Multiple Choice Questions

- 1. The audiogram shows normal hearing up to 1 kHz (mid frequency) and a mild hearing loss in the mid to high frequencies. It is the feature of:
 - a. Sociocusis
 - b. Presbycusis
 - c. NIPTS
 - d. NITTS
- 2. A loss of the structure or function of an organ or system is known as:
 - a. Impairment
 - b. Disability
 - c. Handicap
 - d. None of the above
- 3. Within the auditory system, there are a number of impairments of function which could be measured like:
 - a. Pain in ear
 - b. Alteration in the pure tone threshold
 - c. Tinnitus
 - d. None of the above
- 4. The loss of an individual's functional performance as a consequence of impairment of the diseased organ or system is known as:
 - a. Impairment
 - b. Disability
 - c. Handicap
 - d. None of the above
- 5. What is hearing disability?
 - a. The restriction or lack of ability to perceive everyday sounds in the manner that is considered normal for healthy young people

- b. Cannot work due to ear pain
- c. Cannot work due to tinnitus
- d. None of the above
- 6. The disadvantages experienced by an individual as a consequence of impairments and disabilities is known as:
 - a. Impairment
 - b. Disability
 - c. Handicap
 - d. None of the above
- 7. What is hearing handicap?
 - a. The disadvantage to an individual resulting from a hearing impairment or disability that limits or prevents the fulfillment of a role that is normal for the individual
 - b. Cannot do telephone operation job
 - c. Cannot do listening activity
 - d. None of the above
- 8. What is 'low fence values' in audiogram?
 - a. The low fence is that notional point on the continuum of elevation of the hearing threshold level at which disability is deemed to commence
 - b. Low fencing between air conduction and bone conduction
 - c. Low fencing between conductive deafness and SN type deafness
 - d. None of the above
- 9. What is the starting point of low fence values in audiogram?
 - a. 25 dB
 - b. 30 dB

- c. 35 dB
- d. 40 dB
- 10. What is 'high fence values' in audiogram?
 - a. Point in the continuum of elevation of hearing threshold level at which disability is deemed to be total
 - b. High fencing between air conduction and bone conduction
 - c. High fencing between conductive deafness and SN type deafness
 - d. None of the above
- 11. What is the starting point of high fence values in audiogram?
 - a. 60 dB
 - b. 65 dB
 - c. 70 dB
 - d. 80 dB
- 12. What is AAOO?
 - a. American Academy of Ophthalmology and Otolaryngology
 - b. American Academy of Occupational Organization
 - c. American Association of Occupational Organization
 - d. None of the above
- 13. The following frequencies are used to convert hearing threshold levels into percentages of hearing impairment, according to the 1979 AAOO (American Academy of Ophthalmology and Otolaryngology) formula:
 - a. 1000 Hz, 2000 Hz, 3000 Hz and 4000 Hz
 - b. 500 Hz, 1000 Hz, 2000 Hz and 3000 Hz
 - c. 500 Hz, 1000 Hz, 2000 Hz and 4000 Hz
 - d. 250 Hz, 1000 Hz, 2000 Hz and 3000 Hz
- 14. The percent impairment for each ear is calculated by% the amount by which the average hearing threshold level at 500 Hz, 1000 Hz, 2000 Hz and 3000 Hz exceeds 25 dB:
 - a. 2
 - b. 3
 - c. 1.5
 - d. 2.5

- 15. If the average hearing threshold level of Rt. ear at 500 Hz, 1000 Hz, 2000 Hz and 3000 Hz is 55 dB, what should be the % of hearing loss of that ear:
 - a. 30% b. 40%
 - c. 45%
 - d. 50%
- 16. If the average hearing threshold level at 500 Hz, 1000 Hz, 2000 Hz and 3000 Hz is 65 dB in Rt. Ear and 45 dB in Lt. ear, how much is the hearing handicapped:
 - a. 35%
 - b. 30%
 - c. 40%
 - d. 45%
- 17. Management of noise induced hearing loss include all except:
 - a. Antioxidant treatment
 - b. Engineering controls
 - c. Administrative controls
 - d. To sack from service
- 18. What is Tullio phenomenon?
 - a. Temporary vestibular disturbance in response to loud noise resulting in occupational noise-induced vertigo
 - b. Notch at 4000 Hz
 - c. SN type of deafness due to high noise
 - d. None of the above
- 19. Following are the non-auditory effects of noise except:
 - a. Startle reaction
 - b. Vertigo
 - c. Nausea
 - d. NIPTS
- Following are non-auditory effects of noise except:
 - a. Peptic ulcer
 - b. Increased pulse and respiratory rates
 - c. Decrease physical and psychological stress
 - d. Irritability
- Following are the non-auditory effects of noise except:
 - a. Socially undesirable behaviour
 - b. Reduced work efficiency

- c. Reduced productivity
- d. Decrease accident and error
- 22. Recently, the World Health Organization Noise Environment Burden of Disease (BoD) Working Group has identified environmental noise as a stressor in the evolution of cardiovascular disease because of the release of:
 - a. Cortisol
 - b. Adrenaline
 - c. Noradrenaline
 - d. All of the above
- 23. Startle reaction due to high noise exposure consists of:
 - a. Contraction of blood vessels, and increased blood pressure
 - b. Dilatation of pupil
 - c. Both voluntary and involuntary muscles become tense (contraction)
 - d. All of the above
- 24. Industrial noise is compensable as per:
 - a. Workman's Compensation Act,1923
 - b. Factories Act, 1948
 - c. Mines Act, 1952
 - d. OSH and WC Code 2020
- 25. The successful hearing conservation programme must include the coordination and integration of:
 - a. Physical evaluation of the noise exposure (noise measurement) and noise reduction
 - b. Control of noise exposure (provision of personal ear protection)
 - c. Medical evaluation of hearing of exposed personnel (audiometric test)
 - d. All of the above
- 26. Noise reduction can be done with the following measures:
 - a. Enclosure of source
 - b. Treatment of reflective surfaces with absorbing materials
 - c. Distancing the workers from the areas of maximum noise
 - d. All of the above
- 27. Noise reduction can be done with the following measures except:
 - a. Anti-vibration mountings
 - b. Silencers

- c. The maximum use of noisy equipment for acclimatisation
- d. The enclosure of noisy machines
- 28. Following are the hearing protective equipment except:
 - a. Ear muff
 - b. Ear plug
 - c. Hearing protective helmet
 - d. Face shield
- 29. Consider a worker who is exposed to 98 dBA for 8 hours and whose hearing protectors have a noise reduction rate (NRR) of 25 dB. What is his resultant exposure using the 50# safety factor? a. 89 dBA
 - b. 90 dBA
 - c. 95 dBA
 - d. 85 dBA
- 30. Consider a worker who is exposed to 98 dBA for 8 hours and whose hearing protectors (dual protectors like ear muff and ear plug) have a higher noise reduction rate (NRRh) of 25 dB and other is 24 dB. What is his resultant exposure?
 - a. 100 dBA
 - b. 75 dBA
 - c. 94 dBA
 - d. 87 dBA
- 31. What is "standard threshold shift" as per the occupational safety and health administration (OSHA)?
 - a. A shift of 10 dB or more, in either ear, for the pure tone average of 2, 3, 4 kHz; this is intended to detect small changes in hearing so that preventive action can be taken
 - b. It is standard for workers exposing to noise
 - c. Both a and b
 - d. None of the above
- 32. A good worker's education on hearing conservation programme describes:
 - a. Existing noise hazards
 - b. How hearing loss occurs and can do to protect themselves
 - c. Purpose of audiometric testing
 - d. All of the above

- 33. Type of vibration:
 - a. Hand arm vibration
 - b. Whole body vibration
 - c. Both a and b
 - d. None of the above
- 34. Source of whole body vibration:
 - a. Ship's deck
 - b. The seat of a vehicle traversing rough terrain
 - c. A vibrating platform
 - d. All of the above
- 35. What is 'segmental vibration' or 'handarm vibration'?
 - a. When the route of entry of vibration is through paths to the hands, wrists and arms of the subjects
 - b. When the route of entry of vibration is through paths to the hands
 - c. When the route of entry of vibration is through paths to the feet
 - d. None of the above
- 36. Following are the example of handarm vibration except:
 - a. Pneumatic tools
 - b. Travel by bus
 - c. Electric-driven grinding
 - d. Rock drilling
- 37. The unit of vibration is:
 - a. Hertz (Hz)
 - b. Decibel (dB)
 - c. Lux
 - d. Sievert (Sv)
- 38. Vibration can move in the following orthogonal directions:
 - a. Front to back (X-axis)
 - b. From side to side (Y-axis)
 - c. Vertical mode (Z-axis)
 - d. All of the above
- 39. The measurement of interest, in terms of biological effect, is the magnitude of vibration known as:
 - a. A (8)
 - b. B (8)
 - c. A (9)
 - d. B (9)
- 40. The measurement of interest, in terms of biological effect, is the magnitude of vibration or 'A(8)' which incorporates:

- a. Intensity
- b. Duration
- c. Direction
- d. All of the above
- 41. All are international organisations except:
 - a. BIS
 - b. ANSI
 - c. ACGIH
 - d. IAOH
- 42. What is the full form of ACGIH:
 - a. American Conference of Governmental Industrial Hygienists (ACGIH)
 - b. Andaman Conference of Governmental Industrial Hygienists (ACGIH)
 - c. American Conference of Governmental International Hygienists (ACGIH)
 - d. None of the above
- 43. White finger is due to:
 - a. Hand-arm vibration
 - b. Whole body vibration
 - c. Both a and b
 - d. None of the above
- 44. Following system may be affected by white finger:
 - a. Vascular system
 - b. Nervous system
 - c. Musculoskeletal system
 - d. All of the above
- 45. White finger is also known as: a. Hand-arm vibration syndrome
 - b. Leukoplakia
 - c. Psoriasis
 - d. None of the above
- 46. In hand arm vibration syndrome, which symptom tends to occur first: a. Vascular

 - b. Neurological (sensorineural)
 - c. Musculoskeletal
 - d. All of the above together
- 47. In the Stockholm Workshop Scale for the classification of hand-arm vibration syndrome, what is 3SN stage?
 - a. Intermittent or persistent numbness, reduced tactile discrimination and/ or manipulative dexterity

- b. Intermittent or persistent numbness, reduced sensory perception
- c. Intermittent numbness with or without tingling
- d. Vibration-exposed but no symptoms
- 48. In the Stockholm workshop scale for the classification of hand arm vibration syndrome, what is 4V stage?
 - a. Frequent attacks affecting all phalanges of most fingers with trophic changes in the fingertips
 - b. Frequent attacks affecting all phalanges of most fingers
 - c. Occasional attacks affecting distal and middle (rarely also proximal) phalanges of one or more fingers
 - d. Occasional attacks affecting only the tips of one or more fingers
- 49. In modification of Stockholm workshop scale for classification of SN component of hand-arm vibration syndrome, what is 3SN stage?
 - a. Intermittent and persistent numbness and/or tingling, reduced sensory perception with a score of >6 to <9
 - b. Intermittent and persistent numbness and/or tingling, reduced manipulative dexterity and a SN score of >19
 - c. Intermittent numbness and/or tingling with tingling with a sensory neural score of >3 to <6
 - d. None of the above
- 50. The first symptom or sign of digital arterial vasospasm in white finger is:
 - a. Onset of blanching affecting the tip of one or more digits and occurring in response to cold
 - b. Pain of the fingertips
 - c. Swelling of fingertip
 - d. None of the above
- 51. Patients suffering from hand-arm vibration syndrome are frequently noted to suffer from:
 - a. Weakness of grip
 - b. Weakness of shoulder joint
 - c. Weakness of fist
 - d. None of the above

- 52. Causative factor for white finger: a. Vibration
 - b. Cold and clammy atmosphere
 - c. Smoking
 - d. All of the above
- 53. Differential diagnosis of white finger:
 - a. Carpal tunnel syndrome
 - b. Dupuytren's contracture
 - c. Osteoarthritis
 - d. All of the above
- 54. Vascular test proposed for hand-arm vibration syndrome:
 - a. Adson's test (neck rotation) Doppler (finger blood flow)
 - b. Lewis Prusik (nail-bed compression)
 - c. Allen's test (ulnar, radial compression at wrist)
 - d. All of the above
- 55. Neurological test proposed for hand arm vibration syndrome:
 - a. Light touch (cotton wool)
 - b. Pain (pinprick)
 - c. Vibrotactile threshold test (VTT)
 - d. All of the above
- 56. Following neurological test proposed for hand-arm vibration syndrome:
 - a. Aesthesiometry test (TA)
 - b. Phalen (wrist flexion)
 - c. Tinel (tunnel percussion)
 - d. All of the above
- 57. Following musculoskeletal test proposed for hand-arm vibration syndrome:
 - a. Grip strength (dynamometer)
 - b. Pinch test (thumb and forefinger)
 - c. Moberg pick-up object recognition
 - d. All of the above
- 58. Quantitative sensory testing (QST) for hand-arm vibration syndrome includes:
 - a. Electrodiagnostic testing (for muscles weakness)
 - b. Biopsy of skin and nerve
 - c. MRI
 - d. All of the above
- 59. Following are the preventive measures of hand-arm vibration syndrome except:
 - a. Reduction of vibration exposure time

- b. Continuous vibration, as opposed to interrupted work schedules, should be avoided
- c. An increasing grip force on tool handles
- d. To avoid the lighter tool
- 60. An increasing grip force on tool handles (coupling at the hand-tool interface):
 - a. Increases the vibration energy to the hand with greater damage to arteries, nerves, tendons, joints, and muscles
 - b. Prevents vibration propagation
 - c. Increases greater grip
 - d. Increases greater hold
- 61. Reduction in the weight in a hand-held vibratory tool can produce:
 - a. Reduction of workload on joints (elbow, shoulder)
 - b. Increase the vibration
 - c. More chances of HAVS
 - d. All of the above
- 62. The known hazardous frequency range of hand-arm vibration is assumed to lie between:
 - a. 30 Hz to 300 Hz
 - b. 300 Hz to 3000 Hz
 - c. 500 Hz to 6000 Hz
 - d. None of the above
- 63. The adverse health effects of whole body vibration seem to be related mainly to exposures in the low frequency ranged from: a. 100 to 1000 Hz
 - b. 0.5 to 80Hz
 - c. 5 to 800 Hz
 - d. None of the above
- 64. Health hazard of whole body vibra
 - tion:
 - a. Motion sickness
 - b. Neck-shoulder pain
 - c. Cervical disc degeneration
 - d. All of the above
- 65. Health hazard of whole body vibration:
 - a. Disorder of balance and digestion
 - b. Disorder of digestion

