GOVT POLYTECHNIC SAMBALPUR, BENGAL

DEPARTMENT OF ELECTRICAL ENGINEERING

SUBJECT- CONTROL SYSTEM ENGINEERING SEM- 6TH SEM SESSION- SUMMER 2021-22

NAME OF THE FACULTY-SASMITA TRIPATHY

SL NO.	WEEK NO	DATE	TOPICS TO BE COVERED	NO OF PERIODS
1	1	10.03.2022-11.03.2022	**1. FUNDAMENTAL OF CONTROL SYSTEM** 1.1. Classification of Control system 1.2. Open loop system & Closed loop system and its comparison 1.3. Effects of Feed back 1.4. Standard test Signals(Step, Ramp, Parabolic, Impulse Functions) 1.5. Servomechanism	5
2	2	14.03.2022-19.03.2022	**2. MATHEMATICAL MODEL OF A SYSTEM** 2.1. Transfer Function & Impulse response, 2.2. Properties, Advantages & Disadvantages of Transfer Function 2.3. Poles & Zeroes of transfer Function 2.4. Simple problems of transfer function of network.	4
3	3	21.03.2022-26.03.2022	2.5. Mathematical modeling of Electrical Systems(R, L, C, Analogous systems) **3. CONTROL SYSTEM COMPONENTS** 3.1. Components of Control System 3.2. Gyroscope, Synchros, Tachometer.	5
4	4	28.03.2022-02.03.2022	3.2. DC servomotors, Ac Servomotors. **4. BLOCK DIAGRAM ALGEBRA & SIGNAL FLOW GRAPHS** 4.1. Definition: Basic Elements of Block Diagram 4.2. Canonical Form of Closed loop Systems 4.3. Rules for Block diagram reduction	4
5	5	04.04.2022-09.04.2022	4.4. Procedure for of Reduction of Block Diagram 4.5. Simple Problem for equivalent transfer function 4.6. Basic Definition in Signal Flow Graph & properties 4.7. Construction of Signal Flow graph from Block diagram 4.8. Mason's Gain formula 4.9. Simple problems in Signal flow graph for network	4
6	6	11.04.2022-16.04.2022	**5. TIME RESPONSE ANALYSIS.** 5 . 1 Time response of control system. 5 . 2 Standard Test signal. 5.2.1. Step signal, 5.2.2. Ramp Signal 5.2.3. Parabolic Signal 5.2.4. Impulse Signal	4

7	7	18.04.2022-23.04.2022	5 . 3 Time Response of first order system with: 5.3.2. Unit impulse response. 5 . 4 Time response of second order system to the unit step input. 5.4.1. Time response specification.	5
8	8	25.04.2022-30.04.2022	5.4.2. Derivation of expression for rise time, peak time, peak overshoot, settling time and steady state error.VI Sem Electrical Page 11 of 28 5.4.3. Steady state error and error constant5 . 5 Types of control system.[Steady state errors in Type-0, Type-1, Type-2 system]	5
9	9	02.05.2022-07.05.2022	5 . 6 Effect of adding poles and zero to transfer function. 5 . 7 Response with P, PI, PD and PID controller. 6. **ANALYSIS OF STABILITY BY ROOT LOCUS TECHNIQUE.** 6 . 1 Root locus concept. 6 . 2 Construction of root loci.	4
10	10	09.05.2022-14.05.2022	6 . 3 Rules for construction of the root locus. 6 . 4 Effect of adding poles and zeros to G(s) and H(s). 7. **FREQUENCY RESPONSE ANALYSIS.** 7 . 1 Correlation between time response and frequency response. 7 . 2 Polar plots.	5
11	11	17.05.2022-21.06.2022	7 . 5 Computation of Gain margin and phase margin. 7 . 6 Log magnitude versus phase plot. 7 . 7 Closed loop frequency response.	4
12	12	23.05.2022-28.06.2022	7 . 3 Bode plots. 7 . 4 All pass and minimum phase system. 8. **NYQUIST PLOT** 8.1 Principle of argument.	5
13	13	30.05.2022-04.06.2022	8.2 Nyquist stability criterion. 8.3 Niquist stability criterion applied to inverse polar plot. 8.4 Effect of addition of poles and zeros to G(S) H(S) on the shape of Niquist plot.	5
14	14	06.06.2022-10.06.2022	8.5 Assessment of relative stability. 8.6 Constant M and N circle 8.7 Nicholas chart. REVISION	5

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