The first step of the “shilpasena” Educational and Entertainment Exposition organized by the Ministry of Science, Technology and Research with the objective of pioneering the spread of knowledge of Science and Technology to the ground level has successfully completed. The exhibition was held from July 18th to 21st at the Bandaranayake Memorial International Conference Hall (BMICH) in Colombo in pursuance of a concept by the Minister of Science, Technology and Research Sujeewa Senasinghe. It consisted of 4 main zones. 12 emerging technical themes were discussed at the Exhibition. In addition to that, “Neela Haritha” zone provided the information on the services being rendered to the public by the other line Ministries. “Vidatha Haritha Kadamaniya” zone provided the opportunity to successful “Vidatha” Entrepreneurs Island wide to market their products at the exhibition. There were exhibition stalls dedicated to the Sri armed forces and Sri Lanka Police also available at the “Shilpasena” exhibition. As well as there was an attractive trade fair for the public.

President Maithripala Sirisena, Prime Minister Ranil Wickremesinghe, Speaker of the parliament Karu Jayasuriya, Minister of the Housing and Cultural Affairs Sajith Premadasa, Minister of the Primary Industries and Social Empowerment Daya Gamage, State Minister of the Finance Iran Wickremaratne, Minister of the Science, Technology and Research Sujeewa Senasinghe, Parliamentarian Prof. Ashu Marasinghe and several other MPs graced this event. Secretary to the Ministry of Science, Technology and Research Mr. Chinthaka S Lokuhetti, Additional Secretaries of the Ministry, Heads of the institutions affiliated to the Ministry and other officials of the Ministry participated in this event. Hundreds of thousands of school students, students from universities and other higher educational institutes from all over the country visited and gained knowledge from the exhibition.

By Vindhya Paadukkage

The second stage of “Shilpasena” at the Pollonnaruwa

The second stage of the “Shilpasena” exhibition organize by the Ministry of Science, Technology and Research will be held at the Pollonnaruwa District. It will be presented in a very simple way for the public to understand different aspects of science and technology.

World asteroid day celebrates at ACCIMT To page 11

Another mission of the Ministry of Science, Technology and Research

MAJOR SERVICES OF SRI LANKA STANDARDS INSTITUTION
The Internet of Things (IoT) could be considered as the nova emergence of the internet. It connects devices such as sensors and actuators through internet for a targeted application. The IoT is an expansion of internet for connecting of devices, connectivity of physical objects and monitoring and processing of devices remotely. The internet technologies interact as the transporter for such IoT data. In recent age the IoT is used on many applications of smart Wearables in healthcare, telemedicine, Smart City, Smart grids, Industrial internet, agriculture and etc. As a whole entirely in IoT applications use smart sensors or nodes positioned on wireless area network. Power and size constraints, accuracy and affordability are main advantages of using wireless nodes in wireless sensor network (WSN) which is a subset of IoT. The IoT can bisect in to two categories, consumer IoT (cIoT) and industrial IoT (iIoT). Consumer IoT aims at improving the quality of people’s life by saving time and money. It involves the interconnection of consumer electronic devices, as well as of anything belonging to user environments such as homes, offices, and cities. Conversely, industrial IoT focuses on the integration between Operational Technology (OT) and Information Technology (IT) and on how smart machines, networked sensors, and data analytics can improve business-to-business services across a wide variety of market sectors and activities, from manufacturing to public services. The 5G is seen as the fifth generation cellular network technology that provides broadband access by late 2018 and will hit the market by 2020. Fourth-generation (4G) Long-Term Evolution (LTE) wireless technology provides the foundation for 5G. Unlike 4G, which requires large, high-power cell towers to radiate signals over longer distances, 5G wireless signals will be transmitted via large numbers of small cell stations located in places like light poles or building roofs. This next generation of mobile technology is predicted to be the technological party in IoT. In other words, 5G is targeting to reach both high speed (1 Gbps), low power and low latency (1ms or less), for massive IoT and tactile internet. Does IoT need 5G? 5G promises a more IoT friendly ecosystem. The 5G will be able to embrace up to 100 times more interaction of heterogeneous devices per unit area with low latency. Does 5G expand the IoT platform? Yes. The idea behind IoT is to have multiple connected devices gathering data in real time over a particular period. However, the continuous exchange of data puts a strain on the network and the battery life of the devices. The new wireless network will see a 90% reduction in network energy usage, with up to 10 years’ worth of battery life for low power IoT devices. There are currently an estimated 6.4 billion connected devices in the world, but with home appliances, door locks, security cameras, cars, wearables, animal collars and so many other inert devices beginning to connect to the web, and the researchers predicts that by 2020, that figure will rise to 20.8 billion. Where 5G and IoT could work together: Self-driving cars: Sensors on self-driving cars generate a large amount of data, measuring temperature, traffic conditions, weather, GPS location etc. Healthcare: The medical field will also see improvements in their services as all sorts of medical devices become IoT enabled. Rural areas and other similar remote locations without proper healthcare facilities will hugely benefit from IoT connectivity. With such low latency, world class healthcare services like surgeries performed remotely become a possibility. Logistics: 5G connectivity will make it possible for sophisticated IoT tracking sensors that could transform logistics operations from end to end. Smart cities: 5G will enable wider applications in smart city initiatives from water and waste management, traffic monitoring to enhanced healthcare facilities. Retail: IoT for Retail will see a positive impact from the coming of 5G as they attempt to shape customer engagement and experiences through mobile phones. 5G and IoT together will also help in bringing every item on the shelf to the internet by creating digital twins for them. Agriculture industry: In IoT-based smart farming, a system is built for monitoring the crop field with the help of sensors light, humidity, temperature, soil moisture, etc. and automating the irrigation system. Smart Environment: The applications of IoT in environmental monitoring are broad, environmental protection by extreme weather monitoring for forest fire detection, snow level monitoring and early detection of landslides, earthquakes and flashfloods. To meet the societal needs of our nations the collaboration of industries with the R & D sector will enhance the economic in the country. To be have a high-end research culture among the young technologist in universities who become the entrepreneurs is a must to our country. How we achieve this high-end research culture to produce high tech entrepreneurs? Does IoT and 5G can? Yes, The Sri Lanka’s revolution of the 5G together with IoT on smart applications; As a one nation we are proud to say the first time in south Asia on year 2019 the first pilot on 5G service was powered and the first 5G smartphone was connected to the Sri Lanka’s 5G network. It’s a Blissful news to the nation and the testimony of the beginning of connectivity for IoT. Technological upgradation of local telecommunication service providers, commitment and enthusiasm of universities and R & D institutes and stakeholder collaboration of innovations will partake in gaining of knowledge to our community on this extreme impressive and amazing technology.

