

1. In an underground mine the sump has a peak inflow as 1 meter cube/minute. The capacity of pumping (Installed) in the mine must be
 - (A) Greater than 1 metre cube/minute
 - (B) Less than 1 metre cube/minute
 - (C) Equal to 1 metre cube/minute
 - (D) Equal to 2 metre cube/minute
 - (E) Answer not known

2. In the context of mining engineering, what is the primary purpose of implementing Computer Aided Design (CAD) systems?
 - (A) To automate the operation of mining equipment
 - (B) To enhance the accuracy and efficiency of Mine design and planning
 - (C) To monitor real time environmental conditions in mines
 - (D) To manage the supply chain of mined materials
 - (E) Answer not known

3. In GIS, a “buffer” analysis is used to :
 - (A) Reduce fire size
 - (B) Add colors
 - (C) Determine area around a feature
 - (D) Backup project files
 - (E) Answer not known

4. What is one application of remote sensing in mining?
 - (A) Processing dispatch
 - (B) Environmental monitoring
 - (C) Survey drafting
 - (D) Payroll automation
 - (E) Answer not known

5. What is the role of data loggers in SCADA?
 - (A) Visualization
 - (B) Real-time user feedback
 - (C) Storing and analyzing sensor data
 - (D) Drawing layouts
 - (E) Answer not known

6. The use of microwave sensors in mining is primarily for
 - (A) Communication
 - (B) Weather detection
 - (C) Moisture measurement in stock piles
 - (D) Drafting
 - (E) Answer not known

7. An examples of integrating GIS with remote sensing in mining is :
 - (A) Exporting, .dwg filer
 - (B) Analyzing Landsat images
 - (C) Drafting conveyor plans
 - (D) Creating ERP modules
 - (E) Answer not known

8. The benefit of using LIDAR in mining is :
- (A) Measuring mine output
 - (B) Real-time monitoring
 - (C) Creating high-resolution surface maps
 - (D) Automating vehicle dispatch
 - (E) Answer not known
9. In CAD, mine design primarily uses which of the following drawing formats?
- (A) .csv
 - (B) .dwg
 - (C) .pdf
 - (D) .shp
 - (E) Answer not known
10. Which software is best suited for statistical Geostatistics like kriging?
- (A) MS Excel
 - (B) SURPAC
 - (C) Auto CAD
 - (D) Oracle
 - (E) Answer not known
11. The spatial component in GIS refers to
- (A) Mining volume
 - (B) Numerical output
 - (C) Geographic location
 - (D) Time-bound data
 - (E) Answer not known

12. Data Loggers in SCADA are used for
- (A) Report informing
 - (B) Dynamic modelling
 - (C) Historical data storage
 - (D) Security control
 - (E) Answer not known
13. The use of AutoCAD in mining contributes to
- (A) Data transfer
 - (B) Equipment repair
 - (C) Drafting mine plans
 - (D) Communications
 - (E) Answer not known
14. Which is not RDBMS software?
- (A) Oracle
 - (B) SQL
 - (C) Excel
 - (D) DB2
 - (E) Answer not known
15. Which is not part of structured programming?
- (A) Top down approach
 - (B) Object
 - (C) Bottom-up approach
 - (D) Sequence
 - (E) Answer not known
16. Which is not component of storage manager of DBMS?
- (A) Authorization
 - (B) Transaction
 - (C) Buffering
 - (D) Manipulation
 - (E) Answer not known

17. Which is not application of artificial intelligence?
- (A) Face recognition system
 - (B) Chat bots
 - (C) LIDAR
 - (D) DBMS
 - (E) Answer not known
18. Which is the structured programming?
- (A) C++
 - (B) C
 - (C) Visual C++
 - (D) Java
 - (E) Answer not known
19. In a management appraisal system, there are four criterias for appraisal A, B, C and D with weightages of 10%, 20%, 30% and 40%. On a scale of 5, A person gets scores of 3.5, 3.8, 4.2 and 3.5 in each of the four criterias. The combined average is
- (A) 3.75
 - (B) 3.77
 - (C) 3.79
 - (D) 3.80
 - (E) Answer not known
20. Marginal analysis can be used to compare
- (A) Cost
 - (B) Revenue
 - (C) More revenue due to more cost
 - (D) Loss due to costs
 - (E) Answer not known

21. A drilling machine is expected to drill 60 meters per shift, but due to delays, it only drills 45 meters. What is the efficiency percentage?
- (A) 65 % (B) 75 %
(C) 85 % (D) 95 %
(E) Answer not known
22. A mining project has three-time estimates
- Optimistic time (O) = 10 days
 - Most likely time (M) = 15 days
 - Pessimistic time (P) = 25 days
- Using PERT, what is the expected project duration
- (A) 15.00 days (B) 15.83 days
(C) 16.5 days (D) 17.5 days
(E) Answer not known
23. A system of two identical mine pumps were to connected in series has reliability 0.49. If the pumps were to be connected in parallel, the system reliability would be
- (A) 0.21 (B) 0.60
(C) 0.91 (D) 0.95
(E) Answer not known

