

KADI SARVA VISHWAVIDYALAYA
B.E. SEMESTER - VII EXAMINATION – NOVEMBER – 2016

Subject Code: - CE/IT - 704-4

Subject Name: - Internet of Things

Date: - 16/11/2016

Time: - 10:30 am – 01:30 pm

Total Marks: - 70

Instructions:

1. Answer each section in separate Answer sheet.
2. Use of scientific calculator is permitted.
3. All questions are **Compulsory**.
4. Indicate **clearly**, the options you attempt along with its respective question number.
5. Use the last page of main supplementary of **rough work**.

Section – I

Q-1 (All compulsory)

- (A) What is Internet of Things? List various applications of IoT. [5]
(B) What do you understand about things in IoT? Draw and explain generic block diagram of an IoT device. [5]
(C) List and explain in brief various characteristics of IoT. [5]

OR

- (C) Explain IoT functional blocks with appropriate diagram. [5]

Q-2 Answer the following questions.

- (A) Explain REST-based communication APIs with diagram. [5]
(B) How IoT used for smart appliances. Explain with example. [5]

OR

- (A) What is MAC protocol? Explain MAC layer in reference model. [5]
(B) Explain Wireless medium access issues. [5]

Q-3 Answer the following questions.

- (A) Explain in detail design challenges of IoT. [5]
(B) List and Explain in detail IoT security challenges. [5]

OR

- (A) Draw and explain SDN layers. [5]
(B) How IoT used for industry application? Explain in brief machine diagnosis. [5]

PTO...

Section – II

Q-4 (All compulsory)

- (A) What is M2M? Draw and explain M2M system architecture. [5]
(B) Explain in detail difference between IoT and M2M. [5]
(C) Explain in detail link layer 802.3 Ethernet and 802.11 – Wi-Fi protocol. [5]

OR

- (C) Draw and explain arduino board working principles. [5]

Q-5 Answer the following questions.

- (A) Draw and explain block diagram of M2M gateway. [5]
(B) List and explain key elements of SDN. [5]

OR

- (A) Draw and brief explain categories of MAC protocols. [5]
(B) Draw and explain diagram of blink LED using arduino board. [5]

Q-6 Answer the following questions.

- (A) List and explain limitations of conventional network architectures over SDN? [5]
(B) Explain IoT communication models. [5]

OR

- (A) Draw and explain SDN architecture in brief. [5]
(B) Explain in detail surveillance application. [5]

----- All the Best -----

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Seat No. _____

KADI SARVA VISHWAVIDYALAYA

BE SEMESTER-VII REGULAR EXAMINATION NOV-2016

Subject Code: CE/IT-704-2

Subject Name: EMBEDDED SYSTEMS

Date: 16/11/2016

Time: 10:30 am. to 1:30 pm.

Total Marks: 70

Instructions:

1. Answer each section in separate answer sheet.
2. Use of scientific calculator is permitted.
3. All questions are Compulsory.
4. Indicate clearly, the option you attempt along with its respective question number.
5. Use the last page of main supplementary of rough work.

Section-I

- Q-1** (A) What is a single purpose processor? What are the benefits of choosing a single purpose processor over a general-purpose processor? [5]
(B) Explain common design metrics of Embedded system [5]
(C) Differentiate microprocessor and microcontroller [5]

OR

- (C) Explain key terms which are rejected by ARM designer from RISC? [5]
Give the implementation code of $y = (a+b)-c$

- Q-2** (A) List out types of ROM, write any two in details [5]
(B) Explain Fully associative cache mapping with proper diagram. [5]

OR

- (A) Define three main characteristics of embedded system [3]
Design of Compose 1Kx8 ROMs into a 1K×32 ROM [2]
(Note: 1K actually means 1,024 words).

- (B) Draw the timing diagram (ISA) for bus protocol [5]

- Q-3** (A) What is interrupt, how ISR can response it w.r.t. ISR locations [5]
(B) Schedule the below tasks using Earliest Deadline First scheduling and calculate CPU utilization. [5]

Process	CPU Time	Deadline
P1	1	3
P2	1	4
P3	1	12

OR

OR

- Q-3** (A) Explain Direct Memory Access and its importance with proper diagram [5]
(B) Schedule the below tasks using Rate monotonic scheduling and calculate CPU utilization. shortest period being assigned the highest priority, Show a Gantt chart for the given task [5]

