

SRM VALLIAMMAI ENGINEERING COLLEGE

(An Autonomous Institution)

SRM Nagar, Kattankulathur – 603 203

DEPARTMENT OF MECHANICAL ENGINEERING

QUESTION BANK



I SEMESTER

1914103 - OCCUPATIONAL HEALTH AND INDUSTRIAL HYGIENE

(M.E. INDUSTRIAL SAFETY ENGINEERING)

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1914103 - Occupational Health and Industrial Hygiene

UNIT I: PHYSICAL HAZARDS			
Noise, compensation aspects, noise exposure regulation, properties of sound, occupational damage, risk, factors, sound measuring instruments, octave band analyzer, noise networks, noise surveys, noise control program, industrial audiometry, hearing conservation programs- vibration, types, effects, instruments, surveying procedure, permissible exposure limit. Ionizing radiation, types, effects, monitoring instruments, control programs, OSHA standard- non-ionizing radiations, effects, types, radar hazards, microwaves and radio-waves, lasers, TLV- cold environments, hypothermia, wind chill index, control measures- hot environments, thermal comfort, heat stress indices, acclimatization, estimation and control.			
PART A			
1	What are the factors to be included for identifying noise issues in workers?	BT-1	Remember
2	Define reverberation.	BT-1	Remember
3	Discuss the allowable limit of vibration.	BT-5	Evaluate
4	When an employer has to provide hearing protectors?	BT-4	Analyze
5	Explain the ill effects in human due to overexposure of noise.	BT-2	Understand
6	Discuss the principle involved in octave band analyzer.	BT-5	Evaluate
7	List out the properties of sound.	BT-2	Understand
8	Identify the sound measuring instruments.	BT-3	Application
9	Define Transmission loss.	BT-1	Remember
10	Identify steps involved in measurement of noise exposure in workers.	BT-3	Application
11	Discuss radiation sources in humans.	BT-4	Analyze
12	Elaborate the limitation of Geiger Muller counter.	BT-2	Understand
13	Difference between Ionizing radiation and non-Ionizing radiation.	BT-5	Evaluate
14	Discuss control measures of ionizing radiation.	BT-3	Application
15	Discuss acclimatization in industry.	BT-3	Application
16	What is wind chill index?	BT-6	Create
17	Effect of radar hazards in humans.	BT-2	Understand
18	Define heat stress indices.	BT-1	Remember
19	What are the types of ionizing radiation?	BT-1	Remember
20	Elaborate health effects due to ionizing radiation.	BT-4	Analyze
PART B			
1	Discuss in detail about various sound measuring instruments.	BT-1	Remember
2	Explain mechanisms involved in noise control system.	BT-4	Analyze
3	How will you conduct vibration surveys?	BT-6	Create

4	Elaborate industrial audiometry.	BT-3	Application
5	Explain noise control strategies.	BT-2	Understand
6	Explain principle behind octave band analyzer.	BT-4	Analyze
7	What you know about types and effect of ionizing radiation?	BT-6	Create
8	Discuss the monitoring instrument of ionizing radiation.	BT-2	Understand
9	Elaborate health concerns of people working in cold environment.	BT-5	Evaluate
10	What you know about types and effect in non-ionizing radiation?	BT-2	Understand
11	Discuss the control measures followed for non-ionizing radiations.	BT-4	Analyze
12	Create some methods to manage the excess noise.	BT-6	Create
13	Create some methods to manage the excess vibration.	BT-6	Create
14	How will you find out the levels of excess noise?	BT-1	Remember
PART C			
1	What are the OSHA standards for non-ionizing radiations?	BT-1	Remember
2	Discuss the types, effects and surveying procedure of vibrations.	BT-5	Evaluate
3	Analyze and explain in detail various hearing conservation programmers.	BT-4	Analyze
4	Explore the ill effects in humans due to excess noise vibrations and radiations.	BT-5	Evaluate

