UNIVERSITI KUALA LUMPUR
INSTITUTE OF MEDICAL SCIENCE TECHNOLOGY

FINAL EXAMINATION

OCTOBER 2025 SEMESTER

COURSE CODE	:	HRB20603
COURSE TITLE	:	OSH RISK ASSESSMENT
PROGRAMME NAME	:	BACHELOR OF OCCUPATIONAL SAFETY & HEALTH (HONOURS)
DATE	:	24 JANUARY 2026
TIME	:	2:00PM - 5:00PM
DURATION	:	3 HOURS

INSTRUCTIONS TO CANDIDATES

1. Please read the instructions given in the question paper CAREFULLY.
2. This question paper is printed on both sides of the paper.
3. This question paper consist of TWO sections.
4. Answer ALL questions for Section A.
5. Section B consist of four questions. Answer THREE (3) questions only.
6. Please write your answer on the answer booklet provided.
7. Please answer all questions in English only.
8. Please answer MCQ/EMQ questions using OMR sheet. ☐ *Tick if applicable*
9. Refer to the attached Formula/ Appendies. ☐ *Tick if applicable*

THERE ARE 5 PAGES OF QUESTIONS INCLUDING THIS PAGE

SECTION A (Total: 40 marks)

Answer ALL questions.

Please use the answer booklet provided.

Question 1

Examine **FIVE (5)** advantages of performing risk assessment for an organization.

(10 marks)

Question 2

Examine **FIVE (5)** control measures that can be implemented to prevent noise-induced hearing loss.

(10 marks)

Question 3

Examine **FIVE (5)** impacts of poor management in safety and health.

(10 marks)

Question 4

Examine **FOUR (4)** vulnerability factors that affect the risk index and relate them to the risk formula.

(10 marks)

SECTION B (Total: 60 marks)

Answer THREE (3) questions only.

Please use the answer booklet provided.

Question 1

Upgrading old bulbs (especially traditional incandescents or older fluorescents) to modern LED technology is one of the most effective ways to improve your home's safety and reduce costs. The steps in replacing old bulb includes:

i. Turn Off the Power
ii. Let the Bulb Cool
iii. Remove the Old Bulb
iv. Insert the New Bulb
v. Restore Power and Test

Analyze the steps by using Job Safety Analysis.

(20 marks)

Question 2

You are a newly appointed Safety Officer for 'Skyline Reach,' a 45-story commercial development located in a busy urban center. The project is currently in its peak structural phase where the site is congested, with multiple subcontractors working simultaneously. Analyse the main activities listed in the table by using HIRARC analysis to prevent major lost-time injuries (LTI).

Refer Below - Table1 : Construction Site Activities .

(20 marks)

Table 1: Construction Site Activities

Activity	Description of Hazards, Likelihood, and Severity
i. Tower Crane Operation	Mechanical failure or human error leads to load detachment. While rigorous daily inspections make this unlikely, the massive height (30 floors) ensures any impact results in multiple fatalities and total structural destruction.
ii. Deep Excavation (3m)	Unstable soil at a 3m depth carries a moderate probability of collapse if not shored. If a collapse occurs, the weight of the soil makes escape impossible, resulting in rapid death by crushing or asphyxiation.
iii. Hot Work (80ft High)	Sparks from welding are highly likely to migrate; at 80ft, they can travel 35ft horizontally. If an ignition occurs on a structural beam, the result is critical burns or a fall, likely leading to a single fatality.
iv. Installing Glass (Gondola)	Sustained use of suspended cradles in variable wind speeds creates a moderate risk of cable fatigue or sway. A failure from this height leads to fatal impact for the workers and potential ground-level casualties.
v. Manual Handling (50kg)	Manually lifting 50kg bags (twice the safe limit) is almost certain to cause injury over time. While the severity is moderate (chronic back pain or hernia), it leads to high rates of long-term disability.

Question 3

The Bhopal Gas Tragedy, widely considered the world's most devastating industrial disaster, occurred on the night of December 2–3, 1984, when 40 tons of toxic methyl isocyanate (MIC) leaked from the Union Carbide plant due to a runaway chemical reaction triggered by "water washing" pipes without properly isolating storage tanks. This catastrophic failure was exacerbated by a total collapse of safety infrastructure: the refrigeration system had been shut down to save a mere $50–$70 per day, the Vent Gas Scrubber was inoperative and lacked sufficient caustic soda. The flare tower—the final line of defense—was dismantled for maintenance. Since there were no public warning systems or evacuation plans in place, the heavy gas settled over sleeping communities, highlighting a lethal combination of corporate negligence, inadequate emergency planning and the deliberate deactivation of critical safety systems to cut costs.

By using Fish Bone diagram, analyse the tragedy.

(20 marks)

Question 4

The catastrophic explosion at the Apex Polymer facility occurred when a faulty gasket on a toluene line led to a flammable vapor leak that went undetected due to a lack of gas sensors. This hazard was compounded by a significant operational error when a technician attempted to restart a vibrating industrial blender without conducting a safety inspection, unaware that a misaligned bearing had reached an ignition-capable temperature due to friction. The resulting mechanical ignition of the toluene vapor created a primary blast that shook the building's infrastructure, knocking months of accumulated polymer dust off overhead rafters and into the air. This dust suspension immediately ignited, creating a massive secondary explosion that severed non-rated electrical conduits, causing short circuits that sparked tertiary fires throughout the ruins.

By using Bow-Tie analysis, analyse the occurrence of explosion in industry.

(20 marks)

END OF EXAMINATION PAPER