Faculty of Engineering, KFS University — Subject computerized control exam

13/ 6 / 2019, 2nd term final exam — examiner: prof. Ali Sakr

4th year, computer and control systems dep. — Full marks 90 M

Solve the next problems, Each question is assigned to 10 marks

The exam fulfill NARS metrics: a.3, a.8. a13 , a19 , b.2, b.6, b.7 , b.17, and C17

1= Define the activities of next sensors: pressure sensors, Infra-red sensors , proximity sensors, distance sensors, Accelerometer sensors, Gyroscopes sensors, strain sensors, Global Positioning System (GPS) sensor, Flow sensors, frequency sensors

2=Analogue signal = 10 volts, is measured with a full scale range meter of 20 volts. How it is represented in a 8 bits register. Define resolution, and absolute error for calibration

3= Discuss the structure of microcontroller, Define DDA (data direction register) , write a Fire fighting program using microcontroller that takes digital temperature at port A and produce alarm (signal) at pin portB7 if T>80

4= Discuss the structure of Arduino, write a program that test dimness and write level of light strength, considering 8 bits register.

5= Generate a clock pulse with pulse duration 50 ms, via pin port B1 using PIC-18

6= Design a continuous traffic lighting System, using PLC, green light =60 sec, yellow 5 sec, and red 60 sec, yellow 5 sec, plot ladder diagram,

7= Discuss structure of UART, define MOSI and MISO signals on UART interface

8= Discuss structure of a SCADA system, define how data acquisition is accomplished via an industrial LAN. Design a controller system that open a paint tank for 8 sec. to fill a token, collect 10 tokens in a packet through a production line, then load 100 packet into a container via a robot, discharge the container in a defined location.

9= use Arduino to generate alarm if pressure is higher than analog value $F0_H$