24. Which of the following earnings is not included in the “Ordinary Rate of wages” of mine employees?
- (A) Basic wages
 - (B) Dearness Allowance
 - (C) Bonus excluding incentive for production
 - (D) Compensation in cash
 - (E) Answer not known
25. For a linear programming problem, identify the incorrect statement.
- (A) Optimal point lies in one of the corner points
 - (B) Objective function is linear
 - (C) All the constraints are linear
 - (D) Optimal point lie in any one of the interior points of the feasible region
 - (E) Answer not known
26. Which is not objectives of network analysis?
- (A) To complete project in stipulated time
 - (B) Optimum utilization of available resources
 - (C) Minimize of cost and time
 - (D) Maximize investment in inventory
 - (E) Answer not known
27. Which is not the tools or techniques of project management?
- (A) Milestone charts
 - (B) Simulation
 - (C) PERT
 - (D) CPM
 - (E) Answer not known

28. Which is not part of linear programming model formulation?
- (A) Objective function
 - (B) Variable
 - (C) Optimum value
 - (D) Constraints
 - (E) Answer not known
29. Which is not limitations of operations research?
- (A) Emotional factors
 - (B) Resistance by the employees
 - (C) Numerous quantity and establishing relations factor
 - (D) Scientific factors
 - (E) Answer not known
30. Which of the following artificial intelligence has been developed and introduced to achieve high level in mineral process control and diagnosis?
- (A) Binary matrix
 - (B) Fuzzy logic
 - (C) Expert System
 - (D) Numerical modeling
 - (E) Answer not known
31. What is a distinguishing feature of stirred mills in mineral processing?
- (A) They use large grinding media for coarse grinding
 - (B) They employ a shaft with pins or disks for fine and ultra-fine grinding
 - (C) They use centrifugal force to separate particles
 - (D) They operate only for grinding larger particles ($> 500 \mu\text{m}$)
 - (E) Answer not known

32. Hammer mill is a type of :
- (A) Compression crusher
 - (B) Impact crusher
 - (C) Attrition grinder
 - (D) Roller crusher
 - (E) Answer not known
33. What is a key characteristic of the brake jaw crusher?
- (A) The jaw is pivoted at the top, resulting in a fixed receiving area and valuable discharge opening
 - (B) The jaw is pivoted at the bottom, allowing a fixed discharge and variable feed opening
 - (C) Both jaws are fixed and the material is crushed by vibration
 - (D) It uses rotating hammers for impact crushing
 - (E) Answer not known
34. What does free settling refer to in mineral processing?
- (A) Settling of particles in a confined and crowded fluid medium
 - (B) Sinking of particles in a large volume of fluid relative to the particle volume
 - (C) Settling of particles due to electrostatic forces
 - (D) Sinking of particles only under centrifugal force
 - (E) Answer not known

35. What is the primary purpose of the jigging process in mineral processing?
- (A) To grind the ore into fine particles
 - (B) To separate magnetic materials from non-magnetic ores
 - (C) To separate minerals from gangue based on the colour
 - (D) To separate minerals from gangue based on specific gravity differences
 - (E) Answer not known
36. Jigging is done based on difference in
- (A) Density
 - (B) Mass
 - (C) Volume
 - (D) Terminal velocity
 - (E) Answer not known
37. The mill which accepts the lowest size of feed is
- (A) Rod mill
 - (B) Ball mill
 - (C) Autogenous mill
 - (D) Spherical mill
 - (E) Answer not known

38. The coordinates of three points A, B and C are as follows

	Latitude	Departure
A	769 N (meter)	823 meter (E)
B	447 N (meter)	674 meter (W)
C	835 S (meter)	100 meter (W)

The area of the triangle ABC is

- (A) 1,051, 934.2 meter²
- (B) 1,051, 930.1 meter²
- (C) 1,051, 942.2 meter²
- (D) 1,051, 936.2 meter²
- (E) Answer not known

39. A coal seam is located at a depth of 500 meters at A with a DIP of 10 degrees and direction of N 45° E from A. B is at a distance of 2000 m, 30 m higher than A and bearing of AB is S60 E. The coal seam at B is at a depth of

- (A) 628.1 meters
- (B) 621.3 meters
- (C) 620.1 meters
- (D) 619.3 meters
- (E) Answer not known

40. DGPS stands for

- (A) Different Global Positioning System
- (B) Direct Global Positioning System
- (C) Differential Global Positioning System
- (D) Dynamic Global Positioning System
- (E) Answer not known

41. What will be quadrant bearing of a line whose whole circle bearing is $236^{\circ} 25'$
- (A) S $56^{\circ} 25'$ W
 - (B) N $56^{\circ} 25'$ W
 - (C) S $56^{\circ} 25'$ E
 - (D) S $43^{\circ} 45'$ E
 - (E) Answer not known
42. Poor focusing is a source of
- (A) Instrumental error
 - (B) Personal error
 - (C) Natural error
 - (D) Resolution error
 - (E) Answer not known
43. Permissible limit of error for direct traverse in correlation is
- (A) ± 1 minute of ARC
 - (B) ± 2 minute of ARC
 - (C) ± 3 minute of ARC
 - (D) ± 4 minute of ARC
 - (E) Answer not known
44. The distance between two stations was measured with a 20 m chain and found to be 1500 mtrs. The same was measured with a 30 m chain and found to be 1476 mtrs. If the 20 m chain was 5 cm too short, what was the error in the 30 metre chain?
- (A) 41 cm too long
 - (B) 45 cm too long
 - (C) 50 cm too long
 - (D) 60 cm too long
 - (E) Answer not known

