Model Question Paper-1 with effect from 2019-20 (CBCS Scheme)

USN

Fourth Semester B.E. Degree Examination
Process Instrumentation

TIME: 03 Hours   Max. Marks: 100

Note: 01. Answer any **FIVE FULL QUESTIONS**, choosing at least **ONE QUESTION** from each **MODULE**.

02. .

03. .

		Module -1	
Q.01	a	Discuss the principle, construction and working of liquid filled mechanical thermometers. Describe how compensation is achieved for ambient temperature changes.	10 Marks
	b	With schematic diagrams, equations and graphs explain the principle, construction and working of platinum resistance thermometer.	10 Marks
		OR	
Q.02	a	Define Seebeck effect. With neat sketches describe the working of different thermocouple circuits.	10 Marks
	b	Illustrate the instrumentation system for the measurement of temperature by disappearing filament optical pyrometer.	10 Marks
		Module-2	
Q. 03	a	State the Bernoulli's theorem. Derive an equation for volumetric flow rate (Q_v) for an 'compressible fluid' flowing through variable cross section.	10 Marks
	b	Discuss the principle and procedure of measurement of flow by pitot tube. Drive an equation for the velocity of flow. List its applications.	10 Marks
		OR	
Q.04	a	Describe the principle, construction and working of rotameter. Derive an equation for volumetric flow rate (Q_v) and mass flow rate (Q_m).	10 Marks
	b	Discuss the principle, construction and working of transit time ultrasonic flow meter. Derive an equation for flow velocity (v).	10 Marks
		Module-3	
Q. 05	a	Define vibration and mechanical shock. Discuss the characteristics of vibration.	10 Marks
	b	Discuss the principle, construction and working of velocity type vibration transducers.	10 Marks
		OR	
Q. 06	a	Propose an instrumentation system for the measurement of liquid density based on the displacement of Electromagnetic suspension system.	10 Marks
	b	What is Coriolis effect? Illustrate the instrumentation system for the measurement of liquid density using Coriolis densitometer.	10 Marks
		Module-4	
Q. 07	a	Define the followings with their units: (i) Absolute viscosity (ii) Kinematic viscosity (iii) Relative viscosity and (iv) Apparent viscosity	04 Marks
	b	Discuss the principle and procedure of measurement of viscosity by Saybolt viscometer.	08 Marks
	c	With schematic flow diagram explain the principle and working of differential pressure continuous capillary viscometer.	08 Marks
		OR	
Q. 08	a	List and briefly explain all the factors to be considered in the selection of viscometer for a specific task.	10 Marks

	b	Define turbidity and mention its unit. Propose an instrumentation system for the measurement of turbidity based light transmission and light scattering principle.	10 Marks
	c		
		Module-5	
Q. 09	a	Define the followings and mention their units: (i) Humidity (ii) Moisture (iii) Dew Point (iv) Absolute humidity (v) Relative Humidity.	05 Marks
	b	With a schematic diagram and chart discuss the principle and working of Sling psychrometer.	07 Marks
	c	Describe the principle, components and working of microprocessor based optically chilled dew point instrument for measurement of humidity.	08 Marks
		OR	
Q. 10	a	Discuss the principle and working of nuclear moisture gauge with schematic diagram and equations. Briefly discuss its features and performance characteristics.	10 Marks
	b	With a schematic diagram explain the principle, construction and working of Infrared Absorption Hygrometer for measurement of moisture in liquid/gas samples.	10 Marks