Name: **Enrolment No:**	UPES

UNIVERSITY OF PETROLEUM AND ENERGY STUDIES
End Semester Examination, Dec. 2021

Course: Forensic Science & Law **Semester: IX**
Programme: BA LLB CRIMINAL LAW
Time: 03 hrs. **Course Code: CLCL 5001**
Max. Marks: 100

SECTION A

S. No.	**1. Each Question will carry 2 Marks.** **2. Attempt All Questions.**	**Marks**	**CO**
Q 1	Roberto Calvi was found hanging from scaffolding beneath Blackfriars Bridge in London. Strong evidence that he had not hanged himself was 1. there were no paint flakes from the scaffolding on his shoes. 2. his watch had stopped. 3. there was no water in his lungs. 4. he had a false passport and money in his pocket.	**2**	**CO1**
Q 2	SEM-EDX is the technique of choice for determining elemental composition if 1. the sample is a very small particle. 2. it is desired to analyse just a part of the sample. 3. a non-destructive technique is required. 4. all of the above.	**2**	**CO1**
Q 3	The DNA used for forensic purposes is from 1. the “junk” DNA. 2. the coding regions. 3. all of the DNA. 4. the genes.	**2**	**CO1**
Q 4	In the case of the Stratton brothers, which of the following people were not fingerprinted? 1. A member of the jury. 2. The investigating police officers. 3. The deceased, Mr. and Mrs. Farrow. 4. The milk carrier, Henry Alfred Jennings.	**2**	**CO1**
Q 5	The presence of GSR on a shooting victim indicates that the victim was 1. downwind of the firearm. 2. within ten metres of the firearm. 3. within one metre of the firearm. 4. committing suicide	**2**	**CO1**

SECTION B

S.No.	**1. Each Question will carry 5 Marks** **2. Instruction: Answer all the questions.**	**20**	**CO**
Q 6	Discuss the limits of forensic science.	**5**	**CO2**
Q 7	Explain the principle of reenactment and reconstruction.	**5**	**CO2**
Q 8	Explain the use of chromatography in forensic science	5	**CO2**

Q 9	Explain blood biochemistry & blood typing	5	**CO2**
	SECTION C		
S.No.	**1. Each Question will carry 10 Marks** **2. Instruction: Attempt all.**	**20**	**CO**
Q 10	Explain Internal Ballistics and how does it affects the use of firearms in evidence.	**10**	**CO 3**
Q11	If a sample of an illegal drug is seized in a raid or is discovered being smuggled at an airport, and the investigators find, for instance, a white powder, how do they detect and identify the illegal drugs?	**10**	**CO 3**
	SECTION D		
S.No	**1. Instruction: Attempt all.** You are instructed to refer to annexure 1 to attempt Q.12 & Q.13	**50**	**CO**
Q12.	1. Identify **two** specific mistakes in the application of the forensic science in the work done by the Municipal Police. In each case, explain why you think this is a mistake. 2. Identify **two** specific mistakes in the application of the forensic science in the work done by the Security Police. In each case, explain why you think this is a mistake. 3. What would you do with the evidence found in the Book Depository? You may only give **one** piece of evidence. For that evidence, indicate a specific forensic action that you would take and state how it would assist the investigation.	**30**	**C04**
Q.13	1. Count Sturgkh was killed by only one of the bullets that was fired. From which of the two locations is it most likely that this bullet was fired? Choose only **one** location. Explain the reason(s) for your choice. Give a reason other than the presence of cartridge cases. 2. From the evidence presented, what can you conclude about the identity of the gunman or gunmen who shot Count Sturgkh? Choose only **one** of the options presented below and explain the reason(s) for your choice. 1. A: Mr. X is the gunman 2. B: Mr. Y is the gunman 3. C: Both Mr. X and Mr. Y are the gunmen 4. D: There is no proof that either Mr. X or Mr. Y is the gunman	**20**	**CO4**

Annexure 1

Ruritania Case Study - *The Sturgkh Assassination*

Date: November 25th, 2013

Citizens of Ruritania are shocked to hear the news of the assassination of their beloved Prime Minister, Count Sturgkh. He was shot as he had breakfast at the Sidewalk Café, near the junction of Adler and Oswald Streets. A map of the area is given below. The terrible event is initially investigated by the Municipal Police, but, due to the seriousness of the crime, a second investigation is carried out by the Security Police. Curiously, the two investigations reach different conclusions and identify different suspects.

The waiter gives the following statement to the Police: "It was just after 9 a.m. I know that because I had just heard the time signal on the radio. I was standing in the café doorway. He turned towards me to order another café latte and, as he was speaking, there was a terrible noise and he fell backwards to the ground."

At the autopsy, it is noted that there is a bullet entry wound on the right side of Count Sturgkh's head, 8 cm above the ear, and an exit wound just below the left ear. Three bullet fragments (numbered 1, 2 and 3) are extracted from the Count's head. Two deformed bullet fragment (numbers 4 and 5) are also found embedded in the table. Trace element analysis of the bullet fragments gives the results shown in the table below:

Fragment	Silver (Ag) / ppm	Antimony (Sb) / ppm
1	8.9	715
2	9.3	695
3	6.9	712
4	9.5	811
5	9.1	799

The Municipal Police conclude that there was only one gunman. They suspect Mr. X. He was arrested by a traffic policeman after exiting a back door of the Ruritanian State Book Depository shortly after the incident. The policeman observed him dropping an object into a garbage bin. He was observed to be in an agitated state and his jacket was torn, but he claims that he had just been looking for some books on the ground floor when he heard a noise that scared him. A search of the book depository focused on a store room on the third floor. Three cartridge cases are found in this room. Fibres, bright yellow in colour, are found attached to a loose nail by the door. Using IR spectroscopy, the Municipal Police forensic scientists find that the fibres are identical to the fibres of Mr. X's jacket. A firearm is found in the garbage bin. Back at their Forensic Laboratory, the Municipal Police test fire a bullet from this gun. They claim that the striations on the cartridge cases, caused by the rifling, found at the book depository match the striations on the cartridge case from their test firing.

