

ASSIGNMENT NO 5 - APPLICATION OF PYTHON IN THE FIELD OF REINFORCED CEMENT CONCRETE

Q-1

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#To find the ultimate moment carrying capacity of singly r/f beam
fck = float(input("Enter the value of charateristics compressive strength:"))
fy = float(input("Enter the grade of steel:"))
Es = float(input("Enter the value of Modulus of Elasticity of steel:"))
b = float(input("Enter the value of Width:"))
d = float(input("Enter the value of effective depth:"))
d1 = float(input("Enter the value of bar diameter (d1):"))
d2 = float(input("Enter the value of bar diameter (d2):"))
n=int(input("Enter the number of bars"))
Ast1=(n*0.7854*d1*d1)
Ast2=(n*0.7854*d2*d2)
print("The value of area of steel (Ast1):", Ast1)
print("The vaue of area of steel (Ast2):", Ast2)
#Total area of steel
Ast=Ast1+Ast2
print("The value of area of steel (Ast):", Ast)
#Neutral Axis Factor
ku = 0.0035/(0.0055+(fy/(1.15*Es)))
print("The value of Neutral axis factor (ku):", ku)
#Momenent of Resistance factor
Ru=0.36*fck*ku*(1-(0.42*ku))
print("The value of Moment of Resistance factor (Ru):", Ru)
#Maximum Neutral Axis:
xumax = ku*d
print("The value of maximum neutral axis (xumax):", xumax)
xu = (0.87*fy*Ast)/(0.36*fck*b)
print ("The value of Actual Neutral Axis (xu):", xu)
if xumax>xu:
    print("UNDER REINFORCED")
else:
    print("OVER REINFORCED")
#By Comparing
X = float(input("Enter the value of Neutral Axis:"))
#Moment of Resistance
Mu=0.36*fck*xu*b*(d-(0.42*xu))*10*-6
print("The value of Moment of Resistance is:", Mu)
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Enter the value of charateristics compressive strength:20
Enter the grade of steel:415
Enter the value of Modulus of Elasticity of steel:200000
Enter the value of Width:230
Enter the value of effective depth:400
Enter the value of bar diameter (d1):20
Enter the value of bar diameter (d2):16
Enter the number of bars2
The value of area of steel (Ast1): 628.32
The vaue of area of steel (Ast2): 402.1248
The value of area of steel (Ast): 1030.4448
The value of Neutral axis factor (ku): 0.4791666666666667
The value of Moment of Resistance factor (Ru): 2.7556874999999996
The value of maximum neutral axis (xumax): 191.66666666666669
The value of Actual Neutral Axis (xu): 224.66310086956523
OVER REINFORCED
Enter the value of Neutral Axis:191.666667
The value of Moment of Resistance is: -6822690186.672462
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