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Program: B. Sc. In IPE
Semester: 4th

Date: 05 May 2023
Time: 10.00 a.m. to 01.00 p.m.

ISLAMIC UNIVERSITY OF TECHNOLOGY (IUT)
ORGANISATION OF ISLAMIC COOPERATION (OIC)
DEPARTMENT OF MECHANICAL AND PRODUCTION ENGINEERING

Semester Final Examination
Course Number: IPE 4405
Course Title: Industrial Law and Management

Summer Semester: 2021-2022
Full Marks: 150
Time: 3 Hours

There are **6 (Six) Questions**. Answer **all the Questions**. The symbols have their usual meanings. Marks of each Question and corresponding CO and PO are written in brackets. Assume reasonable values, if necessary.

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1. (a) Explain the conservations of natural resources and environment. Briefly describe the ways of conserving the environment. (6)
(CO1)
(PO1)
 - (b) State the seven categories of pollution based on the basic law for environmental pollution control. Briefly explain them with major causes, major symptoms, and examples on practical applications. (9)
(CO1)
(PO1)
 - (c) Analyze the environmental conservation in terms of its causes, importance, and methodology. (10)
(CO2)
(PO2)
 2. (a) Briefly describe the important hazardous air pollutants in terms of their common sources and human health risks. (6)
(CO1)
(PO1)
 - (b) Describe industrial air pollution. Briefly explain its causes, sources, and controlling methods. (9)
(CO1)
(PO1)
 - (c) Analyze the criteria pollutants in terms of their common sources, maximum acceptable concentrations, and effects in the context of present practical interpretations. (10)
(CO2)
(PO2)
 3. (a) Analyze the industrial air pollution meteorology in terms of its characteristics, types, and examples on the practical applications. (10)
(CO2)
(PO2)
 - (b) Illustrate the eight types of air pollution control systems and equipment in terms of their characteristics, examples, and effects on the human body and the environment. (15)
(CO2)
(PO2)

4. (a) Explain indoor air pollution, its causes, and effects on the environment. (6)
(CO1)
(PO1)
- (b) Analyze the common indoor air pollutants in terms of their characteristics and controlling ways for mitigation. (9)
(CO2)
(PO2)
- (c) Illustrate the eight types of most significant sources of indoor air pollution in the context of modern household systems. (10)
(CO2)
(PO2)
5. (a) Explain the meaning of water pollution. Briefly discuss the different types of water pollution. (6)
(CO1)
(PO1)
- (b) Analyze the major causes and effects of water pollution on the human body and the environment. (9)
(CO2)
(PO2)
- (c) Illustrate the ten types of significant solutions to combat water pollution in the context of modern society. (10)
(CO2)
(PO2)
6. (a) Evaluate the maximum ground level concentration of pollutants, C_{max} in $\text{mg}\cdot\text{m}^{-3}$, in a city where the concentration of pollutants in the measuring section of exhaust duct, $C_{pe} = 10 \text{ mg/m}^3$, diameter of the outlet of the source of air pollutant, $D = 10 \text{ cm}$, average speed of the effluent gas output from the mouth of air pollutant source, $W_0 = 1 \text{ m/s}$, height of the measuring concentration, $H = 50 \text{ m}$, ambient temperature, $T_\infty = 35^\circ\text{C}$, temperature of the effluent gases, $T_s = 85^\circ\text{C}$, coefficient depending on the distribution of air temperature over the height of the troposphere, $A = 1$, coefficient due to particle size, $F = 1$, coefficient due to emission, $m = 1$, coefficient due to emission, $n = 1$, and coefficient due to local landscape, $\eta = 1$. (10)
(CO3)
(PO4)
- (b) The water quality using the standard Water Quality Index (WQI) is to be measured for a river water in Bangladesh where dissolved oxygen (DO) is 20, biochemical oxygen demand (BOD) is 15, chemical oxygen demand (COD) is 30, total suspended solids (TSS) is 200, ammoniacal nitrogen (AN) is 2, and pH is 10. Comment on the overall status of the river of water in terms of the value of WQI, its class, and its quality. (15)
(CO3)
(PO4)

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