

- (1). (a). Briefly discuss what are the possible factors that may cause accidents to occur based on three theories of accident.

Terangkan secara ringkas apakah faktor-faktor yang boleh menyebabkan kemalangan berlaku berdasarkan tiga teori kemalangan.

(5 marks/markah)

- (b). On February 11, 2023, a tragic incident occurred where a man died of extensive crush injuries to his head while attempting to clear waste from a cardboard processing machine by leaning into its window. His head was caught by parts of the machine and his body was pulled in or fell into the machine. He worked as a production fitter for AMB Packaging, a paper and cardboard container and box manufacturer. The machine is used for processing corrugated cardboard into cartons featuring customized designs for customers, utilizing cutting, gluing, folding, and stacking mechanisms (refer to Figure 1). The machine was purchased in May 2019, was several meters long and consisted of six machinery components. There was a viewing window at the bundle stacker portion of the machine, where the machine stacked items. The window was 0.9 m in height and 0.8 m width, featuring an interlocking guard mechanism. The purpose of this guard was to cut off the electrical supply to the machine if the window was opened during operation. However, investigations following the incident revealed that the interlocking guard had been tampered with. A key was found inserted into a device near the window frame, allowing the window to remain open even while the machine was operational.

Pada 11 Februari 2023, satu kejadian tragis berlaku di mana seorang lelaki meninggal dunia akibat kecederaan teruk di kepala ketika cuba membersihkan sisa daripada mesin pemprosesan

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kadbod dengan menyandar badan ke tepi bahagian tingkap. Kepalanya terperangkap oleh bahagian-bahagian mesin dan badannya ditarik masuk atau jatuh ke dalam mesin. Beliau bekerja sebagai penyesuai pengeluaran untuk pakej AMB, pengilang bekas dan kotak kadbod dan kertas. Mesin tersebut digunakan untuk memproses kadbod berlapis menjadi karton yang menampilkan reka bentuk yang disesuaikan untuk pelanggan, dengan menggunakan mekanisma pemotongan, penggelembungan, lipatan, dan susunan (lihat Rajah 1). Mesin itu dibeli pada Mei 2019, mempunyai beberapa meter panjang dan terdiri daripada enam komponen mesin. Terdapat satu tingkap pemerhatian di bahagian pembentuk tumpukan bungkusan mesin, di mana mesin menyusun barang. Tingkap itu mempunyai ketinggian 0.9 m dan lebar 0.8 m, dengan ciri-ciri mekanisma pengawal berkunci. Tujuan pengawal ini adalah untuk memutuskan bekalan elektrik kepada mesin jika tingkap dibuka semasa operasi. Namun, penyiasatan selepas kejadian mendapati bahawa pengawal berkunci telah dimanipulasi. Sebatang kunci ditemui dimasukkan ke dalam peranti berhampiran bingkai tingkap, membolehkan tingkap tetap terbuka walaupun mesin beroperasi.

- (i). Discuss the importance of machine guarding in preventing workplace accidents.

Bincangkan kepentingan pengawal mesin dalam mencegah kemalangan tempat kerja.

(5 marks/markah)

- (ii). Explain the employer's responsibilities in ensuring workplace safety and health.

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Terangkan tanggungjawab majikan dalam memastikan keselamatan dan kesihatan tempat kerja.

(5 marks/markah)

- (c). Discuss the role of human factors such as complacency, risk-taking behavior, and inadequate training can contribute to accidents.

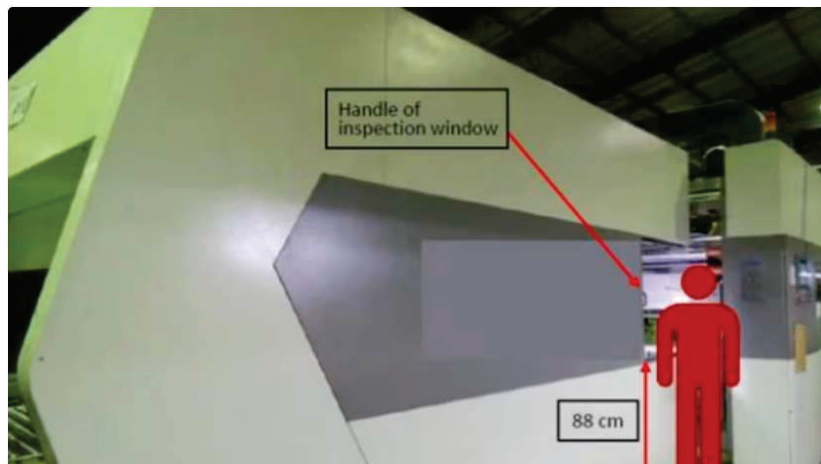
Bincangkan peranan faktor-faktor manusia seperti tidak peka pada situasi, perilaku pengambilan risiko, dan latihan yang tidak mencukupi dalam menyumbang kepada kemalangan.

(5 marks/markah)

- (d). Outline the steps involved in incident investigation and root cause analysis.

Huraikan langkah-langkah yang terlibat dalam penyiasatan kejadian dan analisis punca asal.

