UTHM
Universiti Tun Hussein Onn Malaysia

UNIVERSITI TUN HUSSEIN ONN MALAYSIA

FINAL EXAMINATION
SEMESTER II
SESSION 2016/2017

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COURSE NAME	:	PERVASIVE COMPUTING
COURSE CODE	:	BIW 33403
PROGRAMME CODE	:	BIW
EXAMINATION DATE	:	JUNE 2017
DURATION	:	2 HOURS 30 MINUTES
INSTRUCTION	:	ANSWERS **ALL** QUESTIONS

THIS QUESTION PAPER CONSISTS OF **SIX (6)** PAGES

Q1   State **TRUE** or **FALSE** for each of the following statement.

(a)   Wireless Session Protocol (WSP) provides HTTP 2.0 functionality.

(1 mark)

(b)   Wireless Telephony Application (WTA) Application Programming Interface (API) includes functionalities such as call control, network text messaging, phone book interface and event processing.

(1 mark)

(c)   Wireless Transaction Protocol (WTP) supports peer-to-peer, client/server and multicast applications.

(1 mark)

(d)   Wireless Telephony Application (WTA) User Agent can access mobile device's telephony functions through Wireless Telephony Application Interface (WTAI).

(1 mark)

(e)   Wireless Transaction Protocol (WTP) for class 2 provides reliable message transfer with exactly **ONE (1)** reliable result message.

(1 mark)

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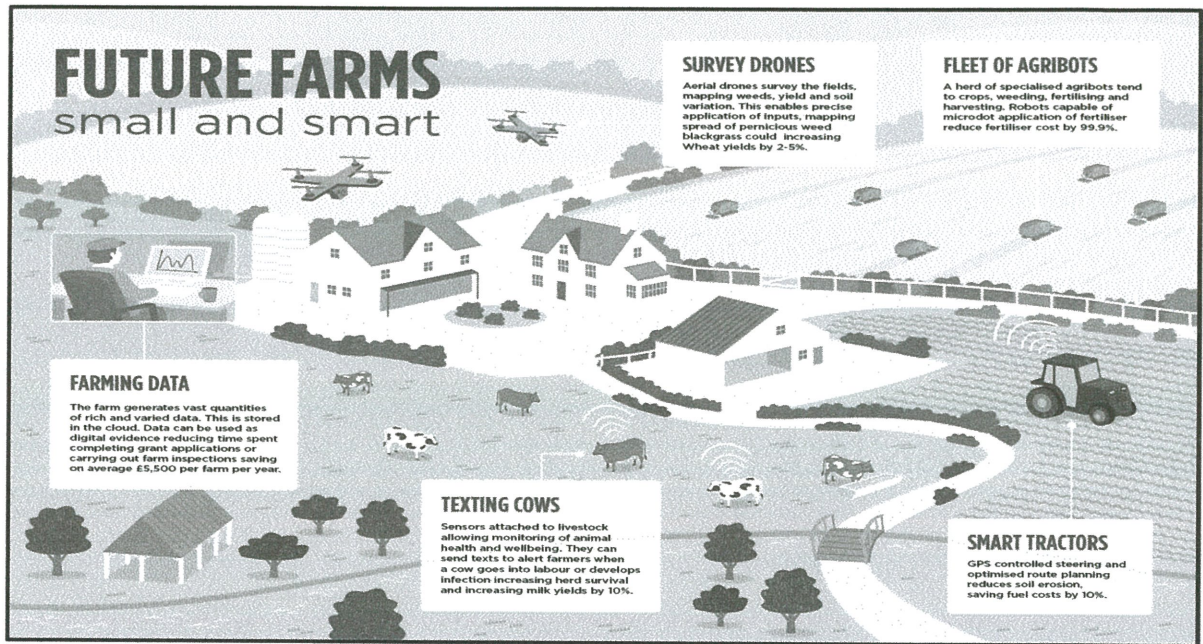Q2   Answer the following questions based on **Figure Q2**.

FUTURE FARMS
small and smart

SURVEY DRONES
Aerial drones survey the fields, mapping weeds, yield and soil variation. This enables precise application of inputs, mapping spread of pernicious weed blackgrass could increasing Wheat yields by 2-5%.

FLEET OF AGRIBOTS
A herd of specialised agribots tend to crops, weeding, fertilising and harvesting. Robots capable of microdot application of fertiliser reduce fertiliser cost by 99.9%.

FARMING DATA
The farm generates vast quantities of rich and varied data. This is stored in the cloud. Data can be used as digital evidence reducing time spent completing grant applications or carrying out farm inspections saving on average £5,500 per farm per year.

TEXTING COWS
Sensors attached to livestock allowing monitoring of animal health and wellbeing. They can send texts to alert farmers when a cow goes into labour or develops infection increasing herd survival and increasing milk yields by 10%.

SMART TRACTORS
GPS controlled steering and optimised route planning reduces soil erosion, saving fuel costs by 10%.

Figure Q2

(a)   Explain **FOUR (4)** areas in computer sciences that are related to design a future farms; small and smart.

