USN

Internal Assessment Test 2 – November 2024

Sub:	Environmental Protection and Management					Sub Code:	21CV753	Branch:	SET 2 - AIML, AIDS, CSE, ELE
Date:	19.11.2024	Duration:	90 min's	Max Marks:	50	Sem / Sec:	VII		OBE

Answer any five questions.
Provide neat sketches wherever necessary

		MARKS	CO	RBT
1	Discuss the benefits and barriers of EMS as per ISO 14001	[10]	CO2	L1
2	Write a note on identifying environmental aspects and impacts within an organizational set up?	[10]	CO1	L2
3	Explain EMS and EMAS.	[10]	CO2	L2
4	Distinguish between pollution prevention and pollution control.	[10]	CO1	L2
5	Give stream classifications. Explain how stream standards influence stream classifications.	[10]	CO1	L2
6	Define benchmarking and explain the three distinctive types of benchmarking.	[10]	CO1	L2

Signature of CI

Signature of CCI

Signature of HoD

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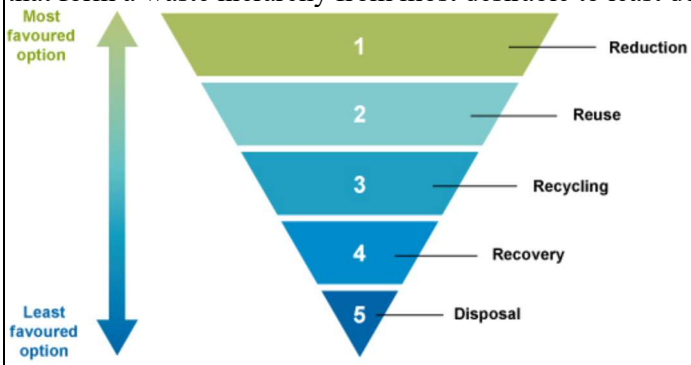
1	Discuss the benefits and barriers of EMS as per ISO 14001 **Key EMS Benefits** • improved environmental performance • reduced liability ¸ competitive advantage • improved compliance • reduced costs • fewer accidents • employee involvement • improved public image • enhanced customer trust • more favorable credit terms • meet customer requirement **Barriers associated with EMS's** In many cases the SMEs themselves are anxious to demonstrate environmental probity by adopting and implementing environmental management system standards, but are reluctant to do so for the following reasons • Fear of the unknown. • Lack of resources. • Lack of technical expertise. • More pressing business imperatives. • Lack of direction. • Fear of failure. • lack of knowledge and skills • lack of professional advice • uncertainty of outcome • certifiers/verifiers • Implementation and maintenance costs.
	Write a note on identifying environmental aspects and impacts within an organizational set up? An environmental aspect is described in BS EN ISO 14001 as an ―element of an organization's activities, products or services that interacts or can interact with the environment‖, from a ―life cycle perspective‖. According to ISO 14001, Life Cycle Assessment (LCA), relates to the environmental aspects and potential environmental impacts throughout a product's life cycle from raw material acquisition through production, use, end-of-life treatment, recycling and final disposal (ie cradle-to-grave). Identifying environmental aspects should take account of whether a particular activity, product or service causes: • air emissions, • effluent discharges • waste arisings • land contamination • use of resources (eg, water, fuel and natural resources and materials). The above aspects relate to those an organization can control. There are other aspects over which the organization may have ―control‖ or ―influence‖. These can include: • product design — to improve environmental performance or extend life of products • packaging — to minimize the use of material resources and energy • performance — of contractors (on site) and suppliers of goods and materials • land use — opportunities to improve biodiversity and wildlife habitats on site.

