ID	PROBEM STATEMENT	DESCRIPTION
PB1	Domain Name Server (DNS) Filtering Service using Threat Intelligence feeds and AI/ML Techniques	Develop a DNS Filtering service with secure DNS resolution, blocking malicious domains via blacklists, threat intelligence feeds (STIX/TAXII), and AI/ML for detecting domain generation algorithms. The solution should prevent DNS tunneling, support DNS over UDP, DTLS, and HTTPS, ensuring scalability for high query volumes (<100ms lookup time). Implement DNS caching for speed, active analysis for real-time filtering, and passive analysis via PCAP/Zeek TSV for retrospectively identifying malicious domains. Include a web interface for monitoring and reporting statistics on identified malicious domains and their source IP addresses.
PB2	Development of UT (user terminal) to UT Voice, Image, Video and Data Communication APP (Android or iOS) using Bluetooth 2.0 or above wireless interface and custom protocol	Two-way voice, video and data Communication between two UTs through BLE (Bluetooth) needs to be addressed using Custom Protocol (with minimum signalling overheads). The APP should establish a BLE connection among peer UT as part of initialization and thereafter carry out full-duplex communication using a custom protocol format viz- Header Payload. The size of header should not be more than 1/8th of Payload size and the delay/latency in voice or data communication should be less than 200ms. The header should contain a Unique word with advanced features so as to facilitate synchronization with minimal false detection probability. It is expected that the application uses a standard ITU vocoder and maintains a constant transfer rate between UT's. This is an essential feature for the end application. UI- The UI should have options for voice, Image, Video or data transfer. It is also expected to have a built-in dialer, contact list wherein each UT is assigned a unique ID/Contact ID through which communication could be established. Note- The custom protocol and sample data will be made available after proposal evaluation.
PB3	Development of Explainable AI (XAI) based model for prediction of heavy /high impact rain events using satellite data	Nowcasting of heavy precipitation rainfall events with an understanding of the most important predictors and also an idea as to why a certain model can fail. Desired Outcome- The developed system shall provide the following: 1. AI based model to predict particular rain episodes of greater impact using satellite data (INSAT-3D/3DR) . 2. An explainable module into the AI model (XAI) 3. The final output should be in terms of a web application, with associated accuracy of the models worked on and an explainable component of the outputs.
PB4	Change detection due to human activities.	Using satellite imagery, create an automated system for detecting change related only to human activities from satellite imagery. i.e. Develop AI/ML based model for change detection of only man-made objects like vehicles, buildings, roads, aircraft etc. from remote sensing images Data: Sentinel-2, LISS-4
PB6	Suggest an Al-based solution to enable ease of grievance lodging and tracking for citizens across multiple departments	A robust grievance redressal mechanism is a crucial component of any administration. An efficient and effective procedure for addresstng grievances demonstrates an administration's accountability responsiveness, and user-friendliness. However, the ease of lodging a complaint or grievance by citizens is often lacking in many Indian cities. Given the large migratory population in tndian cities, consisting of individuals who may not be familiar with English, Hindi, or the local regional language, citizens face challenges in lodging their grievances. Moreover, the process of lodging a gflevance is not always straightforward. Some department websites are inaccessible, and locating the correct website for a specific department can be difficult. Introducing an Al-based chatbot that allows citizens to dictate their grievances in their local language and lodge them, would greatly assist citizens. This tool should be able to understand and process complaints effectively, assign them to the relevant department, and provide citizens with a unique complaint number. Real-time updates on the status of the complaint should be sent to citizens, enabling one-on-one conversations throughout the grievance lifecycle. The primary objective of this solution should be to provide citizens with an easy-to_use chatbot that facilitates efficient lodging and tracking of grievances. This would not only save citizens' time in searching for the appropriate department or category but also enabl; the administration to receive targeted grievances and enhance overall service delivery.