Y. S. Praveen Weerasinghe
Research Engineer
National Engineering Research and Development Centre of Sri Lanka
Sri Lanka Standards Institution, the sole representative of Sri Lanka in the ISO, is an organization with a conscientious vision to provide leadership in uplifting the quality of life of the nation through standardization and quality improvements in all sectors of the economy. Sri Lanka Standards Institution (SLSI) is the National Standards Body of Sri Lanka, established under the Bureau of Ceylon Standards Act No. 38 of 1964. The Institution functioned under the name of Bureau of Ceylon Standards until the Act was repealed and replaced by the Sri Lanka Standards Institution Act No. 6 of 1984. Since its formation, SLSI has become a role model of excellence and developed a self-motivating organizational culture for its beneficiaries, as well as its employees.

SLSI, in its quest for better quality management in the rapidly growing Sri Lankan economy, provides countless services. As the National Standards body, our prime function is formulating Standards. Services such as instrument calibration, systems certification, product certification, training activities, laboratory testing, import inspection and the Sri Lanka National Quality Awards have successfully pushed the quality bar of living in Sri Lanka to a scintillating new level.

With its flawless service over the years, SLSI has secured the confidence of the public. Hence, SLSI’s recognition is both vital and sufficient to convince the customers of the quality of the product. You too can get the assistance from Sri Lanka standards Institution to guide your organization to reach heights, in success.

Services of the Sri Lanka Standards Institution

Formulation of Standards
National Standards are formulated through Technical committees and they are consultative processes with the co-operative effort of all interested parties.

Instrument Calibration
The Metrology Division of the SLSI serves to meet the requirements for the wide range of measurement capabilities of the fields of engineering, medical science and different industries. It provides an opportunity for industrialists to ensure reliability of result of measurements. As an ISO/IEC 17025 accredited laboratory, the metrology division of the SLSI is ready to meet the new challenges of the increasingly competitive world of quality measurement. The traceability of measurement results is central to the structure of a national measurement system in order to have a line of traceable calibrations which relate to national and international measurement standards.

Laboratories
Laboratory Services Division of the SLSI is comprised of six laborato-

ories i.e., Chemical, Electrical & Electronics, Food, Materials, Microbiology and Textiles. All these laboratories are equipped with modern equipments and perform tests by technically competent staff. Facilities are available for testing of more than 200 professional standards. Chemical, Food and Microbiology laboratories are accredited by Sri Lanka Accreditation Board (SLAB) according to ISO/IEC 17025 requirements. Testing services are provided to implement Conformity Assessments, Regulatory Requirements, Import & Export and needs of local industries.

Import Inspections
SLSI has a mandatory Import Inspection Scheme, which ensures that Quality of Products imported tally with the Sri Lanka Standards. This compulsory mechanism was framed under the Imports and Exports (Control) Act, No. 1 of 1969 as amended by Act No. 20 of 1987 and covers more than hundred items. SLSI’s Import inspection scheme has the utmost authority to refuse the release of any product into the market if its test results are unsatisfactory.

