

THE CHARUTAR VIDYA MANDAL UNIVERSITY
MASTER OF SCIENCE INDUSTRIAL HYGIENE AND SAFETY –
SEMESTER II
SUMMER (REGULAR) 2022 EXAMINATION

Course Title: INDUSTRIAL VENTILATION

Course Code: 101360201

Total Printed Pages : 3

Date: 04/05/2022

Time: 10.30 am/pm to 12.30 am/pm

Maximum Marks: 60

Instructions:

- Attempt all questions.
- Numbers to the right indicate full marks for each question.
- Make suitable assumptions wherever necessary.

Q. 1		(12)
	Answer the following multiple choice questions.	
	(1) If hood SP in a 8" duct is 3.0" H ₂ O & the hood C _e is 0.89. What is the VP? a) 2.38" of water b) 0.090" of water c) 0.30" of water d) 0.10" of water	
	(2) A duct is having Part-1 joined to Part-2. Part-1 diameter = 8 inches & velocity = 1,000 fpm. If Part-2 diameter = 4 inches; what will be the velocity? a) 20 m/s b) 1000 f/m c) 8000 f/m d) 40 m/s	
	(3) Calculate duct velocity for a duct diameter = 15 cms & flow rate = 697 cfm? a) 3.95 fpm b) 5,333 fpm c) 3,555 m/s d) 18 m/s	
	(4) A storage room is 12' wide & 20' long with a 10 foot ceiling. The floor area is 240 sqft. What cfm will be required to satisfy 12 ACH for this space? a) 520 cfm b) 480 cfm c) 180 cfm d) 620 cfm	
	(5) 4 pints of methanol spilled over an hour, what dilution rate in cfm will need to reduce level to 1 % of the TLV? K=4, s.g.=0.792, MW=32, TLV= 200 ppm. a) 7,97,94,000 cfm	

		<ul style="list-style-type: none"> b) 7,97,940 cfm c) 13,29,900 cfm d) 13,299 cfm 	
	(6)	<p>Which loss is expected to be the most significant in an LEV system?</p> <ul style="list-style-type: none"> a) Hood entry loss b) Branch loss c) Stack loss d) Elbow loss 	
	(7)	<p>If a room has a concentration of 50 ppm MEK, what will be the concentration after 1.5 room air changes?</p> <ul style="list-style-type: none"> a) 33.3 ppm b) 11 ppm c) 224 ppm d) 75 ppm 	
	(8)	<p>Doubling Diameter of a duct, approximately decreases the Velocity by</p> <ul style="list-style-type: none"> a) 50% b) 25% c) 100% d) None of the Above. 	
	(9)	<p>What will be the air flow when the velocity pressure is 1.1 inches water & the duct circumference is 56.25 inches?</p> <ul style="list-style-type: none"> a) 74000 cfm b) 4700 cfm c) 7400 cfm d) 740 cfm 	
	(10)	<p>What will be the VP in a 36 inch square duct with airflow of 6000 cfm?</p> <ul style="list-style-type: none"> a) 2.8" H₂O b) 0.28" H₂O c) 0.028" H₂O d) 0.0028" H₂O 	
	(11)	<p>A room (volume 1000 ft³) having a source of CO emission with 0.025 ft³/min. What dilution ventilation rate will be required to keep CO concentration at 50 ppm?</p> <ul style="list-style-type: none"> a) 500 ft³/min b) 1,500 ft³/min c) 1,000 ft³/min d) 2,000 ft³/min 	
	(12)	<p>ASHRAE _____, Ventilation for acceptable Indoor Air Quality</p> <ul style="list-style-type: none"> a) 62 b) 64 c) 32 	