- c. Effects on menstruation and perhaps labour
- d. All of the above
- 66. Effects of motion sickness due to whole body vibration are all except:
 - a. Drowsiness
 - b. Nausea and vomiting
 - c. Loss of appetite
 - d. Abdominal pain
- 67. Effects of motion sickness due to whole body vibration are all except:
 - a. Facial flushing
 - b. Dizziness and headache
 - c. Inability to concentrate and sweating
 - d. Retention of urine
- 68. What is the frequency of vibration to develop motion sickness?
 - a. 10 to 50 Hz
 - b. Below 3 Hz
 - c. 5 to 20 Hz
 - d. None of the above
- 69. Hand-arm vibration syndrome may produce:
 - a. White finger
 - b. Blue finger
 - c. Red finger
 - d. Yellow finger
- 70. What is ionising radiation?
 - a. Ionising radiation is any radiation consisting of moving particles or electromagnetic waves that carries sufficient energy to produce ions in matter
 - b. The radiation which can penetrate the human tissue and deposit its energy within it
 - c. Both a and b
 - d. None of the above
- Following may be the high energy electromagnetic ionising radiation:
 a. X-rays
 - b. γ-rays
 - c. Beta (β)-particles
 - d. Both a and b
- 72. Ionising radiation having energetic subatomic particles (corpuscular):a. Alpha (α)-particlesb. Beta (β)-particles

- c. X-rays
- d. Both a and b
- 73. The unit of activity of ionising radiation is:
 - a. Becquerel (Bq)
 - b. Grey (Gy)
 - c. Sievert (Sv)
 - d. Coulomb per kilogram (C/kg)
- 74. The unit of exposure of ionising radiation is:
 - a. Becquerel (Bq)
 - b. Grey (Gy)
 - c. Sievert (Sv)
 - d. Coulomb per kilogram (C/kg)
- 75. The unit of absorbed dose of ionising radiation is:
 - a. Becquerel (Bq)
 - b. Grey (Gy)
 - c. Sievert (Sv)
 - d. Coulomb per kilogram (C/kg)
- 76. The unit of potential danger of health of ionising radiation is:
 - a. Becquerel (Bq)
 - b. Gray (Gy)
 - c. Sievert (Sv)
 - d. Coulomb per kilogram (C/kg)
- 77. Acute effect of ionising radiation:
 - a. Ionising burn
 - b. Ionising sickness
 - c. Ionising syndrome
 - d. All of the above
- 78. Delayed somatic effects of ionising radiation are all except:
 - a. Leukaemia
 - b. Carcinogenic
 - c. Foetal developmental abnormality
 - d. Life expectancy will increase
- 79. Somatic effect of ionising radiation:
 - a. Deterministic b. Stochastic
 - c. Genetic

 - d. Both a and b
- 80. What is deterministic somatic effect of ionising radiation?
 - a. Those for which the severity increases with the dose and for which a threshold exists

- b. Those for which the severity does not increase with the dose and for which a threshold exists
- c. Those whose probability of occurrence increases with the dose and whose severity is independent of the dose and without a threshold
- d. None of the above
- 81. What is stochastic somatic effect of ionising radiation?
 - a. Those for which the severity increases with the dose and for which a threshold exists
 - b. Those for which the severity does not increase with the dose and for which a threshold exists
 - c. Those whose probability of occurrence increases with the dose and whose severity is independent of the dose and without a threshold
 - d. None of the above
- 82. The stochastic somatic effect of ionising radiation may be seen:
 - a. Where the dose is low (as in occupational exposures)
 - b. Where the dose is high
 - c. Where the dose is unpredictable
 - d. None of the above
- 83. Genetic effects of ionising radiation:
 a. Point mutation
 - b. Chromosomal mutation
 - c. Both a and b
 - d. Leukaemia
- 84. What is the most effective treatment of acute somatic effect of ionising radiation?
 - a. IV drip
 - b. Sodium iodide
 - c. Oxygen inhalation
 - d. None of the above
- 85. Deterministic effects of ionising radiation on haematopoietic system are all except:
 - a. Frequently spontaneous bleeding (from thrombocytopaenia)
 - b. Susceptibility to infection
 - c. White finger
 - d. Neutrophils and platelets also show a dose-related decrease

- 86. Radiation pneumonitis appears some weeks or months after exposure. It is a complex phenomenon, including:
 - a. Pulmonary oedema, cell death and cell desquamation
 - b. Fibrin exudates in the alveoli, fibrous thickening of alveolar septa
 - c. Proliferative changes in the blood vessels
 - d. All of the above
- 87. The ionising radiation doses received by the lens may result in:
 - a. Lenticular opacities
 - b. Cataracts
 - c. Both a and b
 - d. None of the above
- 88. The effect of ionising radiation on embryo and foetus:
 - a. Embryonic death
 - b. Gross congenital malformation and growth retardation
 - c. Severe mental retardation
 - d. All of the above
- 89. The acute central nervous system effects are generally reached only when the whole body radiation dose exceeds about 50 Gy. The survival time is usually less than 48 hours. Death is believed to be a functional of several causes, including:
 - a. Vascular damage
 - b. Meningitis
 - c. Myelitis and encephalitis
 - d. All of the above
- 90. Acute whole body radiation of 10 sievert may develop:
 - a. Rapid onset of apathy, prostration, convulsion and death
 - b. Chromosome dosimetry becoming saturated, GI syndrome-diarrhoea
 - c. Rapid onset of nausea, vomiting, headache and pyrexia (within 30 minutes)
 - d. Nausea, vomiting and headache, onset within 30 minutes to 2 hours
- 91. Current UK annual occupational dose limits (mS_V) of whole body is: a. 6

 - b. 20

- c. 1 d. 10
- 92. Treatment for internal contamination of Plutonium isotope radiation is:
 - a. Administration of stable iodine
 - b. Forced dieresis
 - c. Chelating agents (DTP A)- by IV or aerosol inhalation
 - d. Prussian blue given orally inhibits intestinal absorption
- 93. Ionising radiation is measured by:
 - a. Noise dosimeter
 - b. Ionising dosimeter
 - c. Sound level meter
 - d. Ionising level meter
- 94. The main principle of radiation protection as per International Commission of Radiation Protection (ICRP):
 - a. Justification of a practice
 - b. Optimisation of protection
 - c. Aplication of individual dose limits
 - d. All of the above
- 95. Which one is most dangerous ionising radiation:
 - a. Alpha
 - b. Beta
 - c. Gamma
 - d. X-ray
- 96. Ionising radiation with maximum human tissue penetration power:
 - a. Alpha
 - b. Beta
 - c. X-ray
 - d. Both a and b
- 97. [Equivalent Dose (H) = Dose (D) \times QF (Q)] is the dose equivalent equation of ionising radiation where quality factor (Q) is highest for:
 - a. Alpha
 - b. Beta
 - c. Gamma
 - d. X-ray
- 98. Ionising radiation cannot be directly detected by the human senses, but they can be detected physically and measured by:
 - a. Photographic films
 - b. Geiger tubes
 - c. Scintillation counters
 - d. All of the above

- 99. Protection against radiation includes:a. Place shielding between the source and the employee
 - b. Use of lead aprons
 - c. Well ventilated rooms of exposure
 - d. All of the above
- 100. Following are non-ionising radiation except:
 - a. Ultraviolet
 - b. Infrared
 - c. Microwave
 - d. Beta ray
- 101. The range of wavelength of ultraviolet radiation:
 - a. 100 to 400 nm
 - b. 200 to 400 nm
 - c. 200 to 300 nm
 - d. 100 to 300 nm
- 102. The range of wavelength of visible rays:
 - a. 400 to 760 nm
 - b. 300 to 760 nm
 - c. 200 to 660 nm
 - d. 400 to 700 nm
- 103. The range of wavelength of infrared radiation:
 - a. 700 nm to 1 mm
 - b. 760 nm to 1 mm
 - c. 760 nm to 0.1 mm
 - d. 660 nm to 1 mm
- 104. The range of wavelength of microwave radiation:
 - a. 10 mm to 1 m
 - b. 1 mm to 10 m
 - c. 1 mm to 1 m
 - d. 0.1 mm to 1 m
- 105. Type of ultraviolet radiation:
 - a. UV (A)
 - b. UV (B)
 - c. UV (C)
 - d. All of the above
- 106. Types of infrared radiation:
 - a. IR (A)
 - b. IR (B)
 - c. IR (C)
 - d. All of the above
- 107. Mention the correct sequence of ultraviolet radiations placed from lower to higher wavelength:

- a. UV(C) UV(B) -UV(A) b. UV(A) - UV(B) -UV(C) c. UV(C) - UV(A) -UV(B)
- d. UV(B) UV(A) UV(C)
- 108. Mention the correct sequence of infrared radiations placed from lower to higher wavelength:
 - a. IR (A) IR (B) IR (C)
 - b. IR (C) IR (B) IR (A)
 - c. IR (B) IR (A) IR (C)
 - d. IR (C) IR (A) IR (B)
- 109. Elastosis and sunburn of skin is due to the exposure of:
 - a. Ultraviolet radiation
 - b. Infrared radiation
 - c. Microwave radiation
 - d. Visible rays
- 110. Acute effect of skin due to exposure of ultraviolet radiation:
 - a. Erythema or reddening of the skin
 - b. Tanning is also initiated by such exposure, with the migration of melanin pigment and resultant darkening of the skin
 - c. Sunburn
 - d. All of the above
- 111. Chronic effect of skin due to exposure of Ultraviolet radiation:
 - a. Elastosis
 - b. Skin cancers
 - c. Melanoma
 - d. All of the above
- 112. Ultraviolet radiation exposure can also create a photosensitisation reaction if the individual has also been exposed to phototoxic agent such as:
 - a. Psoralens
 - b. Coal tar
 - c. Some cosmetic preparations
 - d. All of the above
- 113. Sources of UV radiation such as welding arc must be shielded from workers near the operation with use of materials opaque to UV to prevent:
 - a. Arc eye or flash eye
 - b. Monday fever
 - c. Monday morning fever
 - d. None of the above

- 114. For the welder who is directly exposed to the UV radiation from the arc welding, use of the following personal protective device required to prevent excessive exposure including:
 - a. Tinted goggles
 - b. Face shields
 - c. Densely woven or leather clothing
 - d. All of the above
- 115. The UV radiation produced by an arc welding can also initiate the chemical reaction that creates ozone and nitrogen oxides from oxygen and can decompose vapour of chlorinated solvents to produce highly toxic:
 - a. Phosgene gas
 - b. Cyanide gas
 - c. CO
 - d. All of the above
- 116. Following PPE can prevent arc eye of welders except:
 - a. Welding goggles
 - b. Welding helmet
 - c. Safety shoe
 - d. Welding face shield
- 117. Photic retinopathy may occur, due to photochemical damage by:
 - a. Blue light component of the arc welding
 - b. Red light component of the arc welding
 - c. Yellow light component of the arc welding
 - d. Violet light component of the arc welding
- 118. Solar retinopathy is a well-recognised form of acute light damage and it is caused by:
 - a. Direct viewing of the sun
 - b. Indirect viewing of the sun
 - c. Viewing solar eclipse
 - d. All of the above
- 119. Industrial sources of significant infrared radiation include all except:
 - a. Furnaces
 - b. Hot metals
 - c. Sunray during outdoor work
 - d. Equipment for drying and baking of paints and surface coatings and spot heating

- 120. "Glass blower's cataract" or "heat cataract" is due to the exposure of:
 - a. UV radiation
 - b. IR radiation
 - c. Microwave radiation
 - d. X-ray radiation
- 121. "Dry eye" irritation of cornea is due to the chronic exposure of:
 - a. UV radiation
 - b. IR radiation
 - c. Microwave radiation
 - d. X-ray radiation
- 122. Following PPE are usually used to reduce infrared exposure and thermal loading for workers at furnaces and other hot metal working operation:a. Reflective aluminium shielding
 - b. Reflective aluminised clothing
 - c. Protective eye wear
 - d. All of the above
- 123. Microwave radiation is found in:
 - a. Radar and communications equipment
 - b. Diathermy applications
 - c. Industrial and consumer ovens
 - d. All of the above
- 124. Effect on eyes due to microwave radiation exposure:
 - a. Lens opacities

d. All of the above

- b. Cataracts
- c. Corneal damage and retinal lesions
- 125. Effect on male reproductive system due to microwave radiation exposure: a. Testicular lesions
 - h Desircular lesion
 - b. Decreased sperm counts
 - c. Both a and b
 - d. None of the above
- 126. Acute accidental exposure of the eyes to microwave radiation may lead to:
 - a. Skin burns
 - b. Conjunctival infection
 - c. Loss of corneal epithelium, as well as stromal oedema and opacificationd. All of the above
- 127. Source of radiofrequency radiation exposure:
 - a. Operating and maintaining radio and television broadcasting and telecommunication systems

- b. Dielectric heaters used for heating
- c. Military and civilian use of radar systems
- d. All of the above
- 128. Source of radiofrequency radiation exposure in the medical field:
 - a. Magnetic resonance imaging (MRI)
 - b. Diathermy
 - c. Electrosurgery
 - d. All of the above
- 129. Health hazard of radiofrequency radiation:
 - a. Interfere with pacemakers and other implanted medical devices
 - b. Severe burns which tend to heal poorly
 - c. Cataract
 - d. All of the above
- 130. Long-term exposure of radio frequency radiation may produce some adverse effects include:
 - a. Decrease birth-weight
 - b. Behavioural changes
 - c. Change in blood cell concentrations
 - d. All of the above
- 131. Exposure to rediofrequency radiation induces all except:
 - a. Heating in body tissues
 - b. Imposes a heat load on the whole body
 - c. Direct damage to the respiratory centre of brain
 - d. Both a and b
- 132. Occupational exposure to radiofrequency radiation may exceed exceptionable limits for all except:
 - a. Maintenance crews on broadcast towers and radar devices
 - b. Operators of dielectric heaters, short wave diathermy devices
 - c. Furnace workers
 - d. Operators of microwave oven
- 133. Exposure to radiofrequency radiation should be reduced by engineering controls, such as:
 - a. Total or partial enclosure to limit leakage
 - b. Interlocks system

- c. Additional shielding where necessary
- d. All of the above
- 134. What is the full form of LASER?
 - a. Light amplification by the stimulated emission of radiation
 - b. Light amplification by the stimulated emission of rays
 - c. Light amplification by the stimulated evaporation of radiation
 - d. Light addition by the stimulated emission of radiation
- 135. Laser is used in:
 - a. Drilling
 - b. Cutting and welding
 - c. Communication
 - d. All of the above
- 136. According to the American National Standards Institute (ANSI) Z-136.1: 2007 and British Standard BS/EN/IEC 6082:2007, lasers are divided into following major classes depending on the potential safety hazard:
 - a. Class 1, Class 2, Class 3, and Class 4
 - b. Class 1, Class 2, and Class 3
 - c. Class 1, and Class 2
 - d. None of the above
- 137. High power lasers which are not only a hazard from direct viewing and from specular reflections, but also from diffuse reflections. This type of laser is classified as:
 - a. Class 1
 - b. Class 2
 - c. Class 3
 - d. Class 4
- 138. Low power visible continuous wave and pulsed lasers which, whether repetitively pulsed or continuous wave lasers, are not hazardous within the eye's aversion response (i.e. d"0.25 second). This type of laser is classified as:
 - a. Class 1
 - b. Class 2
 - c. Class 3
 - d. Class 4
- 139. As per the International Commission on Radiological protection, the permissible dose of ionising radiation is:

- a. 3 rems during any period of 13 consecutive weeks to the testes or ovaries, blood forming organs and lenses of eyes at any age over 18 years
- b. 235 rems of whole body radiation for persons occupationally exposed from 18 to 65 years of age
- c. Both a and b
- d. None of the above
- 140. What is the synonym of arc eye?
 - a. Flash eye
 - b. Ophthalmic electrica
 - c. Snow blindness
 - d. All of the above
- 141. Following may be the signs and symptoms of arc eye:
 - a. Redness, profuse lacrimation and pain of eyes
 - b. Photophobia
 - c. Pronounced blepharospasm
 - d. All of the above
- 142. Acute effects of arc eye subside without any treatment within:
 - a. 1 hour
 - b. 10 hours
 - c. 48 hours
 - d. 24 hours
- 143. Most cases of arc eye occur as a result of unprotected eye due to the exposure of:
 - a. UV (A)
 - b. UV (B)
 - c. UV (c)
 - d. None of the above
- 144. Chronic effect of UV (B): a. Chronic blepharoconjunctivitis with
 - loss of elasticity of the conjunctiva
 - b. Band degeneration of cornea
 - c. Both a and b
 - d. None of the above
- 145. Following may be the acute effect of UV(A) exposure:
 - a. Induced cataract formation
 - b. Pterygia
 - c. Pinguecula
 - d. All of the above

- 146. What is the correct statement about chronic effect on skin due to the exposure of UV(A) radiation?
 - a. Exposure to UV(A) radiation over many years produces increased concentration of chromophores in the lens which produces yellowish discolouration of the lens with age
 - b. This chromophores absorbe UV(A) radiation thus protect retina later in life
 - c. Both a and b
 - d. None of the above
- 147. What is the acute effect of UV(A) on skin?
 - a. Tanning without superficial burning of the skin
 - b. Skin burn
 - c. Blister formation
 - d. Ulceration
- 148. Infrared radiation can injure the following:
 - a. Lens
 - b. Retina
 - c. Choroid
 - d. All of the above
- 149. Why the glass blowers have an increased incidence of cataract formation?
 - a. Due to exposure of infrared radiation which has the property of protein denaturation resulting in coagulation due to raised temperature within lens.
 - b. Due to accidental injury
 - c. Due to more heat
 - d. None of the above
- 150. Why most visible light hazards are due to blue light?
 - a. Annoyance
 - b. Light at the blue end of the visible spectrum contains more energy and this blue wavelength produces more photochemical damage in the retina.
 - c. Sleep disturbance
 - d. All of the above
- 151. Following are the types of light emitted by laser:
 - a. Columnated (parallel light rays)
 - b. Monochromatic (one wavelength)

- c. Coherent (in phase)
- d. All of the above
- 152. Laser is used in:
 - a. Holography
 - b. Communication
 - c. Drilling, cutting and welding
 - d. All of the above
- 153. The ophthalmological use of laser:
 - a. To detect opaque ocular media (cataract, vitreous hemorrhage)
 - b. Scanning laser ophthalmoscopy for the image of retina
 - c. Treatment of glaucoma, diabetes retinopathy
 - d. All of the above
- 154. The dermatological use of laser:
 - a. To produce burn in dermatitis
 - b. To burn the benign vascular tumour
 - c. To improve cosmetic appearances
 - d. All of the above
- 155. Following are the hazards of laser except:
 - a. Retinal burn
 - b. Skin hazards
 - c. Occupational asthma
 - d. Fire hazards
- 156. What is the unit of electromagnetic field (EMF)?
 - a. Tesla (T)
 - b. Lux
 - c. Candela
 - d. Sievert
- 157. Exposure of electromagnetic field (EMF) may occur from:
 - a. Mobile phones and mobile phone towers
 - b. Computers
 - c. Electric cookers (stoves), microwave oven, electric razors, hair dryers, electric wiring, electric heaters
 - d. All of the above
- 158. Exposure of electromagnetic field (EMF) may occur from all except:
 - a. Radar
 - b. Below the high tension electric line
 - c. Sunray
 - d. Small motor/generator

- 159. EMF is a new concept in occupational health. What are the components in electromagnetic field?
 - a. Magnetic field
 - b. Electrical field
 - c. Both a and b
 - d. None of the above
- 160. The health effects of electromagnetic field (EMF) that have received the most attention are all except:
 - a. Cancer
 - b. Reproductive effects
 - c. Neurobehavioural and neurodegenerative conditions
 - d. Arc eye
- 161. The elevated risk that developing from exposure of electromagnetic field: a. Malignant melanoma
 - h Non Hodelin's lymphon
 - b. Non-Hodgkin's lymphoma
 - c. Testicular and prostate cancer
 - d. All of the above
- 162. Following are the carcinogenic hazards from exposure to electromagnetic field except:
 - a. Leukaemia
 - b. Brain cancer
 - c. Breast cancer
 - d. Mesothelioma
- 163. International Agency for Research on Cancer (IARC) and World Health Organization (WHO) classify electromagnetic field (EMF) as:
 - a. Possible human carcinogen (group 2B)
 - b. Carcinogenic to human carcinogen (group 1)
 - c. Probable human carcinogen (group 2A)
 - d. Probably not carcinogenic to humans (group 4)
- 164. What is the EMF measuring equipment?
 - a. Voltmeters
 - b. Ampere meters
 - c. Both a and b
 - d. None of the above
- 165. What is the occupational exposure limit of electromagnetic field?

- a. Occupational exposure to 50 to 60 Hz magnetic fields is limited to 0.5 µT for a complete work day
- b. Occupational exposure to 50 to 60 Hz magnetic fields is limited to $5 \mu T$ for short-term (2 hours) exposure
- c. Both a and b
- d. None of the above
- 166. What is the barometric pressure at sea level?
 - a. 760 kPa
 - b. 100 kPa
 - c. 200 kPa
 - d. 300 kPa
- 167. What is high barometric pressure in compare to sea level where health effects will start:
 - a. 70 times more than sea level (7000 kPa)
 - b. 100 times more than sea level (10000 kPa)
 - c. 50 times more than sea level (5000 kPa)
 - d. 25 times more than sea level (2500 kPa)
- 168. Where we can see high barometric pressure?
 - a. Bottom of the sea and mines
 - b. Caisson activity
 - c. Tunneling activity
 - d. All of the above
- 169. The soluble pressure underwater in ata can simply be calculated from the water depth in metres. What should be the pressure at 50 m depth of water?
 - a. 6 ata
 - b. 7 ata
 - c. 5 ata
 - d. 8 ata
- 170. At the same depth, which one has the highest atmospheric pressure?
 - a. River water
 - b. Sea water
 - c. Bottom of the mines
 - d. Pond water
- 171. 760 mmHg atmospheric pressure at sea level is equivalent to:
 - a. 1 standard atmosphere absolute (at a)

- b. 1 bar (bar)
- c. 100 kilopascal (kPa)
- d. All of the above
- 172. The physical properties of the environment are defined by the following gas laws:
 - a. Boyle's law and Charles' law
 - b. Dalton's law
 - c. Henry's law
 - d. All of the above
- 173. What is Boyle's law?
 - a. For a fixed mass of gas at constant temperature the volume is inversely proportional to the absolute pressure
 - b. For a fixed mass of gas at constant pressure, the volume is proportional to the absolute temperature
 - c. In a mixture of gases, the pressure exerted by each of the constituent gases are the same as it would exert if it alone occupied the same volume
 - d. At constant temperature, the amount of gas which dissolves in a liquid with which it is in contact is proportional to the partial pressure of the gas
- 174. What is Charles' law?
 - a. For a fixed mass of gas at constant temperature the volume is inversely proportional to the absolute pressure
 - b. For a fixed mass of gas at constant pressure, the volume is proportional to the absolute temperature
 - c. In a mixture of gases, the pressure exerted by each of the constituent gases are the same as it would exert if it alone occupied the same volume
 - d. At constant temperature, the amount of gas which dissolves in a liquid with which it is in contact is proportional to the partial pressure of the gas
- 175. What is Dalton's law?
 - a. For a fixed mass of gas at constant temperature the volume is inversely proportional to the absolute pressure

- b. For a fixed mass of gas at constant pressure, the volume is proportional to the absolute temperature
- c. In a mixture of gases, the pressure exerted by each of the constituent gases are the same as it would exert if it alone occupied the same volume
- d. At constant temperature, the amount of gas which dissolves in a liquid with which it is in contact is proportional to the partial pressure of the gas
- 176. What is Henry's law?
 - a. For a fixed mass of gas at constant temperature the volume is inversely proportional to the absolute pressure
 - b. For a fixed mass of gas at constant pressure, the volume is proportional to the absolute temperature
 - c. In a mixture of gases, the pressure exerted by each of the constituent gases is the same as it would exert if it alone occupied the same volume
 - d. At constant temperature, the amount of gas which dissolves in a liquid with which it is in contact is proportional to the partial pressure of the gas
- 177. At higher pressure, the nitrogen in compressed air requires to be replaced either partially or completely by an alternative 'inert' gas with more advantage with:
 - a. Helium
 - b. Argon
 - c. Hydrogen
 - d. None of the above
- 178. What are the health effects of work at high atmospheric pressure and coming back to normal atmosphere?
 - a. Compression barotraumab. Decompression sickness
 - c. Both a and b
 - d. None of the above
- 179. The effect of compression barotrauma?
 - a. Middle and inner ear barotrauma
 - b. Sinus barotrauma
 - c. Pulmonary barotrauma
 - d. All of the above

- 180. Characteristic of compression barotrauma of diver due to high atmospheric pressure:
 - a. Pain in the affected ear that radiating down the neck
 - b. Sudden relief of ear pain due to tympanic rupture
 - c. Immediate vertigo due to the entry of cold water into the middle ear through ruptured eardrum
 - d. All of the above
- 181. A US navy diving medical officer devised a four-point scale for classifying middle ear injury in deep sea. This scale is used by US navy. Who is he?
 - a. Graham Goon
 - b. Wallace Teed
 - c. Wallace Tood
 - d. Wallacer Teed
- 182. Wallace Teed, a US navy diving medical officer, devised the following scale for classifying middle ear injury in deep sea:
 - a. Teed 1: Congestion in Shrapnell's membrane and along the handle of the malleus. Teed 2: Redness of the entire tympanic membrane with retraction
 - b. Teed 3: Haemorrhage into the tympanic membrane but not into the middle ear
 - c. Teed 4: Entire middle ear filled with blood, drum bluish in appearance and possibly ruptured
 - d. All of the above
- 183. What are the characteristics of pulmonary barotrauma of diver due to high atmospheric pressure, if during a rapid ascent the diver does not exhale adequately?
 - a. The lung will expand beyond normal volume and may be overexpansion of the lung (burst lung)
 - b. The gas may trace to the pleural cavity causing pneumothorax often with tension, or into the mediastinum, or it may rupture into the pulmonary venous system and pass

directly into the left heart and result in arterial gas embolism

- c. Rarely, gas may track through the retroperitoneal space and cause pneumoperitoneum
- d. All of the above
- 184. What is reverse ear of diver in compression barotrauma?
 - a. Due to the use of light-fitted hood during the dive, the tympanic membrane is subjected to a potential negative pressure relative to middle ear, sanguineous blisters occur on the external auditory canal and drum and rarely drum may rupture outward.
 - b. Cannot hear from a particular affected ear
 - c. Tinnitus of that ear
 - d. None of the above
- 185. What is alternobaric vertigo due to compression barotrauma?
 - a. Vertigo due to hypoglycaemia
 - b. Vertigo due to the inequality of pressure between right and left middle ears
 - c. Vertigo due to hypoxia
 - d. All of the above
- 186. What is inner ear barotrauma of diver due to exposure of high barometric pressure?
 - a. Rupture of oval and round window and fistula formation due to the transmission of raised cerebrospinal fluid pressure through the perilymph
 - b. Persistent vertigo
 - c. Total or partial sensorineural hearing loss
 - d. All of the above
- 187. Why there is more chance of skin infection to the divers?
 - a. Warm and humid living conditions facilitate bacterial growth, mainly pseudomonas growth
 - b. Unhygienic condition
 - c. Lack of sunrays
 - d. None of the above

- 188. The acute cerebral event that usually almost immediately follow on surfacing from the dive due to arterial gas embolism:
 - a. Convulsion
 - b. Loss of consciousness
 - c. Sudden blindness or hemiplegia
 - d. All of the above
- 189. What is the usual appropriate treatment procedure for arterial gas embolism in pulmonary barotrauma of diver on coming to surface?
 - a. Rapidly administration of 100% oxygen to accelerates the removal of air from the tissues
 - b. Therapeutic recompression using an appropriate treatment procedure
 - c. Rehydration
 - d. All of the above
- 190. The severe condition that may occur following surfacing from the dive:
 - a. Pneumomediastinum
 - b. Pneumothorax
 - c. Pneumoperitoneum
 - d. All of the above
- 191. What is the treatment procedure in severe pulmonary barotrauma of diver on coming to surface?
 - a. Hyperbaric oxygen therapy
 - b. Recompression
 - c. Both a and b
 - d. None of the above
- 192. The aim of hyperbaric oxygen therapy in severe pulmonary barotrauma of diver on coming to surface:
 - a. It reduces the inert gas load within the vascular space and other tissues
 - b. It may provide oxygenation to tissues that remain hypoxic as a result of the injury
 - c. It may help to prevent reperfusion injury in those tissues which had lost their blood supply
 - d. All of the above
- 193. Decompression sickness (Caisson's disease) is due to:
 - a. Expansion of gas in the body
 - b. Evolution of gas bubble in the body
 - c. Both a and b
 - d. None of the above

- 194. What is the safety system in underground tunneling operation?
 - a. The risk of sudden change in pressure is much less in compressed air work where the working chamber pressure and compression and decompression rates are controlled by a pressure lock operator
 - b. Open space communication with outer atmosphere
 - c. Hyperbaric oxygen therapy system on the spot
 - d. None of the above
- 195. What is decompression sickness?
 - a. Illness due to release of compression
 - b. Decompression sickness is a spectrum of clinical syndromes which result from the effects of the formation of excessive amount of gas microbubbles in the tissues and bloodstream, during and after a decompression, from gas which had previously been dissolved in body tissues according to Henry's law.
 - c. Sickness after coming from dive
 - d. None of the above
- 196. The gas responsible for decompression sickness is:
 - a. Nitrogen
 - b. Oxygen
 - c. Helium
 - d. Argon
- 197. What is the mechanism of nitrogen bubble formation in decompression sickness?
 - a. The difference in partial pressure between the diver's tissues and the environment may be sufficient to cause gas to come out of the solution and form bubbles
 - b. Nitrogen bubble is form due to excess nitrogen gas
 - c. None of the above
 - d. Both a and b
- 198. In cutaneous decompression sickness following may occur:
 - a. Itching due to the cutaneous absorption of nitrogen

- b. A blotchy red or purple rash usually over the upper trunk due to superficial vasodilatation and stasis
- c. Peau d' orange due to lymphatic blockage by bubbles
- d. All of the above
- 199. What is bends in decompression sickness?
 - Pain in knees, shoulders and other synovial joints
 - b. There may be redness, oedema and limitation of movement of affected joints
 - c. Here may be osteoarthritis
 - d. Both a and b
- 200. What is 'latency' in decompression sickness?
 - a. Loss of consciousness on arriving at the surface from diving with a relatively rapid ascent due to arterial gas emboli
 - b. It is the incubation period
 - c. It is the lag period
 - d. All of the above
- 201. What are vestibular symptoms (staggers) in decompression sickness?
 - a. Nausea
 - b. Vertigo
 - c. Loss of balance
 - d. All of the above
- 202. What is 'chokes' in decompression sickness?
 - a. It results from massive bubble load in the venous circulation and obstruction of the pulmonary circulation
 - b. Obstruction within trachea
 - c. Tracheal compression
 - d. All of the above
- 203. Following are the symptoms of pulmonary involvement (chokes) in decompression sickness except: a. Cough
 - a. Cougii
 - b. Breathlessness
 - c. Clubbing
 - d. Haemoptysis
- 204. How the nitrogen bubbles behave in decompression sickness?

