

to activity kebethe hai.

TELERAD

Tube - 1 (~~2~~) GM Tube (Geiger Muller Tube)

Detected at - Gamma, X-ray, Beta

Battery - 1.5 volt (5 Nos) (40 hours to 100 hrs)

Extend at - 04 meter.

Detector - 2 type (D1, D2)

Switch - ON or Auto OFF

MINIRAD INTERNAL SURVEY METER

Principle - Gas Fill Detector.

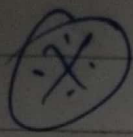
Battery - 5 Nos (AA size, 1.5 volt) (60 hours worked)

Detected - Beta, Gamma, X Ray

Tube - GM Tube (Geiger Muller Tube)

Maximum Range - Gamma and X-ray 50 MR/h

Maximum Range - Beta 54000 CPM (Count per Minute)



- PM Tube Principle - Ventilation Detector. (A Photo ~~photo~~ Multiple)
- GM Tube Principle - Gas fill Detector (Gieger Muller)

(Equipment) ★

MINIRAD SURVEY METER EXTERNAL

- No Tube inside on detector.
- This is personnel Monitoring Equipment.
- GM Tube out side (Gieger Muller Tube)
- Principle Gas fill Detector
- Battery 05 Nos (1.5 volt)

(Equipment) ★

MINIRAD SURVEY METER STANDARD

- Not detected beta
- only detected Gamma and x-ray
- Battery 05 Nos (1.5 volt)
- GM Tube Detected (Gieger Muller Tube)
- Gas filled Detector - principle
- Maximum Range 5 R/hr



2 protons & neutrons is called Alpha particles.

ALSCIN MONITOR

- Purpose - Detected Alpha Particles.
- Reading - CPS / PPS (Count per Second, Particle per Second)
- Principal - Scintillator Detector (PM Tube (photo multiplier tube))
- Display - 04 Digit (9999)
- Working time - 1 min (Automode)
Continuous (manual)
- Battery - R 14 size 05 Nos (1.5 x 5)
- Detected - ZnS (Zinc Sulphat)

Types of Principles in Detectors :-

- 3 types
- 1) Gas fill detector
 - 2) Scintillator detector
 - 3) Semi Conductor detector.

Pocket Dosimeter (Semi Conductor principle)

- TLD - Turbo Lumination Dosimeter.
- pocket Dosimeter detected in dose.
- digit 999999 = 11SV = 15V

MICRO-R SURVEY METER ^(Radiation)

• Detected at Gamma radiations

Measure Exposure : micro (μ) unit

Detection : Gamma

Display : Analogue Panel

Principle : Scintillation

Radiation Type : Background Radiation (2-10 μ R/h 15 μ R/h)

Detection Tube : PMT (Photo multiplier Tube)

Battery : 1.5V x 6 Nos = 9 volt (High volt check (HV), Battery check (BAT))

Minimum Reading : 0.5μ R/h = 0.5μ R x 1 = 0.5 μ R/h

Maximum Reading : $20 \times 10,000 = 200,000 \mu$ R/h = 200 MR/h = 0.2 R/h

Reading : Scale x Range = Final Reading.



★ SBS - Smart Bio Sensor

- Detected in - Bio Agents (less than 2 minutes)
- Principle - PCR and Anti body Screening Technologies.

Q. Which bacteria is Botulinum?

Ans: Clostridium Botulinum.

• PCR Full form :-

Polimerase Chain Reaction.

• Technical Data :-

- Fast Response Classifier (2 minutes)
- Small
- Light
- Low Power
- Detects broad threat classes
- Dry Air Intake.

• Alarm System 2 types :

- LED Light
- Audio

ANTHRAX	- Bacteria
EBOLA	- Virus

• 2 Coupons (1st - 6 hole, 2nd - 4 hole)

2nd Coupons - Virus, Bacteria, Spores detected.
 1st Coupons - Toxins detected.

