Pir Mehr Ali Shah

**Arid Agriculture University, Rawalpindi**

*Office of the controller of Examinations*

**Final Exam (Theory)/ Spring 2020 (Paper Duration 48 hours)**

**To be filled by Teacher**

Course No.: ……**CS-423**……..…………………Course Title: .….**Object Oriented Programming**………..……………

Total Marks:……**30**….……………………………Date of Exam:…**04-August-2020**…………....................................

Degree: …….…… **BS(CS)/BS(IT)/BS(SE)**.. Semester:…….…**2nd** …….…… Section:……**A/B, Mor/Eve**……..……

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Q.No.** | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | Marks  Obtained/  Total Marks |
| **Marks**  **Obt**a**in**e**d** |  |  |  |  |  |  |  |  |  |  | \_ \_ /60 = \_ \_ /30 |

|  |
| --- |
| **Total Marks in Words:** |
| **Name of the teacher: Dr. Kashif Sattar** |
| **E-mail of the teacher: kashif@uaar.edu.pk** |
| **Who taught the course: Signature of teacher / Examiner:** |

**To be filled by Student**

Registration No.: ………………………………………….……… Name:………………………………………………………………….

**Note:** 1. Approximately paper solving time for both papers (Theory and Practical) is 2.5 hrs, however submission time for both is till 48 hours starting from the time of uploading question papers.

1. Try to upload paper as soon as possible to avoid DOS error at server due to bulk submissions in late hours.
2. There are total **three (3)** questions in the theory paper and **two (2)** questions in Practical paper (You can download Practical from other link) and all questions are compulsory.
3. Only code is required so no need to add screen shots in the paper.
4. Make sure you have filled your **Name and Reg. No.** in the above provided space.
5. Upload the paper only through PC or laptop, Mobile submission is not allowed.
6. After submission view your answer sheet file on LMS and if there is something wrong contact the teacher by E-mail mentioned above, before the deadline (date & time) of paper submission.

**Answer the following questions.**

**Q.No.1. (Points: 20)**

The moon sighting is a major and complex activity being performed at the start of every Islamic month. The moon sighting is based on the age of the moon. Age is determined with day and hours. If the age of the moon is less than 24 hours its hard to sight. The user can input the age in hours or both (day and hours) using constructors. If date is given in both days and hours through 2-Arg constructor then it must be converted into hours, within the constructor using overloaded decrement (--) operator. Write a C++ class Age using OOP concepts to determine that either the moon can be sighted or not with respect to age of the moon in hours. Main function is given below for your help (change in main function is not allowed).

int main()

{ //Object through 1-Arg Constructor, Arg value is hours

Age A1(9);

if(A1<24)

cout << "\nMoon cannot Sighted";

else

cout<<"\n Moon Sighted";

//Object through 2-Arg Constructor, first arg is day and second arg is hours

Age A3(1,9); //Overloaded Decrement operator is called in this constructor

//which converts days and hours in hours

if(A3<24)

cout << "\nMoon cannot Sighted";

else

cout<<"\n Moon Sighted";

return 0;

}

Marks Distribution: 2 Points for class data members, 6 Points for constructors, 2 Points for calling overloaded operator, 10 Points for operator overloading.

**Answer Q.No.2.**

**Q.No.2. (Points: 20)**

During Eid Days, people usually go out for refreshment and want to eat some different unusual things. Suppose you went to a refreshment center having one of the desi dish of GolGappay. But due to rush there was a queue of customers and at your turn you told the owner that you are 2nd semester student of computer science in UIIT, Arid University and offered your services to automate the point of sale to reduce owner’s load of customer queries and sales. Owner felt happy to listen your offer and agreed because he was also a student of same department back in 2004 but left degree incomplete due to some personal issues. Next day he sent you a main function having menu options and requested you to Complete the program in C++ Language within 48 hours. Only class is required to complete the main function requirements.

int main()

{

GolGappay \*ggp; //class name is GolGappay having only one variable price which is fixed Rs./100-

//and have only one function other than constructor.

