H.S.E. QUESTIONNAIRE & ANSWERS

SAFETY STANDARS:

- **HELMET** **Z-89.1 (ANSI) 1981**
- **SAFETY GLASS** **Z-87+ (ANSI) 1968**
- **SAFETY HARNESS** **Z-359.1 (ANSI) & 10.4 ANSI**
- **SAFETY SHOES** **Z-47.1 (ANSI) 1967**
- **RESPIRATOR** **Z-88.2 (ANSI) 1992**
- **SAFETY ON SCAFFOLDING** **A-10.4 (ANSI)**

Safety is the control of hazards to obtain any acceptable level of risk, to perform a job properly and avoid incident and accidents at worksite…!!!

1.) WHAT IS METHOD OF STATEMENT?

It is the documents submitted by contractor to client, covering the general work procedure of a particular
Job in safe manners as per required standard.

2.) WHAT IS THE USE OF WMS?

We can plan and execute the work easily and safely, it also helps to know the codes and standards used
For each activity.

3.) WHAT IS JSA AND ITS USE?

Job safety analysis is the step by step analysis of a job to determine the safe working procedures
It includes the following steps.

a.) Watch the job being done
b.) Break the job down into steps
c.) Described the hazards in each step of task
d.) Identity the desired controls measures and
e.) Implement these counter measures in the job executions.

4.) WHAT IS WORK PERMIT?

Is a written document authorizing a person or a group to perform maintenance, inspections or Construction work.

5) HOW MANY TYPE OF PERMITS ARE USED?

- Hot work permit,
- Cold work permit,
- Confined space entry permit,
- Excavation permit,
- Lifting permit,
- Night work permit,
- Radiography permit,

Other permits as per job requirement.

6). What is Safety?

- Safety is a state where the Risk has been Eliminated or Reduced to an Acceptable Level.
- Control of Accidental Loss of Resources Human and Material

7). What is near-miss?

An undesirable event which has the potential to cause loss

8). WHAT IS CONFINED SPACE?

Any space having a limited means of access and egress, when subject to the hazards like deficiency of Oxygen, toxic or flammable gases or substances, dust etc.

9). WHAT IS THE OXYGEN LEVEL IN A CONFINED SPACE?

The Oxygen level in Confined space is 19.5% to 23.5%.

10). IN WHAT CIRCUMTANCES A CONFINED SPACE WORK PERMIT CAN BE ISSUED?

If properly ventilated, gas test reading are satisfactory, properly barricaded and warning signs are Posted, trained stand by man is present with log sheet, sufficient lightening and low voltage Electricity (24V-110V), proper means of communication, locked and tagged out if necessary, lifeline man retrieval System if necessary etc.

11). WHO IS CONFINED SPACE ATTENNDANT?

He is one who is aware of the confined space hazards and knows how to react if any thing goes wrong, able to maintain confined space entry log sheet etc.

12). WHAT ARE THE HAZARDS IN A CONFINED SPACE?

Oxygen Deficiency or Enrichment, presence of toxic or flammable gases, chemical hazards fire hazards
Fall of materials fall hazards electrocution dust sounds heat or cold caught in between moving Equipments engulfment etc.

13). WHAT ARE THE DUTIES OF A CONFINED SPACE ATTENDANT?

He is responsible for the safety of entrants, should be present whenever people are working in confined space, maintain update entry log sheet, maintain continuous communication with entrants and monitor conditions in the confined space to ensure a safe working atmosphere, prevent unauthorized personnel, initiate alarm for help if in need evacuate the entrants if conditions are not satisfying or in case of any general evacuation initiated contact rescue personnel if necessary etc.

14). GIVE SOME EXAMPLE OF A CONFINED SPACE?

Pipes, Vessels, Tanks, boilers, and Tube areas Silos Trenches and excavation deeper then 4feet sludge Pits Duct works etc.

15). NAME ONE HAZARDOUS JOB IN A CONFINED SPACE?

Welding Grinding Chemical Use of gas cutting sets erection of materials

16). WHO IS COMPETENT PERSONS?

Is one who is properly trained and authorized to perform a specific work in a safe manner competent person one who is capable of identifying existing predictable hazards and who has authority to make prompt corrective actions.

17). WHAT IS ACCIDENT?

Accident is uncontrolled events that results in undesirable consequences to personnel injury, illness of the assets damage or loss or to the environment.

An Undesirable event which causes harm to personal Damage to property.

18). WHAT IS A NEARMISS?

A Potential hazards, which has not yet caused an accident or an occurrence that did not results in but have the potentials to results in undesirable consequences to personnel illness injury and or to the assets damage loss or to the neighboring community and environment.

An Undesirable event which has the potential to cause loss.

19). WHO MAKES AN ACCIDENT REPORT?

Concerned area supervisor or site safety representatives.

20). WHO MAKES AN ACCIDENT INVESTIGATION REPORT?

A team of frontline supervisor, HSE manager sub contractor representatives if subcontractor personnel

Are injured high officials depending upon the severity of accident.

21). WHAT IS THE USED OF ACCIDENT REPORT?

To find out the root cause of accident makes recommendations to prevent re-occurrence and evaluate the effectiveness of emergency response.

22). WHAT IS WASTE MANAGEMENT?

Waste management means safely disposing the by-product of a process or a work to the environment after the proper treatment if necessary so that no threat for living properties and environment exists.

23). WHAT IS MSDS?

Materials safety data sheets is the documents prepared by the manufacturer giving product name producer address emergency contact phone number information of ingredients possible hazards

first aid measures precaution to be taken for storage and handling recommended PPE extinguisher physical and chemical properties etc.

24). WHAT IS ISOTOPE?

Isotope means one or more species of atoms having same atomic number but different mass number.

25). WHY IS ISOTOPE IS HAXARDOUS?

Isotope are hazardous because it emits uncontrolled energy in the form of radio active waves which is hazardous to all living things as it can destroy the living tissues that causes fatality or can convert it to cancer.

26). WHAT IS RADIOGRAPHI?

It is use for welding X-rays.
(If the wind velocity is up the 32 km or 20 miles then work should stop.)

27). WHAT IS RADIOACTIVITY?

Radioactivity is the spontaneous disintegration of atomic nucleus emits ALPHA particles BETA particles or GAMA rays or electromagnetic rays during this process.