		d) None	
Q.2		Attempt any eight of the following.	(16)
	(1)	What do we mean by Industrial Ventilation	
	(2)	What are the main functions of Ventilation Systems	
	(3)	Natural Ventilation	
	(4)	What are recommended Air Changes in Living room per hour.	
	(5)	Functions of Air Cleaning Device	
	(6)	What are factors affecting hood design	
	(7)	Vena Contracta	
	(8)	What are the ventilation system used in Laboratories.	
	(9)	Define Face Velocity	
	(10)	Expand HVAC	
Q. 3		Write short note on Purpose of Ventilation	(08)
		OR	
Q.3		What is IAQ ? What are common pollutants in Environment which effects IAQ	(08)
Q. 4		Explain with a picture Components of Local Exhaust Ventilation.	(08)
		OR	
Q. 4		Explain Ductwork Key design points	(08)
Q. 5		Why for Comfort Air Condition is required in context of HVAC	(08)
		OR	
Q. 5		Fire Fighters require good ventilation . True or False Justify	(08)
Q. 6		Fan Pressurization	(08)
		OR	
Q. 6		Explain Smoke Method of testing Ventilation System	(08)

THE CHARUTAR VIDYA MANDAL UNIVERSITY
MSc - INDUSTRIAL HYGIENE AND SAFETY – SEMESTER 2
SUMMER (REGULAR) 2022 EXAMINATION

**Course Title: HAZARD IDENTIFICATION, ASSESSMENT AND
CONTROL TECHNIQUES**

Course Code: 101360202

Total Printed Pages :02

Date: 05/05/2022

Time: 10.30 am/pm to 12.30 am/pm

Maximum Marks: 60

Instructions:

- Attempt all questions.
- Numbers to the right indicate full marks for each question.
- Make suitable assumptions wherever necessary.

Q. 1		Answer the following multiple choice questions.	(12)
	(1)	The unit of scheduled charge is... a. Man hours worked b. Man days worked c. Man hours lost d. Man days lost	
	(2)	The fatal accident should be reported to DISH within... a. 12 hours by any mode of communication b. 72 hours in Form 21 c. 24 hours by any mode of communication d. 12 hours in Form 21	
	(3)	The factual accident investigation can be had from... a. Occupier b. Factory Manager c. Immediate Supervisor d. Safety officer	
	(4)	The periodicity of Safety Report updation is... a. One year b. Two years c. Three years d. Five years	
	(5)	The maximum value of Safety Integrity Level is... 1. Two b. Four c. Six d. Eight	
	(6)	The mean value of PROBIT is... a. Three b. Five c. Seven d. Nine	
	(7)	The analogy of Loss Control Credit Factors is with... a. Offsetting values b. Failure modes c. Criticality d. Guide words	
	(8)	Process Safety Management OSHA Audit Protocol has... a. Six clauses b. Fourteen clauses c. Seven clauses d. Ten clauses	
	(9)	FTA and ETA are logically... a. Same b. Opposite c. Parallel d. Inclined	
	(10)	Reliability is probability of success for... a. Given period of time b. Given Operating Conditions c. Both d. None	
	(11)	Safety Rule is... a. Selection among alternatives b. Customary method c. Reallocation of resources d. plan cum control tool	
	(12)	Mortality Index represents... a. Toxic vulnerability b. Explosion vulnerability c. Fire vulnerability d. Probability unit analysis	
Q.2		Attempt any eight of the following.	(16)
	(1)	Give two significance of safety indices.	
	(2)	What is specific requirement for reporting accident related to electricity?	

	(3)	Name two accident investigation techniques.	
	(4)	Show accident classification as per IS:3786.	
	(5)	Differentiate Puff and Plume.	
	(6)	Give four points of second edition of IS:14489 on Safety Audit.	
	(7)	Comment on meanings of either HAZAN or PHA.	
	(8)	Name Quick Risk Assessment methods.	
	(9)	Expand the terms: CEPPR, ALARP	
	(10)	How standard operating procedure can be made safe operating procedure?	
Q. 3		Calculate FR, SR and IR for a factory having average 1000 employees, manhours worked in the year 2020 was 2000000. One injury was observed on 20.2.20 and that victim resumed duty on 2.3.20. Assume any data if required.	(08)
		OR	
Q.3		Why Accident Reporting and Investigation is necessary?	(08)
Q. 4		Design a worksheet for JSA.	(08)
		OR	
Q. 4		Write short note: Permit to Work system	(08)
Q. 5		Explain Vulnerability Analysis in detail.	(08)
		OR	
Q. 5		Write short note: HAZOP Guide Word Approach	(08)
Q. 6		Differentiate On-site Emergency and Off-site Emergency.	(08)
		OR	
Q. 6		Discuss Risk Acceptability Criteria.	(08)

