Week-6, Practice, Theory, Solution

Problem 1

Question

What are the p and q representing in the following program?

```
1  def addone(index):
2      global q
3      if index in fruit:
4          fruit[index] += 1
5      else:
6          fruit[index] = 1
7          q += 1
8  fruit = {}
9  q = 0
10 l = ['Apple','Banana','Apple','Mango','Apple','Orange','Mango','Banana']
11 for x in l:
12     addone(x)
13 p = 0
14 for f in fruit:
15     p += fruit[f]
```

(a) `p` represent number of types of fruits and `q` represent number of total fruits.

(b) `p` represent number of total fruits and `q` represent number of types of fruits.

(c) `p` and `q` both represent number of total fruits.

(d) `p` and `q` both represent number of types of fruits

Answer

(b)

Solution

`p` represent number of total fruits that calculated in code line 13-15 where each fruit's value from dictionary `fruit` will be added in `p` and `q` represent number of types of fruits that are incremented by 1 inside function `addone` when new fruit name added in the dictionary `fruit`.Hence, Option `b` is correct

Problem 2

Question

```
s1={1,2,3,4,5}
s2={3,4,5,6,7}
###Statement
```

Statement	Output
1. `print(s1.difference(s2))`	A. `{1, 2, 3, 4, 5, 6, 7}`
2. `print(s1.intersection(s2))`	B. `{1, 2, 6, 7}`
3. `print(s1.union(s2))`	C. `{1, 2}`
4. `print(s1.symmetric_difference(s2))`	D. `{6, 7}`
5. `print(s2.difference(s1))`	E. `{3, 4, 5}`

Select the correct match of statement and respective output

(a) `1 - C , 2 - B , 3 - A , 4 - E , 5 - D`

(b) `1 - D , 2 - B , 3 - A , 4 - E , 5 - C`

(c) `1 - D , 2 - E , 3 - A , 4 - B , 5 - C`

(d) `1 - C , 2 - E , 3 - A , 4 - B , 5 - D`

Answer

(d)

Solution

Correct match of statement and respective output is:-

Statement	Output
1. `print(s1.difference(s2))`	C. `{1, 2}`
2. `print(s1.intersection(s2))`	E. `{3, 4, 5}`
3. `print(s1.union(s2))`	A. `{1, 2, 3, 4, 5, 6, 7}`
4. `print(s1.symmetric_difference(s2))`	B. `{1, 2, 6, 7}`
5. `print(s2.difference(s1))`	D. `{6, 7}`

Problem 3

Question

Which one of the following denotes an empty set? It is a Multiple Select Question(MSQ).

(a) `s = set()`

(b) `s = {}`

(c) `s = set([])`

(d) `s = set('')`

(e) `s = set(0)`

Answer

(a), (c) and (d)

Solution

option (b) is not correct because `{}` represents a dictionary and option (e) is not correct because `int` object is not `iterable` to convert in set. Other options are correct to denote an empty set.

Problem 4

Question

Assume that `i, s, l, t` and `st` are variables that have already been defined. All three Boolean expressions given below evaluate to `True`.

```
type(i) == int
type(s) == str
type(l) == list
type(t) == tuple
type(st) == set
```

Which of the following snippets of code will execute without throwing an exception (runtime error)? It is a Multiple Select Question (MSQ).

(a)

```
d = {i: 'int', s: 'string'}
```

(b)

```
d = {s: len(s), i: st}
```

(c)

```
d = {l: s, s: t}
```

(d)

```
d = {i: l, st: len(l)}
```

(e)

```
d = {t: l, s: t}
```

Answer

(a), (b)

Solution

Dictionary key can only be an immutable value like integer, string and tuple. Here option (c) is not correct because list(mutable) `l` can not be assigned as a key. option (d) is not correct because set(mutable) `st` can not be assign as a key and option (e) is not correct due to one corner case if tuple have list inside then it will give error `unhashable type: 'list'`.for example:

```
t=([1,2,3],2)
d={t:[1,2,3],'A':t}
```

Problem 5

Question

Code

```
s1 = {1,2,3,4,4,1,2}
s2 = {4,3,2,1}
l1 = [4,3,2,1]
l2 = [1,2,3,4,4,1,2]
print(list(s1)==l2)
print(set(l1)==s2)
print(s1==s2)
```

(a)

```
True
True
True
```

(b)

```
False
True
True
```

(c)

```
False
False
True
```

(d)

```
False
True
False
```

Answers

(b)

Solution

`print(list(s1)==l2)` returns False because set removes all duplicate values so list(s1) is not equal to l2. `print(set(l1)==s2)` return True because after converting list `l1` into set , its elements are similar to `s2` . `print(s1==s2)` return True because set removes all duplicate elements then s1 and s2 have the same elements.

Problem 6

Question

Select all the correct options to remove “Orange” from the set. It is a Multiple Select Question(MSQ).

```
sampleSet = {"Yellow", "Orange", "Black"}
```

(a) `sampleSet.pop("Orange")`

(b) `sampleSet.discard("Orange")`

(c) `sampleSet.remove("Orange")`

(d) `del sampleSet["Orange"]`

Answer

(b) and (c)

Solution

Option (a) is not correct because in set, `pop()` takes no arguments (here 1 argument is given) and option (d) is not correct because set object does not support item deletion by `del` keyword.