28). WHAT IS THE UNIT FOR MEASURING THE RADIATIONS?

Micro sever or Mille Rem.

29). IN WHAT CONDITIONS A WORK PERMITS CAN BE ISSUED FOR RADIOGRAPHY?

The controlled area is calculated evacuated and barricaded with yellow black tapes warning signs a minimum of 4 no. and red or yellow flash lights.

30). WHAT ARE SAFETY MEASURES TO BE TAKEN WHILE DOING RADOIGRAPHY?

Ensure a competent person is surveying outside the barricaded areas with surveys meters. The crews are observing and following the safety precautions. The controlled areas is calculated evacuated and barricaded with yellow black warning signs a minimum of 4no.s and red or yellow flash lights.

31). WHAT IS THE CONTROLLED AREA?

Any area where the radiations dose is more that 0.75 MREM/h (7.5 Micro sever)

32). WHAT IS A GIEGER METER?

Is the instruments used to measure the radiations dose (Radiation Survey Meter)

33). WHAT IS THE USED OF FILM NADGE?

This badge is worn by the personnel who are exposed to radiation due their nature of duty and this is processed to calculate the received radiation dose of a person during the period normally 1 month of exposure.

34). WHAT IS DECAY CHART

Is the chart showing the change in the radioactivity of an Isotope by losing mass by decay in certain? Period at regular interval of time.

35) WHO IS AN AUTHORIZED EXPOSE PERSON?

He is one who got formal training in the use of sealed source and X-RAY equipment used in industry radiography.

36) WHAT ARE THE REQUIRMENTS OF A MAN BASKET?

It should be designed and fabricated according to standards have party certificates two guide ropes damage free lifting gears the load bearing capacity should be written on man basket shackles with cotter pin only to be used.

37) HOW SLINGS ARE INSPECTED?

All slings must be inspected before every use and periodically it should be inspected thoroughly and shall be rejected if found were one third of the original outside the diameter of outside individual wires serves corrosion distortion linking crushing bird caging broken wires.

38) THE TYPES OF CRANES?

- Mobile Crane
- Crawler Crane
- Tower Crane
- Over Head Crane

39) THE PARTS OFCRANE?

Boom,Slings,Shackie,Flyingjib,Antitwoblock,Outerrigger,Mainhoist,Auxillaryhoist,Pulley,Webslings,LMI(Load Movement Indicator).

40) WHAT ARE THE REQUIRMENTS OF A CRANE LIFTING?

Crane positions on firm and level ground with wood pads and steel plates. Outriggers are fully extended tires are off the ground. Certified operator and rigger are available safe load indicator is working the check list filled by competent persons.

41) WHAT IS WORK RADIUS?

Is the maximum distance where a certain activities for lifting or rigging jobs in progress.

42) WHAT IS SWL?

Safe Working Load is the maximum load that can apply to the lifting tool, safely

43) WHAT IS LIFTING PLAN?

Is the documents prepare for planning a critical lift by calculating and considering all factors which is going to effect the lift and there by selecting the correct tools and cranes and ensure the safe lifting procedure to be followed for the particular lift, which is used for lifting and what the safe factor is, where the load is lifted, where it is fitted, size and SWL of each lifting tool used JSA and load-chart are attached with it.

44) WHAT IS TANDUM LIFT?

A lift in wich two crane are used for Lifting is called Tandum Lifting.

45) What is excavation?

A man made cut, cavity, trench or depression formed by earth removal.

46) What is trench?

A narrow excavation, where the depth is greater than width

47) What is shoring?

A structure that supports the sides of an excavation and protects against cave-ins.

48) What is different between a flash back arrestor and a check valve?

A check valve allows flow in one direction only. This prevents oxygen reaching acetylene cylinder and acetylene reaching oxygen cylinder in the event of blockage in the torch or line or pressure variations.
But a flash back arrestor prevents reverse flow; stop the flow of flame from reaching the cylinder in the event of a flash back or the temperature exceeds a limit (220 degrees f.)

49) How many type of Fall Protection system?

(1) Guardrail system,
(2) Safety Net system.
(3)Personal Fall arrest system (BODY HARNESS)

50) What is the classis of fire and what type of fire extinguishers are used for them?

Class A. Ordinary combustible materials
Example: Wood, Cloth, Plastic, Rubber
Extinguisher- Water, DCP, Foam, CO2, Halon

Class B. Combustible liquids and gases.
Example: Gasoline, Diesel, Oil, Grease, Oil based paint, tar…
Extinguisher- CO2, Foam, DCP

Class C. Energized electrical equipment
Extinguisher - DCP, FM 200, Halon, Carbon dioxide.

Class D: Combustible metals

Example: Magnesium, Potassium, Zinc, Calcium, Titanium
Extinguisher- Metal x-type, Combustatible metal type

51) What is the responsibility of Fire Watch?

Fire watch is the person design to identify and eliminate fire hazards, alert and extinguish fire incase of any out break of fire and to protect the person and properties from a fire. He is the man to reach first in case of fire by keeping a close watch on such hazardous areas.

52) What is color coding system?

This system followed to inspect and insure the serviceability of tools, equipments periodically (normally it is monthly) like fire extinguishers, full body harness, lifting gears, electrical codes and power tools, etc. These things are inspected by competent person and are indicated by putting the color of particular month (this color is decided in advance and is being followed by all people at particular site). The items which are found defective or unserviceable will not be color coded and has to be removed from service.

53) Who can color code?

Competent person

54) What is the maximum distance between two adjacent accesses in a long excavation?

A ladder must be present within 25feet, of employees working in excavation.
In open excavation – At least every 30m on the perimeter, if less than 1.2m deep
- At every 7.5m on the perimeter, if more than 1.2m deep

55) When is an excavation considered as a confined space?

If depth is more than 1.2m

56) Who can erect scaffolding?

Certified scaffold

57) Who can inspect the components used for erecting a scaffold?

A competent and certified scaffolding supervisor

58) What is tag system?

A tag system is put on scaffolding, by a competent person, indicating the present condition whether it can be used and whether fall protection needed or not.
Red tag – Do not use (is being erected or dismantled)
Yellow tag – Can use with 100% fall protection (is incomplete or cannot be completed)
Green tag – Safe to use (scaffolding is complete)

59) Who can place a scaffold tag?

Competent person (scaffolding supervisor)

60) What are the details in a scaffold tag?

