TASK 1: Relational Database Queries - Relational Algebra

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

$R = \pi_{item\_id,\ item\_desc}(\sigma_{ITEM.item\_id\ !=\ APPTSERVICE\_ITEM.item\_id}(ITEM \bowtie APPTSERVICE\_ITEM))$

(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.

$R1 = \pi_{patient\_no,\ patient\_fname,\ patient\_lname,\ ec\_fname,\ ec\_lname,\ ec\_phone}(\sigma_{PATIENT.patient\_city\ =\ \text{“Mooroolbark”}}(\sigma_{PATIENT.ec\_id\ =\ EMERGENCY\_CONTACT.ec\_id}(PATIENT \bowtie EMERGENCY\_CONTACT))$

$R2 = \pi_{patient\_no}(\sigma_{appt\_datetime\ =\ 08\text{-}Sep\text{-}2023}(R1 \bowtie APPOINTMENT))$

$R = R1 \bowtie R2$

(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).

$R1 = \pi_{patient\_no}(\sigma_{spec\_id\ =\ 101}(PROVIDER \bowtie APPOINTMENT))$

$R = \pi_{patient\_no,\ patient\_fname,\ patient\_lname,\ patient\_contactemail}(PATIENT \bowtie R1)$