PB7	Smart and Effective realtime Management of street parking	In India, the number of vehicles is constanfly on the rise, while the availability of parking space in cities has not kept pace with the increasing vehicle numbers, primarily due to the rapid groMh in population. Consequenfly, issues such as traffic congestion, narrowed streets due to on-street parking, a mismatch between parking supply and demand, and illegal parking have become all too familiar in Indian cities. Parking space has become a scarce commodity, and instead of simply increasing the number of available parking spaces, it is crucial to employ effective technology-based solutions to optimize their utilization. Smart parking solutions, utilizing sensors and software, can provade realtime information on available parking spaces to both city officials and drivers. Furthermore, leveraging emerging technologies can help optimize parking prices. A low parking price may encourage more vehicles on the road, leading to increased air and noise pollution, whereas too high prices may generate less revenue and less efectuve resource usage.Apart from the loss of revenue for operators, there is economic downside to the business in vicinity, effect on government taxes, employment.At the same parking space area and costs also have a corelation to balance optimum usage and revenue. Therefore, setting the right price for parking based on demand and optimizing occupancy is the best approach. The primary objective of the solution should be to equip city administrators with an effective parking management tool that can predict, manage, and finance parking in cities. An app should be developed to allow citizens to conveniently reserve pce king spots and make payments based on dynamic pricing This not only saves citizens' time spent searching the parking but also reduces environmental degradation resulting from congestion caused by parking and provides a sustainable source of revenue for the city administration. We need an innovative, simple and widely coveraged parking needs in the city and also become most compliant for Traffic and mobility needs.
PB8	Comprehensive Inspection and Analysis of Water Supply Distribution Lines	Water resources across the globe are slowly on the depletion and its forecasted that the ZERO water day will not be far away if water resources ate not protected well. one the the crucial area that stilp lies in the human hands is to save the watet leakages and pay a strong water distrulibution network that improves effeicient use of water.The challenge is to conduct thorough inspections of water supply distribution lines, ranging from 100 to 200mm in diameter, in order to detect leakages, pilferage, damage, and other issues. The solution requires access to a cloud_based dashboard for data analytics, visualization, and report generation. The solution enhance service delivery, improve repair work efficiency, reduce water leakage, and streamline pipeline condition assessment. The solution should enable immediate action on contamination complaints, early detection of leaks, reduction in labor_intensive breakdown management, and facilitate GIS mapping of the pipelines. Overcoming deployment constraints involving live inspections, image analytics, and laser projections will ensure accurate and efficient assessment of the water supply distribution lines.
PB9	Effective management of construction and demolition (C&D) waste	The problem at hand revolves around the management of construction and demolition (C&D) waste in urban areas. With rapid urbanization and infrastructure development, the volume of C&D waste generated has reached alarming levels. The current practices for C&D waste disposal often lead to environmental degradation, resource depletion, and public health hazards. Therefore, there is a pressing need for a comprehensive and sustainable approach to C&D waste management that focuses on reducing waste generation, promoting recycling and reuse, and ensuring proper disposal methods. This will contribute to sustainable urban development by minimizing environmental impact, conserving resources, and creating a healthier living environment for communities. The problem solution should be addressed at the Hardware level and also forefronted using an intelligent monitoring system
PB10	Centralized Monitoring System for Street Light Fault Detection and Location Tracking	Electricity is the critical need for progress of the livelihood.In many Indian cities, the maintenance of street lights has become a challenging and inefficient process due to the lack of a centralized monitoring system. Identifying faults, such as non- functioning lights, current leakage and cable breakage, relies on citizen grievances, leading to delays, increased costs, and safety concerns. Linemen spend valuable time manually searching for faults, diagnosing issues, and fixing them, which can take several days to complete. The absence of precise fault location information further complicates the process. To overcome these obstacles, we seek an innovative solution that provides realtime fault detection, accurate identification of fault types, and precise location tracking of faulty street lights. This solution aims to empower linemen with efficient fault management capabilities, reducing their workload and ensuring timely maintenance. Moreover, it should enable the local authorities to proactively address faults, enhance service quality, and optimize street light maintenance processes in their respective cities..The prime aim of this problem statement is to develop a "Automated Defect Detection and Prevention Assistance with Effective Governance for Cities in India"""

PB11	Real time Knowledge of ore body being mined out	The ore-body model, containing block-wise or location-wise ore quality details, is prepared in the mine planning software and this information can be documented for further use through maps or spreadsheets. But from the operatorâ€™s perspective, the ore quality information for ensuring quality control during excavation is done purely through eye judgment and previous experiences. Solution Desired: Through use of high precision GPS sensors, location including the elevation data of the shovels/loaders can be traced and by interlacing this information in the ore block model data, we can convey the information to the operator suitably so that quality control can be executed at the site itself.
PB12	Land profiling of Asset Creation process	There are various types of permissible works being taken up under the Mahatma Gandhi NREGS which are earthwork related works which requires excavation/land cuttin& land filling land levelling etc. As per the current practice of execution of the works under the scheme, there is a photograph taken of the worksite before initiating the work and the estimated quantity of the work to be executed in form of technical design & estimate. During the stages of execution, the technical person/engineer in-charge of the site, maintains the work done on site in form of measurements in the measurement book and accordingly the payment of the labour & material is generated. It becomes difficult to ascertain the exact work done on ground during the audit/inspections after the work completion. A land profile of the worksite (in terms of contour levels or 3D modelling) before initiating the work and after work completion can provide a necessary information to derive the actual work done through analysing the land profiles in 3 dimensions (3D1. The profiles can be generated in reference to a fixed benchmark level available on the worksite. In this regard a technology driven solution for 3D Profiling may be provided.
