

Roll No



PRESIDENCY UNIVERSITY BENGALURU

SCHOOL OF ENGINEERING MID TERM EXAMINATION - DEC 2023

Semester : Semester V - B.Tech CIV - 2021

Course Code : CIV2043

Course Name : Sem V - CIV2043 - Urban Sanitation and Hygiene

Program : B.Tech. Civil Engineering

Date : Oct 31, 2023

Time : 4:44 AM - 4:44 AM

Max Marks : 50

Weightage : 50%

Instructions:

- (i) Read all questions carefully and answer accordingly.
- (ii) Question paper consists of 3 parts.
- (iii) Scientific and non-programmable calculator are permitted.
- (iv) Do not write any information on the question paper other than Roll Number.

PART A

ANSWER ALL THE QUESTIONS

(5 X 2 = 10M)

1. The purpose of urban sanitation is to reduce risks to human health by managing factors in the urban environment which can contribute to health problems. Give any four components of sanitation.

(CO1) [Knowledge]

Model Answer



2. Environmental Impact Assessment (EIA) is an early warning process that verifies the enforcement of environmental policies. Define EIA.

(CO1) [Knowledge]

Model Answer

EIA can be defined as the systematic identification and evaluation of the potential impacts of the proposed project, plans, programs or legislative actions relative to the physical-chemical, biological, cultural and socioeconomic components of the total environment.

3. Sanitation systems aim to protect human health by providing a clean environment. Define sanitation.

(CO1) [Knowledge]

Model Answer

4. To effectively utilise solid wastes as fuel or for other purposes, it is crucial to understand the different chemical characteristics of municipal waste. List any four chemical characteristics of municipal waste.

(CO1) [Knowledge]

- 1.Lipids**
2.Carbohydrates
3.Proteins
4.Natural fibres
5.Synthetic organic materials (Plastics)
6.Non-combustibles
7.Heating value
8.Ultimate analysis Proximate analysis

Model Answer

5. A Trap is design to hold some quantity of water. This water is called as trap seal acts as a barrier to prevent back flow of flow of air (foul gases). List the principle points of a plumbing trap.

(CO2) [Knowledge]

Model Answer **1.Crown weir: 2.Dip: 3.Seal:****PART B****ANSWER ALL THE QUESTIONS****(2 X 10 = 20M)**

6. All Indian cities and towns become totally sanitized, healthy and liveable and ensure and sustain good public health and environmental outcomes for all their citizens with a special focus on hygienic and affordable sanitation facilities for the urban poor and women. Enlist the core principles of National Urban Sanitation Policy and explain any two of it in detail.

(CO1) [Comprehension]

- **Institutional Roles and Responsibilities**
- **Awareness Generation for changing mindsets**
- **City-wide Approach**
- **Technology Choice**
- **Reaching the un-served and poor**
- **Client focus and Generation of Demand**
- **Sustained Improvements**

Sanitation Task Force

Mobilize Stakeholders: The first step in making the cities 100% sanitized is to elevate the consciousness about sanitation in the mind of municipal agencies, government agencies and most importantly, amongst the people of the city.

1. Constitute a multi-stakeholder City Sanitation Task Force comprising representatives from

- ü **Agencies directly responsible for sanitation including on-site sanitation, sewerage, water supply, solid waste, drainage, etc including the different divisions and departments of the ULB, PHED, etc;**

Model
Answer

- ü **Agencies indirectly involved in or impacted by sanitation conditions including representatives from the civil society, colonies, slum areas, apartment buildings, etc,**
- ü **Eminent persons and practitioners in civic affairs, health, urban poverty,**
- ü **Representatives from shops and establishments,**

Capacity Building & Training

The role of capacity building and training is crucial in achieving and sustaining 100 % sanitation. Because of the historical neglect, the what and how to do of sanitation is limited to a minuscule group of personnel in ULBs / service provider agencies – even these skills run down over time due to little scope for application and sometimes the narrow nature of the specific job. Therefore, two broad kinds of interventions are necessary:

Ø **Orientation, building of skills and aptitude for carrying out different types of activities in respect of total sanitation**

Ø **Designing and implementing working systems in ULBs or service provision agencies to provide the right kind of structures, linkages and organizational systems and environments that utilize the skills and perspectives imparted above.**

Note: Enlisting-4 marks and Explanation 3marks each

7. A trap is a depressed or bent sanitary fitting which, when provided always remains full of water, thus maintaining a water seal. It prevents the passage of foul gases. Write the classification of traps based on shape and use and explain any three traps based on use.

(CO2) [Comprehension]

Classification of traps**(a) Classification according to shape**

- P-Trap
- Q-Trap
- S-Trap

(b) Classification according to use

- Nahni or Floor Trap
- Gully Trap
- Intercepting Trap

P-Trap

This resembles the shape of letter P, in which the legs are at right angles to each other.

