DPP Daily Practice Problem *Physics*	*Topic : Mathematical Tools* DPP No. 5	Time : 30 min. Total Marks : 56 Max.

Type of Questions
Single choice Objective ('–1' negative marking) Q. 1 to Q. 11
Subjective Questions ('–1' negative marking) Q. 12 to Q. 14

Q 1) If $f(x) = \frac{x}{(x^2+a^2)^{3/2}}$, where a is a constant. The value of $f(\frac{a}{\sqrt{2}})$ is

A) $\frac{2^{3/2}}{3a^2}$ B) $\frac{2a^2}{3\sqrt{3}}$
C) $\frac{2}{3\sqrt{3}a^2}$ D) $\frac{3\sqrt{3}}{2}a^2$

Q 2) $If\ f(x) = \left(\frac{sin\ x}{1-cos^2 x}\right)(cosec\ x + cot\ x)(cosec\ x - cot\ x)$, Then find $f(\pi/2)$

A) 1 B) -1
C) -2 D) $None\ of\ these$

Q 3) If $f(x) = x^3;\ g(y) = y - 1\ ;\ h(z) = z + 1$
The value of $f(g(h(x)))$ is :

A) $x^3 + 1$ B) $x^3 - 1$
C) $x + 1$ D) x^3

Q 4) $if\ f(x) = x^2 - 1$ and $g(x) = \frac{1}{x} + 1$; the value of $f\left(\frac{1}{g(x)}\right)$ is

A) $\frac{(x+1)^2}{2x+1}$ B) $\frac{-2x-1}{(x+1)^2}$
C) $\frac{1+2x}{(x+1)^2}$ D) $\frac{(x+1)^2}{1-2x}$

Q 5) If $y = x^3 + 2x^2 + 7x + 8$ then $\frac{dy}{dx}$ will be $-$

A) $3x^2 + 2x + 15$ B) $3x^2 + 4x + 7$
C) $x^3 + 2x^2 + 15$ D) $x^3 + 4x + 7$

Q 6) If $y = \frac{1}{x^4}$ then, $\frac{dy}{dx}$ will be

A) $\frac{4}{x^3}$ B) $4x$
C) $-\frac{4}{x^5}$ D) $\frac{4}{x^5}$

Q 7) If $y = x^2 sin\ x, then\ \frac{dy}{dx}\ will\ be$

A) $x^2 cos\ x + 2x\ sin\ x$ B) $2x\ sin\ x$
C) $x^2 cos\ x$ D) $2x\ cos\ x$

Q 8) $If\ y = e^x . cot\ x\ then\ \frac{dy}{dx}\ will\ be$

A) $e^x . cot\ x - cosec^2 x$ B) $e^x . cosec^2 x$
C) $e^x[cot\ x - cosec^2 x]$ D) $e^x cot\ x$

Q 9) $If\ y = x\ ln\ x\ then\ \frac{dy}{dx}\ will\ be$

A) $ln\ x + x$ B) $1 + ln\ x$ C) $ln\ x$ D) 1

Q 10) $f(x) = sin^2 x - cos^2 x, then\ the\ value\ of\ f'\left(\frac{\pi}{4}\right)\ is$

(i) 2 (ii) 0 (iii) 1 (iv) $none\ of\ these$

Q 11) $If\ y = tan\ x\ cos^2 x, then\ \frac{dy}{dx}\ will\ be\ -$

A) $1 + 2sin^2 x$ B) $1 - 2sin^2 x$ C) 1 D) $2sin^2 x$

Q 12) $y = 4 + 5x + 7x^3$. Find $\frac{dy}{dx}$

Q 13) $y = x + x^2 + \frac{1}{x} + \frac{1}{x^3}$. Find $\frac{dy}{dx}$

Q 14) $y = x^2 + \frac{1}{x^2}$. Find $\frac{dy}{dx}$