Seat No. _____

Enrollment No. _____

THE CHARUTAR VIDYA MANDAL UNIVERSITY
 MASTER OF SCIENCE INDUSTRIAL HYGIENE AND SAFETY – SEMESTER II
 SUMMER (REGULAR) 2022 EXAMINATION

Course Title: PHYSICAL ASPECTS OF THE ENVIRONMENT

Course Code: 101360203

Total Printed Pages :2

Date: 06/05/2022

Time: 10.30 am to 12.30 pm

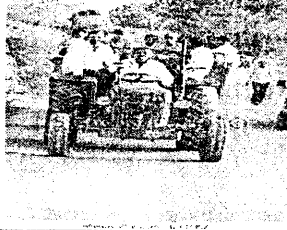
Maximum Marks: 60

Instructions:

- Attempt all questions.
- Numbers to the right indicate full marks for each question.
- Make suitable assumptions wherever necessary.

Q. 1	Answer the following multiple choice questions.		(12)
1)	Units for Sound Power, Sound Intensity & Sound Pressure are respectively:		
	a) Watts/m ² ; Watts & Pa		
	b) Watts/m ² ; Pa & Watts		
	c) Watts; Watts/m ² & Pa		
	d) Watts/m ² ; Watts & Pa		
2)	Given four hours of 90 dBA exposure, two hours of 95 dBA exposure & two hours of 85 dBA exposure, what is the % dose using the OSHA PEL?		
	a) 25% of PEL		
	b) 150% of PEL		
	c) 100 % of PEL		
	d) 125% of PEL		
3)	If sound pressure is 0.02 Pa, what is the sound pressure level?		
	a) 80 dB		
	b) 60 dB		
	c) 70 dB		
	d) None		
4)	A worker removes heat through sweating at a max rate of 47 kcal/hr against requirement of 1.5 kcal/min. What is the heat stress index?		
	a) 1.28		
	b) 3.19		
	c) 31.9		
	d) 128		
5)	What is the estimated Radiant heat load from a rotary dryer operating at a temp of 95 F & the air movement is 40 feet/min?		
	a) 4530 BTU/hr		
	b) 1230 BTU/hr		
	c) 6075 BTU/hr		

		d) None of the Above	
6)		What will be the max evaporative heat loss for a worker on a day with a temperature = 85 degree F; the wind speed = 11.33 feet per second & water vapor pressure = 32 mm Hg? a) 103 BTU/hr b) 6,180 BTU/hr c) 1,230 BTU/hr d) None of the Above	
(7)		Powered tools can cause _____ a) Strain b) Stress c) Vascular disorders d) Blood oozing	
(8)		Primary Raynaud's Phenomenon (Raynaud's Disease) identified in year _____ (A) 1862 (C) 1962 (B) 2020 (D) 1952	
(9)		Each body sub-system has a _____ frequency band (A) Hertz (C) Resonance (B) Transitive (D) Reflective	
(10)		Getting Sunlight may increase _____ levels (A) Vitamin A (C) Vitamin B (B) Vitamin D (D) Vitamin C	
(11)		The eye is most sensitive to damage by UV in the lower UVC band at _____ nm. (A) 90-100 (C) 550-750 (B) 265-275 (D) 120-130	
(12)		_____ radiation does not penetrate deep into the tissues but increases the risk of damage to the skin and eyes. (A) Non-ionising (C) Ionising (B) Gamma (D) X ray	
Q.2		Attempt any eight of the following.	(16)
(1)		What is noise mapping?	
(2)		Addition of Noise.	
(3)		Types of Vibration	
(4)		Raynaud's phenomenon	
(5)		Heat Stroke	
(6)		Acclimatization	
(7)		Write various sources of Radioactive waste	
(8)		Expand ALARA	
(9)		Heat Rash	
(10)		Metabolic Rate	
Q.3		Explain Noise Control in detail	(08)
		OR	
Q.3		Explain Human Response to Sound With a picture	(08)
Q.4		What major Hazard is exposed by the persons and discuss safe work practices to be employed for the driver shown in the image.	(08)



