School of Business
Master of Business Administration MBA Dual Specialization
Semester End Examination - May 2024

Duration : 180 Minutes
Max Marks : 100

Sem IV - MSB23T2006 - Air Traffic and Ramp Operations

General Instructions
Answer to the specific question asked
Draw neat, labelled diagrams wherever necessary
Approved data hand books are allowed subject to verification by the Invigilator

1) Explain the key components of aircraft navigation system to ensure safe and reliable operations. **K3 (6)**

2) In the planning, design, and construction phases of terminal development, several key stages are essential for successful execution. Beginning with site selection based on factors like accessibility and space availability, the process moves to feasibility studies to assess economic viability and environmental impact. Stakeholder consultations are crucial for gathering diverse perspectives and ensuring community engagement. Architectural design follows, integrating aesthetic appeal, functionality, and regulatory compliance. Infrastructure construction involves laying foundations, erecting structures, and installing essential systems. Finally, interior outfitting focuses on creating passenger-friendly spaces, incorporating amenities, and optimizing flow. Collaboration between airport authorities, architects, engineers, and other stakeholders is paramount throughout, facilitating seamless coordination, innovative problem-solving, and adherence to project timelines and budgets, thereby ensuring the terminal's success and long-term sustainability. **K4 (8)**

Q.1 How does stakeholder consultation contribute to the successful execution of terminal development projects ? (4 marks)

Q.2 What strategies can be employed to ensure effective engagement with diverse perspectives and community interests throughout the planning, design, and construction phases? (4 marks)

3) Scenario : K4 (8)

The airport management team is seeking to improve the overall passenger experience by redesigning the landscaping in the public areas of the terminal. You are hired as a landscape architect to analyze the current landscaping and propose enhancements that prioritize passenger comfort, aesthetics, and functionality.

Q.1 Analyze the existing landscaping features in the terminal area, focusing on their impact on passenger experience, visual appeal, and usability. Evaluate the strengths and weaknesses of the current design in meeting the needs and expectations of airport users. (4 marks)

Q.2 Identify key elements of landscape design that contribute to enhancing the passenger experience, such as seating areas, pedestrian pathways, shade structures, and green spaces. Discuss how integrating these features can create a welcoming and relaxing environment for travelers. (4 marks)

4) Examine the impact of the COVID-19 pandemic on Paris Charles de Gaulle Airport's capacity and operations, considering the reduced usage of airport facilities. K4 (4)

5) Case Scenario: K3 (9)

Due to adverse weather conditions, including heavy rainfall and low visibility, the air traffic management at Chennai Airport is facing challenges in managing flight schedules and ensuring safe operations. Indigo Airlines received updates from the Chennai Airport authorities about the weather conditions affecting flight operations. The airlines now need to devise strategies to mitigate the effects of adverse weather on your airline's flights and ensure the safety and efficiency of operations.

Based on the above answer the following questions:

1. How would you prioritize flight schedules and allocate resources effectively during adverse weather conditions?(3marks)

2. Identify the importance of clear communication protocols between your airline's ground staff, pilots, and air traffic control? (3marks)

3. How would you balance the need for timely operations with the imperative of ensuring passenger comfort and safety? (3marks)

6) At Mumbai's Chhatrapati Shivaji Maharaj International Airport, the air traffic control team overseeing IndiGo Airlines' flights faces a sudden system malfunction, disrupting radar and communication systems recently implemented to enhance operational efficiency. This unexpected glitch highlights the risks of increased vulnerability to cyber threats and over-reliance on automation in air traffic control. As controllers work to resolve the issue, the incident underscores the critical importance of human intervention and manual procedures in ensuring the safety and efficiency of air traffic operations amidst technological failures.

Based on the above answer the following:

1.   How should air traffic control teams at Mumbai Airport proactively identify and mitigate potential risks associated with advancing technologies such as increased vulnerability to cyber threats to ensure the safety and efficiency of air traffic operations?(5 marks)

2.   In the event of unexpected technological failures, how can air traffic control teams at Mumbai Airport effectively leverage manual procedures and human intervention to maintain safe operations and minimize disruptions? (5 marks)
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7) Situation:

In response to the global COVID-19 pandemic, your airline has implemented stringent cleaning and sanitation protocols to ensure the safety and well-being of passengers and crew members. As travel restrictions ease and passenger demand increases, maintaining impeccable hygiene standards within aircraft cabins is paramount to instilling confidence among travelers and adhering to regulatory guidelines. You are tasked with overseeing the implementation and enforcement of these protocols to guarantee a safe and hygienic environment for all passengers and crew members.

