ROLL NO.: _____

PATENT AGENT EXAMINATION, 2024

(Under Section 126 of the Patents Act, 1970)

PAPER II

TIME: 02.00 p.m. to 05.00 p.m. (Three Hrs) **Total Marks: 100**

Instructions:

1. This paper consists of 3 parts - Part A (20 Marks), Part B (30 Marks) & Part C (50 Marks).
2. All questions in Part A and B are Compulsory.
3. Part C comprises three parts - Part C1 and C2 of 10 marks each and C3 of 30 marks. Part C1 consists of 2 questions and the Candidate is required to answer any ONE of them, Part C2 consists of 3 questions and the candidate is required to answer any ONE of them; and Part C3 consists of 4 questions and the candidate is required to answer any ONE of them.
4. Candidates should read the questions very carefully before answering.
5. In case a candidate answers more questions than required, the first attempted question shall be evaluated.
6. No clarification will be provided during the course of the examination.
7. Wherever date is mentioned, it shall be treated to be in dd/mm/yyyy format.
8. There is no negative marking.
9. All references to "Act" and "Rules" may be read as The Patents Act, 1970 and The Patent Rules. 2003 respectively, as amended until now and their related applications.
10. Candidate is expected to quote relevant sections and rules as well as prescribed fees and forms in the answer.
11. No candidate will be allowed to leave the Examination Hall till the completion of the half time of the paper.
12. If any candidate wants to leave the Examination Hall after the completion of the half time but before the paper completion time, she/he can do so by surrendering the question paper.
13. After the completion of the paper time, the candidate can take the Examination Paper with her/him.
14. No candidate should leave or will be allowed to leave the Examination Hall (i) without signing the Attendance Sheet; and (ii) without properly handing over her/his OMR sheet/Answer Booklet to the Invigilator.

Part A

(4 Questions * 5 Marks=20 Marks)

1. "When it comes to delimiting the area of monopoly claimed, the patentees were as usual between Scylla and Charybdis; if they stated their claim too widely the invention would sink in the sea of prior art knowledge. If they stated it too narrowly, it would be lost to pirates"
- Salmon L J

Explain the above statement vis-à-vis best practices with regard to drafting of claims for application for grant of patent.

2. Aryabhata Aerospace Limited designed a new and inventive airplane wing and filed an application for the grant of patent wherein angle of attack of the wings claimed was in between 50-60 degree. However, during the prosecution of the said application, further research established that the best/optimum results were obtained with an angle of attack of the wing between 70-73 degrees, keeping all other design parameters same. What would be possible ways to protect the optimum angle of attack found later on? Discuss with relevant provisions of the Act and Rules.

3. Mr. Chandra was doing his Master's thesis at Ramanujam University of Science and Technology. He along with his guide Prof. Chanakya made an invention. Having no IPR policy in place, a patent application was filed (and granted) with Mr. Chandra as applicant, and Mr. Chandra and Prof. Chanakya as inventor. Later on, the University took your help as Patent Agent in forming their IPR policy and realized that the patents generated in the University campus, even in past, should be on their name as Applicant. What is the prescribed procedure and documents required for bringing the name of University as an applicant in Mr. Chandra's granted patent. Mention the corresponding section(s), rule(s), form(s).

4. Ms. Gargi is an inventor who filed an application for the grant of patent along with a provisional specification as an applicant with the patent office on January 11, 2023. Afterwards, Ms. Apala joined Gargi's research project and assisted her in finishing it. Once they finished it, on January 8, 2024, she plans to file the complete specification, wherein

a) She wants to include Apala's name as an inventor. Which form(s) she need to submit to the patent office for this change? Also provide the relevant section(s) and rule(s).
b) Ms. Apala would also like to have her name mentioned in the letter of Patent, which procedure, form(s), section(s), rule(s) would be relevant for the desired change.

Part B

3 Questions * 10 Marks= 30 Marks

5. Recently, The Jan Vishwas (Amendment of Provisions) Act, 2023 (No. 18 of 2023) was passed. Discuss the provisions of the Patents Act, 1970 amended through the Jan Vishwas Act, 2023 by referring to particular sections and rules? What are the objectives for such amendments?

