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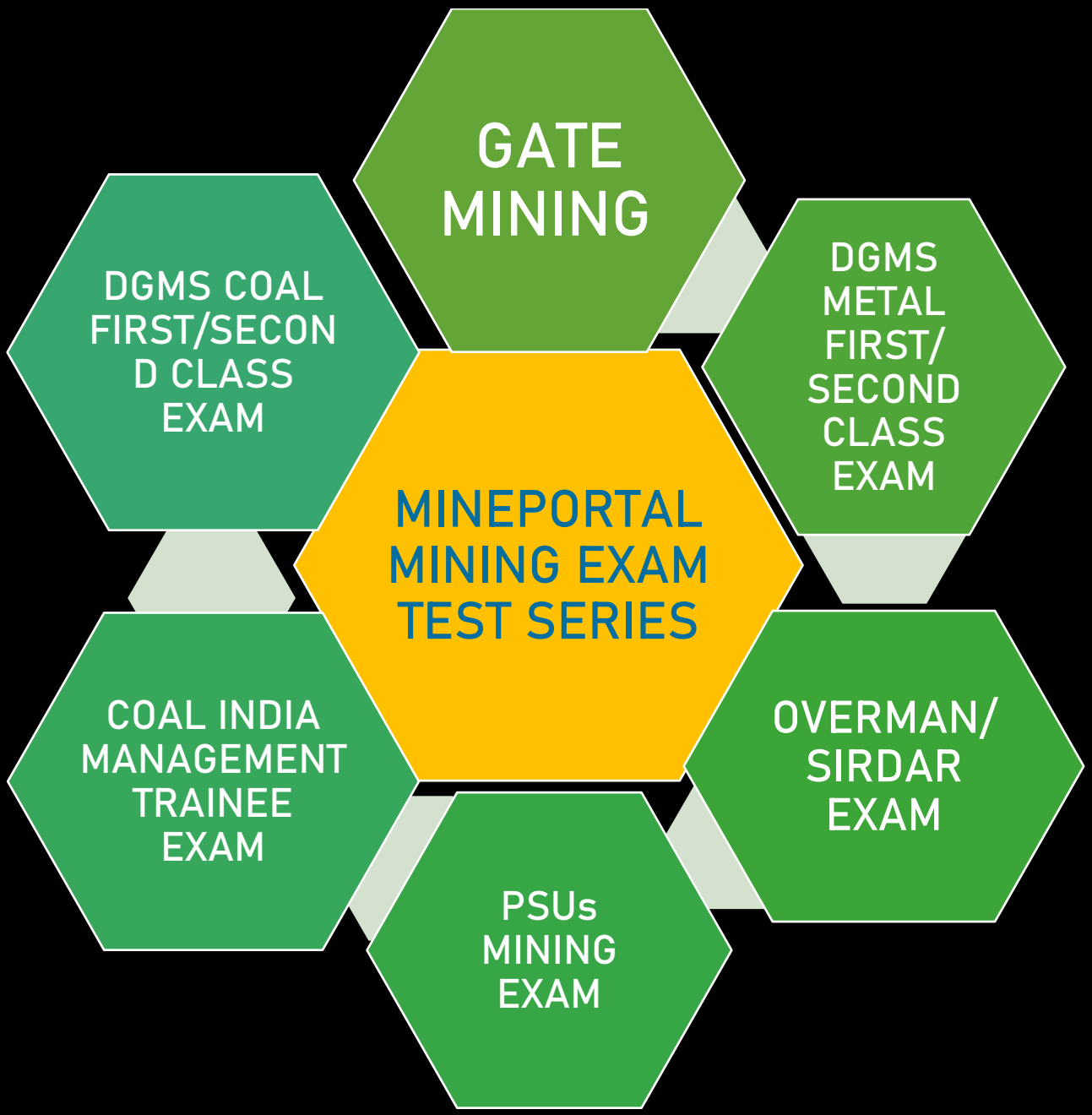