Q.1 How does your company ensure thorough cleaning and sanitation protocols are followed in aircraft cabins between flights to maintain passenger hygiene and safety standards? (5 marks)

Q.2 What measures does your airline take to address potential microbial contamination and ensure high levels of hygiene in areas such as lavatories, galleys, and common touchpoints throughout the aircraft? (5 marks)

8) Case Study: Challenges Faced by IndiGo Due to Fog and Runway Closure at Delhi Airport

IndiGo, a leading airline in India, grappled with operational hurdles on a particular Sunday due to adverse weather conditions and the closure of Runway 10/28 at Delhi airport during the foggy season. The closure of this crucial runway, certified for Category III B operations, exacerbated existing challenges faced by airlines operating at the airport. As a result, IndiGo recorded a dismal On-Time Performance (OTP) of just 21%, primarily due to prolonged delays caused by the thick fog and limited operational capacity. These delays led to a cascade of issues, including extended wait times for passengers and crew, crew duty limitations being exceeded, and dissatisfaction among passengers due to prolonged onboard wait times and subsequent deplaning procedures. Addressing these challenges requires collaborative efforts between airlines, airport authorities, and regulatory bodies to optimize operational efficiency, improve communication with passengers, and ensure compliance with safety regulations amidst adverse weather conditions.

Based on above passage answer the questions:

1.   How do adverse weather conditions, such as fog, impact airline operations, and what measures can airlines like IndiGo take to mitigate these effects?(3 marks)

2.   Discuss the importance of runway maintenance for airports like Delhi to ensure smooth airline operations during adverse weather conditions. (3 marks)

3.   Analyze the impact of prolonged delays on crew duty limitations and its implications for airline operations and passenger experience. (3 marks)

4.   How can airlines like IndiGo manage passenger expectations and mitigate dissatisfaction during extended delays caused by adverse weather conditions? (3 marks)

5.   Evaluate the role of effective communication strategies in minimizing the impact of operational disruptions on passenger satisfaction and airline reputation. (3 marks)

9) Case study:

In the air traffic control (ATC) tower of a bustling international airport, controllers are tasked with managing the flow of aircraft in and out of the airspace safely and efficiently. Among the many sensory inputs they rely on, visual sensation perception plays a crucial role in their decision-making process.

During a particularly busy evening rush, Controller Smith notices a small aircraft entering the airspace from the northeast. However, due to low visibility caused by heavy rain, the aircraft's lights are dim and difficult to discern against the backdrop of city lights. Controller Smith's colleague, Controller Jones, who is assisting with another sector, notices the same aircraft moments later on the radar screen. However, Controller Jones interprets the radar blip as a flock of birds due to the clutter caused by the storm.

Q.1 Reflecting on Controller Smith and Controller Jones' situation, how might collaboration and communication between air traffic controllers help to improve visual perception and decision-making in challenging conditions? (6 marks)

Q.2 Ethically speaking, what responsibilities do air traffic controllers and regulatory bodies have in ensuring the accuracy and reliability of visual sensation perception in ATC operations? How can these responsibilities be upheld in practice? (6 marks)

Q.3 Considering the potential for human error in visual perception, what strategies can be implemented to mitigate the risks associated with relying solely on visual inputs in air traffic management? (6 marks)

10) Case Study: Importance of Effective Communication between ATC and Pilots in Aviation Emergencies

Introduction: On 25 January 1990, Avianca Flight 52 from Bogota, Colombia, to JFK Airport in New York crashed due to fuel exhaustion after being kept in a holding position by air traffic control (ATC). The failure to communicate the gravity of the situation to ATC played a significant role in the tragedy.

Background:
• Avianca Flight 52 faced fuel exhaustion due to prolonged holding by ATC in adverse weather conditions.
• Despite the critical fuel situation, the pilot failed to explicitly communicate an emergency to ATC.
• The lack of proper communication led to a delay in initiating emergency procedures, resulting in the tragic crash and loss of 73 lives.

Factors Contributing to the Tragedy:
1. Communication Failure: The pilot did not explicitly use the word "emergency" or "mayday" when communicating with ATC, leading to a misunderstanding of the gravity of the situation.
2. Misinterpretation of Signals: ATC did not initiate emergency procedures due to the absence of explicit emergency communication from the pilot, leading to a delay in response.
3. Linguistic Nuances: The pilot referred to the fuel situation without conveying the urgency in a manner comprehensible to ATC, highlighting the importance of using proper phrases in aviation communication.

Case Study Questions:
1. Elaborate how can pilots effectively communicate emergencies to ATC to ensure prompt response and appropriate action?(3marks)
2. Discuss the significance of using specific phrases such as "emergency" or "mayday" in aviation communication. (3marks)
3. Considering advancements in aviation technology and communication systems, what measures can be implemented to enhance communication between ATC and pilots. (3marks)