

**M.Sc. DEGREE I SEMESTER EXAMINATION IN ENVIRONMENTAL TECHNOLOGY,
DECEMBER 2006**

ENV/ENB 2103 PHYSICAL PROCESSES IN THE ENVIRONMENT

Time : 3 Hrs.

Maximum marks : 50

PART – A

(25 Marks)

I. Fill in the blanks :

(5 x 0.5 = 2.5)

1. Axis of the Earth is tilted at an angle of -----
2. Air temperature is normally measured at a height of ----- from the ground.
3. Coriolis force non-exist at -----
4. Temperature -----with height in the Stratosphere
5. Acceleration due to gravity is minimum at ----- over the Earth.

II State the following is TRUE or FALSE

(5 x 0.5 = 2.5)

1. Mean reflectivity of the Earth is 50%
2. Deserts are seen normally around 30 degree latitude region.
3. Moist air is dense than the dry air
4. Centrifugal force is maximum at the equator.
5. In a cyclonic flow the low pressure region is towards the right in northern hemisphere.

III. Define the following:

(5 x 1 = 5)

1. Weather
2. Insolation
3. Archipelago
4. Glacier
5. Isobar

IV. Distinguish between the folloing

(4 x 1.5 = 6)

1. Land and sea breezes
2. Isothermal and adiabatic processes.
3. Absorption and Reflection
4. Geostrophic Wind and Gradient Wind

V. Write short notes on any ONE of the following

(1 x 3 = 3)

1. Atmospheric stability
2. Ground water exploitation

VI. Write an essay on any ONE of the following

(1 x 6 = 6)

1. Meteorological factors affecting air pollution
2. Hydrological processes
3. Anthropogenic and natural effects on climate change

(Turn over)

PART – B**(25 Marks)**

*Answer all the questions
All questions carry equal marks*

VII. Choose the most appropriate answer from the following (10 x 0.5 = 5)

1. The sun is directly overhead at Cochin (latitude 10°N):
 - a. *once a year*
 - b. *twice a year*
 - c. *four times a year*
 - d. *never*

2. Lines connecting points of equal pressure is called:
 - a. *isobars*
 - b. *millibars*
 - c. *contours*
 - d. *isotherms*

3. Which surface ocean current transports warm water to higher latitudes?
 - a. Labrador Current
 - b. Falidand Current
 - c. Gulf Stream
 - d. West Wind Drift

4. Which of the following relationships best describes the gas law?
 - a. *pressure is proportional to density times temperature*
 - b. *density is proportional to pressure times temperature*
 - c. *temperature is proportional to density times pressure*
 - d. *temperature times pressure times density remains constant*

5. Which cloud is least likely to produce precipitation that reaches the ground?
 - a. *stratus*
 - b. *nimbostratus*
 - c. *cumulonimbus*
 - d. *cirrocumulus*

6. The order of the layers of the atmosphere from lowest to highest is:
 - a. *troposphere, stratosphere, mesosphere, thermosphere*
 - b. *stratosphere, troposphere, thermosphere, mesosphere*
 - c. *mesosphere, stratosphere, troposphere, thermosphere*
 - d. *thermosphere, stratosphere, mesosphere, troposphere*

(Contd...3)

7. Which of the following will increase in a rising parcel of air?

- a. *saturation vapor pressure*
- b. *relative humidity*
- c. *mixing ratio*
- d. *air temperature*

8. If the environmental lapse rate is 5°C per 1000 m and the temperature at the earth's surface is 25°C , then the air temperature at 2000 m above the ground is:

- a. 25°C
- b. 30°C
- c. 20°C
- d. 15°C

9. Which of the following conditions would be described as the most stable?

- a. *environmental lapse rate is 13°C per kilometer*
- b. *environmental lapse rate is 3°C per kilometer*
- c. *isothermal conditions*
- d. *an inversion*

10. The moisture content of the air can be determined using

- a. *a psychrometer.*
- b. *a thermometer.*
- c. *an anemometer.*
- d. *a barometer.*

VIII. Write notes on any FOUR of the following

(4 x 2.5 = 10)

- (a) Bergeron process.
- (b) Mountain winds and waves
- (c) Sedimentary rocks
- (d) Aquifers
- (e) Surficial geological process
- (f) Aerosols
- (g) Atmospheric visibility

IX. Elaborate upon any TWO of the following

(2 x 5 = 10)

- (a) Water conservation and budgeting
- (b) Monsoons over India
- (c) Air quality modeling
- (d) Gaussian plume model