	Once the environmental aspect and the cause of that aspect have been identified, the next step is to identify the potential environmental impacts associated with it that may adversely affect the environment and human health. An environmental impact is described in BS EN ISO 14001 as a ―change to the environment, whether adverse or beneficial, wholly or partially resulting from an organization‘s environmental aspects‖. Using a live cycle approach, the principal types of impacts are those associated with: □ inputs, e.g., extracted resources used in the form of raw materials and energy — that can give rise to land degradation and depletion of natural resources □ outputs, e.g., emissions to air, discharges to water and waste arisings — that may cause pollution □ on-site activities and processes, eg storage, cleaning, assembly and packaging — that can also cause pollution or loss of materials and other resources.
3	Explain EMS and EMAS. **EMS – ENVIRONMENTAL MANAGEMENT SYSTEM** An **environmental management system** (**EMS**) is "a system and database which integrates procedures and processes for training of personnel, monitoring, summarizing, and reporting of specialized environmental performance information to internal and external stakeholders of a firm. The most widely used standard on which an EMS is based is International Organization for Standardization (ISO) 14001. Alternatives include the EMAS. An environmental management information system (EMIS) or Environmental Data Management System (EDMS) is an information technology solution for tracking environmental data for a company as part of their overall environmental management system. **An environmental management system (EMS):** □ Serves as a tool, or process, to improve environmental performance and information mainly "design, pollution control and waste minimization, training, reporting to top management, and the setting of goals" □ Provides a systematic way of managing an organization's environmental affairs □ Is the aspect of the organization's overall management structure that addresses immediate and long-term impacts of its products, services and processes on the environment. EMS assists with planning, controlling and monitoring policies in an organization. □ Gives order and consistency for organizations to address environmental concerns through the allocation of resources, assignment of responsibility and ongoing evaluation of practices, procedures and processes. □ Creates environmental buy-in from management and employees and assigns accountability and responsibility. □ Sets framework for training to achieve objectives and desired performance. □ Helps understand legislative requirements to better determine a product or service's impact, significance, priorities and objectives. □ Focuses on continual improvement of the system and a way to implement policies and objectives to meet a desired result. This also helps with reviewing and auditing the EMS to find future opportunities. □ Encourages contractors and suppliers to establish their own EMS. □ Facilitates e-reporting to federal, state and provincial government environmental agencies through direct upload. **EMAS - ECO-MANAGEMENT AND AUDIT SCHEME** • It is one of the Voluntary instruments of environmental protection, i.e., it positively motivates organizations for responsible approach and to improving its environmental performance beyond the legal requirements • Established by the European Union in order to detect and monitor the impacts of the activities of organizations on the environment and to publish information in the form of individual environmental statements • EMAS is a proactive approach of the company to monitoring, control and gradual reduction of the impact of the activities of the organization on the environment. • It is designed for organizations functioning in the private sector (joint stock companies, limited liability companies, etc.) as well as for organizations of state and public administration (ministries, municipalities, etc.) or its parts (producing unit, remote workplaces). • EMAS system is one of two ways which an organization can use to implement the EMS

	• The second tool used to implement the environmental management system is ISO • Both ways are similar to each other in many parts - environmental policy, continuous improvement, objectives and target values, programs, the implementation of the system and its operation, monitoring, and management review • EMAS, however, extends the ISO 14001 system, especially in terms of transparency when organizations with an established system, according to EMAS are obliged to publish environmental statements and hold open discussions with the public and other interested parties
4	Distinguish between pollution prevention and pollution control. **Pollution prevention** means avoiding or minimising the generation of wastes that produce pollutants, thereby restricting their release into the environment. **Pollution control** focuses on measures taken after wastes have been produced to limit the damage they may cause. It is often more difficult and expensive to control pollution after it has been released into the environment. Pollution prevention is better. It is better to try and prevent pollution from being created in the first place and it is more difficult and expensive to control pollution after it has been created. However, if pollution has been created, it should be controlled. Pollution prevention There are many methods for prevention of pollution. For water pollution the main priority is to improve water, sanitation and hygiene (WASH) provision. If everyone has access to effective sanitation (latrines) and there is no open defecation, this will prevent contamination of the environment with human faeces. Combined with this is the need for safe drinking water to be available for all. In addition, improving hygiene behaviour and ensuring that everyone washes their hands will radically reduce the impacts on human health from biological pollutants. In practice there needs to be a coordinated approach to improving all three – water, sanitation and hygiene – which is reflected in current WASH programmes. Air pollution can be improved by reducing the reliance on biomass fuels for domestic cooking, especially for indoor fires. Legislation to remove very old vehicles from the road or a requirement for regular maintenance and certification would also help. For pollutants derived from solid wastes, waste optimisation should be adopted. This principle is based on the notion that, ideally, waste should not be produced in the first place. However, this primary target is not always possible and so, if waste is produced, there is a range of options for waste management that form a waste hierarchy from most desirable to least desirable.  Figure: The waste hierarchy. Waste management options are listed in order of desirability, from most desirable at the top to least desirable at the bottom. The waste optimisation principle includes the application of what is known as the '3 Rs' – reduce, reuse and recycle. Reduction refers to the minimisation of waste at source by efficient use of raw materials and changing the technology for producing items. Reuse means using an item more than once, for example, the use of plastic bottles for collecting water. Recycling refers to the use of discarded materials as raw materials that are taken back into the factory process. The use of discarded and broken bottles in a glass factory to make new glass bottles is an example of recycling. The waste hierarchy also includes recovery of materials or energy, for example through composting or incineration. Composting is a good example of recovering materials from waste organic matter that can be then used to improve soil in a constructive way rather than allowing the decomposition process to cause pollution by careless disposal. The concept of waste optimisation is applied in industries through the process of cleaner production. Cleaner production aims to reduce the impact of industry on the environment through waste minimisation and the application of the 3 Rs, and other processes such as replacement of toxic chemicals with less toxic alternatives, and process and product modification to use less energy. Pollution control