45. The bearing of a line that is measured with magnetic North (or South) in a clockwise direction is termed as
- (A) Reduced bearing
 - (B) True bearing
 - (C) Whole circle bearing
 - (D) Fore bearing
 - (E) Answer not known
46. In old map, a line AB was drawn to a magnetic bearing of $5^{\circ} 30'$, the magnetic declination at the time being 1° E . To what magnetic bearing should the line be set now if the present magnetic declination is $8^{\circ} 30' \text{ E}$.
- (A) $350^{\circ} 00'$
 - (B) $158^{\circ} 00'$
 - (C) $258^{\circ} 00'$
 - (D) $58^{\circ} 00'$
 - (E) Answer not known
47. The EDM (Electronic Distance Measurement) is based on
- (A) Manual Chaining and Taping Techniques
 - (B) Theodolite readings and Angular measurements
 - (C) Generation, Propagation, Reflection and Reception of Electromagnetic waves.
 - (D) Photographic Triangulation Method
 - (E) Answer not known

48. A surveyor measured the distance between two points on the plane drawn to a scale of $1\text{ cm} = 40\text{ m}$ and the result was 468 m. Later, however he discovered that he used a scale of $1\text{ cm} = 20\text{ m}$. What is the true distance between the two points
- (A) 234 m (B) 936 m
(C) 468 m (D) 874 m
(E) Answer not known
49. The length of the line measured with a 20 mtr. chain was found to be 250 meters. Calculate the true length of the line if the chain was 10 cm to long?
- (A) 248.75 mtr. (B) 249.50 mtr.
(C) 251.25 mtr. (D) 252.00 mtr.
(E) Answer not known
50. The full form of GIS is
- (A) Geological Information System
(B) Geodetic Information System
(C) Geographic Information System
(D) Global Information System
(E) Answer not known
51. After an explosion in an underground Mine, the sampling of gases should be done :
- (A) Only after full ventilation is restored
(B) After sealing the affected area
(C) As soon as the area is declared safe
(D) Only from surface boreholes
(E) Answer not known

52. What is the Ecolyser in the context of underground mining?
- (A) A ventilation system for fresh air supply
 - (B) An intrinsically safe device for gas detection
 - (C) A mechanical tool for breaking rocks
 - (D) A safety helmet for miners
 - (E) Answer not known
53. The purpose of a water seal in a stopping is to
- (A) Drain water from behind
 - (B) Allow water into the stopping
 - (C) Balance pressures
 - (D) Allow gases to come out
 - (E) Answer not known
54. Two Machines A and B while operating simultaneously produce a sound pressure level of 85 dBA at a point. When the Machine A stops, the sound pressure level at that point reduce to 80 dBA. The sound pressure level at the same point due to Machine A operating alone in dBA is
- (A) 70.0
 - (B) 75.0
 - (C) 80.0
 - (D) 83.3
 - (E) Answer not known
55. Which of the following gas is lighter than air and tends to accumulate near the roof of coal Mines?
- (A) Carbon monoxide
 - (B) Methane
 - (C) Carbon dioxide
 - (D) Hydrogen sulphide
 - (E) Answer not known

56. How the coal seam is classified if emission rate of methane exceeds $10 \text{ m}^3/\text{tonne}$ of coal produced?
- (A) First degree (B) Second degree
(C) Third degree (D) None of the above
(E) Answer not known
57. What is the chemical process called when a substance combines with oxygen?
- (A) Reduction (B) Neutralization
(C) Oxidation (D) Dissolution
(E) Answer not known
58. Why hydrogen sulphide is considered extremely hazardous in Mining Environments?
- (A) It supports combustion
(B) It is heavier than air and flammable
(C) It is extremely toxic
(D) It is radioactive
(E) Answer not known
59. A fan delivers $4 \text{ m}^3/\text{sec}$ of air through a 500 m long and 500 mm dia leak proof duct ventilating a heading. Taking the Darcy-Weisbach resistance co-efficient $f = 0.02$ and density of air $= 1.2 \text{ kg/m}^3$, calculate the area of the orifice which may be used with the duct to deliver the same quantity of air when its length is only 20 m.
- (A) 0.045 m^2 (B) 0.060 m^2
(C) 0.0747 m^2 (D) 0.080 m^2
(E) Answer not known

60. Which type of fans are used in the ventilation system in underground coal mines/collieries?
- (A) Forcing fan (B) Exhaust fan
(C) Pedestal fan (D) None of the above
(E) Answer not known
61. Two splits A and B pass 15 and 20 m³/sec of air respectively with a pressure drop of 500 Pa across them. The Trunk airways consume a pressure of 300 Pa. What is the area of the Regulator required to equalize the flow in two splits. Assume the fan pressure to remain constant.
- (A) 1.22 m² (B) 1.88 m²
(C) 2.22 m² (D) 3.00 m²
(E) Answer not known
62. A standard Pitot-Static tube placed at the centre of a 400 mm diameter circular duct records a velocity pressure of 250 Pa. What is the quantity of air flowing in the duct if the air temperature is 303 K and the Barometer reads 108 KPa? (Assume the air to be dry and the method factor to be equal to 0.85)
- (A) 2.14 m³/s (B) 3.14 m³/s
(C) 4.14 m³/s (D) 5.14 m³/s
(E) Answer not known
63. When an accumulation of firedamp is suspected in an underground coal mine, It is always advisable to go for which test first using a flame safety lamp?
- (A) Flame test (B) Flame colour test
(C) Accumulation test (D) Percentage test
(E) Answer not known