UNIT II CHEMICAL HAZARDS

Recognition of chemical hazards-dust, fumes, mist, vapour, fog, gases, types, concentration, Exposure vs. dose, TLV - Methods of Evaluation, process or operation description, Field Survey, Sampling methodology, Industrial Hygiene calculations, Comparison with OSHAS Standard. Air Sampling instruments, Types, Measurement Procedures, Instruments Procedures, Gas and Vapour monitors, dust sample collection devices, personal sampling Methods of Control - Engineering Control, Design maintenance considerations, design specifications - General Control Methods - training and education

PART A

1	Define fume.	BT-1	Remember
2	Differentiate exposure and dosage.	BT-4	Analyze
3	List out sound absorption materials.	BT-2	Understand
4	Give some examples for transmission loss materials.	BT-2	Understand
5	How will you measure the intensity of sound?	BT-3	Application
6	Write a short note on gas and vapor monitors.	BT-4	Analyze
7	What are the types of air sampling instruments?	BT-3	Application
8	Discuss methods of air pollution control.	BT-4	Analyze
9	List out some common techniques to analyze gaseous pollutants.	BT-2	Understand
10	Discuss about air sampling types.	BT-4	Analyze
11	Give the equation of efficiency of control device.	BT-3	Application
12	Write about the mechanism behind electrostatic precipitator.	BT-5	Evaluate
13	Discuss about dust sample collection devices.	BT-4	Analyze
14	Write about OSHA guidelines.	BT-1	Remember
15	What is the permissible limit for air pollutants in industrial area?	BT-5	Evaluate
16	Write about the methods and control techniques of air pollution.	BT-2	Understand
17	Discuss about air quality index.	BT-4	Analyze
18	What are the major sources of outdoor air pollution?	BT-3	Application
19	What are the types of poisoning due to chemicals?	BT-1	Remember
20	What are the common chemical hazards you come across in daily life?	BT-3	Application

PART B

1	Explain about chemical hazards on human.	BT-2	Understand
2	Discuss on ambient air sampling techniques.	BT-4	Analyze
3	What are the technologies used for coarse particle separation?	BT-1	Remember
4	Write about the control techniques of air pollution.	BT-1	Remember
5	Write in detail about TLV.	BT-4	Analyze

6	Elaborate about sampling techniques.	BT-3	Application
7	Explain various components of air sampling collection devices.	BT-2	Understand
8	Discuss about some forms of chemical hazards in environment.	BT-4	Analyze
9	Give short notes on cyclone separator.	BT-1	Remember
10	Write about absorption and wet scrubbing equipment.	BT-3	Application
11	Explain in detail about toxic gases that cause air pollution.	BT-2	Understand
12	Discuss about the working of electrostatic precipitator.	BT-4	Analyze
13	Write about field survey.	BT-3	Application
14	Express your views on controlling air pollution in future.	BT-6	Create
PART C			
1	Write in detail about air sampling.	BT-2	Understand
2	Explain about bag filter.	BT-3	Application
3	Discuss about the climatic changes due to air pollutants.	BT-3	Application
4	What are the industrial hygiene procedures to control pollution?	BT-5	Evaluate

UNIT III BIOLOGICAL AND ERGONOMICAL HAZARDS

Classification of Bio hazardous agents – examples, bacterial agents, rickettsial and chlamydial agents, viral agents, fungal, parasitic agents, infectious diseases - Biohazard control program, employee health program-laboratory safety program-animal care and handling-biological safety cabinets - building design. Work Related Musculoskeletal Disorders –carpal tunnel syndrome CTS- Tendon pain-disorders of the neck- back injuries.

PART A

1	Draw the biohazard symbol	BT-3	Application
2	List out examples of biohazard agents	BT-1	Remember
3	List some common infectious diseases among workers	BT-2	Understand
4	What are the methods for controlling biohazardous agents in workers?	BT-1	Remember
5	What are the allergies gained from biomedical lab?	BT-3	Application
6	Expand WMSD, PME and PEE.	BT-1	Remember
7	Discuss usage of biological safety cabinets.	BT-4	Analyze
8	What are the common names of tendinitis?	BT-2	Understand
9	Elaborate CTS.	BT-5	Evaluate
10	Why employee health program is conducted?	BT-3	Application
11	What are the causes of neck pain and back pain in workers?	BT-1	Remember
12	Classify biohazards.	BT-2	Understand
13	List some Work Related Musculoskeletal Disorders.	BT-2	Understand
14	What are biological safety cabinets?	BT-1	Remember
15	Discuss prevention of WMSD.	BT-4	Analyze
16	Mention joints affected by WMSD.	BT-4	Analyze
17	What is tendinitis?	BT-1	Remember
18	Classify biological safety cabinets.	BT-2	Understand
19	What are the symptoms of CTS?	BT-1	Remember
20	Discuss common preventive measures to be followed by workers.	BT-4	Analyze