6. Mr. Sudama filed an application for the grant of patent for his invention Cycle Dynamo on 19/05/2012, which was granted and recorded in the register of patent on 19/02/2016. Due to engagement in some personal emergency, he missed the payment of renewal fee timeline of three months. Sudama approaches you for professional advice. Advise him the available options and procedure as prescribed under the Act in the following three scenarios, also mention the relevant section(s), rule(s) and form(s):

a) Scenario 1: Sudama missed the timeline for payment of renewal fee by 5 months.
b) Scenario 2: Sudama missed the timeline for payment of renewal fee by 14 months.
c) Scenario 3: Sudama missed the timeline for payment of renewal fee by 25 months.

What repercussions might an applicant face due to nonpayment of a renewal fee concerning their patent application?

7. Dr. Ranjit developed an innovation based on green algal technology intercalated between sheets of glass. This technology has application in purifying air and increasing oxygen content in nature. The glass so developed finds application in many areas, few to name such as a glazed window, architectural glass etc.. Dr. Ranjit was granted a patent for this invention which caused immense interest in the market. Considering the public health hazard situation due to poor air quality, Government of India would like to acquire his patented invention. What are the provisions and procedure required to be followed by the Central Government under the Patents Act, 1970? What are the options available to Dr. Ranjit under provisions of the Act if he is not in agreement with the terms proposed by the Government for such acquisition by the Central Government?

PART-C

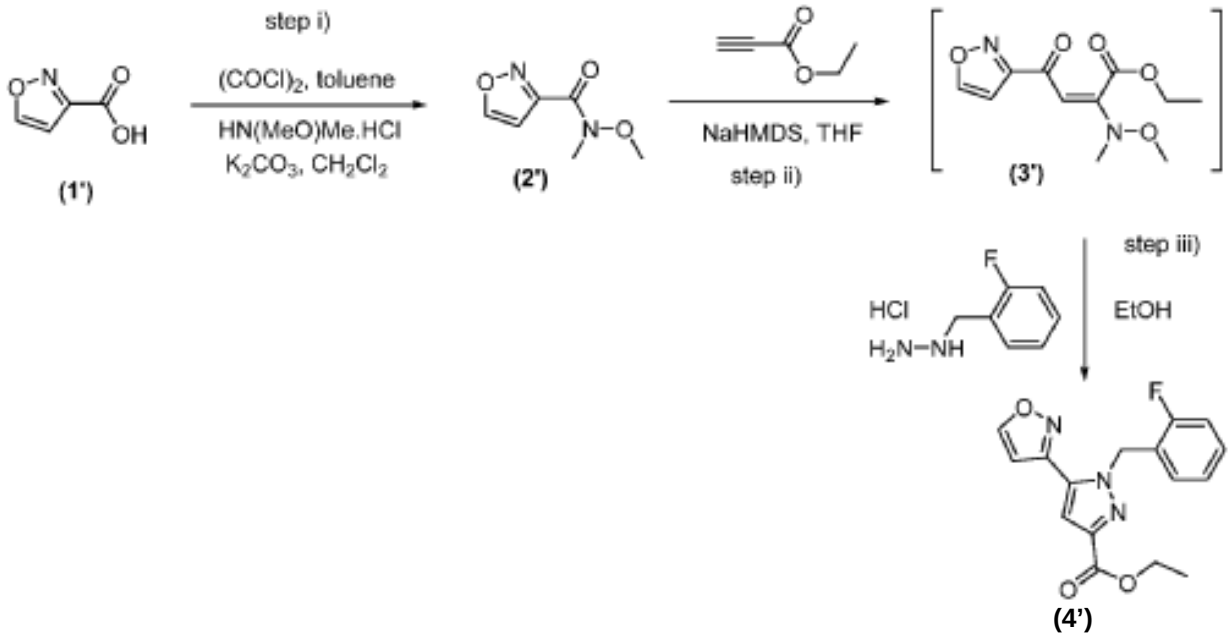
Part C consists of three Parts - Part C1, C2 & C3; each part consists of multiple questions. The candidate is required to answer any ONE of them in each part. In case a candidate answers more than one question in any part, the first attempted question will be considered for evaluation.

PART-C1

1 Question * 10 Marks = 10 Marks

Part C1 contains two questions; the candidate is required to answer any ONE of them.

