

Scientific Computing using Matlab

Live session - Week 2



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1. What is the five-digit rounding value of the irrational number π

A. 3.1415

B. 3.1416



C. 3.14159

D. 3.14150



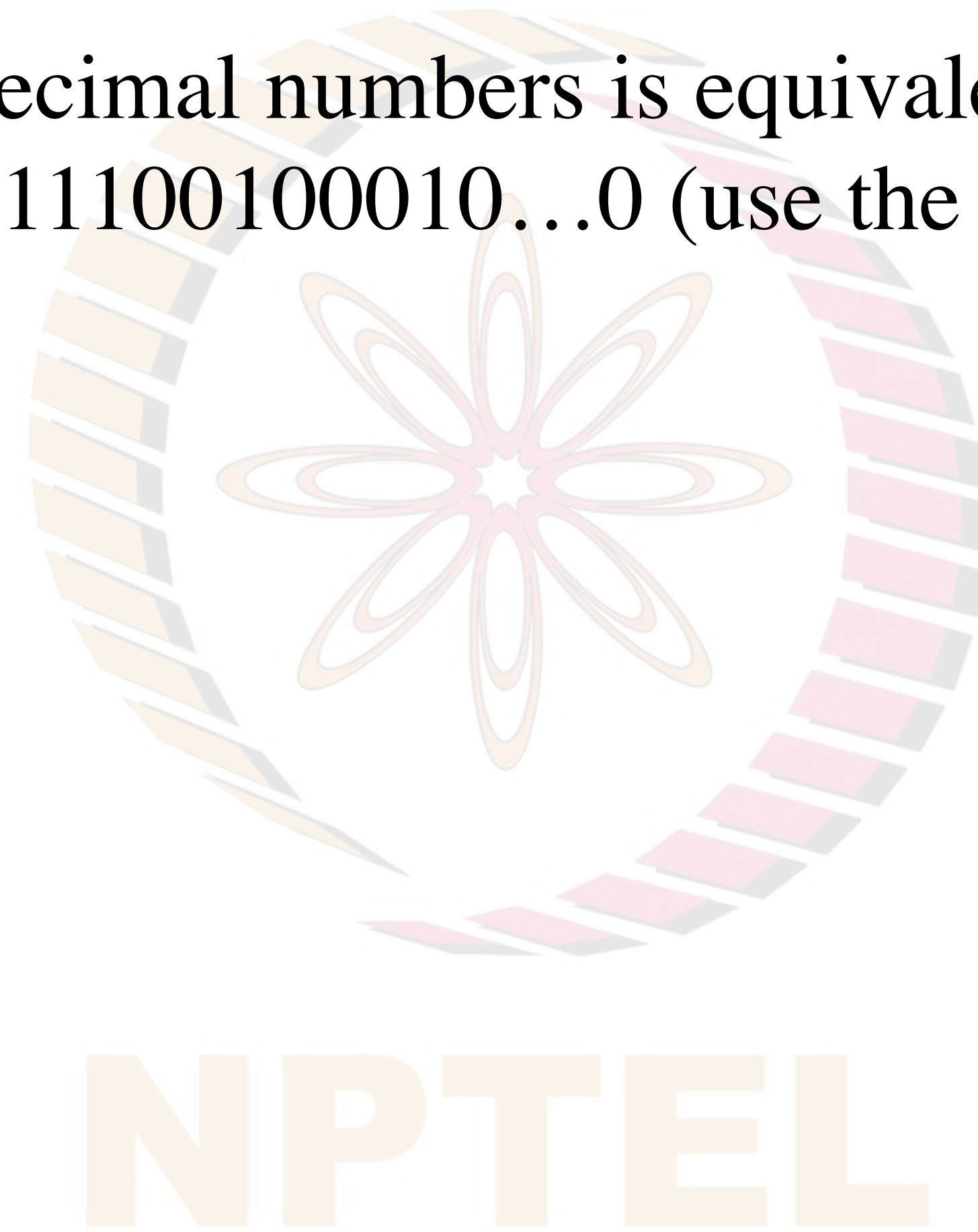
2. Which of the following decimal numbers is equivalent to floating-point machine numbers 0 10000000011 1011100100010...0 (use the 64-bit long real format)

A. 27.56640625 ✓

B. 27.66640625

C. 27.76640625

D. 27.56650625



3. A computer that represents only 4 significant digits with rounding would calculate $66.666 * 33.333$ as

A. 2220

B. 2221

C. 2221.1778

D. 2222



4. Suppose p^* approximate p with relative error at most 10^{-3} . What is the largest interval in which p^* must lies for the value of $p = 150$?

A. [149.85, 150.15] ✓

B. [149.65, 150.35]

C. [149.60, 150.40]

D. None of these

NPTTEL

5. If we perform 3-digit rounding arithmetic on $133 + 0.921$. What is the absolute error with the exact value determined to at least five digits ?

A. 0.078

B. 0.079



C. 0.081

D. 0.082



6. What are the root of the following quadratic equation using four-digit rounding arithmetic

$$x^2 + 62.10x + 1 = 0$$

A. -0.02000, -62.10 ✓

B. -0.02100, -62.11

C. -0.02200, -62.13

D. None of these

NPTTEL

7. What is the truncation error in finding $\int_{-3}^9 x^3 dx$ using left end point Riemann approximation method with equally portioned points $-3 < 0 < 3 < 6 < 9$?

A. 648

B. 756

C. 972 ✓

D. 1620

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8. Let $f(x) = \frac{x \cos x - \sin x}{x - \sin x}$.

If we evaluate $f(0.1)$ by replacing each trigonometric function with its Taylor polynomial
The actual value is $f(0.1) = -1.99899998$. What is the relative error ?

A. 0.00050



B. 0.0045

C. 0.00060

D. 0.0050

NPTTEL

9. Use 4-digit rounding arithmetic to evaluate $f(0.1)$ given

$$f(x) = \frac{x \cos x - \sin x}{x - \sin x} .$$

What is the relative error for value obtained above using the actual value of $f(0.1) = -1.99899998$?

A. 0.029

B. 0.031

C. 0.030

D. None of these



NPTTEL

10. What are the value of x and y while solving the following linear system using 4-digit rounding arithmetic

$$1.130x - 6.990y = 14.20$$

$$1.013x - 6.099y = 14.22$$

A. $x = 2.451, y = -1.635$

B. $x = 2.551, y = -1.735$

C. $x = 2.651, y = -1.335$

D. None of these



NPTTEL