PB13	Leveraging the power of deep learning to overcome the challenges of marine engineering and improve vessel operations:	Developing an artificial neural network for the marine industry presents significant challenges, including limited computing power, unreliable communication infrastructure, low availability of data and complex vessel systems. The goal of this problem is to design and develop an effective AI solution using deep neural networks that can optimize vessel performance, reduce operational costs, and improve safety in the context of merchant vessel operations. The solution must be able to demonstrate high accuracy, robustness, and scalability, while also addressing the unique challenges faced by the marine industry. Participants are encouraged to explore novel approaches to training and deployment, including techniques for data processing, feature extraction, and model optimization.
PB14	Aerial Location of Hazardous Atmosphere in Industries	Fire Prevention is better than Firefighting. With an increase in Industrialization and globalisation, there has been a spate of fire accidents occurring in the past few years. Every fire incident in industries causes massive losses to the assets of the nation. There are various cases of fire which caused enormous loss of property and human life, like the IOCL Jaipur fire in 2009, NTPC Power Plant Explosion, Unchahar in 2017, and various others. As per the National Crime Records Bureau, over 60 people die every day in India due to fire. In IOCL 2009 fire itself, the industry suffered a loss of thousands of crores. To prevent such incidents and minimize such economic losses, all industries need to have a Fire Pre Plan which should be a part of the Emergency Response and Disaster Management Plan (ERDMP), and the extent of a fire hazard which includes Flammability Area, Toxic Area and Threat zone calculation is instrumental in designing the Fire Pre-Plan for any industry using Areal Location of Hazardous Atmosphere.
PB15	Automatic Drug Dispenser	The never-ending queue in hospitals is a nuisance that patients have to go through. Along with the problems being faced by patients due to suffering from diseases, standing and waiting in long queues adds on as a challenge for them to face. This leads to inconvenience to patients at physical as well as mental level. Although in this direction, some steps have been taken by the hospital management system which makes it convenient for patients to consult with doctors by registering and taking an appointment prior to the visit to hospital. But, patients still face inconvenience at the mediciner Developing a QR Code drug ATM muy resolve the situation at hand, there Page 6 + ents. A QR code in the prescription will be used to dish out the right drug from the ATM. The drug ATM should be able to dispense wide range of Ayush Medicines available in a hospital/pharmacy.

PB16	Blended Learning to overcome inadequate infrastructure	Once the class size passes a certain point, the teachers are bound to 'fail' because the demands on their time cannot be met. In essence, the root of this problem is not the number of children in a classroom but rather the inability for each child to receive adequate attention. Combining modern technology and 1:1 tuition, students could perform far beyond other students who were being taught in more conventional ways. By combining blended learning (where face-to-face teaching is combined with online learning) with real-time data, we can get rapid feedback in classrooms and use that feedback to further enhance the quality of education. As an example, consider a classroom of 30 students. Ten students with similar abilities may work closely with the teacher, another ten may work through lectures and online tasks using computer terminals, and the final ten may work together on a group project. In the next lesson, students are rotated so they can learn in different ways throughout the course. This kind of approach enables the teacher to focus more closely on fewer children at once. The teacher can also tailor the learning approach for each student based on how well each one works for the individual. Meanwhile, the software on the computer is advanced enough to tailor the content to each student as well. By collecting real-time feedback on each child's results, the course contents can be adapted per student and make it as if they were receiving a one-on-one tuition. This approach allows each student to have their own learning path that's customized to their needs. By doing this, teachers can easily see which students are falling behind and offer more individualized teaching to those students. If more schools were to adopt a similar approach, where some responsibilities could be handled by tech-aided learning methods, more of the teachers' time could be freed-up to give more attention where it's needed the most, even in larger classroom sizes. Further the objective is to come up with ways and means to make meaningful digital application's that can use this information and generate knowledge, spread massive awareness, and support education delivery effectiveness of students into educational ecosystem and generate insights based on data it collected. The objective of this problem statement solution is also to come up with innovative solution which may use digital and physical medium together to make sure specially abled students who are slow learners are identified, their progress is monitored and right alarms and notifications are generated to assist keeping their education on track with elevated motivation. The solution may use technologies like Artificial intelligence, machine learning and internet of things and blockchain to ensure specially abled children are given right systems and interfaces to learn and grow. This solution's objective is to make sure learning becomes seamless and peaceful with right insights and aids for the children.