8a. Mr. Dhanvantary is a research chemist at Charaka Chemical Innovations. Below described is the preparation of novel compound (4') as carried out according to this scheme :

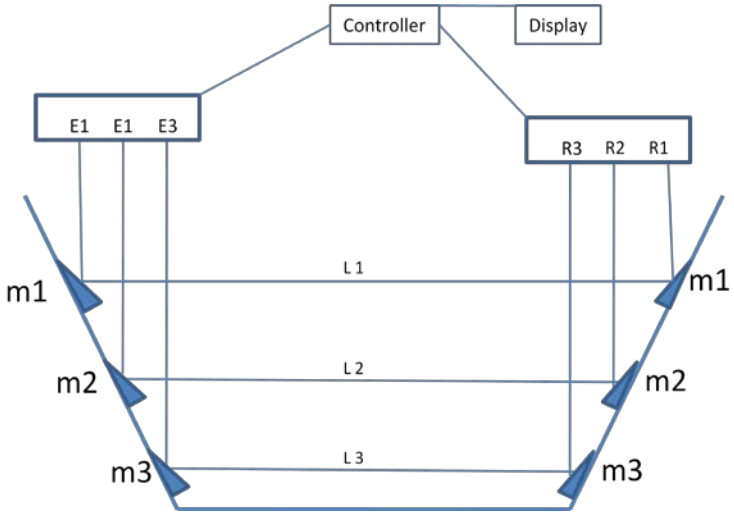


The above synthesis scheme of Mr. Dhanvantary introduces a compound (1') as the starting material in step i) to achieve compound (2'). This starting material is solid at room temperature, and is inexpensively available from commercial sources. The said scheme is more amenable to scale-up for large scale manufacturing, leading to overall higher yields and higher purities. Further, advantage of the synthesis according to scheme is that intermediate (3'), generated in step ii), can be re-crystallized and obtained in high purity. Further compound (4') is obtained by using hydrazine in presence of ethanol as depicted above.

Go through the above scheme and draft at least two independent claims covering both process and product categories.

OR

8b. Dr. Prabhudeva works as an automobile engineer and invented a liquid tank with liquid level indicator as shown below:



In the liquid tank with liquid level indicator, E1, E2 and E3 are three optical emitters and R1, R2 and R3 are corresponding receivers. There are three sets of reflectors (m1, m2, m3) which are arranged on the opposite walls of the tank at different heights. Based on the level of liquid (L1, L2, L3) in the tank, either of emitter-receiver combination generates a signal which is fed to a controller. The controller generates a visual indication of the level of liquid in the tank on a display and generates an alarm whenever the liquid level falls below L3 in the tank.

Go through the above drawing and its explanation and draft at least two independent claims covering both process and product categories.

PART-C2

1 Question * 10 Marks = 10 Marks

Part C2 contains three questions; the candidate is required to answer any ONE of them.

9a. Mr. Ravi works as a Scientist in a Science laboratory and comes up with an invention. He is very keen to file an application for patent, so he sends his proposal to his organization's IPR Cell with a draft of his invention. The IPR Cell conducts a preliminary search and finds two relevant documents D1 and D2 and sends it back to Mr. Ravi asking him to justify novelty and inventiveness of his invention over D1 and D2.

Draft of Mr. Ravi's invention

A Coffee making machine comprising: a heating element within a matrix, a second chamber restricted by a flow restriction device to control the rate of liquid flow, and a stainless steel cup or glass to receive beverage from second chamber. The heating element is for controlling a high temperature and elevated pressure to rise through the delivery tube. The flow restriction device comprises a rotatable plate having plurality of orifices having different diameters preferably between 0.8-2.4 mm.

Disclosure by D1:
A beverage making machine with heating element and optionally pitcher was disclosed. The Pitcher can be provided by the user, instead of being sold with the machine. Pitcher is optionally made of clay.

Disclosure by D2:

D2 discloses an ice tea making machine with heating element, holding unit, pitcher, chilling element. It also discloses a method of making ice tea in this machine wherein tea bag is added to the boiling water in a heater, which is then cooled and chilled.

Go through the draft of Mr. Ravi's invention, disclosures of D1 and D2 given above and prepare a detailed response from Mr. Ravi justifying novelty and inventiveness of his invention vis-a-vis disclosure of D1 and D2.

OR

9b. Dr. Vaishnavi works as a Scientist in Sensor Sciences Limited and comes up with an invention. She is very keen to file an application for patent, so she sends her proposal to her organization's IP Unit with draft of her invention. The IP Unit conducts a preliminary search and finds two relevant documents D1 and D2. They send it back to Dr. Vaishnavi asking her to justify the novelty and inventiveness of her invention over D1 and D2.