PART B

1	Discuss in detail classification of biohazards.	BT-4	Analyze
2	Elaborate some common infectious diseases among workers.	BT-5	Evaluate
3	Give in detail about classification of biological agent.	BT-3	Application
4	What are the benefits of biological safety cabinets?	BT-2	Understand
5	What are the strategies of employee health programmers?	BT-2	Understand
6	Design biological safety cabinets.	BT-6	Create
7	What are the types of injury in WMSD?	BT-3	Application
8	How will you prevent WMSD?	BT-3	Application
9	Elaborate treatment and symptoms of CTS.	BT-5	Evaluate
10	Discuss the emergency procedure to be followed in biological lab.	BT-4	Analyze
11	Analyze the preventive measures to be adopted for skeletal	BT-3	Application

	disorders.		
12	Elaborate treatment and symptoms of WMSD.	BT-5	Evaluate
13	What are the symptoms, treatment and prevention of tendinitis?	BT-2	Understand
14	Discuss causes and prevention of neck and back pain.	BT-4	Analyze
PART C			
1	Discuss usage of biological safety cabinets in laboratory.	BT-4	Analyze
2	Elaborate the symptoms of various occupational diseases.	BT-5	Evaluate
3	Explain in detail the objectives and steps involved in employee health program.	BT-3	Application
4	List some common prevention for various occupational diseases.	BT-2	Understand

UNIT IV OCCUPATIONAL HEALTH AND TOXICOLOGY

Concept and spectrum of health - functional units and activities of occupational health services, pre employment and post-employment medical examinations - occupational related diseases, levels of prevention of diseases, notifiable occupational diseases such as silicosis, asbestosis, pneumoconiosis, siderosis, anthracosis, aluminosis and anthrax, lead-nickel, chromium and manganese toxicity, gas poisoning (such as CO, ammonia, coal and dust etc.) their effects and prevention – cardio pulmonary resuscitation, audiometric tests, eye tests, vital function tests. Industrial toxicology, local, systemic and chronic effects, temporary and cumulative effects, carcinogens entry into human systems

PART A

1	Define occupational health service.	BT-1	Remember
2	How to safeguard from industrial toxins?	BT-3	Application
3	Define occupational diseases.	BT-1	Remember
4	List out the symptoms of silicosis.	BT-2	Understand
5	Discuss causes of asbestosis.	BT-4	Analyze
6	What is pneumoconiosis?	BT-1	Remember
7	Give some examples for occupational diseases.	BT-2	Understand
8	List out the effects of lead and nickel in humans.	BT-2	Understand
9	Elaborate musculo skeletal disorders	BT-5	Evaluate
10	Discuss cardio pulmonary resuscitations.	BT-4	Analyze
11	When will you conduct audio metric test?	BT-3	Application
12	Give examples of carcinogen entry into humans.	BT-2	Understand
13	Discuss the effect of chromium and manganese toxicity.	BT-4	Analyze
14	Differentiate pre-employment and post-employment medical examination.	BT-1	Remember
15	What are the causes of anthracosis and aluminosis?	BT-3	Application
16	Name some poisonous gases emitted from industries.	BT-3	Application
17	What are the main factors considered in employment medical examinations?	BT-1	Remember
18	Why vital functional test is conducted on workers occasionally?	BT-3	Application
19	Mention some temporary effects of industrial toxicology.	BT-5	Evaluate
20	Give some activities of occupational health services.	BT-2	Understand

