IRETA Test Series

july 12 , 2015

Full Marks = 30

Time = 45 min

Candidates must read the following instructions before attempting the question papers:

- All questions are compulsory.
- Please write your name at the top of your Question paper.
- please mark the correct options on the question papers
- each correct answer carries 2 marks .There will be negative marking and $\frac{1}{2}$ marks will be deduced for each wrong answer.
- Return the Question paper to the Invigilator at the end of exam
- Use blue or black pens to marks the correct option. Overwriting should not be evaluated and you will be given negative marks.
- please do not make any stary marks on the question paper.
- please do not do any rough work on the paper. Extra sheet is provided for rough work .

1 Chosse correct options one or more than one options may be correct

1.1

Let $Z_1 = 6 + i$ and $Z_2 = 4 - 3i$. Let Z be a complex number such that

$$arg(\frac{Z - Z_1}{Z_2 - Z}) = \frac{\pi}{2}$$

then Z satisfies

- $\mid Z - (5 - i) \mid = 5$
- $\mid Z - (5 - i) \mid = \sqrt{5}$
- $\mid Z - (5 + i) \mid = 5$
- $\mid Z - (5 + i) \mid = \sqrt{5}$

1.2

The number of solutions of the equation

$$Z^2 + \mid Z \mid^2 = 0$$

- one
- two
- three
- infinitely many

1.3

If one root of the quadratic equation

$$(1 + i)x^2 - (7 + 3i)x + (6 + 8i) = 0$$

is $4 - 3i$ then the other root must be

- $4 + 3i$
- $1 - i$
- $1 + i$
- $i(1 - i)$

1.4

The roots of the quadratic equation

$$(3-x)^4 + (2-x)^4 = (5-2x)^4$$

are

- all real
- all imaginary
- two real and two imaginary
- None of these

1.5

The number of solutions of the equation $\mid x \mid = \cos x$

- one
- two
- three
- zero

1.6

Let $f(x) = ax^2 + bx + c$ and $f(-1) < 1$, $f(1) > -1$, $f(3) < -4$ and $a \neq 0$ then

- $a > 0$
- $a < 0$
- sign of "a" can't be determined
- none of these.

1.7

The number of real solution of the equation $e^x = x$ is

- 0
- 1
- 2
- none of these

1.8

The number of real solutions of

$$x - \frac{1}{x^2 - 4} = 2 - \frac{1}{x^2 - 4}$$

- 0
- 1
- 2
- infinite

1.9

If $\alpha, \beta, \gamma, \delta$ are the roots of $x^4 + x^2 + 1 = 0$ then the equation whose roots are α^2,β^2,γ^2,δ^2 is

- $(x^2 - x + 1)^2 = 0$
- $(x^2 + x + 1)^2 = 0$
- $(x^4 - x^2 + 1) = 0$
- $(x^2 - x + 1) = 0$

1.10

If $(\frac{a^n + b^n}{a^{n-1} + b^{n-1}})$ is the A.M between a and b, then the value of n is:

- -1
- 0
- $\frac{1}{2}$
- 1

1.11

The domain of definition of

$$f(x) = \sqrt{\frac{1 - \mid x \mid}{2 - \mid x \mid}}$$

is

- $(-\infty, \infty) - [-2, 2]$
- $(-\infty, \infty) - [-1, 1]$
- $[-1, 1] \bigcup (-\infty, -2) \bigcup (2, \infty)$
- None of these

1.12

If $5f(x) + 3f(\frac{1}{x}) = x + 2$ and $y = xf(x)$ then

$$(\frac{dy}{dx})_{x=1}$$

is equal to

- 14
- $\frac{7}{8}$
- 1
- None of these.

1.13

If $f(x) = sin^{-1}(\sin x) + cos^{-1}(\sin x)$ and $\phi(x) = f(f(f(x)))$,then $\phi^{'}(x)$ is

- 1
- $\sin x$
- 0
- None of these

1.14

The diff. coeffi. of $f(\log x)$ w.r.t.x, where $f(x) = \log x$ is

- $\frac{x}{\log x}$
- $\frac{\log x}{x}$
- $(x \log x)^{-1}$
- None of these

1.15

If $\tan \frac{\alpha}{2}$ and $\tan \frac{\beta}{2}$ are the roots of the equation $8x^2 - 26x + 15 = 0$ then $\cos(\alpha + \beta)$ is equal to

- $\frac{-627}{725}$
- $\frac{627}{725}$
- -1
- None of these

$$*******END********$$