

## **HKIOEH Registration of Professional Occupational Hygienist Examination Information**

For more information or application materials, please contact:

Chairman of Registered Professional Hygienist (RPH) Registration & Examination Board,  
HKIOEH,  
via the Secretary of HKIOEH: [info@hkioeh.org.hk](mailto:info@hkioeh.org.hk) or [hkioeh@gmail.com](mailto: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. The recognition cycle is currently in a **FIVE-year term**. 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.

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 diseases 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 about 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 about 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 generally 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 could 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 generally in between April - June. Information of the examination date will be posted up in the HKIOEH webpage. RPH R&EB 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) examination result or acceptance of the qualification equivalent to the written examination. The oral examination will be led by the Chief Examiner plus at least 2 other examiners to form the examination panel. 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 for each candidate, and the presentation can be conducted in either **English/ Chinese** as selected by the candidate and agreed by the examiners/ 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 usually 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 the time scheduled for an oral examination.
6. No candidate will be admitted after the written examination has been started for 30 minutes.
7. A candidate arrives late after the start of the examination will not be given additional time.
8. No candidate may leave the examination area in the first half hour of the written examination nor the last fifteen minutes unless with permission from the invigilator.
9. Candidates must bring along their Hong Kong Identity Card or Passport and the letter of admission from the Board for verification by the invigilator.
10. All questions in the written examination will be of multiple choice type, and the current language in use is English.
11. In the oral examination, candidates can choose either English and/ or Chinese languages for answer of the questions as agreed by the examination panel.
12. The Examination Panel will provide all examination books and answer sheets for each session and pencils or pens for writing.
13. Examinees may use a non-programmed calculator and may bring spare calculator batteries.
14. The Examination Panel is not responsible for the supply of electrical power at the examination room.
15. Personal computers or other electronic devices are not permitted in the examinations.
16. Candidates are required to use only the pencils or pens, which are provided by the Examination Panel.
17. Books, manuals, notes or other reference materials are not allowed in the examination room during the written examination.
18. The Examination Panel may change the rules when required. However candidates will be advised the details of arrangement at least one month before the date of the written examination.

## **MARKING SCHEME for examinations**

The written examination consists of two papers, i.e. paper A and paper B. To pass the written examination, the candidate has to score (i) at least 60% in both papers in one examination; **and** (ii) at least 65% for the average of both papers.

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. To pass the written examination, the candidate has to score (i) at least 60% in both paper A and paper B in one examination; **and** (ii) at least 65% for the average of both papers.

## **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 60%. The score of the candidate is the average of the marks given by all oral examiners.

## **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 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.

### **Suggested reference books listing for RPH examination**

#### **Major titles for occupational hygiene study, including topics on air pollution, workplace & environmental exposures, etc.**