PB17	Development of Virtual Reality (VR) technology for Dhatuposhana Nyaya	There are primerly three tissue nourishment theories known as 'Dhatuposhan Nyaya described by Acharya's. They are as follow: 1. Ksheeradadhi Nyaya (Theory of Transformation)- This is compared to the conversion of milk (ksheera) into curd (dadhi) in entirety. This complete transformation of one Dhatu to another is called Sarvatma Parinama (total bio- conversion). According to this theory, nutrients getting converted into tissues. 2.Kedarikulya Nyaya (Theory of Transportation)- According to this theory, nourishment of the tissues can be compared to irrigation of fields by water from a canal. This explains supply of nutrients through circulatory system. 3.Khalckapota Nyaya (Theory of Selection)- Like pigeons pecking the grains from a threshing floor and carrying it back to their nests depend on the direction and the time required for them to travel. The nutrition required by a dhatu (tissue) is selected from the essence part of food being circulated. To understand and apply these principles/process at tissue level scientifically Virtual Reality (VR) technology may be helpful.
PB18	Green options for milk packaging (Low cost, environment-friendly, and extended shelf life packaging for milk)	Currently, most of the liquid milk packaging (pouch milk) in India, uses plastic film. Disposal of the plastic packs has huge environmental concerns and we must seek out for more environment-friendly alternatives. As a step towards reducing carbon footprint options like bioplastics, biodegradable plastics, organic fibres, or any other material, etc. may be explored. Such alternatives must be easy to use for the industry & distribution chain, ensure food safety, safeguard against contamination/leeching/microbial attack, cheap (low cost) and also help in improving shelf life of milk.

PB19	Awareness and Preparedness Towards Disaster Management	Disasters can strike anytime, anywhere, and can have devastating effects on individuals, families, communities, and entire countries. Therefore, it's crucial to have awareness and preparedness towards disaster management. The mock exercises. School Safety Programmes (SSP), and Community Awareness programme (CAP) that will be conducted by various stakeholders such as NDRF/SDRF, etc. These exercises are aimed at enhancing the preparedness and response capabilities of our community to deal with any emergency or disaster situation. The exercises are designed to simulate real-life scenarios and test the response capabilities of various agencies involved in disaster management. These exercises are crucial in identifying gaps in our preparedness and response capabilities and help in improving them To benefit from these programs, it is important to give a notification regarding mock exercises, SSP, and CAP conducted by various stakeholders such as NDRF/SDRF, etc., to concern people so that they registered timely and became a beneficiary/ a part of the exercise. This will enable to concern to be prepared for any eventualities that may occur in the future. The system provides the contact number, links, and information regarding Disaster Management Authorities. Datasheet of various previous disasters, do's, and don'ts, it may include early warning of disaster.
PB20	Get Fit Faster with a High-Tech Tracker: Analyze Human Activity and GPS Data for Improved Results	Description (Background, Detailed Description, and Expected Solution): Various fields require Human Action Recognition (HAR) to function optimally. For instance, the healthcare sector needs HAR to monitor the activities of patients, the elderly, or people with specific needs. By doing so, it can offer prompt services and make decisions in real-time according to the requirements. Similarly, the sports industry also utilizes HAR to track a player's performance by monitoring their movements, identifying and comparing the actions performed, and conducting automatic statistical analysis. Consequently, it is essential to implement such workflows quickly and more efficiently based on specific domain requirements. An effective solution is to consider various sensor data from mobile phones, such as accelerometers and GPS, and analyze such short-duration time series data. The analysis may aim at estimating the activity, distance traveled, steps taken, calories burned, and altitude climbed, among others. The solution is expected in the form of Android/iOS app that is developed using Simulink (with the help of Android/iOS support packages). References links below: 1. Counting Steps by Capturing Acceleration Data from Your Mobile Device https://in.mathworks.com/help/matlabmobile/ug/counting-steps-by-capturing-acceleration-data.html 2. Acquire GPS Data from Your Mobile Device and Plot Your Location and Speed on a Map https://in.mathworks.com/help/matlabmobile/ug/acquire-gps-data-and-plot-your-location-and-speed-on-a-map.html 3. Human Activity Recognition Simulink Model for Smartphone Deployment https://in.mathworks.com/help/stats/human-activity-recognition-simulink-model-for-deployment.html 4. High School Students Create Fitness Trackers for MATLAB STEM Challenge https://blogs.mathworks.com/student-lounge/2019/06/05/fitness-trackers-stem-challenge/ 5. Introduction to Machine Learning https://in.mathworks.com/videos/series/introduction-to-machine-learning.html YouTube Link/Video Link (3-minute video explaining the problem statement): Signal Processing and Machine Learning Techniques for Sensor Data Analytics * https://www.youtube.com/watch?v=GZ3KUPqA1JM
PB21	Efficient enumeration of URLs of active hidden servers over anonymous channel (TOR)	The Onion Routing (TOR) is an overlay anonymous network over internet, which not only anonymizes clients accessing the TOR network or internet but also facilitate hosting of servers anonymously. These servers have been reported to be hosting various hidden services involved in malicious activities. The goal of this problem statement is to develop Proof of Concept (PoC) to enumerate URLs (.onion) of active hidden servers hosted over TOR. Teams are supposed to examine the cryptographic security controls and survey existing vulnerabilities in underlying security architecture of TOR network to develop PoC for efficient enumeration of URLs of active hidden services hosted over TOR.