	The different principles of pollution controls such as Polluter Pays Principle (PPP), User Pays Principle (UPP), Principle of Effectiveness and Efficiency, Precautionary Principle (PP), Principle of Responsibility, Principle of Participation, Principle of Proportionality are used to help control pollution. Pollution control is a term used in environmental management. It means the control of emissions and effluents into air, water or soil. Without pollution control, the waste products from overconsumption, heating, agriculture, mining, manufacturing, transportation and other human activities, whether they accumulate or disperse, will degrade the environment. In the hierarchy of controls, pollution prevention and waste minimization are more desirable than pollution control. In the field of land development, low impact development is a similar technique for the prevention of urban runoff. Practices adapted for pollution control in general • Recycling • Reusing • Waste minimisation • Mitigating • Preventing • Compost Pollution control devices • Air pollution control o Thermal oxidizer • Dust collection systems o Baghouses o Cyclones o Electrostatic precipitators • Scrubbers o Baffle spray scrubber o Cyclonic spray scrubber o Ejector venturi scrubber o Mechanically aided scrubber o Spray tower o Wet scrubber • Sewage treatment o Sedimentation (Primary treatment) o Activated sludge biotreaters (Secondary treatment; also used for industrial wastewater) o Aerated lagoons o Constructed wetlands (also used for urban runoff) • Industrial wastewater treatment o API oil-water separators o Biofilters o Dissolved air flotation (DAF) o Powdered activated carbon treatment o Ultrafiltration • Vapor recovery systems • Phytoremediation
5	Give stream classifications. Explain how stream standards influence stream classifications. A designated best use classification of streams was evolved by the Central pollution control board in its report entitled Scheme for Zoning and Classification of Indian Rivers, Estuaries and Coastal Waters (ADSORBS/3/1978/-79). The central pollution control board classified the inland surface waters into five categories (A to E) on the basis of designated-best-use. The principal concern here is the end use to which the water may be put to by man. The classification has been made in such a way that the water quality requirement becomes progressively lower from A to E. Besides, the water quality of any one of the five categories also satisfies the requirements of categories lower than the chosen one. An area or stretch of a body may be subjected to a number of uses. The area or the stretch is designated by that particular use which demands the highest/purest quality is the best possible way the Designated-best-use can be defined. The existing quality status is not the guiding factor. The quality-based use of this stretch of the river may belong to a lower category (ADSORBS/4/1980-81). The limits of tolerance adopted by the Indian Standards Institution (1982) for the five categories were in a slightly modified form of the Central Board's

parameters. The system of classification based on designated-best-use for fresh and saline waters are quoted below (ADSORBS/2/1980-84,/4/1980-81 AND/7/1983-84).

FRESH WATERS

Designated best uses	Classifications
Drinking water source without conventional treatment but after disinfection	A
Outdoor bathing, swimming and water contact sports.	B
Drinking water source with conventional treatment followed by disinfection	C
Propagation of wild life and fisheries.	D
Irrigation, industrial cooling and controlled waste disposal	E

6 Define benchmarking and explain the three distinctive types of benchmarking.

Benchmarking is the process of improving performance by identifying, understanding, adapting and implementing best practices and processes that are found inside and outside a company. It involves the creation of partnerships to exchange information on processes and measurements, resulting in the setting of realistic improvement goals. Effective benchmarking is a process of continuous improvement. Benchmarking is a framework within which performance indicators and the best practices are examined in order to determine areas where the company performance can be improved. Although most benchmarking initiatives concern financial and management issues, environmental benchmarking is becoming a major element in the environmental management of companies.

Environmental benchmarking is an environmental management tool that can provide a substantial contribution to the improvement of environmental performances by facilitating the identification of the gap between company performance and an optimal performance. It helps the company's management to find out how to continuously and exactly monitor the development of the company's environmental impacts in the chosen sector and to find relationships between the environment, the economy and society and to transform them into Key Performance Indicators (KPIs) for the measurement of environmental performance.

The scope of environmental benchmarking should include all areas of the given company's activities, and not be restricted solely to those activities that have an obvious environmental impact. Therefore, it may include an assessment of Environmental Management Systems (EMS), management performance, Environmental Management Accounting (EMA), resource and waste management, product environmental quality, environmental education and training, customer relations and emergency response.

Benchmarking Systems – three types

The benchmarking process is a series of actions, steps, functions, or activities that bring about an end or a result: the identification and importance of best practices for the improvement of EP. There are dozens of sources which describe the benchmarking process. It is called by some "the nine-step benchmarking process"

Benchmarking is wheel on process/continuous process