

Reg No.: _____

Name: _____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY
SEVENTH SEMESTER B.TECH DEGREE EXAMINATION(S), MAY 2019

Course Code: IT401

Course Name: Embedded Systems

Max. Marks: 100

Duration: 3 Hours

PART A

Answer any two full questions, each carries 15 marks.

Marks

- | | | |
|---|---|-----|
| 1 | a) Explain the general model of an Embedded system with the help of a diagram,. | (5) |
| | b) Why are Infrared LEDs preferred to ordinary LEDs in sensing circuits? | (2) |
| | c) How does the most popular automotive bus CAN work? | (8) |
| 2 | a) What is the role of sensors and actuators in embedded systems. Explain any two sensor and actuators with its application | (8) |
| | b) Explain serial communication using I2C with proper timing diagram. | (7) |
| 3 | a) How can you interface an ADC to 8051? Draw relevant diagrams | (8) |
| | b) If you consider mobile phone as an embedded system, explain its working principle behind. | (7) |

PART B

Answer any two full questions, each carries 15 marks.

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|---|--|------|
| 4 | a) How to setup and run Arduino in Raspberry Pi? | (6) |
| | b) What is IDLE? | (2) |
| | c) Discuss briefly the challenges in embedded system design | (7) |
| 5 | a) To develop a system to blink an LED in Raspberry Pi. | (12) |
| | i) Explain system analysis, specifications and architecture | |
| | ii) Write a python program in Raspberry Pi kit and explain the step by step procedure . | |
| | b) What are the available OS for Raspberry Pi | (3) |
| 6 | a) Explain each line of code of the following Python script. What happens when this python code is executed? | (6) |
| | 1 import serial | |
| | 2 port = "/dev/ttyACM0" | |
| | 3 serialFromArduino = serial.Serial(port,9600) | |
| | 4 serialFromArduino.flushInput() | |
| | 5 while True: | |

```
6  if (serialFromArduino.inWaiting() > 0):
7  input = serialFromArduino.read(1)
8  print(ord(input))
```

- b) Explain embedded system design technique with an example. (9)

PART C

Answer any two full questions, each carries 20 marks.

- 7 a) Explain the general structure of Arduino Sketch code and Intermediate code. (10)
b) Write a short note on real time operating systems. (10)
- 8 a) Define function and explain with example different types of functions supported in Arduino sketch (10)
b) What is the use of cache for any processor (3)
c) Explain the concept of mailbox and message queue used in IPC. (7)
- 9 a) Develop a sample application in Arduino that is easy to build and fun to use by the following phases (10)
i) steps for implementation
ii) Prepare Arduino sketch
iii) Specify components
iv) Expected output
- b) List out the important features of ARM which makes it *special* for embedded system applications (10)
