MI JUNE 05

1) U=2 E=20 V=74 V=U+at => $74 = 2 + a \times 20$ => 72 = 20a=> $0 = 3.6 \text{ ms}^{-2}$

b)

$$S = (u+v)t \Rightarrow S = (2+74)\times20 = 760m$$
A to 8

BC = 1200-760 = 440m

2) $\stackrel{\$}{\overset{\$}{\bigcirc}} \stackrel{\stackrel{?}{\bigcirc}}{\overset{?}{\bigcirc}} \stackrel{?}{\overset{?}{\bigcirc}} \stackrel{?}{\overset{?}{\overset{?}{\bigcirc}}} \stackrel{?}{\overset{?}{\bigcirc}} \stackrel{?}{\overset{?}{\overset{?}{\bigcirc}}} \stackrel{?}{\overset{?}{\bigcirc}} \stackrel{?}{\overset{?}{\longrightarrow}} \stackrel{?}{\overset{?}{\overset{?}{\longrightarrow}}} \stackrel{?}{\overset{?}{\longrightarrow}} \stackrel$

Total before = 0.6x8+0.2x-2=4.4 Ns V=4.4ms-1 Total after = 0.6v+0.2x2v=v

b) Mom B before = $0.2 \times 8.8 = 1.76$ Nm Impulse = 2.16Nm = 2.16Nm

3) $tand = \frac{3}{4}$ $5 \int_{4}^{3} \frac{sna=\frac{3}{5}}{(ssa=\frac{4}{5})}$

TCos« COS W

20500 20020 20500 M=0.6

RFN=0 NR=2g(as20 = 18.4n) RFN=ma \Rightarrow 18-2g(sn20-fmax=2a) fmax=mNR=11.05n \Rightarrow 0.246=2a \Rightarrow a=0.12 ms⁻²

C) $\rightarrow 300 = 900$ $\rightarrow 0$ $\overrightarrow{Rf} = MQ \Rightarrow -300 = 900Q$ $\Rightarrow Q = -\frac{1}{3}MC^{-2}$ V = 6 $Q = -\frac{1}{3}$ V = 0 $V^2 = U^2 + 2QC \Rightarrow 0 = 36 - \frac{2}{3}S$ $\frac{2}{3}S = 36$ $\frac{2}{3}S = 36$

d) before after

NRYTSINIS

900 NR=900g-TSINIS

900 NR=900g

NR increases when tow bar breaks.

- 8) Speed = \(52+82 = 9.48ms^{-1}
 - b) Position = (2i+j)+t(si+8j)=(2+st)i+(1+8t)j
 - c) due North means i value is the same $2+5t=10 \Rightarrow 5t=8 \Rightarrow t=1.6$ sec
- d) B = (10i+7j) + (0i+vj)t = 10i + (7+vi)j $\Rightarrow t=1.6 \Rightarrow 1+8t = 7+vt$ $\Rightarrow 1+12.8 = 7+1.6v \Rightarrow 1.6v = 6.8$ $v=4.2Sms^{-1}$
- e) friction of ball on the floor.

5) 10^{10} a) Area = (10+3)x/2 = 78mb) 15x3 = 45m $\frac{2}{2}$ = 1-5x

 $78+4S+1.5x=13S \Rightarrow 1.5x=12 \quad x=8sec$ Total = 35sec

6) NRA 2 NRC

AV NRc×2 = 12g×1.5 2NRc = 185 NRc = 95N

NR NR A89 129 Rf1=0 2NR=604

A2 $NR \times 2 = |2g \times 1.5 + 48g \times 2$ $2NR = |8g + 48g \times 2$ $60g = |8g + 48g \times 2$ $x = \frac{42g}{2} = 0.875$

NR = 305.

Rf=ma + 1500-900 = 2500 a 0=0.24ms-2

b) NR+TSINIS

300 - 900 -> Toosis

9003

Rf=Ma => TCosIS-300 =900X0 TCosIS = 516 T= 534.2N