(5 marks/markah)



Figure/Rajah 1: An illustration of the accident
Ilustrasi kemalangan

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- (2). (a). In manufacturing industries, safety supervisor plays an important role in ensuring the safety and health of the staff while performing their job. Elaborate THREE (3) key responsibilities of a safety supervisor in terms of safety and health in workplace as stated in OSHA 1994.

Dalam industri pembuatan, penyelia keselamatan memainkan peranan penting dalam memastikan keselamatan dan kesihatan kakitangan semasa menjalankan tugas mereka. Huraikan TIGA (3) tanggungjawab utama penyelia keselamatan dari segi keselamatan dan kesihatan di tempat kerja seperti yang dinyatakan dalam OSHA 1994.

(6 marks/markah)

- (b). There are various Acts and Regulations related to environmental, health and safety in Malaysia. Each Act and Regulations under it are enforced by a government body.

Terdapat pelbagai Akta dan Peraturan yang berkaitan dengan alam sekitar, kesihatan dan keselamatan di Malaysia. Setiap Akta dan Peraturan di bawahnya dikuatkuasakan oleh badan kerajaan.

- (i) State THREE (3) examples of the enforcement body governing these Acts and Regulations related to environmental, health and safety in Malaysia.

Nyatakan TIGA (3) contoh badan penguatkuasaan yang mentadbir Akta-akta dan Peraturan-peraturan berkaitan dengan alam sekitar, kesihatan dan keselamatan di Malaysia.

(3 marks/markah)

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- (ii) Give ONE (1) example of the Acts governed by each of the enforcement body listed in (i) above.

Berikan SATU (1) contoh Akta yang ditadbir oleh setiap badan penguatkuasaan yang disenaraikan dalam (i) di atas.

(3 marks/markah)

- (c). Confined spaces can be deadly. A number of people are killed or seriously injured in confined spaces each year in both manufacturing and construction facilities. Examples of confined spaces include storage tanks, silos, enclosed drains, sewers, ductworks, and unventilated rooms. Here is an example of case study involving workers working in confined space.

Ruang terkurung boleh membawa maut. Ramai orang terbunuh atau cedera parah dalam ruang terkurung setiap tahun di kedua-dua industri pembuatan dan pembinaan. Contoh ruang terkurung termasuk tangki simpanan, silo, longkang tertutup, pembedung, saluran-saluran dan bilik tidak berventilasi. Berikut adalah contoh kajian kes yang melibatkan pekerja yang bekerja dalam ruang terkurung.

“A contract employee was cleaning an underground storage tank. He was overcome by the toxic vapours from the cleaning solvent. Two workers attempted to rescue him, but also collapsed. All three men died.” You were hired as a qualified Safety Officer by the company to investigate the case and to provide recommendations to prevent recurrence of the incident. You have interviewed the safety supervisor and a few workers. A few facts have been summarized as listed below after the interview:

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- The safety supervisor was not around when the incident happened as it was conducted during night shift. There is only one safety supervisor in that workshop.
- The worker has just joined the company 3 months ago and he has not gone through any safety training.
- The Risk Assessment (RA) was not up to date. The safety supervisor was not aware that the company has changed the type of cleaning solvent three months ago and the latest safety data sheet (SDS) was not available.

“Seorang pekerja kontrak sedang membersihkan tangki simpanan bawah tanah. Dia hilang kesedaran kerana terhisap wap toksik daripada pelarut pembersih. Dua orang pekerja cuba menyelamatkannya, tetapi juga rebah. Ketiga-tiga lelaki itu mati. ”Anda sebagai Pegawai Keselamatan yang berkecualan telah dilantik oleh pihak pengurusan untuk menyiasat kes tersebut dan memberi cadangan bagi mencegah kejadian berulang. Anda telah menemu bual penyelia keselamatan dan beberapa orang pekerja. Beberapa fakta telah diringkaskan seperti yang disenaraikan di bawah selepas temu bual tersebut:

- *Penyelia keselamatan tidak berada di sekeliling ketika kejadian berlaku kerana tugas tersebut dijalankan semasa shif malam. Hanya seorang sahaja penyelia keselamatan dalam bengkel pada masa itu.*
- *Pekerja yang meninggal baru sahaja menyertai syarikat 3 bulan lalu dan dia belum lagi menyertai apa-apa latihan keselamatan.*
- *Penilaian Risiko (PR) tidak terkini. Penyelia keselamatan tidak menyedari bahawa syarikat itu telah menukar jenis pelarut pembersihan tiga bulan lalu dan helaian data keselamatan (SDS) terkini tidak tersedia.*

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- (i) Identify the parties accountable for the occurrence of the accident and justify your findings.

Kenalpastikan pihak-pihak yang bertanggungjawab atas kejadian kemalangan tersebut dan terangkan jawapan anda.

(6 marks/markah)

- (ii) Provide relevant recommendations to prevent recurrence of the incident in your investigation report.

Sediakan cadangan yang berkaitan untuk mengelakkan berlakunya insiden dalam laporan anda.

