REGULAR QUIZ 09

Form 1

Area and Volume

Part A – MC (@2marks)

1.	B	let h cm be the height of $CDEF$ with base EF, $10h+\frac{1}{2}(3+3+h)(4)=72$ $h=5$ $\text{area}=\frac{(3+8)(4)}{2}=22\text{cm}^2$
2.	D	let h be the height of ΔABC with base AB, area of $\Delta ABC=x+y=\frac{1}{2}(AB)h$ area of $\Delta ABD=\frac{1}{2}(AB)(h)=x+y$
3.	D	$\text{area}=9^2-\frac{1}{2}(9)(3)-\frac{1}{2}(6)(2)-\frac{1}{2}(7)(9)=30\text{cm}^2$
4.	A	maximum number $=5\times5\times6=150$
5.	B	$\text{volume}=\frac{1}{2}(6)(4)(8)=96\text{cm}^3$
6.	C	$\frac{80x^3}{2}=62.5\times10$ $x^3=15.625$ $x=2.5$
7.	B	water level $=\frac{3\times3\times2+2\times2\times1}{4\times4}=\frac{11}{8}$ cm wet surface area $=4\times4+(4\times4)\times\frac{11}{8}=38\,\text{cm}^2$

Part B – Short Questions (28 marks)

1. $\frac{10\times 8}{2}+10\times 2h-\frac{10\times h}{2}=85$ — 1M for $10\times 2h$

$40+20h-5h=85$ — +1M for $\frac{10\times h}{2}$

$h=3$ — +1M for all correct; 1A

(4)

2. $\frac{2a\times 5}{2}=\frac{12\times 1}{2}$ — 1M

$a=1.2$ — 1M

perimeter $=12+2(1.2)+3(1.2)$ — 1M

$=18\text{cm}$ — 1A

(4)

3. (a) $(6+12)\times 2x+2(6)(12)=576$ — 1M

$x=12$ — 1A

(b) Total surface area of solid in Figure C

$=576+4\times 8\times 2+6\times 4\times 2$ — 1M

$=688\,\text{cm}^2$ — 1A

(4)

4. (a) $\frac{6\times 12}{2}=\frac{(x+6)x}{2}+\frac{(12-x)x}{2}$ — 1M

$36=\frac{x^2}{2}+3x+6x-\frac{x^2}{2}$

$9x=36$ — 1M for correct equation solving

$x=4$

(b) volume $=\frac{(4+6)\times 4}{2}\times 50=1000\text{cm}^3$ — 2M+1A

(c) new water depth $=\frac{1000}{\frac{1}{2}(6)(12)}=27\frac{7}{9}\text{cm}$ — 2M+1A

(8)

5. (a) capacity

$$=\left(\frac{(5+10)(6)}{2}+10\times4+10\times3\right)\times10$$ 2M

$$=(45+40+30)\times10$$

$$=1150\text{cm}^3$$ 1A

(bi) let $h$cm be the water level of the tank,

$$h-6=\frac{830-450}{10\times10}$$ 2M or any other methods

$$h=9.8\text{cm}$$

therefore, the water level is 9.8 cm 1A

(bii) rise in water level $=\frac{10\times6-0.2\times10\times10}{3\times10}+0.2=\frac{23}{15}\text{cm}$ 1M+1A

(8)

Part C - Bonus Questions (8 marks)

1. (a) $\begin{cases}2(AB+BC)=y\\ AB\times BC=x\end{cases}$ 1M

volume $=(AB-4)(BC-4)\times2$ 1M

$$=2(AB\times BC-4(AB+BC)+16)$$

$$=2(x-2y+16)=(2x-4y+32)\text{cm}$$ 1A

(b) volume $=2(2y)-4y+32=32\text{cm}$ 1A

(4)

2. let x be the area of shaded region,

$$x=8(14+10-KL)-\frac{1}{2}(2+8)(10)-\frac{1}{2}(4+8)(14)+x$$ 3M

$$x=192-8KL-50-84+x$$

$$0=58-8KL$$

$$KL=7.25\text{ cm}$$ 1A

(4)