

Total No. of Pages: 1

Roll No. \_\_\_\_\_

BE (COE)  
FIFTH SEMESTER  
MID SEMESTER EXAMINATION, September-2011  
COE-301: INTRODUCTION TO COMPUTER GRAPHICS

Max. Marks: 20

Time: 90 min.

Note: Attempt ALL Questions, All Questions carry equal marks, Assume suitable missing data, if any.

Q1.

An ellipse will be drawn from  $(x_1, y_1)$  and  $(x_2, y_2)$ . Here  $(x_1, y_1)$  lies in region 1 of quadrant 1 and  $(x_2, y_2)$  lies in region 2 of same quadrant. Scan conversion starts from both  $(x_1, y_1)$  to  $(x_2, y_2)$  and  $(x_2, y_2)$  to  $(x_1, y_1)$  simultaneously, following Bresenham's algorithm.

- (a) Write algorithm steps for such implementation.
- (b) What is the advantage of this technique.

[5]

Q2.

- (a) How are Trivial Accept and Trivial Reject carried out in Liang-Barsky Algorithm.
- (b) Use Sutherland-Hodgman algorithm for line clipping to clip a line PQ, where P(0, 0) and Q(10, 10) against a window defined as A(2, 2), B(10, 6), C(8, 10), D(0, 6).

[1, 4]

Q3.

- (a) Write a (Boolean) function that check the inputted polygon as a Convex Polygon or a Concave Polygon.
- (b) For the polygon with an exterior described by points (2, 5), (7, 3) and (5, 11), and an interior hole described by (5, 6), (4, 7) and (6, 8). Apply scan line fill algorithm to scan convert and display (or fill) the solid area interior to the polygon.
  - (i) Construct Global Edge Table to describe the polygon.
  - (ii) Show the traversing steps of Active Edge Table in filling the polygon.

[2, 3]

Q4.

- (a) Find the position of a triangle PQR, after its reflection about a line  $x - 2y = -4$ . Here, triangle PQR coordinates are P(2, 4), Q(4, 6) and R(2, 6).
- (b) Find a transformation which align the vector  $V = I + J$  with the vector  $N = 2I - J$ .

[2.5 X 2]

Total No. Pages: 1  
FIFTH SEMESTER

Roll No. 246/CO/09  
B.E. (COE)

MID SEMESTER EXAMINATION, September-2011

COE-302: DISCRETE MATHEMATICS AND DESIGN OF ALGORITHMS

Time: 1:30 Hrs

Max. Marks: 20

Note: All questions are compulsory. Assume suitable missing data, if any.

1. Verify the validity of the following argument.  
Every living thing is a plant or an animal. John's gold fish is alive and it is not a plant. All animals have hearts. Therefore John's gold fish has a heart. [3]
2. Construct a proof for the following argument, giving all necessary additional assertions. Specify the rules of inference used at each step.  
(My program runs successfully) or (the system bombs and I blow my stack). Further more, (the system does not bomb) or (I don't blow my stack and my program runs successfully.) Therefore my program runs successfully. [3]
3. Let  $A = \{1, 2, 3, 4, 5, 6, 7\}$ . Determine a relation  $R$  on  $A$  by  $aRb \Leftrightarrow 3 \text{ divides } (a-b)$ . Show that  $R$  is an equivalence relation. Also determine the partition generated by  $R$  [3]
4. Using induction prove that  $2^{n+2} + 3^{2n+1}$  is divisible by 7. [3]
5. Simplify the following propositional form. State each law you use.  
a)  $[(P \Rightarrow Q) \vee (P \Rightarrow R)] \Rightarrow (Q \vee R)$   $P \vee Q \vee R$  [2]
6. Determine whether each of the following functions is a bijection from  $R$  to  $R$   
(a)  $f(x) = 2x+1$     (b)  $f(x) = (x^2+1) / (x^2+2)$  [2]
7. State the extended Pigeonhole Principle. Using this principle show that if any 30 students are selected, then we may choose a subset of 5 so that all 5 were born on the same day of the week. [2]
8. A survey of 500 television watchers produces the following information: 285 watch football games, 195 watch hockey games, 115 watch basketball games, 45 watch football and basketball games, 70 watch football and hockey games, 50 watch hockey and basketball games, and 50 do not watch any of the three kinds of games.
  - a. How many people watch all three kinds of games?
  - b. How many people watch exactly one of the games? [2]

TIME: 1 Hour 30 minutes

Max. Marks: 20

Note: Attempt all questions. Missing data/information, if any, may be suitably assumed and mentioned. All questions carry equal marks.

