## Question # 1

Question # 1: Consider the polynomial $p_{25}(x)$. What will be the dimension of the vector space?

- ⦾ 24.

- ⦾ 25.

- ⦾ It cannot be determined as information is incomplete.

- ⦿ None of the above .

## Question # 2

Question # 2: Suppose a polynomial is given as $p_5(x)$. Which of the following is correct?

- ⦿ The basis is $\{1, x, x^2, x^3, x^4, x^5\}$

- ⦾ The basis is $\{1, a, a^2, a^3, a^4, a^5\}$.

- ⦾ The basis is $\{x, x^2, x^3, x^4, x^5\}$.

- ⦾ None of the above .

## Question # 3

Question # 3: Suppose $x_1 = 5/8$ and $x_2 = 7/8$. If the computer reads up to 3 digits after the decimal point, their product will be rounded to

- ⦾ 0.101

- ⦾ 0.1000

- ⦾ 0.10001

- ⦿ None of the above

## Question # 4

1 point possible (ungraded)

A Vandermonde matrix is of order $6 \times 6$. What is the degree of the corresponding polynomial?

- ○ 4
- ● 5
- ○ 6
- ○ None of the above

## Question # 5

1 point possible (ungraded)

Question # 5: Suppose you have $92.25 \times 10^{16}$ no. of electrons. You want to store this value in a machine which has a maximum and minimum storage range of $639.25 \times 10^{17}$ and $2.8 \times 10^{-20}$ respectively. When giving input to store the data, the machine will

- ● Stores the number.
- ○ Underflow.
- ○ OverFlow.
- ○ None of the above.

## Question # 6

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## Question # 6

1 point possible (ungraded)

Question # 6: A function $f(x)$ is interpolated by a polynomial $p_{10}(x)$. The value of $|f(x) - p_{10}(x)|$ at the nodal point $x_2$ is

- ○ It cannot be determined. Need more information.
- ○ It will be a positive fractional value..
- ● 0.
- ○ ∞.

## Question # 7:

Question # 7: It is given that $\beta = 2, m = 4$ and $e \in [-2, 2]$. What will be the highest possible value that can be generated using the normalized form of the floating point representation?

- ⦿ $\frac{31}{4}$.
- ◯ $\frac{31}{16}$.
- ◯ $\frac{31}{2}$.
- ◯ None of the above.

## Question # 8

Question # 8: It is given that $\beta = 2, m = 4$ and $e \in [-2, 2]$. What will be the highest possible value that can be generated using the Floating point representation given in the Course Note by Anthony Yeats?

- ◯ $\frac{15}{2}$.
- ◯ $\frac{15}{8}$.
- ◯ $\frac{15}{16}$.
- ⦿ None of the above.

## Question # 9

Question # 9: It is given that $\beta = 2, m = 3$ and $e \in [-1, 2]$. What will be the machine epsilon value that can be generated using the Denormalized form of the Floating point representation?

- ◯ $\frac{1}{8}$.
- ◯ $\frac{1}{2}$.
- ⦿ $\frac{1}{16}$.
- ◯ None of the above.

## Question # 10

It is given that $\beta = 2$, $m = 4$ and $e \in [-1, 2]$. What will be the Machine Epsilon for the Normalized form of the Floating point representaion?

○ $\frac{1}{16}$.

⦿ $\frac{1}{32}$.

○ $\frac{1}{8}$.

○ None of the above.

Question # 11: According to the IEEE standard for Double precision, what is the number of bits assigned for precision?

○ 11

○ 1

○ 51

⦿ None of the above

Question # 12: How many significant digits does the floating point number $0.02180 \times 10^{-3}$ has?

○ 6

○ 5

⦿ 4

○ None of the above

Question # 13: You are working with a hypothetical binary computer that stores integers as unsigned 5-bit words. What is the largest non-negative integer that can be represented on this computer?

- ⦿ 31
- ◯ 32
- ◯ 64
- ◯ None of the above

Question # 14: Which of the following statements is true?

- ⦿ Loss of significance occurs when subtracting two values which are very close.
- ◯ Machine Epsilon is the minimum scale in variant error.
- ◯ In case of machine epsilon, we consider the max value of $|x|$.
- ◯ All of above are false.

Question # 15: According to the form of the Floating point representation given in the notes by Anthony Yeats, and for $m = 3$ and $\beta = 2$, your computer will round the value of $0.100110101$ to 3 bits after the decimal point. Which one of the following is the correct rounded output?

- ◯ 0.1001.
- ⦿ 0.101.
- ◯ 0.100.
- ◯ None of the above.

Question # 16: A student suggested that we should always take the maximum value of the exponent for calculating the Machine Epsilon for normalized number systems. Do you agree with the student?

- ◉ No, since exponent does not matter while calculating the machine epsilon value.

- ○ No, since we need to take the minimum value.

- ○ Yes I agree completely since maximum value of e will result in maximum machine epsilon value.

- ○ Not enough information given.

Question # 17: Which of the following is the degree of the Interpolating polynomial for $n - 1$ nodes?

- ○ $n + 1$.

- ○ $n$.

- ○ $n - 1$.

- ◉ None of the above.