PB22	Create an intelligent system using AI/ML to detect phishing domains which imitate look and feel of genuine domains	Phishing attack is the most prevalent attack technique to compromise users worldwide. Phishing links/websites are shared through number of mediums like email, SMS etc. to target users. These domains are at times host user login page that imitates the genuine target websites. Login attempts on such pages can lead to compromise of user credentials and may also download malicious payload in user computers. The objective of the problem is to identify such phishing domains from the newly registered websites based on open source databases (Example WHOIS Database). Such databases provide list of newly registered domains. The tool should be automated and harness power of AI/ML to identify phishing domains from genuine domains. It may use the following techniques: (a) Backend code / content similarity in web pages. (b) Web page image analysis (i.e. analysis between genuine and phishing site web page images; more the similarity better is the probability score of being a lookalike phishing site). The evaluation would be based on the toolÃƒÂ¢Ã¢â€šÂ¬Ã¢â€žÂ¢s ability with regard to the following: (e) Probability scores of phishing domains on how close they are to the genuine domain. (f) Ability to detect new phishing domains in reasonable time. (g) Ease of use and flexibility in output formats.

PB23	Investigation of vulnerabilities in implementation of crypto library used by OpenVPN for Internet Protocol Security (IPsec), IPV6 deployment.	Internet Protocol Security (IPsec) is a widely used network layer security control for protecting communications. It is a framework of open standards for ensuring secure communication over IP network. The goal of this problem statement is to identify unknown vulnerabilities in implementation of crypto libraries used by OpenVPN for Internet Protocol Security (IPsec), IPV6 deployment. Teams may undertake static/ dynamic analysis of relevant code to discover any unknown software bug. Emphasis should be on finding unknown vulnerabilities in implementation of cipher suites/ crypto libraries used by OpenVPN for encryption and authentication in IPsec tunnel. Teams may also investigate and report vulnerable configuration and associated exploitation vector leading to compromise of data confidentiality, which have not been reported so far for IPSEC IPv6 deployment using OpenVPN.
PB24	Develop Ransomware Readiness Assessment tool.	Ransomware is a type of malicious software designed to block access ICT devices by encryption of data until ransom is paid to attacker. It is of paramount importance to increase awareness regarding such attacks and assess readiness of the ICT infrastructure of any organisation to thwart these attacks or atleast recover at the earliest. The developer should design and deploy a methodology to evaluate posture and preparedness of an organization towards stopping / mitigating threat from ransomware attack. The developed tool shall be evaluated based on following: (a) Depth of the tool to assess readiness of organization to hinder / stop /mitigate ransomware attack. (b) Assessment of organization towards detection of early signs of ransomware. (c) Ease of use and awareness imparted by the tool. (d) Visualization and reporting of the maturity assessment of the organization.
PB25	Develop a AI/ML tool to detect whether a system / firewall /router / network is compromised. The technique should not rely only on IoCs (Indicators of Compromises) detection.	Early detection of a compromise of any compute device is critical for security of critical information infrastructure. While most of infections on ICT are detected using IoCs (Indicators of Compromises), the objective of this problem is to explore techniques for detection of compromise on devices using AI / ML models when the IoC of the compromise is not known. The developer should employ innovative models for non-IoCs based detection of compromise on devices. The evaluation of the solution will be based on the following: (a) Innovation and ruggedness of the method of detection of compromise. (b) Utility of the method developed over various types of devices including system / firewall / router / network. (c) Ease of deployment and method of reporting of detected compromise. (d) Ability to minimize false alarms of compromise.