Certifications
SLSI provides quality certification for both products and various disciplines of management systems. The certification ensures the customers that the product or the service consistently manufactured or provided in accordance to the standard requirements.

Systems Certification
SLSI provides Systems Certification in the disciplines of Quality, Environmental, Food Safety, Occupational Health and Safety (OHSAS 18001) and many more. Quality Management System Certification provided by SLSI certifies an organization’s consistency in producing quality products in accordance with ISO 9001 series. Environmental Management System Certification takes legislative Requirements and organizations’ understanding of environmental impacts into account for certification, which strictly follows ISO 14001 standard requirements. Food Safety Management Certification is to certify the ability of an organization’s control over their food chain to manage food safety hazards in order to ensure that food is safe at the time of human consumption. SLSI uses ISO 22000 standard for evaluation. HACCP certification is provided by SLSI to ensure customers of Food Safety in all the levels of the food chain in accordance with SLS 1266 guidelines. In addition, organic certification, super market certification, ISO 50001 certification, Vidatha certification and vegetarian certifications are also granted by the Systems Certification Division.

Product Certification
The Product Certification Scheme, which is widely known as the “SLS Marks Scheme” is used to meet the quality level of products from both local and international manufacturers to Sri Lankan Standard. A permit is granted to use the SLS Mark on product after product quality evaluation through laboratory testing and auditing of the factory processes. A thorough evaluation of the manufacturing process done by a team of qualified and competent staff of the Institution, to ensure the manufacturer’s capability to maintain consistent quality of the process. The maintenance of the quality of the product is assured through regular product testing and system audits.

Training
The organization strongly believes that creating awareness about Quality Management plays a vital role in achieving any organization’s mission and its vision. Variety of programme are designed for the career development of personnel in organizations. Diploma courses in Quality Management, Food Quality Management, Certification course in Quality Management and Foundation course in Quality Management, Programmes in standardization and quality management through workshops, training programmes, in-house training programmes and distance learning programmes for all categories of industrial personnel viz: top management to shop floor workers including operators.

Sri Lanka National Quality Awards
The Sri Lanka National Quality Award that recognizes performance excellence of organizations in Sri Lanka. Evaluation is done based on the Malcolm Baldridge criteria used for National Quality Awards Programme in USA. All applicants will receive a complete evaluation of their entity.
With rapid urbanization, and busy life styles, “abdominal obesity” has emerged as a public health problem over recent decades. The reason for that had been identified as consumption of energy dense diet with mainly, high amounts of oil, refined carbohydrates (polished rice, bread, foods made of rice flour/wheat flour, noodles made of refined flour), sugar, saturated fat (red meat, cheese, ice cream, butter) and “trans” fat (margarines, bakery products, potato chips, deep fried fast foods) foods for their main meals and no or less physical activity. Thus, this probably will continue as a major contributory factor of the burden of national non communicable diseases. According to the national study, conducted among adults over 18 years at 2010, shows, prevalence of over weight, obesity and abdominal obesity are 16.8 %, 3.7 %, 26.2 % respectively. Therefore, by considering the individuals who are at a health risk due to so called problem as well as to enhance the nutritional level of the Sri Lankan community, it is timely necessity to concern on “Right way to Reduce Abdominal Obesity”.

What is abdominal obesity?
Abdominal obesity occurs when excessive abdominal fat around the stomach and abdomen has built up to the extent that it is likely to have a negative impact on health. When energy intake is higher than energy expenditure, thus creating a positive energy balance and it leads deposition of excess energy as fat. In Biology, fats are deposited in adipose tissue and its main role is to store energy in the form of lipids. In humans, adipose tissue is located beneath the skin and subcutaneous fat, and located inside the peritoneal cavity, packed in between internal organs (liver, pancreas, intestines and kidneys) and visceral fat. Adipose tissue is found in specific locations, which are referred to as adipose depots. Visceral fat is composed of several adipose depots and an excess of visceral and subcutaneous fat lead abdominal obesity. The “pot belly” effect, in which the abdomen protrudes excessively and this body type is also known as “apple shaped”.

Assessing Abdominal Obesity
There are various ways of assessing abdominal obesity including:

1. Waist Circumference (WC)
The international cut-off values of WC for Asians, to define abdominal obesity as per World Health Organization (WHO) are ≥ 90 cm (36 inches) for men and ≥ 80 cm (32 inches) in women

2. Waist-Hip Ratio (WHR)
The circumference of the waist divided by that of the hips of >0.9 for men and >0.85 for women

3. Body Mass Index (BMI)
The BMI is defined as the body mass (kg) divided by the square of the body height (m), and is universally expressed in units of kg/m².

