BTS(C) – VI – (S) – 09 – 045 – T

B. Tech Degree VI Semester (Supplementary) Examination October 2009

ME 601 INSTRUMENTATION AND CONTROL SYSTEMS

(2006 Scheme)

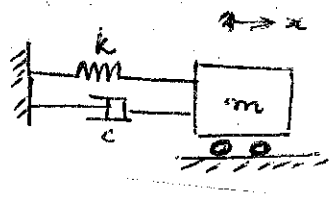
Time : 3 Hours Maximum Marks : 100

PART A

(Answer ***ALL*** questions)

(8 x 5 = 40)

I. (a) Briefly explain the functional elements of an instrument.
(b) Distinguish between active and passive transducers.
(c) Explain the working of hydraulic dynamometer.
(d) Explain the working of ORSAT's apparatus.
(e) Plot the unit step function, ramp function and a unit impulse function.
(f) Develop the mathematical model of a spring-mass-dashpot system shown.



(g) Discuss the stability of the spring-mass-dash pot system for different values of damping factor (ζ). Show the poles on the complex plane when $\zeta = 0$, $\zeta < 1$, $\zeta = 1$, $\zeta > 1$.

(h) ζ Explain the working of stepper motors.

PART B

(4 x 15 = 60)

II. Explain the methods of correction of spurious inputs in an instrument. (15)

OR

III. (a) Explain the working of a displacement measuring potentiometer as a zero order instrument. (8)
(b) Discuss the step response of a first-order-instrument. (7)

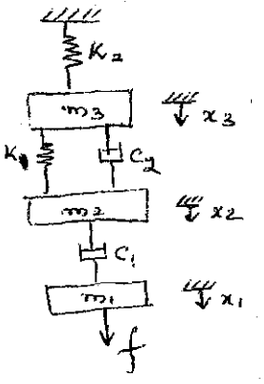
IV. (a) Explain the working of Gieger Muller Counter. (8)
(b) Explain the temperature compensation in strain gauges. (7)

OR

V. Explain the working of
(i) optical pyrometer (8)
(ii) sound level meter (7)

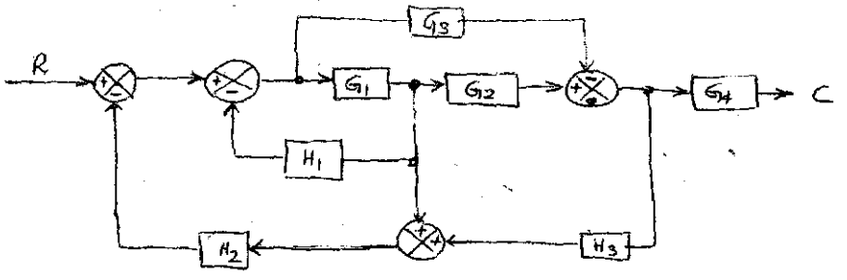
(Turn Over)

VI. Obtain the analogous electrical network of the system shown using force-voltage analogy (15)



OR

VII. Develop the transfer function for the following system shown.



(15)

VIII. Sketch the root locus for a system having $(k>0)$.

$$G(s)H(s)=\frac{K}{S(S+1)(S+2)(S+4)};\ k>0.$$ (15)

OR

IX. Draw the Bode plot for a unity feed back control system having $G(s)=20/(S+2)$. (15)

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