Name: Inzamam
ID#   12998
Course: Software Requirement Specification
Program: BS (SE)

Question No.1:
Ans:
MCQs:

(1): D

(2): E

(3): A

(4): B

(5): A

(6): C

(7): D

(8): B

(9) D

(10): B

(11): A

(12): C

(13): C

(14): D

(15): D

Question No.2

Ans:

TITLE: IoT based Home Security System using Raspberry Pi with Email and Voice alert

In short: iHome

Introduction: Internet of Things (IoT) is one of the most dynamic and exciting developments in information and communication technology, it is the advert of IoT. IoT is the system where computing devices, mechanical devices and digital machines are interacted. IoT provides unique identifiers to the machines, objects, animals or people and the ability to transfer data without requiring any human to human or human to computer interaction. Raspberry Pi is a hardware which is very cheap device compared with others, it is small in size, connectable, portable and programmable. It is a computer that directly plugs in with monitor screens, TV, keyboard and a mouse. It is capable of doing almost everything you would expect a desktop computer to do, from browsing the internet, playing high definition videos, making spread sheets, word processing and playing games.

The most basic definition of any security system is found in its name. It literally a means or method by which something is secured through a system of interworking components and devices. Home Security System which are networks of integrated electronic devices working together with a central control panel to protect against burglars and other potential home intruders.

IoT based home security system using Raspberry Pi with email and voice alert, as the name of this project makes it understandable that there will be a system which is based on IoT and it contains a microcontroller, Pi camera, PIR sensor, power supply and is connected with internet all the time. This system is used for tracking the environment around things you need to secure. The system works as if its sensors detect any unnecessary movement, the system will immediately capture the movement and pictures are then captured. The pictures will be sent to the specific email, through which the owner will get updates immediately. The hardware that is required to fulfil this project is: Raspberry Pi, Pi camera and PIR sensor. This system is based on the hardware, human interaction is minimal in it. Hardware communicate with each other to take actions as per need.

Assumptions: We assumed that each of the features defined could be implemented programmatically in python and using different tools such as OpenCV, Thonny Raspberry Pi. And implement the hardware as per its need.

Constraints: Project should be completed before the deadline.

Question No.3:

(1):

(B):

Ans: **Functional requirements**

- **Power supply:** The system needs a constant power supply that will keep the system awake.

- **Internet connection:** Internet connection is necessary because the information will be sent to the authority's Email.

- **Motion detection:** Motion detection will give signal to the camera which will further capture the movement of the person.

- **Capturing images and image processing:** Capturing information of the person, if the person is predefined, the system will end the process and if the person is unknown, the system will capture its details.

Non-functional requirements

- Burglar alarm: The system will start siren after unauthorized person is detected.

- Response time: The system will send the details right after it captured or detected any type intrusion.

- System (on/off): Power supply for the system, that is up to the user if he/she wants to activate the system or not.

- Reliability: The system will capture all the details and will send it to Email.

(A):
Ans:
User Requirements:

(1): IoT based system which will minimize user interface
(2): Security: Security will be well defined because of the excellent activities of all those devices connected to raspberry pi. It will make sure that the intruder was nothing but a fool.

(3): Intrusion alerts: This system will detect the presence of Intruder and quickly alert the user by sending him an alert mail. This mail will also contain the Picture of the Intruder, captured by Pi camera. Raspberry Pi is used to control the whole system.

(4) Image Processing: Image processing will make difference between a human and animal. Image processing is a method to perform some operations on an image, in order to get an enhanced image or to extract some useful information from it. It is a type of signal processing in which input is an image and output may be image or characteristics/features associated with that image.

System Requirements:

(1): Internet connectivity: Now days internet connectivity is a very common thing as it is must used in every field of engineering. Internet connectivity must be there to run the whole system otherwise the system will be remained shut down

(2): Camera: The camera will take the picture of the intruder and send it to the user through email.

(3): Raspberry pi: It is the mini computer system that controls everything connected to it.

(4): Power Supply: The power supply should be implemented in the system to keep the system active during the process.

(2):
Ans: **Use Case Diagram**