|  |  |
| --- | --- |
| **SESSION** | **Nov-dec2023** |
| **PROGRAM** | **BCA** |
| **SEMESTER** | **III** |
| **course CODE & NAME** | **DCA2101 & Computer Oriented Numerical Methods** |
|  |  |
|  |  |

**SET-I**

**1. Show that**

**(a)**

**(b)**

**Ans 1.**

To prove the given identities, let's start by defining the operators:

= Laplacian operator (also known as the second-order spatial derivative operator)

= Gradient operator (vector of first-order spatial derivatives)

Divergence operator (divergence of a vector field)

Scalar

**b) To prove :**

Let's start with the left-hand side (LHS):

Using the definitions of the Laplacian and gradient operators, we have:

Expanding the terms, we can

Its Half solved only

Buy Complete from our online store

<https://smuassignment.in/online-store/>

MUJ Fully solved assignment available for**session SEPT 2023.**

Lowest price guarantee with quality.

Charges**INR 198 only per assignment.**For more information you can get via mail or Whats app also

Mail id is [aapkieducation@gmail.com](mailto:aapkieducation@gmail.com)

Our website www.smuassignment.in

After mail, we will reply you instant or maximum

1 hour.

Otherwise you can also contact on our

whatsapp no 8791490301.

**2. Solve the system of equation by Gauss Elimination’s method**

***.***

**Ans 2.**

Consider the given system of equations,

2x+y+4z=124

x+11y−z=338

x−3y+2z=20

Convert the system to matrix form,

The augmented matrix for the above matrix form,

**Q3. Find the equation of the best fitting straight line for the data:**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **X** | **1** | **3** | **4** | **6** | **8** | **9** | **11** | **14** |
| **Y** | **1** | **2** | **4** | **4** | **5** | **7** | **8** | **9** |

**Ans 3.**

To find the equation of the best-fitting straight line for the given data points, you can use linear regression. The equation of a straight line is typically represented as:

Y = mx + b

Where:

* Y is the dependent variable (in this case, the Y values).
* X is the independent variable (in this case, the X values).
* m is the

**Set-II**

**Q4. Evaluate *f*(15)*,* given the following table of values:**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **x** | **10** | **20** | **30** | **40** | **50** |
| **y = *f*(*x*)** | **46** | **66** | **81** | **93** | **101** |

**Ans 4.**

To evaluate f(15) using the given table of values, you can use interpolation. Since the table provides values of y = f(x) for specific values of x, you can interpolate to find the value of f(15) which falls between x = 10 and x = 20.

We can use linear interpolation for this purpose. Linear interpolation assumes that the function f(x) varies linearly between two data points. Here's how you can calculate f(15):

First, identify the two data

**Q5. Use Taylor’s series method to solve the initial value problem:**

**for given that .**

**Ans 5.**

The Differential Equation

With initial condition

**6. Apply Runge-Kutta fourth order method to find an approximate value of y when x = 0.1 given that , .**

Ans 6.

To apply the Runge-Kutta fourth-order method to solve the given initial value problem, we need to follow these steps:

1. Define the differential equation:
2. Specify the initial