WHO cut-off points of BMI
Underweight ≤ 18.5, Normal weight = 18.5–24.9, Overweight = 25–29.9, Obesity ≥ 30

Major Health Risks Associated with Abdominal Obesity
• Diabetes (Type 2)
• Asthma
• Alzheimer’s disease
• Ischemic heart disease
• Stroke
• High blood pressure

Prevention and Control
Reducing abdominal fat is highly difficult once it is deposited, hence all possible attempts should be made to prevent/minimize the deposition. Weight loss can be achieved by reducing energy intake, or increasing energy expenditure, thus achieving a negative balance. Therefore, best approach is to better understanding of risk factors associated with abdominal obesity and have a self motivation for:
• Consuming healthy diet with low calories
• Unpolished rice, foods made of whole grains, roots/yams, whole fruits
• Increasing portion of protein in meals eg: whole eggs, fish, dried fish, meat, legumes, nuts, fresh milk
• Improves feeling of fullness thus prevents overeating
• Consuming food rich in fiber eg: brown rice, oats, kurakkan, corn, kohila, ladies fingers, guava, mango, apple
• Slow down the accumulation of visceral fat suppressing appetite and delaying gastric emptying
• Drinking high amount of water
• Adults needs 1-2 L of water daily and depend on the activity level and age
• A permanent routine of exercise eg: aerobic exercises (walking, running, swimming, playing etc.) for 30-60 minutes for several days of week
• Leads major reduction in sub cutaneous fat and prevent accumulation of visceral fat
• Having adequate night sleep
• Average 6-7 hours of night sleep needed to maintain lowest level of visceral fat
• Reducing stress with engaging stress relieving activities eg: listening to relaxation music, meditation, yoga exercises etc.
• Cortisol hormone levels are increasing at stress situations which is contribute to accumulation of abdominal fat

Now, are you ready to follow; “Right way to reduce abdominal obesity” from today onwards?
To fulfill the needs of more than 4 million Sri Lankan students, standardization Division of the Sri Lanka standards Institution prepared the standard specification for School Bags. Concluding this excellent work Sri Lanka standard institution published the SLS 1430: 2011 as a standard specification for school bags.

The panel of experts to prepare this SLS 1430:2011 comprised of officials from the Ministry of Education, Doctors, University Lecturers and researchers of the relevant fields. Due to lack of quality, poor handling and unbearable weight School Children face many health problems. And also less durability cause unnecessary expenses.

The main objective is the development of this SLS 1430:2011 is to minimize these problems faced by school children as well as parents. Another objective is proving a guideline for School bag manufactures to produce healthy and high quantity bags.

Requirements have been made for the respective attributes to measure the health and quality criteria of the school bags. For example fabric material which is the main raw material of the bags should be strong and waterproof. And it should not be discolored when bag expose to the light, washing, sweating, rubbing etc. Other materials such as zip fasteners, closure clip & adjustable clip shall be strong and compatible with the requirements. Considering the health, the unique feature of this bag is that it has belt for to reduce the pressure on the spine due to the weight of the bag. This belt should be equipped with adjustable fasteners or adjustable mechanism to make it fit to the body size. This bag should consist of separate places for lunch box, water bottle and other items. It also should consist of two compartments which the contents of the chamber stationeries in one compartment shall not protrude through the stiff material to the other compartment. These features have been incorporated to minimize negative impact on health of the students due to load carriage.

This specification prescribes quality and performance requirements, methods of test and sampling for school bags. Accordingly school bag manufacturers can produce their product in conformity with the standards specifications preferred manufacturers will also can obtained the SLS logo which is consider the logo for excellence. To obtain the SLS logo, manufacturers shall submit their applications to the Sri Lanka standard institution. Qualified eligible officers will be conducted the systematic audits at the relevant institution and inspect two samples. If they are comply with the requirements and in conformity with the standard specification they can obtain the SLS logo.

M.A. Chandima Nayani Mallawasekara
Assistant Director (Technology)
Sri Lanka Standards Institute
Activities related to the 12 technical themes were implemented by 12 institutions affiliated to the Ministry of Science, Technology and Research.

The "Shilpasesa" initiative to bring technology to the village is successful

Continued from page 01...

The first step of transferring Science and Technology to the ground level started from Colombo and will soon go through Pollonnaruwa, Kandy and Hambantota Districts. Subsequently, the Ministry of Science, Technology and Research is the pioneer of equipping the ground level with modern technology. The exhibition is mainly organized under four zones: namely, Technology Zone, Job-Cleaver zone, Entrepreneur Zone, and Innovation & Entertainment zone. The technical zone, which had the most attraction consisted of 12 main technological themes. These are: Education & Skill (STEM Education, Robotics) and Edutainment zone. The technical zone was organized by12 affiliated institutions of the Ministry of Science, Technology and Research. These technologies were introduced to the public in simplified versions. Science, Technology, Engineering and Mathematic Education (STEM) had drawn the most attraction from School children and the parents. Students were given hands-on opportunities to learn spectrum and other various activities on science, technology stream, as well as friendly classroom experiences, a variety of disco activities and many other board games.

