

HKIOEH Registration of Professional Occupational Hygienist Examination Information

For more information or application materials, please contact:

Chairman of Registered Professional Hygienist Registration & Examination Board,
HKIOEH. via the Secretary of HKIOEH: hkioeh@gmail.com

Note:

The Examination for Registration of Professional Occupational Hygienist is intended to enhance and endorse the qualification for practicing occupational / industrial hygienists who have practiced in the field for a period of experience as specified in the rules and regulations. Members or people who are recognised by the Registered Professional Hygienist Registration & Examination Board (RPH R&EB) can use the designation of “Registered Professional Hygienist” or RPH for a five year cycle. The recognition cycle is currently in a **FIVE-year term**.

RPH may work in the comprehensive field of or combinations fields of identifying of hazardous agents/ activities; chemical, physical, biological and ergonomic; in the workplace that could cause disease or discomfort, evaluating the extent of the risk due to exposure to these hazardous agents, and the control of those risks to prevent ill-health or injuries in the long or short term exposure.

Definition of Occupational Hygiene

'Occupational Hygiene is the discipline of anticipating, recognising, evaluating and controlling health hazards in the working environment with the objective of protecting workers' health and well-being and safeguarding the community at large.'

GENERAL

To assist candidates who are preparing for the examination for Registration of Professional Occupational Hygienist, RPH R&EB provides the following information.

The examination consists of a **written** part and an **oral** part. The written examination has a total of 220 multiple choice type questions (MCQ) set in two papers, of which one will be conducted in the morning and one in the afternoon. Each session will therefore have 110 questions covering the basic principles and facts that every occupational hygienist should know, regardless of the aspect in which he or she may specialize. To pass the written examination, candidates have to pass both papers in one round. The result will normally be announced within a month after the completion of the written examination.

The written examination is in **English** and is designed to test an individual's knowledge across the broad general practice of occupational hygiene. Questions may be expected in all technical areas, as well as questions in a management area. Knowledge about local laws and regulations might be tested in both the written as well as the oral part – including the understanding of the Factories & Industrial Undertakings Ordinance and the Occupational Safety and Health Ordinance and their subsidiary Regulations, as well as the other related aspects as listed in reference section below.

The written examination date is normally held once a year in between April - June. Information of the examination date will be posted up in the HKIOEH webpage. The Examination Board will inform the candidates of the exact examination date and details in advance.

An **oral** examination will normally be arranged upon the success of the written examination within TWO months after the announcement of the written result or acceptance of the qualification equivalent to the written examination. The oral examination panel contains no less than 3 persons, including the panel chairman (or the Chief Examiner). The main objective of the oral part is to examine the candidate's knowledge on current and local issues and understanding of the local development and practice in the field of occupational hygiene. The acquaintance with local laws and regulations is essential. The duration of an oral examination is normally one hour, and the presentation can be conducted in either **English/ Chinese** as selected by the

candidate and agreed by the Examination Panel.

EXAMINATION PROCEDURES

1. Each written examination will be conducted in two 3-hour sessions.
2. The morning session starts usually at 9:30 AM and ends at 12:30 PM.
3. The afternoon session starts at 2:00 PM and ends at 5:00 PM accordingly.
4. The time for oral examination is normally NOT less than one hour. Each candidate will be informed the venue and time for arrival separately by a letter or e-mail.
5. Candidates are expected to arrive at the examination room 10 minutes before the commencement of each session for the written examination or time scheduled for an oral examination.
6. No candidate will be admitted after the written examination has been started for 30 minutes.
7. Candidates arrived late after the start of the examination will not be given additional time.
8. No candidate can leave the examination area in the first half hour of the written examination.
9. No candidate can leave the examination area in the last fifteen minutes.
10. Candidates must bring along their Hong Kong Identity Card or Passport and the letter of admission from the Board for verification by the invigilator.
11. All questions in the written examination will be of multiple choice type, and the current language in use is English.
12. In the oral examination, candidates can choose either English and/ or Chinese languages for answer of the questions as agreed by the Examination Panel.
13. The Examination Panel will provide all examination books and answer sheets for each session and pencils or pens for writing.
14. Examinees may use a non-programmed calculator and may bring spare calculator batteries.
15. The Examination Panel is not responsible for the supply of electrical power at the examination room.
16. Personal computers or other electronic devices are not permitted in the examinations.
17. Candidates are required to use only the pencils or pens, which are provided by the Examination Panel.
18. Books, manuals, notes or other reference materials are not allowed in the

examination room.