Location, Maximum loading capacity (kN/m2 or psf), Date erected and date inspected with foreman's name and signature.

61) In which condition a scaffold cannot be erected?

Extreme weather (strong wind, rain, ice), ground not stable, safe clearance (minimum 10 feet) can't be maintained with live wire, certified workers and supervisor are not available, permit not available.

62) What is the minimum overlapping of two adjacent planks in a platform?

Not less than 12 inches

63) What is a guard rail system?

A barrier consisting of top rail and med rails, toe board and vertical up right erected to prevent men and materials falling from an elevated work area.

64) What is a toe board?

Barrier secured along the sides and ends of a platform to guard falling of materials, tools, and other objects.

65) What is the minimum height of a toe-board?

Minimum 4 inches

66) What is the height of the top-rail from the platform?

38 inches to 45 inches

67) What are the requirements in placing an access ladder on a scaffold?

Provide access when scaffold platforms are more than 2 feet above or below a point of access. When using ladders, bottom rung must not be more than 24 inches high. Ladder to be at the correct angle (i.e. Feet out for every 4 feet in height) Ladders are to be tied at both sides not by the rungs. Make sure the ladder extends a safe distance (at least 90cm) above the landing stage. When the horizontal travel distance exceeds 15 meters provide at least two accesses. If the platform is longer, access shall be provided at every 30 meters. The ladder should be free from damage and should be color coded. All access ladders must be tagged.

68) In what circumstances fall protection system has to be used?

If the person could fall more than 1.8 meter then a fall protection system should be used. Example- Any activity at an elevation more than 1.8 meter such as erection, dismantling or maintenance of scaffolding pipes, equipments.

69) What is the minimum width required for a walk-way?

Minimum width of a walk-way is 18 inches.

70) What material's can be placed on a scaffold platform?

All types of construction materials which are used for particular construction activity can be kept on scaffolding platform but before keeping the materials and tools required for the work on the platform, we must ensure load bearing capacity of that scaffolding platform. The platform shall not be overloaded and shall be fitted with object protection system like toe board nets etc.

71) What are the requirements for working on a moving scaffold?

Mobile scaffolding shall be plumb, level and square. It shall be moved only by manually pushing or pulling the base. No men, equipment, or materials shall be on the working platform or elsewhere on the scaffolding while it is in motion. Castors shall be locked at all times except during scaffold movement. The temporary foundation or truck set on uneven ground for scaffold movement shall be level and properly secured. The height of the working platform shall not exceed 4 times of the minimum base dimension, if it exceeds this limit outriggers must be installed. A complete guard rail system must be provided. The scaffolding shall be inspected and tagged before use by a competent person.

72) When should we inspect scaffold?

Scaffolding shall be inspected and tagged after completing erection. Also before each work period or where they are altered, adjusted to rain or heavy winds. Thereafter the scaffolding shall be examined at least once in every seven days.

73) What is the angle to fixed the Ladder?

The angle of Ladder is 75deg or **¼.**

74) What is the space between the two ladder Rungs?

The gape or space is 12inch or 30cm.

75) With what color a ladder can be painted?

Aluminum ladders and wooden ladders shall not be painted.

76) What is a life-line?

Life line is component that consists of a flexible line that connects to an anchorage at one end to hang vertically or that connects to anchorages at both ends to stretch horizontally and which serves as a method to connect component of a personnel fall arrest system to the anchorage.

77) How can we calculate the safe anchorage of a life-line?

When life is used they shall be fastened to fixed safe points of anchorage capable of supporting 2300 kilos shall be independent, and shall be protected from sharp edges and abrasion. Safe anchorage points may include structural members (minimum 4 inches structural member or 4inces pipes) but do not include guard rails, vents, other small dia piping system, electrical conduit, outrigger beams or counter weights. It shall be maid from 10mm dia wire ropes. Horizontal lifelines shall be installed at the highest feasible point, preferable above shoulder height. This life lines shall be maintained with unloaded sag at the centre no longer than 30cm (12inches) for every 10meters of life line length between attachment points.

78) What is lock-out/tag-out system?

For servicing or maintenance of live equipments or pipe lines where the unexpected energizing or release of energy could cause of injury, lock and tag are place on the isolating device to avoid uncontrolled operation and give details of the lock-out schedule.

79) Abbreviation use for safety?

STARRT - Safety Task and Risk Reduction Talk
COSHH - Control of Substance Hazardous to Health
OSHA - Occupational Safety and Health Administration
CFR - Court of Federal Regulation
OHSAS - Occupational Health and Safety Assessment Series
ELCB - Earth Leakage Circuit Breaker
GFCI - Ground Fault Circuit Interrupter
BSI - British Standard Institute
SWL - Safe Working Load
ANSI - American National Standard Institute
LTI - Lost Time Incident
LMI - Load Movement Indicater
MSDS - Material Safety Data Sheet
TWA - Time Wated Average
STEL - Short Term Exposure Limit
ERP - Emergency Response Plan
ASTM - American Society for Testing and Material
JSA - Job Safety Analysis
LEL - Lower Explosive Limit
UEL - Upper Explosive Limit
PEL - Permissible Explosive Limit
REL - Recommended Exposure Limit
PSI - Pound per Square Inches (1 bar = 14.7 psi)
STEL - Short Term Exposure Limit
WBGT - Wet Bulb Globe Temperature
APR - Air Purifying Respirator
ASR - Air Supplying Respirator
SCBA - Self Contained Breathing Apparatus
RSO - Radiation Safety Officer
NFPA - National Fire Protection

80) What is the importance of a tool-box meeting?

The workers can be educated about safe work rules and procedures, and their awareness can be improved on some task.

81) What is an Emergency Evacuation Plan?

It is the procedure to provide concise guidelines for evacuation in case of some emergencies and to identify the emergencies in advance. This also helps us to plan and to define roles and responsibilities of all building custodian, fire wardens and occupants.

82) What is a hydro-test?

It is the test carried out for leak test for pipes, equipments etc, by filling water in these equipments and pipes with some pressure and its joints and connections are checked for ant leak or breakage.

83) What is a hypo-test?

It is the insulation leakage test done for high electrical cables, with high voltage merger.

84) What are the safety requirements for doing a hot work?

