# ממן 12 מערכות בסיסי נתונים

**שאלה 1.**

1. ∏ lno (σ Odate ≥ 1.1.2020 ∧ Odate < 1.1.2021 ∧ city = ‘Tiberias’ (restaurant) )
2. ∏ mname( manager ⋈ restaurant)
3. ∏ lno (σ idate ≥ 1.1.2021 ∧ idate < 1.1.2022 (inspection) ÷ ∏ iid(inspector) )
4. ∏ rname, violation(σ idate = odate +1 ∧ passed = 0 (Inspection ⋈ restaurant))
5. ∏ mname( ∏ mid(σ r1.mid = r2.mid ∧ city ≠ city(ρr1(restaurant) × ρr2(restaurant))) ⋈ manager)
6. ∏ lno(σ i1.lno = i2.lno ∧ i1.idate ≠ i2.idate ∧ passed =’1’ (ρi1(inspection) × ρi2(inspection))) - ∏ lno(σ passed =’0’ (inspection))

**שאלה 2.**

**א' ב' בתחשיב יחסים לפי שורות ג' ד' בתחשיב יחסים לפי תחומים.**

1. {t(lno, rname) | ∃ k,d, k ∈ manager, d ∈ restaurant (d[city] = ‘jerusalem’ ∧ d[lno] = t[lno] ∧ d[rname] = t[rname]) ∧ (k[mid] = d[mid] ∧ k[city] = ‘givataim’)}
2. {t(lno) | ∃ d, k d ∈ restaurant, k ∈ inspection (d[lno] = k[lno] = t[lno] ∧ k[passed] = ‘0’ ∧ (5.8.2021- k[idate]) > 7 ∧ 5.8.2021- k[idate]) < 14)}
3. {<mn> | ∃ mi, a, c, mo, e (<mi, mn, a, c, mo, e> ∈ manager) ∧ ∃ ln1, rn1, ra1, rc1, p1, o1 (<ln1, rn1, ra1, rc1, p1, o1, mi> ∈ restaurant) ∧ ∃ ln2, rn2, ra2, rc2, p2, o2 (<ln2, rn2, ra2, rc2, p2, o2, mi> ∈ restaurant) ∧ ¬∃ ln3, rn3, ra3, rc3, p3, o3 (<ln3, rn3, ra3, rc3, p3, o3, mi> ∈ restaurant) ∧ ln1, rn1, ra1, rc1, p1, o1 ≠ ln2, rn2, ra2, rc2, p2, o2 ≠ ln3, rn3, ra3, rc3, p3, o3 }
4. {<iid, in> | ∃ b, s, m (<iid, in, b, s, m> ∈ inspector) ∧ ∀ l, id, s, v (<l, id, iid, s, ‘1’, v> ∈ inspection)}

←×÷∏ Πρσ ∪∩−÷×← ≥≤⋈ Π∏ ∈∀∃∈ ∧∨ ∉