PART B

1	Elaborate on health spectrum.	BT-5	Evaluate
2	Discuss functional units and activities of occupational health services.	BT-4	Analyze
3	Write in detail about pre employment medical examination.	BT-3	Application
4	What are the symptoms, causes and preventive measures of silicosis?	BT-1	Remember
5	What are the symptoms, causes and preventive measures of asbestosis?	BT-1	Remember
6	Mention the effects and causes of gas poisoning.	BT-2	Understand

7	Write in detail about post employment medical examination.	BT-4	Analyze
8	Write about the symptoms, causes and treatment of anthracosis and siderosis.	BT-3	Application
9	Discuss the effects due to nickel, chromium, lead and manganese in humans.	BT-4	Analyze
10	Elaborate local systematic and chronic effects of industrial toxicology.	BT-5	Evaluate
11	Write in detail about cardio pulmonary resuscitations.	BT-3	Application
12	Give the effects of carcinogen entry into humans.	BT-4	Analyze
13	What are the various eye test and vital functional test conducted in workers?	BT-1	Remember
14	What are the symptoms, causes and preventive measures of asbestosis?	BT-1	Remember
PART C			
1	Give your thoughts on carcinogen entry into humans due to industrial activities.	BT-6	Create
2	Give a detailed report on audiometry, eye and vital functional test.	BT-2	Understand
3	Give your suggestions for improving employment medical examinations.	BT-6	Create
4	Elaborate any four occupational diseases.	BT-5	Evaluate

UNIT V OCCUPATIONAL PHYSIOLOGY

Man as a system component – allocation of functions – efficiency – occupational work capacity – aerobic and anaerobic work – evaluation of physiological requirements of jobs – parameters of measurements – categorization of job heaviness – work organization – stress – strain – fatigue – rest pauses – shift work – personal hygiene.

PART A

1	Discuss about health effects due to stress.	BT-4	Analyze
2	Write about occupational work capacity.	BT-3	Application
3	Differentiate aerobic and anaerobic work.	BT-3	Application
4	Define job strain.	BT-1	Remember
5	What is rest pause?	BT-1	Remember
6	What is work organization?	BT-3	Application
7	List out causes of stress.	BT-2	Understand
8	Is multi tasking useful?	BT-3	Application
9	What are the ill effects of job strain?	BT-1	Remember
10	Give basic hygiene habits to be followed by workers.	BT-2	Understand
11	What physiological changes are required for a student to become workers?	BT-4	Analyze
12	Does physiology affects productivity? Explain.	BT-3	Application
13	What are the causes of fatigue?	BT-4	Analyze
14	How are rest pauses useful?	BT-3	Application
15	Does allocation of functions affect productivity?	BT-3	Application
16	How to improve work efficiency?	BT-3	Application
17	Discuss the importance of workers health for an organization.	BT-5	Evaluate
18	What is the role of management on workers health?	BT-4	Analyze
19	Write your views on machine replacing humans.	BT-6	Create
20	What are the advantages and disadvantages of shift work?	BT-1	Remember

PART B

1	Give your views on providing education in occupational safety.	BT-6	Create
2	Elaborate the duties of an employer in maintaining occupational safety.	BT-5	Evaluate
3	What are the strategies an employer must adopt to provide a healthy working environment?	BT-1	Remember
4	Explain - man as a system component.	BT-4	Analyze
5	Write about the advantage of people over machine.	BT-3	Application
6	Discuss about the limitation of human over machine.	BT-3	Application
7	Explain about classification of work heaviness.	BT-1	Remember
8	Elaborate job strain.	BT-5	Evaluate
9	Discuss on occupational work capacity.	BT-4	Analyze
10	Express your views on improving personal hygiene.	BT-6	Create
11	How does shift work physiologically influence workers?	BT-4	Analyze
12	Discuss about the requirements of work organization.	BT-3	Application

13	Write short notes of stress management.	BT-1	Remember
14	Elaborate on the principles of a good work organization.	BT-5	Evaluate
PART C			
1	Explain in detail about development of stress concept.	BT-3	Application
2	Elaborate workers duties and right in creating healthy working environment.	BT-5	Evaluate
3	Analyze about physiological requirements of a job.	BT-4	Analyze
4	Give your views on physiological changes due to occupation.	BT-6	Create