The exhibition chamber under the theme of Robotics and Industrial Automation showcased a variety of robotic applications in various industries. The Artificial Intelligence (AI) theme, which attracted the majority of young people, was organized in order to impart knowledge on Artificial Intelligence. Applications of AI such as in robotics and smart computer assisted translation system, transportation and advanced agriculture were exhibited. Internet (5G) is another theme identified which attracted the attention of young people. There were many opportunities to engage a variety of fun games using the latest technology to gain knowledge and to familiarize with the modern technologies. The Sustainable Energy Authority of Sri Lanka (SLEA) had set up a new energy stall displaying many details on new energy sources. The Space Technology stall was specially designed, organized and presented by the astronomy team of the Nalanda College Colombo. Under the personalized medicine theme many advanced technologies of Western medicine and Ayurveda medicine, (Uarah etc., were introduced. Opening entrepreneurial gateways through Science, Technology and Innovation was expected of the career job zone. A large number of officers from various public and private sector institutions were alternatively engaged in leasing applications to job-seekers and enlightening them about the vacancies at their respective organizations.

The Invention Zone was operated by the Sri Lanka Inventions Corporation, which is affiliated to the Ministry of Science, Technology and Research. The main objective of this zone was promoting local innovation by providing technical assistance and providing technological assistance for new innovations & inventions. A waste recycler, an equipment to detect skin diseases, an automated electrical battery, a clock with time and eclipse which was invented by a schoolgirl, a tea fibre separator for tea factories, a burette, a clock with time and eclipse were showcased there. Over 300 inventions and innovations presented their creations at the innovation zone. This zone consisted of Open Division, School Division, University Division and Tercentary Educational Division. In addition, special awareness programs were conducted by the Intellectual Property Office of Sri Lanka regarding the basic steps required to obtain a patent for inventions. Also there was a stall in this zone to support inventors to commercialize their new inventions. The main objective of this zone was to showcase the inventions of Sri Lanka, encourage the public and school children embark on to innovations and to provide the opportunity of witnessing the operation of these inventions. The "Innovation zone" was designed to provide educational entertainment. In addition to these key zones, the public were made aware of the services rendered to the general public by the Government Ministries and Institutions coming under the purview of the Ministry of Science Technology and Research through the Blue Green zone. The zone consisted of 67 stalls. The Department of Survey, Ministry of Highways Development and Plantation Resources Development, Department of National Botanical Gardens, Department of Agrarian Development, Health Promotion Bureau, Sri Lanka Red Cross Society, National Science Foundation, Primary Industries and Ministry of Social Empowerment, Department of Avenues, Ministry of Education, Agricultural Publications Department, Ports Authority, Registrar General’s Department, State Engineering Corporation, National Housing Development Authority, Sri Lanka Foreign Employment Bureau, Ministry of Plantation Industries, Sri Lanka Tea Board, Supercentre Research Institute, Sri Lanka and a number of institutions including the Ceylon Cashew Corporation had their stalls within this zone.

There were also trade stalls to sell electrical appliances, kitchen utensils, textiles, ready-to-wear handicrafts etc. to make life easier for people. There were also book fairs with exclusive discounts on offer with the participation of large number of publishers.

Vinthiya Paadukka
Photo: Hirantha Gunawardena / Dulpay Nayanapriya
The environment consists of air, land, water, forest, and the natural resources. The physical, chemical and biological changes that take place are called as environmental pollution. The earth is always consist different type of sounds. Sound is a very common occurrence of everyday life. Sound is a very useful phenomenon in our modern society and also in the ancient days. We rarely appreciate all of its functions. Communication through speech, sounds from children at play, music, natural sounds in parks and gardens, sound from TV, radio and human activities are all examples of sounds. Sound provides enjoyable satisfaction in everyday life. At times it can alert or warn us – for example, with the ringing of a telephone, a horn or bell, a wailing siren.

In urbanized modern society, sound also annoys us. Many sounds are unpleasant or unwanted - these are called noise. The level of annoyance depends not only on the quality of the sound, but also our attitude towards it. As an example some type of music enjoyed by some people could be regarded as noise by others, especially if it is loud. The judgement of loudness will also depend on the time of the day and attitude and is also dependent on the situation. For example, the higher level of noise will be tolerated during the day than at night. Also anger, changes in mood, social or any conflicts depend on the attitude to sound. Sound can also damage and destroy property. A bomb blast sound, instant noise can shatter windows, cause hearing damage and shake plaster off walls.

Noise is an unavoidable part of everyday life. Industrialization, urbanization and technology development has resulted in an increase in noise level from machines, factories, motorways and communities, etc. The growth in noise pollution is unsustainable because it involves direct, as well as cumulative, adverse health effects. It also adversely affects future generations, and has socio-cultural, aesthetic and economic effects.