64. What is true about blackdamp in terms of its physical properties?
- (A) It is lighter than air and accumulator near the roof
 - (B) It is heavier than air and settler in low areas
 - (C) It is explosive and flammable
 - (D) It is composed mainly of methane and carbon monoxide
 - (E) Answer not known
65. Why explosion will not occur when the CH₄ percentage in underground mine atmosphere is more than 14.8%?
- (A) Ignition temperature will increase
 - (B) Percentage of oxygen will fall down
 - (C) Percentage of oxygen will go up
 - (D) None of the above
 - (E) Answer not known
66. A mine airway 2.1 meter wide 2.4 meter high and 600 meter long contains a bend of $\pi/3$ radians (angle of deflection) and radius of curvature of 3 meters. The shock factor for the bend is
- (A) 0.0608
 - (B) 0.0508
 - (C) 0.0708
 - (D) 0.0808
 - (E) Answer not known

67. A 300 meter long airway in an underground mine passes 10 meter cube of air per second. The quantity of air passing through it when another airway of 250 meter long is added parallel is
- (A) 20.95 meter cube / second
 - (B) 2.095 meter cube / second
 - (C) 200.95 meter cube / second
 - (D) 0.2095 meter cube / second
 - (E) Answer not known
68. What is underground mine 'Relighting stations'?
- (A) Lamp stations for Relighting safety lamps
 - (B) Lamp stations for Relighting the Electric light
 - (C) Lamp stations for Restarting the Booster fan
 - (D) Lamp stations for Restarting the Auxiliary fan
 - (E) Answer not known
69. A standard pitot static tube placed at the centre of 500 mm diameter circular duct records a velocity pressure of 300 Pa. Calculate the quantity of air flowing in the duct if the air temperature 301 K and density of air is 1.2 kg per cubic meter. Assume the air to be dry and the method factor is 0.8
- (A) 3 m³/s
 - (B) 3.5 m³/s
 - (C) 4 m³/s
 - (D) 4.5 m³/s
 - (E) Answer not known

70. Why auxiliary fan of forcing type is located in the airway atleast 9m up stream of the corner of pillar at the junction of the heading to be ventilated?
- (A) To allow minimum deposition of dust
 - (B) To avoid recirculation of hot return air mixed with dust and gases
 - (C) To avoid chances of any explosion
 - (D) To avoid mixing of intake and return air
 - (E) Answer not known
71. Which of the following is classified as a Naturally supported STOPE?
- (A) Cut and fill stoping
 - (B) Sub-level stopping
 - (C) Shrinkage stoping
 - (D) Top slicing
 - (E) Answer not known
72. In block caving, the ore is broken by
- (A) Controlled blasting
 - (B) Wedge-cutting
 - (C) Induced collapse of the ore body
 - (D) Top slicing
 - (E) Answer not known
73. The sub-level caving is not preferred for high grade ore
- (A) Poor ventilation
 - (B) Low production rate
 - (C) High dilution due to mixing of ore and waste
 - (D) Need for square sets
 - (E) Answer not known

74. What is the purpose of sump in underground workings?
- (A) To store coal (B) To store explosives
(C) To collect water (D) To improve ventilation
(E) Answer not known
75. Which equipment is typically used for drivage in underground coal mines?
- (A) Dragline (B) Road header
(C) Shovel (D) Surface miner
(E) Answer not known
76. Which of the following is an essential constituent of a permitted explosive to act as a cooling agent?
- (A) Ammonium nitrate
(B) Charcoal
(C) Sodium chloride, potassium chloride, or sodium fluoride
(D) Diesel oil
(E) Answer not known
77. Which of the following are considered as “Fuel Sensitizers” in explosive?
- (A) Ammonium Nitrate and Urea
(B) TNT, PETN and PENTOLITE
(C) Diesel oil and Charcoal
(D) Water and Gum
(E) Answer not known

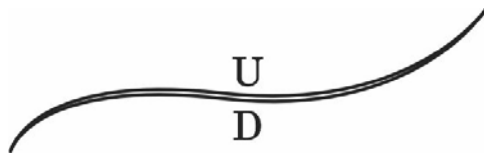
78. The most effective and oxygen balanced Ammonium Nitrate-Fuel Oil (ANFO) explosive mixture contain
- (A) 1-2% diesel oil by weight
 - (B) 3-4% diesel oil by weight
 - (C) 5-6% diesel oil by weight
 - (D) 10-12% diesel oil by weight
 - (E) Answer not known
79. Which of the following is a white Hygroscopic salt, very soluble in water and comparatively very safe to handle?
- (A) Gun powder
 - (B) TNT
 - (C) Calcium Nitrate
 - (D) Ammonium Nitrate
 - (E) Answer not known
80. When a low explosive is blasted, the process of oxidation is propagated by
- (A) Instantaneous detonation across the entire mass
 - (B) Rapid combustion from particle to particle through the mass
 - (C) Slow thermal expansion without combustion
 - (D) Absence of any shock wave
 - (E) Answer not known
81. Zero oxygen balance for an explosive is the state at which
- (A) Contains oxygen to form oxides of nitrogen
 - (B) Energy output is optimized
 - (C) Contains oxygen to oxidize all fuels
 - (D) No oxygen is left out for fuels
 - (E) Answer not known

