

Group: Control**Midterm I****Date:** 28 / 11 / 2018**Important Notes:**

- This paper contains **FOUR** questions in **TWO** pages.
- Attempt **ALL** questions.
- Total time allowed **ONE HOUR**.
- Total Marks: **30**
- Enhance your answers with proper sketches whenever applicable.

Q.1 Multiple Choice Questions (MCQ): (10 Marks)

- *To access a memory of size **1KB**, the sizes of data and address lines are
 - 8 data / 8 address lines. ()
 - 8 data / 10 address lines. ()
 - 10 data / 10 address lines.(●)
 - 16 data / 16 address lines.()
- The ATmega328 instructions **CLC** and **CLT** belong to the following category
 - Arithmetic Instructions. ()
 - Logic Instructions. ()
 - Bit-wise Instructions. (●)
 - None of the above. ()
- In microcomputer systems, push buttons are used as
 - Digital input devices. (●)
 - Analog input devices. ()
 - Digital output devices. ()
 - Analog output devices. ()
- After reading an instruction from ROM it is saved temporarily in
 - program counter. ()
 - instruction register. (●)
 - top of stack. ()
 - any GPR. ()
- ATmega328 bandwidth is
 - 4-bits ()
 - 8-bits (●)
 - 16-bits ()
 - 32-bits ()
- Von-Neumann microcomputer can access data and program memories simultaneously
 - True. ()
 - False. (●)
- TinyAVR microcontrollers can process **complex** data such as audio and video.
 - True. ()
 - False. (●)
- To restart ATmega328, pin #1 must be connected to ground.
 - True. ()
 - False. ()
- EEPROM of ATmega328 is 1KB volatile memory.
 - True. ()
 - False. (●)

10. T bit of status register is set when the result is positive.

- a. True. () b. False. (●)

Q.2 Write short hands on the following: (4 Marks)

- a) Assembly language statement format. b) The purpose of instruction decoder.

ADD R16,R17
وهو يعني اجمع البيانات الموجودة في R17 مع البيانات الموجودة في R16 وخرن الناتج في R16

يقوم بتحليل الامر (عملية DECODE) القادم من INSTRUCTION REGISTER وإصدار إشارات تحكم يتم ارسالها الى ALU حتى تنفذ العمليات المطلوبة طبقا للبرنامج حيث يتم

Q.3 Briefly explain the difference between the following: (4 Marks)

- a) Direct versus indirect addressing modes.
b) Static versus dynamic RAM.

Q.4 Referring to ATmega328 instruction set, what errors are in the following?

Write the correct form.

(6 Marks)

- a) PUSH R17 , 17 c) TST R20 , 0x5A
b) LDI R0, R8 d) LDS R17, 0xFF

No.	Error	Reason	Correction
b	LDI R0, R8	الامر LDI لا يمكن ان يتعامل مع أي مسجل قبل المسجل R16... بمعنى اخر ان R16 هو اول مسجل يتعامل معه هذا الامر	LDI R16, R8

*End of questions
Good luck!*