30/12
*
equipment

BIO SEEQ PLUS

- Principle - Late PCR (Linear After the Exponential Polymerase chain Reaction).
- Cartridges - 6 colours
 - Red - Anthrax px01 (Bacteria)
 - Orange - Anthrax px02 (Bacteria)
 - White - Tularemia Assay
 - Black - Plague Assay
 - Yellow - Orthopox Assay (Virus)
 - Blue - Training Assay

• Specification :-

Detection Principle - Mo.
 Used from - 4°C to 37°C
 Stored room temp - 27°C

• STEL :-

Short Term Exposure Limit.

• IDLH :-

Immediate Danger to Life and Health.

• OEL :-

Occupational Exposure Limit (of 11uf) 2.96M

identifies Bio Agent with In - 0.5 - 40

(Equipment)

★ FIRST AID KIT TYPE - A

Total number of items - 11

Sl. No	Name of items	Qty	Code	Use
1)	Decontamination kit	A-20gms	PDK-1	
		1 - 80gm	PDK-2	Yellow - Palm chloride
2	Auto Injectors	06 Nos	3 yellow 3 Red	Red - Antoprin (Nerve Agent)
3,	T.C.D.P (Three colour Detection Paper)	10 paper		Detected in 2 Agents.
4	Inhaler			- Choking agent / Lung Agent
5	Amyl Nitrate.			- Blood Agent
6	Dressing	02 Nos		
7	Ointment (skin, eye)	2 types	5 gm	Neosprin - chemical burn / Blister Agent → skin
8	Paracetamol Tablets			Fever, pain Body.
9	CODEINE Tablet			Dry Cough
10	Amphillicin Anti-biotic Tablets			
11	Eye Ointments			chloramphenicol and Hydro cortisone.

• PDK full form :-

Personnel Decontamination Kit.

• PDK-1 -

multan mitti or fullers Earth

(Equipment)

★ PERSONNEL DOSIMETER TLD (Thermo Luminescent Dosimeter) AND DRD (Direct Reading Dosimeter)

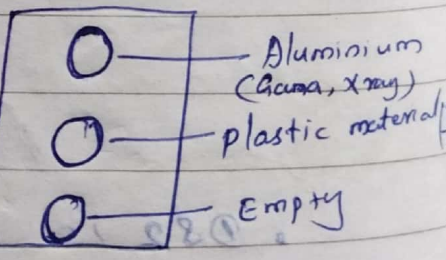
- Detected at - External Radiation monitoring
- TLD - off-site equipment
- DRD - ON-site equipment

• Dose per year :-

Employees 1 year - 20 msv/year
 Rescuer 1 year - 30 msv/year

• Also Monitor - Zinc Sulphate

• metal of TLD - CaSO4 Calcium Sulphate. (CaSO4 mixed in the Tef)



• Principle - Scintillation

• Range - 10 MR/hr - 10000000 MR/hr

• Windows :- (3 windows)

- i) Aluminium + copper window (only Gamma stored)
- ii) Perspex window (high Energy Beta + Gamma stored)
- iii) Open window (High and Low Energy Beta and Gamma)

★ DRD (Direct Reading Dosimeter) (Pocket Dosimeter)

- it is Electronic Dosimeter.

Battery : Lithium (2450)

Max. Reading : 999999 μ Sv

Principle - Semi Conductor.

• Pocket Dosimeter Principle :

Gold leaf Electroscopic

Range : 50 mR - 5 mR

Electric Dosimeter



★ RESIDUAL VAPOUR DETECTION KIT (RVD)

- Chemical warfare Agent Detector.

- it is on-site equipment.

• Detected Toxic gas - 0.01 mg/L

• Sulphur mustard and Nerve Agent - 0.005 / 0.00004 mg/L

• Detector Tubes - 06 Tests.

