## SARDAR PATEL UNIVERSITY

Vallabh Vidyanagar - 388120

B. Sc. - 5th Semester (Instrumentation-vocational)

US05CINV02 (Control technique-1)

Wednesday, 13/11/2019, 10:00 am to 01:00 pm

Maximum Marks: 70 [10]Objective Type Questions. Que 1 Pneumatic control system requires \_\_\_\_ for its operation. 1 b) Voltage a) Current d) Air c) Frequency Refrigerated type air dryers usually uses \_\_\_\_\_ to cool the air. 2 b) Refrigerant a) Water d) Cooling agent e) Coolant Gas analyzers depend for their operation upon the fact that some gases and 3 vapors absorb specific wavelengths of infrared radiation falling on it. b) Magnetic wind type a) Thermal conductivity d) Infrared (IR) c) Paramagnetic oxygen (O<sub>2</sub>) Amongst the following, gas is not paramagnetic in nature. 4 b) Nitrogen dioxide a) Oxygen d) None of these c) Nitric oxide is basic controller. 5 b) Proportional a) ON-OFF d) PID e) Pl A Fan without regulator is example of \_\_\_\_\_ control system. 6 b) Integral a) Two position d) PID c) Derivative Control mode/s is/are continuous control mode/s. 7 b) Integral a) Proportional d) All of these c) Derivative The range of error to cover the 0 % to 100 % controller output is called \_\_\_\_\_. 8 b) Direct action a) Proportional band d) Offset c) Reverse action Zero of electrical control system is ... 9 b) 4 mA a) 3 psi d) 15 psi e) 20 mA 10 Zero of pneumatic control system is \_\_\_\_\_. b) 20 mA a) 4 mA d) 15.psi e) 3 psi

l What types of precautions should be taken if pneumatic control system is to be used in moisturized environment? 2 State importance of gas analyzers. 3 On the basis of their operating principles, give classification of gas analyzers. 4 Explain operating principle of thermal conductivity analyzer. What are the drawbacks of discontinuous control mode? 5 Explain any two characteristics of integral (1) control mode. 6 7 Enlist any two advantages of proportional-integral (PI) control mode. 8 Briefly explain instrument air system (IAS). 9 Explain briefly on pressure levels of an IAS. 10 What is control system? 11 What are benefits of industrial automation? 12 Differentiate: Direct and reverse action. Que 3 [A] Explain what floating control mode is. |05|Discuss ON-OFF control mode. 181 |05|OR Que 3 What are the drawbacks of two position control modes? Explain Multiposition [A][05]control mode in detail. |B|What do you mean by process equation? Explain it with necessary example.  $\{0.5\}$ Que 4 [A]Explain continuous control mode 'proportional control mode' in detail. |05||B|Discuss PID control mode. [05] $\Omega$ R Que 4 Discuss integral (I) control mode in detail. A [05]Write on composite control mode 'proportional-derivative (PD) control mode' [B][05]in detail. Que 5 What is compressor? Explain reciprocating type compressor with necessary  $\lfloor 05 \rfloor$ [A.] diagram. [13] What is dryer? Write on refrigeration type dryer. [05]Que 5 IAI Discuss sliding vane rotary compressor with necessary diagram. [0.5]|0.5| $|\mathbf{B}|$ Explain non-lubricated compressor in detail. Que 6 With necessary diagram, explain operating principle of magnetic wind  $\{10\}$ [A] instruments. Explain it in detail. OR Que 6 Give an account of paramagnetic oxygen (O2) analyzer with necessary AL



diagram.