

12221

11122

3 Hours / 100 Marks

Seat No.

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- Instructions* – (1) All Questions are *compulsory*.
- (2) Answer each next main Question on a new page.
- (3) Illustrate your answers with neat sketches wherever necessary.
- (4) Figures to the right indicate full marks.
- (5) Assume suitable data, if necessary.
- (6) Use of Non-programmable Electronic Pocket Calculator is permissible.
- (7) Mobile Phone, Pager and any other Electronic Communication devices are not permissible in Examination Hall.

Marks

1. a) Attempt any **THREE** of the following: 12
- (i) Define ecosystem and state its types.
- (ii) List eight types of pipes used for conveyance of water.
- (iii) State any four objects of sewage treatment.
- (iv) State any four characteristics of waste from dairy plant.

P.T.O.

- b) Attempt any **ONE** of the following: 6
- (i) State the causes and effects of pollution on environment.
 - (ii) List any four characteristics of drinking water, describe any one in detail.
2. Attempt any **FOUR** of the following: 16
- a) Define noise pollution and enlist sources of noise pollution.
 - b) Enlist methods of disposal of solid waste and explain any one method.
 - c) State the necessity and importance of rural sanitation.
 - d) Draw the layout of sanitary plumbing and sewage collection of residential building.
 - e) Draw neat sketches of 'P' and 'Q' traps.
 - f) State the permissible limits for pH, turbidity, Hardness and chlorides for drinking water as per Indian standards.
3. Attempt any **FOUR** of the following: 16
- a) State the objective and methods of aeration.
 - b) Define the term 'BOD' and state its importance in sewage analysis.
 - c) Draw a layout plan of treatment plant for sugar industry effluent.
 - d) What is global warming? State four effects of global warming on environment.

- e) Explain with neat sketch drop manhole.
- f) Define the term 'co-agulation'. State four types of coagulants used in water treatment plant.

4. a) Attempt any THREE of the following: 12

- (i) State any four advantages of rapid sand filter over slow sand filter.
- (ii) Explain with sketch working of trickling filter.
- (iii) Explain the importance of 'vermiculture'.
- (iv) Compare one pipe system and two pipe system of plumbing.

b) Attempt any ONE of the following: 6

- (i) Draw a general layout of water treatment plant and explain purpose of each component.
- (ii) Draw a general layout of sewage treatment plant and explain purpose of each component.

5. Attempt any FOUR of the following: 16

- a) Draw a layout of sanitary plumbing for one pipe system.
- b) Explain with sketch Aqua Privy.
- c) What are the constituents of dry refuse. Explain any two methods of disposal of dry refuse.
- d) Define COD and state its significance.
- e) List different types of intake and explain any one with sketch.
- f) Explain the procedure of lowering and laying of sewers.

P.T.O.

6. Attempt any FOUR of the following:**16**

- a) Define the term 'self cleaning velocity' and state factors affecting this velocity.
 - b) State functions of :
 - (i) Air relief valve
 - (ii) Non return valve
 - c) Name any four types of pipe joints.
 - d) Explain the importance of Sant Gadge Baba, Swachhatha Abhiyan.
 - e) Explain with sketch activated sludge process.
 - f) Draw sectional view of oxidation pond.
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