19. The Examination Panel may change the rules when required. However candidates will be advised at least one month before the date of the written examination.

MARKING SCHEME for examinations

The marking scheme will be decided by the current Examination Panel once nominated by RPH R&EB after the announcement of the examination date.

In the written examination, the information and passing mark for the set examination will be shown in the front cover of the question book; **such as**

1. 1 mark will be awarded for each correct answer.
2. No mark will be deducted for wrong or not attempted question.
3. All questions carry equal mark.
4. The passing mark of this paper is 65%.

RECHECK OF THE Written Examination Result

A candidate may request the Examination Panel to recheck the markings of his/her written examination papers. Such request should be made in writing to the Chairman of RPH R&EB within 2 weeks after the announcement of the result.

RESULT OF THE ORAL EXAMINATION

The passing mark for the oral examination is usually 60% and the candidate will be informed of the passing mark before taking the examination by the Examination Panel. The score of the candidate is the average of the marks given by the members of the oral Examination Panel of no less than 3 persons, who might be experts in different areas of occupational hygiene practice and one of the members could be an external examiner from the related fields, e.g. expert in a special field like radiation protection, ergonomics, asbestos management, and acoustics may be invited to sit in the oral examination if necessary (as decided to be appropriate by RPH R&EB).

USEFUL REFERENCES IN OCCUPATIONAL HYGIENE

HKIOEH Examination questions are taken from a variety of sources in the literature to reflect the underlying purposes and principles of occupational hygiene as well as the current knowledge which is expected of the occupational hygienist. The following abbreviated list includes references which are considered valuable by individual Board members and other Registered Professional Occupational hygienists. The list is not a complete bibliography of the occupational hygiene literature, nor does it include the sources of all questions in the examinations.

Texts

1. Air Contaminants ventilation, and Industrial Hygiene economics Roger L. Wabeke, CRC press , 2013.
2. Bioaerosols: Assessment and Control, ACGIH. Cincinnati, OH: ACGIH, 1999.
3. Casarette and Doull's Toxicology: The Basic Science of Poisons, Seventh edition. By C.D.Klaassen, M.O. Amdur, and J. Doull, Editors. New York: McGraw Hill, (2008).
4. Design of Industrial Ventilation Systems, Fifth Edition. J.L. Alden and J.M. Kane. New York: Industrial Press, 1982.
5. Engineering Control of Workplace Hazards. R.A. Wadden and P.A. Scheff. New York: McGraw Hill Book Co., 1987.
6. Ergonomic Design for People at Work. Eastman Kodak Company Staff, New York: Van Nostrand Reinhold, 2004.
7. Epidemiology, Part 1s of, Third Edition. D.E. Lillienfeld and A.M. Lillienfeld. New York: Oxford University Press, 1994.
8. ILO Encyclopaedia of Occupational Health and safety. SafeWork. CD or web-version. <http://www.ilo.org/oshenc/> (free)
9. Fundamentals of Industrial Hygiene, Sixth Edition. National Safety Council, 2012.
10. Hamilton and Hardy's Industrial Toxicology, Fourth Revised Edition. A.J. Finkel, Editor. Littleton, MA: PSG Publishing, 1991.
11. Handbook of Ventilation for Contaminant Control, Second Edition. H.J. McDermott. Stoneham, MA: Butterworth, 1985.
12. Indoor Air Quality, Second Edition. P.J. Walsh, C.S. Dudley, and E.L. Copenhaver. Boca Raton, FL: CRC Press, 1993.

