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MANIPAL INSTITUTE OF TECHNOLOGY
MANIPAL

A Constituent Institution of Manipal University

FIFTH SEMESTER B.TECH. (INSTRUMENTATION & CONTROL ENGG.)

END SEMESTER EXAMINATIONS, NOV - 2017

SUBJECT: MICROPROCESSORS & MICROCONTROLLERS [ICE 3104]

Time: 3 Hours

MAX. MARKS: 50

Instructions to Candidates:

- ❖ Answer **ALL** the questions.
- ❖ Missing data may be suitably assumed.

- 1A.** What is addressing mode? With an example explain 8051 addressing modes for accessing external memory. **5**
- 1B.** Draw the format of 8051 program status word and explain the functions of each bits. **3**
- 1C.** Differentiate between the Von-Neumann & Harvard architecture. **2**
- 2A.** What do you mean by stack and stack pointer? With the help of an illustration, explain the operations on stack for 8051 microcontroller. **5**
- 2B.** With the help of an example, explain the following instructions, **3**
 - i) JNC ii) DIV AB iii) RRC
- 2C.** Write an 8051 ALP to double the number in register R2 and store the result in registers R3 (high byte) and R4 (low byte). **2**
- 3A.** Write a program that continuously receives 8 bit data from port 1 (P1) and sends it to port 0 (P0) while simultaneously creating a square wave of 200 microseconds on pin P2.1. Use timer 0 to create the square wave. Assume that XTAL=11.0592MHz. **5**
- 3B.** Draw the format of PCON register and explain how the methods to double the baud rate for serial communication. **3**
- 3C.** Indicate which timer in which mode is selected when the following instructions are executed: **2**
 - i) MOV TMOD, #20h ii) MOV TMOD, # 12h
- 4A.** Explain the exception groups in ARM7 and list its vector address. With an example explain the entry and exit steps for an exception mode. **5**
- 4B.** With suitable example explain base plus offset addressing mode. **3**
- 4C.** List any two THUMB-ARM similarities and differences. **2**
- 5A.** Show the interfacing diagram of LED and toggle switch with LPC2148 and write a program to toggle alternate LED's. **5**
- 5B.** Explain the registers associated with PWM in LPC2148. **3**
- 5C.** List any four features of LPC2148 timer. **2**