The following day, Mr. X is handed over to the Security Police. At their Forensic Laboratory, his hands are tested for GSR. The test is negative and Mr. X is released. The Security Police choose to investigate the Oswald Street Apartments Building, as a rear window is observed to have been smashed. It is known that this building has been unoccupied for some time. Upon entry, broken glass is found on the floor inside. An almost empty bottle of a soft drink is found inside the back door. A partial fingerprint is found

on the bottle. They search the apartments and their search focuses on Apartment 03-01 from where there is a good view of the café. CCTV footage recorded at the back of the Oswald Street Apartments shows a man leaving the building. From this footage, the Security Police identify Mr. Y as the suspect. They claim that the partial print from the bottle matches one of the fingerprints of Mr. Y.

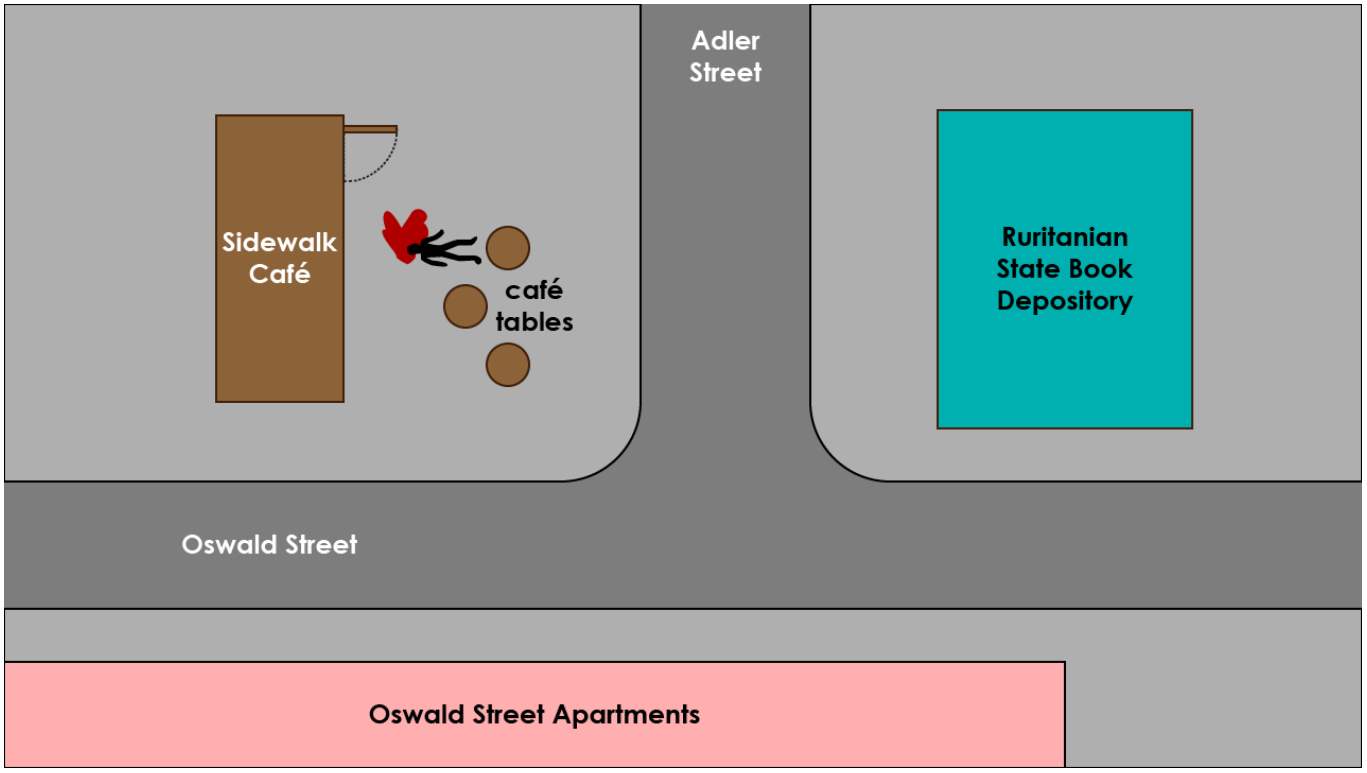
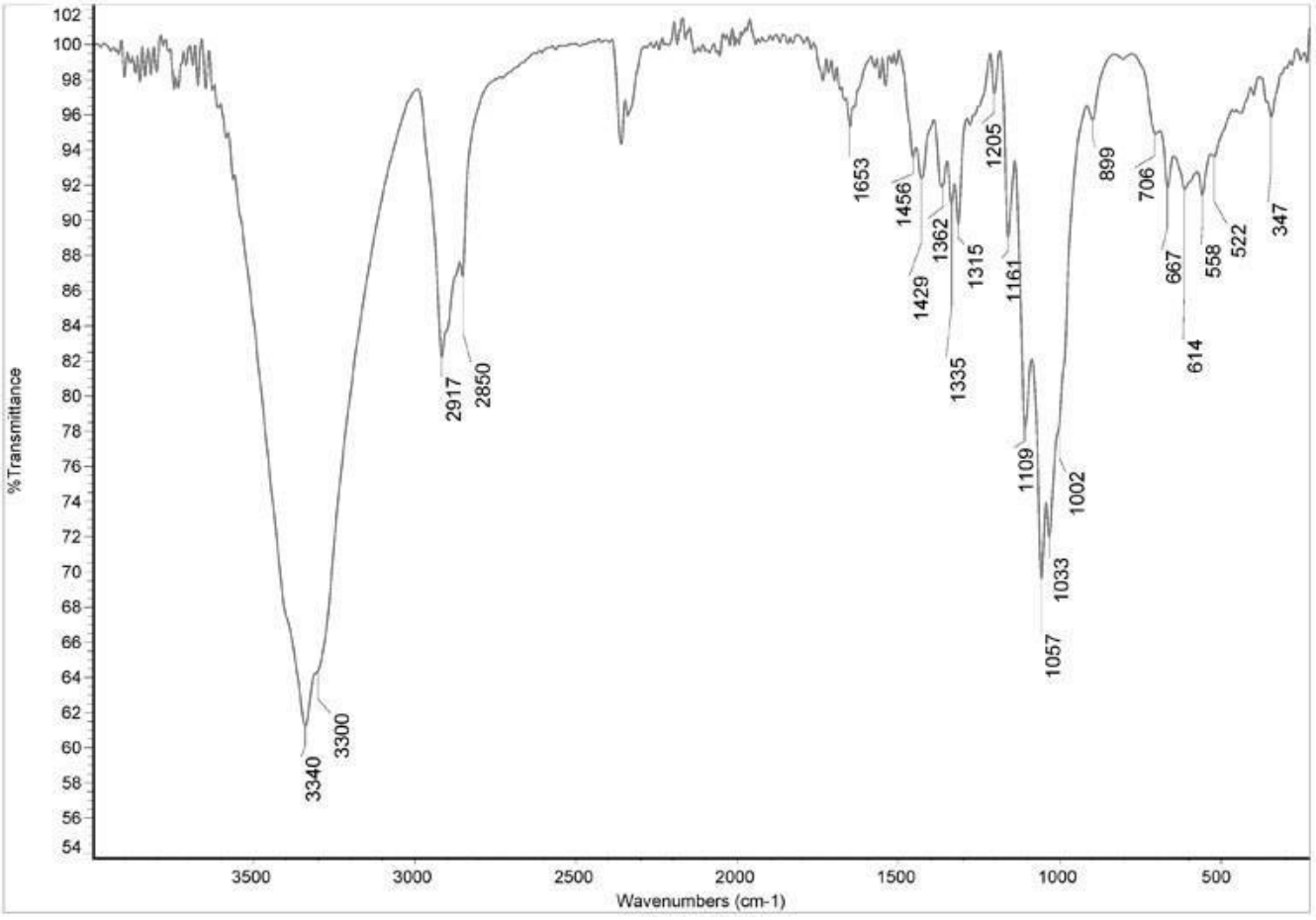