Process	CPU Time	Period
P1	1	5
P2	2	10
P3	2	10
P4	3	15

Section-II

- Q-4** (A) What is cache memory, differentiate Static vs Dynamic Memory [5]
(B) Difference between strobe and hand shaking control methods with necessary diagram [5]
(C) What is RTOS? Explain classification and features of RTOS. [5]

OR

- Q-4** (C) Discuss about ARM Processor Operation modes [5]

- Q-5** (A) 1. Differentiate LCD & LED [2]
2. What do you mean by context switching in real time system [3]
(B) Write embedded C program code for blinking two LED's alternate. [5]

OR

- Q-5** (A) 1. What do you mean by process? How system can manage it? [2]
2. Define terms: (Compile time, Load time, Execution time) [3]
(B) Define IPC, explain with need of IPC and advantages & disadvantages [5]

- Q-6** (A) Explain wireless protocols w.r.t interfacing (any two) [5]
(B) Write Embedded C program code for display numerical using a 7-segment numerical display [5]

OR

- Q-6** (A) Explain Flex Sensor with its Applications. [5]
(B) Explain working of GSM interface in short. [5]

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KADI SARVA VISHWAVIDYALAYA

B.E SEMESTER VII EXAMINATION (NOVEMBER-2015)

SUBJECT CODE: CE 704-2 / IT 704-2

SUBJECT NAME: Embedded

System

DATE: 1/12/15

TIME: 10:30 to 11:30

TOTAL MARKS: 70

Instructions:

1. Answer each section in separate Answer Sheet.
2. Use of scientific Calculator is permitted.
3. All questions are compulsory.
4. Indicate clearly, the options you attempted along with its respective question number.
5. Use the last page of main supplementary for rough work.

Section - 1

Q:1 (All Compulsory)

- (A) Explain common design metrics for Embedded System. [5]
- (B) Explain the requirement analysis of a GPS moving map [5]
- (C) Compare General purpose and Single purpose processor technologies in detail. [5]

OR

- (C) Explain Write ability and storage permanence of memory in detail. [5]

Q:2 Answer the following Question.

- (A) Write ARM assembly code to implement the C assignment: $y = (c*d)+(e/f)$ [5]
- (B) Explain EPROM and EEPROM in detail with proper diagram. [5]

OR

- (A) Write ARM assembly code to implement the C assignment: $z = a*(b+c)-d*e$ [5]
- (B) Explain DRAM and NVRAM in detail. [5]

Q:3 Answer the following Question.

- (A) Explain fully associative Cache mapping in detail with proper diagram. [5]
- (B) Explain Cache write-through technique in detail. [5]

OR

- (A) Explain set-associative Cache mapping in detail with proper diagram. [5]
- (B) Explain Cache write back technique in detail. [5]

Section - 2

Q:4 (All Compulsory)

- (A) Explain DMA interfacing in detail with proper diagram. [5]

(B) Explain the requirement of multiple task and multiple processes with example. [5]

(C) Compare strobe and handshake protocol control methods.

OR

(C) Compare port based and bus based I/O addressing. [5]

Q:5 Answer the following Question.

(A) Explain Interrupt driven I/O using fixed ISR location with flow diagram. [5]

(B) Explain scheduling states of a process in Real time system.

OR

(A) Explain Interrupt driven I/O using vectored interrupt with flow diagram. [5]

(B) Explain Context switching in Real time system. [5]

Q:6 Answer the following Question.

(A) For below periodic tasks compute the CPU utilization. [5]

Task	Period	Execution Time
P1	5 ms	2 ms
P2	10 ms	3 ms
P3	10 ms	3 ms
P4	15 ms	6 ms

(B) For below periodic tasks compute the CPU utilization by Rate monotonic scheduling. [5]

Task	Period	Execution Time
P1	4 ms	1 ms
P2	6 ms	2 ms
P3	12 ms	3 ms

OR

[5]

(A) For below periodic tasks compute the CPU utilization.

Task	Period	Execution Time
P1	5 ms	1 ms
P2	10 ms	2 ms
P3	10 ms	2 ms
P4	15 ms	3 ms

(B) For below periodic tasks compute the CPU utilization by Earliest Deadline first scheduling. [5]

Task	Period	Execution Time
P1	3 ms	1 ms
P2	4 ms	1 ms
P3	8 ms	2 ms

KADI SARVA VISHWAVIDYALAYA

B.E. SEMESTER VII EXAMINATION NOVEMBER 2015

Date : 1/12/2015

Branch : CE & IT

Subject Name & Code: Internet of Things (CE 704-4 / IT 704-4)

Semester : VII

Time : 10:30 AM to 1:30 PM

Max. Marks : 70

- Instructions:
- 1) All questions are compulsory.
 - 2) Figures to the right indicate full marks.
 - 3) Use of scientific calculator is permitted.
 - 4) Indicate clearly, the options you attempt along with its respective question number.
 - 5) Use the last page of main supplementary for rough work.