1) Ammonia (2 times Sucking) (blue) (CK)

2) Cyanogen Chloride (20 times) (Pink) (CK)

3) Hydrogen Cyanide (20 times) (Red) (AC)

4) Sulphur Mustard (20 times) (Blue) (H) (CK)

5) Nerve Agent (20 times) (Blue) (GA, GB, GD, VX)

6) Phosgene (20 times) (Red) (CG)

BASICS OF SAMPLE COLLECTION / SAMPLING KIT

• Item Names

- (Red colour) 1) Micropipette (Liquid Sample Collecting - 200 microliters & 1000 microliters)
- (Green colour) 2) Suction Pump / pipette (Gases form Collecting)
- 3) Teflon Tube (Deep area se liquid Collecting)
- 4) Spatula 6" (Spoon - Powder form Collecting)
- 5) Forcep 6"
- 6) Droppers 6" (Liquid drop kartha hai)

• Sample :-

Solid, Liquid, or Gas

• Chemical Agent Sample

- 1) ~~Chemical~~ Solid
- 2) Liquid
- 3) Air or Vapour

★ HGVI - Hand Held, Multi Sensor Gas & Vapour Identifier

• Sensor - 3

• Sensor Names

IMS - Ion Mobility Spectrometry.

PID - Photoionization Detection

TGS - Taguchi Gas Sensors

Detection Principle - Spectrometry

• Tested in 10 CWA :-

- 1) Tabun Sieve Pack kit
- 2) Sarin
- 3) Soman
- 4) Cyclosarin
- 5) VX
- 6) VX R
- 7) Distilled Mustard
- 8) Nitrogen Mustard
- 9) Lewisite
- 10) ~~Cyanogen~~ Cyanogen chloride.

Tested for TIC/TIMA (Toxic Industrial chemical and material)

Structure of Atom ?

STEL full form :-


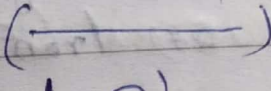
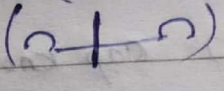
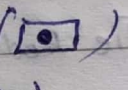

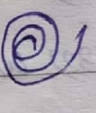
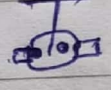
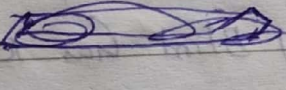
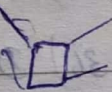
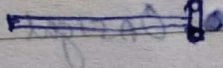






Short Time Exposure Limit,

(Equip. ment)
★



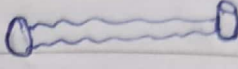





DM KIT / EMERGENCY SEALING KIT.

• Used for chlorine leakage / offsite Emergencies used

Parts :-

- 1) Universal Ring (Multi purpose) 
- 2) Tie Rod 
- 3) Base Plate 
- 4) Patch Plate 
- 5) Big Hood 
- 6) Vend Valve
- 7) Flexible Copper Tube 
- 8) Round Yak plate with stud 
- 9) MS Angle 
- 10) PVC Hood with Glass bolero (Helmet)
- 11) PVC Apron (Yellow) 
- 12) PVC Suite (Yellow)
- 13) Fire man Axe
- 14) Allanky with Extended Handle 
- 15) Yak with Stud 
- 16) Drift Pin 
- 17) Slide Wrench / Pipe Wrench
- 18) Spanner 
- 19) Yak clamp with stud 
- 20) Vend Valve Key (Allanky)
- 21) Carpenter Hammer
- 22) Rubber Gas Cut / Big Hood 
- 23) Rubber Gas Cut / small Hood 

