

CICT PART III SECTION 5

MOBILE APPLICATION DEVELOPMENT

THURSDAY: 29 November 2018.

Time Allowed: 3 hours.

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

QUESTION ONE

- (a) Explain the meaning of the term “backlink” in the context of mobile computing. (2 marks)
- (b) Consider the form given below:

ID No:	<input type="text"/>
GENDER:	<input type="radio"/> Male <input type="radio"/> Female
SALARY:	<input type="text"/>
<input type="button" value="CALCULATE"/>	

Required:

- (i) Write a HTML5 code to display the above form. (4 marks)
- (ii) Write an Android code to register a listener when user clicks on button “btnCalculate” using Java class. (2 marks)
- (iii) Write a Java statement for Android to add a new button labelled “clear”. (2 marks)
- (c) Content provider component in Android supplies data from one application to others on request. Such requests are handled by methods of the ContentResolver class.
- Discuss four methods which you need to override in the content provider class in order to have a working content provider. (4 marks)
- (d) Mary James is a mobile applications developer who has just created her first app to help in tax calculations. She has approached you for advice on recovery testing which he intends to perform.
- Prepare a checklist of three items for recoverability testing. (3 marks)
- (e) State the purpose of the following files:
- (i) Androidmanifest.xml. (1 mark)
- (ii) Res/Layout/main.xml. (1 mark)
- (iii) gen/R.Java. (1 mark)

(Total: 20 marks)

**QUESTION TWO**

- (a) Using android code, write an intent to send email. (6 marks)
  - (b) Using HTML5, write a code that builds a web application which requests access to address book contacts and outputs the following information:
    - Name and phone number.
    - Successful contact access and displays "fail" on contact access fail.
 (8 marks)
  - (c) Write an android skeleton code to launch an activity named "myactivity.class" using an intent. (2 marks)
  - (d) Highlight two differences between a mobile operating system and a desktop computer operating system. (4 marks)
- (Total: 20 marks)**

**QUESTION THREE**

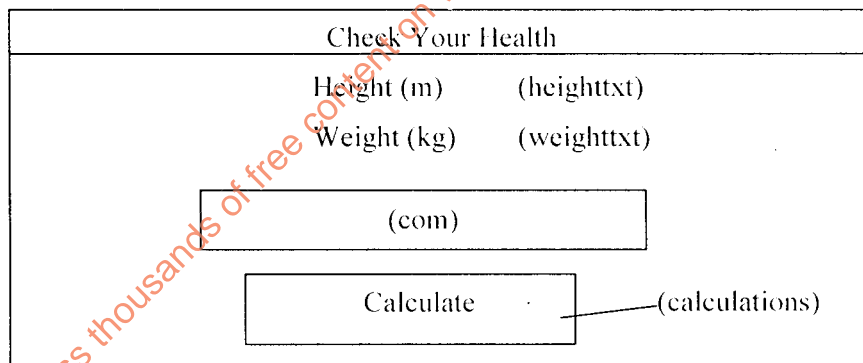
- (a) To promote good health in the country, Hope nutritionists' takes the height of their clients in meters (m) and weight in kilograms (kg) to obtain body mass index (BMI) using the formula:

$$BMI = \frac{Weight}{(Height)^2}$$

Conclusions from different BMIs are as shown in the table below:

BMI	REMARKS
≤ 18.5	Underweight
18.6 – 24.9	Normal weight
25 - 29.9	Overweight
30 – 34.9	Class I obese
35 – 39.9	Class II obese
Above 40	Class III obese

To reach many people, the management decided to develop an application to run in a windows phone to look like the diagram below:



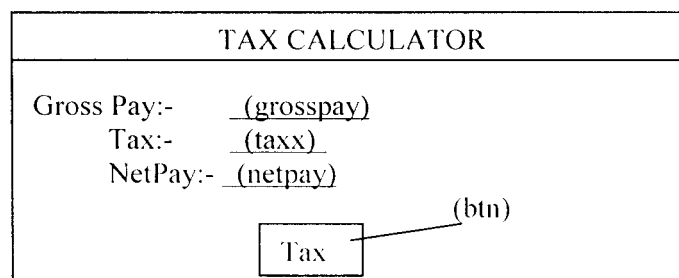
The object types: heighttxt and weighttxt are text boxes, com is a label and calculations is a command button.

The names in the brackets represent the name the objects are identified with.

**Required:**

A code to run on a windows phone and calculate the BMI using the information provided. The remarks should be shown on the com label when the button calculations is clicked. (8 marks)

- (b) The diagram below represents a phone window of a tax calculator:



Tax calculation is computed as shown on the table below:

Gross pay (Sh.)	Tax as % of grossPay
0 – 50,000	0%
50,000 – 100,000	20%
Above 100,000	30%

The names of variables as found in the program logic are shown in brackets in the program window. The variables are of type EditText except the “Tax” which is a button.

**Required:**

An android function called “calc” to calculate tax and netpay using the information provided. (8 marks)

- (c) Describe four advantages of having a mobile subdomain. (4 marks)  
**(Total: 20 marks)**

**QUESTION FOUR**

- (a) Citing an example, explain the meaning of “service application component” in the context of mobile computing. (2 marks)
- (b) Using JQuery, write a code snippet to accomplish the tasks below:
- Set the opacity of a picture on hover
  - Add picture into the DIV
  - Assign Id “clear” to div
  - Picture size height = width = 100
- (4 marks)
- (c) Write a code snippet to demonstrate how one can exclusively create an instance of a class in Objective - C. (6 marks)
- (d) Explain the type of archive file extension used in the following mobile devices:
- (i) Android. (2 marks)
- (ii) Apple. (2 marks)
- (e) Describe the emerging trends in mobile application development under the following titles:
- (i) Augmented reality. (1 mark)
- (ii) Virtual reality. (1 mark)
- (iii) Artificial intelligence. (1 mark)
- (iv) Accelerated mobile pages. (1 mark)
- (Total: 20 marks)**

**QUESTION FIVE**

- (a) (i) Describe how one could ensure code confidentiality in mobile development. (1 mark)
- (ii) State two examples of tools that could be used to maintain code confidentiality. (2 marks)
- (b) (i) Explain the meaning of SQL injection in the context of mobile application development. (1 mark)
- (ii) Propose two methods of preventing SQL injection in mobile applications. (2 marks)
- (c) (i) Distinguish between USSD code and shortcode in the context of mobile application development. (2 marks)
- (ii) Study the USSD code below and construct the expected output on a user’s mobile device:

```
bit_set(req.pi, MAPPN_USSD_string);
mtu_args.message =
“Welcome to XYZ Telecom \n Press:\n 1.Balance Info\n
2. Top up Service”;
num_da_chars = MTU_str_to_def_alph (mtu_args.message, &req.ussd_string.data
[req.ussd_string.num_bytes],
&da_len,
MAX_DATA_LEN-req.ussd_string.num_bytes);
```

(4 marks)

(d) Explain two APIs that are provided by the HTML5 standard. (4 marks)

(e) Debugging is an important aspect of testing your mobile application when you are through with its development.

**Required:**

Discuss debugging options available for testing android applications other than USB debugging. (4 marks)

**(Total: 20 marks)**

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