- [1] For the current-to-voltage converter of Fig. 1, deduce an expression for the output voltage  $V_o$  in terms of input current  $I_{in}$  assuming ideal op-amps.

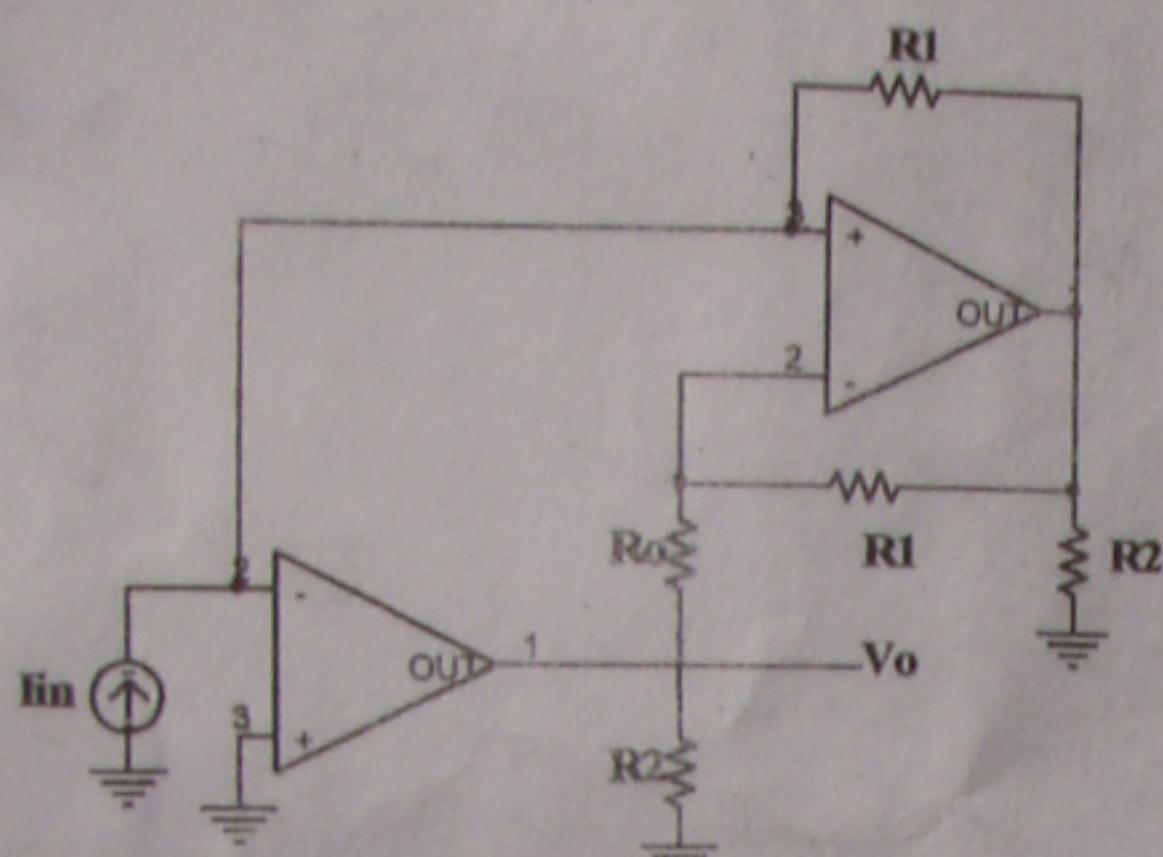


Fig. 1

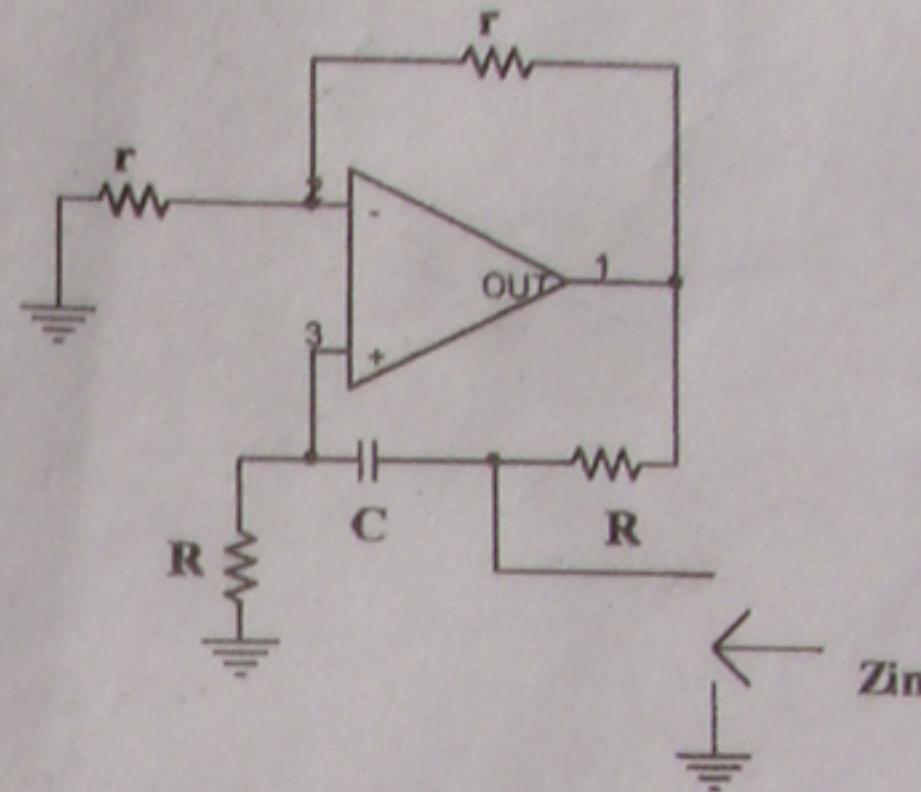


Fig. 2

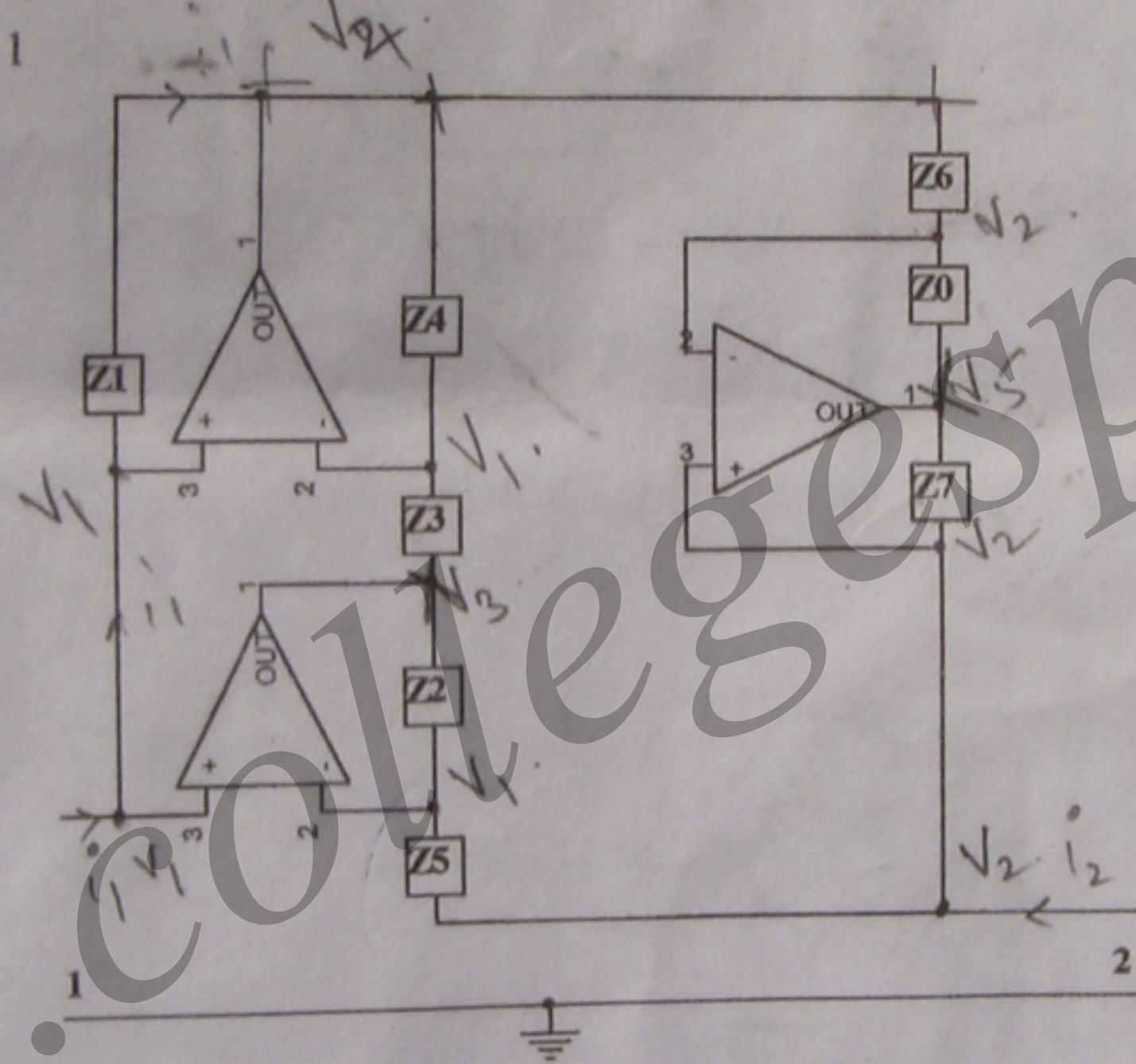


Fig. 3

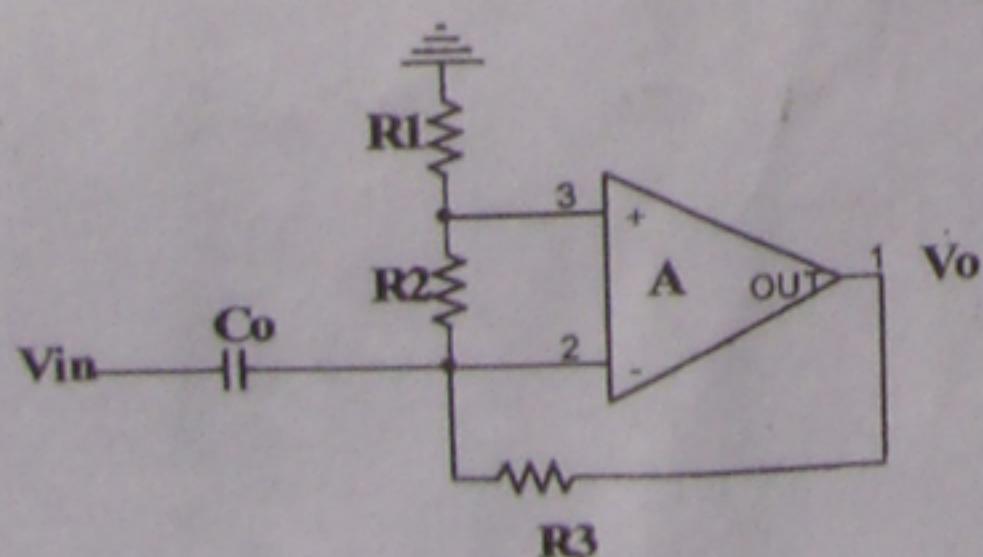


Fig. 4

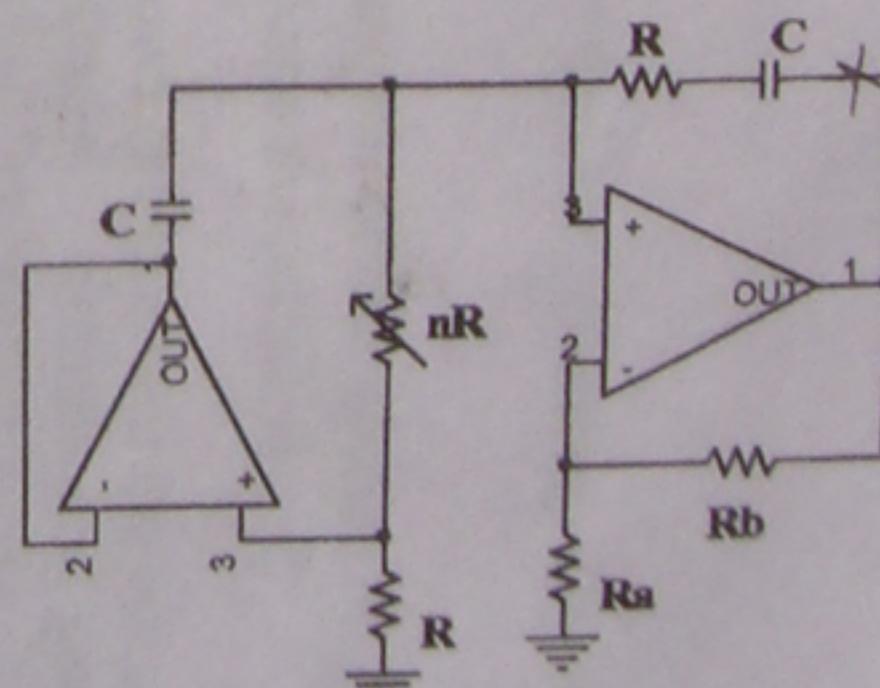


Fig. 5

- [2] Assuming ideal op-amps, find  $Z_{in}$  for the circuit of Fig. 2 and hence, the passive equivalent impedance realized?  
 [3] Assuming ideal op-amps, determine the [Y] matrix or [T] matrix for the circuit of Fig. 3 and hence, find the floating impedance  $Z_{eq}$  simulated by the circuit between ports 1 and 2, assuming  $Z_5 = Z_6 = Z_1$  and  $Z_7 = Z_0$ .  
