UNIVERSITI TEKNOLOGI MARA
FINAL EXAMINATION

COURSE	:	**OBJECT ORIENTED PROGRAMMING**
COURSE CODE	:	**CSC186**
EXAMINATION	:	**JULY 2021**
TIME	:	**3 HOURS**

INSTRUCTIONS TO CANDIDATES

1. This question paper consists of THREE (3) questions.
2. Answer ALL questions in English. Start each answer on a new page.
3. Answer must be handwritten. Scan and save the answer paper in ONE file only.
4. Upload the file at the specified platform.
5. You are strictly prohibited to discuss/share/disseminate the questions and answers amongst your classmates/coursemates. If found guilty or committed to one of the actions, you will be penalised.

DO NOT TURN THIS PAGE UNTIL YOU ARE TOLD TO DO SO

This examination paper consists of 7 printed pages

QUESTION 1 (15 marks)

The Academic Affairs Department of Cemerlang College provides photocopy services for the lecturers. To request the service, the lecturers will need to provide their name, staff id, faculty code (FHTM-Faculty of Hotel and Tourism, FSSR-Faculty of Sports Science and Recreation), type of assessment (quiz, test, examination), number of pages for master copy and number of copies required. All the data will be stored in a file named `photocopyInfo.txt`. The following class `Photocopy` defines all the details required for the photocopy service.
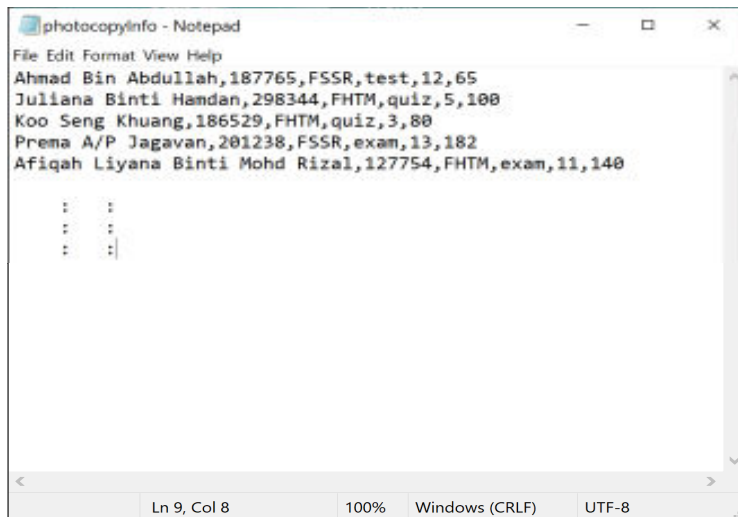
```
Class Name : Photocopy

Attributes :
    String lectName;
    String staffID;
    String facCode;    //faculty code either FHTM(Faculty of Hotel and
                       //Tourism) or FSSR(Faculty of Sports Science and
                       //Recreation).
    String assType;    //either quiz or test or exam.
    int masterNum;     //number of pages of master copy.
    int copiesNum;     //number of copies.

Behavior :
    public Photocopy() {..} //default constructor
    public void setPhotocopy(..) {..} //setter method

    //retr iever methods
    public String getLectName(){..}
    public String getStaffID(){..}
    public String getFacCode(){..}
    public String getAssType(){..}
    public int getMasterNum(){..}
    public int getCopiesNum() {..}

    public String toString() {..} //display method
```
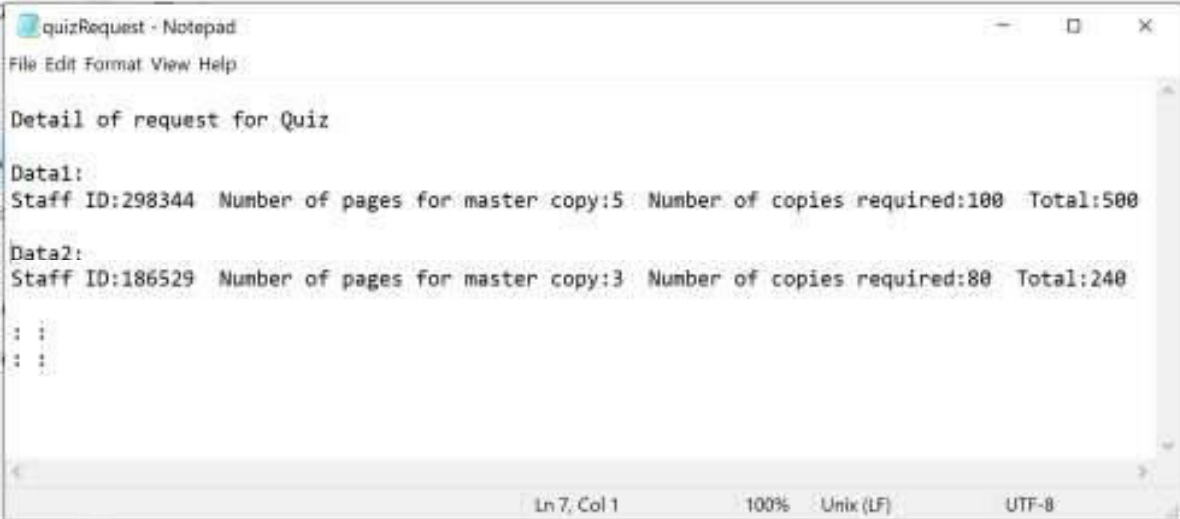

