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MATRIC NO: 18/ENG06/020

DEPARTMENT: MECHANICAL ENGINEERING

ANSWER:

1. 1200gal of water

150lb of salt initially

50gal of brine

Each gallon = 1+sint

Mout = 30gal per minute

dm/dt = Min - Mout …(i)

Mout = 30gal/min x 1 + sint = 30 + 30sint … (ii)

1200gal of water with dissolved salt of the solution leaves the galloon per minute

That is, 30/1200 = 0.025 = 2.5%

Min = 2.5% opm

From equation (ii)

Dm/dt lb/min = 30+30sintlb/min – 2.5m lb/min

Dm/dt = -2.5m + 30+30sint

Dm/dt = -2.5 (2.5m/-2.5 + ((30+30sint)/-2.5))