		OR	
Q. 4		A fettle uses three tools during a working day: 1. An angle grinder: 4m/s^2 for $2\frac{1}{2}$ hours 2. An angle cutter for 3m/s^2 for 1 hour 3. A chipping hammer 20m/s^2 for 15 minutes Calculate partial vibration exposures for the three tasks ,daily exposures and conclude.	(08)
Q. 5		Explain Heat Stress Control Measures.	(08)
		OR	
Q. 5		What is Heat Balancing equation and what significance Evaporative Cooling have.	(08)
Q. 6		Explain the disposal method of Low Level radioactive waste	(08)
		OR	
Q. 6		Draw the Electromagnetic Spectrum. What is the difference between non-ionizing radiation and ionizing radiation?	(08)

Seat No. _____

Enrollment No. _____

THE CHARUTAR VIDYA MANDAL UNIVERSITY
MSc - INDUSTRIAL HYGIENE AND SAFETY – SEMESTER 2
SUMMER (REGULAR) 2022 EXAMINATION

Course Title: SAFETY IN CHEMICAL INDUSTRY**Course Code: 101360204****Total Printed Pages :02****Date: 07/05/2022****Time: 10.30 am/pm to 12.30 am/pm****Maximum Marks: 60****Instructions:**

- Attempt all questions.
- Numbers to the right indicate full marks for each question.
- Make suitable assumptions wherever necessary.

Q. 1		Answer the following multiple choice questions.	(12)
	(1)	Which of the following is a surface corrosion? a. Granular b. Stress c. Selective leachate d. Crevice	
	(2)	Stability of chemical is decided based on... a. Flash Point b. TLV c. Adiabatic decomposition temp. d. Vapour density	
	(3)	Which of the following is the parameter to determine Chlorine dryness? a. Dew point b. Specific gravity c. AIT d. HAZCHEM	
	(4)	Which of the following is in use to show lay of under water pipeline? a. Tracer b. Floating Tracer c. Wrapping d. Colour code	
	(5)	Emergency Information Panel should be displayed at... a. Three sides of a vehicle b. Two sides of a vehicle c. Two places d. Three places	
	(6)	Which of the following test must be carried out twice to avoid error? a. DPT b. MPT c. Eddy current d. Percussion	
	(7)	Which of the following is a main parameter of for pressure vessel? a. Atmospheric pressure b. Gauge pressure c. Maximum working pressure d. Absolute pressure	
	(8)	IATA is used for... a. Road transport b. Sea Transport c. Air transport d. Rail transport	
	(9)	Reverse printing in EAC means... a. BA for fire only b. Full protection c. Contain d. Dilute	
	(10)	Ethylene oxide... a. Is SHC b. Storage requires magnetic float LI c. All of the above d. None	
	(11)	The best safety measure for Oleum spillage is... a. Sand b. Wet sand c. Dry sand d. Water	
	(12)	The periodicity of external examination for pressure vessel is... a. Annual b. Biannual c. Once in six months d. Once in a quarter	
Q.2		Attempt any eight of the following.	(16)
	(1)	Differentiate Fired and Unfired Pressure Vessel.	
	(2)	What is function of Transducer?	
	(3)	Enlist the factors contributing Corrosion.	
	(4)	Give two examples of NDT involving light.	
	(5)	Define Flash Point.	

	(6)	What is the purpose of colour band?	
	(7)	What are the qualifying criteria for a driver to transport hazardous goods?	
	(8)	Differentiate Unit Processes and Unit Operations.	
	(9)	Enlist four safety features of DCS control room.	
	(10)	Sketch various types of spheres used for storage of chemicals.	
Q. 3		Discuss Health Data of Material with suitable examples.	(08)
		OR	
Q.3		Sketch Instrumentation System Diagram for a Chemical Industry. Prepare a Process Flow Chart and write its importance.	(08)
Q. 4		Write Short Note on Safety in Laboratory.	(08)
		OR	
Q. 4		Write short note: Safety Considerations for Ammonia Tanking.	(08)
Q. 5		Explain pipeline colour code with its purpose and coverage.	(08)
		OR	
Q. 5		Enlist various safety documents, safety displays and safety equipment necessary for safe transportation of hazardous chemical by road.	(08)
Q. 6		What do you mean by NDT. Enlist various NDTs with their salient features, limitations and safety measures.	(08)
		OR	
Q. 6		Define Corrosion. Enlist various types of corrosion with industrial examples, location and safety measures to overcome it.	(08)