- Remove all combustible materials from the area (with in 10m), if possible.
- Use fire blanket to protect immovable combustible materials and also for welding slugs.
- Cover the area with fire blanket for containment of sparks generated while doing hot work.
- Provide proper fire extinguisher in sufficient numbers.
- Appoint a fire-watch with red jacket, if necessary.
- Barricade the area and post proper signage.
- Use of proper PPE and damage free
- Conduct gas test if presence of combustible gases expected prior to work.

85) What are the benefits of near-miss reporting?

To make analysis of the incident, in order to avoid re-occurrence.
To rectify the cause of those near misses before it turns into accidents.
To identify the deficiencies of site safety performances and find remedial actions.
To improve safety performances by reducing LTA's incidents and near misses.

86) What is a risk assessment?

Risk assessment is a method of estimating the rate of risk of an activity, by classifying actual and potential consequence and finding out mitigation actions to limit that risk.

87) In what situation "ear protection is needed"?

In the areas, where sound pollution is more than 85 dBA

88) What is the emergency evacuation procedure to follow in the event of a gas release?

Don't get panic on hearing alarm
Observe the direction of wind flow, proceed out in the cross wind direction to the plant boundary fence and then proceed up wind.
Obey further instructions from emergency response team.
Resume work after getting clearance only.

89) What is an "Assembly Muster Point "?

The area determined and marked, for assemble of people working the area in case of any emergency.

90) What is meant by "Head counting"? What is the purpose?

On hearing emergency alarm, all people have to assemble in "Assembly Muster Point".
There area supervisor will call his workers with attendance sheet and confirm that nobody is trapped in the site. This procedure is called head counting. Its purpose is to ensure all workers are present in the assembly area, they are safely evacuated and identify the person if anybody is trapped and take necessary actions to rescue these trapped workers.

91) What is heat stroke? What are the different stage through which a person undergoes before he gets heat stroke?

During hot days, due to dehydration, body temperature increases beyond safe limit, because of break down of body's heat regulating mechanism. Due to this the person collapses and if not taken care off he can even die. This is called heat stroke.
Generally pulse raises 20 beats per minute for each 1 degree C rise in temperature, heat cramps: Exercising in hot weather can lead to muscle cramps, because of brief imbalances in body salt.
Heat exhaustion: further losing of fluid and salt can lead to dizziness and weakness body temperature may rise up to 102 degree F.
Heat stroke: In some cases, extreme heat can upset body's thermostat, causing body temperature to rise to 105 degree F. or higher. Symptoms are lethargy, confusion and unconsciousness, heat stroke can kill.

92) How is the soil classified? What is the slope to be given for each type of soil while excavating?

The following is a short explanation of soil classifications. You should check the standard for detailed information regarding classifying soils

.Type A soils

- Cohesive soils that have an unconfined compressive strength of 1.5 tsf or greater.
- E.g., clay, salty clay, sandy clay & clay loam
  Type A soils cannot have or be subjected to the following:
- Fissures
- Subjection to vibration from traffic, pile driving or similar conditions
- Been previously disturbed
- Or if it has been subjected to other factors that would change it's classification

Type B soils

- Cohesive soils that have an unconfined compressive strength greater than 0.5 tsf but less than 1.5tsf
- E.g., angular gravel, silt, silt loam, sandy loam and previously disrobed soils except those which would be classified as Type C soil
- Also includes soils that meet some of the requirements of Type A soils but is fissured or subject to vibration; or dry rock that is not stable.

Type C soils

- Cohesive soils with an unconfined compressive strength of 0.5tsf or less
- E.g. granular soils including gravel, sand and loamy sand
- Also submerged soil or soil from which water is freely seeping or submerged rock that is not stable

  Stable rock
- A natural solid mineral material that can be excavated with vertical sides and will remain intact while exposed.

Maximum allowable slopes

- Stable rock: vertical (90degrees)
- Type A: ¾ :1 (53degrees)
- Type B 1:1 (45degreed)
- Type C : 1 ½ : 1 (34degrees)
- ½ : 1 (63 degrees) slope is allowed for only short term excavations that are 12feet deep or le

93) What are the precautions to be taken while handling and storing compressed cylinders?

1) Where cylinders are to be kept for an appreciable length of time should be provided to ensure that they cause no hazard to workers or public in the area.
2) Cylinders should be stored in a well ventilated area-preferable in open air but protected from the weather.
3) The store should be away from fire risks and source of heat and ignition. Nothing else should be stored in the area.
4) The cylinders should be stored upright on a firm level, well drained surface free from hollows and cavities. All long grass, weeds etc. should be removed.
5) Cylinders should be secured so as they are prevented from falling over, when in storage or use.
6) Cylinders should be segregated within the store according to type and weather full or empty.
7) Oxygen and oxidizing gases should be separated flammable gases by 6m or by a fire resistant partition.
8) No electrical apparatus should be installed within a cylinder store unless it is constructed to a suitable standard for the hazard.
9) No cylinder should be used in a storage area.
10) Appropriate warning signs “HIGHLY FLAMMABLE”. NO SMOKING”, “FULL/EMPTY” etc. should be displayed.
11) Suitable fire fighting apparatus should be situated adjacent to the store. Typically dry powder fire extinguishers. These should be inspected and maintained at intervals not exceeding 1 year.

12) Where cylinders area required to be stored in a compound this should be located not less than 3 meters from any building, site or public access road. The compound fence should be a minimum of 2 meters high, and it should have two means of escape, with the gates opening outwards.
13) Where it is necessary to take precautions vandalism or theft, suitable protection cages should be used.
14) Each cylinder should be adequate marked to include the manufacturer's mark and serial number, together with an indication of the specification to which the cylinder is constructed and its years of manufacture. A date of test and pressure test, together with weight of cylinder and the name of the product, should be displayed.
15)When gas cylinders are to be transported they should be protected from physical damage and the consequences of any leaks that may occur minimized
16)Move cylinders by hand in proper cylinder trolleys where the cylinder is secured in the trolley.
17)Take great care when lifting cylinders as they can be very heavy and awkward to handle.
18)Before moving any cylinders remove all attached equipment including regulators and safety cap must be provided.
19)The cylinders should be properly supported and secures within the vehicle so they cannot move during the journey. They should be totally within the vehicle and protected from impact.
20)The cylinders should be checked to ensure that the valves are closed and there are no leaks.
21)The vehicle should be equipped with a suitable fire extinguisher. Typically dry powder, minimum capacity 2kg.
22)There should be no smoking within the vehicle while crying cylinders.
23)The driver of the vehicle should be conversant with the load and have written information on the hazards and the action to be taken should any problems occur. The driver should also have training in the operation of the fire extinguisher and any other safety equipment carried.