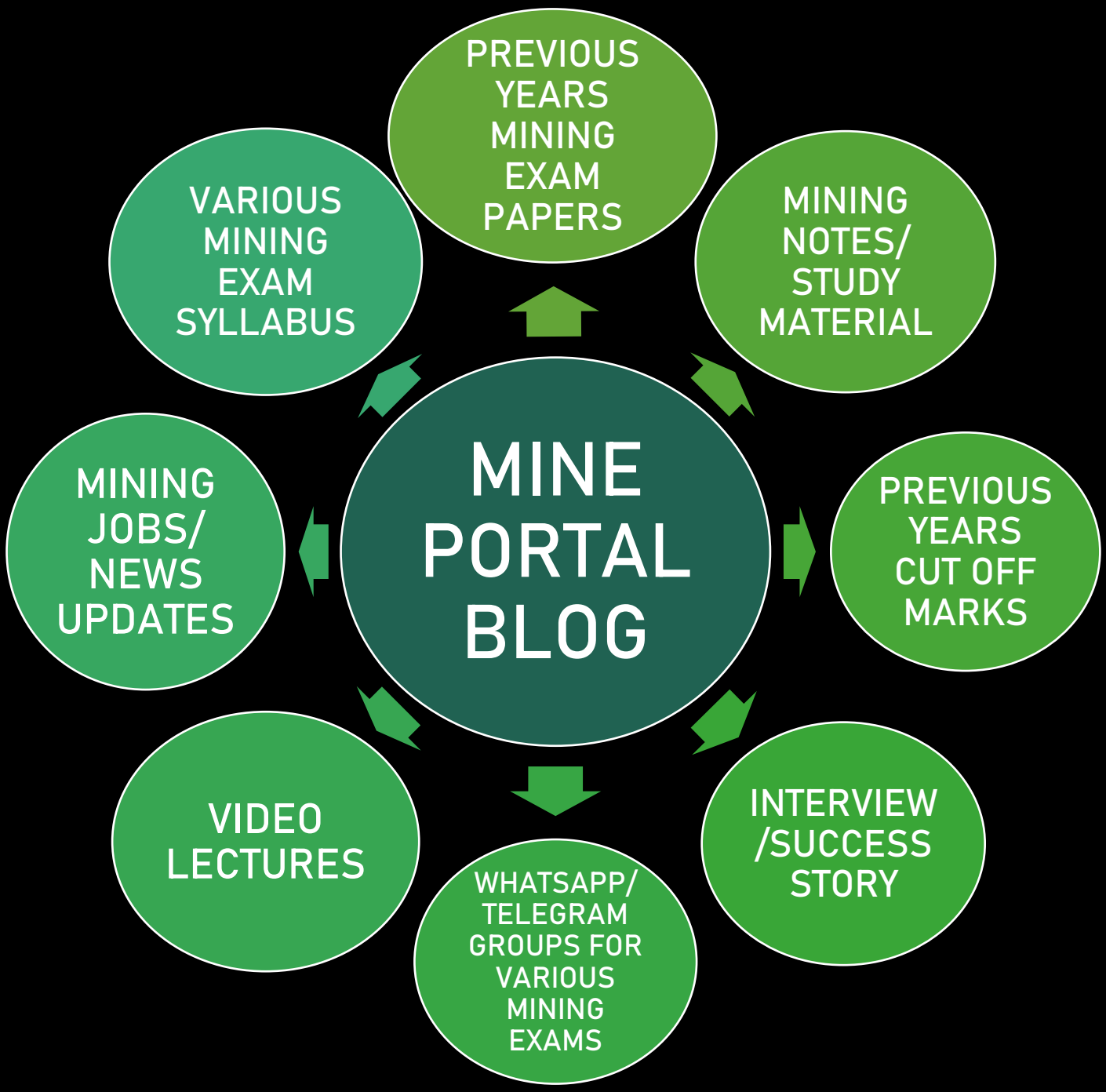

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QUESTIONS & ANSWERS ON LEGISLATIONS

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COAL INDIA LTD EMPLOYEES' SUBSIDIARY MUTUAL TRANSFER FORUM

Mines Safety Association Karnataka – Zone III – 2013

No	Question	Mar
01	***Write down the safety features shall be provided in Excavators***	***05***

Answer:- Ref; DGMS (Tech) Circular No. 09 Dated 02.12.2008

1. All functions cutoff switch.
2. Swing motor Brake.
3. Fire resistant hydraulic hoses in place of Ordinary hoses to decrease the chance of fire. All the sleeves and conducts where cable/wire is passed shall be fire resistant.
4. Turbo charger guard.
5. Seat belt.
6. Vent valve on top of hydraulic tank should be able to be removed without any tool.
7. A baffle plate between cold zone and hot zone.
8. Provision for limiting of hydraulic cylinders – stoppers.

