APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

Scheme for Valuation/Answer Key

Scheme of evaluation (marks in brackets) and answers of problems/key

SEVENTH SEMESTER B.TECH DEGREE EXAMINATION (S), MAY 2019

Course Code: EC409

Course Name: CONTROL SYSTEMS

Max. Marks: 100 Duration: 3 Hours

PART A

Answer any two full questions, each carries 15 marks.

			Marks
1	a)	Differential equation	(5)
	b)	Steps	(7)
		Transfer Function	(3)
2	a)	Deriving transfer function from G(s) – 2 marks	(5)
		Application of partial fraction to the transfer function-2 marks	
		Application of inverse laplace transform to obtain the final result – 1 mark	
	b)	Rise time-2.5 marks Peak Time-2.5 marks	(5)
	c)	Response-3 marks	(5)
		Error -2 marks	
3	a)	Block diagram reduction	(5)
		Verification	(5)
	b)	Derivation	(5)

PART B

Answer any two full questions, each carries 15 marks.

4	a)	Any three parameters	(5)
	b)	Steps(6 Marks)	(10)
		Plot(4 marks)	
5	a)	Bode plots (1 mark) its advantages(2 marks). stability determined from Bode plots(2 marks)	(5)
	b)	Calculation of slope with respect to slope-(2 marks), magnitude calculation at each corner frequency(2 mark) phase calculation (2 marks),graph plot(4 marks)	(10)
6	a)	Steps (6)	(8)
		Final plot (2)	
	b)	Design Procedures (3)	(7)

Plot (2)

Transfer function of the compensated network (2)

PART C

Answer any two full questions, each carries 20 marks.

7 a) Steps- 7marks (10)

Final answer- 3marks

b) Controllability- 5 marks

Observability- 5marks (10)

8 a) Stable. (10)

necessary condition 3 marks

sufficient condition 7 marks

b) Derivation 10 mark (10)

9 a) Steps-7 marks (10)

final expression 3 marks

b) (a) $H(z)=\frac{aTze^{-aT}}{(z-e^{-at})^2}$ (b) $H(z)=\frac{z\,sinhaT}{z^2-2zcoshaT+1}$ 5 marks each (10)

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