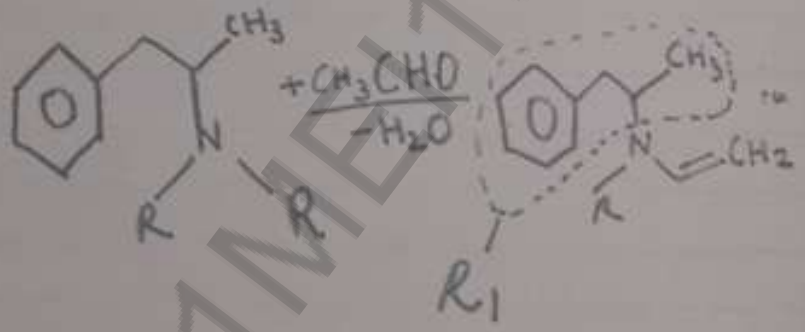
Q1) c) Titanium oxide
Q2) a) Gas chromatography
Q3) a) Accuracy
Q4) b) vibrational Spectroscopy
Q5o b) Paper

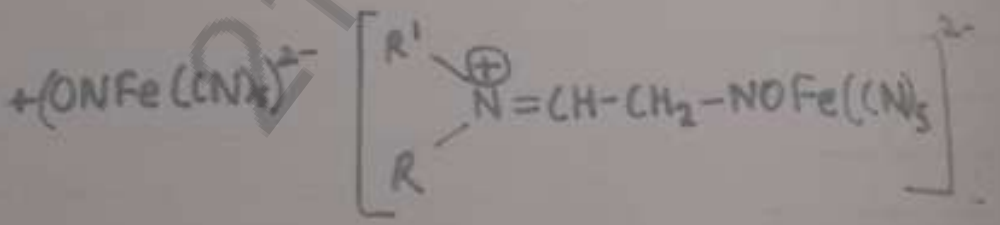
1)
Presumptive colour tests are designed to suggest the presence or absence of certain drug classes in a test sample. Colour testing is the lowest discriminating power technique, alongside ultraviolet spectroscopy and immunoassays. However, they are still widely employed by law enforcement and other security personnel as a means to provide rapid results at a significantly lower cost compared to other techniques. The main advantage offered by colour spot test methods is the ability to perform them in the field using portable test kits.
The appearance of colour or a change of colour is the evidence that a chemical reaction has occurred, just evolution of gas indicates chemical decomposition. Appearance or change of colour indicates alteration in chemical bonding that accompanies a reaction Colour test target the type of compound and functional group but drugs have various active moiety so identification by colour testing is more complex

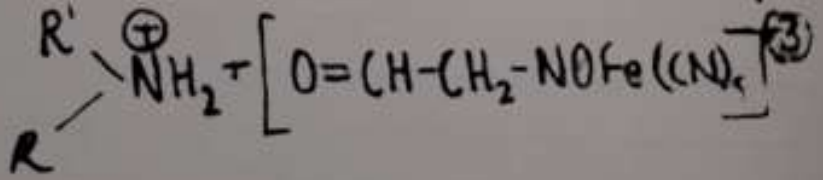
A) Marquis Test is most widely used and first to be used in sequence of drug analysis. It reacts with Morphine, Opiates, amphetamine, methamphetamine and some other controlled substance to produce coloured intermediate. Marquis Reagent The Marquis reagent is a solution of 0.25 ml of formaldehyde (40%) in 5 ml of concentrated sulfuric acid. 20 µl of the reagent is added to 10 µl of the sample to be tested & presence of drug of abuse is revealed by appearance of colour.

The colour produced by Marquis reagent is distinct orange-red colour but to differentiate between amphetamine and methamphetamine, additional colour test is needed (Simon Test)

The Simon colour test comprises two reagents. Reagent- A and Reagent-B.
Reagent- A is prepared with 50 mg of sodium nitroprusside dissolved in 0.5 ml of acetaldehyde and 4.5 ml of D. M. water
Reagent- B is 2% (w/v) sodium carbonate in D. M. water. 10 µl of reagent- A is added to 10 µl of the test sample, followed by the addition of 10 µl of reagent -B
Simon test is used to differentiate between amphetamine (RNH_2) and methamphetamine (R_2NH). Methamphetamine gives blue colour with Simon Reagent.







Drugs can be classified on various basis
1) By origin and function
2) General effect
3) By use
4) By Schedule

By origin and function:
A drug can be classified on the basis of its origin (how it was obtained). on this basis drugs can be natural product, semisynthetic, synthetic. Alkaloids are extracted from seed plant and are natural. These compounds are basic and have alkaline character.

By general effect:
Drugs can be categorised on the basis of the physiological consequences of ingesting them. on the basis of general effect drugs are of five types
1) Analgesics
2) Depressant
3) Hallucinogens
4) Narcotics
5) Stimulants

Analgesics:-
These are the drugs that relieve pain. For e.g.- Aspirin, Ibuprofen, Morphine, Naproxen sodium.

Aspirin:-
Aspirin and other related drugs are nonsteroidal anti-inflammatory drugs which stops pain by reducing fever and inflammation.
Reduction in fever and inflammation is done by blocking the function of prostaglandins (physiologically active lipid), fatty acid derivatives found associated with cell membrane.
Aspirin also inhibits pyrogens ("Fire starters") released by white blood cells in response to injury or infection.

Pyrogens act on hypothalamus (part of brain) and stimulate both the release of prostaglandins and heat producing process in the body.

Morphine:-
Morphine and other opiates (Afeem) (containing or derived from opium) reduces the pain by attaching to the site called opiod receptors scattered throughout the central nervous system & also in gastrointestinal track. Morphine By binding to opiod sites morphine blocks the transmission of nerve impulses that relay the sensation of pain to brain. Morphine can also bind with multiple sites, the side effects of pain relief is sleepiness, sense of well being and produce pleasurable sensation and euphoria.

Depressants:-
Depressants, depresses the function of the central nervous system resulting in slow heartbeat, reduction in anxiety and promotion of sleep. For e.g. Barbiturates, Benzodiazepine, Tranquilizers, Sleep aids & Ethanol are Depressants.

Hallucinogens:-
Hallucinogens drugs alter the perception of time and reality, a difficult effect to quantify. During its effect movement, thought, perception, vision and hearing are effected. For e.g. Mescaline, Marijuana, Methamphetamine

Hallucinogens are of two type:-
1) Based on phenethylamine molecular skeleton
2) Based on tryptamines molecular skeleton.
Mechanism of action of hallucinogens is difficult to predict and can not be summarized.

Narcotics:-

Narcotics drugs have analgesic effect and tend to depress the central nervous system and promote sleep. For e.g. Opiate alkaloids (Drugs derived from opium plant), Morphine, Codeine, Heroin, Hydromorphone, Oxycodone and Hydrocodone.

Stimulants:-

Stimulants, stimulate functions of the central nervous system line induce alertness and interferes with sleep. For e.g. Cocaine, Amphetamine, Methamphetamine At high dosage all the stimulants are hallucinogenic. The mechanism of action within the class varies widely.