Mower Numerical

Q1. A flail mower is operated using the PTO power of a tractor through a bevel gear drive. The tractor forward speed is 10.8 km 11-1. The velocity of the flail tip with respect to the ground is 18 m s-1. The length of each flail is 400 mm and the diameter of the shaft carrying the flails is 100 mm. If the tractor PTO speed is 800 rpm, the required bevel gear reduction is

(A) 1.13   (B) 2.00   (C) 2.25   (D) 2.51   [GATE 2008]

Q2. A tractor mounted off-set type reciprocating mower is driven by the PTO shaft. The maximum inertia force of 3.2 kN occurs along the pitman at 32o crank angle and 27o pitman angle with the horizontal plane. The knives of the cutter bar are riveted to the slider. If each of the allowable tensile and compressive stresses of the slider material is 50 MPa, the minimum cross-sectional area of the slider in mm2 is

(A) 29.05 (B) 33.91 (C) 54.27 (D) 57.02   [GATE 2013]

Q3. A mower with a reciprocating type cutter bar uses an offset slider crank mechanism to drive the cutterbar in the horizontal plane. The length of the pitman is 40 cm , offset distance is 6 cm and crank radius is 3.8 cm . (a) The crank angle positions measured from the horizontal at which the knife bar reaches ends of the strokes are (B) the stroke length of cutter bar   [GATE 2004]

Q4.

In a reciprocating type mower, the maximum inertia force of 2.2 kN along the pitman occurs at 35° crank angle and 25° pitman angle with the horizontal plane. The crank radius is 50 mm and the equivalent mass at the crankpin is 2.5 kg. If the crank rotates at 600 rpm, the resultant force passing through the crankpin in kN will be

(A) 2.25   (B) 2.68   (C) 2.98   (D) 3.42

Q5. A mower with a reciprocating type cutter bar uses an offset slider crank mechanism to drive the cutterbar in the horizontal plane. The length of the pitman is 40 cm , offset distance is 6 cm and crank radius is 3.8 cm . (a) The crank angle positions measured from the horizontal at which the knife bar reaches ends of the strokes are (B) the stroke length of cutter bar   [GATE 2004]

Q6. A mower with a reciprocating type cutter bar uses an offset slider crank mechanism to drive the cutter bar in the horizontal plane. The length of the pitman is 360 mm, offset distance is 72mm and crank radius is 36 mm. Calculate the the stroke length of cutter bar
[GATE 2011]

Q9. The cumulative discharge of a tractor mounted hydraulic sprayer having 7 nozzles is 2.0 L /min ,when the tractor is operated at 4 km/h. If the nozzle spacing is 0.3 m, the discharge in L / ha is
                    [GATE 2013