

(a) List the id and description of all items which have never been used in any appointment service.

$R = ((\pi \text{ item_id } \mathbf{ITEM}) - (\pi \text{ item_id } \mathbf{APPTSERVICE_ITEM})) \bowtie (\pi \text{ item_id, item_desc } \mathbf{ITEM})$

(b) List the patient number, patient first name, patient last name, emergency contact first name, emergency contact last name and emergency contact phone number of all patients who live in a city named Mooroolbark and had appointment/s on 08 September 2023.

$R1 = \pi \text{ patient_no, patient_fname, patient_lname, ec_id } (\sigma \text{ patient_city= 'Mooroolbark' } \mathbf{PATIENT})$

$R2 = \pi \text{ patient_no } (\sigma \text{ appt_datetime = 08-09-2023 } \mathbf{APPOINTMENT})$

$R = \pi \text{ patient_no, patient_fname, patient_lname, ec_fname, ec_lname, ec_phone } (R1 \bowtie R2 \bowtie \mathbf{EMERGENCY_CONTACT})$

(c) List the number, first name, last name and email address of all patients who have been attended by endodontists (i.e. providers who specialise in ENDODONTICS).

$R1 = \pi \text{ spec_id } (\sigma \text{ spec_name= 'ENDODONTICS' } \mathbf{SPECIALISATION})$

$R2 = \pi \text{ provider_code } (R1 \bowtie \mathbf{PROVIDER})$

$R3 = \pi \text{ patient_no } (R2 \bowtie \mathbf{APPOINTMENT})$

$R = \pi \text{ patient_no, patient_fname, patient_lname, patient_contactemail } (R3 \bowtie \mathbf{PATIENT})$