Q1)Smart Home Temperature Control

Goal: Monitor and adjust home temperature based on a setpoint.

Pseudocode:

SET temperature\_setpoint

WHILE true

READ current\_temperature FROM sensor

IF current\_temperature > temperature\_setpoint THEN

ACTIVATE cooling\_system

ELSE IF current\_temperature < temperature\_setpoint THEN

ACTIVATE heating\_system

ENDIF

DISPLAY current\_temperature AND temperature\_setpoint ON LCD

IF sensor\_error THEN

DISPLAY error\_message ON LCD

ENDIF

WAIT 1 minute

ENDWHILE

Q2)Automated Plant Watering System

Goal: Automatically water plants when soil moisture is low.

Pseudocode:

SET moisture\_threshold

WHILE true

READ soil\_moisture\_level FROM sensor

IF soil\_moisture\_level < moisture\_threshold THEN

ACTIVATE water\_pump

TURN\_ON LED

LOG watering\_event WITH timestamp

WAIT 10 seconds

TURN\_OFF LED

ENDIF

WAIT 1 hour

ENDWHILE

Q3)Motion Detection Alarm System

Goal: Detect motion and trigger an alarm if detected for more than 5 seconds.

Pseudocode:

WHILE true

CHECK motion\_status

IF motion\_detected FOR > 5 seconds THEN

TRIGGER alarm

SEND notification TO mobile\_device

ENDIF

IF reset\_button\_pressed THEN

DEACTIVATE alarm

ENDIF

ENDWHILE

Q4)Heart Rate Monitor

Goal: Monitor heart rate, calculate average, and alert if rate is high.

Pseudocode:

INITIALIZE heart\_rate\_data ARRAY

WHILE true

READ heart\_rate

ADD heart\_rate TO heart\_rate\_data

IF heart\_rate\_data HAS 60 readings THEN

CALCULATE average\_heart\_rate

IF average\_heart\_rate > 100 THEN

ACTIVATE alert

ENDIF

DISPLAY current\_heart\_rate AND average\_heart\_rate

LOG heart\_rate\_data

REMOVE oldest reading FROM heart\_rate\_data

ENDIF

WAIT 1 second

ENDWHILE

Q5)LED Control Based on Light Sensor

Goal: Control LED based on light intensity with a manual override.

Pseudocode:

SET light\_intensity\_threshold

WHILE true

IF manual\_override IS ACTIVE THEN

TOGGLE LED

ELSE

READ light\_intensity

IF light\_intensity < threshold THEN

TURN\_ON LED

ELSE

TURN\_OFF LED

ENDIF

ENDIF

WAIT 1 minute

ENDWHILE

Q6)Digital Stopwatch

Goal: Implement a stopwatch with start, stop, and reset features.

Pseudocode:

INITIALIZE hours, minutes, seconds TO 0

INITIALIZE running TO false

WHILE true

IF Start\_button\_pressed THEN

SET running TO true

LOG Start\_time

ELSE IF Stop\_button\_pressed THEN

SET running TO false

LOG Stop\_time

ELSE IF Reset\_button\_pressed THEN

SET hours, minutes, seconds TO 0

ENDIF

IF running THEN

DISPLAY time ON LCD

WAIT 1 second

INCREMENT seconds

IF seconds == 60 THEN

SET seconds TO 0

INCREMENT minutes

IF minutes == 60 THEN

SET minutes TO 0

INCREMENT hours

ENDIF

ENDIF

ENDIF

ENDWHILE

Q7)Temperature Logging System

Goal: Record temperature at intervals and allow data retrieval.

Pseudocode:

WHILE true

READ temperature

IF temperature IS VALID THEN

LOG temperature WITH timestamp

ENDIF

WAIT 10 minutes

ENDWHILE

ON data\_request

DISPLAY logged\_data

END

Q8)Bluetooth Controlled Robot

Goal: Control robot movements through Bluetooth commands.

Pseudocode:

CONNECT TO Bluetooth\_device

WHILE true

RECEIVE command FROM Bluetooth

CASE command OF

‘F’: MOVE forward

‘B’: MOVE backward

‘L’: TURN left

‘R’: TURN right

‘S’: STOP

ENDCASE

SET\_LED state BASED\_ON movement

ENDWHILE

Q9)Battery Monitoring System

Goal: Monitor voltage and alert if it falls below a safe level.

Pseudocode:

WHILE true

READ battery\_voltage

DISPLAY voltage ON LCD

IF voltage < 11V THEN

TRIGGER alert

ENDIF

WAIT 1 minute

ENDWHILE

Q10)RFID-Based Access Control System

Goal: Control access using RFID authorization.

Pseudocode:

WHILE true

READ RFID\_tag

IF RFID\_tag DETECTED THEN

IF RFID\_tag IS IN authorized\_list THEN

ACTIVATE relay FOR access

LOG successful\_access

ELSE

ACTIVATE alert

LOG unsuccessful\_access

ENDIF

ENDIF

ENDWHILE