

CHOITHRAM SCHOOL MANIKBAGH INDORE

CLASS Session: 2017-18

Subject: MATHEMATICS
Allotment Date: 07/07/17

Assignment No: 2
Submission Date: 12/07/17

S.No	QUESTION	MARKS	LEVEL
OBJECTIVE TYPE			
1	Using principal value evaluate : $\cos^{-1}(\cos\frac{2\pi}{3}) + \sin^{-1}(\sin\frac{2\pi}{3})$	1 mark	Knowledge
2	Using principal value evaluate : $\tan^{-1}\sqrt{3} - \sec^{-1}(-2)$	1 mark	Understanding
3	Prove the following : $\tan^{-1} x + \tan^{-1} \left(\frac{2x}{1-x^2} \right) = \tan^{-1} \left(\frac{3x-x^3}{1-3x^2} \right)$	1 mark	H.O.T.
SHORT ANSWER TYPE I			
4	Solve for x : $\tan^{-1} \left(\frac{x-1}{x-2} \right) + \tan^{-1} \left(\frac{x+1}{x+2} \right) = \frac{\pi}{4}$	2 Marks	Knowledge
5	Prove the following : $\tan^{-1} \left(\frac{1}{3} \right) + \tan^{-1} \left(\frac{1}{5} \right) + \tan^{-1} \left(\frac{1}{7} \right) + \tan^{-1} \left(\frac{1}{8} \right) = \frac{\pi}{4}$	2 Marks	Understanding
6	Prove that : $\cos(\sin^{-1} \frac{3}{5} + \cot^{-1} \frac{3}{2}) = \frac{6}{5\sqrt{13}}$	2 Marks	logic
7	Find $\frac{dy}{dx}$, if $y = \sin^{-1} [(2^{x+1}) / (1+4^x)]$	2 Marks	H.O.T.
SHORT ANSWER TYPE II			
8	If f(x), defined by the following, may be continuous at x=0, find the values of a, b, & c $f(x) = \begin{cases} \frac{\sin(a+1)x + \sin x}{x} & , \text{if } x < 0 \\ c & , \text{if } x = 0 \\ \frac{(\sqrt{x+bx^2} - \sqrt{x})}{bx^{\frac{3}{2}}} & , \text{if } x > 0 \end{cases}$	3 Marks	Understanding
9	If $y = a \sin t$ & $x = a [\cos t + \log \tan \frac{t}{2}]$, find the value of $\frac{dy}{dx}$ at $t = \frac{\pi}{4}$	3 Marks	value
10	Prove the following : $\cos[\tan^{-1}\{\sin(\cot^{-1}x)\}] = \sqrt{\frac{1+x^2}{2+x^2}}$	3 Marks	Multi concept
11	If $y = \frac{\sin^{-1} x}{\sqrt{1-x^2}}$ Show that $(1-x^2) \frac{d^2y}{dx^2} - 3x \frac{dy}{dx} - y = 0$	5 Marks	H.O.T.
12	If $y = \operatorname{cosec}^{-1} x$, $x > 1$, then show that: $x(x^2-1) \frac{d^2y}{dx^2} + (2x^2-1) \frac{dy}{dx} = 0$	5 Marks	Logic