photocopyInfo - Notepad

File Edit Format View Help

```
Ahmad Bin Abdullah,187765,FSSR,test,12,65
Juliana Binti Hamdan,298344,FHTM,quiz,5,100
Koo Seng Khuang,186529,FHTM,quiz,3,80
Prema A/P Jagavan,201238,FSSR,exam,13,182
Afiqah Liyana Binti Mohd Rizal,127754,FHTM,exam,11,140
```

Ln 9, Col 8   100%   Windows (CRLF)   UTF-8

`photocopyInfo.txt`

Write Java program segments to do the following:

a) Open an input file named `photocopyInfo.txt`, read all the data and store them into an array of object, `copiesArr` of type `Photocopy`. This array can store up to 200 records, but the actual storage used is based on number of records in the input file.

(5.5 marks)

b) Display all information of photocopy services requested by the lecturers of FHTM.

(1.5 marks)

c) Find all photocopy requests for quiz and copy the staff id, number of pages for master copy, number of copies required and total number of copies (number of pages for master copy multiply with number of copies required) into an output file named `quizRequest.txt` as depicted in the following diagram.


```
quizRequest - Notepad                                    —   □   ×
File Edit Format View Help

Detail of request for Quiz

Data1:
Staff ID:298344  Number of pages for master copy:5  Number of copies required:100  Total:500

Data2:
Staff ID:186529  Number of pages for master copy:3  Number of copies required:80  Total:240

: :
: :

                        Ln 7, Col 1        100%    Unix (LF)        UTF-8
```

quizRequest.txt

(4 marks)

d) Each photocopy uses A4 papers and two-sided copying mode. Each ream has 500 pieces of A4 paper. Calculate and display number of reams needed to meet all the photocopy requests.

(4 marks)

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QUESTION 2 (25 marks)

Kesuma Skills Development Centre (KSDC) is a training center that offers some of the most comprehensive facilities and support services to cater corporate activities. KSDC also provides auditoriums, meeting rooms, computer labs and seminar rooms.

