CLASS:XII	INDIAN SCHOOL MUSCAT SECOND PERIODIC ASSESSMENT Marking Scheme	SUBJECT: MATHEMATICS
	SET - A	
Q. NO.	**VALUE POINTS**	**SPLIT UP OF MARKS**
1	$x = a\cos\theta$; $y = b\sin\theta$ $\frac{dx}{d\theta} = -a\sin\theta$; $\frac{dy}{d\theta} = b\cos\theta$ $\frac{dy}{dx} = \frac{-b}{a}\cot\theta$ $\therefore \left(\frac{dy}{dx}\right)_{x=\frac{\pi}{6}} = \frac{-\sqrt{3}b}{a}$	$\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$
2.	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**
3.	Finding LHL and RHL Conclusion	**1** $\frac{1}{2}$ $\frac{1}{2}$
4.	Let $g(x) = \sin x$ and $h(x) = x^2$ $f = g \circ h$ g and h are continuous function conclusion	**Each step carries $\frac{1}{2}$ mark**
5.	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**

6.	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** $\frac{1}{2}$ $\frac{1}{2}$
7.	y= $\left(\sin^{-1} x\right)^2$ 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** $\frac{1}{2}$