94) What are the type of fire extinguishers commonly used and briefly, explain each one?

Multipurpose dry chemical, carbon dioxide, halon, wet chemical or foam, pressurized water are the commonly used fire extinguishers.

Multipurpose dry chemical / class "A", "B", or "C" fires.2.5-20lb. dry chemical (ammonium phosphate) pressurized to 10.5-18 bar by CO2 gas (8-25 seconds discharge time). Has pressure gauge to allow visual capacity check.5-20ft maximum effective range. Extinguisher by ***smothering*** burning materials

Smothering – Cut off oxygen / close the ventilation using fire extinguisher
Starving – Remove the fuel / remove the material going to burn
Cooling – Reduce the heat / use water

Carbon Dioxide – Class "B" or "C" fires 2.5-100lb. of CO2 gas at 150-200 psi (8-30seconds discharge time).
Has NO pressure gauge-capacity verified by weight 3-8 ft. maximum effective range.
Extinguisher by ***smothering*** burning materials, Effectiveness *decreases* as temperature of burning material increases.
Halon – Class "A","B", or "C" fires (smaller sizes ineffective against class "A"). 9-17 lb. Halon 1211 (pressurized liquid) releases as vapor (8-18 seconds discharge time). Has pressure gauge to allow visual capacity check 9-16 ft. maximum effective range. Works best in confined area – ideal for electronics fire due to lack of residue. Extinguishers by ***smothering*** burning materials, Fumes toxic if inhaled, Halon is ozone depleting chemical – production halted in Jan '94.

Wet Chemical or Foam – Class "A", "B" fires 1.5gal of stored pressure PRX wet chemical extinguishing agent (40 sec. discharge time) 10-12 ft. maximum effective range. On Class "K" fires, don't use until after fixed extinguishing system has activated, Extinguishes by ***cooling*** and forming foam blanket to prevent reigniting.

95) What is the formula for incident rate? $\frac{\text{Number of Record able injuries X 200,000}}{\text{Number of employees Hour Worked}}$

200,000 is the equivalent of 100 full time employees working for 40 hours per week or 50 weeks per year (OSHA guidelines)

96) What is First Aid and CPR?

Medical aid provide to a victim of an accident scene. This first aid is administered by trained nurse. CPR (Cardio Pulmonary Resuscitation) a first aid given to a person having heart blocked or chocked due to sudden shock.

FIRE

97) What is Fire?

Chain reaction of FUEL, HEAT, OXYGEN.

A) Fuel any material which can burn like Paper, Rubber, Wood, Oil, Lubricants, Gases, Metals like Phosphorous, Magnesium.
B) Heat or temperature at which the any fuel can ignite this depends on its flash point.
C) Oxygen which is helping in combustion and is present in the air.

98) How Fire can be extinguished?

Remove anyone of the above three elements of Fire. Fire will extinguished,

A) Remove the burning material, the remaining materials will be safe.
B) Cut off the Oxygen by blanketing with foam or Fire blanket or any other materials which can not burn the oxygen will be cut off and fire extinguished.
C) Remove or lessen the heat with water or use Carbon Dioxide fire cylinder. Never use Water for Electric Fire as water is good conductor of electricity and you will get electric shock if water is used for electric fire.

99) What common type of the fire extinguisher is used for fire?

ABC or Dry Chemical Powder Fire Extinguisher used for Solid, Liquid Gases and Electric Fire.

WORK PERMIT

100) What is a Work Permit?

A written document authorizing employees to carryout a work in a designated area on an equipment specifying the hazards, safety instructions and PPE required for work.

CONFINED SPACES

101)What is a Confined Space?

A vessel, column, tank, pit, trench which has limited entry and access and one can not stay inside for long time due to following factors.
Lack of fresh air or Oxygen, Heat, Fumes, Toxicity of storage Contents, Noise any other annoyance, causing disturbance in normal work.

102)What is (a) THLV (b) LEL (c) UEL?

Threshold Limit Value, Lower Explosive Limit, Upper Explosive Limit

103)What is ASPHYXIANTS?

Chemical gases which can cause suffocation by restricting the uptake of oxygen or by respiratory paralysis or by diluting / displacing oxygen below the levels needed by human body.

104) What is a SCBA?

Self Contained Breathing Apparatus, use in confined spaces or where oxygen deficiency exists or where concentration of toxics gases is harmful to humans.

105) What is toxic Material?

A material or substance which adversely effects body or organs.

106) What are Flammable and Combustible Liquids?

Liquids that give off enough vapors to form an ignitable mixture with air and produce a flame when a source of ignition is present.

107) What is MSDS?

Material Safety Data Sheet

108) What is a Risk Assessment/Hazard Identification Plan?

Identifying hazards and risk involve in a specific job and control measures required to eliminate them or bring them to minimum acceptable limit for the job to be done in safe manner

SCAFFOLD

Before erecting scaffolds assess the work area for existing and for potential future hazards which may impact on the work.

109) What are basic components of scaffolds?

a) Base Plate
b) Sill Boards
c) Screw Jack
d) Couplers
e) Vertical tubes or Bearer also called LEDGERS
f) Horizontal tubes or Ledgers also called STANDARDS
g) Transoms connected across the width
h) Hand rails mid rails
i) Toe Boards
j) Platforms
k) Ladder
l) Diagonal Bracings for stability

RIGGING

110) What are different types of slings used for lifting?

a) Wire rope slings
b) Synthetic/Nylon Webbings
c) Chain Slings

111) When a sling is considered unsafe for use?