TIN Chlorine Suit (yellow) Ammonia (Green) Mark V - Army label

- 24) Patching Plate Rubber 
- 25) Canister for chlorine  (2000ppm @11C)
- 26) Corrogetted hose Pipe 
- 27) Iron chain (96 inch)
- 28) Cap knot 
- 29) Tie Rod Pieces 
- 30) Tie Rod Nut / Tie Rod washer
- 31) Tool kit Bag
- 32) Wise grip  (majbooth pakad keliye karam attached)
- 33) Teflon Tape (Tight karme keliye)
- 34) Blind Gas kit 
- 35) Hand Gloves (Rubber, PVC, Heavy duty)
- 36) Ditection Torch / Ammonia Solution (Bottle, Bamboo)
- 37) Air Tight Goggles 
- 38) Face Mask with Corrogetted Hose
- 39) IHM (Integrated Hood Mask)

• On sight Emergencies :-

plant ka andhar hota hai

• Off sight Emergencies :-

plant ka bhar hota hai

GAS ALERT MICRO - 5

classmate
Date 10/01/2023
Page

(Chemical Equipment)

- Detected at :- 05 types Gas detected.
 - 1) LEL Combustible Gas (Low Explosive Limit Gas)
 - 2) Hydrogen Sulfide (PPM)
 - 3) Carbon Monoxide (PPM)
 - 4) Sulphur Dioxide (PPM)
 - 5) Ammonia
 - 6) Chlorine
 - 7) Oxygen
- ~~Order~~ ~~Restart~~ ~~Equipment~~ Memory - 512 MB, 5 Languages
- Only Gases form detected, not liquid form.
- Used also CSSR operation.

• STEL : Short Term Exposure Limit. (Bina PPE 15 mins only worked)

• PPM : Part Per million

• TWA : Time Weighted Average. (without PPE 8 hours per day 40 hrs per week only worked)

• Working Principal :-

Catalyst. (Quickly mentioned)

Sensor Type :-

- 1) O₂ %
- 2) H₂S (Hydrogen Sulphide) ----- PPM
- 3) Cl₂ (Chlorine Gas) ----- PPM

(Equipment)

ISOTOP IDENTIFIER / GAMMA IDENTIFIER

CLASSMATE
Date
Page

Isotope Identifier is a radiation detection tool that has the ability

Detected at - Gamma and ~~Electron~~ X-ray (NaI)

- GM Tube Detector / Sodium Iodised Detector

- N - Not Calibrated (Reading not correct)

- S - Calibrated OK (Reading correct)

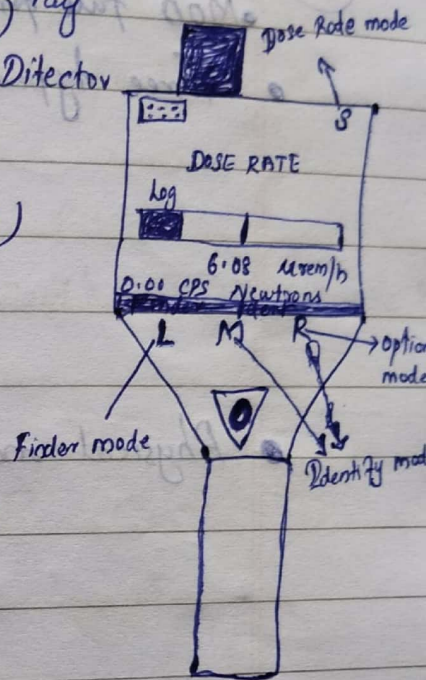
- L M R :-

L - Locate (Finder mode)

M - Identify mode

R - Options mode (Reset)

Dose reading at (sv, msv)



⊗ • URN Full form :-

Unique Reference Number.

⊗ • MIC Gas - Methyl Iso Cyanide.

1 SV - 100 RAM

maximum Range - 1 SV

• Storage options:

- Refrigeration (2°C , 4°C)
- Temporary burial (1.5m deep and 200m from drinking water)
- Dry ice (10 kg of dry ice per body)
- Ice

Home work Importance of Cordon Teams and DO's and DON't's in the incident site

Equipment ★ RAMAN SPECTROMETER

- It is a chemical Equipment.
- Detected at more than 14000 chemicals
- 2681 chemicals at the date detected (solid, Powder, liquid)
- Supported at 11 languages.
- working at laser view
- Start at below 20 sec
- Principle - Raman Spectrometric.