82. Most commonly used oxidisers for explosives are
- (A) Ammonium nitrate, sodium nitrate and calcium carbonate
 - (B) Carbon, aluminum and TNT
 - (C) Carbon, sodium nitrate and TNT
 - (D) Ammonium nitrate, sodium nitrate and aluminum
 - (E) Answer not known
83. The shape formed by a pyramid cut is generally
- (A) Hexagonal
 - (B) Triangular
 - (C) Square or polygonal
 - (D) Conical
 - (E) Answer not known
84. Which explosive is most suitable for use in gassy underground coal mines?
- (A) Emulsion explosive
 - (B) Permitted explosive
 - (C) Slurry explosive
 - (D) ANFO
 - (E) Answer not known
85. Which drilling method is suitable for obtaining rock cores for testing porosity and strength?
- (A) Diamond drilling
 - (B) Cable drilling
 - (C) Manual drilling
 - (D) Percussion drilling
 - (E) Answer not known
86. In percussion drilling, which part actually strikes the rock surface?
- (A) Water hose
 - (B) Bit holder
 - (C) Chisel
 - (D) Clamp
 - (E) Answer not known

87. Which is the correct arrangement of equipment for diamond drilling on surface?
- (A) Compressor, light, casing pipe, rod
 - (B) Pump, hose, drill rod, detonator
 - (C) Crane, blower, tank, engine
 - (D) Derrick, engine, winch, water pump, settling tank
 - (E) Answer not known
88. What is the function of the chamber screw in cable drilling?
- (A) To rotate the bit
 - (B) To power the winch
 - (C) To generate water pressure
 - (D) To secure the rope to the clamp
 - (E) Answer not known
89. What is the usual diameter range of drill holes in Mining areas?
- (A) 100 mm to 250 mm
 - (B) 25 mm to 125 mm
 - (C) 150 mm to 300 mm
 - (D) 10 mm to 50 mm
 - (E) Answer not known
90. The part of the mineral resource that can be economically mined is
- (A) Proved
 - (B) Proved and probable
 - (C) Indicated
 - (D) Indicated and probable
 - (E) Answer not known

91. Which of the following has poor water resistant property?
- | | |
|------------------------|------------------------|
| (A) ANFO | (B) Slurry explosive |
| (C) Emulsion explosive | (D) NG based explosive |
| (E) Answer not known | |

92.



The above symbol in a Geological mapping indicates what?

- | | |
|---|--|
| (A) Relative horizontal movement of fault | |
| (B) Relative slip direction and plunge | |
| (C) Relative vertical movement of fault | |
| (D) Uncertain fault | |
| (E) Answer not known | |
93. Which mineral is the main constituent of limestone?
- | | |
|----------------------|--------------|
| (A) Gypsum | (B) Dolomite |
| (C) Quartz | (D) Calcite |
| (E) Answer not known | |
94. Which rock type is formed by the action of high temperature and pressure on existing rocks?
- | | |
|----------------------|----------------------|
| (A) Igneous rock | (B) Sedimentary rock |
| (C) Plutonic rock | (D) Metamorphic rock |
| (E) Answer not known | |

95. What is the typical silica content in basic rocks?
- (A) More than 65% (B) 45% to 55%
(C) 55% to 65% (D) Less than 45%
(E) Answer not known
96. Which mineral gives a white streak and is a major component of marble?
- (A) Calcite (B) Dolomite
(C) Gypsum (D) Quartz
(E) Answer not known
97. Why is the ANFO mixture said to be less suitable in very wet or water-logged boreholes?
- (A) Low VOD
(B) Diesel oil gets washed away
(C) Ammonium nitrate absorbs water and reduces sensitivity
(D) Difficult to prime with no. 8 detonation
(E) Answer not known
98. Which element's loss determines the 'Volatile matter'?
- (A) Calcium (B) Sulphur
(C) Hydrocarbon gases (D) Silica
(E) Answer not known
99. What is the typical calorific value (ev) of lignite?
- (A) 6200 kcal/kg (B) 3200 kcal/kg
(C) 2400 kcal/kg (D) 5000 kcal/kg
(E) Answer not known

100. Which of the following is a lignite field?
- (A) Raniganj (B) Neyveli
(C) Umaria (D) Sohapur
(E) Answer not known
101. Fixed carbon is calculated by
- (A) Adding ash and volatile matter.
(B) Gravimetric analysis
(C) Direct burning
(D) Subtracting, moisture and volatile matter from 100
(E) Answer not known
102. Which of these is NOT a method of proximate analysis reporting?
- (A) Unit - Coal basis (B) Air - dried basis
(C) On - field basis (D) As - Received basis
(E) Answer not known
103. Which coal rank is considered the Purest?
- (A) Peat (B) Lignite
(C) Anthracite (D) Bituminous
(E) Answer not known
104. What kind of fault has movement parallel to the dip of beds?
- (A) Strike fault (B) Listric fault
(C) Dip fault (D) Oblique fault
(E) Answer not known