1) 10 wire broken in one rope lay randomly distributed
2) 05 wires broken in one strand in one lay
3) 1/3rd of original diameter is scrapping or worn
4) Kink crushing, bird caging, or other damage or distortion of wire rope structure
5) Evidence of heat damage
6) End attachments that are cracked worn or damaged
7) Hooks open more than 15% of normal throat
8) Twisted more than 10 degrees from the plane

112) What safety measure are required for SAFE CRANE OPERATION

1) Crane is to be positioned on level ground
2) Outriggers fully extended
3) Mats to be used for stability
4) Crane radius of swing should be barricaded and no one to cross under the suspended load
5) Ensure clear of obstructions
6) Load chart available in the cabin
7) Qualified Operator and rigger to rig the loads
8) Only one rigger is authorized to signal the operator

9) Do not lift the load beyond the rated capacity of the crane
10) Wind speed not more than 20miles/hr or 32km/hr
11) Anti two block system working
12) Load monitoring indicator operational
13) Telescopic boom free moment
14) Operators cabin have clear view and not obstructed

PORTABLE ELECTRICAL TOOLS

114) Why this should be used with electric tools?

To protect the workers from shock in case of current leakage

115) What is the sign of a potable electric tool having double insulated?

(Double square)

116) Why tools having broken insulation must not be used?

To avoid possible electric shock

117) What is meager test?

The insulation break down test is known as meager test

118) Why meager test is necessary for electric tools?

A tool having subjected to harsh use at site needs to be tested for insulation break down to avoid possible electric shock.

119) Why dead man switch should be used on electric tools?

To cut off the power supply to the tool in emergency

120) Why Safety Training is required?

To make the employees familiar with the hazards associated with their work safety orientation and some other trainings is required, also special craft training is required before start of work, safety assessment risk assessment for potential hazards is essential which covers the general hazards and specific hazards associated to the work being undertaken and the control measures applied to eliminate or minimize the potential of harm to the employees, therefore emphasis of accidental loss of resources (Men and Materials) to reduce the direct and indirect costs and loss time delays due to interruptions providing safe and friendly environment for timely completion of projects therefore imparting plays an important role in loss control and it is an idea sound business to have safety culture prevailing on the construction sites.

121) What is LOTO?

Lock out tag out, to lock out specific breakers are used for the maintenance of all equipments

122) What is GFCI?

Ground Fault Circuit Interrupter

123) What is Excavation and Ditches?

Digging of land with Machine or with men

124) What is Confined Space?

Space heaving a limited entrance or egress but that is large enough to bodily entrance and performed the work, i.e.

1) Pits sumps
2) Vessels
3) Boilers
4) Tanks Sewers
5) D-Excavations

Hazards

A) High Temperature
B) High Noise
C) Fall from Elevation
D) Sleeping
E) Oxygen deficiency

125) What are the scaffoldings and its kinds and it's Consists?

It is temporary platform

Kinds

A) System Scaffolding
B) Under Hang Scaffoldings
C) Mobile Scaffolding
D) Bract Scaffolding
E) Tower Scaffolding
F) Tube and Copular scaffolding

Scaffolding Consists

A) Sole Boards
B) Base Plates
C) Posts
D) Ledgers
E) Couplers
   1. Right angle couplers
   2. Right angle Double couplers
   3. End to End Couplers
   4. Adjustable Couplers

5. Girder Couplers

F) Top rail

G) Mid rail

1. Should be in between top rail and toe boards

H) Toe Board

1. Distance between toe board to top rail should be 38 to 43 inches

I) Bracings

1. Zigzag bracings
2. Transverse bracings
3. Longitudinal bracings and cross bracings

126) What is KENAPI?

To Safe Workers from falling objects we can use KENAPI nets and catch plate forms.

127) Which Permit is use for Vehicles?

Hot Work Permit

128) What is Risk Assessment?

Simply we can defined it with

- ❖ What can go wrong
- ❖ What can cause its going wrong
- ❖ What can we do to prevent it from going wrong

129) What is Evocation?

- ❖ Stop the work and switch off equipment and proceed to nearest assembly ground
- ❖ Always walk against wind direction
- ❖ If you driving a vehicle, stop on road side switch off engine and proceed to assembly area and let the key should inside the ignition point.
- ❖ Head count will taken by Safety Officer in assembly area.
- ❖ Do not come to work tell all clear alarm sounds.

130) How many types of accident in construction area?

1. Fatality case
2. Last work day case
3. Restricted work case
4. Medical treatment case
5. First aid case
6. Near miss Incident

- ❖ An incident, which could cause property damage or personal injury and if we will not stop near miss incidents then can happen an accident.

131) What is Toolbox Talks?

Awareness about work situation to the employee is called toolbox talk
A development of safety bricfings and deal with special issues at the workplace.

132) What is DBA?

The frequency of noise at which we should use ear plug or muffs is 85DBA.

- DBA Decibel at scale A

133) What are LEL and UEL?

- Lower Explosive Limit
- Upper Explosive Limit

Level of Flammable gases or toxic gasses should be zero
Level of Oxygen should be in between 19.5 – 23.5 in volume

134) How many scaffolding tags used in scaffolding?

- Green tag - Scaffolding is safe to work
- Yellow - Use full body harness is required with double Lyn yard
- Red tag - Means scaffolding is unsafe or not able to use (only scaffolder can work)

Note: Safety Harness can bear the weight 2450kg

135) What are the precautions for Welding?

- Hot work permit is required
- Area should be barricaded and warning signage should be placed
- Area should be clean at least 8 meters (free from combustible materials)
- Fire extinguisher and fire blankets should be available
- Trained fire watch man should be available
- Fire water drum should be available

Note: Welder must use complete PPE's (Welding Helmet, Gloves and Long sleeves shirt)

SAFETY DEFINATIONS

136) Safety

Safety is a state where risk has been eliminated or reduced to an acceptable level

137) Fire

Fire is a chemical reaction involving rapid oxidation or burning of a fuel. It needs three elements to occur

138) Fuel

Fuel can be any combustible material – solid, liquid, or gas. Most solids and liquids become a

139) Oxygen

Oxygen the air we breathe is about 21 percent oxygen. Fire only needs an atmosphere with at least 16 percent oxygen.

140)Heat

Heat is the energy necessary to increase the temperature of the fuel to a point where sufficient vapors are given off for ignition to occur.

142)Flash Point

Flash Point is the lowest temperature at which a fuel produces enough vapors to ignite in the presence of a heat source.

143) Dust
Dust consists of solid particles and is created by such operations as grinding or sieving of solid materials, controlled detonations and various drying processes.

144) Fumes
Fumes are finely particulate solids which are created by condensation from a vapor, very often after a metal has been converted to the molten state. Fumes are usually highly toxic.

145) Gases
Gas is the formless chemical which occupies the area in which it is enclosed. There are many toxic gases used in industry, such as chlorine.

