

2024-2025 العام الدراسي الفصل الثاني		جامعة دمشق كلية الهندسة المدنية
مدة الامتحان: 2 سا	المقرر: التصميم بمعونة الحاسب	القسم: عام
العلامة القصوى: 70 درجة	تاريخ الامتحان: 2025 / 1	

Question ١:(٢٠ points)

Answer the following questions **in short**:

١-What is the definition of: **FEM** system, **ODBC** software(short explanation for each).

٢-List the **BIM BuildingLife - Cycle**(Briefly).

٣-What are the Benefits of BIM during the design phase of a project.

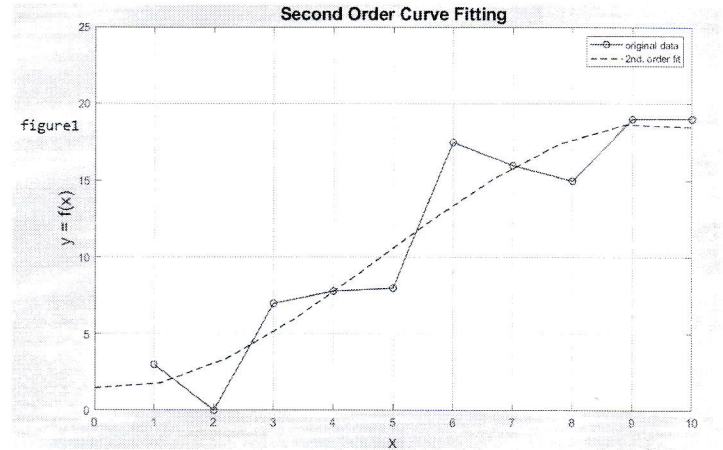
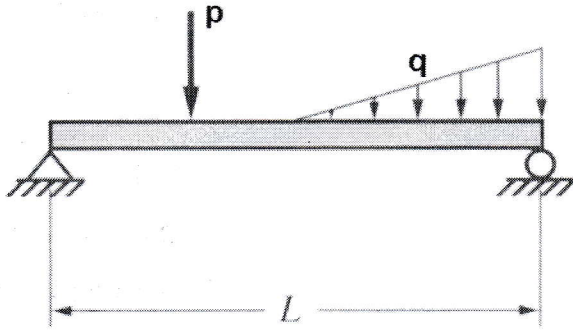
Question ٢:(٣٠ points)

١-**Use matlab script** to fit the polynomial curve ,shown bellow,X polynomial values are shown in the figure١ , y values are given in order as follows:

(٣ , ٠ , ٧ , ٧.٨ , ٨ , ١٧.٥ , ١٦ , ١٥ , ١٩ , ١٩)

Note:(write the corresponding instructions to draw the two Diagrams as shown aside and(Specify the two Diagrams, x Axis , y Axis and labels)

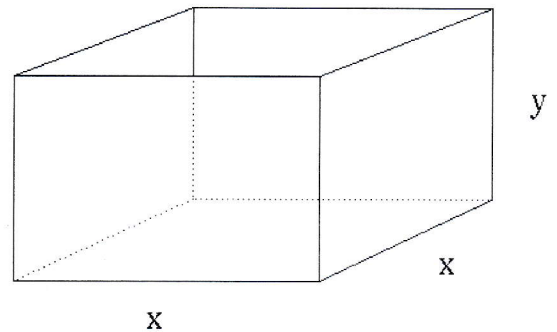
٢-**Write matlab function(type٢)** to calculate the reactions and the moment at ٢٠ points for the beam in figure٢.



Question ٣:(٢٠ points)

An open rectangular box with a square base is to be made from $4^{\wedge} m^2$ of material, what dimensions will result in a box with the largest possible volume?

Figure٢



Scale

Question 1:(20 points)

Answer the following questions **in short**:

1-What is the definition of: **FEM** system,**ODBC** software(short explanation for each).(10 points)

2-List the **BIM BuildingLife - Cycle**(Briefly).(5 points)

3-What are the Benefits of BIM during the design phase of a project.(5 points)

Question 2:(30 points)

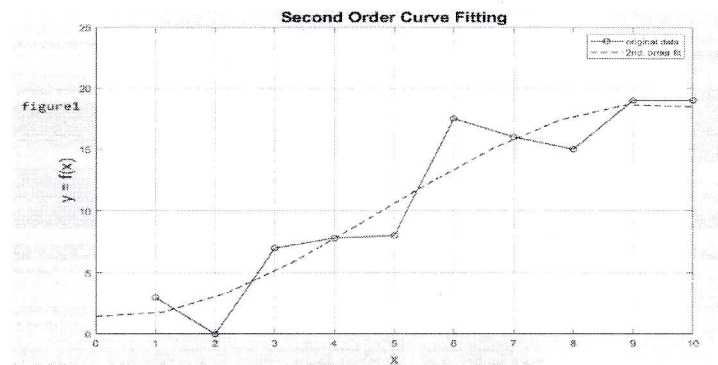
1-**Use matlab script** to fit the polynomial curve ,shown below,X polynomial values are shown in the figure 1 ,y values are given

in order as follows:

(3, 0, 7, 7.8, 8, 17.0, 16, 10, 19, 19)

Note:(write the corresponding instructions to draw the two Diagrams as shown aside and(Specify the two Diagrams, x Axis, y Axis and labels)

2-**Write matlab function(type 2)** to calculate the reactions and the moment at 20 points for the beam in figure 2.



```

x = [1 2 3 4 5 6 7 8 9 10]
y = [3 5 7 7.8 8 17.5 16 15 19 19]
n = 2 ;

p = polyfit(x, y, 2);
xi = linspace(1, 10, 10);
yi = polyval(p, xi);
plot(x, y, '-o b', xi, yi, '--g'), grid
xlabel('x');
ylabel('y = f(x)');
title('Second Order Curve Fitting');
axis([1, 10, 0, 20])
legend('original data', '2nd. order fit')

```

(10 points) for function

2 - Question 3: (20 points)

An open rectangular box with a square base is to be made from 4 m^2 of material, what dimensions will result in a box with the largest possible volume?

$$4 = x^2 + 4xy \quad (\text{2 for method, 2 for each result})$$

$$4xy = 4 - x^2$$

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

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

$$v = x \cdot x \cdot y = x^2 y$$

$$\frac{1}{2} x - \left(\frac{1}{2} \right)^3 x^3$$

$$v' = \frac{1}{2} - \left(\frac{1}{2} \right)^3 x^2$$

$$= \left(\frac{3}{2} \right) \left(\frac{1}{2} - x \right) \left(\frac{1}{2} + y \right) = \cdot$$

$$x = \frac{1}{2} \quad x = -\frac{1}{2}$$

$$x = \frac{1}{2}, y = \frac{1}{2} \quad v = \frac{1}{8}$$