



PRINCE OF SONGKLA UNIVERSITY
FACULTY OF ENGINEERING

Midterm Examination : Semester 2

Academic Year : 2010

Date : 26 Dec 2010

Time : 9.00-12.00

Subject : 225-349 Safety and Environmental Engineering

Room : S817

คำสั่ง

1. ข้อสอบมีทั้งหมด 4 ส่วน ในกระดาษคำถาม 7.หน้า รวมหน้าปก (นับให้ครบก่อนลงมือทำ)
2. ห้ามการหยิบยืมสิ่งใด ๆ ทั้งสิ้น จากผู้อื่น ๆ เว้นแต่ผู้คุมสอบจะหยิบยืมให้
3. ห้ามนำส่วนใดส่วนหนึ่งของข้อสอบออกจากห้องสอบ
4. ผู้ที่ปฏิบัติเข้าข่ายทุจริตในการสอบ ตามประกาศคณะกรรมการศาสตร์ **มีโทษ คือ ปรับตกในรายวิชาที่ทุจริต และพักการเรียน 1 ภาคการศึกษา**
5. ให้ทำในกระดาษคำตอบเท่านั้น ตอบนอกกระดาษ คำตอบไม่มีคะแนน
6. เขียน ชื่อ **หรือรหัส** ในกระดาษคำตอบทุกหน้าก่อนเริ่มทำ เพื่อป้องกันความสับสน ในกรณีกระดาษคำตอบหลุดจากฉบับ
7. ให้นักศึกษาสามารถนำสิ่งต่อไปนี้เข้าห้องสอบได้
 - ตำรา หนังสือ กระดาษ A4 เขียนด้วยลายมือตนเอง 3 แผ่น

“ส่งกระดาษ A4 ทั้ง 3 แผ่นมาพร้อมกระดาษคำตอบด้วย”

 - นำ Dictionary และ เครื่องคิดเลข เข้าห้องสอบได้
8. ให้ทำข้อสอบโดยใช้ ดินสอ ปากกา

Question#	1	2	3	4	Total
Full score	10	10	30	10	60
Score					

ผู้ออกข้อสอบ ผศ.ดร.กลางเดือน โพนนา

Student name :code :

Part 1 Answer all questions. Please determine whether these following sentences are correct or incorrect. One point (1 point) will be given for the right answer. Minus half point (-0.5 point) will be given for the wrong answer. (Total 10 points)

Q no. 1.	Correct ✓	Incorrect x	Question
1			“What-if” analysis is normally used for identifying hazard that may occur in the complex production process such as chemical reaction unit or petrol chemical process.
2			ETA is the hazard identification tool that uses guideword to identify the occurred accident.
3			JSA is one of the safety management tools that can be used to define and control the hazards associated with a certain process, job or procedure.
4			The third domino according to the Domino Theory is “accident”.
5			Accident chain is sometimes called instead of the Domino Theory.
6			The accident which is caused by “Acts of God” - natural incident- is approximately 2%
7			The ratio of average days charged per accident is shortly named as ACD.
8			The cost of training employee about safety is classified as indirect cost.
9			HAZOP analysis is a systematic method for identifying potential accidents by using a set of Guide Words to each parameter for each section of the process.
10			ETA is used for determining the root cause of accident by using specific symbols such as “and” gate, “or” gate, etc.

RSW

Question 2 : From the following news, consider whether these situations are unsafe act and/or unsafe condition. Preventive action on each situation must be suggested. (5 points each, total 10 points)

#	News	Unsafe act	Unsafe condition	Preventive Action
1	Prompt action by a nurse saved the life of an elderly patient whose bed caught fire in the early hours of Wednesday while he was smoking in bed at Cairns Base Hospital in Queensland. The nurse and another patient sustained burns themselves rescuing the patient from his burning bed, 10 patients in all were evacuated.			
2	A fall from a forklift truck has killed a 51-year old worker at the Super-Dog Pet Food Company in Taunton, Maine. He was operating a stand-up forklift which collided with a vertical steel beam, pitching him off and inflicting fatal head injuries at the premises on Liberty and Union Industrial Park.			

Part 3: Answer these following questions. Each question has different score.(30 points)

1. According to the news below, answer the following questions. (10 points)

Accident News: At the Newport inquest into the deaths of 2 teenagers by carbon monoxide poisoning verdicts of accident death were returned. The Deputy Gwent coroner heard evidence that 1 of the 18-year olds had applied a modification to the portable heater being used in an outbuilding which depressed a malfunctioning button in order to maintain flame. Tests revealed that this modification by-passed a safety cut-out. An engineer conducting an examination of the heater, which had faulty burners emitting dangerous levels of CO, described it as being "in a poor state and with a malfunction", preventing adequate ventilation. It had been procured second-hand and had apparently lacked servicing within the 2 years of changing ownership.

1.1) What is the cause of the accident?

1.2) How can this accident be prevented?

Student name and code :(กรอกเฉพาะหน้าที่เป็นกระดาษคำตอบ)

2. Thongchai wants to work in a seafood canning factory in the south of Thailand. He is interested in 4 factories, which are A, B, C and D. The accident records of each factory in 2009 shown in the following table. Thongchai seriously concerns about his safety. He wants to select the most safety workplace. According to the factories' accident records, which factory should be recommended for Thongchai? Reason with **detail calculation** must be shown. (10 points)

Records	A	B	C	D
Total number of accidents	150	155	160	180
Total number of day charged	2850	2750	2600	2650
Total number of employees	500	450	390	420
Average working hours per employee per year	2400	2410	2450	2450

Student name and code :(กรอกเฉพาะหน้าที่เป็นกระดาษคำตอบ)

3. The accident occurred in the welding workshop last week. Mario was injured on his left hand figure. His figure got a minor burnt. The preliminary investigation was made. It was found that in his workshop he did not follow the instruction and he also did not wear any protection equipments. Please give advice according to 3E principle. (10 points)

Part 4. Answer questions in table “B” by using the words in table “A “ only. Some words can be used more than once. Some words may not be used. (1 point each, total 10 points)

Table “A”

BB	Aspect
CB	Customer audit
OHSAS	Policy
EIA	Impact
EMR	Surveillance
EMS	Internal audit
CAR	Environmental review
Plan	Corrective action
Do	Preventive action
Check	Seiton
Act	All of pipe
EMP	Calibration
ISO	Seiri
PP	End of pipe
PM	Self-discipline
IQA	NAC

Table “B”

No	Question	Answer
1	National organization which is responsible for accrediting certification body.	
2	The establishment of policy is a step of in PDCA process.	
3	The organization has a right to assess the conformity and effectiveness of management system of any organizations.	
4	The visit of the certification organization which shall be performed every year.	
5	Top management of the company shall establish the statement that gives direction of the organization’s development. This statement is called.....	
6	The organization that establishes ISC 14001 shall assess environmental aspects to find out whether their environmental aspects have significant impacts to the environment.	
7	The action which is taken after actual non-conformity is found.	
8	Positive work attitude.	
9	A place for everything. Everything is in its place.	
10	The second party audit.	

Asst. Prof. Dr. Klangduen Pochana.

 GOOD LUCK AND HAPPY NEW YEAR

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