Marks

SECTION-I

- Q.1** (A) List out and explain characteristics of IoT. [5]
 (B) What are the functional blocks in IoT? [5]
 (C) Write embedded C program to blink LED of Arduino board. [5]
- OR**
- (C) Explain physical design of IoT. [5]
- Q.2** (A) List out the advantages and disadvantages of contention free and contention based protocols. [5]
 (B) Explain SMAC. [5]
- OR**
- (A) Draw System Architecture, Flow chart and Circuit Diagram for following IoT system which fulfills following functionalities: "When any obstacle is detected within the specific range on the path of robot, ring the alarm" [5]
 (B) Write an embedded C program for following IoT system which fulfills following functionalities: "When any obstacle is detected within the specific range on the path of robot, ring the alarm" [5]
- Q.3** (A) Give significance and syntax of following embedded C functions. [5]
 1. digitalWrite() 2. analogRead()
 (B) What are the different operational modes in Dynamic Power Management? What is the need of these operational modes? [5]
- OR**
- (A) Explain MACAW. [5]
 (B) What is the difference between synchronous mode and asynchronous mode in ZigBee? [5]

SECTION-II

- Q.4** (A) Define follower and synchronizer. When a node can be considered as follower and synchronizer? [5]
 (B) What is channel hopping and why protocol should use it? [5]
 (C) What are the different categories of MAC layer protocol? [5]
- OR**
- (C) Write embedded C program to sense room temperature using temperature sensor. [5]

- Q-5** (A) How hidden terminal and expose terminal problem occurs? [5]
(B) What is the role of Neighbor Protocol (NP) in TRAMA? [5]
- OR**
- (A) Explain system architecture of IoT level-2 system. [5]
(B) Explain different communication models used in IoT. [5]
- Q-6** (A) How accelerometer is used to detect the movement of the object? Write embedded C program to print notification message on serial console when object's movement is beyond limit. [5]
(B) Explain the working of GSM module with the help of program. [5]
- OR**
- (A) Create a Web service which will notify user when temperature goes beyond limit. [5]
(B) Write down code to send sensor's data to a web service with the help of GPRS module. [5]

KADI SARVA VISHWAVIDYALAYA

B.E SEMESTER VII EXAMINATION (December 2015)

SUBJECT CODE: CE 704-3 / IT 704-3

DATE: 01/12/2015

TIME: 10:30 a.m. to 01:30 p.m.

SUBJECT NAME: Semantic web

TOTAL MARKS: 70

Instructions:

1. Answer each section in separate Answer Sheet.
2. Use of scientific Calculator is permitted.
3. All questions are compulsory.
4. Indicate **clearly**, the options you attempted along with its respective question number.
5. Use the last page of main supplementary for rough work.

Section - 1

- Q:1 (All Compulsory)
- (A) Explain Layered approach of semantic web with proper diagram. 05
(B) Differentiate semantic web versus artificial intelligence. 05
(C) Discuss personal agent's importance in semantic web in detail. 05
- OR
- (C) Explain RDF,SPARQL ,OWL semantic web technologies in detail. 05
- Q:2 Answer the following Question.
- (A) Write DTD file for given computerparts.XML document. 05
(B) What are Description Logics? Explain DL System Architecture in detail. 05
- OR
- (A) Explain the tree model of XML document with example. 05
(B) Explain DTD attribute, attribute type, value type, referencing. 05
- Q:3 Answer the following Question.
- (A) Write XSD file for given computerparts.XML document. 05
(B) Explain XML schema element type, attribute types, data types, data type extension, 05 data type restriction in detail.
- OR
- (A) How to addressing an XML document using Xpath. Explain Xpath in detail. 05
(B) How XSLT is used to process any XML document? Explain XSLT with example 05

Section - 2

- Q:4 (All Compulsory)
- (A) What is Ontology? Describe RDF, RDFS in detail. 05
(B) Discuss Three species of OWL in detail. 05
(C) Discuss RDF resource attribute, type element, container element, schema class and properties. 05
- OR
- (C) Discuss OWL class element property, element property restriction, boolean combination and data types. 05
- Q:5 Answer the following Question.
- (A) How to build RDF graphs? Explain it with proper example. 05
(B) How to query any document using select -from-where. Explain it with proper example. 05
- OR
- (A) List and explain all graph patterns in SPARQL. 05
(B) Discuss the Limitation of RDF schema. 05

Q:6 Answer the following Question.