PB26	Develop and deploy a Large Language Model (LLM) based tool for generating human like responses to natural language inputs for network not connected over internet	LLMs have been released by various entities / research organizations for academic and commercial use. These models can be used for generating human like responses on text based systems with server-client model. The objective of the problem is to develop a tool for network not connected to internet with following basic functions: (a) AI/ML based Text Summarization of given text. (b) Summarization of Science andamp; Technology (Sandamp;T) related documents. (c) Summarization of NEWS papers headlines and editorial pages for quick overview of specific topics. (d) Reformatting and grammar checks with contextual integrity. (e) Additional capabilities which the developer can incorporate based on features available in open source LLM models. The solutions shall be graded on the capabilities, ease of use, flexibility and scalability of deployment and number of compatible models.
PB27	Developing a GUI based hardening script for Ubuntu operating system with flexibility to cater for organisational security policies	Hardening of an operating system involves implementation of security measure to make the system compliant with the security policies of the organization. The procedure for hardening should be intuitive to allow ease of use by personnel with minimal IT skills. The goal of this problem statement is to generate a script which is undertakes hardening of Ubuntu OS using an GUI based approach. During the hardening process, the user should have the flexibility to make settings based on the organisations IT security policy provision like blocking ssh, usb, ToR etc. The grading of tool will be based on hardening functions implemented, attention to user experience and flexibility to take user settings. Developer should remember that security is of utmost importance.
PB28	De-anonymisation for monitoring and tracking of illegal activities performed using cryptocurrency transaction technology	Whatever the darkest corner of diabolical human mind can conceive, Dark-Web can deliver with anonymity and impunity. Dark web markets and forums are filled with illicit activities such as counterfeit currency, fake documents, contraband drugs, ransomware attacks etc. In India, Dark-web crimes have proliferated in recent times especially in the arena of Cyber terrorism, drug trafficking, counterfeit documents, currency and sale of classified Government documents. Governments have also recently raised concern over digital currency and use of Dark-Web for drug trafficking. It is important that appropriate tools and techniques may be developed to monitor and track anti-national activities carried out behind the shield of anonymity by using dark web and cryptocurrency technology.

PB29	An application under which all rescue agencies are registered and which can display the location of other rescue relief agencies during natural/ man made calamities	To build such an application. there is need to create a central database where all rescue agencies can register their information, including their location, contact details, and areas of expertise. This information could be entered manually by agency administrators, or automated using GPS or other location tracking technologies. Once the database is populated, the application would need to be designed to display this information in an easy-to-use interface: It could include a map that shows the locations of all registered rescue agencies, along with filters that allow users to narrow down the results based on specific criteria, such as the type of disaster, the resources available, or the time since the last reported activity. In addition to displaying the locations of rescue agencies, the application could also include features for communication and collaboration. For example, agencies could send alerts or requests for assistance to each other directly through the application, or collaborate on shared resources such as medical equipment or transportation. Security and privacy would be major considerations in building such an application. It would be important to ensure that only authorized users have access to the database, and that sensitive information such as personal contact details is protected. Overall, building an application that allows rescue agencies to coordinate their efforts and provide aid more effectively could be a valuable tool for responding to natural or man-made disasters.
PB30	Robotics Device for Borewell Rescue Operation	A robotics device for borewell rescue operation for NDRF can be a valuable tool to assist in the rescue of individuals who are trapped in a borewell. These devices can be equipped with cameras, sensors, and other tools that can be used to locate and extract individuals who are stuck in a borewell. In recent years, there have been several incidents in India where children and adults have fallen into open borewells, resulting in tragic outcomes. The rescue of individuals who are trapped in borewells is a complex and challenging operation that requires specialized equipment and expertise. NDRF is often called upon to assist in these rescue operations. A robotics device for borewell rescue operation can significantly enhance NDRF's capabilities in these situations. The device can be equipped with cameras and sensors that can provide real-time data on the location and condition of the individual trapped in the borewell. It can also be equipped with specialized tools that can be used to extract the individual safely The robotics device can be remotely controlled, which means that it can be operated from a safe distance. This feature can be particularly useful in situations where the borewell is unstable, and there is a risk of further collapse. The device can also be designed to be lightweight and compact. making it easy to transport to the rescue site. The deployment of such robotics device for borewell rescue operations can be a significant step in enhancing NDRF's capabilities in these complex and challenging situations. It can help to save lives and minimize damage during these emergencies.