1. Advances in Air sampling (ACGIH), CRC Press (reissue in 2018)
2. Aerosol Science: Technology and Applications, edited by I. Colbeck, Wiley, 2014.
3. Air Contaminants ventilation, and Industrial Hygiene economics Roger L. Wabeke, CRC press , 2013.
4. Air monitoring for toxic exposures – an integrated approach, Shirley Ness (1991)
5. Air quality. by Godish Thad, 5<sup>th</sup> edition, Taylor & Francis Group, 2015.
6. Air quality management, edited by S.T. Nesaratnam, et al, Wiley, 2014.
7. Air Sampling Instruments, ninth Edition. Cincinnati, OH: ACGIH, 2001.
8. Ambient Air Quality Monitoring and Community Air Sampling, ACGIH Instruments Committee, 2008.
9. Air pollution control engineering, 3rd edition, by Noel de Nevers, Waveland Press, 2017.
10. Bioaerosols: Assessment and Control, ACGIH. Cincinnati, OH: ACGIH, 1999.
11. Continuous Monitoring for Hazardous Material Release, American Industrial Hygiene Association, Fairfax, Virginia, 2009.
12. Fundamentals of Industrial Hygiene, Sixth Edition. National Safety Council, 2012.
13. Fundamentals of Radiation and Chemical Safety, Ilya Obodovski, Elsevier, 2015.
14. Hunter's Diseases of Occupations, Tenth edition, edited by Peter J Baxter, Tar-Ching Aw, Anne Cockcroft, Paul Durrington and J Malcolm Harrington, CRC Press, 2010.
15. Indoor air quality: The latest sampling and analytical methods, by Kathleen Hess-Kosa, 2<sup>nd</sup> edition, CRC Press, 2011.
16. Modern Occupational hygiene, Vol.1 - Recognition and Evaluation of Chemical Agents. J.L Perkins. 2nd edition, New York: Van Nostrand Reinhold, 2008.
17. Monitoring for health hazards at work, 4<sup>th</sup> edition, J Cherrie, Wiley-Blackwell, 2010.
18. 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.
19. Occupational hygiene edited by K Gardiner and J.M. Harrington, 3<sup>rd</sup> edition, Blackwell, 2005.
  20. Patty's Industrial Hygiene. 6th Edition, 4 volume set; G.D. Clayton and F.E. Clayton, Editors. New York: John Wiley and Sons, 2011.
  21. An introduction – Principles of Occupational Health & Hygiene. Edited by S Reed et al, 2nd edition, A&U, 2013.
  22. Proctor and Hughes' Chemical Hazards of the Workplace, fifth Edition. G. Hathaway, N.H. Proctor, J.P. Hughes. New York: Van Nostrand Reinhold, 2004.
  23. Recognition of Health Hazards in Industry: A Review of Materials and Processes, Second Edition. W. A. Burgess. 2nd edition, New York: Wiley-Interscience, 1995.
  24. Safety aspects of engineered nanomaterials, edited by W. Luther, Pan Stanford publishing, 2013
  25. Survey methods in community medicine, J.H. & Z.H. Abramson, 5<sup>th</sup> edition, Churchill Livingstone, 1999.

### **Prevention and Control of hazards**

26. Chemical Protective Clothing, Fairfax, VA : Second edition, AIHA Press 2003.
27. Companion study guide to Industrial Ventilation, A Manual of Recommended Practice, 27th Edition. Burton J. Cincinnati, OH: ACGIH. 2010.
28. Industrial Ventilation, A Manual of Recommended Practice, 27th Edition. Committee on Industrial Ventilation. Cincinnati, OH: ACGIH. 2010.
29. Personal Protective Equipment for Chemical, Biological, and Radiological Hazards: Design, Evaluation, and Selection, Eva F. Gudgin Dickson, John Wiley & Sons, Inc., 2013.
30. Plant and Process Ventilation, Third Edition, W.C.L. Hemeon, D.J. Burton. Boca Raton, FL: Lewis Publishers, 1998.
31. Ventilation for control of work environment, edited by W Burgess, M.J. Ellenbecker, et al. 2<sup>nd</sup> edition, Wiley-Inter science, 2004.

### **Ergonomics (including lighting, noise and thermal, etc.)**

32. Ergonomic check point, 2<sup>nd</sup> edition, ILO/IEA, 2010.
33. Ergonomic Design for People at Work. Eastman Kodak Company Staff, New York: Van Nostrand Reinhold, 2004.
34. Handbook of human factors and ergonomics, edited by G. Salvendy 4<sup>th</sup> edition, 2012.
35. Human factors in lighting, 3<sup>rd</sup> edition, P.R. Boyce, CRC Press, 2014.
36. Human Thermal Environments: The Effects of Hot, Moderate, and Cold Environments on

Human Health, Comfort, and Performance,, 3<sup>rd</sup> edition, K. Parsons, CRC Press 2014.