- a. They are not inert and the bubble surface is capable of triggering a reaction in tissues and in blood involving the coagulation system and an inflammatory process
- b. They only act as air bubble
- c. They only do the thrombosis
- d. None of the above
- 205. Why slow ascent is less dangerous in decompression sickness?
 - a. On slow ascent, this excess gas will mostly be transferred through the circulation to the GI tract and expelled out
 - b. On slow ascent, this excess gas will mostly be transferred through the circulation to the lungs and exhaled
 - c. On slow ascent, this excess gas will mostly be transferred through the circulation to the kidney and excreted in dissolved condition
 - d. All of the above
- 206. Recognised risk factor for clinical episode of decompression sickness fall into the following categories:
 - a. Pressure exposure-related factors, such as depth (pressure) and duration of exposure, previous exposures over the preceding hours and days
 - b. The ascent/decompression rate, decompression methodology and individual diver's predisposing clinical factors, such as intracardiac shunt or personal susceptibility
 - c. Both a and b
 - d. None of the above
- 207. Following are the long-term effects of high barometric pressure except:
 - a. Dysbaric osteonecrosis
 - b. Memory difficulties and concentration problems
 - c. Bends
 - d. Small airway obstruction
- 208. What is dysbaric osteonecrosis?
 - a. This is a form of aseptic bone necrosis which results as a longterm health effect of high barometric pressure

- b. Bone necrosis due to sepsis
- c. Bone deformity due to fracture
- d. None of the above
- 209. Following are the health effects of low barometric pressure except:
 - a. Acute mountain sickness
 - b. High altitude pulmonary oedema (HAPO)
 - c. Decompression sickness
 - d. High altitude pulmonary oedema (HAPO)
- 210. Acute mountain sickness is due to:
 - a. Low barometric pressure
 - b. High barometric pressure
 - c. Both a and b
 - d. None of the above
- 211. Characteristic of acute mountain sickness?
 - a. Headache
 - b. Sleep disturbance
 - c. Anorexia, nausea, and vomiting
 - d. All of the above
- 212. Following cerebral symptom of acute mountain sickness may occur?
 - a. Profound fatigue
 - b. Dizziness
 - c. Irritability, lack of concentration and confusion
 - d. All of the above
- 213. Physical signs of acute mountain sickness:
 - a. Periorbital oedema
 - b. Peripheral oedema
 - c. Both a and b
 - d. None of the above
- 214. What are the manifestations of normal physiological response to high altitude exposure?
 - a. Shortness of breath on exertion
 - b. Tachycardia
 - c. Both a and b
 - d. None of the above
- 215. If the condition is ignored and ascent to greater altitude is attempted, acute mountain sickness may progress to potentially fatal condition known as:
 - a. High altitude cerebral oedema (HACO)

- b. High altitude pulmonary oedema (HAPO)
- c. Both a and b
- d. None of the above
- 216. Acute mountain sickness (AMS) score is known as:
 - a. Lake Louise acute mountain sickness (AMS) score
 - b. River Louise acute mountain sickness (AMS) score
 - c. Sea Louise acute mountain sickness (AMS) score
 - d. None of the above
- 217. What is the score of Lake Louise for acute mountain sickness (AMS)?
 - a. At least 2
 - b. At least 3
 - c. At least 4
 - d. At least 5
- 218. Following are the self-report questionnaire of Lake Louise acute mountain sickness (AMS) score relating to all except:
 - a. Headache and dizziness/lightheadedness
 - b. Musculoskeletal system
 - c. GI symptoms and difficulty in sleeping
 - d. Fatigue and/or weakness
- 219. What is score 3 or more in Lake Louise acute mountain sickness (AMS) score? a. Severe reduction inactivity
 - b. Moderate reduction inactivity
 - c. Mild reduction inactivity
 - d. No reduction inactivity
- 220. What is high altitude pulmonary oedema (HAPO)?
 - a. High altitude pulmonary oedema is a non-cardiogenic form of pulmonary oedema
 - b. High altitude pulmonary oedema is a cardiogenic form of pulmonary oedema
 - c. High altitude pulmonary oedema is both non-cardiogenic and cardiogenic forms of pulmonary oedema
 d. None of the above
- 221. What is the principal pathological process causing leakage of oedema

fluid from intravascular space into the alveolar bed in association with an exaggerated pulmonary vasoconstrictive response to hypoxia and exercise, which is distributed unevenly throughout the lung vasculature?

- a. High blood pressure
- b. Pulmonary hypertension
- c. Abnormal endothelial synthesis of vasoactive substances disturbs the balance between vasodilators (e.g. nitric oxide) and vasoconstrictors (e.g. endothelin-1)
- d. Both b and c
- 222. Sign and symptom of high altitude pulmonary oedema (HAPO) that may occur as:
 - a. Marked breathlessness at rest
 - Rapid respiratory rate (>30 breaths/ minute)
 - c. Dry cough, frothy or blood-streaked sputum
 - d. All of the above
- 223. Following are the signs and symptoms of high altitude pulmonary oedema (HAPO) except:
 - a. Deep cyanosis
 - b. Chest discomfort
 - c. Extensive bilateral crepitations (rales)
 - d. Clubbing
- 224. Following are the signs of high altitude pulmonary oedema (HAPO) except:
 - a. Tachycardia (pulse rate >120 beats/ minute)
 - b. The second heart sound is accentuated and sometimes palpable
 - c. Elevation of pulmonary artery pressure
 - d. All of the above
- 225. Arterial blood gas measurements in high altitude pulmonary oedema confirm the following except:
 - a. Severe hypoxaemia
 - b. Low arterial partial pressure of oxygen (paO₂)
 - c. Anaemia
 - d. Respiratory alkalosis

- 226. Following may be the ECG finding in high altitude pulmonary oedema:
 - a. Right axis deviation
 - b. Right bundle block
 - c. Right ventricular strain
 - d. All of the above
- 227. Following may be the finding of chest radiograph in high altitude pulmonary oedema:
 - a. Prominence of the pulmonary arteries
 - b. Patchy infiltrates seen in chest in early disease
 - c. Homogenous bilateral infiltration in severe cases
 - d. All of the above
- 228. The development of high altitude pulmonary oedema is related to:
 - a. Speed of ascent and the exertion involved
 - b. The altitude achieved
 - c. The susceptibility of the individual
 - d. All of the above
- 229. Following are the treatment of high altitude pulmonary oedema:
 - a. Descent to low altitude
 - b. Administration of oxygen
 - c. Both a and b
 - d. None of the above
- 230. High altitude cerebral oedema (HACO) presents typically with: a. Intense headache
 - b. Profound lethargy
 - c. Ataxia
 - d. All of the above
- 231. High altitude cerebral oedema presents typically with:
 - a. Impaired coordination
 - b. Confusion
 - c. Disorientation and hallucinations
 - d. All of the above
- 232. High altitude cerebral oedema presents typically with: a. Convulsions
 - b. Cranial nerve palsies
 - c. Visual field loss
 - d. All of the above
- 233. Following are the appearance of neurological signs in high altitude cerebral oedema except:

- a. Ataxia on walking (poor heel to toe walking) or sitting (truncal ataxia)
- b. Cranial nerve palsies
- c. Visual field loss
- d. Wrist drop
- 234. Following are the investigations and findings of high altitude cerebral oedema except:
 - a. Raised cerebrospinal fluid pressure on lumbar puncture
 - b. Increased signal in white matter reflecting oedema of the corpus callosum on T-2 and diffusionweighted magnetic resonance imaging (MRI)
 - c. Postmortem examination reveals extensive cerebral oedema, intracerebral haemorrhage and thrombosis in cerebral veins and dural sinuses
 - d. Flash eye
- 235. What is the current thinking of the mechanism of high altitude cerebral oedema?
 - a. HACO is due to vasogenic oedema related to disruption of the bloodbrain barrier with extravasation of fluid into the interstitial space rather than cytotoxic oedema related to cell death due to increased intracellular osmolarity
 - b. Damage to the blood-brain barrier may be "mechanical" induced by impairment of cerebrovascular autoregulation or "chemical" related to release of mediators of barrier permeability, such as bradykinin and hydroxyl-free radicals
 - c. Cerebral hypoxia is exacerbated by exercise which reduces oxygenation further
 - d. All of the above
- 236. What is the role of exercise in relation to health hazards in high altitude?
 - a. Exercise induces sodium and water retention, decrease oxygen saturation and increases pulmonary artery pressure, thus aggravating the pathological processes leading to altitude sickness

- b. Exercise induces fatigue and tiredness
- c. Exercise induces heavy sweating
- d. None of the above
- 237. What is the treatment for all grades of severity of acute mountain sickness in relation to body metabolism?
 - a. Rest
 - b. Abstinence from alcohol
 - c. Adequate fluid intake and frequent small meals of carbohydrate contentd. All of the above
- 238. What is the medical treatment of acute mountain sickness?
 - a. Non-steroid anti-inflammatory for headache
 - b. Anti-emetics
 - c. Short-acting sedatives and a lowdose acetazolamide
 - d. All of the above
- 239. What is the treatment of high altitude cerebral oedema?
 - a. Descent and oxygen inhalation
 - b. Dexamethasone
 - c. Nifedipin
 - d. All of the above
- 240. Following statements are correct in case of high altitude retinal haemorr-hage (HARH) except:
 - a. May occur at altitude above 14000 ft
 - b. It is usually asymptomatic but defect in peripheral vision rarely occur
 - c. Prognosis is bad
 - d. Treatment is oxygen inhalation with early descent to a lower altitude
- 241. This is a disorder that develops in some native highlanders after many years of residence at altitude above 4000 m. What is it?
 - a. Chronic mountain sickness (Monge's disease)
 - b. High altitude retinal haemorrhage (HARH)
 - c. Acute mountain sickness (AMS)
 - d. High altitude cerebral oedema (HACO)

- 242. The characteristic of chronic mountain sickness (Monge's disease):
 - a. Fatigue, decreased exercise tolerance and marked central cyanosis with pulmonary hypertension with hepertrophy of the right ventricle
 - b. Cyanosis combined with excessive polycythaemia gives the lips and mucous membranes an almost black colour
 - c. The haemoglobin concentration exceeds 23 g/dl and the arterial oxygen tension and oxygen saturation are severely depressed
 - d. All of the above
- 243. Following are the high altitude related disorders except:
 - a. High altitude retinal haemorrhage (HARH)
 - b. High altitude cerebral oedema (HACO)
 - c. Caisson's disease
 - d. High altitude pulmonary hypertension
- 244. What is the characteristic of highaltitude pulmonary hypertension?
 - a. Dyspnoea, cough, cyanosis and peripheral oedema
 - b. Right-axis deviation, right ventricular hypertrophy, and p-pulmonale may be present on the electrocardiogram
 - c. Chest imaging reveals right ventricular and right atrial enlargement and prominence of pulmonary arteries
 - d. All of the above
- 245. Following are the characteristics of a metal except:
 - a. Typical lustrous appearance
 - b. Bad conductors of heat
 - c. Good conductors electricity
 - d. Takes part in chemical reactions as positive ions (cations)
- 246. Following are the example of alloys except:
 - a. Aluminium
 - b. Brass
 - c. Bronze
 - d. Steel

- 247. Brass is an alloy produced from:
 - a. Copper and zinc
 - b. Copper and tin
 - c. Iron and carbon d. None of the above
- 248. Bronze is an alloy produced from:
 - a. Copper and zinc
 - b. Copper and tin
 - c. Iron and carbon
 - d. None of the above
- 249. Steel is an alloy produced from:
 - a. Copper and zinc
 - b. Copper and tin
 - c. Iron and carbon
 - d. None of the above
- 250. What are super alloys?
 - a. Alloys with excellent mechanical strength
 - b. Alloys with ability to resist deformation at high temperature
 - c. Both a and b
 - d. None of the above
- 251. Following are the example of metalloids except:
 - a. Antimony
 - b. Arsenic
 - c. Polonium and tellurium
 - d. Nickel
- 252. The toxicity of any metal depends upon a number of factors, including:
 - a. Chemical species, including its valency and particle size
 - b. The route of exposure, the mode of entry to the body, other contaminant exposures, use of protective equipment
 - c. Reaction of the body to the metals, and the capability for clearance
 - d. All of the above
- 253. Absorption of lead varies inversely with:
 - a. The amount of calcium in the diet
 - b. The amount of iron in the diet
 - c. Both a and b
 - d. None of the above
- 254. Absorption of lead is influenced by:
 - a. Presence of fat in the gut
 - b. Presence of protein in the gut
 - c. Presence of vitamin D in the gut
 - d. All of the above

- 255. The uptake of cadmium is affected by the following metal content of the diet:
 - a. Zinc
 - b. Iron
 - c. Aluminium
 - d. Lead
- 256. The uptake of manganese is affected by the following metal content of the diet:
 - a. Zinc
 - b. Iron
 - c. Aluminium
 - d. Lead
- 257. The metallic agents that may cause acute lung injury are all except:
 - a. Oxide of cadmium
 - b. Oxide of manganese
 - c. Lead oxide
 - d. Oxide of nickel
- 258. The metallic agent that may cause acute lung injury:
 - a. Oxide of cobalt
 - b. Oxide of beryllium
 - c. Mercury vapour
 - d. All of the above
- 259. The metallic agent that may cause acute lung injury:
 - a. Zinc chloride
 - b. Nickel carbonyl
 - c. Oxide of osmium
 - d. All of the above
- 260. The toxic/hazardous agent responsible for health hazards in arc welding: a. Particulate emission
 - b. Toxic gaseous emission
 - c. Heat UV(B) and noise
 - d. All of the above
- 261. What is "spatter"?
 - a. These are coarser, discrete, unfractionated particles of electrode, usually larger than the respirable range
 - b. Big stone
 - c. Chips
 - d. None of the above
- 262. Following are the gaseous emission in arc welding in confine space except: a. Ozone
 - b. Oxide of nitrogen