PB31	Developing an algotithim / programme to measure increase in income of FPOs on account of project interventions under WDC 2.0.	With the objective to help achieve higher economic growth for the project community and collectivization of farm operations, which can be realized through FPOs, the New Generation Watershed Guidelines envisage formation of FPOs right from the planning stage of the projects. The FPO shall be the member - owned and member - managed institution. Any household dependent directly or indirectly on the natural resources of watershed can join the FPO by paying prescribed share capital amount and membership fee as defined by the organization. Methodology: Computing of Incomes generated through provision of demand based services, operation of Custom Hiring Centre (CHC), marketing of local agricultural produce through alternate market channels etc.
PB32	Making career choices and AI based counselling accessible to every child at secondary level along with aptitude tests and detailed career paths.	The project team shall establish an interactive AI based model that will help students to to choose from careers. The model should handhold student in assessing his capabilities and subsequently help him in deciding a career path.
PB33	Mental health and well-being surveillance, assessment and tracking solution among children.	Develop a model/software which will help students to assess mental health of students, build methods to find out and provide solution for the improvement
PB34	Identify slow learners for remedial teaching and capacity building for innovative methods.	Developed based on available assessment data for students the slow learners and build inovative methods to help them cope up with the educational requirements
PB35	Lowest Cost Smart Board - A Seamless Teaching Experience.	Develop a smart board for students which will help students in effective interaction and teaching experience
PB36	AR/VR based application which helps visualize the complete house virtually at an early stage, which can help in cost estimation, planning and completion of the house in time'	AR/VR technology based solution will help the beneficary to get a virtual miniature of the completed house at an early stage and will also give an estimate of the cost so that the beneficiary can do the necessary planning before starting the construction.
PB37	Web /Mobile based tool for mapping of Water supply network	Jal Jeevan Mission was launched with the vision of providing drinking water in adequate quantity of prescribed quality on regular and long-term basis to every rural household. A cost effective technology is required for providing web/ mobile based tool for mapping of water supply network through creating geospatial database of all major structure of Water supply system with provision with grievance redrassal and IoT system for alert monitoring.

PB38	Devise the method for identification of victims buried under avalanches.	Description (Background): Avalanches can be very dangerous and unpredictable. Even if we take preventive measures to avoid them, probability of getting caught in an avalanche is still there. Ff victims are buried under avalanche, it is important to take immediate action because the probability of survival decreases with time (survival chances goes down to less than 30% after an hour). Avalanche victim detector or other Ground Penetrating radar-based methods are there for victim identification but these field based techniques are difficult to use during harsh climatic condition but these field based techniques are difficult to use during harsh climatic conditions and rough terrain. Explore the new technologies for example in the field of Al/ML that can be used for detection of victim buried under an avalanche.
PB39	Novel Technologies for Early Detection and Mitigation of Avalanches	Avalanche is a sudden downhill movement of snow mass along with rocks and boulders which can cause damage to human life and property. An early detection of avalanches and pre-warning about the threat can save precious lives and habitats. Suggest innovative ideas for early prediction and Mitigation of Snow Avalanches in vulnerable mountain terrain.
PB40	Lean module for reasoning about computational complexity in GPTs.	Formalization of mathematics and computer science is in vogue. Formalization means to express mathematical concepts, definitions, theorems, and proofs in a way that can be checked by a computer for correctness. Lean theorem prover is interactive and based on dependent type theory which is a powerful and expressive framework for formalizing computer science. It has been used for example in formalization of number theory. Similarly, it can be used to formalize the notion of computational complexity of generalized probabilistic theories (GPTs). Some of the relevant computational complexity classes are BGP (=AWPP), BQP, BPP, PP, PSPACE. We can formalize the notions of these computational complexity classes and the relations among them in lean. We can also move further on to formalize the notion of higher order interference in physical theories and formalize some theorems related to it. The exact problem is to write relevant lean module(s) containing the basic definitions, results in GPTs and tools for reasoning about computational complexity in GPTs. The developed module can further be used to give formal proofs for theorems and lemmas.
PB41	AI based Automatic alarm generation and dropping of payload at a particular object through a Drone.	Drones are currently being widely utilized in civilian applications and military uses too. In severe earthquake and flood situations, the Drones with artificial intelligence based automatic object recognition capability can help rescue teams a lot through automatic alarm generation and dropping of payloads like food, clothes, rescue tools near detected human being. Challenge here is to detect human being from around 50-100 m above the ground at a slanted angle and then drop a payload (say flower for demonstration purposes) near him/ her. Technologies needed will be Drone, Cameras, Processor Board (Raspberry Pi or Intel NUC), Artificial Neural Network or AI hardware and Software, Payload dropping mechanism etc. The developed system will be highly useful in many DRDO projects and civilian applications.