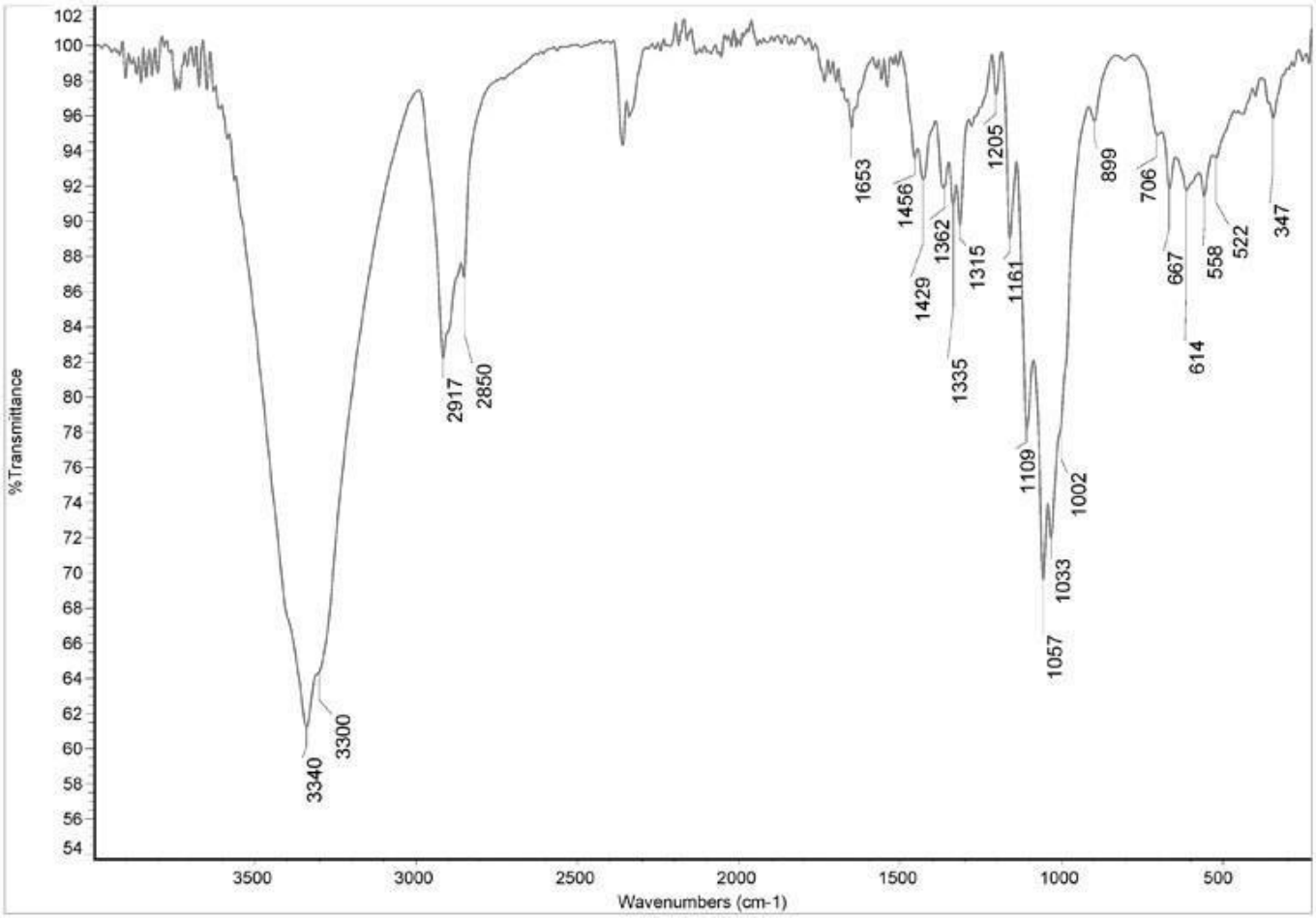
Figure 1. Map of the area where the crime occurred