105. Most major coal deposits formed during which geological period?
- (A) Jurassic
 - (B) Triassic
 - (C) Cretaceous
 - (D) Carboniferous
 - (E) Answer not known
106. Which is not ore body modeling techniques?
- (A) Triangle
 - (B) Polygon
 - (C) Round
 - (D) Block
 - (E) Answer not known
107. Which of the following parameters most directly influences the stripping ratio in a pushback design?
- (A) Commodity price
 - (B) Pit slope angle
 - (C) Milling cost
 - (D) Drill hole spacing
 - (E) Answer not known
108. What is the primary objective of mine design?
- (A) To maximize dilution
 - (B) To ensure safety, efficiency and economic viability
 - (C) To reduce ore recovery
 - (D) To increase environmental footprint
 - (E) Answer not known
109. If Net value is N and grade is G , they are related by the equation $N = -36 + 0.3G$, then cut off grade is
- (A) 0.2
 - (B) 0.1
 - (C) 0.3
 - (D) 0.5
 - (E) Answer not known

110. In a Block model, the block height is mostly
- (A) Height of bench
 - (B) Width of bench
 - (C) Height/Width of bench
 - (D) Thickness of deposit
 - (E) Answer not known
111. He O' Hara cost estimator is used for
- (A) Environmental impact assessments
 - (B) Quick and dirty mining cost estimates
 - (C) Geotechnical slope stability
 - (D) Ore Reserve classification
 - (E) Answer not known
112. What is the main purpose of drilling in Mining?
- (A) To stove explosives underground
 - (B) To improve ventilation only
 - (C) To reduce noise levels in Mines
 - (D) To obtain information about rock structure and mineral beds
 - (E) Answer not known
113. Restoration, Reclamation and Rehabilitation of land shall be completed
- (A) After abandoning mine
 - (B) Before abandoning Mine
 - (C) Before handling over to NGO'S
 - (D) Prior to opening up a New Mine
 - (E) Answer not known

114. If the reserves for a mine is 7,800,000 tonnes, and the production rate is 700,360, the mine life is
- (A) 11.1 years (B) 11.0 years
(C) 10.9 years (D) 10.8 years
(E) Answer not known
115. Sensitivity analysis in feasibility studies is primarily used to
- (A) Calculate slope stability
(B) Compare competitor mine performance
(C) Assess impact of varying key inputs on project viability
(D) Design haul roads
(E) Answer not known
116. A mine uses 4.5 BCM|truck| load. With a swell factor of 1.3 and a fill factor of 0.9, what is the loose volume hauled per cycle
- B – Bulk L – Loose
- (A) 4.2 LCM (B) 5.26 LCM
(C) 4.95 LCM (D) 6.5 LCM
(E) Answer not known
117. Why is a minimum turning radius important in haul road design?
- (A) To reduce grade control errors
(B) To accommodate equipment maneuverability
(C) To increase haulage speed
(D) To improve blasting efficiency
(E) Answer not known

118. What would be the likely consequence of using an excessively low cutoff grade in pit design?
- (A) Increased NPV
 - (B) Reduced tonnage
 - (C) Pit enlargement beyond economic limits
 - (D) Better concentrate quality
 - (E) Answer not known
119. The use of stockpiling in open pit operations primarily affects
- (A) Overall pit slope
 - (B) Drill pattern design
 - (C) Economic performance via cut off grade flexibility
 - (D) Bench width
 - (E) Answer not known
120. Which of the following is treated as one of the important input of planning and decision making?
- (A) Resource allocation
 - (B) Scheduling
 - (C) Forecasting
 - (D) Capital budgeting
 - (E) Answer not known
121. Gross domestic happiness (GDH) refers to which Index?
- (A) Index of Market Price
 - (B) Index of Poverty
 - (C) Index of Progress
 - (D) Index of Literacy
 - (E) Answer not known

122. Which feasibility study includes detailed Engineering designs and accurate cost estimates.
- (A) Scoping study
 - (B) Pre-feasibility study
 - (C) Feasibility study
 - (D) Environmental study
 - (E) Answer not known
123. Which of the following is not typically included in a Detailed Project Report (DPR)?
- (A) Environmental clearance documentation
 - (B) Final pit slope validation
 - (C) Capital and operating cost estimates
 - (D) Project implementation schedule
 - (E) Answer not known
124. What is the role of Work Break down Structure (WBS) in feasibility studies?
- (A) Defines are grade requirements
 - (B) Outlines environmental compliance steps.
 - (C) Breaks down the project scope into logical work per changes
 - (D) Estimates Labour requirements
 - (E) Answer not known
125. A phase schedule for a mine has 4 stages and for each stage the time period is 1.08 years, 1.24 years, 3.04 years, 5 years, 6.04 years and 5.20 years.
- (A) 20.6 years
 - (B) 19.6 years
 - (C) 21.6 years
 - (D) 22.1 years
 - (E) Answer not known