37. Introduction to ergonomics, 3<sup>rd</sup> edition, R.S. Bridger, CRC Press, 2009.

38. Occupational exposure to noise: evaluation, prevention and control. Edited by B. Goelzer, WHO, 2001. [http://www.who.int/occupational\\_health/publications/occupnoise/en/](http://www.who.int/occupational_health/publications/occupnoise/en/)

### **Toxicology**

39. Casarette and Doull's Toxicology: The Basic Science of Poisons, eighth edition. By C.D.Klaassen, M.O. Amdur, and J. Doull, Editors. New York: McGraw Hill, (2013).

40. Hamilton and Hardy's Industrial Toxicology, Sixth Edition. R.B. Harbison, et al. Littleton, MA: PSG Publishing, (2015).

### **Other references on the web**

41. BOHS Technical Guide 15 - Direct Reading Devices for Airborne Chemical Contaminants.

<http://www.bohs.org/wp-content/uploads/Technical-guide-on-direct-reading-devices.pdf>

42. ILO Encyclopedia of Occupational Health and safety. SafeWork. CD or web-version. <http://www.ilo.org/oshenc/> (free)

43. NIOSH Manual of Analytical Methods, Fourth Edition. Cincinnati, OH: NIOSH or the NMAM available in web: <http://www.cdc.gov/niosh/docs/2003-154/>

44. 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/sltc/methods/toc.html>

45. OHTA training programme materials at <https://www.ohlearning.com/>

46. Publications issued by the Labour Department of HKSAR: [http://www.labour.gov.hk/eng/public/content2\\_9.htm](http://www.labour.gov.hk/eng/public/content2_9.htm)

## **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 safety and health at work in confined space, second edition (2024); (published by the Labour Department)
- 5.** Code of Practice for Working with Display Screen Equipment (published by the Labour Department)
- 6.** Guidance Notes on prevention of heat stroke at work, second edition; (2024) (published by the Labour Department)
- 7.** Guidance on Diagnosis of Occupational Disease (published by the Labour Department)
- 8.** Guidance and Codes of Practice relating to Occupational Health and Occupational Hygiene (Published by the Labour Department)
- 9.** Dangerous Goods Ordinance
- 10.** Radiation Ordinance and Regulations
- 11.** Air Pollution Control Ordinance & Regulations
- 12.** Chemical Waste Ordinance & Regulations
- 13.** Waste Disposal Ordinance, including the chemical and clinical disposal.
- 14.** Code of Practise for the Clinical Waste Disposal
- 15.** Noise Pollution Control Ordinance & Regulations
- 16.** Criteria for a Recommended Standard: ... (various topics). Cincinnati, OH: National Institute for Occupational Safety and Health.
- 17.** The Documentation of TLVs and BEIs, 7<sup>th</sup> edition. Cincinnati, OH: ACGIH. 2003-2007
- 18.** NIOSH/OSHA Occupational Safety and Health Guidelines for Chemical Hazards, NIOSH and OSHA. Washington, DC: U.S. Government Printing Office.
- 19.** 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).
- 20.** 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/organising/analysing data.

### **Evaluator of Health Stressors**

Develop data collection plan; Obtain samples/make observations of environmental factors; Analyse biological and environmental specimens; Analyse/ 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 programme.

## **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 in the subjects that follow: 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, moulds, 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, such as the means for control of hazards due to manual handling of loads, work in computer workstations are included.

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

The basic concept of hazards and risks in occupational health risk assessment, risk management and treatment, and strategies for hierarchy of controls, etc. 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) in the code of practice on control air impurities (chemical substances) in the workplace.;
- 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; recognition of symptoms of temperature-related health effects mainly on heat related illnesses and steps to reduce the risk, as well as exposure control techniques, and first-aid/medical response.

Heat stress risk assessment of heat related illnesses by scientific methods, e.g. the WBGT methods

### **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**

*(Previous versions on 2<sup>nd</sup> April 2011, 22<sup>nd</sup> August 2011; 28<sup>th</sup> July 2014; 10<sup>th</sup> Dec 2016 last updated by RPH R&EB on 12<sup>th</sup> Aug 2018.);*

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