MATRIC NO: 17/MHS01/314

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Given that,

for case A; $u(t) \geq 50$

for case B; $g(t) \geq 150$

and $(0 \leq t \leq 15)$ hr

Considering case A,

$u(t) = 3u_0(t)$ at 9hrs ——①

Using $y = y_0 e^{kt}$,

$\Rightarrow u(t) = u_0(t)\, e^{9k}$

But $u(t) = 3u_0(t)$

$\Rightarrow 3u_0(t) = u_0(t)\, e^{9k}$

$3 = e^{9k}$

$\ln 3 = 9k$

$k = \ln 3 / 9$

$\therefore k = 0.122$

Thus for case A,

$u(t) = 50e^{0.122t}$

Considering case B,

$g(t) = 3g_0(t)$ at 9hrs ——①

Using $y = y_0 e^{kt}$,

$\Rightarrow g(t) = g_0(t) \cdot e^{9k}$

$3g_0(t) = g_0(t) \cdot e^{9k}$

$3 = e^{9k}$

$\ln 3 = 9k$

$\therefore k = 0.122$

Thus for case B,

$g(t) = 150e^{0.122t}$