

M.Sc. Examination, 2018

Semester-I

Environmental Science

Course : MEC-11

(Fundamentals of Environmental Science)

Time : 3 Hours

Full Marks : 40

Questions are of value as indicated in the margin

Answer question No. **1** and **any four** from the rest.

1. Write short notes on **any four** of the following. 2×4=8
 - a) Bacterial flagella
 - b) Type I and Type II error
 - c) UNFCCC
 - d) WSSD
 - e) Nernst Equation
 - f) Electromotive force (emf)
 2. a) Define life support system.
b) Illustrate the relationships among various components of environment and tie-in with technosphere. 2+6=8
 3. Write notes (**any two**) on the followings: 4×2=8
 - a) Bacterial growth curve
 - b) Okazaki fragments
 - c) Techniques for control of microbial growth
 4. a) From a random sample of $n = 36$ New Delhi Civil Service (NDCS) personnel, the mean age and the sample Standard Deviation were found to be $\bar{X} = 40$ years and $\sigma_x = 4.5$ years respectively. Construct a 95% confidence interval for the mean age of NDCS personnel. (Table value of 'Z' at 95% confidence is 1.96).
b) The specimen of copper wires drawn from a large lot has the following breaking strength in Kg wt) : 578, 572, 570, 568, 572, 578, 570, 572, 596, and 544 Test (using Students 't' statistics) whether the mean breaking strength of the lot may be taken to be 578 kg. Test at 5% level of significance. (Tabulated value of 't' at 5% level of significance with 9 degrees of freedom is 2.262). 4+4=8
 5. What do you understand by lithophile? Explain the geochemical classification of elements. 2+6=8
 6. Write notes on the following (**any four**) : 2×4=8
 - a) Nebular hypothesis
 - b) Outer and Inner core
 - c) Principles of Earth System Science
 - d) Order of relief
 - e) Composition of the hydrosphere
 7. a) Describe briefly the origin and evolution of Earth's atmosphere.
b) Discuss the fluctuations of CO₂ concentration in the atmosphere in different time scales. 4+4=8
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