Noise annoyance is not easy to judge but noise levels can be simply measured. In the case of noise annoyance there are so many non acoustical variables such as age, education, sex, social status, attitude, etc. In general noise has become a serious problem in many metropolitan areas and it is difficult to regulate by physical means alone.

The audible sound pressure variation are very small ranging from about 20 μPa (20 X 10-6 Pa) to 100 Pa, compared to the static air pressure(105 Pa). 20 μPa is the quietest sound that can be heard by an average person and it is called the threshold of hearing. A sound pressure of approximately 100 Pa is so loud that it causes pain and therefore called the threshold of pain. A direct application of linear scale (Pa) to the measurement of sound pressure leads to large and unwieldy numbers. Additionally the ear responds not linearly but logarithmically to stimulus. For these reasons, it has been found more practical to express acoustic parameters as a logarithmic ratio of the measured value called a decibel or dB. The linear scale with its large numbers is converted into a manageable scale from 0 dB at threshold of hearing (20 μPa) to 130 dB at the threshold of pain (100 Pa).

The number of pressure variation cycles per second is called the frequency of sound and is measured in hertz (Hz). The normal hearing for a healthy young person (teens - average 13 to 19 years old) ranges from approximately 20 Hz to 20000 Hz (20 kHz). This range is called as audio frequency range. Our hearing systems are not equally sensitive to all sound frequencies. The minimum noise level in a rural environment is in the range of 30-40 decibels. This level has increased to 45-60 decibels in the urban environment. The followings are the major causes for sound pollution in our society:

- **Traffic noise**
- **Community noise**
- **Industrial noise**

Environmental noise is a worldwide problem. This problem is not only affected to the Sri Lanka but also to Asian countries in Western and European countries too. The problem is dealt with variety of methods that differ widely from country to country. Noise problems are also dependent on culture, economy and politics. Noise control/ protection programmes differ from country to country due to the following factors: legal requirements, existing not identical, variation in control techniques and methods and different political focus.

### Traffic noise

Often the most European and developed countries in the world produce vehicles with low noise levels. But, due to the lack of standardized vehicles in our country and the lack of proper maintenance, the noise emanating from vehicles is very high. Mainly on Colombo highways day to day noise levels are in the range of 70-75 decibels. There is also a very high noise level at night. High noise level can also be found on other highways too. There is a clear increase of noise level compared to the situation on several decades ago. Day time noise level of the main roads (category A roads) is in the range of 60-70 decibels, secondary roads (category B roads) exceed 65 decibels. That level exceeds the noise level assign to industries in accordance with the National Environmental noise regulation Act. These noises are mainly due to the noise emanating from the silencers of the vehicle and the sound of the horns. In addition, heavy noises can be observed vehicles like buses, tippers, three-wheelers and containers. In Sri Lanka, now the Gazette notification has been issued regarding the sound of horns in vehicles. But the values are not still determined in relation to other sounds of the vehicles. We can careful planning and growing of roadside vegetation, effect of road noise can be reduced.

### Community Noise

Community noises are also common in Sri Lanka these days. Noise pollution by various activities has become a major problem in today's society. Although this is not a concern, there are lot of social noises, especially in urban areas and rural areas. There are people who have some knowledge about this in the recent past. Loudspeakers which used for business, events, music shows and trade shows have become a powerful sound polluting media. Similarly, home-based noise generators (cassette recorders, radios) and home appliances have become the noisy medium. Two decades ago, sound generators were used only for very important purposes, such as public meetings and entertainment activities. That was just for the venue. These loudspeakers are common in use these days the unnecessary usage of these loudspeakers has become a major social problem. Sound levels of loudspeakers are as high as 70-80 decibels. Loudspeakers are being used by disturbing residents during the day and night time.

### Industrial Noise

The noises generated by industries also have become a serious environmental problem. The main reason for this is the establishment and placement of industries without proper mechanism. When maintain industries and buildings, first should think about surrounding homes and environment also need to take necessary action to control the noises. In accordance with the provisions of the National Environmental Act, the Gazette Notification No. 924/12 of 1996 has set rules and regulations for industrial pollution. Accordingly, an Environmental Protection License is required to operate or operate any industry.

**The main need for a long term program for pollution control**

This will ensure good environmental conditions while also providing opportunities for industries which are essential for the economic development of the country.
The Importance and Benefits of Metrology

Measurements have been carried out for as long as civilization has existed. Started as the need for human beings to observe, analyze and explore the world, measurement’s application held an important role as discoveries have been made. The concept of traceability is central to the structure of a national system of measurement so that industrial, commercial or scientific measurements have a line of traceable calibrations, which relate ultimately to National and International Standards.

Metrology is categorized as scientific metrology, industrial metrology and legal metrology. Scientific metrology deals with the organization and development of measurement standards (SI Units) and with their maintenance. It signifies the highest level of accuracy within the given area (mass, volume, etc) and is supplemented by legal and industrial metrology. Industrial metrology concerns the application of measurement science to manufacturing and other processes and their use in society, ensuring the suitability of measurement instruments, their calibration and quality control of measurements.

