovery unit Development of an indigenous acid recovery unit which as the capacity to recover the catalyst widely used for acid hydrolysis of biomass to produce biofuels and in the transesterification of oils to produce biodiesel. Recovery of acid will have both economical and environmental impact.</p> | JECHAC3 | Renewable / Sustainable Energy |
| 4 | ONGC | <p>Recovery of crude oil from oily sludge Recovering crude oil from oil sludge generated during oil production in oil fields is vital for environmental sustainability and resource management. This project should focus on employing extraction techniques to efficiently separate oil from sludge. The method should not only recycle valuable hydrocarbons but also be environmentally sustainable.</p> | JECHAC4 | Crude oil |
| 5 | ONGC/ OIL | <p>Green hydrogen production This project should focus on the production of hydrogen by using electrolysis of water by using electrolytic cell via green electricity. It should also focus on the development of new storage and transportation alternatives for highly flammable hydrogen gas.</p> | JECHAC5 | Clean & Green Technology |
| 6 | ONGC/OIL | <p>Green hydrogen storage and transportation Development of storage units for hydrogen which can cater the high pressure and low temperature requirement of hydrogen.</p> | JECHAC6 | Clean & Green Technology |
| 7 | ONGC | <p>Use of Drones to survey oil spills and bioremediation The project should aim to explore the potential of drone technology in monitoring crude oil spillage in water and soil pits. By utilizing unmanned aerial vehicles (UAVs), the project should seek to gain a better understanding of oil spill characteristics, including thickness, penetration, and spread. The data collected from drone-mounted sensors should be able to analyse and develop a comprehensive model for monitoring crude oil spillage during bioremediation. The project will contribute to improved environmental monitoring, enhanced spill response, and reduced ecological impact of crude oil contamination in water and soil pits.</p> | JECHAC7 | Robotics and Drones |
| 8 | ONGC | <p>Water treatment procedures There is observance of yellowish colour in treated drinking water even though iron content at permissible limit. Even after treatment with recommended dosage of Sodium Hypochlorite and Bleaching powder, no residual</p> | JECHAC8 | Clean & Green Technology |

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| | | chlorine concentration is observed in treated water. Solution required: 1. Suggested design of filter media and system that can help solve the problem of drinking water colouration. 2. Suggested changes in dosing system/proposed dosing design to achieve the desired residual chlorine concentration level in drinking water (0.2-0.5 ppm). | | |
| 9 | OIL | Developing solar powered attendance management system for employees working at remote operational areas of OIL INDIA LIMITED. | JECHAC9 | Smart Automation |
| 10 | JECAA | Rural education Rural education is a particularly challenging area in India due to its size and spread. An Innovative idea for solving any one identified problem in this segment is required to be showcased. The idea should demonstrate some original thinking and problem-solving aptitude. | JECHAC10 | Edutech |
| 11 | JECAA | Improvement of Technical Skill Training thru AR/VR Technical education and training needs a combination of Expert teachers and study content. There is a huge market for such AR/VR solutions which can improve the delivery of technical education. The Edutech startup is expected to develop an innovative idea for solving any one identified problem in the field of technical education. The idea should showcase some original thinking and problem-solving aptitude. | JECHAC11 | Edutech |
| 12 | JECAA | Drone based surveillance of garden areas Tea gardens are very big in size and cost of manual labour to oversee the garden is going up. A drone-based system which can reduce this manual supervision cost is required. A system which is easy to operate and uses computer vision helps control the issues in garden management. | JECHAC12 | Robotics and Drones |
| 13 | JECAA | Better quality control in the factory thru automation / Data Analytics The process of tea factory needs extensive control of quality of leaves and its processing steps. Assam tea is losing its quality status as most of the garden are now buying leaves from outside their garden areas. Quality control of leaves is a manual process. Some has tried to import some machines which can do a computer vision-based analysis of leaves and raise alarms. | JECHAC13 | Smart Automation |
| 14 | JECAA | Bamboo based products Innovative Bamboo-based building materials are becoming popular due to their sustainability benefits. An example is Bamboo based Wooden flooring. An innovative Bamboo based product idea for the building material industry is required to be showcased. The idea should showcase some original thinking and problem-solving aptitude | JECHAC14 | Clean & Green Technology |
| 15 | JECAA | Student Innovation The ideas should be firmly based on the agricultural challenges, issues faced by Agri Industry and Progressive Farmers. Its main aim is to solve the current Agricultural problems through technologies and bring forward all the enthusiastic start-ups, entrepreneurs, Researchers and students to come forward and show up their technical potential. | JECHAC15 | Agriculture, FoodTech & Rural Development |