Draft of Dr. Vaishnavi's invention:

A system to predict heavy rain fall comprising, rain sensors attached to wiper of vehicle, the said sensors communicate over a communication network to an analyzing server; a first detection mechanism to detect the operational speed of the wiper, a second detection mechanism to gather information about the geographical location of the vehicle and a transmission unit connected to the said sensors. The first detection mechanism and second detection mechanism for transferring the operation information of the wiper speed and the location of the vehicle to the remote

analyzing server, characterized in that the analyzing server collects the operation information and current location of multiple vehicles and statistically analyze them and compare the analyzed data with a pre-determined threshold values thereby specifying a point at which heavy rains occurs and forwards the rain information to other portable terminals connected over the network.

Disclosure of Document D1:

A windshield wiper failure detection system comprising sensors attached to the wipers of plurality of vehicles, and an analyzing server connected to the said sensors through a network. A detection unit to detect the speed information of the wiper and the geographical location of the sensor and a transmission unit transfers the detected information to the analyzing server. The analyzing server compares the collected operational information with the past information and predicts a failure in wiper operation whenever a pre-determined threshold is breached. A notifying unit notifies an administrator of the specific windshield wiper company and current position information thereof.

Disclosure of Document D2:

A heavy rain point specifying system comprising a plurality of portable terminals (mobile phones etc.), and an analyzing server connected to the said portable terminals through a network; wherein the analyzing server analyze the messages (including the word “heavy rain” or “Strong rain” etc.) which are posted on the social networking service (SNS) from the portable terminals of the users, thereby specifying the point at which the heavy rain occurs. Specifically the geographical space is divided into meshes each having a particular distance square. And based on the number of messages from a given mesh is beyond a threshold value, the mesh/grid is specified as heavy/strong rain occurring point.

Go through the disclosures of the draft of Dr. Vaishnavi’s invention, disclosures of D1 and D2 given above and prepare a detailed response from Dr. Vaishnavi justifying novelty and inventiveness of his invention vis-a-vis disclosure of document D1 and D2.

OR

9c. Dr. Suryavanshi works as a Scientist at IAR organization and comes up with an invention. He is very keen to file a patent application for his invention, so he sends his proposal to his organization’s IPR Cell with a proposed invention draft. The IPR Cell conducts a preliminary search and finds two relevant documents D1 and D2, which it resends to Dr. Suryavanshi asking him to justify the novelty and inventiveness of his invention over D1 and D2.

Invention of Dr. Suryavanshi:
The Invention is related to a M-crystalline form of Sitagliptin phosphate with specific XRD diffraction pattern which is useful in the treatment of diabetes. M-crystalline sitagliptin phosphate has improved properties, such as chemical and thermal stability upon storage, and decreased hygroscopicity, while maintaining chemical and enantiomeric stability over non-crystalline sitagliptin phosphate.

Disclosure by D1:
D1 discloses Phosphate salt of Sitagliptin and its crystalline hydrochloride salt. D1 also discloses Sitagliptin's anti-diabetic activity.

Disclosure by D2:
A dihydrochloride monohydrate salt of Sitagliptin and its preparation is disclosed by D2. It further discloses different crystalline forms of a dihydrochloride monohydrate salt of Sitagliptin and its preparation. D2 further discloses test results of anti-diabetic activity in mouse models using dihydrochloride monohydrate salt of Sitagliptin.

Go through the disclosures of the draft of Dr. Suryavanshi's invention, disclosures of D1 and D2 given above and prepare a detailed response from Dr. Suryavanshi justifying novelty and inventiveness of his invention vis-a-vis disclosure of document D1 and D2.

PART-C3

1 Question * 30 Marks = 30 Marks

Part C3 contains four questions; the candidate is required to answer ANY ONE of them.

A client meets you and provides technical information regarding his invention. Draft a complete specification with at least two claims and a title for anyone of the following descriptions, for filing in the Indian Patent office. While drafting the complete application, specify an appropriate title, abstract summarizing the invention, description explaining its details, claims defining its protectable aspects, drawings or figures or tables for visual representation.

Also write a justification for the drafted claims explaining how it protects the desired scope of the invention.