Legal metrology concerns regulatory requirements of measurements and measuring instruments for the protection of health, public safety the environment and consumers, for enabling taxation, and for fair trade.

Metrology all around ensures quality. Without the correct measurements, the ability to produce consumer and user requirements would not be possible. It ensures that all we invest will be in line with specifications. If the measurements are off the root cause have to be rectified to minimize wastage. So without reliable accurate measurement, the correct decision cannot be made.

As explained in the above, measuring equipment used in quality related activities have to be calibrated to ensure the measurement reliability and accuracy. As a leading ISO/IEC 17025 accredited calibration laboratory, Metrology Division of SLSI, fulfills your calibration needs by providing industrial calibration services traceable to SI units in the fields of force, mass, length, pressure, temperature, torque and volume. Further more, SLSI Metrology division fulfills the national obligation by being a part of the National Measurement System of Sri Lanka.
Asbestos is a natural fiber that was used for decades in insulation, siding, asbestos floor tile, joint compound, asbestos ceiling tile, asbestos roofing, and brake pads. Asbestos was commonly used in these products due to its heat resistant characteristics and durability. Asbestos containing insulation, gaskets, and packing has been used in conjunction with high temperature equipment such as boilers, turbines, steam pipes, pumps, valves, and furnaces. Asbestos containing materials were also commonly used during the construction of homes and offices, as well as on ships and in industrial settings. Asbestos became increasingly popular among manufacturers & builders due to its sound absorption, tensile strength, resistance to fire, heat, electrical & chemically damage & affordability. Older generation in Sri Lanka were exposed to woven Asbestos in their homes as wicks of lamps & mantles in Patrolmax lamps during kerosene days. Also, Asbestos products became very popular in Sri Lanka as substitute building material because of scarcity of other building materials such as timber, clay tiles. According to the statistics, for more than 60 years Sri Lanka has been importing white Asbestos mainly from various countries. Though there are many forms of Asbestos, Sri Lanka imports only the white variety of Asbestos (Chrysotile) for production of roofing and ceiling sheets, where Asbestos is mixed with cement acting as a binding agent reducing fiber escape. It has already been scientifically proven that blue and brown asbestos fiber can cause cancer, and hence it needs to explore the impact of white asbestos fiber on human health. Asbestos is not a mineral itself. It is a collective term given to a group of minerals whose crystals occur in fibrous forms. The term Asbestos was adopted for commercial identification. Asbestos fibers are naturally occurring minerals found in underground rock formations. It is a set of six naturally occurring silicate minerals which has long thin fibrous crystals. These fibrous materials can be released by abrasion and other processes (King, 2007). The six minerals commonly referred to as Asbestos come from two distinct groups of minerals such as Serpentines & Amphiboles. Amphiboles group is sub divided in to 5 groups such as Amosite (Brown Asbestos), Crocidolite (Blue Asbestos), Anthophyllite and Termolite & Actinolite (King, 2007).

Asbestos has got many unique properties, which has led to its application in more than 3000 products. The main properties are high tensile strength, high resistance to abrasion, resistance to corrosion, resistance to heat, non-combustibility, resistance to alkali attack, durability & toughness, good electrical insulation properties & chemical inertness.

International Programme on Chemical Safety (IPCS) with World health Organization(WHO), 2011, reveals that all forms of Asbestos pose a health hazard. According to WHO, 107,000 people die each year from Asbestos related Lung Cancer, Mesothelioma & Asbestosis due to mainly from occupational exposures. Asbestos factory workers, carpenters who work on roofing projects, labourers of Asbestos stores facilities & workers at building demolishing sites are in high risk categories. IPCS 2011, worked with members to strengthen the capacities of the Ministries of Health to provide leadership for activities to improve workers’ health, to formulate and implement policies, action plans and stimulate intercessional collaborations etc. More than 50 countries have banned the use of asbestos fiber. According to Basel convention on trans-boundary movement of hazardous wastes & their disposal, 1992, Asbestos has been listed in the category of controlled waste. Although International Labour Organization convention on safety in the use of Asbestos, 1986, was introduced and signed by 162 countries in the world, it has been ratified by 36 countries only.

The International Agency for Research on Cancer (IARC), 2006, identified the classification of hazard substances. According to the classification, there are five groups of human carcinogens such as, Group 1 – Cacogenics to humans – 108 agents, Group 2A – Probably Carcinogenic – 63 agents, Group 2B – Possibly Carcinogenic – 271 agents, Group 3 – Not classifiable – 509 agents & Group 4 – Probably not Carcinogenic -1 agent. Presently, IRAC has classified Asbestos in group one.

Concentration of Asbestos fibers in the air, duration of the exposure, frequency of exposure & size of the Asbestos fibers inhaled are some of the factors that contribute to the seriousness of Asbestos related health hazards (Ministry of Health, New Zealand, 2014).

