# MID - SEM EXAM

1740256

1.

In [10]:

```
principle=float(input("Enter principle amount: "))
time=int(input("Enter time duration: "))
rate=float(input("Enter rate of interest: "))
amount=(principle * (1 + (float(rate)/100))**time)
compound_interest=amount-principle;
print("Total amount:- ",amount)
print("Compound interest:- %0.2f"%compound_interest)
```

```
Enter principle amount: 2000
Enter time duration: 6
Enter rate of interest: 0.06
Total amount:-  2007.210808643888
Compound interest:- 7.21
```

5.

In [3]:

```python
from mpl_toolkits.mplot3d import Axes3D
import matplotlib.pyplot as plt
import numpy as np
from pylab import *
from matplotlib import cm
%matplotlib inline
plt.style.use('seaborn-white')
ax=Axes3D(figure())
x=arange(-3*pi,3*pi,0.1)
y=arange(-3*pi,3*pi,0.1)
xx,yy=meshgrid (x,y)
z=sin(xx)+sin(yy)
ax.plot_surface(xx,yy,z,cmap=cm.jet,cstride=1)
plt.show()
```


4

In [6]:
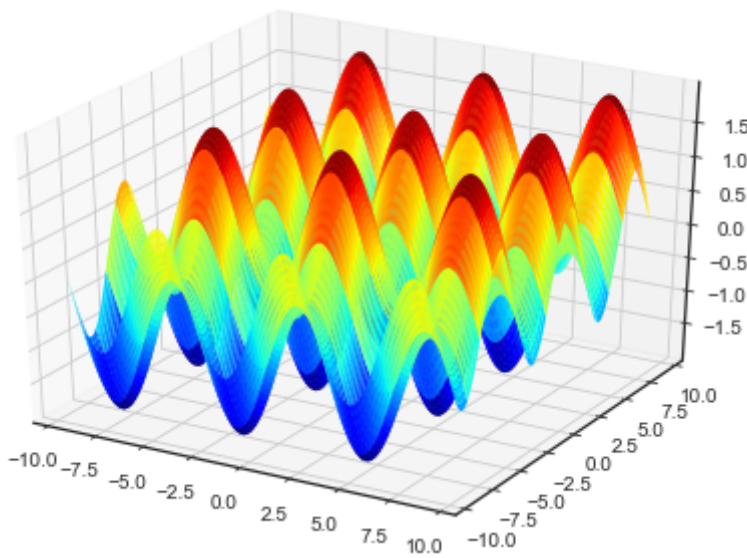
```python
import sympy as sp
from sympy import *
x = Symbol('x')
y = Function('y')(x)
diffeq = Eq(y.diff(x,x)-2*y.diff(x)+5*y,sin(3*x))     #define the differential equation
print('The differential equation is: ')
print(diff)
print('The solution is: ')
dsolve(diffeq,y)
```

The differential equation is:
<function diff at 0x000002AEFED4D378>
The solution is:

Out[6]:

Eq(y(x), (C1*sin(2*x) + C2*cos(2*x))*exp(x) - sin(3*x)/13 + 3*cos(3*x)/26)

2.

In [14]:

```python
#3x3 matrix
X=[[1,2,3],[4,5,6],[7,8,9]]
#3x4 matrix
Y=[[1,2,1,2],[3,4,3,4],[5,6,5,6]]
result=[[0,0,0,0],[0,0,0,0],[0,0,0,0]]

for i in range(len(X)):
    for j in range(len(Y)):
        for k in range(len(Y)):
            result[i][j]+=X[i][k]+Y[k][j]
            for r in result:
                print(r)
```

```
[2, 0, 0, 0]
[0, 0, 0, 0]
[0, 0, 0, 0]
[7, 0, 0, 0]
[0, 0, 0, 0]
[0, 0, 0, 0]
[15, 0, 0, 0]
[0, 0, 0, 0]
[0, 0, 0, 0]
[15, 3, 0, 0]
[0, 0, 0, 0]
[0, 0, 0, 0]
[15, 9, 0, 0]
[0, 0, 0, 0]
[0, 0, 0, 0]
[15, 18, 0, 0]
[0, 0, 0, 0]
[0, 0, 0, 0]
[15, 18, 2, 0]
[0, 0, 0, 0]
[0, 0, 0, 0]
[15, 18, 7, 0]
[0, 0, 0, 0]
[0, 0, 0, 0]
[15, 18, 15, 0]
[0, 0, 0, 0]
[0, 0, 0, 0]
[15, 18, 15, 0]
[5, 0, 0, 0]
[0, 0, 0, 0]
[15, 18, 15, 0]
[13, 0, 0, 0]
[0, 0, 0, 0]
[15, 18, 15, 0]
[24, 0, 0, 0]
[0, 0, 0, 0]
[15, 18, 15, 0]
[24, 6, 0, 0]
[0, 0, 0, 0]
[15, 18, 15, 0]
[24, 15, 0, 0]
[0, 0, 0, 0]
[15, 18, 15, 0]
[24, 27, 0, 0]
[0, 0, 0, 0]
[15, 18, 15, 0]
```

```
[24, 27, 5, 0]
[0, 0, 0, 0]
[15, 18, 15, 0]
[24, 27, 13, 0]
[0, 0, 0, 0]
[15, 18, 15, 0]
[24, 27, 24, 0]
[0, 0, 0, 0]
[15, 18, 15, 0]
[24, 27, 24, 0]
[8, 0, 0, 0]
[15, 18, 15, 0]
[24, 27, 24, 0]
[19, 0, 0, 0]
[15, 18, 15, 0]
[24, 27, 24, 0]
[33, 0, 0, 0]
[15, 18, 15, 0]
[24, 27, 24, 0]
[33, 9, 0, 0]
[15, 18, 15, 0]
[24, 27, 24, 0]
[33, 21, 0, 0]
[15, 18, 15, 0]
[24, 27, 24, 0]
[33, 36, 0, 0]
[15, 18, 15, 0]
[24, 27, 24, 0]
[33, 36, 8, 0]
[15, 18, 15, 0]
[24, 27, 24, 0]
[33, 36, 19, 0]
[15, 18, 15, 0]
[24, 27, 24, 0]
[33, 36, 33, 0]
```

In [ ]: