UNIVERSITI MALAYSIA PERLIS

OPEN BOOK EXAM 2 (ONLINE)
Semester 2
Sidang Akademik 2021/2022

April 2022

NDJ10703 –Object Oriented Programming
[Pengaturcaraan Berasaskan Objek]

Masa: 1 Jam 30 Minit

Please make sure that this examination paper has **SIX (6)** printed pages including this front page and appendix before you start the examination.
*[Sila pastikan kertas peperiksaan ini mengandungi **ENAM (6)** mukasurat yang bercetak termasuk muka hadapan dan lampiran sebelum anda memulakan peperiksaan ini.]*

Answer **ALL** questions.
*[Jawab **SEMUA** soalan-soalan.]*

Question 1
[Soalan 1]

Given the source codes that create a Graphical User Interface (GUI) application by using *wxWidgets* library in **Figures 1(a)**, **1(b)**, **1(c)** and **1(d)**,answer the following questions:
[Diberi kod-kod sumber yang menghasilkan aplikasi grafik antaramuka pengguna dengan menggunakan perpustakaan wxWidgets dalam Rajah 1(a), 1(b), 1(c) dan 1(d), jawab soalan-soalan berikut:]

(a)   Given a statement class MyMenu : public wxFramein **Figure 1(a)**,identify the base class and the derived class.
        [Berdasarkan penyataan class MyMenu : public wxFrame di dalam Rajah 1(a),kenalpasti kelas asas dan kelas yang diwarisi.]

                                                                    (2 Marks/*Markah***)**

(b)   Analyze the source codes and identify **FOUR (4)** classes from wxWidgets library that are used in this application.
        [Analisa kod sumber yang diberikan dan kenalpasti EMPAT (4) kelas dari perpustakaan wxWidgets yang digunakan di dalam aplikasi ini.]

                                                                    (4 Marks/*Markah***)**

(c)   In your own words, explain the meaning of source code in **Figure 1(d)**.
          [Dengan ayat anda sendiri, terangkan maksud kod sumber di dalam Rajah 1(d).]

                                                                    (4Marks/*Markah***)**

(d)   Draw the output window of the GUI application.
        [Lukiskan output tetingkap aplikasi GUI itu.]

                                                                    (5 Marks/*Markah***)**

(e)   Modify the program to add menu "View" with sub menu "zoom in" and "Zoom Out" .
        [Ubahsuai program untuk menambah menu "View" dengan sub menu "Zoom in" dan "Zoom out"]

                                                                    (10 Marks/*Markah***)**

```
#include <wx/wx.h>
#include <wx/menu.h>

class MyMenu : public wxFrame        //Question 3(a)
{
public:
    MyMenu(const wxString& title);
    void OnQuit(wxCommandEvent& event);
    wxMenuBar *menubar;
    wxMenu *file;
};
```

Figure 1(a)
[Rajah 1(a)]

```
#include <wx/wx.h>

class NewApp : public wxApp
{
public:
    virtual bool OnInit();
};
```

Figure 1(b)
[Rajah 1(b)]

```
#include "main.h"
#include "menu.h"

IMPLEMENT_APP(MyApp)

bool NewApp::OnInit()
{

    MyMenu *menu = new MyMenu(wxT("This is my menu"));
    menu->Show(true);

    return true;
}
```

Figure 1(c)
[Rajah 1(c)]

```
#include "menu.h"
SubMenu::SubMenu(const wxString& title)
        : wxFrame(NULL, wxID_ANY, title, wxDefaultPosition,
wxSize(280, 180))
{
  menubar = new wxMenuBar;
  file = new wxMenu;
  file->Append(wxID_ANY, wxT("&New"));
  file->Append(wxID_ANY, wxT("&Open"));
  file->Append(wxID_ANY, wxT("&Save"));
  file->AppendSeparator();
  imp = new wxMenu;
  imp->Append(wxID_ANY, wxT("Import images..."));
  imp->Append(wxID_ANY, wxT("Import documents..."));
  imp->Append(wxID_ANY, wxT("Import audios..."));
  file->AppendSubMenu(imp, wxT("I&mport"));
  quit = new wxMenuItem(file, wxID_EXIT, wxT("&Quit\tCtrl+W"));
  file->Append(quit);
  menubar->Append(file, wxT("&File"));
  SetMenuBar(menubar);
  Connect(wxID_EXIT, wxEVT_COMMAND_MENU_SELECTED,
      wxCommandEventHandler(SubMenu::OnQuit));
  Centre();
}
void SubMenu::OnQuit(wxCommandEvent& WXUNUSED(event))
{
  Close(true);
    MyMenu *menu = new MyMenu(wxT("This is my menu"));
    menu->Show(true);

    return true;
}
```

Figure 1(d)
[Rajah 1(d)]

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