(7 marks/markah)

- (3). (a). Discuss SIX ways in which an employer can promote and implement a positive safety and health culture in the workplace.

Bincangkan ENAM cara yang mana majikan dapat mempromosi dan melaksanakan budaya keselamatan dan kesihatan yang positif di tempat kerja.

(8 marks/markah)

- (b). Many problems in safety and health at the workplace arise due to poor communication. Explain THREE basic methods of effective communication in relation to health and safety in the workplace.

Banyak masalah keselamatan dan kesihatan di tempat kerja timbul akibat komunikasi yang lemah. Terangkan TIGA kaedah asas komunikasi berkesan berhubung dengan kesihatan dan keselamatan di tempat kerja.

(7 marks/markah)

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- (c). ISO 45001 is an international standard that specifies requirements for an occupational safety and health management system and also as a standard to enable organizations to proactively improve their occupational safety and health performance in preventing injury and ill health. Explain FOUR roles and responsibilities of top management in any industry to implement the ISO 45001:2018.

ISO 45001 ialah piawaian antarabangsa yang menetapkan keperluan untuk sistem pengurusan keselamatan dan kesihatan pekerjaan dan juga sebagai piawaian untuk membolehkan organisasi meningkatkan prestasi keselamatan dan kesihatan pekerjaannya secara proaktif dalam mencegah kecederaan dan keuzuran. Terangkan EMPAT peranan dan tanggungjawab pengurusan atasan dalam mana-mana industri untuk melaksanakan ISO 45001:2018.

(10 marks/markah)

- (4). (a). There are many ways to prevent or mitigate accidents. However, systematic approaches are needed when dealing with safety as the workplace. One of them is the Hierarchy of Control. As a safety manager, you have found out that the noise level at a certain area in the workplace was constantly above the required safety limit. Noise was generated by various heavy equipment. Each worker working in the area is given an ear muffler. However, the workers often remove the ear muffler due to hot and sweaty condition.

Terdapat banyak cara untuk mencegah atau mengurangkan kemalangan. Walau bagaimanapun, pendekatan yang sistematik diperlukan untuk menangani keselamatan di tempat kerja. Salah satunya ialah Hierarki Kawalan. Sebagai pengurus keselamatan, anda telah mendapati bahawa tahap hingar di kawasan tertentu di tempat kerja sentiasa melebihi had keselamatan yang diperlukan,

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disebabkan oleh bunyi bising yang dijana oleh pelbagai peralatan berat. Walaupun setiap pekerja yang bekerja di kawasan itu diberi penutup telinga, pekerja kerap menanggalkan penutup telinga tersebut kerana keadaan panas dan berpeluh.

- (i) Sketch and explain the Hierarchy of Risk Control.

Lakar dan terangkan Hierarki Kawalan Risiko.

(8 marks/markah)

- (ii) By using Hierarchy of Control, describe the current approach and suggest other alternatives could be put in place to ensure that safety measure is not compromised.

Dengan menggunakan Hierarki Kawalan Risiko, huraikan pendekatan semasa dan cadangkan alternatif lain boleh dilaksanakan untuk memastikan Langkah keselamatan tidak terjejas.

(5 marks/markah)

- (b). Mr. Khan is an electrician in his forties. One day, he was instructed to carry out some routine maintenance work in an electrical switch room. When he was reconnecting some wiring in the switch room, he found that the wiring was in an awkward spot to reach. He had to gain access to an area that was between two wooden cabinets. Due to poor access, he could not reach the wiring. He climbed up the cabinet to reach the wiring and as a result, he accidentally slipped and was electrocuted while he tried to grab something to avoid the fall. He suffered severe burns to his left hand and face.

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Encik Khan ialah seorang juruelektrik pada usia empat puluhan. Pada suatu hari, dia diarahkan untuk melakukan beberapa kerja penyelenggaraan rutin di bilik suis elektrik. Ketika dia menyambung semula beberapa pendawaian di ruang suis, dia mendapati bahawa pendawaian berada di tempat yang sukar dicapai. Beliau terpaksa mendapatkan akses melalui kawasan yang berada di antara dua kabinet kayu. Disebabkan akses yang sempit, beliau tidak dapat mencapai pendawaian tersebut. Beliau terus memanjat ke atas kabinet untuk mencapai pendawaian dan sebagai hasilnya, dia secara tidak sengaja tergelincir dan terkena renjatan elektrik ketika beliau berusaha meraih sesuatu untuk mengelakkan terjatuh. Beliau melecur teruk di tangan kiri dan muka.

Identify and justify TWO (2) types of hazards posed in the job activity described above. Thereafter, classify the hazards (e.g. chemical, physical, biological etc.) and recommend TWO (2) appropriate control measures to mitigate each hazards.

Kenalpasti dan terangkan DUA (2) jenis bahaya yang tertimbul dalam aktiviti pekerjaan yang dinyatakan di atas. Selepas itu, klasifikasikan bahaya tersebut (contohnya kimia, fizikal, biologi dan sebagainya) dan cadangkan DUA (2) langkah kawalan yang sesuai untuk mengurangkan setiap hazard.

(12 marks/markah)

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