

KASNEB

CICT PART II SECTION 4

OBJECT ORIENTED PROGRAMMING

THURSDAY: 26 November 2015.

Time Allowed: 3 hours.

Answer ALL questions. Marks allocated to each question are shown at the end of the question. Show ALL your workings.

ALL programs written should be in C++ object oriented programming language.

QUESTION ONE

- (a) Identify four circumstances in which objects with unique names are unsuitable for use in an object oriented program. (4 marks)
- (b) An extract of object-oriented code is given below:

```
# include <iostream.h>

Class emp
{
    int empno;
    char name [10]
    float salary;
} el ;

Void main ( )
{
    cout<< sizeof (emp) << endl << sizeof (e
```

Required:

Generate the output to the code above. (3 marks)

- (c) A priority queue is an abstract data type that captures the idea of a container whose elements have “priorities” attached to them.

Required:

Describe four operations used in object oriented class template priority queue. (8 marks)

- (d) Citing two examples, explain the use of arithmetic operators with pointers in object oriented programming. (5 marks)
(Total: 20 marks)

QUESTION TWO

- (a) Summarise three problems associated with object oriented programs. (6 marks)
- (b) (i) Explain the fundamental difference between passing an argument by value and passing an argument by reference. (4 marks)
- (ii) A function named “swap” interchanges two integer values; x and y.

Required:

Write two versions of the above function to illustrate passing an argument by value and passing an argument by reference.

Ensure that in each case you include a main function that prompts for entry of the two integer values and calls the above functions. (10 marks)

(Total: 20 marks)

QUESTION THREE

(a) Rewrite the C++ code below correctly by debugging the error:

```
Int main ( )  
{  
    Const double Pi;  
    inst n;  
    Pi = 3.14;  
    n = 22;  
}
```

(2 marks)

(b) Describe each of the following methods of handling exceptions:

(i) Try.

(2 marks)

(ii) Catch.

(2 marks)

(iii) Throw.

(2 marks)

(c) Using illustrations, describe the following types of inheritance in the context of object oriented programming:

(i) Multiple inheritance.

(2 marks)

(ii) Hierarchical inheritance.

(2 marks)

(iii) Multilevel inheritance.

(2 marks)

(iv) Hybrid inheritance.

(2 marks)

(d) Use a suitable C++ code to explain the use of constant member functions.

(4 marks)

(Total: 20 marks)

QUESTION FOUR

(a) Explain the effect of the following functions used during file operations:

(i) Good ().

(2 marks)

(ii) Eof ().

(2 marks)

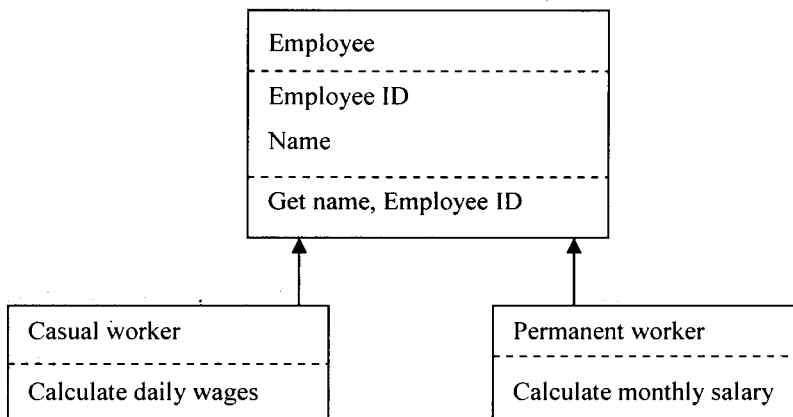
(iii) Fail ().

(2 marks)

(iv) Bad ().

(2 marks)

(b) The figure below shows a type of generalisation in object oriented programming:



Required:

Write an object-oriented program to implement the above generalisation.

The program should consist of the following:

- (i) Three class declarations containing data members and function members where necessary. (8 marks)
- (ii) A main program which instantiates the classes created in (b) (i) above and returns a worker's daily wages or monthly salary. (4 marks)

Assume that casual workers are paid on daily basis depending on the number of hours worked and permanent workers are paid a basic salary less statutory deductions at the end of the month.

(Total: 20 marks)

QUESTION FIVE

(a) Citing a suitable example in each case, describe the following message passing relationships in object-oriented programming:

- (i) Association. (3 marks)
- (ii) Dependency. (3 marks)

(b) An extract of object oriented code is given below:

```
#include <iostream.h>
class ABC
{
    private int i;
           float f;
    public tp( );
           {
               i = 0;
               f = 0.0;
           }
}

void main ( )
{
    tp t1;
}
```

Required:

- (i) Identify three errors in the code segment. (3 marks)
 - (ii) Rewrite the debugged code. (3 marks)
- (c) Using C++ code, create a class 'Rider' with one attribute "rider_name". The class should consist of a parameterised constructor to set the name when an instance of the class is created and a method to return the rider's name. (8 marks)

(Total: 20 marks)

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