1.Explain the key features of Python that make it a popular choice for programming?

Ans-Python is widely used Interpreted,object oriented and high level programming language.it is general purpose programming language and we use to it develope gui and web application.

some of the key features of Python that make it a popular choice for programming :

1} - Simple to code: Python code looks clean and impressive when the scope is indented using spaces or tabs.

2}Language Interpretation: Python is an interpreted language, which means that its code gets executed line by line rather than all at once.

3} Object-Based Programming: Python is compatible with several object-oriented programming features, including inheritance, polymorphism, classes, and data encapsulation.

4} Open Source and Free: Python is an open-source as well as free programming language.

Q 2. Describe the role of predefined keywords in Python and provide examples of how they are used in a program?

Ans: Python, predefined keywords are reserved words that have special meanings and are used to perform specific tasks. They are used to define the structure and logic of a program.

```
#Example -compare two numbers we use if

a=int(input("Enter a first num"))
b=int(input("Enter a second num"))
if a>b :
  print("A is Greater", a)
else :
  print("B is greater",b)


#Example
for i in range(5):
  print(i)

# while - Used for loops.
i = 0;
while i< 5:
   print(i);
   i += 1
```

```
Enter a first num52
Enter a second num42
A is Greater 52
0
1
2
3
4
0
1
2
3
4
```

Q.4 Discuss the different types of operators in Python and provide examples of how they are used ?

Ans-Python has various types of operators that perform different operations.

1. Arithmetic Operators: Example a= 10 and b= 5
    - Addition: a + b = 15
    - Subtraction: a - b = 10

- Multiplication: a * b = 50
- Division: a / b = 2
- Modulus: a % b=0
- Exponentiation: a ** b

2. Comparison Operators:

- Equal: a == b
- Not Equal: a != b
- Greater Than: a > b
- Less Than: a < b
- Greater Than or Equal: a >= b
- Less Than or Equal: a <= b

3. Logical Operators:

- And: a and b
- Or: a or b
- Not: not a

4. Assignment Operators:

- Assign: a = b
- Add and Assign: a += b
- Subtract and Assign: a -= b
- Multiply and Assign: a * = b
- Divide and Assign: a /= b
- Modulus and Assign: a %= b

5. Membership Operators:

- In: a in b
- Not In: a not in b

Example: if x in [1, 2, 3]: print("x is in the list")

1. Bitwise Operators:

- AND: a & b
- OR: a | b
- XOR: a ^ b
- Shift Left: a << b
- Shift Right: a >> b

2. Identity Operators:

- Is: a is b
- Is Not: a is not b

Q.5} Explain the concept of type casting in Python with examples?

Ans- Type casting means convert one data type into another.

```
#casting

a=10
b=2
c=2.03

aa=int(c)
bb=float(b)
cc=str(a)
print(aa)
print(bb)
print(cc)
```

```
2
2.0
10
```

Q.6 How do conditional statements work in Python? Illustrate with examples?

Ans-condition statements are used to check the condition and work according to that condition .A condition may have two result either the condition true and false.

```
#Examples

def check_voting_age(age):
    if age >= 18:
        return "You are eligible to vote!"
    else:
        return "You are not eligible to vote yet!"

age = int(input("Enter your age: "))
print(check_voting_age(age))
```

```
Enter your age: 12
```

Q.7 Describe the different types of loops in Python and their use cases with examples?

Ans- 1} While Loop: Used to execute a code block as long as a certain condition is true.

2} For Loop: Used to iterate over a sequence (such as a list, tuple, or string) or other iterable objects.

3} Nested Loops: Used to nest one loop inside another.

```
#Example -print 1 to 10 using while loop
num = 1
while num <= 10:
    print(num)
    num += 1
```

```
1
2
3
4
5
6
7
8
9
10
```

```
#Exmples to print odd even using for loop
numbers = range(1, 11)
for num in numbers:
    if num % 2 == 0:
        print(f"{num} is even")
    else:
        print(f"{num} is odd")
```

```
1 is odd
2 is even
3 is odd
4 is even
5 is odd
6 is even
7 is odd
8 is even
```