146) Mist
Mist consists of finely suspended droplets formed by condensation from a gas or the atomizing of a liquid or from aerosols.

147) Vapors
Vapors are the gaseous form of a solid or a liquid, rise in temperature causes the vaporization. Examples are organic solvent vapors'.

148) Liquid
Liquid is a typical example of a liquid, Can be in other forms as droplets or aerosols.

149) Very Toxic
Substances and preparations which in very low quantities cause death or acute or chronic damage to health when inhaled swallowed or absorbed via the skin.

150) Toxic
Toxic substances and preparation that in low quantities cause death or acute or chronic damage to health when inhaled swallowed or absorbed via the skin.

151) Corrosive
Corrosive is substances and preparations that may on contact destroy living tissues.

152) Density
The density of a material is defined as the mass of one cubic meter of material
DENSITY = MASS/VOLUME

153) Specific Gravity
We can therefore say that any liquid that will not dissolve (not miscible) in water, with a specific gravity higher than 1, will sink, whilst those with a specific gravity lower than 1 will float on top. For example:
1m3 of water (1000 liters) weights 1000kg
1m3 of aviation gasoline (1000 liters) weight 720 kgs

154) Heat
Heat is a form of energy. Heat can be produced by chemical means, e.g., by burning aviation fuel or by mechanical means, by fiction. Passing electric current through a resistor also produces heat as in an electric fire.

155) Element
Substances that consist of only one type of atom are known as elements. EX. CARBON

156) Molecules
If an element consists of more than one of the same type of atom, chemically bound together, it is known as a molecule. EX. OXYGEN, The term molecule can also be used to describe a substance that is made up of more than one type of atom, water is example.

157) Compound
A mixture is a term used to describe a substance that is made up of more than one type of molecule. EX. WATER

158) Combustion
Combustion is a chemical process. For it to occur, oxygen, usually from the air, must combine with a fuel. A fuel is any substance that will burn and may be in any one of the three states, solid, liquid or gas. EX. SMOLDING OR FLAMING

Flammability Limits:

Flammability Limit (% Fuel/Air by volume)		
GAS	**LOWER LIMIT**	**UPPER LIMIT**
Hydrogen	**4**	**75**
Carbon Monoxide	**12.5**	**74.2**
Methane	**5**	**15**
Butane	**1.5**	**9**
Ethylene	**2.7**	**28.6**
Acetylene	**5.5**	**80**

159) Organization Culture
Shop floor representatives, supervisors and managers who meet to discuss general health and safety matters affecting the company

160)Attitude
A person's point of view, or their way of looking at something.

161) Mistakes or Errors
Doing the wrong thing, believing it to be right

162)Influence of peer group
A peer group is a group of individuals of a similar age or background with whom a person mixes in a social context.

163)Work place group
The workplace group is such a group and we behave in accordance with the collective, accepted behavior of the group.

164)Communication
Communication is defined as, imparting, conveying or exchanging information, ideas or opinion by the use of speech, written, or graphics.

165)Written communication
Written a postal service or a notice board

166) Oral or Verbal (SPOKEN) Communication
Oral or Verbal (spoken) a personal interview or telephone system

167) Notices, Posters, Films
Used to draw attention to hazards and risks or safe practices and measures, need to be 'eye catching' and relevant.

168) Tool Box Talks
A development of safety briefings and deal with specific issues at the workplace

169) Employee Hand Book:
Key document laying out company policy and certain procedures, Effective as part of induction training

170) Investigation
The purpose of an investigation is primarily to find the cause, with the intention of preventing a recurrence, rather than to blame

171) Reactive Monitoring
Reactive Monitoring, which is used in the investigation of accidents, incidents or dangerous occurrences-**After**

172) Proactive Monitoring
Pro-active monitoring, which involves checking that standards, practices, procedures and system are being complied with. **Before**

173) Maintenance Inspections
Inspections involve examining, testing and making repairs/adjustments to such items, often specified by the manufacturer or supplier.

174) Safety Inspection
A formal inspection by a team of inspectors who go round an area or section of work to check on standards; e.g floor condition, HK, warning signs, fire equipment

175) Safety Survey
An in-depth examination of specific procedures such as the introduction of new equipment, or investigating a rise in accident or incident rate

176) Chemical Hazard
Liquids, dusts, fumes, mists

177) Biological Hazards
Exposure to bacteria, viruses and fungi

178) Physical Hazard
Mechanical, noise, radiation, heat etc. also includes ergonomic factors

179) Psychological Hazards
Refers to mental stress

180) Safe Work System
A safe system of work is: a formal procedure which results from systematic examination of a task in order to identify all the hazards

181) Permit to Work
A permit to work can be described as: **A formal document giving written authority to carry out specific work.'**

182) Hot Work
Any work that increases the risk of fire and explosion by the introduction of an ignition source, such as welding, flame cutting, use of electrical equipment may be subject to a permit to work system.

183) First Aid
First aid is the immediate care given to victims of an accident or illness before qualified medical assistance arrives

184) Crushing
Crushing is where the body or part of the body is caught between two moving parts of the machine or between moving and static objects such that they meet together.

185) Shearing
Shearing is where two parts of the machine are moving together to a situation where one moves over the top of the other.

186) Cutting and Severing
Cutting and Severing is where a sharp-edged part of the machinery comes in contact with the person. As implied, it is a similar effect to what happens when someone cuts himself with a knife.

187) Entanglement
Entanglement is associated with a single rotating part of a machine. Usually an item of clothing gets caught on the rotating part and the person is draw rapidly to the machine.

188) Drawing or Trapping
Drawing in or Trapping is where the body is caught between two moving parts and drawn into machine.

189) Impact
Impact is where a powered part of the machine hits the person.

190) Stabbing or Punctured
Stabbing or Puncture is caused by some sharp part of the machine or process penetrating the person.

191) Friction or Abrasion
Friction or Abrasion is caused by coming into contact with a fast moving surface.

192) Fixed Guard
These are guards with no moving parts designed to prevent access by enclosing the hazard. Typically, a fixed guard will required a tool, such as a spanner or screwdriver, to remove it.

193) Risk
Risk can be defined as the likelihood that the harm from a particular hazard will happen. Risk reflects both the likelihood and severity of the harm.

