PART II : APPLIED MATHEMATICS 2014

1. Let's us find this time :

$z = 49m$

$V = gt$

$$z = \frac{1}{2}gt^2 \Rightarrow t^2 = \frac{2z}{g} \Rightarrow t = \sqrt{\frac{2z}{g}}$$

$$t = \sqrt{\frac{2x49}{9.8}} \Rightarrow t = 3.16s$$

1.*D*

2. Let's us find the speed

$V = gt$

$V = 9.8x3.16 \Rightarrow V = 30.96 \approx 31m/s$

$V = 31m/s$

2.*A*

3. C

4. AB=186m

$V = 26.5m/s$

$a = 1.5m/s^2$

$V_B^2 - V_A^2 = 2.a.AB$

$V_B = \sqrt{2.a.AB + V_A^2}$

$V_B = \sqrt{2X1.5X186 + (26.5)^2}$

$V_B = 35.5m/s$

$4.A$

5. Let's find the time t:

$V_B - V_A = a\Delta t$

$\Delta t = \dfrac{V_B - V_A}{a}$

$\Delta t = \dfrac{35.5 - 26.5}{1.5}$

$\Delta t = 6s$

$5 - C$

6. The average speed over AB

$V_m = \dfrac{V_A + V_B}{2}$

$V_m = \dfrac{35.5 + 26.5}{2} = 31m/s$

$6 - B$

7. $AC = \dfrac{AB}{2} = \dfrac{186}{2} = 93m$

$V_C^2 - V_A^2 = 2.a.AC$

$V_C = \sqrt{2axAC + V_A^2}$

$V_C = \sqrt{2X93X1.5 + (26.5)^2}$

$V_C = 31.3m/s$

$7 - A$

8.

. $V_{\lim} = 70mph$

$$V_{\lim} = \frac{70}{0.622} = 112.54km/h$$

$$V_{\lim} = \frac{112.54X1000}{3600} = 31.26m/s$$

B at point C

9. 9-B

10.

Question 11 to 13

11. $y = 17.14\sin(0.48x - 1.75) + 7.11$

$y_{\max} = 17.14x1 + 7.11 = 24.25$

$y_{\min} = -17.14x1 + 7.11 = -10.03$

$$Ampli = \frac{y_{\max} - y_{\min}}{2} \Rightarrow Ampli = \frac{24.25 + 10.03}{2} = 17.14^0$$

$11 - D$

12. 12-A

13. $y = 17.4\sin(0.48x8 - 1.75) + 7.11 = 22^0$

$13 - C$

14. $g = 9.8N/kg$

$V_i = 15m/s$

$V_f = 35m/s$

$$V_f{}^2 - V_i^2 = 2gh \Rightarrow h = \frac{V_f{}^2 - V^2{}_i}{2g}$$

$$h = \frac{35^2 - 15^2}{19.6} \Rightarrow h = 51m$$

$14 - B$

15. $A = 17m^2$

$\cos t = 21.500FCFA$

Let find the number of can

$can = 2.75m^2$

$nCar = \frac{17}{2.75} = 6.18 \approx 7can$

$total.\cos t = 7x21500 = 150.500\,fcfa$

$15-A$

16. $50km/h = \frac{50000}{3600} = 13.88m/s \square 13.9m/s$

$16-C$

17. Thinking distance=9.7m V=13.9m

$TD = Vxt \Rightarrow t = \frac{TD}{V}$

$t = \frac{9.7}{13.9} = 0.7s$

$17-A$

18. Breaking distance=14.7m V=13.9m/s

$t = 1.05 + 0.7 = 1.75 \square 1.8s$

$18-C$

19. $V_f^{\ 2} - V^2_{\ i} = 2ad\ V_f = 0$

$a = \frac{-V_i^2}{2d} = \frac{-(13.9)^2}{2x14.7} = -6.6m/s^2$

19-D

20. $V_f^{\ 2} - V^2_{\ i} = 2ad\ V_f = 0$

$a = \frac{-V^2_{\ i}}{2d}$

$d = \frac{-(30.56)^2}{2x(-6.6)} = 70.75m$

$d_{total} = d + d_{thinking} = 70.75 + 21.4 = 92.3m$

$20-B$

21. Let Un the new price at n years Uo=25000000

$U_1 = 8\%U_0 + U_0 = (8\% + 1)U_0$

$U_2 = 8\%U_1 + U_1 = (8\% + 1)U_1$

$U_n = \ldots\ldots\ldots\ldots = (8\% + 1)U_{n-1}$

$U_n = (8\% + 1)^n U_0$

$U_5 = (1.08)^5 x 25000000$

$U_5 = 36.733.000 FcFA$ $21 - B$

22. $V = 25m/s$

$d = 11.9m$

$d = vt \Rightarrow t = \frac{d}{v} = \frac{11.9}{25} = 0.476s$

$t = 0.476s$ $22 - A$