13. In-Plant Practices for Job-Related Health Hazards Control, L.V. Cralley and L.J. Cralley, Editors. New York: John Wiley & Sons, 1989. Volume I, Production Processes, 1989. Volume II, Engineering Aspects, 1989.
14. Indoor Air and Human Health, Second Edition. R.B. Gammage and B.A. Berven. Boca Raton, FL: CRC/Lewis Publishers, 1996.
15. Occupational hygiene Management. J.T. Garrett, L.J. Cralley and L.V. Cralley, Editors. New York: John Wiley & Sons, 1988.
16. Introduction to Health Physics, Second Edition. H. Cember. Elmsford, NY: Pergamon Press, 1983.
17. Management of People and Programs in Occupational hygiene. F.M. Toca and D. Woodhull. Fairfax, VA: AIHA Press, 1996.
18. Modern Occupational hygiene, Vol.1 - Recognition and Evaluation of Chemical Agents. J.L Perkins. New York: Van Nostrand Reinhold, 1997.
19. Occupational Biomechanics, Second Edition. D.B. Chaffin and G.B. Anderson. New York: John Wiley & Sons, 1991.
20. Occupational exposure to noise: evaluation, prevention and control. Edited by B. Goelzer, WHO, 2001.
21. The Occupational Environment: Its Evaluation, Control and Management. 2nd edition. S.R. DiNardi, Editor. Fairfax, VA: AIHA Press, 2003. Or 3rd edition (Vol. 1 & 2) Edited by Daniel H. Anna, PhD, 2011. .
22. Occupational Safety and Health Guidance Manual For Hazardous Waste Site Activities, NIOSH, the OSHA, the US Coast Guard, and EPA. Cincinnati, OH: NIOSH. 1985.
23. Patty's Industrial Hygiene. 6th Edition, 4volume set; G.D. Clayton and F.E. Clayton, Editors. New York: John Wiley and Sons, 2011.
24. Plant and Process Ventilation, Third Edition, W.C.L. Hemeon, D.J. Burton. Boca Raton, FL: Lewis Publishers, 1998.
25. Practitioner's Approach to Indoor Air Quality Investigations, AIHA. Fairfax, VA: AIHA Press, 1989.
26. An introduction – Principles of Occupational Health & Hygiene. Edited by S Reed et al, 2nd edition, A&U, 2013.
27. Proctor and Hughes' Chemical Hazards of the Workplace, Fourth Edition. G. Hathaway, N.H. Proctor, J.P. Hughes. New York: Van Nostrand Reinhold, 1996.
28. Protecting Personnel at Hazardous Waste Sites, Second Edition. S.P. Levine and W.F. Martin, Editors. Stoneham, MA: Butterworth, 1994.
29. Radiation Protection: A Guide for Scientists and Physicians, Third Edition. J. Shapiro. Cambridge, MA: Harvard University Press, 1990.
30. Research Methods in Occupational Epidemiology, H. Checkoway, N.E. Pearce, and

- D.J. Crawford-Brown. New York: Oxford University Press, 1989.
31. Recognition of Health Hazards in Industry: A Review of Materials and Processes, Second Edition. W. A. Burgess. 2nd edition, New York: Wiley-Interscience, 1995.
 32. Work Design: Industrial Ergonomics, Fourth Edition. S.A. Konz. Scottsdale, AZ: Holcomb Hathaway, 1995.

Handbooks and Manuals

1. Air Sampling Instruments, ninth Edition. Cincinnati, OH: ACGIH, 2001.
2. Ambient Air Quality Monitoring and Community Air Sampling, ACGIH Instruments Committee, 2008.
3. Companion study guide to Industrial Ventilation, A Manual of Recommended Practice, 27th Edition. Burton J. Cincinnati, OH: ACGIH. 2010.
4. Guidelines for the Selection of Protective Clothing, Third Edition. A.D. Schwope, P.P. Costas, J.O. Jackson, J.O. Stull, E.J. Weitzman. Cincinnati, OH: ACGIH, 1987.
5. Industrial Ventilation, A Manual of Recommended Practice, 27th Edition. Committee on Industrial Ventilation. Cincinnati, OH: ACGIH. 2010.
6. American National Standard for the Safe Use of Lasers ANSI Z136.1 (2007), Laser Institute of America, ANSI, New York. – THE standard for laser safe
7. NIOSH Guide to Industrial Respiratory Protection, N.J. Bollinger and R.H. Schutz. NIOSH Publication No. 87-116. Cincinnati, OH: NIOSH, 1987.
8. NIOSH Manual of Analytical Methods, Fourth Edition. Cincinnati, OH: NIOSH, 1997 or the NMAM available in web: <http://www.cdc.gov/niosh/docs/2003-154/>
9. Noise and Hearing Conservation Manual, Fourth Edition. E.H. Berger, W.D. Ward, J.C. Morrill, and L.H. Royster, Editors. Fairfax, VA: AIHA Press, 1986.
10. OSHA Analytical Methods Manual, OSHA Analytical Laboratories. Salt Lake City, UT. Or the relevant information of Analytical methods listed in the webpage : <https://www.osha.gov/dts/slhc/methods/toc.html>
11. Respiratory Protection: A Manual and Guidelines, Second Edition. Fairfax, VA: AIHA, 1991

