CLASS:XII	INDIAN SCHOOL MUSCAT SECOND PERIODIC ASSESSMENT Marking Scheme	SUBJECT: MATHEMATICS
	SET - C	
Q. NO.	VALUE POINTS	SPLIT UP OF MARKS
1	y= $\tan^{-1}\frac{\sqrt{1+x^2}-1}{x}$, put x= $\tan\theta$ y= $\tan^{-1}(\tan\frac{\theta}{2})$ $=\frac{1}{2}\tan^{-1}x$ $\therefore \frac{dy}{dx}=\frac{1}{2(1+x^2)}$	Each step carries $\frac{1}{2}$ mark
2.	$x=a(\theta+\sin\theta)$; $y=a(1-\cos\theta)$ $\frac{dx}{d\theta}=a(1+\cos\theta);\frac{dy}{d\theta}=a\sin\theta$ $\frac{dy}{dx}=\tan\frac{\theta}{2}$ $\therefore \left(\frac{dy}{dx}\right)_{x=\frac{\pi}{3}}=\frac{1}{\sqrt{3}}$	$\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$
3.	Let $g(x)=\cos x$ and $h(x)=x^2$ $f=g\circ h$ g and h are continuous function conclusion	Each step carries $\frac{1}{2}$ mark
4.	Finding LHL and RHL Conclusion	$1\frac{1}{2}$ $\frac{1}{2}$
5.	y= $(\sin^{-1}x)^2$ Differentiating both sides w.r.t.x, $\Rightarrow \frac{dy}{dx}=\frac{2\sin^{-1}x}{\sqrt{(1-x^2)}}$ $\Rightarrow \sqrt{(1-x^2)}\frac{dy}{dx}=2\sin^{-1}x$ Squaring & differentiating both sides w.r.t.x and proving	$1\frac{1}{2}$ $2\frac{1}{2}$

6.	f is continuous at x = 2 and x = 10 Continuity at x = 2 $\Rightarrow$2a + b = 5----------(i) Continuity at x = 10 $\Rightarrow$10a + b = 21----------(ii) Solving (i) & (ii) Final answer : a = 2 & b = 1	**Each step carries 1 mark**
7.	Let $u = x^{\sin x}$ and $v = (\sin x)^{\cos x}$ $\Rightarrow$y=u + v $\Rightarrow \frac{dy}{dx} = \frac{du}{dx} + \frac{dv}{dx}$ $\frac{du}{dx} = x^{\sin x}\left[\cos x \log x + \frac{\sin x}{x}\right]$----------(i) $\frac{dv}{dx} = (\sin x)^{\cos x}\left[-\sin x \log \sin x + \cos x \cot x\right]$----------(ii) $\therefore \frac{dy}{dx} = x^{\sin x}\left[\cos x \log x + \frac{\sin x}{x}\right] + (\sin x)^{\cos x}\left[-\sin x \log \sin x + \cos x \cot x\right]$	$\frac{1}{2}$ **1** $\frac{1}{2}$ **1** $\frac{1}{2}$ $\frac{1}{2}$