Roll No. .....

NATIONAL INSTITUTE OF TECHNOLOGY, KURUKSHETRA

Month and Year of Examinations: **December, 2019**

Programme: **B.Tech. 1st Year** Semester: **1st**

Subject: **Energy & Environmental Science (Common to all Branches and Reappears)**

Course Code: **CHIR11**

Maximum Marks: **50** Time allowed: **03 hours**

Note:

1. The Question Paper is printed on the back side of this page also.
2. The candidates are required to attempt all five questions in the single Answer Sheet provided. They must also write their Sub-section on the Top RHS Corner of the Answer Sheet.
3. The candidates, before starting to write the answers, should ensure themselves that they have been delivered the Question Paper of right course No. and right subject title.
4. Unless stated otherwise, the Symbols have their usual meanings in context with the Subject.

<table>
<tr><th>Q. No.</th><th>Description</th><th>Marks</th></tr>
<tr><td>I</td><td>(a) Describe the reason(s), why is freshly prepared starch solution (used as indicator in the estimation of Dissolved Oxygen by Winkler's method) added in one lot and that too towards the end point and not in the beginning of the titration?
(b) Photo autotrophs synthesize their food through the process of photosynthesis. However, the chemo autotrophs (for example- sulphur bacteria) are known to synthesize their food in the absence of light in the depth of ocean. Illustrate your answer for the conversion of CO_2 into organic compounds with chemical reactions involved therein in both the cases.
(c) 25 mL of a sample for COD analysis was treated with 15 mL of acidified standard $K_2Cr_2O_7$ solution. The resulting solution consumed 10 mL of 0.1 N Mohr's salt (FAS) solution. Under identical conditions, 15 mL of the same $K_2Cr_2O_7$ solution, diluted with 25 mL of distilled water, consumed 15 mL of above FAS solution. Calculate the COD (ppm) of the above sample.</td><td>3
3
4</td></tr>
<tr><td>II</td><td>(a) State and explain the term Biodiversity. Discuss the consumptive use value and productive use value of diversity.
(b) 20 mL of a sewage sample was diluted to 2 L. The diluted sample was collected in two BOD bottles (300 mL capacity) and named as Bottle-A and Bottle-B. The Bottle-A was incubated for 5 days at 20 °C. As per the well established procedure laid down, the Dissolved Oxygen of the diluted solutions of both the bottles was estimated. The following observations were made:
<table>
<tr><td>SN</td><td>Volume (mL) of—</td><td>Bottle-A</td><td>Bottle-B</td></tr>
<tr><td>1.</td><td>Diluted sample taken</td><td>100</td><td>100</td></tr>
<tr><td>2.</td><td>0.0125 N hypo consumed</td><td>5</td><td>10</td></tr>
</table>
Calculate the BOD (ppm) of the sample.
OR
Define renewable energy. Discuss the working principle of solar cell.
(c) Name two chemical compounds whose excessive presence is responsible for causing eutrophicaion of ponds/lakes.</td><td>5
3
2</td></tr>
<tr><td>III</td><td>(a) What is meant by acid rain? How does it form? Describe any two major impacts of acid rain. OR
How will you define pollution as per Water Act 1974 (Prevention & Control of</td><td></td></tr>
</table>

	Pollution). What are the salient features of this Act? (b) Explain the mechanism for the photochemical smog formation.	5 5
IV	(a) Discuss the salient features of hot spots of biodiversity. Name any two hot spots found in our Country (no description is required). (b) What is non-renewable energy? Give its two examples. (c) Explain the ozone layer depletion. Discuss its ill-effects on the living beings. Define the Unit for the measurement of the amount of atmospheric ozone. ***OR*** What is the role of Environmental Legislation in Environmental Protection?	4 2 4
V	(a) What are minerals? Write two examples each of metallic minerals and non-metallic minerals. Mention some significant environmental damages caused by mining activities. (b) Answer the following in brief: (i) The date on which is the World Environment Day celebrated. (ii) How much should be the minimum % of geographical area of a country reserved for forest? (iii) Name the States of our Country where the Satluj-Yamuna Link (SYL) has always been a bone of contention (dispute) from the past several decades. (iv) Name the anion that causes Blue Baby Syndrome. (v) Name the type of Pyramid, which is always upright. (vi) Name the tree from whose bark is quinine obtained. (vii) Name any one Indian Environmentalist who has been awarded Nobel Peace Prize. (viii) The missing species (X) in the following Grassland Ecosystem Food Chain may be: Grass→X→Frog→Snake→Hawk. (ix) Write the catagory of the species which are restricted only to a particular area. (x) The odorless CO_2 gas, and another pungent smell gas (**B**), when passed separately through a freshly prepared colourless lime water turn milky. If any one of these gases is passed for a longer time, the milky colour disappears. The gas (***B***) reduces the acidified $K_2Cr_2O_7$ solution. Identify the gas(***B***).	5 0.5 x 10