

Roll No: _____

JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT
TEST -3 EXAMINATION- Dec 2018
B.Tech 7th Semester

COURSE CODE: 10B13CE742

MAX. MARKS:35

COURSE NAME: Air Pollution Monitoring and Control

COURSE CREDITS: 3

MAX. TIME: 2 Hrs

Note: All questions are compulsory. Carrying of mobile phone during examinations will be treated as case of unfair means. Assume all necessary data suitably.

1. Determine the effective height of a stack, given the following data :
 - (a) Physical stack is 170 m tall with a 1.25 m inside diameter
 - (b) Wind velocity is 5.17 m/s
 - (c) Air temperature is 18 °C
 - (d) Atmospheric pressure is 1000 millibars
 - (e) Stack gas velocity is 8.75 m/s
 - (f) Stack gas temperature is 128 °C

(3)
2. A filter bag house must process 15 m³/sec of waste gas. The bag house is to be divided into 8 sections of equal cloth area so that one section can be shut down for cleaning and repairing while the others continue operating. Lab analysis indicates an air to cloth ration 9 m³/m²min cloth will provide sufficient treatment. The bag serves 0.25 m in diameter and 7 m long. Determine the no of bags ant the physical arrangement to meet the above requirement.

(4)
3. Name and describe the control devices developed for control of automobile pollution

(2)
4. A parcel of dry air rising over a grass fire has a temperature of 60° C at 10 m. Assume a dry adiabatic lapse rate; determine the temperature at 200 m.

(1)
5. An electrostatic precipitator is to be constructed to remove fly ash particles for stack gases flowing at 10 cu.m/sec. Analysis of a similar system shows that the drift velocity can be taken as, $w = 300000 \times d_p$ m/sec. Determine the plate area required to collect 0.5 micron particle with 99.9% efficiency.

(4)
6. Define primary pollutants and secondary pollutants with examples. Define dust, smokes, mists, fumes.

(3)
7. Define and explain the relationship between ambient and adiabatic lapse rates and atmospheric stability. What is meant by effective stack height and what factors control this?

(4)
8. Sketch and explain different kinds of plumes depending upon different environmental conditions.

(4)
9. Discuss the merits and demerits of the following:
 - (a) Electrostatic Precipitator
 - (b) Cyclone
 - (c) Settling Chamber

(6)
- 10 Describe the sources, sinks and effects of carbon dioxide.

(4)