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Crafting Excellence

DELHI SKILL AND ENTREPRENEURSHIP UNIVERSITY
PROGRAM: All Full Time Diploma Programs
END-SEMESTER EXAM; First Semester, AY: 2022-2023
Course: Applied Mathematics-1
Course Code: FC-011

Time: 1 hour 30 minutes **Max. Marks: 25**

Note: Write your Answers in the Answer Booklets provided

NOTE: 1. This Question Paper is divided into three Sections: Section A, Section B & Section C. Attempt all Sections as per the directions given along.

SECTION A

This Section contains 9 MCQ type questions each of 1 mark. **Attempt any EIGHT questions** out of them.

$(8 \times 1 = 8)$

Q1. The value of $\cot(-264°)$ is the same as
$(a)\ \tan 6°$ $(b)\ \cot 6°$ $(c) -\tan 6°$ $(d) -\cot 6°$

Q2. If the polar co-ordinates of a point are $\left(-6, -\frac{7\pi}{10}\right)$, the point lies in the
(a) *I quadrant* (b) *II quadrant* (c) *III quadrant* (d) *IV quadrant*

Q3. A function $f(x)$ is such that $\lim_{x\to 2^-} f(x) = 2k+1$, $\lim_{x\to 2^+} f(x) = k$. Then $\lim_{x\to 2} f(x)$ exists if $k =$
$(a)\ 1$ $(b) -1$ $(c)\ 2$ $(d)\ 0$

Q4. $\lim_{x\to\pi} \frac{1+\cos x}{\tan^2 x}$ equals
$(a)\ \frac{3}{2}$ $(b)\ \frac{1}{3}$ $(c)\ \frac{2}{3}$ $(d)\ \frac{1}{2}$

Q5 If $f(x) = |x-2|$, find $f'(1)$.
$(a)\ 1$ $(b) -1$ $(c)\ 2$ $(d) -2$

Q6. $\frac{d}{dx}\left(\sin^2\frac{x}{2}\right)$ is equal to
$(a)\ \sin x$ $(b)\ \cos x$ $(c)\ \frac{1}{2}\sin x$ $(d)\ \frac{1}{2}\cos x$

Q7. If $x = a\sin t$ and $y = b\cos t$, then the value of $\frac{dy}{dx}$ at $x = \frac{\pi}{4}$, is
$(a)\ \frac{a}{b}$ $(b) -\frac{a}{b}$ $(c)\ \frac{b}{a}$ $(d) -\frac{b}{a}$

Q8. Determine the value of $\left(\frac{dy}{dx}\right)_{x=2}$, given that $y = \log_x 2$.
$(a)\ \log_2\sqrt{e}$ $(b) -\log_2\sqrt{e}$ $(c)\ \log_e 2$ $(d) -\log_e 2$

Q9. If $y = \log(\sec x + \tan x)$, then the value of $\frac{d^2y}{dx^2}$.
$(a)\ \sec x\tan x$ $(b)\ \sec x + \tan x$ $(c)\ \sec x$ $(d)\ \tan x$