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SF-8346

B. E. III (Sem. VI) (Instrumentation & Control) Examination

May / June – 2011

Control System Component

Time : **3** Hours] [Total Marks :**100**

Instructions :

(1)

નીચે દર્શાવેલ ☛ નિશાનીવાળી વિગતો ઉત્તરવહી પર અવશ્ય લખવી.
Fillup strictly the details of ☛ signs on your answer book.

Name of the Examination :

☛ B. E. 3 (SEM. 6) (INSTRUMENTATION & CONTROL)

Name of the Subject :

☛ CONTROL SYSTEM COMPONENT

☛ Subject Code No. : 8 3 4 6 ☛ Section No. (1, 2,.....) : Nil

Seat No. :

Student's Signature

(1) Answers to each section section must be written in separate answer books.
(2) Figures to the right indicate maximum marks.
(3) Draw neat figure wherever required.

1 Answer the short questions : **10**

(i) State the use of Extension bonnet and seals.
(ii) What are booster relays and state its two advantages.
(iii) Define C_V
(iv) Difference between safety valve and relief valve.
(v) Draw curve for typical control valve pressure gradient.

2 (a) State and explain inherent characteristics of control valve in detail. **8**

(b) Explain the working of current to pressure converter. **6**

OR

(b) Explain the following terms : **6**

(1) Actuator
(2) Plug
(3) Piston
(4) Stem
(5) Seat
(6) Yoke

(c) A heating surface requires a control valve passing 10 gpm preheated light fuel oil (S_G=0.8) at full load and only 0.2gpm at the smallest heating load. The pressure differential at wide open in 20 psi. Calculate (i) Turndown (ii) Rangeability (iii) C_V (iv) K_V. **6**

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3 (a) State sliding stem control valves and explain any two in detail. **8**

(b) Explain split-ranging control valves and also state its applications. **6**

OR

(b) Explain reflux failure in detail. **6**

(c) Explain installed valve charateristics in detail. **6**

OR

(c) State rotating-shaft control valves and explain any two in detail. **6**

4 (a) Answer the short questions : **10**

(i) Draw characteristic graph for D-R-D-F cam and R-R-D-R-D-R cam.

(ii) Define planetary or epicyclic gear train

(iii) Define rack and pinion

(iv) Define HOLD current of relay

(v) Define pitch circle in CAMs

5 (a) Explain speed characteristic of electromechanical relay with neat and clean diagram. **8**

(b) Give the classification of CAMs and explain any two type according to shape with neat and clean diagram. **6**

OR

(b) Define follower. Give the classification of follower and explain any two of them with neat diagram. **6**

(c) List different type of gear trains. Explain simple and compound gear train. **6**

6 (a) Explain construction and working of variable reluctance type stepper motor. **8**

(b) Explain with neat diagram : **6**

(i) Bevel gears

(ii) Worm gears

OR

(b) Explain relay race. **6**

(c) Explain construction and working of disk magnet type stepper motor. **6**

OR

(c) Explain overload relay with neat and clean diagram.
