

**M.TECH/RE/2<sup>ND</sup> SEM/REEN 5242/2018**  
**ENERGY & ENVIRONMENTAL IMPACT ANALYSIS**  
**(REEN 5242)**

**Time Allotted : 3 hrs**

**Full Marks : 70**

*Figures out of the right margin indicate full marks.*

*Candidates are required to answer Group A and  
any 5 (five) from Group B to E, taking at least one from each group.*

*Candidates are required to give answer in their own words as far as  
practicable.*

**Group - A**  
**(Multiple Choice Type Questions)**

1. Choose the correct alternative for the following: **10 × 1 = 10**
- (i) As per the CPCB standard, for bathing water (organized) total coliforms organism MPN/100ml shall be  
(a) > 500 but <1000 (b) 0  
(c) 500 or less (d) >1000.
- (ii) The theme of World Environment Day 2018 is related to  
(a) desert & desertification (b) beat the plastic pollution  
(c) seven billion dreams. one planet (d) think, eat, save.
- (iii) A plant manufacturing solar PV module is considered as  
(a) red category industry  
(b) white category industry  
(c) green category industry  
(d) orange category industry.
- (iv) Grey water is also termed as  
(a) sewage (b) river water  
(c) sullage (d) spring water.
- (v) Identify the metal not associated with E-waste pollution.  
(a) Lead (b) Cadmium  
(c) Chromium (d) Calcium.
- (vi) Identify the parameter which need not be considered in EIA report.  
(a) Religious belief of community (b) Air quality  
(c) Water quality (d) Flora & Fauna.

- (vii) A permit which allows a country to produce a certain amount of carbon emissions and which can be traded if the full allowance is not used is known as  
 (a) carbon footprint (b) carbon flip bond  
 (c) carbon credit (d) none of the above.
- (viii) Mercury pollution is associated with  
 (a) LED light (b) CFL  
 (c)  $\gamma$ -ray (d) nichrome filament light.
- (ix) Rotating Biological Disk Contactor is  
 (a) extended aeration system (b) trickling filter  
 (c) canna species (d) earthworm.
- (x) Identify the Act which is concerned with genesis of Environmental Statutory Authority in India  
 (a) Water Act 1974  
 (b) Bengal Smoke Nuisance Act 1905  
 (c) Air Act 1981  
 (d) E-waste (Management) Rules 2016.

**Group - B**

2. (a) Discuss in brief the significance of Water Act 1974.  
 (b) Enumerate the steps of obtaining consent to establish a solar Power Plant.  
**6 + 6 = 12**
3. (a) Delineate few steps for reducing Carbon Foot Print by use of renewable energy devices.  
 (b) A captive power plant uses 2,00,000 litres of furnace oil (specific density 0.97) per month. If for one million litres of oil used per year, the particulate matter emitted is 3.0 tonnes per year, SO<sub>2</sub> emitted is 59.7 tonnes per year, NO<sub>x</sub> emitted is 7.5 tonnes per year, hydrocarbons emitted are 0.37 tonnes per year, and carbon monoxide emitted is 0.52 tonnes per year, calculate the height of the chimney required to be provided for safe dispersion of the pollutants.  
**6 + 6 = 12**

**Group - C**

4. The ultimate BOD of a flowing stream below a sewage outfall of a solar PV manufacturing establishment is 60.0 mg/L and the DO is at the saturation

value of 10.0 mg/L. The deoxygenation rate coefficient is 0.30/day and reaeration rate coefficient is 0.90/day. The stream is flowing at a speed of 80 kms/day. The only source of BOD on this stream is this outfall.

Find the critical distance downstream at which the DO is a minimum? Find the minimum DO?

If a wastewater treatment plant is to be built, what fraction of the BOD would have to be removed from the sewage to assure a minimum of 5.0 mg/L of oxygen everywhere downstream.

**(3 + 3 + 6) = 12**

5. Discuss the construction and operation of a Rotating Biological Disk Contactor required to be set up for a medium sized Renewable Energy Industry with a workman force of 1000 per day with a neat sketch.

**(8 + 4) = 12****Group - D**

6. (a) Design an E-waste management plan following the statutory provisions of our country with a block diagram.  
 (b) What do you mean by biomass energy potential? Sketch the standard biomass energy paths.  
**6 + (1 + 5) = 12**
7. (a) Write down the advantages and disadvantages of using Incinerator.  
 (b) Discuss a nuclear waste management plan and mode of its execution.  
**6 + (2 + 4) = 12**

**Group - E**

8. Delineate a case study on Energy Saving in connection with operation of a desalination plant in coastal area using solar PV/hybrid System.  
**12**
9. (a) Write technical notes on rapid EIA and comprehensive EIA with examples.  
 (b) Discuss the preliminary steps for obtaining ISO 14000.  
**6 + 6 = 12**