Department of Computer Science & Engineering

University of Asia Pacific (UAP)

Program: B.Sc. in Computer Science and Engineering

Final Examination	**Spring 2020**	**3rd Year 1st Semester**
Course Code: CSE 309	**Course Title: Object Oriented Programming II: Visual and Web Programming**	**Credits: 3**
Full Marks: 120* (Written)		**Duration: 2 Hours**

* Total Marks of Final Examination: 150 (Written: 120 + Viva: 30)

Instructions:

1. There are **Four (4)** Questions. Answer all of them. All questions are of equal value. Part marks are shown in the margins.
2. Non-programmable calculators are allowed.

1. a) Suppose, one of your team members has written the "Product" model in the models.py file as following

```
class Product(models.Model):
    name = models.CharField(max_length=100)
    price = models.IntegerField(blank=True)
    category = models.CharField(max_length=100)
    description = models.TextField(blank=True)

    image = models.ImageField(upload_to='products/images/', blank=True, null=True)
    file = models.FileField(upload_to='products/files/', blank=True, null=True)

    reviews = models.ManyToManyField(Review)

    def __str__(self):
        return self.name
```

Now write the necessary codes to implement a **modified** "Upload product" functionality where the system saves only the products with price more than 100 taka. Write the codes in the following files — 22 (4+4+12+2)

I. upload_product.html
II. forms.py
III. views.py
IV. urls.py

Assume other necessary modules are already implemented and imported in the files.

b) Draw a diagram to demonstrate the interaction among files in Django. — 8

2. a) Suppose one of your team members has written the "Product" and "Cart" model class in the models.py file as following

```
class Product(models.Model):
    name = models.CharField(max_length=100)
    price = models.IntegerField(blank=True)
    category = models.CharField(max_length=100)
    description = models.TextField(blank=True)

    image = models.ImageField(upload_to='products/images/', blank=True, null=True)
    file = models.FileField(upload_to='products/files/', blank=True, null=True)

    reviews = models.ManyToManyField(Review)

    def __str__(self):
        return self.name


class Cart(models.Model):
    user = models.ForeignKey(User, on_delete=models.CASCADE)
    product = models.ManyToManyField(Product)
    created_date = models.DateTimeField(auto_now_add=True, auto_now=False)
    updated_date = models.DateTimeField(auto_now_add=False, auto_now=True)

    def __str__(self):
        return self.user.username
```

Now write the necessary codes to implement the **modified** "Display Cart" functionality. The modified cart only shows the products which have images. Write the codes in the following files — 18 (6+10+2)

I. cart.html
II. views.py
III. urls.py

Assume other necessary modules are already implemented and imported in the files.

b) Suppose you have a functional e-commerce website developed in the Django framework. Now find out the purpose of this following code segment by explaining each code-line. No need to write the codes in your answer script just use the numbers to refer to the code lines. — 12

```
1  def showProducts(request):
2
3      products = Product.objects.all()
4      if request.method == 'POST':
5          products = Product.objects.filter(name__icontains = request.POST['search'])
6          category = Product.objects.filter(category__icontains = request.POST['search'])
7          description = Product.objects.filter(description__icontains = request.POST['search'])
8
9          products = products | category | description
10
11     user_count = User.objects.count()
12     product_count = Product.objects.count()
13
14     context = {
15         'products': products,
16         'u_c': user_count,
17         'p_c': product_count
18     }
19     return render(request, 'ProductManagement/products.html', context)
20
```

3. a) "*Samsung Note 10*" is a smartphone model of Samsung. What should be the best representation of "*Samsung Note 10*" (Abstract class, Class or Object)? Justify your answer. 10

b) The University of Asia Pacific is one of the top-most private universities in Bangladesh and the Department of Computer Science and Engineering (CSE) is the most popular department of this university. CSE department has around 500 active students and 25 faculty members. Mr. Tanmoy Sakar is teaching Python course to the brilliant students of 3-1 semester. 20

Now draw a diagram to represent the above scenario using all the concepts of OOP. You may add new classes or objects to the diagram if necessary.

4. a) Why do we need the concept of inheritance in OOP? 3

b) Explain the different types of inheritance using real-life examples. Just draw class diagrams to explain these. 15

c) Write a python code of the Hybrid inheritance example from answer "b". 12

Or

a) What is the importance of encapsulation? 3

b) Explain the difference between abstract class and interface using real-life examples. 15

c) Write the python code of an Abstract Class "Mobile" and an interface "Camera" considering the necessary functionalities. 12