



MACHAKOS UNIVERSITY COLLEGE

(A Constituent College of Kenyatta University)
University Examinations for 2015/2016 Academic Year

SCHOOL OF ENGINEERING AND TECHNOLOGY

DEPARTMENT OF COMPUTING AND INFORMATION TECHNOLOGY

SECOND SEMESTER EXAMINATION FOR DEGREE IN BACHELOR OF SCIENCE IN COMPUTER SCIENCE

SCO 202: EVENT DRIVEN PROGRAMMING

Date: 3/8/2016

Time: 8:30 – 10:30 AM

INSTRUCTIONS

Answer **question ONE** and any other **TWO** questions

QUESTION ONE

- a) Explain the role of the following visual studio IDE components
 - i. Solution explorer (1 mark)
 - ii. Tool box (1 mark)
 - iii. Object browser (1 mark)
- b) Critically discuss the approaches adopted by the .NET framework to support multiple languages (4 marks)
- c) You have been hired by KPLC to design a windows form based application to assist its clients in billing operation. The application shall capture the current and previous meter reading then calculate the unit as follows

$$\text{Units} = \text{current reading} - \text{previous reading}$$

Based on the units, the application is supposed to calculate customer bill. The bill is based on the following category

Category	Units	Rate per unit (Ksh.)
01	0-52	2.50
02	53-100	11.50
03	Over 100	22.00

The customer bill is calculated by multiplying the rate with the number of units. All bills are subjected to 16% tax. Finally, the tax amount is added to the customer bill amount to get the final bill amount

The application should display the customer bill information on a data gridview control upon the click of a button as follows

Units consumed	Rate	Bill	tax	Tax Bill

Required:

- i. Sketch appropriate user Interface to implement the above scenario. (2 marks)
 - ii. Write appropriate C# code to implement the above business logic. (10 marks)
- d) Explain what is meant by the term ‘event driven programming’ (1 mark)
- e) Write appropriate C# code to capture information about n clients. The information includes Tenant ID, Tenant Name, Gender, Mobile No, Address and city. The details of the n client shall be displayed on a datagrid view control in the following format. Use a do... while loop to implement the program

#	Tenant ID	Tenant Name	Gender	Mobile No	Address	City
1	0001	Joe	M	75256	4	Nrb
2	0002	Peter	M	6957	62	Ksm
3	0003	Anne	F	6677	92	Msa

(10 marks)

QUESTION TWO

- a) With respect to .NET framework, explain how the source of a .NET compliant language is compiled into machine code. Use a diagram to support your arguments. (7 marks)
- b) A windows forms application is supposed to enable users to capture information about a product i.e. product code, name, price and category ID. Based on Category ID, the program should display category Name and the description on data grid view control. Assume the following categories exists. Use switch case to make your decisions

Category ID	Category Name	Description
001	Food	Contains different foods
002	Electronics	Contains different electronics
003	Automobile	Category on different vehicles

(7 marks)

- c) Explain the role of the following windows forms control
- i. Timer control (1 mark)
 - ii. Context Menu strip control (1 mark)
- d) with examples, discuss the two various mechanisms used by C# to implement type casting (4 marks)

QUESTION THREE

- a) Compare and contrast .NET and J2EE architectures from the following perspectives
- i. Execution engine (3 marks)
 - ii. Tools support (2 marks)
 - iii. Language support (2 marks)
- b) The salary earned by staff of a company named XYZ is based on three major components i.e. basic salary, commuter allowance and housing allowance. All employees who work for overtime hours are paid overtime amount based on the following criteria

Overtime hours	Rate in (Ksh)
0-10	1500.00
Over 10	2000.00

The overtime amount is added to basic salary, commuter allowance and housing allowance to get employee gross salary. The gross salary is used to calculate employee PAYE (Paye As You Earn) as shown below

Gross salary	PAYE
0-5,000	5%
5001-10,000	7%
10,001-20,000	9%
20,001-30,000	12%
Above 30,000	15%

The net salary is calculated as follows

$$\text{Net salary} = \text{gross} - \text{PAYE}$$

Required:

Write a C# program to implement the above business logic. The program should accept employee basic salary, commuter allowance, housing allowance and overtime hours worked (if any) then display the following information on appropriate control (s).

Gross salary	PAYE amount	Net salary	Overtime amount

(13 marks)

QUESTION FOUR

- Differentiate between Single Document Interface (SDI) and Multiple Document Interface (MDI) applications (4 marks)
- Explain the role played by the two major components of the .Net Framework (4 marks)
- Write appropriate C# code to
 - Load an image selected using an openFileDialog to a pictureBox known as 'picsample' (3 marks)
 - Run a form known as 'FrmCustomer' to the current MDIform (3 marks)
- Discuss any two repetitive control structures supported by C# and how they are implemented. Use an example for each to demonstrate how it is implemented by the language (6 marks)

QUESTION FIVE

- a. Critically discuss the rationale behind the two stages of compilation exhibited by .NET framework (4 marks)
- b. Explain the role of the following ADO.NET class objects
- i. SQL connection (1 mark)
 - ii. SQL command (1 mark)
 - iii. Data reader (1 mark)
- c. The following case study relates to Taji College grading criteria
- A student is supposed to sit for 7 subjects in a given semester. During the semester, a student sits for a cat (out of 20 marks), project (out of 30 marks) and end of semester exam (out of 50 marks). The three are added together to get the final mark of the student (out of 100 marks). Based on the final mark, grading is done on the following criteria

70-100	A	Excellent
60-69	B	Good
50-69	C	Fair
40-49	D	Pass
0-39	F	Fail

Required:

Write appropriate C# code to implement the above business logic. The program shall accept the unit name, unit code, semester (1,2,3) academic year, cat marks, project marks and exam marks. The final mark shall be passed to a method known as grade () which calculates and returns the grade of the student. The programs produce output in the following format

Final mark	Grade	Remarks

(13 marks)