10a. Problem Statement: In many regions, air transport accessibility is hindered by the lack of adequate runway length. Remote areas or developing regions often have airstrips or airports with limited runway distances, restricting the types of aircraft that can operate effectively.

Challenges: Communities and regions with shorter runways struggle to access reliable air transport services.

Economic Impact: Limited access to air transportation affects trade, tourism, and economic development in these regions.

Safety Concerns: Short runways pose safety challenges for conventional aircraft during takeoff and landing.

Solution offered: The solution involves integrating rocket technology into aircraft to enable safe takeoff and landing on short runways. This approach enhances the aircraft's capabilities, addressing the challenges posed by limited runway lengths.

Key Components: Rockets are incorporated into the aircraft to provide additional thrust during takeoff, reducing the ground roll required for liftoff.

Precision Landing: Rockets assist in decelerating the aircraft during landing, reducing the necessary landing distance for a safe touchdown.

Adaptive Technology: The system includes variable thrust control and advanced avionics for precise and adaptable operation based on runway conditions.

Impact and Benefits: Improved air transport accessibility for remote areas, fostering economic growth and connectivity.

Operational Efficiency: Airlines can utilize smaller runways, optimizing routes and flight schedules.

Safety Improvement: Enhanced capabilities minimize risks associated with operating on short runways.

Integrating rockets into aircraft operations for short runway capabilities represents an innovative solution to improve air transport accessibility and operational flexibility in regions constrained by limited runway lengths.

OR

10b. Problem Statement: Traditional automobile construction predominantly relies on steel, which poses limitations in achieving optimal strength-to-weight ratios, affecting fuel efficiency, performance, and safety. Addressing these constraints, enhancing sustainability in vehicle manufacturing remains a pressing challenge.

Challenges: Melding titanium wire and carbon fiber to create a cohesive, durable structure poses technical challenges in manufacturing and assembly processes. The cost of these advanced materials and the associated manufacturing techniques might hinder widespread adoption in mainstream vehicle production.

Solution Offered: The instant application utilizes titanium wire and carbon fiber reinforcements in car design and construction. By leveraging the exceptional properties of these materials, it creates a new paradigm in vehicle manufacturing, focusing on strength, lightweight construction, and improved safety.
Key Components: Renowned for its high strength-to-weight ratio and corrosion resistance, titanium wire would serve as the primary structural material.
Carbon Fiber Reinforcements: Adding stiffness and strength, carbon fiber complements titanium wire, enhancing the overall structural integrity of the vehicle.
Advanced Manufacturing Techniques: Utilization of innovative manufacturing methods such as additive manufacturing and composite molding to optimize the integration of these materials.
Impact and Benefits: Improved strength-to-weight ratio leads to enhanced performance, agility, and fuel efficiency.
Safety Advancements: Superior structural integrity and crash resistance contribute to heightened safety standards. Sustainability: Reduction in vehicle weight enhances fuel efficiency, thus reducing carbon emissions.
Technological Innovation: Pioneering the use of advanced materials sets a benchmark for future automotive design and manufacturing. This technology may find application in making automobile from bikes (cycle) to rocket construction creating safer, efficient, and sustainable vehicles.

OR

10c. Problem Statement: Fungal infections present persistent challenges due to resistance and a diverse range of fungal species necessitating targeted eradication. This proposal explores the novel strategy of merging clotrimazole and miconazole to potentiate antifungal efficacy across multiple fungal strains.

Methodology: Extensive in vitro studies evaluated the Minimum Inhibitory Concentration (MIC) values of clotrimazole and miconazole individually and in combination against various fungal species. The MIC, representing the lowest inhibitory concentration, was crucial in assessing the observed synergistic effects.

Findings: The innovative combination of clotrimazole and miconazole showcased substantial synergistic effects against a multitude of fungal species;

Data Summary: MIC of Clotrimazole obtained was Trichophyton spp. (8 µg/mL), Candida albicans (10 µg/mL), Malassezia furfur (6 µg/mL), Cryptococcus neoformans (12 µg/mL).

MIC of Miconazole obtained was Trichophyton spp. (12 µg/mL), Candida albicans (15 µg/mL), Malassezia furfur (9 µg/mL), Cryptococcus neoformans (18 µg/mL).

