1.control structure of python:

```
a=10
b=20
if a>b:
print("a is greater than b")
else:
print("b is greater than a")

num=int(input("enter a number:"))
if (num%2==0):
print("number is even")
else:
print("number is odd")
```

2.list, dictionary,tuple:

```
l=[]
l.append(5)
l.append(10)
print("adding 5 & 10 in list",l)
l.pop()
print ("popped one element from list",l)
print()
t=tuple(l)
print("tuple",t)
print()
d={}
d[5]="five"
d[10]="ten"
print("dictionary",d)
del d[10]
print("dictionary",d)
```

3.concept of functions, scoping, recursion, and list mutability:

```
def factorial(n):
if n==0 or n==1:
return 1
else:
return n* factorial(n-1)
n=int(input("enter any number:"))
fact=factorial(n)
print(fact)
```

4.object oriented programming :

```
class person:
def __init__(self,name,age):
self.name=name
self.age=age
p1=person("john",36)
print(p1.name)
print(p1.age)
```

5.exception handling

```
def demo():
try:
print("Hello")
print(10)
except ZeroDivisionError:
print("ZeroDivisionError")
return 10
finally:
print("This code will run")
return 5
print(demo())
```

6.armstrong number

```
num=int(input("Enter a number:"))
sum=0
temp=num
while temp>0:
digit=temp % 10
sum += digit ** 3
temp //= 10
if num==sum:
print(num,"is an armstrong number")
else:
print(num,"is not an armstrong number")
```

7.factorial number:

```
num=int(input("Enter a number:"))
fact=1
for i in range(1,num+1):
fact=fact*i
print ("the factorial of",num,"is",fact)
```

8.prime number:

```
num=int(input("Enter a number:"))
flag=False
 if num>1:
for i in range(2,num):
 if (num % i) ==0:
 flag=True
 break
 if flag:
print(num,"is not a prime number")
else:
 print(num,"is a prime number")
```

9.calculator:

```
def add(x,y):
return x + y
 def sub(x,y):
 return x - y
def mul(x,y):
return x * y
def div(x,y):
 return x / y

print ("select option:")
print("1.add")
print("2.sub")
print("3.mul")
print("4.div")

while True:
choice = input ("enter your choice(1/2/3/4):")
if choice in('1','2','3','4'):
```

```
num1=float(input("enter num1:"))
num2=float(input("enter num2:"))
if choice == '1':
print(num1,"+",num2,"=",add(num1,num2))
elif choice == '2':
print(num1,"-",num2,"=",sub(num1,num2))
elif choice == '3':
print(num1,"*",num2,"=",mul(num1,num2))
elif choice == '4':
print(num1,"/",num2,"=",div(num1,num2))
next_calculation=input("lets do next calculation?(yes/no):")
if next_calculation=="no":
 break
else:
print("invalid input")
```

10.lambda function:

```
d=lambda p:p*5
t=lambda p:p*2
x=7
x=d(x)
x=t(x)
x=d(x)
print(x)
nums=[6,16,26,36,46,56]
result=list(map(lambda x:x*2+2-4,nums))
print (result)
t=[1,2,3,4,5,6,7,8,9]
result=filter (lambda v:v%2!=0,t)
        print (list(result))
```

11.binary search:

```
List1=[12,24,32,39,45,50,54]
N=45
S=len(list1)
Print("length of list",s)
def binary_search(list1,n):
low=0
high=len(list1)-1
mid=0
while low<=high:
mid=(high+low)//2
if list[mid]<n
low=mid+1
elif list1[mid]>n:
high=mid-1
else:
return mid
return -1
result=binary_search(list1,n)
if result!=-1
print("element is present at index",str(result))
else:
print("element is not present in list1")
```