PB42	Development of motion amplification video techniques for vibration analysis	Motion Amplification video (MAV) is a technique for visualizing and measuring vibration of structures and machinery. This processes a video clip of an object, extracts feature that are moving from frame to frame, then amplifies and replays the motion in each frame. Defects at micro scales are rendered visible. Vibration amplitudes and mode shape can be thereafter be determined. Time waveform and FFT spectrum can also be captured. This would be extremely useful in evaluating noise, vibration and shock on various platforms. It is also useful in automobile, power plants, industry and other engineering sectors.
PB43	Drone based Intelligent Magnetic sensing system and Metallic anomaly detection system	Most of the metallic objects are constructed of Ferromagnetic materials and in the presence of EarthÃƒÂ¢Ã¢â€šÂ¬Ã¢â€žÂ¢s magnetic field, these create localized magnetic disturbances in Earth magnetic field which is termed as Magnetic signature. This magnetic signature of objects can be used for detection, identification and classification of objects. The above problem statement envisages, that a Drone based Intelligent Magnetic sensing system be developed to assess the magnetic fields in a particular area (above sea or above land) and identify any magnetic anomalies in that measurement region. A Portable Drone Control module for control along with an in-built learning and prediction algorithms to compensate self magnetic field of drone and measure the magnetic fields in a particular area of interest also be developed. Suitable metallic object detection methodology for identifying unidentified metallic magnetic anomaly in that particular region is also to be developed. A drone fitted with magnetic sensing system be developed with suitable compensation methodology for compensating own droneÃƒÂ¢Ã¢â€šÂ¬Ã¢â€žÂ¢s magnetic fields. Based on open source geomagnetic anomalies data of a particular region, identification and classification of metallic magnetic anomaly to be carried out.

PB44	Simulator system for counter Hijack and sky Marshalling operations	Developing a simulator system for counter hijack and sky marshalling operations.You can develop a simulator system that provides realistic and effective training for counter hijack and sky marshalling operations. Collaborating with experts in aviation security, law enforcement, and simulation technology can further enhance the development process and ensure the system meets the specific needs of the training program.
PB45	IT System log analyzer	CRPF units/offices and personnel are deployed in different location of CRPF. There is no centralised system to analyse the log of IT system by the experts to access threats and breaches. Proposed Solution: Centralized system should be developed for analysing the systems deployed at the different location of the country Expert per problems statement
PB46	Low-cost Myoelectric Prosthetic Arm	In India the cost of a new Myoelectric/Bionic prosthetic arm can range from 1lakh - 2 lakh Rupees, putting the Myoelectric hand out of reach of many middle-class and lower middle-class patients/amputee, we decided to design and build a far cheaper and pocket friendly version of prosthetic arm with Myoelectric capabilities. We are using 3-DPrinting technology for the structure of the prosthetic hand, and servo motors and Arduino for the mechanical purpose, Myoware muscle sensor is responsible for reading the electrical signals generated by muscle. These components and microprocessor can bring the cost of the prosthetic arm much cheaper and pocket friendly for the patient/amputee.
PB47	APP Based Digital Audiometer	To know a person Hearing Loss, generally we use a Pure Tone Audiometer. To use this it requires a bulk of the instrument to be carried. This testing requires a considerable amount of time for testing. It was observed that during a large level hearing testing it is consuming much time. So a hand held Mobile phone operated APP BASED AUDIOMETER will be of immense useful in finding and detecting the hearing loss in children in a schools
PB48	Virtual Zoo	Design software and hardware to display holograms of existing and extinct species of flora and fauna to depict complex ecosystems from various parts of the world. The virtual zoo could be displayed in schools, museums, and Ministries without using much physical space. The zoo could also hold educational sessions about the environment within the virtual space using pre-recorded videos of teachers from around the world.
PB49	E-Waste Facility Locator	Website that tells you the location of the nearest e-waste collection and recycling facility. Offers educational pop-ups on the harmful components of your e-waste and their effects on the environment and human health if not disposed correctly. There could be an option to input the model of your old device and earn credit points relative to the amount of precious metals recovered from the device if disposed correctly.
PB50	Detection of Malwarei Trojan in softwares used in Power Sector.	The power system networks are getting automated and software are being updated or new Software are being used in the network for various purposes including SCADA, Head End System, Meter Data Management System, Billing System, etc. Most of these software are loaded in demilitarized zones; regular patch updates and penetration tests are normally avoided on the live systems. These systems become vulnerable, and hackers try to exploit such systems using various attack vectors. The challenge is to validate presence of malicious codes if any in the software which could exploit specific attacks including the zero day attack.