02	***What are the types of Brakes to be provide in Dumper/Tipper***	***02***

Answer:- Ref; DGMS (Tech) Circular No. 04 Dated 06.03.2012

1. Service Brake 2. Parking Brake 3. Retard Brake

03	***Write down the test procedure in Dumper for one of the following*** ***1. Retard Brake or*** ***2. Steering***	***03***

Answer:- Ref; DGMS (Tech) Circular No. 04 Dated 06.03.2012

Test procedure-Retard Brake:-

1. Fasten the seat belt.
2. Move the machine to dry level surface.
3. Check the area around the machine and ensure that machine is clear from obstacles.
4. Start the engine and build air pressure up to cut off point.
5. Apply the Retard Brake while keeping all other brakes off and move transmission selector lever to first range forward.
6. Accelerate the engine RPM to 1300 and maintain it for few seconds.

Desired result: Machine should not move.

Test procedure-Steering:-

1. Fasten the seat belt.
2. Move the machine to dry level surface.
3. Check the area around the machine and ensure that machine is clear from obstacles.
4. Start the engine and build air pressure up to cut off point.
5. Remove all brakes and keep gear in neutral.
6. Rotate the steering wheel and bring the tyres to an extreme and position.
7. Remove the hands from steering wheel.
8. Accelerate the engine RPM to 1000.
9. Rotate the steering wheel and bring the tyres to other an extreme end position.

Desired result: when the hand is removed from the steering wheel either the steering or the tyres shall not move on its own. If any movement is observed it shall be concluded that the steering system needs checking and necessary repairs shall be carried out before putting the dumper into service.

No	Question	Mar
04	***What are the circulars issued under 106 of MMR 1961 regarding Height and Width of Haul Roads in Opencast Mines.***	***05***

Answer:- Ref; DGMS (Tech) Circular No. 09 Dated 02.12.2008

1. No road shall be of width less than three times plus 5 mts width of the largest vehicle plying on road.
2. All corners and bends shall be made in such a way that operator of vehicle have clear view of distance of not less than 3 times the braking distance of longest HEMM working at 40 Km/hr.
3. Where it is not possible to ensure a visibility for a distance as mentioned in (2) there shall be provided with two roads of width not less than 2 times plus 3 mts of largest vehicle plying on the road with a strong road divider at center with adequate lighting and reflector along the divider.
4. Where any road existing above level of surrounding area it shall be provided with strong parapet wall/embankment of following dimensions.
    a. Width at top not less than 1 mtr.
    b. Width at bottom not less than 2.5 mts.
    c. The height not less than the diameter of tyre of largest vehicle plying on road.

    It may be noted that just dumping of mud or OB shall not treated as strong parapet wall.
5. No road shall have gradient more than 1 in 16 ramps with 1 in 10 gradients should not be more than 10 mts at one stretch and permission shall be obtained from Directorate.

05	***List out any Five questions a workman should ask himself before commencing any activity.***	***05***

Answer:-

1. Have I adequately trained for this work or am I with an adequately trained supervisor?
2. Does a Safe Operating Procedure exist for this work?
3. Do I have required knowledge about the work place?
4. Are suitable tools and equipment provided and are they in good condition?
5. Do I have necessary Personal Protective Equipment?
6. Do I have the required authorization/permit/permission for the work?
7. Can weather, working condition, work environment or poor lighting affect job safety?
8. Are there any danger created by my activities or am I in danger due to other's activities?
9. Are work environment hazardous to health?
10. In the event of emergency do I know the emergency action plan?