126. When mineral is extracted from an underground mine the void (Goaf) is perched with sand or other perching material. This process is called as
- (A) Roof bolting
 - (B) Subsidence control
 - (C) Grouting
 - (D) Showing
 - (E) Answer not known
127. A rock sample has bulk density of 2.89 GM/CC. IFS moisture content was found to be 1.38%. It's dry density will be
- (A) 2.52 GM/CC
 - (B) 2.69 GM/CC
 - (C) 2.85 GM/CC
 - (D) 2.96 GM/CC
 - (E) Answer not known
128. (i) The creep has got three parts: Primary; Secondary and tertiary creep
- (ii) Primary creep is followed by tertiary and secondary creep
 - (iii) Tertiary creep is followed by primary and secondary creep
 - (iv) Primary creep is followed by secondary and tertiary creep
- Out of the above statement
- (A) (i) and (iii) are correct
 - (B) (i) and (ii) are correct
 - (C) (i) and (iv) are correct
 - (D) None is correct
 - (E) Answer not known

129. In Mohr's circle of stresses the angle between principal plane and maximum shearing plane is
- (A) 90 degree
 - (B) 180 degree
 - (C) 360 degree
 - (D) 45 degree
 - (E) Answer not known
130. In resin bolting, gel time refers to the time
- (A) Before inserting capsule
 - (B) To drill the hole
 - (C) Between spinning and hardening
 - (D) To insert bolt
 - (E) Answer not known
131. CMRS hydraulic props include which safety feature?
- (A) Ventilation pipes
 - (B) Shear pins
 - (C) Safety release valve
 - (D) Expansion shell
 - (E) Answer not known
132. What is the compressive strength of cured resin?
- (A) 25 MN/m²
 - (B) 50 MN/m²
 - (C) 125 MN/m²
 - (D) 10 MN/m²
 - (E) Answer not known
133. Which prop type is unsuitable in uneven roof seams?
- (A) Resin bolt
 - (B) Bamboo bolt
 - (C) Steel Joist prop
 - (D) Concrete set
 - (E) Answer not known

134. What is the function of a cantilever bar in powered supports?

- (A) To support immediate roof (B) To Support the goaf
(C) To move support units (D) To transmit hydraulic fluid
(E) Answer not known

135. In a borehole log of 1.2m in length, recovery of rock cores in cm is given below 20, 8, 15, 8, 8, 4, 3, 9, 10, 1, 5, 10. The RQD in percentage is

- (A) 29.2 (B) 31.8
(C) 45.8 (D) 50.0
(E) Answer not known

136. Match the following

Equipment	Component
(P) Scraper	1. Dribble belt
(Q) Dragline	2. Dipper stick
(R) Bucket wheel Excavator	3. Fair lead
(S) Rope shovel	4. Bowl

- | | (P) | (Q) | (R) | (S) |
|-----|------------------|-----|-----|-----|
| (A) | 2 | 4 | 3 | 1 |
| (B) | 4 | 2 | 1 | 3 |
| (C) | 4 | 3 | 1 | 2 |
| (D) | 2 | 4 | 1 | 3 |
| (E) | Answer not known | | | |

137. The rate at which a machine component oscillates is called
- (A) Speed of machine
 - (B) Vibration frequency
 - (C) RMS frequency
 - (D) Indicator of machine condition
 - (E) Answer not known
138. The volume of a given mass of gas varies inversely as the absolute pressure when the temperature remains constant. The relationship is described by which of the following law.
- (A) Boyle's law
 - (B) Charles law
 - (C) Avagadro's law
 - (D) Gay-Lussae's law
 - (E) Answer not known
139. In a right-hand lay wire rope, how do the wires spiral around the core.
- (A) Opposite to the threads of a right hand Screw
 - (B) Perpendicular to the rope axis
 - (C) In the same direction as the threads of a right hand screw
 - (D) Randomly arranged around the core
 - (E) Answer not known
140. What is the defining characteristic of an epicyclic gear Train?
- (A) All gears are fixed and rotate about the same axis
 - (B) There is no motion between gear axes
 - (C) There is relative motion between the axes of the shafts
 - (D) It can only be used in vertical shafts
 - (E) Answer not known

141. As per DCF analysis a project report is acceptable if
- (A) Discounting rate $>$ IRR
 - (B) Discounting rate $<$ IRR
 - (C) Discounting rate = IRR
 - (D) There exist no relation between the two
 - (E) Answer not known
142. A mining project requires an investment of Rs.100 million and will generate annual cash flows of \$.20 million for 7 years. If the IRR is estimated to be 12%. Which of the following statements is true?
- (A) The project should be accepted if the required return is 10%
 - (B) The project should be rejected if the required return is 15%
 - (C) The project's NPV is negative if the discount rate is 12%
 - (D) Both (A) and (B) are correct
 - (E) Answer not known
143. If inflation increases unexpectedly during a mining project, what is its likely effect on NPV?
- (A) NPV increases
 - (B) NPV remains constant
 - (C) NPV decreases
 - (D) NPV turns negative
 - (E) Answer not known

144. A Mining project has the following cash flows

Year	Cash flow (\$M)
0	−50
1	15
2	18
3	14
4	12
5	10

What is the payback period for the project?

- (A) 2.75 years
- (B) 3.0 years
- (C) 3.25 years
- (D) 3.5 years
- (E) Answer not known

145. A Mining project has an initial investment of \$75 Million and the present value of future cash flows is \$ 90 million. If the discount rate increases, what will happen to the PI?

