

## Indian Statistical Institute

M.Tech. (CS), First Year, Mid-Sem of Second Semester Examination, 2023-24  
**Database Management Systems**

### Answer Keys

1. (a) Two relations that have no common attribute.  
(b)  
(c) If  $Y$  is neither a key for  $R_1$  nor for  $R_2$ :  $(t_1 - n) + (t_2 - n) = t_1 + t_2 - 2n$ .  
If  $Y$  is either a key for  $R_1$  or for  $R_2$ :  $t_1 + t_2 - n$ .
2. (a) The order is 5. The reconstructions are shown below.  
  
(b) Heap-based secondary indexing.
3. (a) A.  
(b) Third Normal Form.  
(c)  $\{BD, ABCE\}$  or  $\{DE, BD, ABC\}$ .  
(d) Yes.  
(e) Yes.
4. (a) (i)  $\min(710, 7) = 7$   
(ii)  $\max(710, 7) = 710$   
(b) 100