Pafe.3128   Food Storage Engineering (2+1)   Marks: 50
                                                                            Time: 2 hours

I   **State True or False**   **(10x1=10)**
1. Hypobaric storage uses higher pressure than atmospherics pressure.
2. One ton of refrigeration means cooling provided by one kg of ice in one hour.
3. Bukhari is traditional storage structure.
4. Standard Free Volume (SFV) in typical warehouses ranges from 1.5 to 3.0
5. The storage Capacity of mud kothi is 1- 50 tons
   Fill in the blanks
6. Intermediates produced during ethylene bio-synthesis in plant is ……………….
7. …………gas is responsible for the bacteriostatic and fungistatic effect in MA packaged foods.
8. Plant hormone responsible for fruit ripening is …………..
9. Fruits that do not ripen after harvest and ripen on the plant itself are called ………..
10. CAP storage stands for …………………..

II   **Write short notes on ANY FIVE of the following**   **(5x2=10)**
1. How respiration influences quality of plantation products?
2. What are the biochemical changes that occur during ripening of fruits?
3. What is fumigation? What are the most common fumigants used for the treatment of stored grains?
4. What are the most common scrubbers used for the removal of CO_2 in control atmospheric system (CAS)?
5. Describe lateral pressure equation for deep bin wall as per Janssen's theory.
6. Discuss importance of aeration in grain storage.
7. What is respiratory quotient?

III   **Answer ANY FIVE of the following**   **(5x4=20)**
1. Differentiate climacteric and non-climacteric fruits.
2. Describe direct and indirect damages that occur during storage of produce.
3. Explain evaporative cooling and its advantages over mechanical refrigeration.
4. Describe Hypobaric storage and its principle.
5. Discuss controlled atmospheric (CA) storage and its advantages.
6. State various advantages of aeration in grain storage.
7. A cold storage plant is used for storing 50 tons of apple in perforated plastic crates. During the storage, apples are cooled down from 28^0 C to storage temperature of 2^0 C (Specific heat of apple = 0.874 Kcal kg^{-1} $^0C^{-1}$). If the required cooling is attained in 16 hours, calculate refrigeration plant capacity in Tons.

IV   **Write an essay on ANY ONE of the following**   **(1x10=10)**
1. Discuss about
    (a) CAP storage structures
    (b) Pusa Bin
2. Discuss aeration system design for long term storage of low moisture grain and short-term storage of high moisture grain.

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