Risk = LIKELY HOOD X SEVERITY

194) Risk Assessment
A planned layout of the workplace is essential if a safe place of work is to be provided.

195) Objectives of Risk Assessment
We can identify three main reasons for assessing and managing risk.

196) Moral
Moral reasons are based on the concept of preventing people being hurt or becoming ill.

197) Legal
Employers have a legal duty to protect their employees.

198) Economic
Accidents and ill-health costs can be high in terms of sick pay, lost production, replacing damaged equipment etc.

199) Damage Only
An incident that does not result in injury but property or equipment may be damaged.

200) Health
Examples of illnesses that are reportable are poisonings, skin and lung disease, infections and occupational cancer.

201) Danger Occurrence
Non-injury incidents where there is serious potential for injury, such as a collapsing scaffold.

INCIDENT AND ACCIDENT RATIO:

Probability	No. of accidents resulting in serious injury / Total number of accident
Frequency Rate	No. of lost time accidents x 100,000 / Number of man-hour worked
Severity Rate	Total number of days lost x 1,000 / Total number of man-hours worked
Risk	Frequency (likelihood) x Severity

202) Health Risk Hazard
Acute – Causing immediate ill-health after one exposure
Chronic – Causing ill-health after long term exposure

203) Flammable Gasses
Flammable Gases - such as methane (marsh gas) and carbon monoxide **Toxic gases** such as hydrogen sulphide

204) Battering
Allows almost any excavation to be carried out safely without the need for a support system

205) Shoring
Shoring is artificial support for the side walls of an excavation.

206) Health
Health includes material as well as physical health and relates to the protection of people, weather they are employees, contractors or visitors, from harm.

207) Biological Hazard
Biological hazards relate mainly to illness contracted from exposure to bacteria, viruses and fungi.

208) Welfare
Welfare is concerned with the well-being and comfort of, primarily, employees.

209) Environmental Protection
Environmental protection relates to issues such as lighting, noise, heat, etc.

210) Incident
Events that give to accidents or have the potential to lead to an accident.

211) Accident
Accidents are undesired and unplanned events. They may cause personal injury or property damage or both.

212) Dangerous Occurrence
An event or situation that could harm employees at work, in such a way that there is a legal requirement to report it

213) Near Miss
Any form of incident which could result in injury or loss but does not.

Psychological Problems
Psychological problems are diseases or injuries caused by exposure to dangerous substances or practices.

215) Psychological Problems
Psychological Problems are stress related and be due to traumatic events or exposure to workplace pressures.

216) Hazard
A hazard can be defined as a situation with the potential to cause harm or danger.

217) Harmful
Harmful-substances and preparations that may death or acute or chronic damage to health when inhaled swallowed or absorbed through the skin.

218) Chemical
Chemical health hazards may be divided into the following groups.

219) Carcinogenic

Substances and preparations which if inhaled or ingested or absorbed by the skin may induce cancer or increase its incidence

220) Irritant
Non-corrosive substances and preparations which through immediate, prolonged or repeated contact with the skin or mucous membrane may cause inflammation

221) Sensitizing
A substance or preparation that may cause an allergic reaction

222) Acute Toxicity
This describes a condition where the quality of a toxic substance absorbed into the body process harmful effects very quickly, i.e. within seconds, minutes or hour.

223) Chronic Toxicity
The term chronic toxicity describes a condition where the harmful effects of a toxic substance absorbed into the body take a very long time to appear-months or perhaps years.

224) Ammonia
A colorless gas with a pungent odor, soluble in water, a strong respiratory irritant and corrosive substance, either as a gas or when combined with water as a liquid, entry is by inhalation into the lungs or absorption through the eyes or the skin

225) Chlorine
The basic ingredient of mustard gas but is also used in cleaning swimming baths and in chlorine tanks, the immediate effect is choking, but it may also damage the lining of the lungs

226) Carbon Monoxide
Carbon Monoxide (CO) is a colorless, odorless, tasteless gas. It is found in combustion gases such as coal gas, car exhaust, producer gas, blast-furnace gas and water gas.

227) Isocyanides
Used to make adhesives, synthetic rubber, polyurethane paints and lacquers, and quick-drying printing inks, the most important industrial applications are in the manufacture of plastics and paints to make them harden quicker.

228) Asbestos
Previously used as an insulation and fire-resistant material in building construction, it was also a common friction lining in machinery (brakes, clutch plates, etc.

229) Silica
Silica is a naturally occurring element present in many and stones, particularly sandstone, quartz and slate. It is a high toxic irritant when inhaled as a dust and can cause numerous chest and respiratory tract diseases.

230) Laptospira
Rats are the primary cause of the disease (Confined Space).

231) Hepatitis
Hepatitis is a virus causing similar symptoms to weil's deases-fever, jaundice, enlargement of the lever, hemorrhages and feverish relapses. It is contracted primarily through injection, although ingestion of infected substances may also be a route of entry.

232) Local Exhaust Ventilation
Local exhaust ventilation operates by removing a contaminant at the point of generation and ducting it away in a flow to a safe place

233) Respirators
Respirators, which are designed to purify desirable air by inhaling it through a medium which removes the contaminants

234) Breathing Apparatus
Breathing apparatus, which supplies pure desirable air from an uncontaminated source

235) Basic Environmental issues
Pollution is the contamination or damage caused by human activity to the environment, it arise in respect of three aspects of the environment

236) Atmospheric Pollution
Fumes, smoke and dust discharged into the air from incinerators, traffic exhausts or other by-products of industrial processes

237) Water Pollution
Liquid waste (effluent) comprising toxic substances such as detergents discharged into ground water, rivers or sea water directly from sewers, factories or surrounding land (such as fertilizers being washed away from farm land by the rain).

238) Land Pollution
Solid waste from industrial processes deposits on land

239)Integrated Pollution Control (IPC)
Is a system established, under part of the EPA, to control the release of polluting substances to air, land and water by industries?

240) Control Waste
Controlled waste-defined as household, industrial and commercial waste or any substance which is scrap or is effluent or unwanted surplus from a process

241) Special Waste
Special waste defined a waste which may be so dangerous or difficult to treat, keep or dispose of that special provision is required for dealing with it

242) Independent Scaffold
An independent tied scaffold is designed to carry its own mass and the full load of all materials and workers used on the scaffold

Thank You and Best Regards!!!

"Let us protect the People, the Environment and the Equipments!!!"