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**UNIVERSITI TUN HUSSEIN ONN MALAYSIA**

**FINAL EXAMINATION  
SEMESTER II  
SESSION 2020/2021**

COURSE NAME	:	AVIATION SAFETY MANAGEMENT
COURSE CODE	:	BDL 30602
PROGRAMME CODE	:	BDC
EXAMINATION DATE	:	JULY 2021
DURATION	:	2 HOURS
INSTRUCTION	:	ANSWER <b>FOUR (4)</b> QUESTIONS <b>ONLY</b>

THIS QUESTION PAPER CONSISTS OF **FIVE (5)** PAGES

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- Q1**
- (a) Identify the reasons to conduct the aircraft accident investigation. (4 marks)
- (b) Imagine you live in the country where the aviation industry is still in a premature level and want to progress further. Propose to the country's Civil Aviation Authority the whole eco-system of aviation reporting system. (9 marks)
- (c) James Reason's accident causation model was published in 1990 as a way to illustrate how human factors at various levels of an organization, such as an airline, can lead to accidents.
- i. Describe the important features of Reason's model. (2 marks)
- ii. Suppose you are head of the aircraft accident investigation for Air Timbuktu flight that is crashed due to pilot error. Illustrate the cause of the event in terms of Reason's model which include organization influences, supervision, preconditions of unsafe acts, and unsafe acts. (10 marks)
- Q2**
- (a) Imagine an aviation maintenance technician who is taking over the task of replacing a leaky oil pump from a colleague during a shift change. The handoff has to be carefully performed in order for the incoming technician to correctly know what tasks have already been accomplished. By knowing that, the completed task can be fitted into the overall process of replacing the pump. Finally, the incoming technician can determine how he/she will proceed to complete the task.
- i. Describe the multiple levels of Situational Awareness (SA). (3 marks)
- ii. Employ the multiple levels of situational Awareness (SA) to explain the statement above. (3 marks)
- (b) Discuss how the implementation of satellite-based Navigation is able to improve safety across the airspace. (6 marks)
- (c) Automation has touched so many facets of today's society. The impacts of automated systems are very visible in the aviation sector.
- i. Describe the benefits of automation in aircraft systems. (4 marks)
- ii. **Figure Q2(c)** shows that the pilot may be moving a heading knob but looking at flight display instead of the knob to see the actual output of the

change. Interpret the problem that may be arise in term of automation. Write a simple strategy to deal with this situation.

(9 marks)

**Q3** (a) An airport that meets FAR Part 139 (United States) criteria is issued an Airport Operating Certificate (AOC) to be able to operate.

i. Discuss the intention of the mentioned certification implement by the Federal Aviation administration (FAA).

(3 marks)

ii. List down 4 basic elements that should be in the AOC.

(4 marks)

(b) Sixty-nine acts of unlawful interference were recorded between 2011 and 2016. Twenty-one out of 69 incidents had fatalities (a total of 884 deaths). Facility attacks represented the highest number with 24 incidents, followed by unlawful seizure with 18 incidents, sabotage with 15 incidents and other acts with 12 incidents. As the member states of the ICAO, propose to other member states on what should be done to manage the security. Identify the priorities that each of the member states should focus their attention, resources, and efforts on.

(12 marks)

(c) Create 3 different data based safety parameter (safety performance indicator) used for monitoring and assessing safety performance for situation where a commercial jet face an air pocket during flight.

(6 marks)

**Q4** (a) Edward (1972) presented the SHELL model dealing with man and machine interface. SHELL is a visual conceptual tool in aviation accident theory.

i. Discuss the 5 basic elements of the SHELL model.

(5 marks)

ii. Demonstrate the SHELL model with respect to the pilot being in the center of the model.

(8 marks)

(b) Describe the variables that affect human performance.

(7 marks)

(c) Analyse the effects to the aviation industry when the aircraft structural safety ecosystem is disturbed by the following situation:

i. Airplane operators do not perform the require maintenance inspection/ structural inspection.

(1.5 marks)

- ii. Airworthiness authorities disintergrate from the structural safety ecosystem. (1.5 marks)
- iii. Write a conclusion derived from the situation (i) and (ii). (2 marks)

**Q5** (a) States is responsible to establish a State Safety Programme (SSP) in order to achieve an Acceptable Level of Safety (ALoS) in civil aviation, as mentioned in Annex 19: Safety Management of International Civil Aviation Organisation (ICAO).

(i) Define ALoS with an example. (2 marks)

(ii) Describe the framework of SSP. (8 marks)

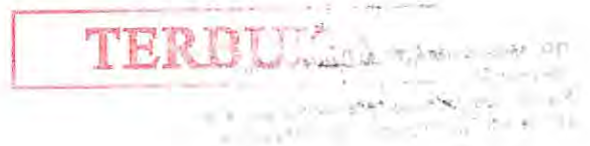
(b) **Table Q5(b)** shows monthly maintenance incident statistics for 2019 and 2020 generated from the safety department of an aircraft maintenance organisation (AMO). Suggest, as the appointed safety manager:

(i) The performance indicator you will use to monitor the incident performance. (2 marks)

(ii) The alerts and triggers (please show your calculation when necessary). (8 marks)

(iii) Analyse the current safety performance for year 2020. (5 marks)

**- END OF QUESTIONS -**



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**Figure Q2(c)** Pilot moving the knob

**Table Q5(b)** 2019 and 2020 monthly maintenance incident statistics

Year 2019		Year 2020	
Month	Maintenance Incident	Month	Maintenance Incident
January	4	January	0
February	0	February	3
March	7	March	6
April	5	April	1
May	3	May	6
June	2	June	6
July	1	July	3
August	3	August	5
September	5	September	4
October	5	October	2
November	2	November	2
December	0	December	4