Problem 7

Question

Code-1

```
d = {'virat' : 100, 'Dhoni' : 140, 'Rohit' : 60}
d['sachin']=150
```

Code-2

```
d = {'virat' : 100, 'Dhoni' : 140, 'Rohit' : 60}
d['virat']=150
```

Which of the following statements are true about Code-1 and Code-2 . It is a Multiple Select Question(MSQ).

(a) Code-1: Give error because `sachin` does not exist in dictionary d.

(b) Code-2: Update the value of key(`virat`) in dictionary d.

(c) Code-1: Add new item(key= `sachin` and value= `150`) in dictionary d.

(d) Code-2: Add new item(key= `virat` and value= `150`) in dictionary d.

(d) Code-2: Give error because `virat` already exists in dictionary d and its value can not be changed.

Answer

(b) and (c)

Solution

In Dictionary, when we assign value by `dict_name[key]=value` statement, if key already exists in dictionary then value will be updated by new value and if key does not exist in dictionary the new item will be added in dictionary with key and value. Hence, option (b) and (c) are correct.

Problem 8

Question

Select the correct match of method of Dictionary and respective description

Method	Description
1. `items()`	A. `Returns a list of all the values in the dictionary`
2. `keys()`	B. `Returns a dictionary with the specified keys and value`
3. `values()`	C. `Returns the value of the specified key`
4. `get()`	D. `Returns a list containing a tuple for each key value pair`
5. `fromkeys()`	E. `Returns a list containing the dictionary's keys`

(a) `1 - B , 2 - E , 3 - A , 4 - C , 5 - D`

(b) `1 - D , 2 - E , 3 - C , 4 - A , 5 - B`

(c) `1 - D , 2 - E , 3 - C , 4 - B , 5 - A`

(d) `1 - D , 2 - E , 3 - A , 4 - C , 5 - B`

Answer

(D)

Solution

Correct match of method of Dictionary and respective description:-

Method	Description
1. `items()`	D. `Returns a list containing a tuple for each key value pair`
2. `keys()`	E. `Returns a list containing the dictionary's keys`
3. `values()`	A. `Returns a list of all the values in the dictionary`
4. `get()`	C. `Returns the value of the specified key`
5. `fromkeys()`	B. `Returns a dictionary with the specified keys and value`

Problem 9

Question

Which of the following statements are true about Dictionaries in python. It is a Multiple Select Question(MSQ).

(a) The values of a dictionary can be accessed using keys

(b) The keys of a dictionary can be accessed using values

(c) Keys must be immutable

(d) Values of a dictionary must be unique

(e) Duplicate keys are allowed in Dictionary

(f) Dictionaries are mutable

Answer

(a), (c), and (f)

Solution

Option (b) is incorrect because The keys of a dictionary can not be accessed using values. Option (d) is incorrect because the value of the dictionary can be duplicated and Option (e) is incorrect because the dictionary key can not be duplicated. Remaining options (a), (c), and (f) are true about the dictionary.

Problem 10

Question

Which of the following snippets of code will execute without throwing an exception (runtime error)? .if `t` is already initialized as a tuple. It is a Multiple Select Question(MSQ).

(a) `t[3]=40`

(b) `t.append(50)`.

(c) `t.remove(30)`

(d) `t = t * 3`

(e) `t = t + (40 , 50)`

(e) `None of the above`

Answers

(d), (e)

Solution

tuple is immutable and its value can not be changed after initializing. but in option (d) and (e) new tuple is initializing with value return by `t * 3` or `t + (40 , 50)`. For example:

```
t=(1,2)
t=t*3
print(t)
t=t +(40 , 50)
print(t)
```

Output

```
(1, 2, 1, 2, 1, 2)
(1, 2, 1, 2, 1, 2, 40, 50)
```

Problem 11

Question

What will be the output of the following code snippet

```
D = {1 : 1, 2 : '2', '1' : 1, '2' : 3}
D['1'] = 2
print(D[D[D[str(D[1])]]])
```

(a) `2`

(b) `3`

(c) `'2'`

(d) `Error`

Answer

(b)

Solution

After updating D['1']=2 in dictionary

for `print(D[D[D[str(D[1])]]])`

`str(D[1])` return '1'

`D['1']` return 2

`D[2]` returns '2'

and finally

`D['2']` returns 3

Hence, option (b) is correct

Problem 12

Question

What will be the output of the following code snippet

```
D = dict()
for i in range (3):
    for j in range(2):
        D[i] = j
print(D)
```

(a) `{0: 0, 1: 0, 2: 0}`

(b) `{0: 1, 1: 1, 2: 1}`

(c) `{0: 0, 1: 0, 2: 0, 0: 1, 1: 1, 2: 1}`

(d) `TypeError`

Answer

(b)

Solution

For each value of `i` the last value of `j` which is 1 will be the final update in the dictionary for key `i`, Hence option (b) is correct.