

## Ch 9 CODED INEQUALITIES

### ANSWERS AND EXPLANATIONS

1. (c)  $M = K$  ..... (i);  
 $D \leq K$  ..... (ii);  
 $R < K$  ..... (iii)  
 From (i) and (ii), we get  
 $M = K \geq D \Rightarrow M \geq D$   
 Hence, either  $M > D$  (conclusion II) or  $M = D$  (conclusion I) is true
2. (d)  $F \leq M$ ... (i);  $M > R$ ... (ii);  $E \geq F$ ... (iii)  
 From (i) and (iii), no specific relation can be obtained between  $M$  and  $E$ . Similarly, no specific relation can be obtained between  $R$  and  $E$ .
3. (e)  $H = K$ ... (i);  $T < H$ ... (ii),  
 $W \leq T$ ... (iii)  
 From (i), (ii) and (iii), we get  
 $K = H > T \geq W \Rightarrow K > W$  (conclusion I) and  
 $T < K$  (conclusion II).
4. (b)  $N > A$ ... (i),  $A < L$ ... (ii),  $F = N$ ... (iii)  
 From (i) and (iii), we get  
 $F = N > A \Rightarrow F > A$  (conclusion II). But no specific relation can be obtained between  $L$  and  $F$ . Hence, conclusion I is not necessarily true.
5. (b)  $B \leq D$ ... (i);  $D = M$ ... (ii);  
 $F > M$ ... (iii)  
 From (i), (ii) and (iii), we get  
 $F > M = D \geq B \Rightarrow B \leq M$  and  $F > B$  (conclusion II).  
 Since,  $B \leq M$ , therefore, conclusion I is not necessarily true.
6. (e)  $P \neq Q$ ... (i),  $Q > R$ ... (ii),  $P = R$ ... (iii)  
 From (ii) and (iii), we get  $Q > R = P \Rightarrow Q > P$ .  
 Hence, both I and II are true.
7. (a)  $A = B$ ... (i),  $B \neq C$ ... (ii),  $C < A$ ... (iii) From (iii), conclusion I is true. II contradicts statement (ii), hence, it is not true.
8. (d)  $Y \geq Z$ ... (i),  $Z > Q$ ... (ii),  $Q \neq P$ ... (iii)  
 From (i) and (ii), we get  $Y > Z > Q \Rightarrow Y > Q$ ... (A)  
 Hence, I is not true. From (iii), two possible relationships between  $P$  and  $Q$  are;  
**Case I:** When  $P > Q$   
 Now, using (A), we get  $Y > Q < P \Rightarrow$  no conclusion.  
**Case II:** When  $Q > P$   
 using (A), we get  $Y > Q > P \Rightarrow Y > P$ . Hence, II is not true.
9. (b)  $E > F$ ... (i),  $F > L$ ... (ii),  $L = N$ ... (iii)  
 From (ii) and (iii), we get  $F > L = N \Rightarrow F > N$  or  $N < F$ .  
 Hence, I may be true but not necessarily so.  
 From (i) and (ii), we get  $E > F \geq L \Rightarrow E > L$   
 Hence, II is true.
10. (d)  $H \geq J$ ... (i),  $J < K$ ... (ii),  $K > M$ ... (iii)  
 From (ii) and (iii), we get  $J < K > M \Rightarrow$  no relationship between  $J$  and  $M$  can be established. Hence, II can't be established. Again, combining all we can't conclude the relationship between  $H$  and  $M$ . Hence, I is not true.
11. (c)  $M \geq T$ ... (i),  $T = V$ ... (ii),  $V < E$ ... (iii)  
 From (i) and (ii), we get  
 $M \geq T = V \Rightarrow M \geq V \Rightarrow$  either  $V = M$  or  $V < M$  is true.
12. (d)  $L < U$ ... (i);  $U > G$ ... (ii);  $G > S$ ... (III)  
 Combining (ii) and (iii), we get  
 $U > G \geq S$ ... (IV)  
 Now, from (i) and (iv), we do not get any specific relation between  $L$  and  $S$ . Hence, conclusion I ( $L > S$ ) is not true. On a similar basis conclusion II



