



MEHRAN UNIVERSITY OF ENGINEERING & TECHNOLOGY, JAMSHORO  
DEPARTMENT OF ELECTRONIC & TELECOMMUNICATION  
ENGINEERING FIRST TERM THIRD YEAR (04TL BATCH) B.E REGULAR  
PRACTICAL EXAMINATION, 2006

SUBJECT: **FEEDBACK CONTROL SYSTEMS**

ID.NO.

DATE: .....

TIME ALLOWED: 30 MIN

MAX.MARKS: 10

MARKS OBTAINED:

Signature

1. Internal Examiner.....

2. External Examiner.....

IN WORDS: .....

---

**SECTION#01 (MULTIPLE CHOICE QUESTIONS) [2.5 marks]**

- i. Which of the following system is stable:  
(a)  $AS^2+BS+C$  (b)  $AS^4+BS^2+CS+D$   
(c)  $-AS^2+BS-C$  (d)  $AS^2-BS-C$
- ii. Control systems is stable when  
(a) Roots of the characteristic equation have positive real part  
(b) Zeros of the system have negative real part  
(c) Impulse response approaches zero when time tends to infinity  
(d) None of these
- iii. One of the following methods can be used to determine the relative stability of a control system  
(a) Routh stability criterion (b) Bode plot  
(c) D' Alembert principle (d) None of these
- iv. Routh tables are separately constructed for two control systems. The first column obtained were (1, 3, 5, 0, -1) for system M and (2, 3, -4, 6, 1) for system N. then  
(a) M and N both are stable (b) M is more stable than N  
(c) N is more stable than M (d) Both are unstable but N is more unstable
- v. The phase angle of a zero at origin is  
(a)  $-180^\circ$  (b)  $-90^\circ$  (c)  $180^\circ$  (d)  $90^\circ$

**SECTION#02 (TRUE/FALSE)**

**[2.5 marks]**

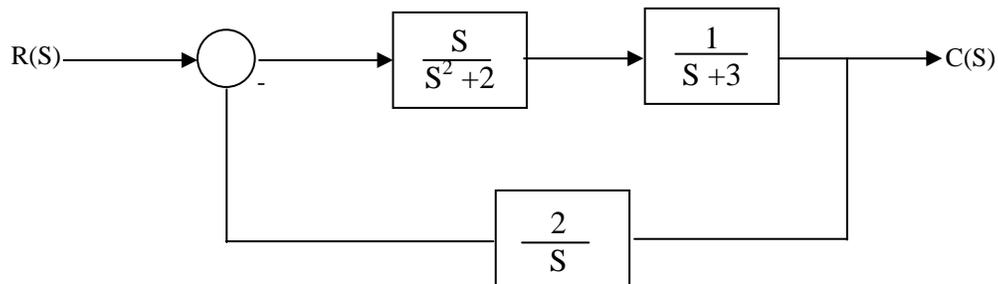
- i. Infinite steady state error is observed if unit ramp signal is applied to a type zero system. ( )

- ii. The system is said to be marginally stable if magnitude curve crosses the 0db axis. (     )
- iii. Pole is a critical frequency at which transfer function becomes infinite. (     )
- iv. Transfer function is said to be improper if number zeros are greater than the number of poles. (     )
- v. Infinite steady state error is observed if unit step signal is applied to a type zero system. (     )

**SECTION#03 (MATLAB PROGRAM)**

**[2.5 marks]**

**Q#1:** - Use MATLAB program to reduce the following block diagram into a single block and find out the closed loop transfer function.



- (a) Write down the MATLAB program to find out the poles and zeros of the system. Also write the command to draw the pole zero map.
- (b) Write down the MATLAB program for the step, impulse and ramp responses.

**SECTION#4 (Basic terms and Definitions)**

**[2.5 marks]**

**Q#5:** - Define following terms.

- i. Sensitivity
- ii. Rise time
- iii. State Vector
- iv. Robust control systems
- v. Actuating signal

**THE END**