Figure 2. A CCTV image of Mr. Y

The partial fingerprint Mr. Y Fingerprint



IR spectrum of fibres from Mr.X's jacket



IR spectrum of fibres from the nail in the Book Depository

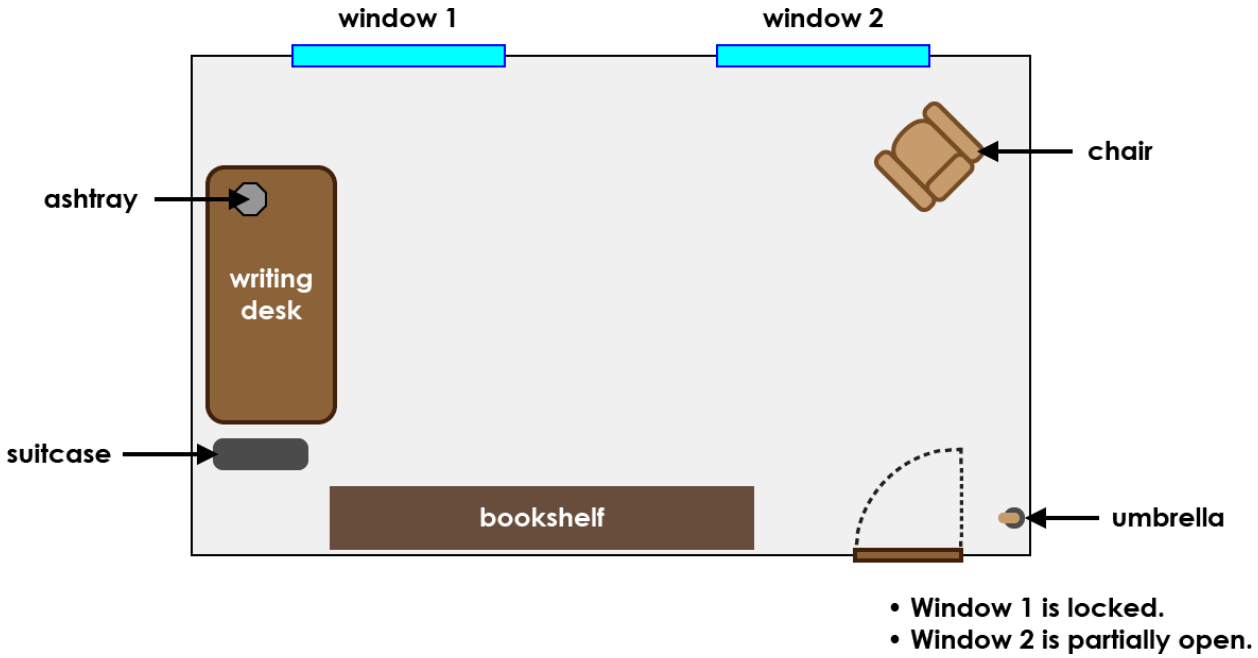


Figure 3. The front room of apartment 03-01 in the Oswald Street Apartments (windows face Oswald Street)

