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**UTHM**  
Universiti Tun Hussein Onn Malaysia

**UNIVERSITI TUN HUSSEIN ONN MALAYSIA**

**FINAL EXAMINATION  
SEMESTER II  
SESSION 2022/2023**

COURSE NAME : OCCUPATIONAL SAFETY AND HEALTH  
COURSE CODE : BDX 20902  
PROGRAMME : BDX  
EXAMINATION DATE : JULY/ AUGUST 2023  
DURATION : 2 HOURS  
INSTRUCTION : 1. ANSWER **FOUR (4)** QUESTIONS **ONLY**  
2. THIS FINAL EXAMINATION IS CONDUCTED VIA **CLOSED BOOK.**  
3. STUDENTS ARE **PROHIBITED** TO CONSULT THEIR OWN MATERIAL OR ANY EXTERNAL RESOURCES DURING THE EXAMINATION CONDUCTED VIA CLOSED BOOK.

THIS QUESTION PAPER CONSISTS OF **SEVEN (7)** PAGES

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**TERBUKA**

- Q1** (a) In OSHA 1994 Act 514 part IV section 15, write **TWO (2)** general duties of employers with suitable examples.
- (5 marks)
- (b) Mr. Nelson have been appointed as a safety and health officer at Skyways Technics Asia Sdn. Bhd., Subang, Selangor. His responsibility to establishing a safety and health committee (SH) at the workplace.
- (i) Illustrate the **FOUR (4)** designated posts in your SH organization chart.
- (5 marks)
- (ii) Propose appointment criteria for **Q1(b)(i)**.
- (5 marks)
- (c) UMW Aerospace Sdn Bhd was inducted into the UMW Group family. Its main core business is to manufacture and assemble fan cases for Rolls-Royce aero engines making it the first Malaysian company to be a Tier-1 aerospace engine component manufacturer. As a safety & health officer at this company, you have needed to prepare the compliance document based on the Occupational Health and Safety Assessment Series (OHSAS 18001: 2007).
- (i) Interpret the system requirements that based on the Plan-Do-Check-Act (PDCA) framework for the OHSAS 18001 standard.
- (4 marks)
- (ii) Write **THREE (3)** designated clauses for developing OHSAS 18001: 2007 at the workplace.
- (6 marks)

**Q2 (a)** Risk assessment has always been the most challenging part of the risk management process for aviation operations. The risks that may occur during all aviation operations, identifying the best countermeasures to be implemented for the collected risks, and finally continue with reviewing if the implemented countermeasures are the right choice or if they should be replaced with other better solutions for the treated risks. With suitable diagram, distinguish following risk analysis techniques by explaining their function:

(i) Bow tie analysis (BTA) (5 marks)

(ii) Failure modes, effects and analysis (FMEA) (5 marks)

**(b)** **Figure Q2(b)** shows real accident case of aircraft during take-off. It happened shortly after rotation, the crew heard a loud bang with associated engine exhaust gas temperature (EGT), followed by left engine failure. The EGT engine auto shut down and continued takeoff. The flight crew then declared an emergency and cleared for landing. As the aircraft was over weighted, the rollout after landing was prolonged causing high brakes temperature. Consequently, resulted in the aircraft main landing gear (MLG) thermal fuses melting due to the high brakes temperature, and all the MLG tires deflated. The shedding of the nose wheel tire tread occurred because of tire contacting foreign object debris (FOD). Subsequently the damaged tire debris was ingested by the EGT engine causing engine failure.

(i) By using the hierarchy of control, sketch the hierarchy of control based on the control effectiveness and business value. (6 marks)

(ii) From **Q2(b)(i)**, choose **THREE (3)** steps considered in managing and reducing the hazard with appropriate example in each step. (9 marks)



- Q3** (a) Construction sites, manufacturing plants, and metalworking plants are just a few examples of industries that require workers to use a range of tools and machinery in order to do their jobs. These machines help workers complete a range of tasks more quickly, efficiently, and safely when used properly. However, if employees are not properly trained, fail to follow the necessary safety precautions, or the machine malfunctions, it can cause devastating injuries. In extreme cases, the injuries can be fatal. Identify **FIVE (5)** typical accidents happen in construction site.
- (5 marks)
- (b) Exposure to chemicals and pollutants can have short and long-term effects on your health. Discuss **THREE (3)** chemical health effects.
- (6 marks)
- (c) The National Safety Council has a team of consultants who travel across the country and the world to visit worksites and conduct safety audits. As one of the team members, spot and interpret **SEVEN (7)** hazards based on the **Figure Q3(c)**.
- (14 marks)
- Q4** (a) List **THREE (3)** secondary prevention as an early detection of hazards.
- (3 marks)
- (b) Tin-lead alloy solder is one of the most important essential uses of lead (Pb). It has been used to assemble the avionics of every aircraft currently flying and continues to be used in production. All existing aircraft systems use electronics soldered with leaded alloys and therefore must be repaired using these same leaded alloys. Solder alloys cannot be changed in an existing design without requalification of these systems. Aviation systems are built

and maintained by industrial personnel, ensuring that the general public has no exposure to these solder joints.

- (i) State **TWO (2)** legislations related to lead exposure.  
(4 marks)
- (ii) If in certain condition the public has been exposed to the lead, relate **FIVE (5)** the potential hazards to the health effect with suitable explanation.  
(10 marks)
- (iii) Based on Q4(b)(ii), recommend **FOUR (4)** exposure control measure with suitable examples.  
(8 marks)

- Q5** (a) Accident analysis/investigation is widely recognized as a crucial part of comprehensive and efficient safety management. The investigation report provides details about the occurrence and process of the accident and provides first-hand information for accident analysis and prevention.
- (i) Draw the Accident Causation Model (1974)  
(5 marks)
  - (ii) Draw the Accident Pyramid Theory (Heinrich's / Bird's Triangle 1969-1975)  
(5 marks)
  - (iii) Analyze **FIVE (5)** the principle of investigation.  
(10 marks)
- (b) The corrective and preventive action is collective process, or series of measures, to correct the immediate problem, to determine the cause or causes of the problem, and to develop and implement a plan to prevent the

problem from recurring. State how corrective and preventive action can be implemented.

(5 marks)

- END OF QUESTION -

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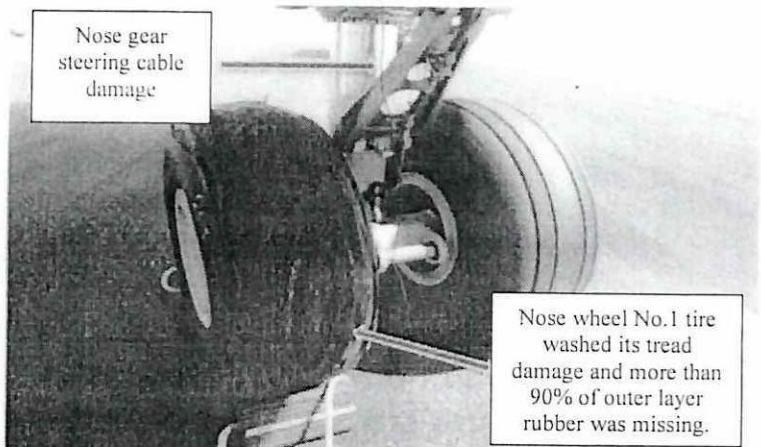


Figure Q2(b)



Figure Q3(c)