- $(G < L)$  is also not true.
13. (e)  $A \leq U$  ... (i)  $U = L$  ... (ii),  $J > L$  ... (iii)  
Combining (i), (ii) and (iii), we get  
 $J > U = L \geq A \Rightarrow J > A$  and  $J > U$ .  
Hence, both the conclusions are true.
14. (a)  $C \leq S$  ... (i)  $S < D$  ... (ii);  $D > M$  ... (iii)  
Combining (i) and (ii), we get  
 $D > S \geq C$  ... (iv)  
From (iv), we get  $D > C$ . Hence, conclusion I is true. From (iii) and (iv), we do not get any specific relation between  $S$  and  $M$ . Hence, conclusion II is not true.
15. (c)  $Y < G$  ... (i);  $G \geq H$  ... (ii);  $H = R$  ... (iii)  
Combining (ii) and (iii), we get  
 $G \geq H = R \Rightarrow R = G$  or  $R < G$   
Hence, either conclusion I or conclusion II is true.
16. (b)  $P \geq Q$  ... (i),  $D > P$  ... (ii);  $S = D$  ... (iii)  
Combining (ii) and (iii), we get  
 $S = D > P \Rightarrow S > P$ . Hence, conclusion II is true. But I is not true.
17. (b)  $Z < N$  ... (i);  $F \geq N$  ... (ii);  $F \leq K$  ... (iii)  
Combining all, we get  
 $K \geq F \geq N > Z \Rightarrow K \geq N$  and  $K > Z$   
Hence, conclusion I ( $K = N$ ) is not necessarily true but conclusion II ( $K > Z$ ) is true.
18. (c)  $D = T$  ... (i);  $T \geq M$  ... (ii);  $M < K$  ... (iii)  
Combining (i) and (ii), we get  
 $D = T \geq M \Rightarrow D \geq M \Rightarrow D = M$  or  $D > M$   
Hence, either conclusion I ( $M = D$ ) or conclusion II ( $D > M$ ) is true.
19. (c)  $W \geq A$  ... (i);  $B \leq A$  ... (ii);  $B > M$  ... (iii)  
Combining all, we get  
 $W \geq A \geq B > M \Rightarrow B \leq W$   
 $\Rightarrow B < W$  or  $B = W$   
Hence, either conclusion I or II is true.
20. (a)  $J \leq M$  ... (i);  $M = N$  ... (ii);  $N < T$  ... (iii)  
Combining all, we get  
 $J \leq M = N < T \Rightarrow T > J$
- Hence, only conclusion I is true
21. (d)  $V \leq F$  ... (i);  $F > R$  ... (ii);  $R \geq G$  ... (iii)  
Combining (ii) and (iii), we get  $F > R \geq G$  ... (iv)  
Comparing (i) and (iv), we can't get any specific relationship between  $G$  and  $V$ . Hence, both conclusions are not true.
22. (d)  $B = K$  ... (i);  
 $K < D$  ... (ii);  
 $D > M$  ... (iii)  
From (i) and (ii), we get  
 $D > K = B$  ... (iv)  
From (iii) and (iv), no specific relation can be obtained between  $B$  and  $M$ . Therefore,  $B = M$  (Conclusion I) and  $B < M$  (Conclusion II) are not necessarily true.
23. (b)  $H < N$  ... (i)  
 $N > W$  ... (ii);  
 $W \geq V$  ... (iii)  
From (ii) and (iii), we get  
 $N > W \geq V$  ... (iv)  
From (i) and (iv), no specific relation can be obtained between  $H$  and  $V$ . Hence,  $H < V$  (Conclusion I) is not necessarily true. But  $V < N$  (Conclusion II) follows from equation (iv).
24. (c)  $J \leq D$  ... (i);  
 $Q \geq D$  ... (ii);  
 $Q < M$  ... (iii)  
Combining (i) and (ii), we get  
 $Q \geq D \geq J \Rightarrow Q > J$  (Conclusion I) or  $Q = J$  (Conclusion II)  
Hence, either conclusion I or conclusion II is true.
25. (b)  $F \geq G$  ... (i);  
 $N = G$  ... (ii);  
 $N > T$  ... (iii)  
Combining all, we get  
 $F \geq G = N > T \Rightarrow N \leq F$  (Conclusion II) and  $T < F$   
Hence, conclusion I ( $T > F$ ) is not true but conclusion II is true.
26. (a)  $M > R$  ... (i);