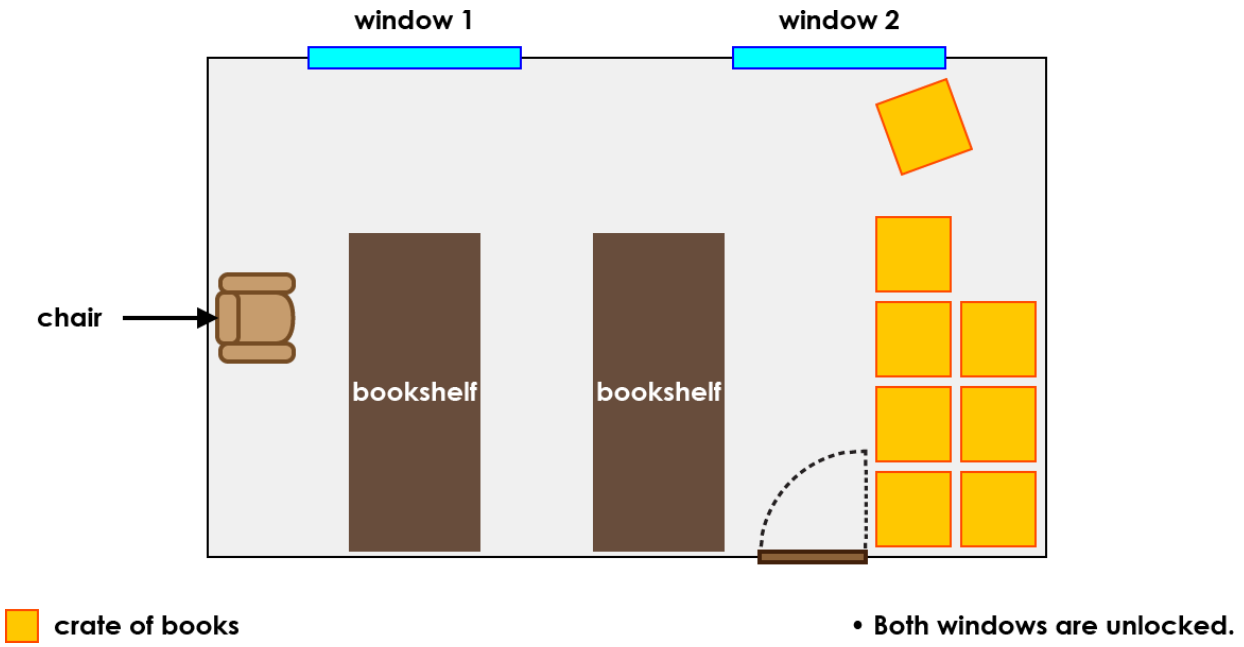
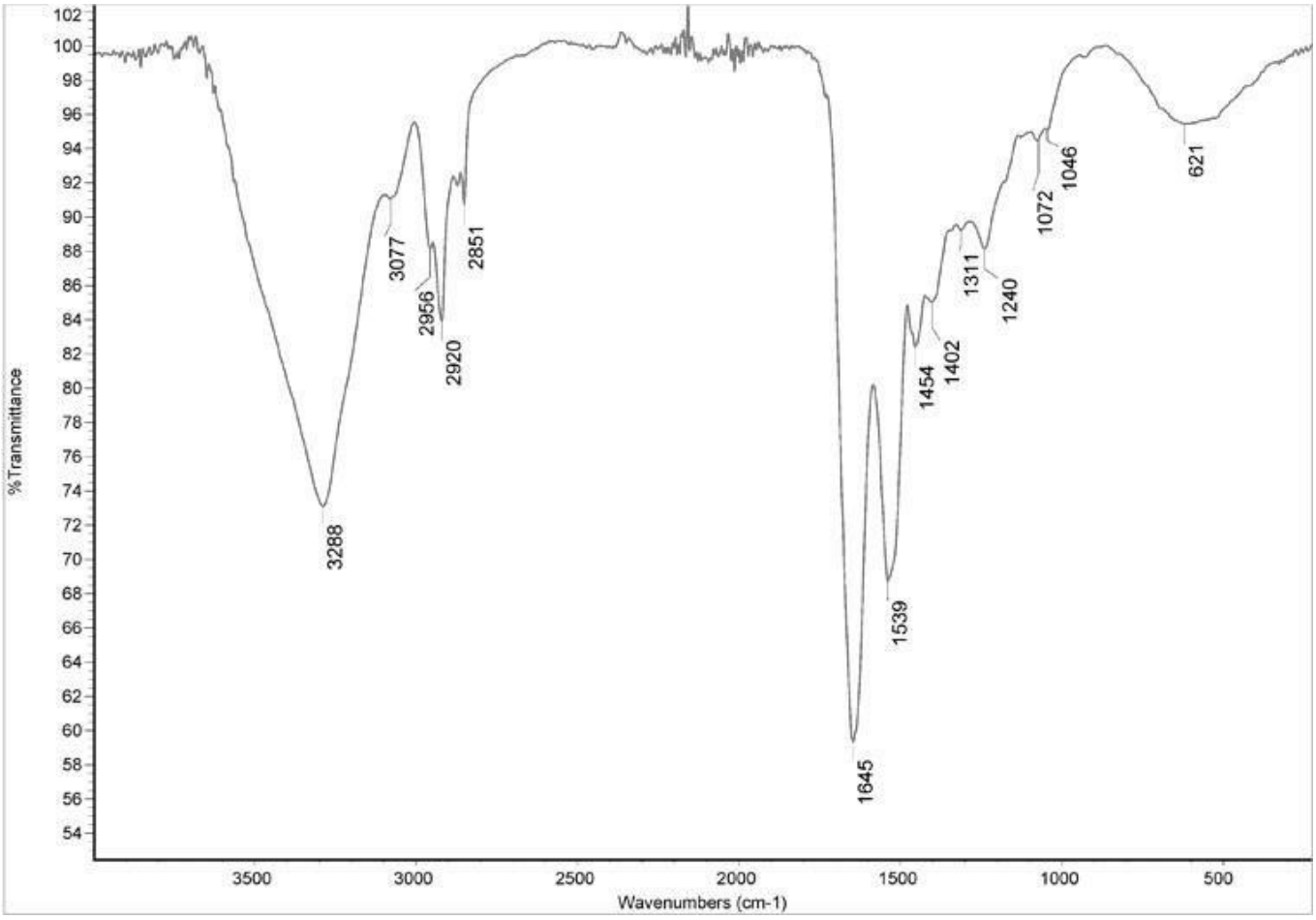
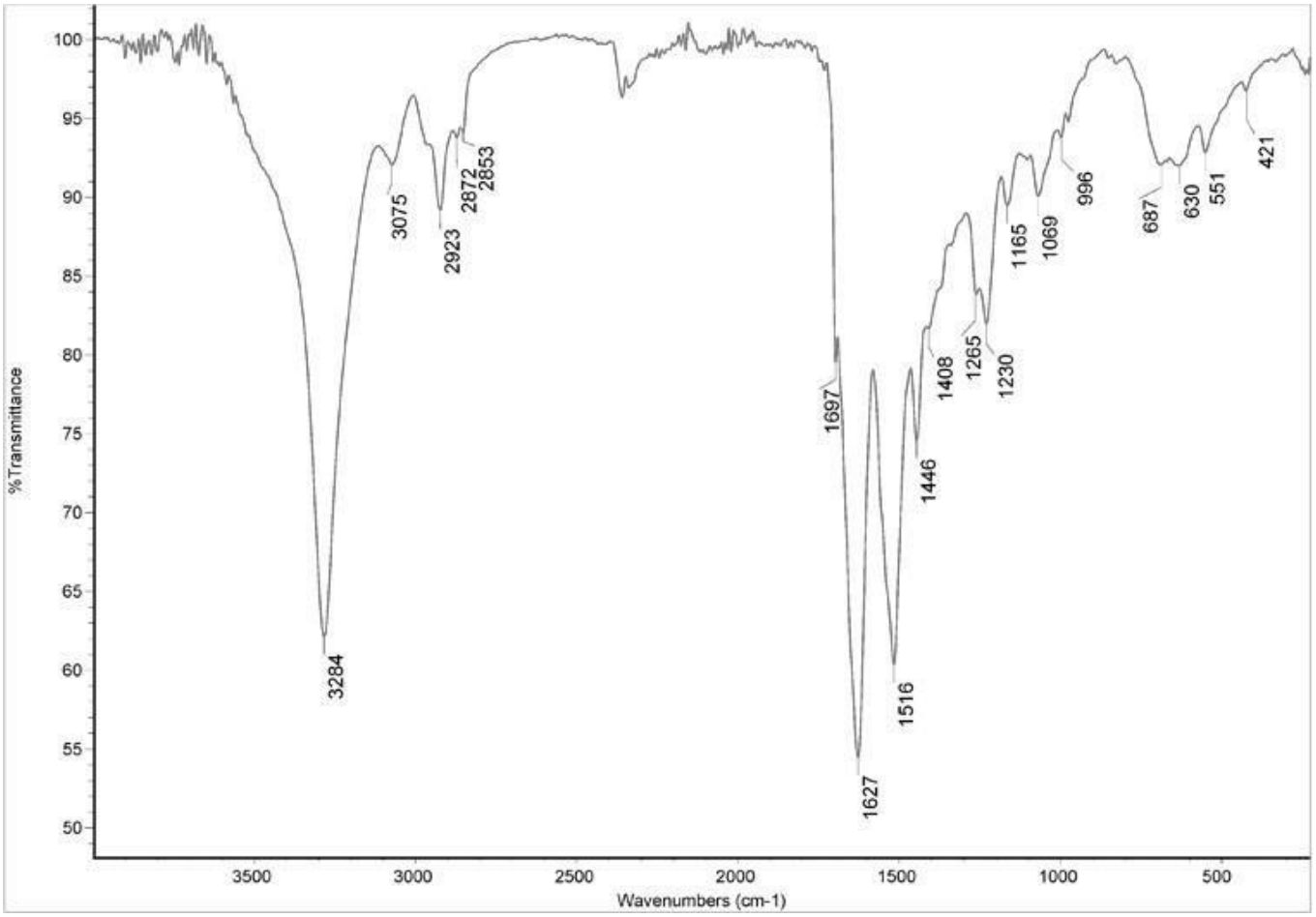