06	***What is Automatic Fire Detection and Suppression System (AFDSS)***	***05***

"The Automatic Fire Detection and Suppression System" consists of one or more containers of fire suppressant (usually of dry chemical, mono-ammonium phosphate base or Halon 1301 at 7% concentration). The detection may be electrical (thermal) or pneumatic (non-electric) system. The former consists of a steel sheathed cable containing two electrical conductors separated by heat-sensitive insulator. This cable is looped around the fire prone areas. At the rated temperature of the detection (around 1800C), the insulation melts allowing the internal conductors to touch each other completing the detection circuit, results in an alarm in the control module and within seconds triggers the fire suppression discharge system. The whole system depends on vehicle's battery. Due to some weaknesses in this system, a totally nonelectric (pneumatic) automatic fire sensing device has been in use. This features a fusible plastic tube sensing system that triggers cartridge actuated dry chemical extinguishers by a pneumatic signal. Cont……

The detection tubing is paned through all fire hazard areas to be protected and connects pressure make up device (PMD) and detection actuation device (DAD). A high pressure (1800 psi) nitrogen gas cartridge pressurizes the detection tubing through a regulator of about 80 psi. This pressure acts on a piston and puncture pin assembly in the DAD to compress an actuation spring. When the heat from a fire softens the detection tubing at about 355 0C, the internal gas pressure causes the tube to rupture. The rapid release of gas allows the actuation spring force to overcome the nitrogen pressure on the piston in the DAD causing the puncture pin assembly to pierce the brass seal of second high pressure nitrogen cartridge. This gas operates a cartridge actuated pre-engineered and fixed dry chemical fire suppression system to discharge within seconds. This system can be operated manually also.

07	***What are the harmful effects of Noise on Humans?***	**05**

Answer:-

Physical effects;

1. Loss of hearing.
2. Permanent damage to inner ear.
3. Health disorders like high blood pressure, reduced gastric activity / peptic ulcer, decreased electrical resistance of skin, increased muscle tension, disturbed sleep.
4. Proneness to accidents.
5. Decreased efficiency of work.

Psychological effects;

1. Annoyance
2. Induced stress and impairing concentration.
3. Nervous irritability and strain.
4. Fatigue resulting from having talk loudly or from extra effort caused by misunderstanding.
5. Poor concentration.

08	***What is SIMULATOR? How it can be used in Mining Industry?***	***05***

Answer:-

Simulator is state of the art indoor mining equipment that helps to impart basic and advanced skills required to operate HEMM in challenging environment. It uses 3-D computer generated imaginary and simulates motion, feel and visuals.

Effective training on Simulator will have huge impact on operating skills and it will reduce accidents. Operator operates the system and gets familiarized with the equipment and has a feeling of operating the main equipment. Operator can be

evaluated and further training given if necessary.

09	***List out the persons holding position of supervision or Management.***	***05***

Answer:- Ref; Rule No. 46 of Mines Rules 1955

The following shall be deemed to be persons holding position of supervision or management or employed in confidential capacity –

a) Manager, Assistant Manager and Safety Officer.
b) Mining, Electrical and Mechanical Engineer.
c) Foreman and Mate.
d) Mechanical & Electrical Foreman and Electrical supervisor.
e) Surveyor and assistant Surveyor.
f) Medical Officer, Chemist, Assayer, Metallurgist and Welfare or Personnel Officer.
g) Any other person who in the opinion of the Chief Inspector holds a position of supervision or management.

10	***Briefly explain the factors influencing Over Burden Dump stability?***	***05***

Answer:-

1. Characteristics of the material i.e. its size, hardness, density, composition, nature etc.
2. Height of the Dump. Height should be designed for the particular mine considering physical and mechanical properties of the material, method of dumping and topography of the dumping area.
3. Sequence in which the material is deposited in the dump. If materials of different characteristics are dumped in the same dump, it will not settle and consolidate uniformly.
4. Softness or slipperiness of the floor.
5. Vibrations caused by blasting and dynamic loading caused by plying of HEMM.
6. Amount of rain fall in the area.

11	***List out the safety features of Belt Conveyors?***	***05***

Answer:-

1. Emergency switch and pull cord.
2. Signaling system.
3. Interlocking system.
4. Cross over bridge.
5. Earth leakage relay.
6. Main switch locking system.
7. Guards and fencing.
8. Fire extinguishers.