• Specification :-

Startup time - less than 20 sec
memory - 16 GB

- Display - 3.5" TFT with LED
- Storage Temperature - -30° to +50°c
- Detector - Linear CCD Array
- Laser Type - class 3B laser
- Memory - 16 GB
- Battery - Rechargeable.
- Substance Analysis - Solid, liquid, Powder.
- Libraries - More than 14000 Substances.
- Weight - 650 gm

• Parts :-

- 1) Sample vial (bottle)
- 2) Vial Holder Adapter
- 3) Strap Attachment (sealing)

• Chemicals detected :- (4 types)

- 1) Demo (103)
- 2) Explosives (118)
- 3) Hazardous (2213)
- 4) Narcotics (247)

Total - 2681

RESTRAINING VS CASTING (Animals)

Burley Method

Ruff's Method

Purpose

MULTI RAY (Chemical Equipment)

• Sensor - 05 types

- 1) oxygen (O_2)
- 2) Hydrogen Sulphide (H_2S)
- 3) CO (Carbon)
- 4) LEL (Low Explosive Limit)
- 5) ϕ VOC (Volatile Organic Compounds)

ϕ VOC: Full form Volatile Organic Compounds

PID

Photo Ionization Detector

CWA (CHEMICAL WARFARE AGENT)

Types of CWA :- Chemical warfare agents are chemical substances which are intended

~~Dissemination of~~

Threshold Dose or Threshold Concentration :-

The capability of the cell to accept certain dose or concentration of chemical and safely eliminate it is called Threshold dose or Threshold Concentration.

Types of CWA :- (6 Types)

- Nerve Agents
- Blistering Agents / vesicant Agents
- Blood Agents (cellular expiration to block kartha ha)
- Choking Agents. (Lungs irritate Agents)
- Incapacitating Agents or psycho-chemicals.
- Riot Control / Tear Agents

TLV Full form :-

Threshold Limit Value

TWA : Time weighted Average.

TLD :- (Thermo Luminoscent Dosimeter)

- Detected Dose

maximum 10 Sv

Principle - Gold leaf Electroscope

Gamma Ray
→ Aluminium + Copper

High Energy β
Gamma

β , Gamma

Chemical Equipment's :-

1) RVD (Residual Vapour Detector)

2) WPK

3) Sampling Kit (Hazardous, Gases and vapour Identifier)

4) HGV (Hand Held Multi Sensor Gas, vapour, Identifier)

5) Gas Alert Micro-5

6) Raman Spectrometer

7) PDK (Portable Decon kit)

8) PDA (Portable Decontamination Apparatus)

9) DM Kit

10) Multi-Rae (VOC)

11) Rescivator

12) Air Sampler Kit (operation time - 8 hrs)

13) NBC First Aid Kit - Type - A

VETERINARY SCIENCE

Chemical Agents

- C - Choking Agent
- B - Blister Agent (sulphur mustard)
- I - Irritating Agent
- N - Nerve Agent (GA, GB, GD, VX)
- P - Psycho Chemical (LSD, 25/B5)
- D - Diffolien (24, 3) (2, 4, 5, T)
- T - Toxin (SAB/specific)

Definition :-

- Micro-R - Survey meter } (PM Tube, scintillation principle)
- Alsin Monitor } "
- Teletector / Telerad (4 meter) (2 tubes)

Chemical Equipments

- RVD (CWA detected)
- Gas Alert Micro-5 (4 sensor)
- Raman Spectrometer
- Sampling Kit (Gas, liquid, solid)