- c. Carbon disulphide
- d. Carbon monoxide
- 263. Following are the physical agents originated from arc welding except:
 - a. Heat
 - b. UV ray
 - c. Infrared radiation
 - d. Noise
- 264. What is metal fume fever?
 - a. It is an unpleasant but uncomplicated, self-limiting, non-allergic, influenza-like reaction following a single exposure to high concentration of metal fumes
 - b. It is a complicated but self-limiting, allergic, influenza-like reaction following a single exposure to high concentration of metal fumes
 - c. It is an unpleasant but uncomplicated, allergic, influenza-like reaction following a single exposure to high concentration of metal fumes
 - d. None of the above
- 265. Metal fume fever is also known as:
 - a. Monday fever
 - b. Mill fever
 - c. Both a and b
 - d. None of the above
- 266. The syndromes of metal fume fever consisting of all except:
 - a. Fever
 - b. Chills
 - c. Occupational asthma
 - d. Muscle pains and malaise
- 267. Metal fume fever is the health hazard of:
 - a. Welders
 - b. Smelters
 - c. Painters
 - d. Sweepers
- 268. The metal oxide mainly responsible for metal fume fever:
 - a. Lead oxide
 - b. Zinc oxide
 - c. Cadmium oxide
 - d. None of the above
- 269. Following work is the source of metal fume fever:
 - a. Welding

- b. Flame cutting
- c. Both a and b
- d. None of the above
- 270. Arc welding may cause reduction of fertility due to:
 - a. Exposure to radiant heat
 - b. Exposure to metal oxide like chromium, nickel, manganese, and cadmium
 - c. Both a and b
 - d. None of the above
- 271. The effects of arc welding on skin are all except:
 - a. Ray burn
 - b. Permanent pigmentation in the unprotected areas of skin
 - c. Photo dermatitis
 - d. Eczema
- 272. Arc-eye is due to:
 - Exposure of arc's ultraviolet radiation from arc welding
 - b. Exposure of ultraviolet radiation from gas welding
 - c. Exposure of radiant heat radiation from flame welding
 - d. None of the above
- 273. Arc-eye is also known as:
 - a. Black eye
 - b. Red eye
 - c. Flash eye
 - d. Opaque eye
- 274. What is the typical presentation of arceye?
 - a. Pain due to spasm of iris and ciliary muscles
 - b. Photophobia
 - c. Excess lacrimation and feeling of gritiness
 - d. All of the above
- 275. Preventive measure that must be taken to achieve adequate control of the welding hazards:
 - a. Improve working practices by modification of process, process parameters or consumables to lower fume and gas emission rates or toxicity of the constituents
 - b. Prevent exposure by natural ventilation and/or engineering controls, including isolation or segregation

- c. Prevent exposure by wearing respiratory personal protective equipment
- d. All of the above
- 276. What is primary production of a metal?
 - a. When production from the mine's ore
 - b. When production from scrap
 - c. Both a and b
 - d. None of the above
- 277. What is secondary production of a metal?
 - a. When production from the mine's ore
 - b. When production from scrap
 - c. Both a and b
 - d. None of the above
- 278. Aluminium is produced from the ores (primary production) called:
 - a. Bauxite
 - b. Detonite
 - c. Allunite
 - d. None of the above
- 279. The workers of aluminium processing work may be exposed to following hazardous chemicals other than aluminium:
 - a. Fluorides
 - b. Polycyclic aromatic hydrocarbons
 - c. Carbon dioxide and carbon monoxide
 - d. All of the above
- 280. The workers of aluminium processing work may be exposed to following all hazardous chemicals except:
 - a. Perfluorocarbons
 - b. Sulphur dioxide
 - c. Lead oxide
 - d. Carbon dust
- 281. Primary production of aluminium from boxite is of following energy-intensive process:
 - a. Extraction and refining of bauxite by the bayer process to produce alumina
 - b. Electrolytic reduction of alumina by the Hall-Heroult and reduced to metallic Al in electrolytic cells
 - c. Both a and b
 - d. None of the above

- 282. Aluminium may be applied in:
 - a. Transportation
 - b. Building and construction
 - c. Packaging and electrical equipment
 - d. All of the above
- 283. Ligand in the gut enhance uptake of aluminium:
 - a. Citric acid
 - b. Carboxylic acids
 - c. Both a and b
 - d. None of the above
- 284. Ligands in the gut reduce uptake of aluminium:
 - a. Phosphate
 - b. Silicon-compounds
 - c. Both a and b
 - d. None of the above
- 285. In the handling of minerals which contain aluminium (bauxite and corundum), exposure to aluminium accompanied by exposure to silica. This combined exposure may lead to the development of fibrosis of the lung known as:
 - a. Kaolinosis
 - b. Shaver's disease
 - c. Aluminosis
 - d. All of the above
- 286. China clay workers exposing to hydrated aluminium silicate may suffer from the disease known as:
 - a. Kaolinosis
 - b. Shaver's disease
 - c. Aluminosis
 - d. None of the above
- 287. Workers working in aluminium paints industry exposing to stamped aluminium may suffer from pneumoconiosis known as:
 - a. Kaolinosis
 - b. Shaver's disease
 - c. Aluminosis
 - d. None of the above
- 288. Following are the restrictive pulmonary disease except:
 - a. Kaolinosis
 - b. Shaver's disease
 - c. Byssinosis
 - d. Aluminosis

- 289. What is Shaver's disease?
 - a. Exposure to aluminium accompanied by exposure to silica in the handling of mineral which contain alluminium may lead to the development of fibrosis of the lung
 - b. Due to exposure of cold
 - c. Due to exposure of hydrated aluminium silicate
 - d. Due to exposure of stamped aluminium
- 290. Aluminium exposure can exhibit microcytic anaemia due to:
 - a. Aluminium inhibits the synthesis and ferrochelation of haemoglobin
 - b. Due to inhibition of iron uptake
 - c. Due to uptake of vitamin B_{12}
 - d. All of the above
- 291. Aluminium induced senile dementia of Alzheimer type consists of:
 - a. Deterioration of mental functions involving memory, judgment and abstract thinking
 - b. Changes in personality
 - c. Changes in behaviour
 - d. All of the above
- 292. Morphologically, Alzheimer's disease is a neurodegenerative disease characterised by neurofibrillary degeneration, senile plaques, and amyloid. Aluminium has been detected in association with:
 - a. Senile plaques
 - b. Amyloid
 - c. Neurofibrillary degeneration
 - d. Both a and b
- 293. An excess of pulmonary and bladder cancer has been observed in aluminium production workers and aluminium production has been recognised by the International Agency for Research on Cancer (IARC) as causing human cancer because:
 - a. The excess risk of both lung and bladder cancers has been attributed to coal tar pitch volatiles and benzo(a) pyrene exposure in the process
 - b. Aluminium is human carcinogen

- c. Hydrated aluminium silicate may be the causative agent
- d. None of the above
- 294. Arsenic is employed in:
 - a. Agriculture (as a cotton desiccant),
 - b. Animal husbandry (for sheep dip and growth promotion of swine and poultry)
 - c. Forestry (as a silvicide)
 - d. All of the above
- 295. German Chemist in 1815 inspired a small portion of arsine (AsH₃) and at the termination of one hour was seized with continued vomiting, shivering, and weakness, which increased until the ninth day, when he died. Who is he?
 - a. Gehlen
 - b. Scheele
 - c. Ramazzini
 - d. None of the above
- 296. Hydride of arsenic or arsine (AsH₃) was first discovered in 1775 by:
 - a. Gehlen
 - b. Scheele
 - c. Ramazzini
 - d. None of the above
- 297. Arsenic reacts with the following agent to form arsine gas:
 - a. Nascent hydrogen
 - b. H₂O
 - $c. H_2S$
 - d. None of the above
- 298. Arsenic (As) is a/an:
 - a. Metal
 - b. Atmophilic metalloid or intermetal
 - c. Alloy
 - d. Super alloy
- 299. Arsenic exists in:
 - a. Bivalent (+2, -2) state
 - b. Trivalent (+3, –3) state
 - c. Pentavalent (+5, -5) state
 - d. All of the above
- 300. Following statements are correct about arsine (AsH₃) except:
 - a. It is a colourless gas
 - b. It is odourless at low concentration but smells of garlic at high concentration

Multiple Choice Questions on Occupational Health and Safety

- c. It is formed whenever arsenic comes in contact with nascent pure Hydrogen: As + 3H = AsH₃
 d. It is non toxic
- d. It is non-toxic
- 301. The greatest occupational risk of arsenic appears to be from:
 - a. Inorganic forms
 - b. Organic forms
 - c. Both a and b
 - d. None of the above
- 302. Perforation of the nasal septum by arsenic is due to:
 - a. Transformation of the trioxide into the form of arsenous acid by the moisture of the mucous membrane
 - b. Irritation of septum of nose
 - c. Burn of the septum of the nose
 - d. All of the above
- 303. Perforation of the nasal septum due to exposure of arsenic is preceded by:
 - a. Epistaxis
 - b. Irritation of the nose and crust formation
 - c. Obstruction of nasal breathing and necrosis
 - d. All of the above
- 304. Arsine has the following mechanisms of action entirely different from other arsine compounds:
 - a. It acts as a powerful haemolytic poison
 - Renal failure results from the blockage of the kidney tubules by haemoglobin casts
 - c. Local irritation effects of the arsinehaemoglobin degradation product on kidney
 - d. All of the above
- 305. What is the mechanism of action of arsine gas?
 - a. Arsine appears to have an affinity for glutathione (a peptide composed of glutamic acid, cystine, and glycin)
 - b. It has the affinity towards thiol group
 - c. Both of the above
 - d. None of the above
- 306. The *ghost cell* are seen in peripheral blood due to the exposure of:

- a. Inorganic arsenic
- b. Organic arsenic
- c. Arsine gas
- d. All of the above
- 307. Acute arsenic poisoning may follow the ingestion of deliberation or accidentally contaminated food or drinks. It is due to:
 - a. Organic arsenic
 - b. Inorganic arsenic
 - c. Both of the above
 - d. None of the above
- 308. Following are the clinical signs of acute arsenic poisoning except:
 - a. Acute abdominal pain, profound vomiting, rice-water stool, and dehydration
 - b. Shock, stupor, and coma
 - c. Convulsion and death
 - d. Haemoptysis
- 309. What is the underlying lesion in acute arsenic poisoning?
 - a. Dilatation and increased permeability of the small blood vessels in the gut and elsewhere
 - b. Irritation of GI tract
 - c. Both a and b
 - d. None of the above
- 310. Granulo-fatty degeneration in multiple organs is caused by:
 - a. Arsine gas
 - b. Arsenic trichloride
 - c. Beryllium
 - d. None of the above
- 311. Raindrop pigmentation of the skin is due to the chronic exposure of:
 - a. Mercury b. Arsenic
 - D. Alsellic
 - c. Bromic acid d. None of the above
- 312. Skin disorder due to the chronic arsenic poisoning are all except: a. Eczematous or follicular dermatitis
 - b. Ulceration
 - c. Hyperkeratosis of palms and soles d. Acne
- 313. The chronic arsenic poisoning is related to skin carcinomas which usually may be of following type:

Multiple Choice Questions

- a. Basal cell carcinoma
- b. Squamous cell carcinoma
- c. Bowen's disease
- d. All of the above
- 314. Mees' line is the effect of chronic exposure of:
 - a. Arsine gas
 - b. Mercury
 - c. Arsenic
 - d. Lead oxide
- 315. What is Mees' lines?
 - a. White striae in the finger nails
 - b. White striae on the skin
 - c. White striae in the eyelids
 - d. None of the above
- 316. Following are the effect of chronic exposure of arsenic on respiratory system except:
 - a. Painless perforation of nasal septa
 - b. Bronchitis and pneumonitis
 - c. Pneumoconiosis
 - d. Lung cancer
- 317. Chronic exposure of the following toxic chemical can produce loss of vibration sense:
 - a. Carbon monoxide
 - b. Mercury
 - c. Arsenic
 - d. Lead oxide
- 318. Chronic exposure of arsenic on mucous membrane can produce:
 - a. Keratoconjunctivitis
 - b. Corneal necrosis
 - c. Rhinopharyngeal tracheobronchitis
 - d. All of the above
- 319. Chronic exposure of arsenic may cause megaloblastic anaemia due to:
 - a. Arsenic is found to interfere with sulphydryl (–SH) group enzymes concerned with haem synthesis in a manner analogous to lead
 - b. Its effect on bone marrow
 - c. Its effect on RBC
 - d. None of the above
- 320. What is true regarding arsenic poisoning about perforation of nasal septum?
 - a. Arsenic can produce perforation of the nasal cartilaginous septum

- b. Arsenic can produce perforation of the nasal cartilaginous septum due to inflammation and erosive lesions in the mucosa which is painless
- c. Arsenic can produce perforation of the nasal cartilaginous septum due to inflammation and erosive lesions in the mucosa which is painless and may occur within a short time of exposure
- d. All of the above
- 321. Laboratory methods, after collection of the arsenic on filters, rely mostly upon:
 - a. Atomic absorptions pectrophotometry
 - b. Spectrophotometer
 - c. Calorimeter
 - d. None of the above
- 322. Commonest cause of occupational jaundice due to the exposure of:
 - a. Lead
 - b. Arsine gas
 - c. Benzene
 - d. Ionising radiation
- 323. Following are the acute toxic effects of arsine gas exposure except:
 - a. Haemolytic jaundice
 - b. Abdominal pain, nausea, vomiting
 - c. Anuria or oliguiric renal failure
 - d. Acute pancreatitis
- 324. Sources of arsine poisoning:a. Electronic and quartz industries for the production of semiconductors
 - b. Metal smelting and extraction
 - c. Galvanising and soldering
 - d. All of the above
- 325. The most important treatment of acute arsine (AsH₃) poisoning is:
 - a. Forced diuresis
 - b. Oxygen inhalation
 - c. Exchanged blood transfusion
 - d. IV fluid
- 326. Arsenic in hairs and in nails has long been used by forensic scientists to determine exposure to arsenic in case of suspected poisoning. Hair concentrations give a reliable indication of exposure to:
 - a. Organic arsenic
 - b. Inorganic arsenic