12	***What are the factors responsible for blast induced vibrations?***	***07***

Answer:-

1. Sub grade drilling.
2. Charge depth, charge weight per delay.
3. Types of explosives and their properties.
4. Delay interval between the rows and between the holes in the same row.
5. Height of stemming column and stemming material used.
6. Geology of the area.
7. Physio-mechanical properties of rock mass.

8. Irregular shape of free face.
9. Due to large spacing & burden or blasting without free face.

13	***Briefly explain the term "Super Elevation"***	***03***

Answer:-

At curves, the road should be given proper Super elevation so that vehicles do not have to be slowed down for fear of getting overturned due to centrifugal force which would try to throw the vehicle radially outward.

To take of care or skidding away of the truck from the road in turnings due to centrifugal forces, super elevation @ 4 cms per meter width up to 30 kmph speed is to be given. For every additional 10kmph speed addition of 1 cm per metre width is recommended. Higher super elevation will introduce stress on the suspension system. Lower super elevation will drag the truck outwards.

14	***What are the types of slope failures? What is the latest instrument do you suggest for slope monitoring?***	***05***

Answer:-

1. Planar failure.
2. Circular failure.
3. Wedge failure.
4. Toppling failure.

Latest instrument for slope monitoring "Slope Stability Radar"

15	***What is the composition of safety committee? How frequently safety meetings should be conducted?***	***05***

Answer:-Ref; Rule No.29U & 29V of Mines Rules 1955.

The Safety committee shall consist of:

a) The Manager who shall be the chairman,
b) Five officials or competent person of the mine nominated by the chairman,
c) Five workmen nominated by the workmen of the mine
d) Workmen's inspector where designated: and
e) The Safety officer, or where there is no safety officer, the senior most mine official next to the manager, who shall act as secretary to the committee:

Provided that any other official, competent person or work person may be co-opted by the chairman as a member of the committee on any day or days of the meeting, if considered necessary.

Safety Meetings should be conducted at least once in 30 days.

16	***What are the statutory duties and responsibilities of an Engineer?***	***05***

Answer:- Ref; Reg.53 of MMR 1961.

The engineer or other competent person for the purpose:

1. Shall subject to the orders of the manager and other superior official, hold general charge of all machinery at the mine: and shall be responsible for the proper installation, maintenance and safe working of such machinery:
2. Shall, when any machinery is shifted or newly installed, see that it is given a trail run before it is put into use and shall be present during every such trail run:
3. Shall be present throughout whenever any work is installing, changing or recapping of any winding rope, or of installing changing or annealing any suspension gear, is being carried on:
4. Shall see that provisions of the Act and of the regulations and orders made there under relating to the installation, maintenance, operation or examination of machinery are properly carried out by himself or by sub ordinate officials, competent persons or work persons as the case may be, appointed for the

purpose: and

5. Shall, if machines, electricians or other subordinate officials or competent persons are appointed for the purpose, examine all reports, registers, and other records relating to the installation, maintenance, operation or examination of machinery required to be made or kept in pursuance of the Act, these regulations or orders made there under, and shall countersign the same and date his signature.

17	***What are the notified occupational diseases?***	***05***

Answer:-

1. Asbestosis;
2. Mesotheliomas;
3. Asbestos-induced lung, laryngeal and gastrointestinal cancer;
4. Coal worker's pneumoconiosis;
5. Silicosis;
6. Lead poisoning;
7. Noise induced hearing loss;
8. Contact dermatitis caused by direct contact with chemicals;
9. Pathological manifestations due to radium or radioactive substances and
10. All other types of Pneumoconiosis excluding Coal workers pneumoconiosis, Silicosis and Asbestosis. This includes Siderosis & Berillyosis.

18	***Write few causes of accidents due to Wheel Loader?***	***05***

Answer:-

a) Faulty design of machine and lack of built in safety.
b) Non-provision or removal of guards of moving parts of machines, keeping safety devices inoperative.
c) Lack of proper maintenance.
d) Faulty operation of machine, untrained and inexperienced operators, unmindful and rash acts by operators.
e) Working at overload.
f) Unauthorised riding on the machine.
g) Insufficient tyre pressure and use of poor quality tyres.
h) Brake failure.

