

(4)

- (b) Explain global wind pattern with proper diagram.
6. (a) Explain the working of solar collector. Obtain the expression of Hottel-Whillier-Bliss equation for solar water heater.

OR

- (b) Explain the heat transfer and thermal insulation phenomena. What are fabric loss and verification loss in buildings?

M.Sc.-Phy.-IIS-(CBCT 306)

2016

ENVIRONMENTAL PHYSICS

Time : Three Hours] [Maximum Marks : 80

Answer from both the Sections as directed. The figures in the right hand margin indicate marks.

SECTION-A

1. Answer any four of the following : 4×4
- (a) Explain the concept of entropy. Let absolute entropy of 1 mole of pure water as ice at 0°C and as liquid at 0°C is 41J/k and 63 J/k respectively, then what will be entropy change ds . If Latent heat of fusion is 3.33×10^5 J/kg.
- (b) Explain how first law of thermodynamics governs energy transfer in metabolic processes.
- (c) Describe the structure and composition of atmosphere.
- (d) Explain why there is a possibility of loss of He and H_2 to space over a period of 10^9 years.

(2)

- (e) What is hydroelectric power ? If speed of water is v , then how much power will be available ?
- (f) Explain the wave power and its expression. How Slater Duck generator works ?

OR

2. Answer all the questions from the following : 2×8

- (a) What is second law of thermodynamics ?
- (b) State the Fourier law thermal conduction.
- (c) What is Black-body radiation phenomena ? Explain Stefan-Boltzmann Law ?
- (d) What is atmospheric aerosol ?
- (e) How ozone forms in atmosphere ?
- (f) What do you understand by Hadley cell, Ferrel cell and Polar cell ?
- (g) What are fossil fuels ?
- (h) Define critically factor k for nuclear chain reaction.

SECTION-B

Answer all the questions : 16×4

3. (a) Explain how laws of thermodynamics relate to the energetics of body.

OR

(3)

- (b) (i) Explain different mechanisms of energy transfer.
- (ii) Let a person is releasing radiant energy between 70 and 100W. calculate how much energy the person is radiating. Assuming that the emissivity for the human body is 0.5, with an average surface temperature of 35°C, that room temp. is 20°C, and body surface area is 1.8m².

4. (a) Explain the forces acting on air masses in atmosphere.

OR

- (b) (i) Explain the formation of cyclone and anticyclone.
- (ii) Calculate the geostrophic wind speed for a pressure gradient of 0.03 mb/km, assuming that the Coriolis parameter $f = 10^{-4}S^{-1}$.

5. (a) Explain the following forces acting on parcel of air in atmosphere :

- (i) Coriolis frictional force
- (ii) Gravitational force

OR