العام الدراسي 2023/2024 الفصل الثاني		جامعة دمشق كلية الهندسة المدنية
مدة الامتحان: 2 سا	المقرر: التصميم بمعونة الحاسب	القسم: عام
العلامة القصوى: 70 درجة	تاريخ الامتحان: 2024-	

Question1:(15points)

1-What are the Benefits of BIM during the design phase of a project.
2-What are the Main ideas for BIM-based site safety.
3-What are the deffirences between CAD,BIM SYSTEMS .

Question 2:(20 points)

-Write **Matlab Script** ,to calculate the Shear and the Moment values in 1000 points of L , for the beam showing in figure1.

-Write Matlab Commands to draw the shear and the moment diagram as shown in figure2.

(Specify the Shear Diagram(v),the MomentDiagram(m), x Axis ,y Axis and labels ,using subplot Matlab Method).

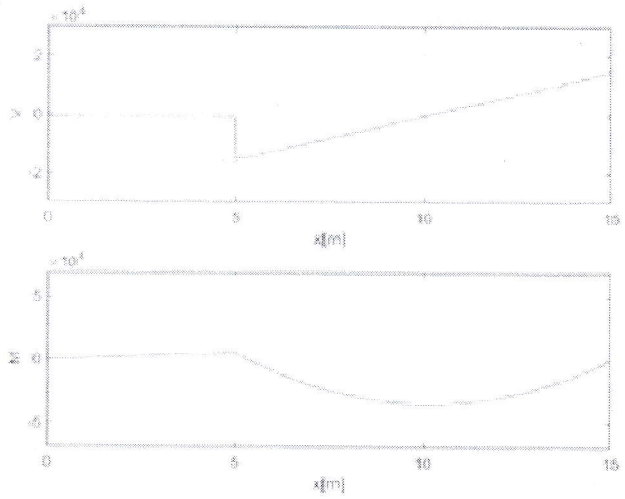


figure 2

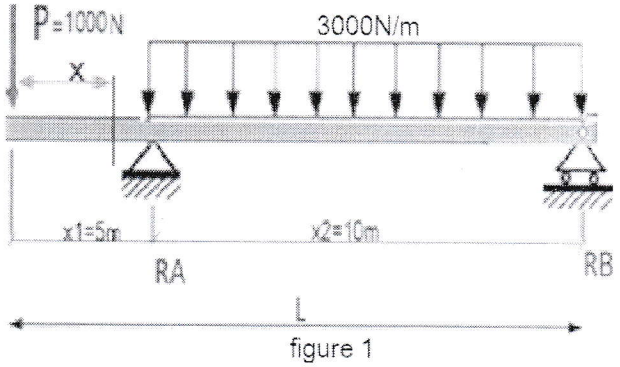
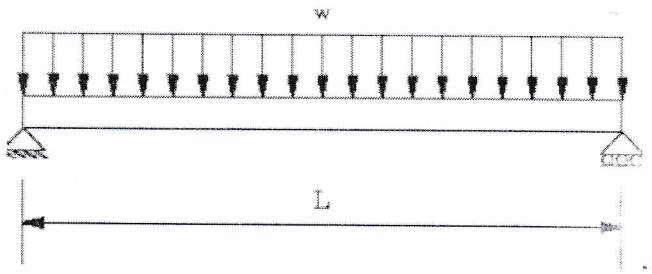


figure 1

Question3(15 points)

-Use **Simpsone Rule** to calculate the area of the moment diagram for the beam showing aside.
-Use the matlab command Trapz to calculate the area of the moment diagram.
(w=1 kn/m L=8m n=10)



Question 4:(20 points)

By using the **Golden Section** search method, find the value of x that maximize:

$f(x) = 2x - 1.75x^2 + 1.1x^3 - 0.25x^4$,

find(x_{op},$f(x_{op})$), where (**xL = -2 , xu = 4**),try **three iterations.**

(write the results in a table).

End Of Questions

Question2 (20 points)

```
x1=input('x1=') (5 point: inputs)
x2=input('x2=enter x2>x1')
p=input('p=')_
w=input('w=')_
L=x1+x2
x=linspace(0,L,1000); (1 point)
rb=(w*x2^2/2-p*x1)/x2     (1 point)

for i=1:length(x)_  (8 points)
    if (x(i)<x1)_
        V(i)=-p;_
        M(i)=p*x(i);
    else
        V(i)=rb-w*(L-x(i));
        M(i)=w*(L-x(i))^2/2-rb*(L-x(i));_
    end %if
end %for
subplot(2,1,1), plot(x,V)    (5 points)
axis([0,L,-30000,+30000])
grid
xlabel('x[m]'),ylabel('V')_
subplot(2,1,2), plot(x,M)
axis([0,L,-70000,+70000])
grid_
xlabel('x[m]'), ylabel('M')
rb=14500
```

Question4(20 points)

Golden section: (15 point for tables values)

i	xL	xu	X1	X2	F(x1)	F(x2)
1	-2	4	1.708	0.292	1.664	0.460
2	0.292	4	2.584	1.708	1.316	1.664
3	0.292	2.584	1.708	1.167	1.664	1.235

iter 1: a = -2 , b = 4 , x1 = a + R(b-a) = 1.708 , x2 = b - R(b-a) = 0.292 f(x1) = 1.664 , f(x2) = 0.460 f(x1) > f(x2) then continue with [x2 , b]. f(x1) > f(x2) then xopt = x1 = 1.708 , ea = (1-R) * (b-a) / |xopt| * 100 = 134 %

iter 2: a = 0.292 , b = 4 , x1 = a + R(b-a) = 2.584 , x2 = 1.708 f(x1) = 1.316 , f(x2) = 1.664 f(x1) < f(x2) then continue with [a , x1]. f(x1) < f(x2) then xopt = x2 = 1.708 , ea = (1-R) * (b-a) / |xopt| * 100 = 83 %

iter 3: a = 0.292 , b = 2.584 , x1 = 1.708 , x2 = b - R(b-a) = 1.167 f(x1) = 1.664 , f(x2) = 1.235 f(x1) > f(x2) than continue with [x2 , b]. f(x1) > f(x2) then xopt = x1 = 1.708 , ea = (1-R) * (b-a) / |xopt| * 100 = 51 % .

XOP=(2.585+.292)/2=1.4385 (5 points)