19	***Write down the Voltage Limits.***	***05***

Answer:- Ref; Central Electricity Authority (Measures relating to Safety and Electric supply) Regulations, 2010

Permissible Voltage Limits;

For transmission of power in to a Mine: **11,000 Volts**
For use in a Mine: **6,600 Volts**
Special limits for use;

a) Hand held portable apparatus: **125 V**
b) Lighting (Having mid or neutral point earthed)
    i. U.G Mines: **125 V**
    ii. Opencast Mines: **250 V**
c) Portable hand held lamp In U.G. Mines: **30 V**
d) Circuits for remote control or electric inter-locking of apparatus: **30 V**
e) In fixed plants, if a bolted type plug is used: **650V**

20	***Briefly describe Environment Management Plan?***	***05***

Answer:-

EMP includes

1. Environment inventory
    a. Physical Environment
        i. Geology
        ii. Topography
        iii. Surface and Ground water resources
        iv. Water quality
    b. Biological Environment
        i. Flora
        ii. Fauna
        iii. Species of trees
        iv. Birds
        v. Fish
        vi. Mammals
    c. Cultural Environment
        i. Human population
        ii. Trends & distribution
        iii. Historical
        iv. Religion & archaeological sites
        v. Economic indicators of human welfare).

2. Environmental Impact Assessment
    a. Air
        i. Diffusion factors
        ii. Particulates
    b. Water
        i. Flow variation
        ii. Oil
        iii. Suspended solids
        iv. Acidity
        v. Dissolved solids
        vi. Toxic compounds
    c. Land
        i. Soil stability
        ii. Natural hazard
    d. Ecology
3. Environment pollution control
    a. Air pollution control
        i. Dust control
        ii. Covered ore carrying
        iii. Water spray
        iv. Black topped roads
        v. Dust extraction system
        vi. Plantation & green belt
    b. Water pollution control
        i. Waste water collection & treatment facility
        ii. Slurry and Muck settling facility
        iii. Water conservation & reuse
        iv. Septic tanks & Soak away pits

v. Garland drains

c. Land degradation control
   i. Solid waste dumping facility
   ii. Afforestation programme
   iii. Reclamation
   iv. Plantation on Dumps and waste land

d. Noise pollution control
   i. Ear muffs
   ii. Green belt
   iii. Improved machine design
   iv. Isolate the source of Noise

21	*Briefly explain the contractor's responsibilities as recommended by 10th National Safety Conference.*	*05*

Answer:-

1. Prepare written Safe Operating Procedure (SOP) for the work to be carried out, including an assessment of risk, wherever possible and safe methods to deal with it/them.
2. Provide a copy of the SOP and keep an up to date SOP to the person designated by the mine owner who shall be supervising the contractor's work.
3. Ensure that all work is carried out in accordance with the Statute and SOP and for the purpose he may deploy adequate qualified and competent personnel for the purpose of carrying out the job in a safe manner.
4. For work of a specified scope/nature, develop and provide to the mine owner a site specific code of practice. Ensure that all sub-contractors hired by him comply with the same requirement as the contractor himself and shall be liable for ensuring compliance all safety laws by the sub or sub-sub contractors.
5. All persons deployed by the contractor for working in a mine must undergo vocational training, initial medical examination, PME. They should be issued cards stating the name of the contractor and the work and its validity period, indicating status of VT & IME.
6. Every person deployed by the contractor in a mine must wear safety gadgets to be provided by the contractor. If contractor is unable to provide Owner / Agent / Manger of the mine shall provide the same.
7. The contractor shall submit to DGMS returns indicating – Name of his firm, Registration number, Name and address of person heading the firm, Nature of work, type of deployment of work persons, Number of work persons deployed, how many work persons hold VT Certificate, how many work persons undergone IME and type of medical coverage given to the work persons. The return shall be submitted quarterly (by 10th of April, July, October & January) for contracts of more than one year. However, for contracts of less than one year, returns shall be submitted monthly.