CLASS:XII	INDIAN SCHOOL MUSCAT SECOND PERIODIC ASSESSMENT Marking Scheme	SUBJECT: MATHEMATICS
	SET - B	
Q. NO.	**VALUE POINTS**	**SPLIT UP OF MARKS**
1	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**
2.	y= $\tan^{-1}\frac{\sqrt{1+x^2}+1}{x}$, put x= $\tan\theta$ y= $\tan^{-1}(\cot\frac{\theta}{2})$ $=\frac{\pi}{2}$ - $\frac{1}{2}\tan^{-1}x$ $\therefore \frac{dy}{dx}=-\frac{1}{2(1+x^2)}$	**Each step carries $\frac{1}{2}$ mark**
3.	Finding LHL and RHL Conclusion	**1** $\frac{1}{2}$ $\frac{1}{2}$
4.	$x=a(\theta+\sin\theta)$; $y=a(1-\cos\theta)$ $\frac{dx}{d\theta}=a(1+\cos\theta);\frac{dy}{d\theta}=a\sin\theta$ $\frac{dy}{dx}=\tan\frac{\theta}{2}$ $\therefore \left(\frac{dy}{dx}\right)_{x=\frac{\pi}{3}}=\frac{1}{\sqrt{3}}$	$\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$
5.	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** $\frac{1}{2}$ $\frac{1}{2}$

6.	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** $\frac{1}{2}$
7.	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**