(12 marks)

(b)   Discuss **FOUR (4)** benefits of implementing the idea of future farms; small and smart to the farmers.
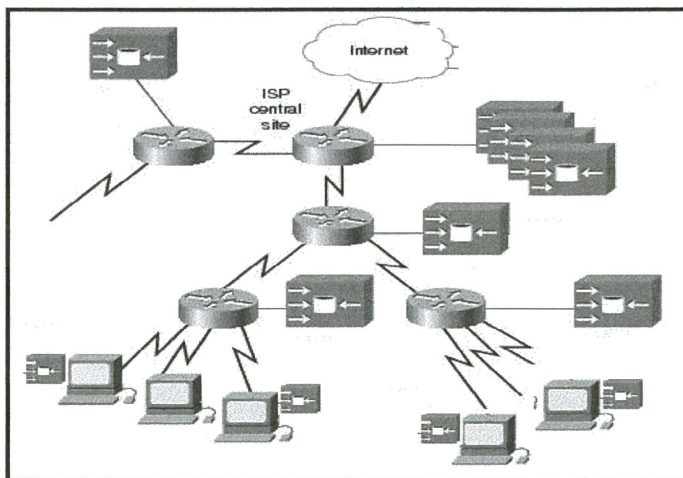
(8 marks)

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(c)   Examine **FOUR (4)** potential limitations in designing future farms; small and smart.

(12 marks)

(d)   Assume that you are the person who design the smart tractor in **Figure Q2**. Explain **TWO (2)** categories of Intellectual Property Rights that can be issued for your design.

(3 marks)

Q3   Answer the following questions based on **Figure Q3**.

Figure Q3

(a)   Redraw **Figure Q3** by incorporating **SIX (6)** levels/areas where cooperative caching process should be done.

(6 marks)

(b)   Examine **THREE (3)** major issues after implementing cooperative cache in **Q3(a)**.

(6 marks)

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(c)   Explain **TWO (2)** methods to calculate the performance of data caching.

(4 marks)

(d)   Differentiate **TWO (2)** criteria of Most Recently Used (MRU) Cache Replacement and Least Frequently Used (LFU) Cache Replacement.

(4 marks)

Q4   Consider the following scenario:

```
You are asked to design a user interface for a wrist watch. In your
research you find out that people will use it for;

        - indoors and outdoors,
        - they will use it in the dark as well as in sunlight,
        - they will use it when they run to catch the train,
        - they sit in a lecture hall,
        - exercise purposes.

As a good designer, you will end up with many ideas for an exciting user
interface for each situation.
```

(a)   Propose **FIVE (5)** ideas on how context-aware computing concept can be implemented when you design that specific wrist watch.

(10 marks)

(b)   Based on **Q4(a)**, justify whether the design of your wrist watch is an active or passive context-aware application. Give **TWO (2)** reasons for your justification.

(5 marks)

(c)   By using an appropriate figure, illustrate the abstract layered architecture for context-aware systems.

(5 marks)

Q5   Answer the following questions based on **Figure Q5.**
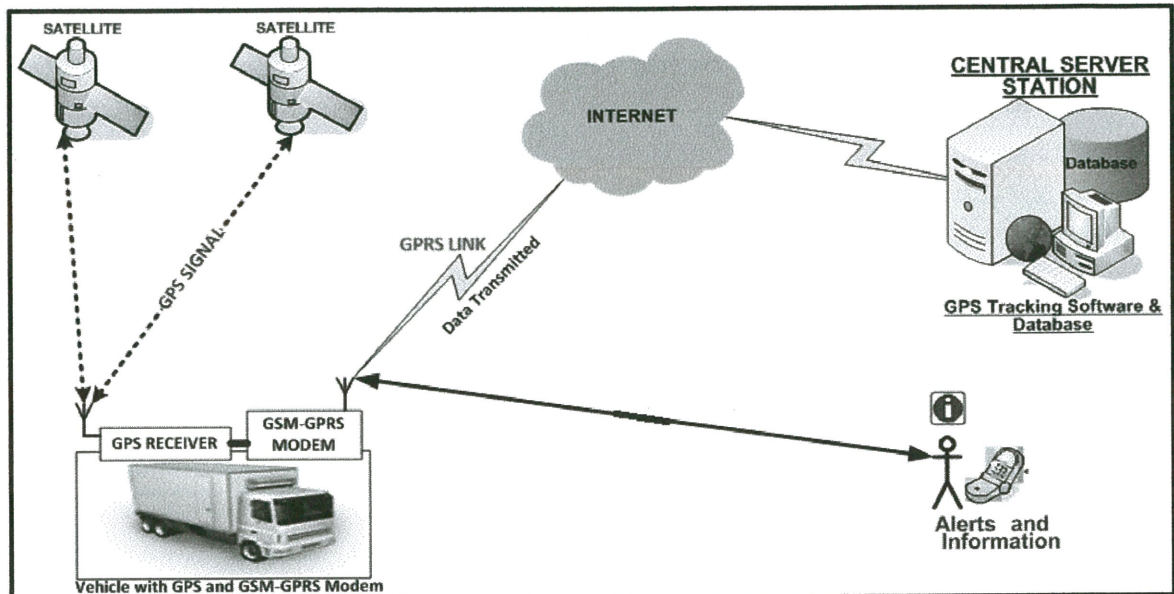
Figure Q5

(a)   Suggest **THREE (3)** potential limitations of the smartphones features which can receive alerts and information from vehicle tracking system.

(6 marks)

(b)   Explain how Global Positioning System (GPS) satellites work to detect vehicle (truck) on earth.

(8 marks)

(c)   Describe **THREE (3)** advantages and **THREE (3)** disadvantages of implementing satellite applications.

(6 marks)

- **END OF QUESTION** -

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