//Also you cannot create object of this class

int choice;

char option;

do {

cout<<"Welcome \n there are 6 GolGappay per plate";

cout<<"\n Press 1 for Sour and Rs.100/- per plate";

cout<<"\n Press 2 for sweet and 10% extra charge";

cout<<"\n Press 3 for Yogurt and 20% extra charge";

cout<<"\n Enter your choice:";

cin>>choice;

switch(choice)

{

case 1:

ggp= new Khatay();

ggp->show(); //All show functions ask about quantity of plates and display the bill

break;

case 2:

ggp= new Meethy();

ggp->show();

break;

case 3:

ggp= new Dahiwale();

ggp->show();

break;

deafult: cout<<"\nInvalid Option please try again..";

}

cout<<"\nDo you want to continue….y/n";

cin>>option;

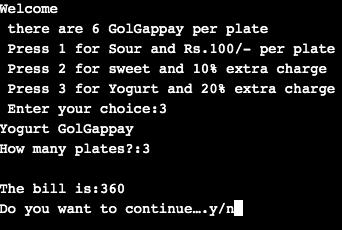
}while(option=='y');

return 0;

}

/\*

Example screen shot:



\*/

Marks Distribution: 2 Points for main class, 2 Points for class data members, 5 Points for class functions, 11 Points for other classes, their data members and member functions.

**Answer Q.No.2.**

**Q.No.3. (Points: 20)**

Pakistan Motorway and Highway Authority (MHA) wants to automate the fine calculation for HTV traffic. Due to monsoon rains, motor way is very risky for heavy load vehicles and particularly if they are overspending too. MHA only allows 4 wheel, 6 weel and 8 weel trucks in HTV category. Main function and class layout is given for your ease. Apply try block in the main function wherever required followed by three catches for three different type of exceptions. One exception is due to over speeding, second exception is due to overweight and third is for both violation together. The message of first catch block should be like this “Exception Raised due to over speeding and the fine is Rs. 9000”[other catch blocks print their own messages and fine values], where 9000 value is the only fine value(enclosed in an object) thrown from the function of the class where exception occurs, after the fine calculation based on the following criteria.

If speed is more than 110 (kmph) then Rs.3000/- fine is imposed on all type of vehicles.

If summer (between 1st Apr to 30th September) then weight limit is 400Kg per wheel. Otherwise for winter the weight limit is 500Kg per wheel.

The fine for over weight is Rs.10 per kg on extra weight only.

Complete the following program with missing code. Locations for missing code is highlighted with green color dots.

Marks Distribution: Mentioned below

#include <iostream>

#include <ctime> //for getting system time

using namespace std;

class Vehicle{

int type; //4 or 6 or 8 wheels

int wt;

int speed;

**………..** //Exception class/es should be here 5 Points

void getData()

{

cout<<"\nEnter Weight in Kg:";

cin>>wt;

cout<<"\nEnter Speed:";

cin>>speed;

}

bool check\_summer()

{

**………..**//will return true if system date is between 1st Apr to 30th September 2 Points

}

void checkwheel(int x)

{

type=x;

getData();

int perwheel\_wt\_limit\_summer=400; //summer between 1st Apr to 30th Sep

int perwheel\_wt\_limit\_winter=500;

int over\_weight\_fine\_perKg=10; //On extra weight only

int speed\_limit=110;

int speedfine=3000; //fix fine for all type of vehicles

int fine=0;

int allowed\_weight;

**………..** //calculate allowed\_weight here 2 Points

if(wt<=allowed\_weight&&speed<=110)

cout<<"\n Perfect Driving, No fine";

else

{

//All the three exceptions thrown from here based on if else conditions.

**………..** 6 Points

}

}

};

int main()

{ //Add try and catch blocks somewhere in the main function at suitable place 5 Points

int option;

char optionc;

Vehicle v1;

do

{

system("cls");

cout << "\n&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&";

cout << "\n\tWelcome to HTV Limit Check Program";

cout << "\n&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&&";

cout << "\n\tPress 1 for 4 wheel truck";

cout << "\n\tPress 2 for 6 wheel truck";

cout << "\n\tPress 3 for 8 wheel truck";

cout << "\n\tEnter Option:";

cin >> option;

switch (option)

{

case 1: v1.checkwheel(4); break;

case 2: v1.checkwheel(6); break;

case 3: v1.checkwheel(8); break;

default: cout<<"\n Invalid Option";

}

cout << "\n\n\t Do you want to continue...y/n:";

cin>>optionc;

} while (optionc == 'y');

cout << "\n\t Good Bye..!";

return 0;

}

**Answer Q.No.3.**