THE CHARUTAR VIDYA MANDAL UNIVERSITY
MASTER OF SCIENCE INDUSTRIAL HYGIENE AND SAFETY – SEMESTER II
SUMMER (REGULAR) 2022 EXAMINATION

Course Title: INDUSTRIAL VISITS AND SEMINARS

Course Code: 101360207

Total Printed Pages : 2

Date: 09/05/2022

Time: 10.30 am/pm to 12.30 am/pm

Maximum Marks: 60

Instructions:

- Attempt all questions.
- Numbers to the right indicate full marks for each question.
- Make suitable assumptions wherever necessary.

Q. 1		Answer the following multiple choice questions.	(12)
(1)		The firing of products were happening at _____ degree Celsius at RK industry Kanjari	
	(A)	2200	(C) 1200
	(B)	300	(D) 700
(2)		In the _____ process water is removed and cake is made.	
	(A)	Dewatering	(C) De tempering
	(B)	Glazing	(D) Extrusion
(3)		Dead Vs _____ resources	
	(A)	Dead	(C) Live
	(B)	Women	(D) Men
(4)		_____ is one of the factors that stimulates or influences job performance	
	(A)	Cultivation	(C) Motivation
	(B)	PPE	(D) Fencing
(5)		Compensation cannot bring the life back. Is it a _____ statement	
	(A)	False	(C) Doubtful
	(B)	True	(D) Null
(6)		Lack of inspection, supervision and training for safety is _____ issue	
	(A)	Government	(C) Worker
	(B)	Society	(D) Management
(7)		Five '_____'s of Accident Prevention	
	(A)	H	(C) E
	(B)	F	(D) M
(8)		Analysis of the Facts is necessary for avoiding _____	
	(A)	Eye contact	(C) Severity
	(B)	Trapping	(D) Accidents
(9)		Worry is _____ cause of Accident	
	(A)	Psychological	(C) Physiological
	(B)	Physical	(D) Environmental
(10)		Planning is the most fundamental and the _____ function	
	(A)	Third	(C) Second
	(B)	Fourth	(D) First
(11)		Managers should guide and counsel subordinates to win their confidence and trust. It shows _____ leadership skill	
	(A)	Good	(C) Poor
	(B)	Over Confident	(D) Underestimating
(12)		Rail, road is _____ to RK industry at Kanjari	

	(A)	Advantage	(C)	Disadvantage	
	(B)	No Road	(D)	Poorly connected	
Q.2	Attempt any eight of the following.				(16)
	(1)	Noise prevention in Traffic Junctions			
	(2)	Heat Strain			
	(3)	Fire Triangle			
	(4)	Noise Dose			
	(5)	Role of Safety Officer in Construction Industry			
	(6)	Tool Box Talk			
	(7)	Ball Milling			
	(8)	Safety Harness			
	(9)	Silicosis			
	(10)	Wet process of agate Industry			
Q. 3	Flow chart of Ceramic Industry at Kanjari. Explain it in detail				(08)
	OR				
Q.3	Industrial Hygiene monitoring in Foundry. Write Short note w.r.t Industrial Hygienist perspective				(08)
Q. 4	How Good housekeeping can best used in Foundry				(08)
	OR				
Q. 4	Best Methods for safety motivation				(08)
Q. 5	Explain the Fire Hydrant system with a clear picture				(08)
	OR				
Q. 5	Enlist various types of safety work permits practiced in. What are some specific important aspects for the Work at Height entry permit in Construction Industry ?				(08)
Q. 6	What are various PPE which can be used in Ceramic industry w.r.t specific processes.				(08)
	OR				
Q. 6	What are the duties of OH doctor.				(08)
