मोतीलाल नेहरू राष्ट्रीय प्रौद्योगिकी संस्थान इलाहाबाद

प्रयागराज -211004 [भारत]

Motilal Nehru National Institute of Technology Allahabad

Prayagraj-211004 [India]

Name of the Department: Chemical Engineering

End Semester (Odd) Examination 2020-21

Programme Name: B.Tech. **Semester:3rd**

Course Code: CH13102 **Course Name: Process Instrumentation**

Branch :Chemical Engineering **Student Reg. No.:** | | | | | | | | |

Duration: 120 Minutes **Max. Marks: 40**

Instructions: (Related to Questions)

1. ***Draw diagrams only if asked in the question.***
2. ***Read questions carefully and write to the point.***

			Marks	Mapped to CO number **(Optional)**
Q 1	**a**	Describe the differences between diaphragm and buttefly valves in terms of design and applications. Give magnitude of pressure drop losses(range) in these valves for gases.(no diagram of valves please, only if you feel very necessary then only draw)	5	1
	b	Delineate the differences between transducer and transmitter.	5	1
	c	Define static and dynamic errors. What can be source of some of the errors in liquid thermometers.	5	1,2
Q 3	**a**	IN RTDs why nickel, copper and platinum are used and why the R/Ro vs temperature curve for nickel not linear. How will you remove the problems like lead error and self heating in RTDs?	4+3	3

		Select one material other than nickel, copper and platinum and try to design a new RTD (design here means to give equations of resistance change with temperature and advantages and disadvantages of choosing such materials)		
	c	How are temperature and pressure measured in a distillation column?	3	3
Q4		What are the differences between gamma and neutron radiation. What is backscattering. How are neutron radiation generated in the devices for level measurement. How is the level of liquid measured in industrial boilers?	5	3,4
Q5		Give the range of values of accuracy and measurement range of oval gear flow meters. Can there be hysteresis in such flow meters. Or Explain the working of capacitance pressure gauge along with design features.	5	4
Q6		Describe the principles of optical pyrometer and pH meter. And what can be the sources of errors in optical pyrometer. (no diagram please of the instrument)	5	4