REGULATIONS, STANDARDS, GUIDELINES

1. Factories and Industrial Undertakings Ordinance and Regulations
2. Occupational Safety and Health Ordinance and Regulations
3. Code of Practice on Control of Air Impurities (Chemical Substances) in the Workplace (published by the Labour Department), 2002.
4. Code of Practice for Working with Display Screen Equipment (published by the Labour Department)
5. Guidance on Diagnosis of Occupational Disease (published by the Labour Department)
6. Guidance and Codes of Practice relating to Occupational Health and Occupational Hygiene (Published by the Labour Department)
7. Dangerous Goods Ordinance
8. Radiation Ordinance and Regulations
9. Air Pollution Control Ordinance & Regulations
10. Chemical Waste Ordinance & Regulations
11. Waste Disposal Ordinance, including the chemical and clinical disposal.
12. Code of Practise for the Clinical Waste Disposal
13. Noise Pollution Control Ordinance & Regulations
14. Criteria for a Recommended Standard: ... (various topics). Cincinnati, OH: National Institute for Occupational Safety and Health.
15. The Documentation of TLVs and BEIs, 7th edition. Cincinnati, OH: ACGIH. 2003-2007
16. NIOSH/OSHA Occupational Safety and Health Guidelines for Chemical Hazards, NIOSH and OSHA. Washington, DC: U.S. Government Printing Office.
17. TLVs: Threshold Limit Values and Biological Exposure Indices, (Includes threshold limit values for chemical substances and for physical agents). Cincinnati, OH: ACGIH, current issue (Issued annually).
18. Workplace Environmental Exposure Level Guides, AIHA WEEL Committee. Fairfax, VA: AIHA Press, 1980-1998.

TEST SPECIFICATIONS

Recognizer of Health Stressors

Foresee health stressors in plants and operations Identify potential workplace health stressors; Recognize existing exposures to health stressors; Set priorities by recording/organizing/analyzing data.

Evaluator of Health Stressors

Develop data collection plan; Obtain samples/make observations of environmental factors; Analyze biological and environmental specimens; Analyze/interpret results of observations.

Controller of Health Stressors

Educate people about health and environmental stressors; Prescribe appropriate personal protective equipment (PPE); Design and/or prescribe engineering controls; Design and/or prescribe administrative measures; Communicate recommendations to appropriate people; Verify efficiency of control measures.

Ethics Standards of ethical and professional conduct

Manager of Occupational hygiene Programme

Develop, implement, and evaluate the industrial hygiene program.

SCOPES to be examined

Examination questions are categorized generally in the following areas.

Areas of Occupational hygiene Knowledge

1. Air pollution and Environmental Exposure

Air pollution, air cleaning technology, ambient air quality considerations, emission source sampling, atmospheric dispersion of pollutants, ambient air monitoring, health and environmental effects of air pollutants and related calculations. These also include other environmental subjects such as chemical emergency planning and response.

2. Air Sampling and Instrumentation

Selection, use and limitations of field air-sampling instruments, full shift and grab samples, including direct reading instruments. Included are the set-up, calibration and use (including quality assurance practices) of air-sampling apparatus and direct reading instruments. Sampling strategy considerations are included. Calculations related to sampling and calibration are included. Measurement of exposures to noise, ionizing radiation, non-ionizing radiation, and thermal stressors are included in the areas dealing with those specific subject areas.

3. Basic Science, including analytical chemistry and biostatistics, etc.

General scientific concepts, chemistry, biochemistry, biology, anatomy and physiology, general physics and mathematics. Properties of flammable, combustible and reactive materials (compatibility) are included. Included are calculations such as those relative to gas laws, airborne concentrations, and unit-of-measure conversions and conditions of non-standard pressure.

Laboratory analytical procedures for work place environmental samples and related calculations. Included are gas chromatography, infrared, visible and ultraviolet spectrophotometry, high performance liquid chromatography, mass spectroscopy, atomic absorption spectrophotometry, wet chemical methods, and microscopy and laboratory quality assurance and chain of custody.