SUITS

- Permissible (Air jutha hai)
- NON Permissible (Air nahi jutha hai)
- Mark - IV (Permissible) (6-8 hrs)
- Mark - V (Dangri type) / Army colour (6-8 hrs)
- Chlorin - Yellow (2 hrs)
- Ammonia - Green (2-3 hrs)
- Decon suit (2-3 hrs)
- Fire Proximate Suit (Aluminium Coated) (250° to 300° safe)
- water mixed with Back pack Fire Extinguisher
 - water - 8.5ltr (9 ltr Capacity) (23 sec wearal)
 - AFFF Form - 500ml (Acquired film forming foam)
 - Spray Gun (Sprinkler, Jet mode) (Jet mode 20 meter)
 - SCBA - 300 BAR (50 whistle aha-hai) (374 BAR Capacity)
- 'A' level suit - PRP - Power Respiratory Suit.
 - BTT - Break Through Time
 - HQVI - Hazard Gas Vapour Identifier
 - WPK - water Poison ^{tection} decontamination kit.
 - IDS -
 - IAEA - International Atomic Energy
 - WMD - weapon of Mass Destruction.
 - MOPP - Mission Oriented Protective Posture.
 - DRD - Direct Reading Dosimeter.
 - APK - Agent pretreatment kit.

• Classification of Fire :-

Class A

Class B

Class C

Class D

• Class A :-

Fire involving solid combustible materials of organic nature such as wood, paper, rubber, plastic, cloth etc.

• Class B :-

Fire involving inflammable liquids or liquifiable solids such as petrol, kerosene, acids, solvent etc. ★

• Class C :-

Fire involving inflammable gases under pressure including liquefied gases such as methane, hydrogen, acetylene, LPG etc.

• Class D (5) :-

Fire involving combustible metals such as magnesium, zinc, sodium, aluminium, potassium, radio active materials etc.

• Class F :-

Cooking fats (deep fat fryers)

4) CO (Carbon Monoxide) --- PPM

5) LEL (Flammable Gas) - SO_2 , PH_3 , Cl_2 , HH_3 , NO_2 , HCM , ClO_2

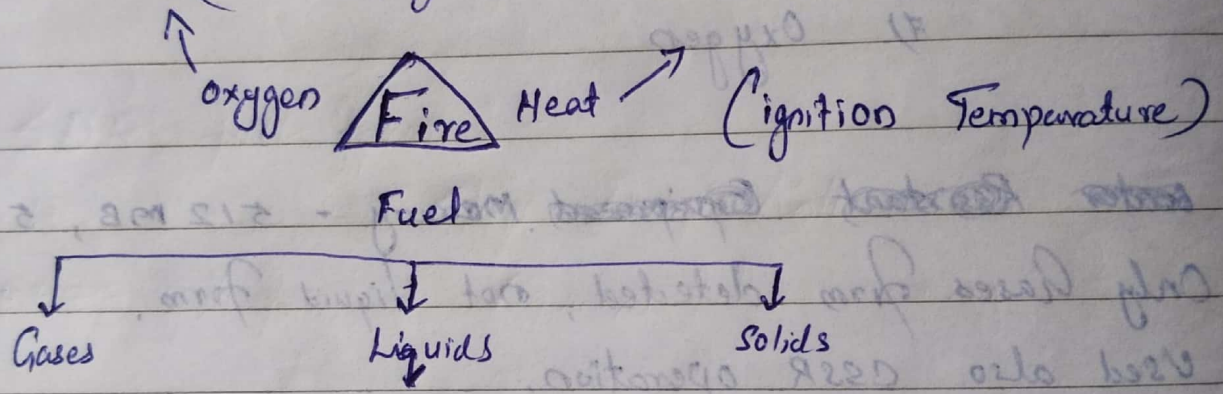
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★ INTRODUCTION OF FIRE AND ITS CHARACTERISTICS

• Definition :-

It is a Chemical chain reaction / combustion which takes place with the evolution of heat and light.

(Heat (ignition Temperature), Oxygen, Fuel.)



Conduction - metal

Convection - liquid, gases

• Three progressive stages of Burning :-

- 1) Incipient or beginning phase.
- 2) Free Burning phase.
- 3) Smoldering phase.

