Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

ME – SEMESTER II (NEW) – • EXAMINATION – SUMMER 2016

Subject Code: 3725202 **Date: 25/05/2016**

Subject Name: Protocols and Interfaces

Time:10:30 am to 01:00 pm **Total Marks: 70**

Instructions:

1. **Attempt all questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**

Q.1 **(a)** Draw the block diagram of ACPI system and explain its components. Describe how ACPI helps todayôs computer systems to do integrated power management. **07**

(b) What is de-bouncing of a switch. Draw the diagram to interface one push button switch and two LEDs with any of the GPIO pins of LPC2148 ARM controller. Write a part of program to implement de-bouncing of the switch. (Do not write full program, only the code which will implement de-bouncing). **07**

Q.2 **(a)** What is the difference between programmed I/O and Interrupt based I/O. Describe which one is better for which application. How interrupt based I/O can be used to transmit and receive bytes on RS232 link on LPC2148 ARM Controller ? **07**

(b) Write a short note on video RAM. What are its applications in todays industry? **07**

OR

(b) Draw a block diagram to describe configuration of SCSI drive. What are the different phases of SCSI protocols ? **07**

Q.3 **(a)** Describe the working of PLL in LPC2148 ARM controller. How the PLL can be used to generate PWM waveforms for driving a stepper motor ? **07**

(b) (i) Explain conditional execution of ARM instruction. Describe with an example how it generates a compact code compared to conventional microprocessor. **03**

(ii)With the help of a diagram explain interfacing of an 8-bit LCD screen with LPC2148 microcontroller. Why do you need to give delay after every command issued to the LCD controller ? **04**

OR

Q.3 **(a)** Draw the block diagram of Watch Dog Timer of LPC2148 and explain its working. How it helps in guarding the system against the program going into an infinite loop. **07**

(b) (i) Write a sequence of ARM assembly instructions to multiply a number in register R1 with 67 and store the result in register R3. **03**

(ii) Describe how the GPIO is used in LPC2148 ARM Controller. **04**

Q.4 **(a)** Explain with suitable examples, the precautionary measures you need to take while ï **07**

(i) Writing a loop in a program
(ii) Using unsigned and short int.

(b) Describe Von Neuman architecture and explain its drawbacks. Give reasons why this architecture is used by almost 99% of computers today in spite of its drawbacks. **07**

OR

Q.4 **(a)** Write an assembly language program for LPC2148 to encrypt a message by replacing each letter by a letter which comes 4 letters ahead. For example letter óAô gets replaced by óEô and so on. Assume the alphabet wraps around at the end i.e. Letter óVô gets replaced with óZô, óWô by óAô, óXô by óBô etc. Assume message is a null-terminated byte string pointed by address stored in R1. **07**

(b) Describe how cache memory works. What is hit ratio and what is its normal value for a general purpose computer ? **07**

Q.5 **(a)** Explain the block diagram of a typical industrial control system starting from sensors to actuators. What interfacing is required to make the sensor output suitable for a microcontroller and the output of microcontroller to make suitable to drive the actuators ? **07**

(b) Write short note on USB protocol. Compare this protocol with RS232 and Firewire and explain why this protocol has become so popular and widespread? **07**

OR

Q.5 **(a)** Describe how LPC2148 allows multiple analog signals to be connected to the on board ADC. What is the impact of connecting more than one signals in relation to scanning frequency and the resolution of ADC? If 6 signals are to be connected and 7 bits of resolution is found to be enough then what is maximum scanning frequency? **07**

(b) Give brief introduction of 802.11 protocol. **07**

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