Principles of epidemiology, techniques used to study the distribution of occupationally induced diseases and physiological conditions in workplaces and factors that influence their frequency. It includes concepts of prospective and retrospective studies, morbidity and mortality and animal experimental studies, data and distribution of data. Also

included are basic biostatistics and statistical and non-statistical interpretation of data in the evaluation of hazards.

4. Biohazards

Principles of sanitation, personal hygiene, the recognition, evaluation and control of biological agents or materials having the capacity to produce deleterious effects upon other biological organisms, particularly humans (virus, bacteria, fungi, molds, allergens, toxins, recombinant products, bloodborne pathogens, etc.) and infectious diseases that appear in workplaces including industry, agriculture, offices and health care facilities.

5. Engineering Controls including Ventilation

Control of chemical and physical exposures through engineering measures. Included are local exhaust ventilation, dilution ventilation, isolation, containment and process change. Also included are mechanics of airflow, ventilation measurements, design principles and related calculations. This area also covers in-plant recirculation air-cleaning technology. Engineering control of ionizing and non-ionizing radiation, thermal stressors, and noise and vibration sources including principles of isolation, enclosure, absorption and damping are included in the areas dealing with those specific subject areas.

6. Ergonomics

Application of principles from anthropometry, human factors engineering, biomechanics, work physiology, human anatomy, occupational medicine and facilities engineering to the design and organization of the workplace for the purpose of preventing injuries and illnesses.

7. Health Risk Analysis, Hazard Communication, management and legislation

Understanding of principles and requirements for the interpretation and use of guidelines for the assessment of health hazards and law compliance, including:-

- Hong Kong Labour Department Occupational Exposure Limits (OEL);
- American Conference of Governmental Occupational hygienists (ACGIH) Threshold Limit Values (TLVs), Biological Exposure Indices (BEIs);
- Health and Safety Executive EH40;
- Industrial ventilation guidelines, American Society for Heating, Refrigeration, and Air Conditioning Engineers (ASHRAE) guidelines;

- American Industrial Hygiene Association (AIHA) Workplace Environmental Exposure Level (WEEL) guides;
- National Institute for Occupational Safety and Health (NIOSH) Criteria Documents and recommendations;
- Hazard communication and training of employees;
- Communication of recommendations by appropriate techniques to implement control.

The decision making for risk management can help in acquisition, allocation and control of resources to accomplish occupational hygiene anticipation, recognition, evaluation and control objectives in an effective and timely manner. Included are such topics as establishment of policy, planning and budgeting, delegation of authority, productivity, accountability, communication, staff versus line authority, organizational structure, performance evaluation and decision making. This area also includes ethics.

8. Noise & Vibration

Health effects resulting from exposure to noise and vibration. Computations related to combining noise sources and octave band measurements are included as are audiometric testing programs. It includes exposure measurement, evaluation, and control.

9. Non-Engineering Controls

Personal protective equipment, including the principles governing selection, use and limitations of respirators and protective clothing. Included are respirator fit testing, breathing air specifications, glove permeability, eye protection and the use of administrative controls.

10. Radiation, including both Ionizing and non-ionizing hazards

Physical characteristics and health and biological effects associated with alpha, beta, gamma, neutron and x-radiation, including source characteristics. It includes exposure measurement, evaluation, and control.

Physical characteristics and health effects associated with electromagnetic fields, static electric and magnetic fields, lasers, radio frequency, microwaves, ultraviolet, visible, infrared radiation and illumination. It includes exposure measurement, evaluation, and control.

11. Thermal Stressors

Adverse health effects associated with heat and cold, symptoms of temperature-related health effects, exposure control techniques, and first-aid/medical response.

12. Toxicology

Health effects resulting from exposure to chemical substances. Included are symptomatology, pharmacokinetics, mode of action, additive, synergistic and antagonistic effects, routes of entry, absorption, metabolism, excretion, target organs, toxicity testing protocols and aerosol deposition and clearance in the respiratory tract. Also included are carcinogenic, mutagenic, teratogenic and reproductive hazards

13. Work Environments and Industrial Processes

Included are the hazards associated with specific industrial or manufacturing processes. Topics include, but are not limited to confined space entry, spray-painting, welding, abrasive-blasting, vapour-degreasing, foundry operations, and hazardous waste site remediation, as well as general indoor environmental issues.

End

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