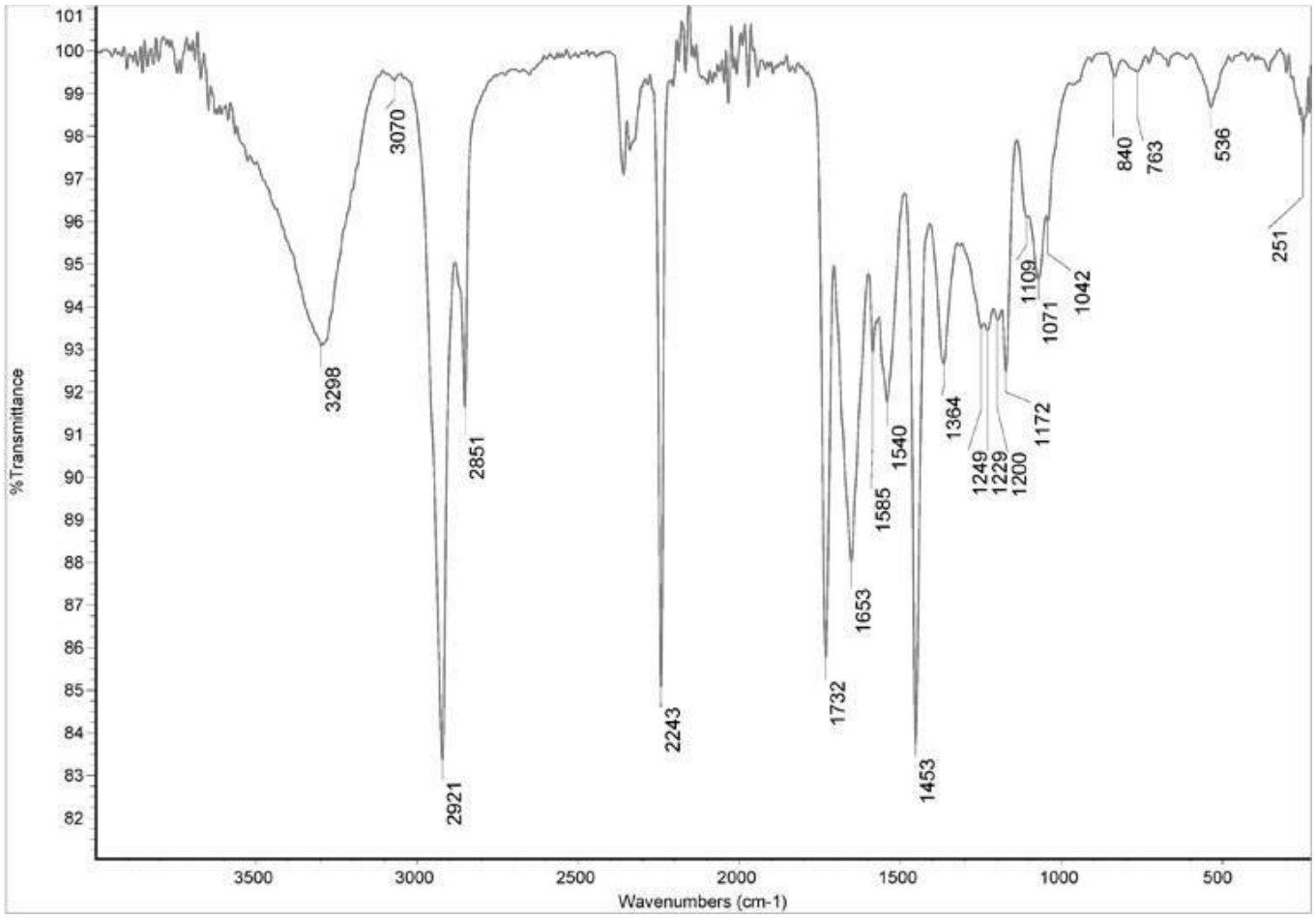
Figure 4. The third floor storeroom in the Book Depository (windows face Adler Street)



