B.E.(PRODUCTION)(SEM VIII) (CBSGS) // Dec. 2019 / 09.12.2019



**Time : 3 Hours** **Total Marks : 80**

N.B. (1) Question 1 is compulsory.
(2) Attempt **any three** Questions from the remaining five Questions.
(3) Figures to the right indicate full marks.
(4) Support your answers with examples / case studies / Diagrams wherever possible.

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| 1. | | **Attempt any Five of the following** | **20** |
| | (a) | Define Automation. What are the types of automation? | |
| | (b) | Enlist 5 different types of pneumatic valves with their applications. | |
| | (c) | Write briefly about Timers and Counters in Electro-Pneumatics. | |
| | (d) | What are Accumulators in Hydraulic Circuits? Give its chief purpose. | |
| | (e) | Write a short note on : Karnaugh map | |
| | (f) | What is working principle of stepper motor? | |
| | (g) | Give applications of Polar plots and Bode Plots in control Engg. | |
| 2. | (a) | Design a pneumatic circuit for the sequence **A+B+C+ BC- Delay A-** where A, B and C are pneumatic actuators. | 12 |
| | (b) | Explain the basic elements of Automated system | 08 |
| 3. | (a) | Design an Electro-pneumatic single solenoid method circuit for the sequence **A- A+B+C+ B-C-** where A, B and C are pneumatic actuators. | 12 |
| | (b) | What is PLC controller? Explain its configuration with block diagram | 08 |
| 4. | (a) | Design a Hi-Lo Hydraulic Circuit and give its application | 10 |
| | (b) | Explain the concept of digital and servo hydraulic controls | 10 |





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5. (a) A unity feedback control system has T.F.

$$G(s)H(s) = \frac{100(s+4)}{s(s+0.5)(s+10)}$$

Draw the bode plot . Determine the G.M. P.M. gain crossover frequency and phase crossover frequency. 10

(b) Draw any two proximity sensors and explain in short its working principle. 10

6. (a) Explain the steps in finding stability of system using Routh Stability Criteria. 06

(b) Classification of Control System 14

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