- c. Arsine gas
- d. All of the above
- 327. Following are the uses of beryllium:
 - a. To manufacture alloys
 - b. Oil drilling equipment manufacturing
 - c. Aircraft landing bearing
 - c. All of the above
- 328. Why beryllium is used to manufacture window material in X-ray generator and detector?
 - a. As beryllium is highly transparent to X-ray radiation
 - b. Very hard material, therefore no chance of leakage
 - c. Suitable for that purpose
 - d. None of the above
- 329. Why beryllium is used in nuclear reactor?
 - a. As it is very hard metal
 - b. Because it has high melting point, specific heat and conductivity
 - c. No reaction with nuclear power
 - d. All of the above
- 330. Beryllium is used in:
 - a. Electric insulator
 - b. Electrical circuitry
 - c. Microwave transmitter and laser
 - d. All of the above
- 331. Following are the chemical and physical property of beryllium except:
 - a. Beryllium is corrosive resistant
 - b. Non-sparking, non-magnetic, has a low density and is heat resistant
 - c. Has high tensile strength and thermal conductivity
 - d. It is malleable
- 332. Why beryllium is used as under sea applications?
 - e) Because it is corrosive resistant
 - a. Because it has a low density
 - b. Both a and b
 - c. None of the above
- 333. Beryllium is most commonly alloyed with all except:
 - a. Copper
 - b. Aluminium
 - c. Iron
 - d. Nickel

- 334. Exposure to beryllium dust and fumes can cause:
 - a. An immune hypersensitivity reaction
 - b. Dermatitis
 - c. Lung diseases, including acute barylliosis, chronic beryllium disease and lung cancer
 - d. All of the above
- 335. The most widely used beryllium biomarker test:
 - a. Blood beryllium lymphocyte proliferative test (BeLPT), which is commonly used to determine beryllium sensitivity
 - b. Bronchoalveolar lavage (BAL) fluid obtained from the lung during bronchoscopy is used to distinguish between beryllium sensitisation and chronic beryllium disease (CBD)
 - c. Both a and b
 - d. None of the above
- 336. Although acute disease is rare, exposure to elevated concentration of beryllium can result in:
 - a. Nesopharyngitis
 - b. Tracheobronchitis
 - c. A lymphocyte-predominant acute pneumonitis
 - d. All of the above
- 337. The signs and symptoms of lymphocyte-predominant acute pneumonitis due to exposure of beryllium are all except:
 - a. Dyspnoea
 - b. Chest pain
 - c. Clubbing
 - d. Cyanosis
- 338. Formation of non-caseating granuloma of skin is due to:
 - a. Cut with a brocken fluorescent tube coated with beryllium phosphate
 - b. Cut with a glass
 - c. Cut with a tin
 - d. None of the above
- 339. The International Agency for Research on Cancer (IARC) classifies beryllium as:
 - a. Carcinogenic to humans (Group 1)

- b. Probably carcinogenic to humans (Group 2A)
- c. Possibly carcinogenic to humans (Group 2B)
- d. None of the above
- 340. What is chronic beryllium disease?
 - a. It is a condition associated with pulmonary granuloma formed as a result of chronic inhalation of beryllium dusts
 - b. Disease due to chronic exposure of barium salt
 - c. It is a condition associated with pulmonary granuloma formed as a result of chronic inhalation of barium salt
 - d. None of the above
- 341. Chronic beryllium disease is:
 - a. Lung cancer
 - b. Pneumoconiosis
 - c. Occupational asthma
 - d. None of the above
- 342. Chronic beryllium disease is:
 - a. Obstructive disorder
 - b. Restrictive disorder
 - c. Mixed disorder
 - d. All of the above
- 343. Bertrandite, the ore for beryllium is extracted via open-pit mining. The ore is leached with:
 - a. Sulphuric acid
 - b. Hydrochloric acid
 - c. Nitric acid
 - d. None of the above
- 344. Exposure of beryllium may cause:
 - a. Acute berylliosis
 - b. Chronic beryllium disease
 - c. Both a and b
 - d. None of the above
- 345. Radiological finding of chronic beryllium disease:
 - a. Diffuse pulmonary infiltration
 - b. Hilar lymphadenopathy
 - c. Evidence of collapse usually in the upper lobe
 - d. All of the above
- 346. Following are the pulmonary physiology of chronic beryllium disease except:

- a. Decreased oxygen consumption (VO₂)
- b. Common abnormalities noted on exercise testing including reduced exercise tolerance
- c. The diffusion capacity for carbon monoxide (D_LCO) is reduced in more advanced disease
- d. An obstructive pattern with decreased lung volumes
- 347. In chronic beryllium disease, bronchovascular lavage (BAL) shows:
 - a. Increased total white cells with CD₄⁺ T lymphocyte predominance
 - b. Increased RBC
 - c. Increased platelet count
 - d. All of the above
- 348. The diagnosis of chronic beryllium disease (CBD) is confirmed by:
 - a. Demonstrating a beryllium-specific immune response, through the BeLPT on blood or, preferably, on BAL fluid
 - b. Pathological changes consistent with CBD on transbronchial biopsy
 - c. Chest radiograph or CT scan
 - d. All of the above
- 349. What is the first-line therapy for chronic beryllium disease?
 - a. Removal from exposure
 - b. Corticosteroids
 - c. Anti-inflammatory drug
 - d. None of the above
- 350. Cadmium is used in:
 - a. Electroplating
 - b. To make pigment
 - c. For cadmium nickel batteries
 - d. All of the above
- 351. As a consequence of its relatively high vapour pressure, cadmium releases fumes during thermal treatments. These fumes are rapidly transformed into a very fine aerosol of:
 - a. Cadmium oxide
 - b. Cadmium sulphate
 - c. Cadmium nitrate
 - d. None of the above
- 352. Tobacco smoking may significantly increase exposure to cadmium.

Cigarettes contain generally 1 to 2 µg cadmium, of which about 10% is absorbed by the lungs. Hence heavy smokers have a cadmium body burden than that of nonsmokers on the average of:

- a. Three times
- b. Twice
- c. Four times
- d. None of the above
- 353. In the tissue cadmium is largely bound
 - to a zinc storage protein known as:
 - a. Haemoglobin
 - b. Metallothionein
 - c. Myoglobin
 - d. All of the above
- 354. Following is the effect of zinc on cadmium in the body:
 - a. Additive effect
 - b. Synergistic effect
 - c. Reducing effect
 - d. Potentiating
- 355. Cigarette smoking can give rise to the following exposure:
 - a. Carbon monoxide
 - b. Cyanide
 - c. Benzene
 - d. All of the above
- 356. Cigarette smoking can give rise to the following exposure:
 - a. Lead
 - b. Cadmium
 - c. Nicotine
 - d. All of the above
- 357. Cadmium is absorbed through:
 - a. Ingestion
 - b. Inhalation
 - c. Both a and b
 - d. Skin absorption
- 358. Acute effect of cadmium is due to usually 10 hours after the inhalation of:
 - a. Cadmium sulphate fumes
 - b. Cadmium oxide fumes
 - c. Cadmium nitrate fumes
 - d. All of the above
- 359. Following are the acute effect of cadmium:
 - a. Retrosternal pain
 - b. Cough and dyspnoea

c. Pulmonary oedema

- d. All of the above
- 360. Acute oral intoxication usually results from the ingestion of acidic food or beverages that have been contaminated with cadmium, usually during storage in cadmium-plated containers. It may lead to:
 - a. Nausea and vomiting
 - b. These symptoms are followed by shock due to the loss of liquid or by acute renal failure or cardiopulmonary depression
 - c. Death (a single oral administration exceeding 300 mg may be fatal)
 - d. All of the above
- 361. Various organs may be affected after long-term exposure to cadmium, including all except:
 - a. Kidney
 - b. Lung
 - c. Bone and hematopoietic system
 - d. Ophthalmic system
- 362. The principal target organ of cadmium poisoning is:
 - a. Kidney
 - b. Lung
 - c. Bone
 - d. None of the above
- 363. Classically, the functional lesion due to cadmium toxicity that may occur at:
 - a. Renal cortex
 - b. Proximal tubule of kidney
 - c. Distal tubule of kidney
 - d. All of the above
- 364. Classically, the functional lesions of cadmium toxicity give rise to a tubular type proteinuria as in the fanconi syndrome with excretion of lowmolecular-weight proteins such as:
 - a. β_2 -microglobuline
 - b. Retinol binding protein
 - c. Lysozyme
 - d. All of the above
- 365. The most widely used test for the early detection of tubular proteinuria in cadmium poisoning is:
 - a. Urinary β_2 -microglobuline
 - b. Urinary retinol binding protein

- c. Urinary lysozyme
- d. All of the above
- 366. Following abnormal excretion of kidney may occur due to cadmium toxicity:
 - a. Proteinuria
 - b. Aminoacidurea and calciuria
 - c. Glycosuria and phosphaturia
 - d. All of the above
- 367. Classically, the functional lesions of cadmium toxicity give rise to a tubular type proteinuria as it is found in:
 - a. Fanconi syndrome
 - b. Diabetes nephropathy
 - c. Nephrotic syndrome
 - d. None of the above
- 368. Kidney dysfunction due to cadmium toxicity may produce:
 - a. Calciuria
 - b. Phosphaturia
 - c. Renal stone formation
 - d. All of the above
- 369. All are the severe effect of long-term exposure to cadmium on the respiratory system except:
 - a. Émphysema
 - b. Obstructive lung disease
 - c. Pulmonary fibrosis
 - d. Cadminosis
- 370. Anosmia, or loss of sense of smell is the feature of chronic toxicity of:
 - a. Cadmium
 - b. Lead
 - c. Mercury
 - d. All of the above
- 371. Late manifestation of severe chronic cadmium intoxication on bone lesions may be characterised by:
 - a. Osteomalacia
 - b. Osteoporosis
 - c. Spontaneous fractures
 - d. All of the above
- 372. The causes of osteomalacia due to chronic cadmium intoxication are:
 - a. Cadmium may induce a fanconylike syndrome, so, a hypophosphataemia osteomalacia may occur
 - b. Failure of calcitrol formation in the renal tubular cells

- c. Perturbation (deviation/disturb) of vitamin D metabolic pathway arises through an interaction of cadmium with renal mitochondrial hydroxy-lase of the vitamin D₃ endocrine complex
- d. All of the above
- 373. Itai-itai disease is the feature of chronic exposure of:
 - a. Chromium
 - b. Cadmium
 - c. Nickel
 - d. Inorganic lead
- 374. What is Itai-itai disease?
 - a. Pain in the back and legs (Itai-itai means ouch-ouch) and a number of pathological fracture may develop due to osteomalacia due to chronic cadmium intoxication
 - b. Italian disease
 - c. Disease due to chronic exposure of chromium
 - d. Disease due to chronic exposure of nickel
- 375. In 1993, the International Agency for Research on Cancer (IARC) classified cadmium as:
 - a. Group 1 carcinogenic to humans
 - b. Probably carcinogenic to humans (Group 2A)
 - c. Possibly carcinogenic to humans (Group 2B)
 - d. None of the above
- 376. Managements of chronic cadmium toxicity are all except:
 - a. To ensure that the patient is remove from exposure and general and symptomatic treatment
 - b. To monitor renal function.
 - c. To monitor subclinical osteomalacia
 - d. Chelating agents such as BAL and EDTA
- 377. Chromium was discovered in a relatively rare red-orange mineral, crocoites, by the noted French chemist in 1797 known as:
 - a. Nicholas vauquelin
 - b. Michael vauquelin
 - c. Nicholas abra
 - d. None of the above

- 378. Following valence of chromium are the only compounds known to be significantly associated with human disease:
 - a. Trivalent
 - b. Hexavalent
 - c. Divalent
 - d. Both a and b
- 379. Following may be the examples of hexavalent chromium:
 - a. Zinc chromate
 - b. Lead chromate
 - c. Barium chromate
 - d. All of the above
- 380. Hexavalent chromium is used in:
 - a. Pigment for textile dyes
 - b. Paints, inks and plastics
 - c. Corrosion inhibitors
 - d. All of the above
- 381. Chromium is an essential element of the human body which is required for:
 - a. Carbohydrate metabolism
 - b. To potentiate the action of insulin
 - c. Protein metabolism
 - d. Both a and b
- 382. The most hazardous chromium is:
 - a. Hexavalent chromium
 - b. Trivalent chromium
 - c. Divalent chromium
 - d. All of the above
- 383. Hexavalent chromium is absorbed through:
 - a. Inhalation
 - b. Ingestion
 - c. Skin
 - d. All of the above
- 384. Use of chromium and its compounds: a. Against rust
 - b. Provide colour
 - c. Manufacturing of foam rubber
 - d. All of the above
- 385. Why hexavalent chromium is more hazardous than trivalent chromium?
 - a. Trivalent chromium is poorly absorbed through the skin. The hexavalent form easily penetrates the skin
 - b. Trivalent chromium's passage through cell membranes is inhibited

Hexavalent chromium is not. Thus, from an exposure viewpoint, hexavalent forms are potentially more hazardous

- c. Both a and b
- d. None of the above
- 386. What is the fate of hexavalent chromium if it is ingested?
 - a. Gastric fluids readily reduce hexavalent to trivalent chromium, the valence known to be significantly absorbed intestinally
 - b. It will absorbe unchanged
 - c. It will be reduced to divalence
 - d. None of the above
- 387. What will happen when hexavalent chromium enters the cell?
 - a. Hexavalent chromium, which readily transits cell membranes, has a short intracellular life, reducing "within minutes to hours" to the potentially carcinogenic trivalent state
 - b. Like the fabled trojan horse, chromium is thus acceptably disguised as Cr⁺⁶ to gain cellular entry, only to transform into the intracellularcarcinogenic form Cr⁺³
 - c. If the reduction occurs in the cytoplasm, the hazard is low. But if it occurs in the proximity of DNA, the mutagenic potential is significant
 - d. All of the above
- 388. Which form of chromium is carcinogenic?
 - a. Hexavalent chromium
 - b. Trivalent chromium
 - c. Divalent chromium
 - d. Pentavalent chromium
- 389. The International Agency for Research on Cancer (IARC) classified chromium compounds as:
 - a. Group 1 human carcinogen
 - b. Probably carcinogenic to humans (Group 2A)
 - c. Possibly carcinogenic to humans (Group 2B)
 - d. None of the above

- 390. Hexavalent chromate, a hexavalent chromium is used for:
 - a. Surface treatment of metals
 - b. Electroplating
 - c. Glass cleaning
 - d. All of the above
- 391. Chrome hole is due to the exposure of:
 - a. Chromic acid
 - b. Chromium oxide
 - c. Chromium sulphate
 - d. None of the above
- 392. Following are the characteristics of 'chrome ulcer' or 'chrome hole':
 - a. Chromic acid is a strong tissueoxidising agent and may produce small, usually slightly painful ulcers of the fingers and hands
 - a. The ulcers are circular, well-demarcated lesion look as if they have been punched out of the skin
 - b. They tend to heal spontaneously but may be troublesome if secondarily infected
 - c. All of the above
- 393. What is the treatment of chrome ulcer? a. 10% solution of calcium EDTA
 - b. Antibiotic ointment
 - c. Steroid ointment
 - d. All of the above
- 394. Chronic exposure of chromic acid can produce:
 - a. 'Chrome ulcer' or 'chrome hole'
 - b. Ulceration and perforation of the nasal septum
 - c. Both a and b
 - d. None of the above
- 395. Management of ulceration and perforation of the nasal septum due to exposure of hexavalent chromium includes:
 - a. Antibiotic ointment
 - b. Steroid ointment
 - c. Frequent rinsing with a fresh aqueous solution of 10% ascorbic acid, which reduces the hexavalent chromate
 - d. All of the above
- 396. Following statements about trivalent chromium are true except:

- a. Extremely low water solubility
- b. Poorly absorbed through the skin
- c. It is extremely hazardous
- d. It does not usually contribute to the development of clinical contact dermatitis
- 397. Dermatitis in cement industry is usual and it is due to the exposure of:
 - a. Chromate
 - b. Trivalent chromium
 - c. Cement dust
 - d. All of the above
- 398. Water-soluble hexavalent chromate may be reduced to trivalent chromate in cement by adding:
 - a. Ferrous sulfate
 - b. Ascorbic acid
 - c. Lead sulphate
 - d. None of the above
- 399. Water-soluble hexavalent chromate may be reduced to trivalent chromate by the addition of ferrous sulphate to cement and it felt to reduce the risk of:
 - a. Pneumoconiosis
 - b. Having contact allergy develop from chromate
 - c. Liver damage
 - d. All of the above
- 400. What are the sources of chromium in cement?
 - a. Magnesia-chrome kiln refractory brick and raw materials or fuel
 - b. Wear metal from raw mill grinding process, if chromium alloys are used
 - c. Gypsum, pozzolans, ground granulated blast furnace slag, mineral components, and cement kiln dust
 - d. All of the above
- 401. Cobalt is used:
 - a. To manufacture of high temperature resistant alloy called super alloy.
 - b. For cutting of steel and rock
 - c. Used in magnet
 - d. All of the above
- 402. Radioactive cobalt (Co^{60}) is a:
 - a. Source of high energy gamma radiation in radiotherapy
 - b. Source of high energy gamma radiation in radiography

- c. Both a and b
- d. None of the above
- 403. 80% cobalt is excreted through:
 - a. Urine
 - b. Bowel
 - c. Expiration
 - d. None of the above
- 404. Cobalt is absorbed through:
 - a. Lungh
 - b. Gut
 - c. Skin
 - d. Both a and b
- 405. Hard metal fibrosis is due to the exposure of:
 - a. Lead powder
 - b. Beryllium powder
 - c. Cobalt powder
 - d. Aluminium powder
- 406. Hard metal fibrosis or industrial lung fibrosis due to exposure of cobalt powder has the following characteristics:
 - a. Shortness of breath and wheeze
 - b. Chest tightness
 - c. Lung function shows restrictive pattern with reduction of diffuse capacity
 - d. All of the above
- 407. Hard-metal pneumoconiosis is a severe and progressive type of pneumoconiosis which may develop after several years of exposure to:
 - a. Cobalt-containing dust
 - b. Lead-containing dust
 - c. Nickel-containing dust
 - d. None of the above
- 408. Epidemic outbreaks of cardiomyopathy with mortality up to 50% have been described among heavy consumers (up to 10 L/day) of cobaltcontaminated beer is due to:
 - a. There was a synergistic action between the cobalt in the beer
 - b. The direct effect of alcohol on the myocardium
 - c. An inadequate intake of protein and vitamins
 - d. All of the above

- 409. Why cobalt was used in bear?
 - a. To improve the stability of the foam
 - b. To make the bear tastier
 - c. To avoid the bitterness of beer
 - d. All of the above
- 410. Polycythemia has been reported in heavy drinkers of cobalt fortified beer probably due to:
 - a. An increased release of erythropoietin from the kidney as a result of tissue hypoxia
 - b. Inactivation of 2,3-diphosphoglycerate (2,3-DPG), due to the impaired released of oxygen from red cells which deplete 2,3-DPG
 - c. Due to the formation of cobalthaemoglobin with a consequent shift of the oxygen dissociation curve to the left
 - d. All of the above
- 411. What is the effect of cobalt on thyroid gland?
 - a. Cobalt inhibits tyrosin which prevents the synthesis of thyroxine. This in turn leads to an over secretion of thyroid stimulating hormone
 - b. Increase TSH
 - c. Thyroid cancer
 - d. None of the above
- 412. International Agency for Research on Cancer (IARC) concluded that cobalt and cobalt compounds are:
 - a. Group 1 human carcinogen
 - b. Probably carcinogenic to humans (Group 2A)
 - c. Possibly carcinogenic to humans (Group 2B)
 - d. None of the above
- 413. What is the erythropoietic effect of cobalt?
 - a. Increasing blood volume
 - b. Increasing total erythrocyte mass
 - c. Both a and b
 - d. None of the above
- 414. Cobalt has been used for treating:
 - a. Anaemia
 - b. Jaundice
 - c. Skin irritation
 - d. Hypothyroidism

- 415. Following are the components of health surveillance of cobalt related work except:
 - a. Periodic health check-up including clinical examination with especial attention to lung and skin
 - b. Pulmonary function test and X-ray chest—PA view
 - c. Periodical urine examination for cobalt
 - d. Pre-employment medical examination of urine for cobalt
- 416. Following are the properties of copper, except:
 - a. Malleability
 - b. Ductility
 - c. Thermal conductivity
 - d. No effect on corrosion
- 417. Copper is used in the following applications:
 - a. Piping and plumbing systems
 - b. Electrical wiring and electronic applications
 - c. In the manufacture of rayon
 - d. All of the above
- 418. Copper sulphate is used in:
 - a. Water treatment
 - b. Fungicide and algaecide
 - c. Pesticide in organic farming
 - d. All of the above
- 419. Copper is an essential nutrient of human body and needed for:
 - a. Copper under pins the synthesis of adrenalin and noradrenalin, neurotransmitters, encephalins and neuropeptides
 - b. The absorption and distribution of iron, and haemoglobin synthesis
 - c. Efficient muscle contractibility; and the formation of melanin
 - d. All of the above
- 420. Copper has following biologically relevant oxidation (valency) states:
 - a. Cu (I)
 - b. Cu (II)
 - c. Cu (III)
 - d. Both a and b
- 421. Copper is absorbed through:
 - a. Skin
 - b. Inhalation

- c. Ingestion
- d. Both b and c
- 422. The absorbed copper is carried in the portal circulation bound to:
 - a. Albumin
 - b. Amino acids
 - c. A specific carrier, transcuprein
 - d. All of the above
- 423. To the liver where copper is taken up by the hepatocytes and is incorporated into apocaeruloplasmin to form:
 - a. Caeruloplasmin
 - b. Copper complex
 - c. Coprocaerulopasmin
 - d. None of the above
- 424. Following are the pools of copper in liver:
 - a. One is the cuproenzymes, another is caeruloplasmin which is the major means for systemic distribution of copper
 - b. The third pool is a depot of copper bound to a cysteins-rich protein, metallothionein, and which is probably a reserve of the element
 - c. The fourth pool is that of copper principally accrued from recirculated caeruloplasmin from which copper is transferred to a pool destined for biliary excretion
 - d. All of the above
- 425. The major route of copper excretion is through:
 - a. Urine
 - b. Bile
 - c. Exhalation
 - d. None of the above
- 426. Wilson's disease is caused by an inborn error of:
 - a. Copper metabolism
 - b. Zinc metabolism
 - c. Lead metabolism
 - d. None of the above
- 427. Following are the characteristic of Wilson's disease except:
 - a. Diminished capacity to produce caeruloplasmin
 - b. Eliminate copper via bile

- c. The copper concentration is normal in urine
- d. Leading to copper accumulation and secondary lesions in the liver and brain
- 428. Inhalation of copper dust and fumes result in:
 - a. Irritation of the upper respiratory tract
 - b. Ulceration and perforation of the nasal septum
 - c. Metallic or sweet taste
 - d. All of the above
- 429. Suicidal drinking of copper solutions involving doses of 20–70 g of copper
 - is associated with the effects of:
 - a. Nausea, abdominal pain and vomiting
 - b. Haematemesis, diarrhoea, headache, dizziness
 - c. Tachycardia, respiratory difficulty, intravascular haemolysis, haematuria, gastrointestinal haemorrhagic necrosis, hepatocellular necrosis and liver failure, hypovolaemic shock, and acute tubular necrosis and kidney failure, coma and death
 - d. All of the above
- 430. Following diseases/syndroms are at increased risk when exposed to copper occupationally:
 - a. Copper overload syndrome
 - b. Wilson's disease
 - c. Down syndrome
 - d. Both a and b above
- 431. Acute ingestion of copper can be managed by:
 - a. Gastric lavage
 - b. Standard systemic metabolic support
 - c. D-penicillamine as chelating agent d. All of the above
- 432. Following chelating agent will reduce the copper load, in both acute and chronic copper overload of the body:
 - a. D-penicillamine
 - b. EDTA
 - c. Ca-EDTA
 - d. None of the above

- 433. What is the colour of stool and vomit of suicidal drinking of copper solutions?
 - a. Normal
 - b. Blue
 - c. Green
 - d. Red
- 434. Copper fumes may cause an influenzalike illness called:
 - a. Metal fumes fever
 - b. Monday fever
 - c. Monday morning fever
 - d. All of the above
- 435. Copper may develop all except:
 - a. Diffuse pulmonary linear and nodular interstitial fibrosis
 - b. Granulomatous disease of the lung and liver
 - c. Fancony syndrome
 - d. Discolouration of the exposed skin, hair and the tongue and of the teeth
- 436. The copper overload syndromes may occur as:
 - a. Indian childhood cirrhosis (ICC)
 - b. Idiopathic copper toxicosis (ICT)
 - c. Both a and b
 - d. None of the above
- 437. Indian childhood cirrhosis (ICC) of copper overload syndrome is due to:
 - a. Drinking milk that has been heated or stored in bras vessels first described in India, classically buffalo milk
 - b. Inhalation of copper dust
 - c. Ingestion of copper dust
 - d. None of the above
- 438. Idiopathic copper toxicosis (ICT) of copper overload syndrome is due to: a. Inhalation of copper fumes
 - b. Ingestion of copper dust
 - c. High copper content in water supplies, e.g. local well water, in North America and Europe
 - d. None of the above
- 439. Following serum copper values indicates severe poisoning:
 - a. Above 8 mg/L
 - b. Above 3 mg/L
 - c. Above 10 mg/L
 - d. None of the above

- 440. Following are the occupations with potential exposure to hydrofluoric acid:
 - a. Alloy steel cleaners
 - b. Ceramic workers
 - c. Glass etchers
 - d. All of the above
- 441. What is glass etching?
 - a. The fluorine ions in hydrofluoric acid readily combine with silica
 - b. Allergy due to glass exposure
 - c. Glass cutting
 - d. None of the above
- 442. Following are the characteristics of hydrofluoric acid (HF) except:
 - a. Fluoride gas is highly reactive, and with water in air forms hydrofluoric acid (HF)
 - b. It is corrosive to all common metals
 - c. It is corrosive to glass
 - d. It is a chemical asphyxiant
- 443. Following are the characteristics of hydrogen fluoride except:
 - a. Hydrogen fluoride is a colourless liquid or gas
 - b. It has a pungent, irritating odour which is easily detected at a few parts per million
 - c. It is not corrosive to glass
 - d. This gas, purified, and then condensed as liquid anhydrous hydrogen fluoride
- 444. Fluorine compounds are also important in all except:
 - a. Gold refining
 - b. Phosphorus extraction
 - c. Water treatment
 - d. Silicate extraction
- 445. Following fluoride compound used in chemical warfare:
 - a. Sodium fluoroacetate
 - b. Sodium fluoride (NaF)
 - c. Sodium silicofluoride (Na₂SiF₆)
 - d. All of the above
- 446. Deficiency in fluoride can lead to:
 - a. Osteoporosis
 - b. Calcified abdominal nodes
 - c. Ligamentous calcification and bone spurs
 - d. All of the above

- 447. Acute effect of hydrofluoric acid:
 - a. Irritation of nose and eyes (and other mucous membranes), coughing, choking
 - b. Feeling of chills, skin irritation
 - c. Rapid death may be due to intense inflammation in the respiratory tract and/or gross haemorrhagic pulmonary oedema
 - d. All of the above
- 448. Skin burn from hydrofluoric acid always is more severe than its appearance. This is a reaction of:
 - a. Hydrogen ions on the lipids within the cells
 - b. Acid burn
 - c. Fluoride ions on the lipids within the cells
 - d. None of the above
- 449. Treatment of skin burn from hydrofluoric acid:
 - a. Washing with running cool water as soon as possible after the burn for an hour or longer or until other therapy begun
 - b. Iced alcohol compresses and magnesium oxide dressing made of 20% magnesium oxide in glycerine.
 - c. Ten percent calcium gluconate injected around and under the burn area (this is supposed to limit the spread of the acid) and rigorous topical application of 10% calcium gluconate gel
 - d. All of the above
- 450. Chronic health effects of hydrofluoric acid are all except:
 - a. Osteofluorosis
 - b. Dental fluorosis
 - c. Dental caries
 - d. Reactive airway dysfunction syndrome
- 451. Up to 99% of the body burden of fluoride is found in:
 - a. Skeleton
 - b. Blood
 - c. Soft tissue
 - d. Liver

- Multiple Choice Questions on Occupational Health and Safety
- 452. Following are the differential diagnosis of osteofluorosis except:
 - a. Paget's disease
 - b. Osteoblastic metastasis
 - c. Itai-itai disease
 - d. Ankylosing spondylitis
- 453. Characteristics of osteofluorosis:
 - a. Back stiffness
 - b. Vague joint pain
 - c. In severe cases exostoses and osteophytes develop and calcification of ligaments, tendons and muscles insertions may lead to fusion of the spine and the development of a 'poker back' which clinically resembles ankylosing spondylitis
 - d. All of the above
- 454. Following are the X-ray findings of osteofluorosis except:
 - a. Initially there may be increased density of vertebral and pelvic bones. Later the bone contours and trabeculae become uneven and blurred
 - b. Features of pathological fracture
 - c. The bones of the extremities show irregular periosteal thickening with calcification of ligaments and muscular attachments
 - d. In severe cases exostoses and osteophytes develop and calcification of ligaments, tendons and muscles insertions may lead to fusion of the spine and the development of a 'poker back' which clinically resembles ankylosing spondylitis
- 455. Following are the features of dental fluorosis except:
 - a. Chalky white flecks on the teeth
 - b. Brown discolouration on the teeth
 - c. Dental caries
 - d. Pitting on the teeth
- 456. Following teeth are extremely sensitive to fluoride during their formation:
 - a. Permanent teeth
 - b. Temporary teeth
 - c. Both a and b
 - d. None of the above