 [4] Determine the expression for  $\omega_0$  and bandwidth of the band pass filter realized by the circuit shown in Fig. 4,

assuming  $A \cong \frac{\omega_t}{s}$  where  $\omega_t = A_o \omega_p$  for  $\omega \gg \omega_p$ .

[5] Verify that the circuit shown in Fig. 5 realizes a sinusoidal oscillator whose frequency can be controlled by ' $nR$ '.

Roll No.

**BE (V) SEMESTER MID TERM EXAMINATION (COE/ECE/ICE - 305)**  
**INDUSTRIAL ORGANIZATION AND MANAGERIAL ECONOMICS**  
Course No. 305      Time: 1:30 Hrs.      September, 2011

Max. Marks 20

Note: 1. Attempt any ten questions 2. All Questions carry equal marks

- Q.1. How did the Industrial Revolution influence the management practices?
- Q.2. Explain Adam Smith's contribution to the field of management.
- Q.3. Why is F.W.Taylor called the 'father of scientific management'?
- Q.4. Explain Henry Fayol's principles of management.
- Q.5. What were the contributions of Hawthorne studies to Human Resource approach?
- Q.6. Explain the different managerial skills required at different levels of management.
- Q.7. Distinguish between manager, administrator and entrepreneur.
- Q.8. Define the concepts of plant location. Explain various factors that affect the choice of the location of plants.
- Q.9. Describe the advantages and disadvantages of urban, semi-urban and rural location of a plant.
- Q.10. Differentiate between job production, batch production and continuous production with suitable examples.
- Q.11. Explain the nature and types of an organizational structure.
- Q.12. What is the difference between line organization and functional organization?
- Q.13. Distinguish between product layout and process layout of an industrial plant with examples.
- Q.14. Discuss important principles of a plant layout.
- Q.15. Identify the tools used in designing a plant layout.
- Q.16. What are the roles of committees, task force and consultancy firms in management decisions?
- Q.17. The EOQ for an item is 4 weeks supply. The ordering cost is Rs.100 per order.  
What is the ordering cost per year.
- Q.18. The EOQ for an item is 4 weeks supply. The ordering cost is Rs.100 per order.  
What is the carrying cost per year.