Q-Trap

Also known as half-S-trap. This resembles the shape of letter Q, in which two legs meet at an angle other than a right angle.

S-Trap

This resembles the shape of letter S, in which both the legs are parallel to each other, discharging in the same direction.

Gully Trap: • Provided at the external face of the wall disconnecting main drainage from the waste water from kitchen, Bath etc.

- Prevents backflow of fowls air of main house drainage to enter inside the building
- Made up of Cast iron or glazed stoneware
- Fitted in a small masonry enclosure.
- Grating is also provided at the top.

Intercepting / Disconnecting Trap

Model

- This trap is provided at the junction of the house drain and street (public) sewer.

Answer

- This trap is provided to disconnect house drain from the public sewer.
- Made up of glazed stoneware and has an opening at top called Rodding Arm or Cleaning Eye.
- This Cleaning eye is closed with tight fitting plug – opened only in case of cleaning of the trap.
- Has a deeper seal than normal (less than 100mm)

Bottle Traps: Mainly for Wash basins and Kitchen sinks or appliances without built in traps

- Bottle traps are Cast in one piece - in brass with copper content not less than 56%
- Appearance – chromium plated or nickel plated – now available in PVC
- Both the internal and external surfaces should be smooth and clean.
- Traps are provided with detachable bowls or cleanout plug.
- 32 to 40mm Dia in size

Grease Trap

• Provided in large hotels, restaurants or industries producing large quantity of greasy waste. • to remove grease before discharging into main drainage.

- Being sticky in nature, greasy matters induce deposition of solids – may result in the blockage.
- This is a small masonry or cast iron chamber with a T or Bent pipe as a outlet. • The velocity of waste water get reduced on entering the trap due to large C/S area – this separates oily matters from waste.
- Oily matters appears as floating and is removed periodically with the help of M S tray. drainage system.

Silt Trap

- Large and heavier silt particles enter into the house drain due to practice of washing utensils with ashes and pulverized brick bat.
- Transportation of these silt particles requires higher velocity and steeper slopes.
- This trap is provided to remove silt from the drain before discharging into the house

ANSWER THE FOLLOWING QUESTION**(1 X 20 = 20M)**

8. a) A survey by the Central Pollution Control Board (CPCB) found that 351 river segments on 323 different rivers throughout the nation were polluted. Describe the Initiatives taken up by the Government of India for wastewater Management. (10 marks)
- b) India took a defining step to curb pollution caused by littered and unmanaged plastic waste on July 1, 2022, when a ban was imposed on the manufacture, import, stocking, distribution, sale and use of identified single-use plastic items, which have low utility and high littering potential. Explain the Plastic Waste Management Amendment, 2021 (10 marks)

(CO1) [Application]

Initiatives by the Government**Water Act of 1974 (Prevention and Control of Pollution)**

Ø It was the nation's first legislative action to deal directly with the problem of water contamination and conservation. This Act addresses wastewater discharge as a pollution issue.

Ø The establishment of Central and State Pollution Control Boards (SPCB) tasked with the prevention and management of water pollution is made possible by this Act.

Ø SPCBs review and determine standards for wastewater treatment facilities, trade effluents, and sewage and trade effluents.

Water (Prevention & Control of Pollution), Act of 1974, and Environment (Protection) Act of 1986

According to the provisions of these Acts, industrial units must set up effluent treatment facilities (ETPs) and treat their effluents to meet the specified environmental standards before releasing them into rivers and other bodies of water.

National River Conservation Plan

Among the pollution control measures undertaken under the NRCP are the installation of sewerage systems to capture and divert raw sewage entering rivers through open drains, as well as the construction of Sewage Treatment Plants (STPs) to treat the diverted sewage.

Model
Answer

Plastic Waste Management Amendment, 2021

Ø The Ministry of Environment, Forest and Climate Change (MoEFCC) has introduced a new set of guidelines – Plastic Waste Management Amendment Rules, 2021. That replaced the existing Plastic Waste Management Rule, 2016 (PWM Rules, 2016), amended in 2018.

Ø

Ø Prime Minister Narendra Modi stated in June 2018 that India will ban SUP by 2022.

Ø The ban got its strength during the fourth United Nations Environment Assembly (UNEA) in March 2019, where India was giving two resolutions, one on SUP and the other on Sustainable Nitrogen Management.

Ø This also helped in acknowledging the urgent need for the global community to focus on this critical problem and was also a significant step for India.

Ø India engaged constructively and embarked on the journey to end plastic pollution by taking sound and effective measures.

Ø Our country is striving hard to overcome the challenges that occur in plastic waste management.

Ø India sends a message of hope and optimism that humankind needs to not only take an active part in order to deal with the causes of climate change but also find effective solutions to reduce the threat to the environment.

Note: 10 marks each