

UNIVERSITY OF RUHUNA
FACULTY OF TECHNOLOGY
DEPARTMENT OF ICT
MID EXAMINATION (SEMESTER1)
ICT1133 – FUNDAMENTALS OF COMPUTER PROGRAMMING (3-CREDIT)

Time Allowed – 1 ½ hour

April 2021

Instructions:

1. This is a practical examination.
2. This paper has two questions on three pages.
3. Answer all the questions.
4. This examination accounts for 20% of the module assessment.
5. Programs should be saved as **Q1.c** and **Q2.c** and upload these two source files within a directly named using your index number (Ex: TGXXX).
6. The answer for the questions will be evaluated via a Q&A session

Question 1

Write a program to find the answer for **A** in the bellow expression. Your program should accept a value for the angle(Θ) in degrees (deg) as a standard user input. After the calculation, print the result of A.

$$A = \sqrt{\frac{2ab^3}{\cos \theta}}$$

- First convert the angle value taken in degrees into radians using the following formula
 $\Theta = \text{deg} / 180 * \pi$
- π is a constant 3.14
- Assume the value of a is 10 and b is 11

You can verify your answer by getting $A=230.63$ when $\text{deg} = 60^\circ$

Question 2

Write a C program to calculate the total bill of a customer for the service taken from a holiday resort. Customers can reserve rooms and order meals at this resort. Implement the program by considering following details.

- The three types of available rooms in the resort and their **prices per day** are given below.

Room type	Room with meals	Room only
Single	Rs. 5000	Rs. 3000
Double	Rs. 8000	Rs. 4500
Triple	Rs. 10000	Rs. 6000

- All the customers will get a discount for their total bill according to the following criteria based on both; the number of rooms reserved and the total bill amount.

Number of rooms		Total bill in Rs	Discount
> 1	and	>=10000	10% discount from the total bill

- At the beginning, the program should **repeatedly** display a **screen with options** to the customer as given in the following screenshot.

```
Welcome to Sunflower Holiday Resort Room Reservation

Select the room type:
- Single
- Double
- Triple
Enter Choice: S
Do you want to order meals? y? n? : y
Enter number of days: 2

Do you want to reserve another room? y? n? y

Select the room type:
- Single
- Double
- Triple
Enter Choice: D
Do you want to order meals? y? n? : n
Enter number of days: 2

Do you want to reserve another room? y? n? n

-----
Total Bill: 19000.00
Discount: 1900.00
Payable Amount: 17100.00
```

According to the screenshot, the order of the user inputs are;

- i. **Get room type** (S/s, D/d, T/t, error message for other letters) (*Use a **switch case** for selection*)
- ii. **Get the choice of with meal or without meal** (y, n, error message for other letters) (*use **if-else if** for selection*)
- iii. **Get number of days** (only integers)
- iv. **Get the choice of continuing the room reservation screen** (y – continue to the option menu to reserve another room, n – stop execution of the menu and display values for the current reservations)

Finally, the program should output the **total bill**, **discount amount** and the **payable amount** according to the preview given above.

Consider the following information as well.

- Room type should be entered using the **first letter of the type** ex: if user wants to reserve a double room → user input is 'd' and must accept **both upper case and lower** case letters
- Give suitable **error messages** when user entered incorrect **room types** and **meal option**
- Number of days should be entered as full days (integers)
- Use a **do-while loop** to repeat the reservation screen