

Registration no:

--	--	--	--	--	--	--	--	--	--

Total Number of Pages: 02

B.Tech
PCEI4305

6th Semester Regular / Back Examination 2016-17
INSTRUMENTATION DEVICES AND SYSTEMS - II

BRANCH(S): AEIE, EIE, IEE

Time: 3 Hours

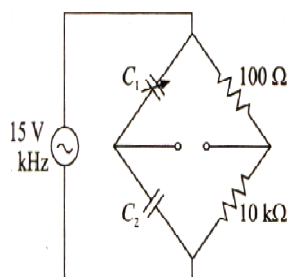
Max Marks: 70

Q.CODE: Z246

Answer Question No.1 which is compulsory and any five from the rest.
The figures in the right hand margin indicate marks.

- Q1 Answer the following questions: (2 x 10)**
- a) What is the function of charge amplifier in piezoelectric measurement system ?
 - b) Define "d" constant of a piezoelectric crystal .And show, how cable capacitance affect the sensitivity of the system
 - c) An accelerometer consist of mass ,spring and damping.Write conditions for which deflection of the seismic mass will be under damped, critically damped and over damped.
 - d) How conductivity can be measured by two pole cell arrangement.
 - e) Explain about resistive type hygrometer.
 - f) Write the operation of PN Junction photo diode
 - g) Briefly explain the working principle of a solenoid
 - h) How final control operation is performed in a process control system. Explain with suitable block diagram.
 - i) What is Plank's law and how it is related to wavelength of light.
 - j) Write the basic principle of operation of a Relay
- Q2 a) What is charge sensitivity of piezo-electric element? (2)**
- b) Draw an equivalent circuit of piezoelectric crystal, cable, charge amplifier and recorder. Derive its transfer function (8)**
- Q3 a) Write the principle of operation of a level measurement system using capacitive transducer for a non-conducting liquid. (5)**
- b) Describe with a neat sketch,the working principle of float type level measurement (5)**

- Q4** a) Explain the working of a flapper-nozzle system. Also explain how this system act as current to pressure converter. (5)
- b) Explain the operation of SCR (Silicon control rectifier) used as electronic switch for low load and high load power delivery. (5)
- Q5** a) What is Pyrometry? Describe construction and principle of operation of a narrowband pyrometers. (5)
- b) Explain about phase modulated sensor and describe the operation of interferometric sensor. (5)
- Q6** a) Explain the basic principle of operation of Stepper motor with neat diagram (5)
- b) What is Ladder diagram?.Explain its elements with symbols used in Ladder diagram. (5)
- Q7** Two concentric tubes of length 8m and diameter ratio of 2 are used as a capacitive level transducer to measure the depth 'h' of a liquid tank. The liquid depth varies between 0m to 7m. Dielectric constant of liquid is 2.4 and permittivity of free space is 8.85 pF/m . The transducer is (C_2) is incorporated in a bridge as shown in the figure. (10)



- (a) Calculate C_1 to set the open circuit voltage to zero when tank is empty.
- (b) Calculate output voltage V_0 when the tank is full.

- Q8** Write short answer on any TWO: (5 x 2)
- a) DC motors
- b) Fiber Optic Sensing –principle of measurement
- c) Capacitive Hygrometer
- d) Types of Control Valves and their characteristics