The persons who are prone to risk of asbestos related diseases in Sri Lanka are the:
1) Workers in Asbestos manufacturing industries
2) Carpenters working on installation of asbestos roofs and ceilings
3) Policemen on traffic duties exposed to asbestos emanating from vehicle brake pads
4) Carpenters/ masons working on demolishing of asbestos roofs and ceilings
5) Persons who lives under asbestos roof

In Sri Lanka, blue asbestos was banned in 1997 but white asbestos has been used mainly for the production of roofing sheets. Sri Lanka ratified the Rotterdam convention in 2006 and the Sri Lankan government officially announced that the import of asbestos fiber would be reduced by year 2018 due to health and environmental risks.

Since the use of Asbestos roofing and its production process shows many health impacts on the people who involve in the production of asbestos and also on the users, it is highly justifiable that Sri Lanka should ban the use of this product and should go for an alternative product to safeguard the future of the country. As the use of asbestos is already controlled by the Government of Sri Lanka with effect from 2018, it is high time to find out an alternative and environmentally friendly product which could be a solution for non-asbestos roofing in Sri Lanka.

Recent study was carried out to:
• find out an environmentally friendly alternative fiber material instead of asbestos fibers and;
• Check the feasibility of selected alternative fiber materials for non-asbestos roofing solution in Sri Lanka.

During the study, Asbestos fiber was replaced by alternative cellulose fiber materials found in Sri Lanka. Selected alternative cellulose fiber materials are Rice husk, Burnt Rice husk, Paper pulp, Coir fiber & Coconut Charcoal. These materials are found in abundance in Sri Lanka and are thrown to the environment as waste materials. Fly ash was also selected to the study in order to improve the strength while sand was used as a filler material.

According to the test results, the rice husk can be used as an alternative fiber material for Asbestos fiber in the production of roofing sheets as per all tested parameters obtained from both ISO 10904: 2011 & Bureau of Indian standards, IS 14871:2000 standards. The second option is paper pulp as per the test results of all parameters obtained from both ISO 10904: 2011 & IS 14871: 200 standards compiled except marginal failure of breaking load test at once out of five samples.

Eng. Priyanga Peiris
Assistant Director
Engineering Standardization Division
Sri Lanka Standards Institution
Is your science knowledge really up-to-date? If so, read the newspaper and write the answers to the 10 questions given below and send them to us. One hundred winners will receive valuable prizes from the Ministry of Science, Technology and Research.

1. What is the certificate issued by the Sri Lanka Standards Institution, ensuring that food is safe for human consumption?
2. How do you ensure that the quality of a product is maintained throughout?
3. What are the criteria used to assess the abdominal obesity?
4. What is the internationally recognized unit of the body mass index?
5. What is the sound range that a healthy person can hear? What is the unit measuring of the intensity of sound?
6. What are the health problems that school children face due to the lack of quality of School bags?
7. What is the symbol of the excellence provided by the Sri Lanka Standards Institution?
8. What type of fibre can be used to replace asbestos fibre? What are materials that we can obtain these fibres from?
9. What are the deceases which can occur due to asbestos?
10. What are the properties of the measurement system

Send your answers to reach the following address on or before 25th August 2019. With your name and personal address. Please mentioned as “Science knowledge” on the upper left corner of the envelop.

Director (Research),
Science and Research Development Division, Ministry of Science, Technology and Research,
3rd Floor, Sethsiripaya (Stage 1),
Battaramulla

Are you interested in scientific writing?

So, here is a great opportunity for you....
Please send your any scientific article or scientific fiction to the following address. Please mention as “Scientific Writing” on the left upper Corner of the envelop.

Director (Research),
Science and Research Development Division, Ministry of Science, Technology and Research,
3rd Floor, Sethsiripaya (Stage 1),
Battaramulla

Answers to the questions which appeared in July edition, and the winners are mentioned in www.most.gov.lk the official website of the Ministry of Science Technology and Research.

Dr. Nalin Amarasinghe connecting with Skype Technology

The United nation has declared 30th of June every year as world asteroid day since 2014. This day has been named as the “world asteroid day” signifying the disaster which occurred as a result of the 60 meter meteorite crashing into the Tunguska region of Siberia, Russia on June 30th 1908.

The astronomy division of the Arthur C Clarke Institute for Modern Technologies annually organizes a world asteroid day program. Astrophysicist Dr. Nalin Amarasinghe delivered a commemorative lecture and answered school children’s questions via Skype. Professor Chandana Jayaratne and a group of scientists also contributed to this special celebration.

Dr. Nalin Amarasinghe connecting with Skype Technology

Chinthana Wijewardene
Deputy Director (Media)
Arthur C Clarke Institute for Modern Technologies

School children observing asteroid fragments

Wednesday, August 7, 2019

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Shilpasena
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