- (A) Explain LOD cloud in detail. 05
(B) Discuss the requirement of ontology language. 05

OR

- (A) Discuss the modal extensions in detail with respect to descriptive logic. 05
(B) Explain process of reification in detail. 05

Computerparts.XML

```
<?xml version="1.0"?>
<PARTS>
    <TITLE>Computer Parts</TITLE>
    <PART>
        <ITEM>Motherboard</ITEM>
        <MANUFACTURER>ASUS</MANUFACTURER>
        <MODEL>P3B-F</MODEL>
        <COST> 123.00</COST>
    </PART>
    <PART>
        <ITEM>Video Card</ITEM>
        <MANUFACTURER>ATI</MANUFACTURER>
        <MODEL>All-in-Wonder Pro</MODEL>
        <COST> 160.00</COST>
    </PART>
    <PART>
        <ITEM>Sound Card</ITEM>
        <MANUFACTURER>Creative Labs</MANUFACTURER>
        <MODEL>Sound Blaster Live</MODEL>
        <COST> 80.00</COST>
    </PART>
</PARTS>
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-----All the Best ---

Seat No:- _____

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KADI SARVA VISHWAVIDHYALAYA
B.E. C.E. Semester VII Examination- NOV-2015

Subject Code:- CE 704-1

Subject Name:- Image Processing

Date:- 01/12/2015

Total Marks:- 70

Instructions:

1. Answer each section in separate Answer sheet.
2. All questions are **Compulsory**.
3. Indicate **clearly**, the options you attempt along with its respective question number.

Section – I

Q-1 Answer the following questions. (All compulsory)

- (A) How image sampling and quantization be useful to convert image from Analog to digital. [5]
- (B) Write short note on Bit Plane Slicing with Example. [5]
- (C) What is Digital image processing and describe an image processing applications in health care. [5]

OR

- (C) Describe types of images in detail. [5]

Q-2 Answer the following questions.

- (A) Consider the following image F and apply interpolation technique and obtain result. $F =$ [5]

5	2	4
1	3	9
7	0	6

- (B) Consider two pixel p and q whose coordinates are (1,1) and (7,4). Calculate the Euclidean Distance , D4 and D8 distances [5]

OR

- (A) Assume the following image F . construct the matrix of 4*4 applying linear interpolation technique to obtain image F1. Apply order dithering technique to obtain image F2. $F =$ [5]

4	5
3	1

Consider Unit matrix U as per requirement.

(B) Explain CMK and CMYK Models. [5]

Q-3 Answer the following questions.

(A) Write a short note on different color models used in image processing. [5]

(B) What is the difference between image enhancement and image restoration ? [5]

OR

(A) Describe at least three applications of image processing. [5]

(B) Explain gray level enhancement using gamma and log transformations. [5]

Section - II

Q-4 Answer the following questions. (All compulsory)

(A) Does the Huffman scheme always give the same code ? What is the meant by prefix property ? [5]

(B) Explain DCT(discrete cosine transform) with illustration. [5]

(C) Explain Down sampling and Up sampling with illustration. [5]

OR

(C) What is the use of repeated application of low-pass or high-pass filters to an image ?

Q-5 Answer the following questions.

(A) Define following terms. [5]

- Pixel
- Resolution
- pixel size
- Halftonal Image
- palette

(B) Apply the following filters on the given image and show intermediate results. [5]

- Low pass filter
- High pass filter
- Median filter

1	3	5
4	4	3
5	2	2

OR

- (A) Explain the Haar wavelet scheme. [5]
- (B) Explain these geometrical transformations and give their matrices : Shear, Rotation. [5]

Q-6 Answer the following questions.

- (A) Apply DCT to the following Matrix [5]

1	2
2	1

- (B) What is the need for transformation and explain advantages of transformation. [5]

OR

- (A) Apply DFT to following Matrix. [5]

7	0
3	1

- (B) What is the difference between thinning and thickening ? [5]