- Electricity Can Involved in any type of fire.

• Principle of Fire Extinction :-

- 1) Starvation (Removal of un burnt material from fire)
- 2) Smothering (cutting of the supply of oxygen from fire area)
- 3) Cooling (Removal of heat from the burning material)
- 4) Breaking of Chain Reaction

• SDR full form :-

Stop Drop Roll

• AFFF full form :- Aqueous film forming foam

★ FIRE EXTINGUISHERS

• Suitability of Fire Extinguishing Media :-

CLASS A :-

- water
- Dry chemical

△ - water - Red

◻ - foam - Yellow

○ - CO₂ - Black

CLASS B :-

- Mechanical foam
- Dry chemical
- Carbon - di - oxide, CO₂

★ - DCP - Blue

Clean Agent - Green

CLASS C :-

- Carbon-Di-oxide
- Dry chemical

CLASS D :-

- Special Dry Powder

Types of Portable fire Extinguishers :-

- Water
 - i) Gas
 - ii) stored pressure.

- Mechanical foam
 - i) Gas Cartridge
 - ii) stored Pressure.

- Dry chemical
 - i) Gas Cartridge
 - ii) stored pressure.

BACK PACK AND HAND HELD TYPE FIRE EXTINGUISHERS

Filling Capacity - 9 Liter
Working pressure - 15 BAR

Compressed Air Cylinder - 4.7 L / 300 bar
 weight of Extinguisher Gun - 2 kg
 Min. Time with Continuous Jet - 20-23 s
 Lancing Distance (Jet) - 12 m
 Propellant - Compressed Air
 Total weight - 25.5 kg

• Fire vehicle is called Fire Tender

• PASS System :-

P - Pull the Pin

A - Aim at the base of the fire.

S - Squeeze the top handle or lever.

S - Sweep from side to side until the fire is completely out.

• Springler System Fire Extinguisher.

3 types

1) Dry (Air)

2) Wet (Water)

3) Alternative (Air + Water)

• Foam is a solution of _____ ?

Ans :- Foam Concentration water

• Level of PPE :- 04 levels (A, B, C, D)

(A level Suit) A level - High Respiratory & Skin Protection.

(Mark IV with SCBA) B Level - High Respiratory of low Skin Protection.

(Mark IV with canister) C Level - Low Respirator of low Skin Protection.

D level - (Uniform with Normal Mask) No Respiratory of No skin Protection

• CBRN Suit 2 types :-

• Permeable suit (Mark IV, Mark V)

(High level Protection) • Non Permeable Suit (others) (A level suit, chlorine suit)

* United Nations Hazard classes :- (1 to 9)

Class 1 - Explosives

Class 2 - Gases

Class 3 - Flammable liquids

Class 4 - Flammable Solids

Class 5 - Oxidizers

Class 6 - Poisonous (Toxic)

Class 7 - Radioactive Material

Class 8 - Corrosives

Class 9 - Miscellaneous Dangerous Substances.

• TREM Full form :-
Transport Emergency Card

• LLW Full form :-
Low Level Waste.

• Used of ^{which} Fire Extinguisher :- (Placard for Chlorine)

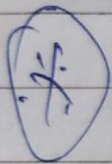
Code - 1 Water Jet

Code - 2 Fog

Code - 3 Foam

Code - 4 Dry chemical Powder.

CHLORINE	
UN No 1097	
HAZCHEM 2XE	
in emergency call	SPECIALIST ACTION



• Wearing Types of PPE

P - Violent (Full PPE - A Level)

R - Full PPE

S - Full PPE

W - Violent (Full PPE - A level)

X - Full PPE

Y - Full PPE

[S] - meaning of legnese BA set (Breathing Apparatus) Pehna hai

• MSDS - Material Safety Data Sheet.

Total - 16 Section

UN Number - 4 Digit.