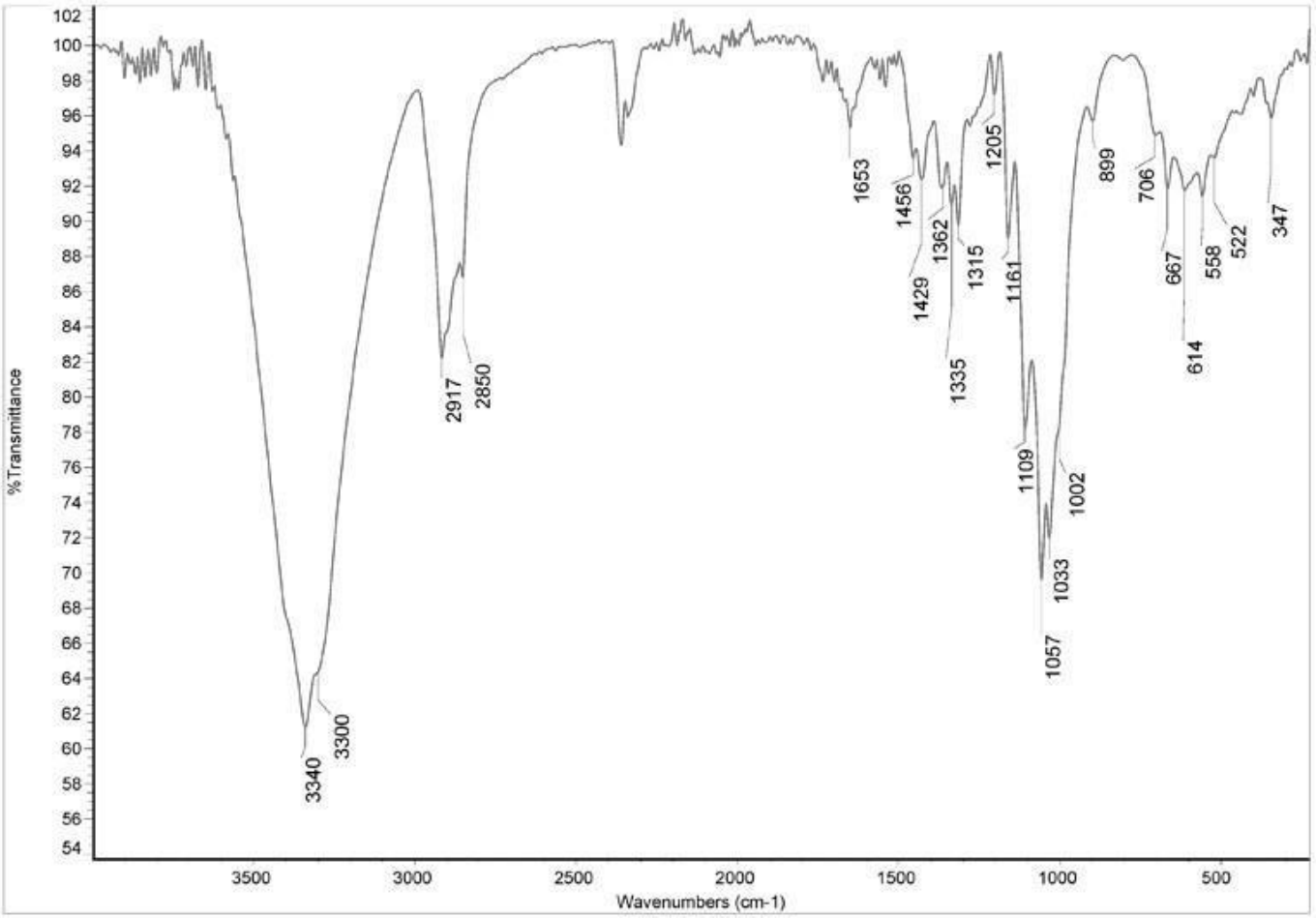
IR spectrum of wool



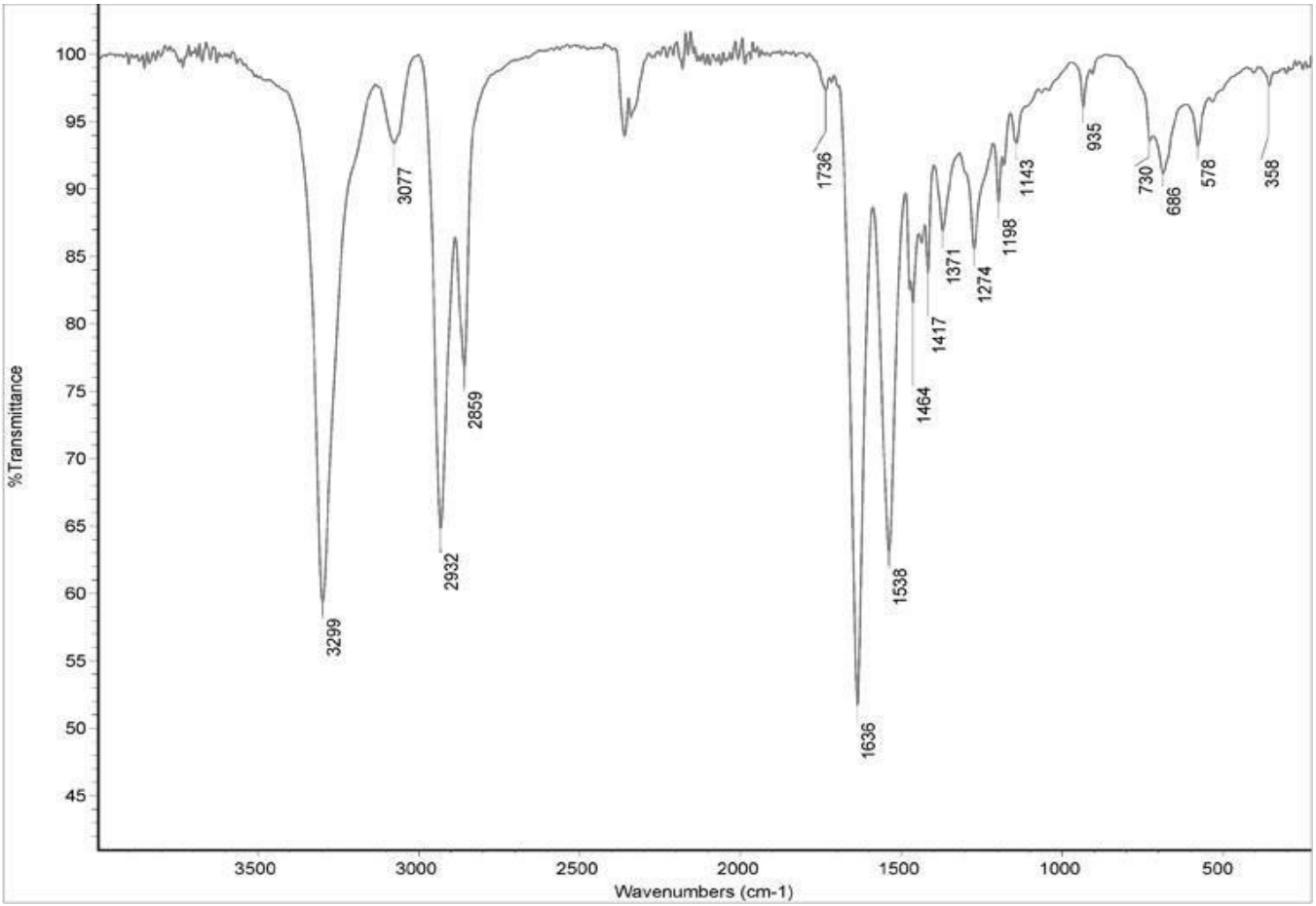
IR spectrum of silk



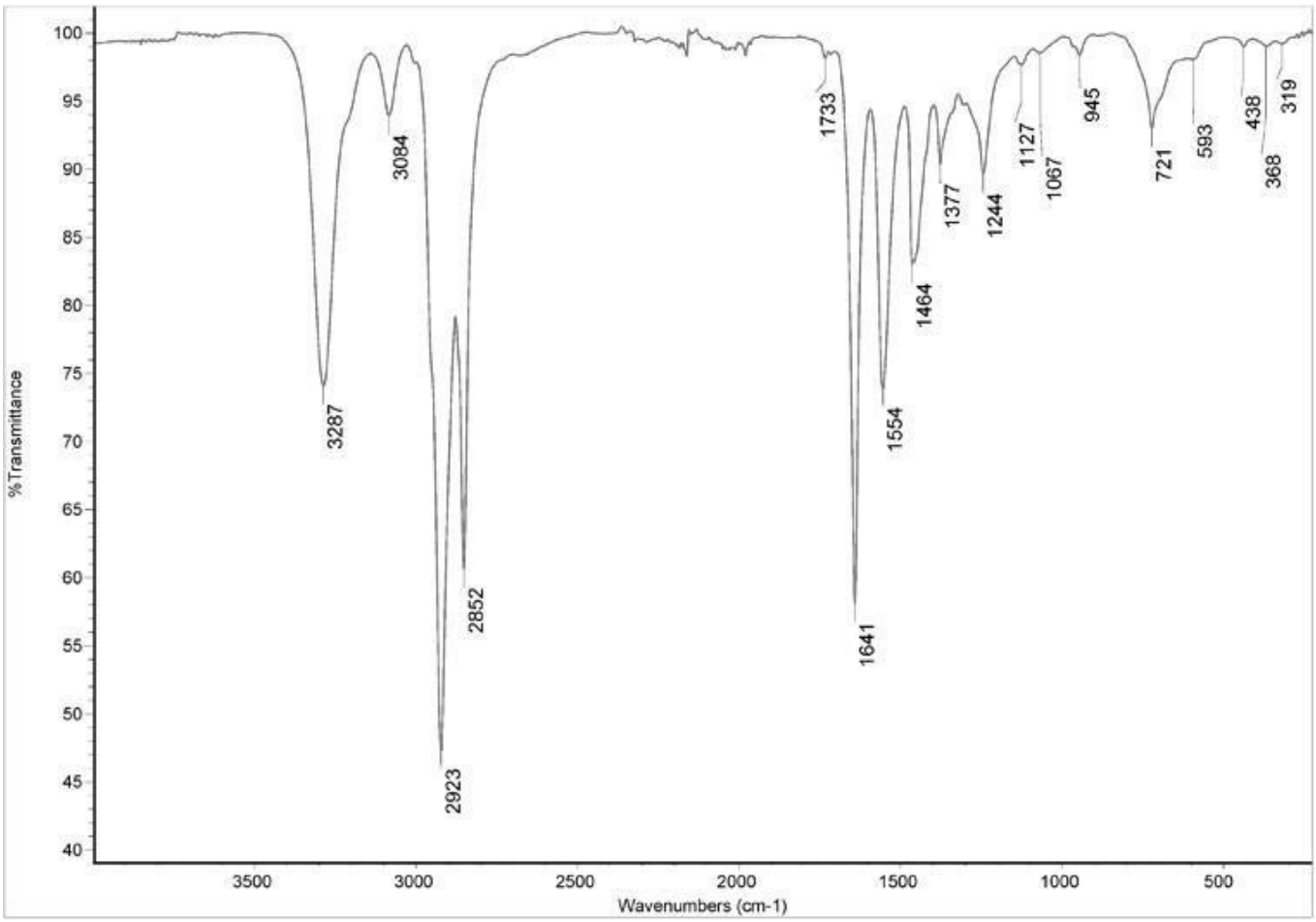
IR spectrum of acrylic



IR spectrum of cotton



IR spectrum nylon



IR spectrum of polyamide

Note: It is not necessary to read the peak values printed on the spectra.