MIC of Combination obtained was Trichophyton spp. (4 µg/mL), Candida albicans (5 µg/mL), Malassezia furfur (3 µg/mL), Cryptococcus neoformans (6 µg/mL).

The invention demonstrates synergy against a range of fungal species, including dermatophytes, Candida, Malassezia, and select yeasts and molds, signifies a groundbreaking advancement in antifungal therapies. This potent combination shows promise in overcoming resistance and broadening spectrum coverage, presenting a more effective treatment approach. The innovation, capitalizing on the synergistic potency of clotrimazole and miconazole, heralds a transformative approach in treating diverse fungal infections. Its potential to significantly enhance efficacy against various fungal species warrants further development and clinical validation for practical implementation.

OR

10d. Problem Statement: Developing a palatable liquid formulation of clarithromycin for children due to its bitter taste, makes it challenging for pediatric administration.
Solution: Oran-Z has invented a liquid formulation of clarithromycin, tailored for children, addressing the limitations posed by its bitter taste, unpleasant smell, and large size. The key breakthrough lies in the use of Copovidone, a polymer known for its effectiveness in masking undesirable flavors.
Key components: Through meticulous experimentation, varying formulations were explored, revealing that the most potent masking agent for clarithromycin is Copovidone, is a water-soluble polymer compound made from the monomer N-vinylpyrrolidone. This polymer, available in calcium salt and acid forms under different trademarks, has been traditionally used for treating bowel conditions and is non-absorbable by the body.
Methodology: The experiments have shown that mixing clarithromycin and Copovidone in a ratio of between 1:10 and 6:1 by weight reduces bitterness. The formulation process involved blending clarithromycin and Copovidone at specific weight ratios, followed by the addition of ethanol to create a wet mass. Drying, milling, and subsequent granulation steps were employed to create specific-sized granules.
Final Product Formulation: Transform the finished granules into a liquid suspension or dispersion suitable for pediatric use.
Optimal Ratio: Particularly effective is a 5:3 ratio of clarithromycin and Copovidone by weight in the granules for the liquid formulation which was found to significantly reduce the bitterness of clarithromycin. This resulted in the development of granules, which when processed into a liquid suspension or dispersion, offered a palatable form of the medication suitable for pediatric use.

Data of palatability tests among children to validate the effectiveness of the formulation in reducing bitterness and ensuring acceptability.

Sample Size: 50 children aged between 5 and 12 years.

Randomization: Subjects will be randomly assigned to two groups: Group A (experimental - with Copovidone) and Group B (control - without Copovidone).

Procedure:

Preparation of Formulations:

Group A: Liquid suspension of clarithromycin with Copovidone (5:3 ratio).

Group B: Control liquid suspension of clarithromycin without Copovidone.

Administration:

Each participant was given a single dose of the assigned liquid formulation (Group A or Group B).Participants were instructed to report on taste, bitterness, smell, and overall acceptability.

Assessment: A Likert scale (1-5) for subjective ratings on taste, bitterness, smell, and overall acceptability.

Additionally, a facial hedonic scale (smiley faces) for easier assessment by younger children was used.

Data Collection and Analysis:

Document and record individual responses for each parameter assessed. Statistical analysis (e.g., t-tests, ANOVA) to compare the mean scores between Group A and Group B for taste, bitterness, smell, and overall acceptability was done.

Data Summary:

Parameters Assessed	Group A (with Copovidone)	Group B (Control)
Taste (Likert Scale)	Mean: 4.2	Mean: 2.0
Bitterness	Mean: 4.0	Mean: 1.5
Smell	Mean: 4.5	Mean: 2.2
Overall Acceptability	Mean: 4.3	Mean: 2.1

The liquid suspension of clarithromycin formulated with Copovidone (Group A) demonstrated significantly higher mean scores for taste, bitterness, smell, and overall acceptability compared to the control group (Group B), indicating a substantial improvement in palatability and acceptability among pediatric subjects.

This data supports the efficacy of Copovidone in enhancing the palatability of the clarithromycin formulation for pediatric use, validating its suitability and acceptability among children.

Regulatory Compliance was obtained for pediatric formulations and stability studies were conducted to confirm shelf life and safety.

Overall, this innovative method represents a significant advancement in creating a child-friendly formulation of clarithromycin, effectively overcoming its taste and smell limitations through the use of Copovidone as a potent masking agent.

----------END OF PAPER----------