- 457. What is pot room asthma?
 - a. Asthma during production of pot
 - b. Exposure to irritant gases in the production process of aluminium from bauxite such as hydrogen fluoride can cause a bronchial inflammatory reaction and a reactive airway dysfunction syndrome
 - c. Occupational asthma due to aluminium production
 - d. None of the above
- 458. Systemic effect of chronic hydrofluoric acid poisoning:
 - a. Inhibition of the enzyme involving vital functions such as the origin and transmission of nerve impulses
 - b. Calcium complex formation with a rapid fall in plasma calcium
 - c. It can produce shock-like syndrome with tetany is a prominent characteristic
 - d. All of the above
- 459. Calcium complex formation due to chronic exposure of hydrofluoric acid with a rapid fall in plasma calcium may interfere with blood clotting and cell membrane permeability due to:
 - a. Hypocalcaemia
 - b. Hypermagnesaemia
 - c. Hyperkalaemia
 - d. All of the above
- 460. What is the treatment of choice of systemic poisoning in case of chronic exposure of hydrofluoric acid?
 - a. Slow infusion of intravenous calcium gluconate
 - b. D-penicillamine
 - c. EDTA
 - d. All of the above
- 461. Lead may be:
 - a. Organic
 - b. Inorganic
 - c. Both a and b
 - d. None of the above
- 462. The most toxic inorganic lead is:
 - a. Lead oxide
 - b. Lead chromate
 - c. Tetraethyl lead
 - d. Tetramethyl lead

Multiple Choice Questions

- 463. The least toxic inorganic lead is:
 - a. Lead oxide
 - b. Lead chromate
 - c. Tetraethyl lead
 - d. Tetramethyl lead
- 464. The most toxic organic lead is:
 - a. Lead oxide
 - b. Lead chromate
 - c. Tetraethyl lead
 - d. Tetramethyl lead
- 465. The least toxic organic lead is:
 - a. Lead oxide
 - b. Lead chromate
 - c. Tetraethyl lead
 - d. Tetramethyl lead
- 466. Lead has a wide range of uses because of:
 - a. Low melting point and it is malleable
 - b. Resistance to corrosion
 - c. Ease to casting and fabrication
 - d. All of the above
- 467. Inorganic lead has been used in:
 - a. Soldering
 - b. Ammunition
 - c. Shielding against X-rays
 - d. All of the above
- 468. Organic lead, TEL was used in:
 - a. As an anti-knocking agent in gasoline
 - b. Soldering
 - c. Ammunition
 - d. Shielding against X-rays
- 469. Organic lead, TEL used extensively as an anti-knocking agent in gasoline has been replaced by:
 - a. Kerosene
 - b. Hydrocarbon
 - c. Diesel
 - d. All of the above
- 470. What is 'dross'?
 - a. Oxidised lead
 - b. Oxidised copper
 - c. Oxidised nickel
 - d. Oxidised chromium
- 471. Airborne lead dust, sufficient to cause poisoning, may be produced during the manufacture of: a. Lead batteries
 - a. Lead batteries
 - b. Paints and colours

- c. During the dry disking, grinding and cutting power tools of lead
- d. All of the above
- 472. Fire arms instructors and members of rifle clubs have also been found to have increased lead absorption resulting from exposure to:
 - a. Lead dust from bullets
 - b. Lead azide fume from the explosive charge
 - c. Both a and b
 - d. None of the above
- 473. What is lead azide?
 - a. Lead azide is an explosive and toxic crystalline compound frequently used in primers, blasting caps, and fuses
 - b. Alternate term of lead oxide
 - c. Lead and zinc alloy
 - d. None of the above
- 474. Inorganic lead is absorbed through: a. Inhalation
 - b. Ingestion
 - c. Skin absorption
 - d. Both a and b
- 475. Organic lead is absorbed through:
 - a. Inhalation
 - b. Ingestion
 - c. Skin absorption d. All of the above
- 476. Ingestion is often the principal route of entry for inorganic lead in the following conditions except:
 - a. Good standards of personal hygiene are not maintained
 - b. Lead workers who are allowed to eat or drink in their workplace without careful washing their hands
 - c. Lead workers who are not allowed to eat or drink in their workplace
 - d. Smoke at work
- 477. In case of gastrointestinal absorption of inorganic lead, all are true except:
 - a. Low content of calcium or iron in the diet increases lead absorption
 - b. Diet deficient in phosphorus increases lead absorption
 - c. The absorption of lead through the intestinal mucosa possibly involves

- a competitive mechanism with regard to calcium
- d. Milk enhances lead absorption
- 478. Respiratory absorption of lead depends on:
 - a. Deposition
 - b. Mucociliary clearance
 - c. Alveolar clearance
 - d. All of the above
- 479. Alveolar clearance of lead particle takes place in the following ways:
 - a. Transport to the mucociliary escalator
 - b. Passage through one of the membranes into the pulmonary tissue
 - c. Passage through the pulmonary tissue into the lymph and blood
 - d. All of the above
- 480. The total body burden of lead can be considered to consist of following pools except:
 - a. A rapidly exchangeable pool in the blood and soft tissues
 - b. Intermediate pool in the soft tissue
 - c. The skeletal pool
 - d. Liver pool
- 481. Rapidly exchangeable pool in the blood in toxicologically the most important with the following characteristics except:
 - a. It represents only about 2% of the total body burden
 - b. It has a biological half-life of about 30 days
 - c. It is a slow exchangeable pool
 - d. It reflects only recent exposure
- 482. Following is the only metabolite of the tetraethyl form of lead that appears in the urine:
 - a. Triethyl lead
 - b. Monoethyl lead
 - c. Diethyl lead
 - d. All of the above
- 483. Inorganic lead is excreted through:
 - a. Through kidney
 - b. A small amount of lead is excreted into the bile to appear in the faces
 - c. It is eliminated in other body fluids, e.g. sweat, saliva and breast milk
 - d. All of the above

- 484. Following may be the important property of inorganic lead?
 - a. It has a very high affinity for sulphydryl (–SH) groups and thus is able to inhibit the activity of enzymes which depend upon –SH group for their proper functioning
 - b. The metabolism of lead mimics that of calcium in many respects
 - c. Lead may affect both DNA and RNA *in vitro*
 - d. All of the above
- 485. It has a very high affinity for sulphydryl (-SH) groups and thus is able to inhibit the activity of enzymes which depend upon –SH group for their proper functioning. Following may be the enzyme that may be inhibited by inorganic lead:
 - a. 5-aminolaevulinic acid dehydratase (ALAD)
 - b. Ferrochelatase
 - c. ALA synthase
 - d. Both a and b
- 486. Following enzyme responsible for haem synthesis may be inhibited by inorganic lead:
 - a. 5-aminolaevulinic acid dehydratase (ALAD)
 - b. Ferrochelatase
 - c. Both a and b
 - d. None of the above
- 487. Inorganic lead is able competitively to inhibit the action of calcium at some important sites such as:
 - a. Šynapse
 - b. During the mitochondrial respiration
 - c. Bone
 - d. All of the above
- 488. Depression of ALAD and of ferrochelatase by inorganic lead, results in increased amounts of:
 - a. ALA in the urine
 - b. Increased amounts of protoporphyrin in the circulating red cellsc. Both a and b
 - d. None of the above
- 489. How zinc protoporphyrin (ZPP) is formed due to inorganic lead exposure?

- a. Because of the ferrochelatase suppression, protoporphyrin forms a metal chelate with zinc instead of with iron, giving increased amounts of zinc protoporphyrin (ZPP)
- b. Iron fails to form haemoglobin
- c. Direct toxic effect of lead
- d. None of the above
- 490. The mild anaemia in lead poisoning is mainly due to:
 - a. Vitamin B_{12} deficiency
 - b. Impairment of haem synthesis
 - c. Heavy blood loss through GI tract
 - d. None of the above
- 491. There is also some evidence that red cell lifespan is somewhat shortened due to inorganic lead toxicity. This may be due to:
 - a. Increase in the mechanical or osmotic fragility of the red cells which, in turn, may be related to a loss of potassium caused by the inhibition of Na-K-ATPase
 - b. Direct toxic effect of lead
 - c. Inhibition of haem synthesis
 - d. None of the above
- 492. Classically, the patient with lead poisoning presents with a history of: a. Abdominal pain
 - b. Abdominal colic (lead colic)
 - c. Constipation
 - d. All of the above
- 493. What is called lead poisoning?
 - a. Having abnormal biological tests
 - b. Presence of clinical symptoms and signs
 - c. Both a and b
 - d. None of the above
- 494. 'Excessive lead absorption' may be more appropriate term when:
 - a. There is abnormal biological tests
 - b. Absence of clinical symptoms and signs
 - c. Both a and b
 - d. None of the above
- 495. The major renal effect of acute excessive inorganic lead exposure is disruption of the proximal tubular architecture and function, resulting in: a. Aminoaciduria
 - b. Phosphaturia

c. Glycosuria

- d. All of the above
- 496. The major renal effect of acute excessive inorganic lead exposure is disruption of the proximal tubular architecture and function, resulting in aminoaciduria, phospaturia and glycosuria, collectively known as:
 - a. Fanconi syndrome
 - b. Nephrotic syndrome
 - c. Nephropathy
 - d. None of the above
- 497. Feature of Fanconi syndrome due to acute excessive inorganic lead toxicity:
 - a. Histological changes include eosinophilic intranuclear inclusions in the proximal tubular cells, consisting of lead-protein complexes and mitochondrial swelling
 - b. The blood lead level at which this tubular disorder develops is usually in excess of 150 µg/100 ml
 - c. As with other forms of Fanconi syndrome, vitamin D-resistant rickets may develop and appears to be rapidly reversed following chelation therapy, which reverses both the tubular reabsorption defect and removes the inclusion bodies
 - d. All of the above
- 498. Chronic exposure to high levels of lead results in irreversible changes in the kidney, including:
 - a. Progressive renal interstitial fibrosis
 - b. Dilatation of the tubules
 - c. Tubular atrophy
 - d. All of the above
- 499. Following has been used as a marker of renal tubular dysfunction induced by inorganic lead:
 - a. Urinary N-acetyl-beta-D-glucosaminidase (NAG)
 - b. Urinary lead
 - c. Glucosuria
 - d. Phosphataemia
- 500. What is the cardiovascular effect of inorganic lead poisoning?
 - a. Coronary heart disease
 - b. Hypertension
 - c. Myocardial infarction
 - d. None of the above

Multiple Choice Questions on Occupational Health and Safety

ANSWERS

1. b	2. a	3. b	4. b	5. a	6. c	7. a	8. a	9. a	10. a	11. с	12. a
13. b	14. c	15. c	16. a	17. d	18. a	19. d	20. c	21. d	22. d	23. d	24. a
25. d	26. d	27. с	28. d	29. a	30. b	31. a	32. d	33. c	34. d	35. a	36. b
37. a	38. d	39. a	40. d	41. d	42. a	43. a	44. d	45. a	46. b	47. a	48. a
49. b	50. a	51. a	52. d	53. d	54. d	55. d	56. d	57. d	58. a	59. c	60. a
61. d	62. a	63. b	64. d	65. d	66. d	67. d	68. b	69. a	70. c	71. d	72. d
73. a	74. d	75. b	76. c	77. d	78. d	79. d	80. a	81. c	82. a	83. c	84. b
85. c	86. d	87. c	88. d	89. d	90. a	91. b	92. c	93. b	94. d	95. a	96. c
97. a	98. d	99. d	100. d	101. a	102. a	103. b	104. c	105. d	106. d	107. a	108. a
109. a	110. d	111. d	112. d	113. a	114. d	115. a	116. с	117. a	118. d	119. c	120. b
121. b	122. d	123. d	124. d	125. c	126. d	127. d	128. d	129. d	130. d	131. d	132. с
133. d	134. a	135. d	136. a	137. d	138. b	139. c	140. d	141. d	142. c	143. b	144. с
145. d	146. c	147. a	148. d	149. a	150. b	151. d	152. d	153. d	154. d	155. c	156. a
157. d	158. c	159. c	160. d	161. d	162. d	163. a	164. c	165. c	166. b	167. a	168. d
169. a	170. b	171. d	172. d	173. a	174. b	175. c	176. d	177. a	178. c	179. d	180. d
181. b	182. d	183. d	184. a	185. b	186. d	187. a	188. d	189. d	190. d	191. c	192. d
193. c	194. a	195. b	196. a	197. a	198. d	199. d	200. a	201. d	202. a	203. с	204. a
205. b	206. c	207. c	208. a	209. c	210. a	211. d	212. d	213. с	214. с	215. с	216. a
217. b	218. b	219. a	220. a	221. d	222. d	223. d	224. d	225. с	226. d	227. d	228. d
229. c	230. d	231. d	232. d	233. d	234. d	235. d	236. a	237. d	238. d	239. d	240. с
241. a	242. d	243. с	244. d	245. b	246. a	247. a	248. b	249. с	250. c	251. d	252. d
253. с	254. d	255. a	256. b	257. с	258. d	259. d	260. d	261. a	262. с	263. с	264. a
265. d	266. c	267. a	268. b	269. c	270. с	271. d	272. a	273. с	274. d	275. d	276. a
277. b	278. a	279. d	280. с	281. с	282. d	283. с	284. с	285. b	286. a	287. с	288. с
289. a	290. a	291. d	292. d	293. a	294. d	295. a	296. b	297. a	298. b	299. d	300. d
301. a	302. a	303. d	304. d	305. a	306. c	307. b	308. d	309. a	310. b	311. b	312. d
313. d	314. c	315. a	316. c	317. с	318. d	319. a	320. d	321. a	322. b	323. d	324. d
325. c	326. b	327. d	328. a	329. b	330. d	331. d	332. a	333. c	334. d	335. с	336. d
337. c	338. a	339. a	340. a	341. b	342. b	343. a	344. c	345. d	346. d	347. a	348. d
349. b	350. d	351. a	352. b	353. b	354. c	355. d	356. d	357. c	358. b	359. d	360. d
361. d	362. a	363. b	364. d	365. d	366. d	367. a	368. d	369. d	370. a	371. d	372. d
373. b	374. a	375. a	376. d	377. a	378. d	379. d	380. d	381. c	382. a	383. d	384. d
385. c	386. a	387. d	388. b	389. a	390. d	391. a	392. d	393. a	394. c	395. c	396. c
397.a	398. a	399. b	400. d	401. d	402. c	403. a	404. d	405. c	406. d	407. a	408. d
409. a	410. d	411. a	412. c	413. c	414. a	415. d	416. d	417. d	418. d	419. d	420. c
421. d	422. d	423. a	424. d	425. b	426. a	427. c	428. d	429. d	430. d	431. d	432. a
433. c	434. a	435. c	436. c	437. a	438. c	439. a	440. d	441. a	442. d	443. c	444. c
445. d	446. d	447. d	448. a	449. d	450. c	451. a	452. c	453. d	454. c	455. c	456. a
457.b	458. d	459. d	460. a	461. C	462. a	463. b	464. c	465. d	466. d	467. d	468. a
469. b	470. a	471. d	472. c	473. a	474. d	475. d	476. C	477. d	478. d	479. d	480. d
481.C	482. d	483. d	484. d	485. d	486. c	487. d	488. c	489. a	490. b	491. a	492. d
493. c	494. c	495. d	496. a	497. d	498. d	499. a	500. b				