A program is written to store information of activities at KSDC. The following is `RoomActivity` class which is inherited from `Activity` class.

```
class: Activity
Attributes:
    private String activityName;   //My New Me, Big Data
    private char organiser;        //G-Government, P-Private ,
                                   //U-University
    private double budget;         //33600.00
    private String date;           //dd/mm/yyyy

Methods:
    //a normal constructor, accessors, a printer



class: RoomActivity
Attributes:
    private String roomType;       //A-Auditorium, M-Meeting Room
                                   //L-Computer Lab, S-Seminar Room
    private int numOfParticipant;  //number of participants

Methods:
    //a normal constructor, accessors, a printer

    public double roomCharges() { … }
    /*
        Fixed rate for Government Activities is RM1500.00. Private and University
        organisers will be charged RM25.00 and RM10.00 for each participant respectively.
    */
```
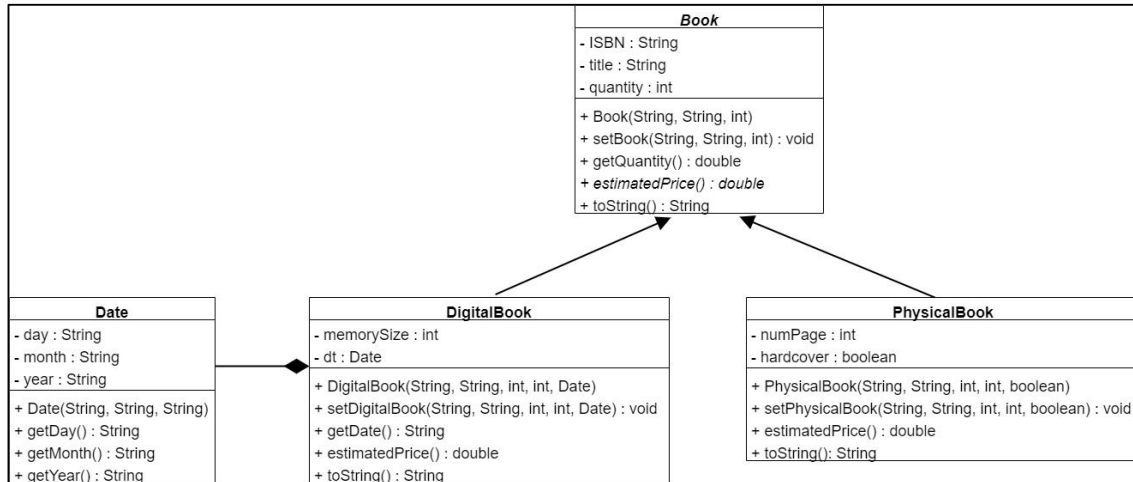
a) Based on the information above, state TWO (2) benefits of the concept and draw a UML diagram to illustrate the relationship.

(3 marks)

b) Explain the method overriding concept. Based on the given classes, give one example of overridden method.

(2 marks)

c) Write the complete definition for class `RoomActivity`.

(10 marks)

d) In the `main()`, write Java program segments to perform the following tasks:

   i. Declare an array of **FIFTY (50)** `RoomActivity` objects named `activity`.

   (1 mark)

   ii. Input and store all information of activities into the array.

   (3 marks)

   iii. Display all the booked activities.

   (1 mark)

   iv. Calculate and display charges and all information of each booking made by private organisers.

   (1.5 marks)

   v. Find and display name of bookings for lab with more than 30 participants.
      Also, calculate and display the number of bookings which fulfill the criteria.

   (3.5 marks)

QUESTION 3 (20 marks)

A KonaKuni bookstore started its operation by selling physical and digital books. Each book has its ISBN, title and quantity. The company is planning to develop an application that can calculate an estimate price of books to forecast the profit. Estimated price for digital books depending on the size of memory (in kilobyte) consumed. A 10% discount is given to all digital books for every purchase on 22nd July annually in conjunction with digital awareness day. Estimated price of physical books is related to the number of pages and book's hardcover.

a) Based on the class diagram above, write the class definition that performs the following tasks.

    i. Write the definition of normal constructor for superclass and both subclasses.

(3 marks)

    ii. Write the definition of method `estimatedPrice()` for superclass and both subclasses. The estimated prices are based on the tables below.

Size of memory (kilobyte)	Charge (RM)
Less than 200	30.00
200 - 500	100.00
Every additional 30 kilobyte after 500	3.00

10% discount for purchases on 22nd July.
Example date formatting is 22072021 (DayMonthYear).

Number of pages	Charge (RM)
Less than 100	30.00
100 – 200	60.00
Every additional 30 pages after 200	5.00

Extra charge is RM10.00 for hardcover.

(9 marks)

b) Write the `main` application segment to do the following tasks.

   i. Declare an array named `arrBook` to store 100 objects of `Book`.

                                  (1 mark)

   ii. Calculate and display the total of estimated price of all purchases on 22nd July.

                                  (3.5 marks)

   iii. Determine the highest demand type of book by displaying either "Digital Book!", "Physical Book!" or "Equal demand!".

                                  (3.5 marks)

END OF QUESTION PAPER