B.E. / B.Tech. (Full Time) ARREAR EXAMINATIONS, NOV / DEC 2011

AGRICULTURAL AND IRRIGATION ENGINEERING BRANCH

SIXTH SEMESTER – (REGULATIONS 2008)

AI 9351 – TRACTORS AND FARM EQUIPMENTS

Time: 3 hrs Max Marks: 100

Answer ALL Questions

Part – A (10 x 2 = 20 Marks)

1) Differentiate Internal Combustion and External Combustion engine.
2) Define compression ratio of an engine.
3) What is the role of a pre-cleaner?
4) List out different brands of tractors, their makes and HP.
5) Write a note on tread and retreading of a tyre.
6) Differentiate tracts and tyres in a bull dozer.
7) How is the effective field capacity of a farm machine calculated?
8) List the uses of dusters.
9) How the depreciation of machinery is calculated using Straight Line method?
10) What are the various sources of power for a farm?

Part – B (5 x 16 = 80 Marks)

11) a) The calorific value of a fuel is found by experiment to be 16000 Kcal/kg. The carbon and hydrogen content of this fuel are 87% and 4% respectively by weight and the remaining portion is ash. Find the weight of necessary air for complete combustion of 1 kg of the fuel. (8)

b) List the advantages and disadvantages of two stroke cycle over four stroke cycle engine. (8)

12) a) Explain the principle of operation of a clutch and discuss the single plate and dual plate clutch systems in detail. (16)

(or)

b) i) Write short notes on the principle of gearing. How is the final gear reduction in tractor arrived? (9)

ii) Explain the hydraulic system in a tractor with a neat sketch. (7)

13) a) Discuss the special features of bull dozers and their merits. (16)

(or)

b) Compare and contrast Tractors and Power tillers in various dimensions. (16)

14) a) i) Discuss the principle of operation, components, functions and advantages of a combine harvester. (12)

ii) A bullock drawn desi plough working at 2.4 kmph cuts soil 10 cm deep and makes 20cm wide furrow at the top. Calculate the volume of soil handled in 3 hours. (4)

(or)

b) i) Explain the disc plough, tilt angle and disc angle with neat sketches. (8)

ii) Discuss the various forces acting upon a tillage implement? (8)

15) a) Discuss the various non-conventional energy sources, their merits and demerits in detail. (16)

(or)

b) i) Discuss the status of farm mechanization in India. (6)

(ii) Explain the overhead cost estimation procedure for farm machineries. (10)