



EASTERN UNIVERSITY SRILANKA, FACULTY OF AGRICULTURE
FIRST YEAR SECOND SEMESTER EXAMINATION IN AGRICULTURE 2008/2009
(September/October 2009)
AEN 1201 FARM POWER AND MACHINERY (3:30/30)
PRACTICAL EXAMINATION

Answer all questions

Time: 2 hours

Index No:

01. A four stroke 4 cylinder gas engine has cylinder diameter of 25cm, stroke-bore ratio is 1.8, clearance volume 4500cm^3 , engine speed 240 rev/min, mean effective pressure 700 kPa and mechanical efficiency is 75%. Calculate the following.

- (i) Indicated power
- (ii) Break power
- (iii) Compression ratio
- (iv) Swept volume

02.

- (i) Draw sketches of the various kinds of share and mould boards of a mould board plough
- (ii) What is the tillage working part in a disc plough?
- (iii) State the conditions under which it may be advantageous to use a disc plough
- (iv) What is the difference in design of a disc plough and a disc harrow?
- (v) Explain the structural and design features of a spring loaded tine cultivator.

03.

- (i) Name the main components of a knapsack sprayer.
- (ii) List the types of nozzles used to spray chemicals
- (iii) Briefly describe the procedure for determining the volume flow rate from a nozzle?
- (iv) Can you measure the swath width on a wet soil? Why?
- (v) A knapsack sprayer fitted with hollow cone nozzles is required to be calibrated for an application rate of 150 l/ha. The sprayer speed is 6.5 km/hr and the nozzle height is 50cm from the ground. The swath width of the spray is 1m. Calculate the volume flow rate from the nozzle.

(PTO)

04. The following passage describes the function of a 4 stroke internal combustion engine. Read the passage carefully and fill in the blanks with most appropriate word/term.

Internal combustion engine is an assembly which, converts heat energy produced by internal combustion under high pressure into work. The generated heat is converted into useful power by a piston, constrained within the The motion of the piston rotates a with the help of The heat that supplies the energy for working substance is generated within the cylinder.

Fuel/ air mixture comes into the cylinder when the valve is open, and when the valve closes, the mixture is by the piston moving up. The mixture is then ignited and expands rapidly, and the expansion produces a downward thrust to the, which in turn causes the to rotate. The thrust is sufficient to keep the crankshaft turning so that the piston also continues to move up and down. The movement of these parts in relation to each other makes possible the operating cycle.

If the flywheel is turned, the crankshaft will also turn and this will cause the piston, which is free to move in the cylinder, to travel up and down. Because the gear wheel on the crankshaft is in mesh with the gear on the, the valves will also move up and down. If a thrust is applied to the top of the piston, the and crankshaft will again turn and in doing so will also operate the camshaft and