TRADE TEST OF CRAFT INSTRUCTOR  
(SEMESTER SYSTEM)  
JULY – 2016

TRADE: ELECTRONICS MECHANIC  
SUB: TRADE THEORY – II  
MARKS: 100  
TIME: 3 HRS.

Note: Attempt all questions.

1. A) State True or False:  
   (10x1=10)
   i) LED TVs do not use LCDs in their screens.  
   ii) All TV remote controls use IR Light Sources.  
   iii) IPS panels have much better viewing angles.  
   iv) All LED lights must use a driver circuit.  
   v) HV power supply in microwave ovens always use a HV transformer.  
   vi) A control valve may be connected to an analog input module of a PLC.  
   vii) The PLC on/off delay timers will keeps resetting when the sensor turns off/on.  
   viii) Pneumatic systems are used for high pressure and low speed applications.  
   ix) A proximity switch can sense only a metal object.  
   x) The servomotors are lighter than equivalent A.C servomotors.

B) Choose the correct answer:  
   (10x1=10)
   i) The type of access used in GSM technology is
      a) FDMA/ TDMA  
      b) CDMA  
      c) Both (a) & (b)  
      d) None of these

   ii) PIC16F74 devices are available in
      a) 28-pin or 40-pin or 44-pin packages  
      b) 40-pin or 44-pin packages  
      c) Both (a) & (b)  
      d) None of these

   iii) In microwave ovens, the commonly used radio wave frequency is roughly
      a) 2,500 megahertz  
      b) 8000 kilohertz  
      c) 1000 megahertz  
      d) None of these

   iv) The direction of rotation of a D.C. series motor can be changed by
      a) Interchanging supply terminals  
      b) Interchanging field terminals  
      c) Either of (a) or (b)  
      d) None of these

   v) In induction motors the difference in speed between the stator field and rotor is
      a) Full load speed  
      b) No load speed  
      c) Slip  
      d) Regulation

   vi) Five percent increase in supply frequency will change the synchronous speed of a
      motor by
      a) -10 %  
      b) +5 %  
      c) -5 %  
      d) +10 %

   vii) IGBTs are capable of being switched several
      a) Times  
      b) Thousand times  
      c) Hundred times  
      d) Million times

   viii) A DC servomotor is similar to a regular D.C motor except that its design is modified
to cope with
      a) Electronic switching  
      b) Slow speeds  
      c) Static conditions  
      d) Both (b) & (c)

   ix) In a stepper motor, the speed of rotation determined by
      a) By the current supplied to the motor  
      b) By the magnitude of the voltage applied  
      c) By the load applied to the motor  
      d) By the frequency of the waveforms used

   x) A servo system must have
      a) A feedback system  
      b) An amplifier to amplify error  
      c) Capacity to control position or its derivation  
      d) All of these

Contd…2/-
C) Fill in the blanks:

i) A sim card is basically is ___________.

ii) The PIC 16 instruction set consists of just ________ instruction as opposed to 111 in 8051.

iii) PIC 16 three has modules, viz., Timer-0, Timer-1, and Timer-2 of these Timer-0 and Timer-2 are ________ bit Timer. Timer-1 is a ________ bit timer.

iv) PIC 16C74A has an inbuilt ADC with ________ bit conversion and ________ number of analog input channels.

v) In a PIC16F74 the synchronous serial port can be configured as either ________-wire serial peripheral interface or the ________-wire inter - integrated circuit bus.

vi) The cell size in CDMA is ________ compared to GSM.

vii) During the spin portion of the cycle of a washing machine, the inner tube spins around ________ in a top – loading washing machine, while front – loading and energy saving washers spin at about ________.

viii) Induction cook tops require cooking vessels be of ________.

ix) As per ladder diagram rules stop buttons should be given a ________ order of importance and therefore be shown ________ other devices.

x) In a PWN Drive lower resultant voltage is created by ________ and ________ pulses.

2. Write short answers on (Any Twenty):

a) List the OSC options for a PIC microcontroller.

b) List on chip peripheral resources on a PIC16.

c) Explain the need of backlighting in TVs.

d) List the types of Data transfer by a HDMI interface.

e) List the specifications of LED lamps.

f) List the various subassemblies in a typical LED light system.

g) Briefly explain how to use IEMI number to trace a lost mobile phone.

h) List the common features of a cell phone.

i) List the various techniques used for the speed control of three phase induction motors.

j) Explain the working of speed control circuit in domestic Mixers/ Grinders.

k) List the safety features built in a microwave oven to prevent microwave radiation.

l) List the different types of timers used in washing machines. Mention the type of washing machine each type of the timer is mostly used.

m) Mention the role of induction tube in cook top. List the different types of induction tubes.

n) Show the wiring to connect a sourcing input device to a PLC with a built-in DC power supply.

o) Briefly describe the role of HMI in PLC environment.

p) Write a program depicting “OR Operation” in ladder logic as well as in functional block diagram in order to illustrate the difference between the two.

q) List various types of DC motors. Give an application example for each.

r) List the types of starters used for induction motor. Explain the purpose of using starters.

s) Explain the function of pressure dependent value in pneumatic applications.

t) Name two types of Pneumatic timers. Mention the use of each type.

u) Describe an opto-coupler device and explain its use in AC drives.

v) Describe the role of a DC Link stage of AC drive. List the type of components used in it.

w) Name of three control modes of a PID controller.

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3. Attempt Any Five questions:

i) Explain the Memory organization of PIC16F74 microcontroller.

ii) Describe the various timer/counter modes in PIC16 microcontroller.

iii) a) List various types of TV remote controls.
    b) Explain the working of a IR code transmitter.

iv) Give description of the microwave generation system of a microwave oven. Explain its working also explain the working of the power supply used for microwave generation circuit.

v) Explain the working principle of UV type of water purifier. Describe its various components. Also list the consumables required for servicing the water purifier.

vi) Give example of three different types of input modules used in PLC. Describe the characteristics to be considered while selecting the PLC for any one of these modules.

vii) Explain the role of timers in PLCs. List the various types of timers. Describe the required information to implement the timers in a PLC.