- (A) PI will increase
- (B) PI will decrease
- (C) PI will remain the same
- (D) PI will become negative
- (E) Answer not known

146. China clay, Fireclay and Ballclay are

- (A) Coproducts of Lignite
- (B) Byproducts of Lignite
- (C) Coproducts of coal
- (D) Byproducts of coal
- (E) Answer not known

147. If Rs.10,000 is invested in a bank at the end of each year for a period of 5 years, the present value of these payments is
- (A) Rs. 37,090 (B) Rs. 37,900
(C) Rs. 36,900 (D) Rs. 36,090
(E) Answer not known
148. If the discount rate increases, what happens to the NPV of a mining project?
- (A) NPV increases (B) NPV remains unchanged
(C) NPV decreases (D) NPV turns positive
(E) Answer not known
149. A mining company processes ore at a cost of \$ 50 per ton. The price of the metal is \$ 500 per ounces, and the recovery rate is 85% if each ton of ore contains 0.15 ounces of metal, what is the cut - off grade (minimum ore grade to be profitable)
- (A) 0.10 ounces per ton (B) 0.12 ounces per ton
(C) 0.15 ounces per ton (D) 0.08 ounces per ton
(E) Answer not known
150. A mining project shall be accepted or operated if
- (A) NPV is Negative (B) NPV is Zero
(C) NPV is positive (D) NPV is unpredictable
(E) Answer not known

151. Use of power in a mine shall be at a voltage of
- (A) Not more than 6600 V
 - (B) More than 6600 V
 - (C) Both (A) and (B)
 - (D) None of the above
 - (E) Answer not known
152. In which regulation of CMR 1957, the duties of safety officers is stipulated?
- (A) 41
 - (B) 41 (A)
 - (C) 42
 - (D) 42 (A)
 - (E) Answer not known
153. In second or third degree gassy mine use of electric welding apparatus is permitted by
- (A) Colliery Manager
 - (B) Agent
 - (C) Regional Inspector
 - (D) Director (Technical)
 - (E) Answer not known
154. As per mine rules 1955, workmen inspectors are mandated in mines if the number of persons ordinarily employed in the mine is equal to or exceeds?
- (A) 500
 - (B) 1000
 - (C) 1500
 - (D) 2000
 - (E) Answer not known

155. As per 10th National conference on safety in mines, what is the test stipulated for canteen workers in the mines and what is the periodicity of such test?
- (A) Stool and sputum test, once in every six months
 - (B) Tuberculosis test, once in a year
 - (C) Eye test, once in every six months
 - (D) Periodic medical examination, once in 3 years
 - (E) Answer not known
156. A first-aid room is required at a miner when the number of persons employed on any given day in the previous calendar year is more than _____?
- (A) 150
 - (B) 200
 - (C) 250
 - (D) 300
 - (E) Answer not known
157. In the interest of safety, the earth fault current shall not be more than _____ milliamperes in installations of voltage exceeding 250 V and upto 1100 V for below ground mines and oil fields?
- (A) 750 mA
 - (B) 1000 mA
 - (C) 1500 mA
 - (D) 2000 mA
 - (E) Answer not known

158. As per CEAR 2023, electricity shall not be transmitted into a below ground mine at a voltage exceeding 11000 V and shall not be used therein at a voltage exceeding ————— ?
- (A) 6000 V
 - (B) 3300 V
 - (C) 250 V
 - (D) 440 V
 - (E) Answer not known
159. A miner finds that an unused flexible cable is still energized in an underground mine. According to CEAR 2023, what action should be taken?
- (A) Secure the cable properly
 - (B) Immediately detach or isolate the cable from supply
 - (C) Wrap the cable with insulation tape
 - (D) Allow it to remain energized if no one is working nearby
 - (E) Answer not known
160. As per Reg. 96 (Haulage rope) of CMR 2017, every rope which is capped shall be recapped once atleast in how many months?
- (A) Every Six months
 - (B) Every Eight months
 - (C) Every Nine months
 - (D) Every Twelve months
 - (E) Answer not known

161. As per coal mines regulations an automatic contrivance shall be provided for winding in a shaft of depth exceeding.
- (A) 50 m (B) 100 m
(C) 150 m (D) 500 m
(E) Answer not known
162. As per coal mines regulations the minimum distance between the opening of a seam and an active fire should be
- (A) 30 meters (B) 45 meters
(C) 60 meters (D) 100 meters
(E) Answer not known
163. As per coal mines regulations, the length of the shot hole in comparison with the hole depth shall be
- (A) less than 20 centimeter in length
(B) less than 5 centimeter in length
(C) less than 10 centimeter in length
(D) less than 15 centimeter in length
(E) Answer not known
164. As per Regulation 4 of emr 2017, on or before 1st day of February every year, the owner, agent or manager shall submit to the chief inspector the regional inspector and to the District Magistrate Annual Returns in respect of the preceeding year in which form?
- (A) Form - I (B) Form - 2
(C) Form - 3 (D) Form - 4A
(E) Answer not known

165. As per 12th National Conference on safety in Mines, what is the permissible respirable dust levels in mines in case percentage of free silica in mines is less than 5 %.
- (A) 3.0 mg/m³ (B) 1.0 mg/m³
(C) 2.0 mg/m³ (D) 5.0 mg/m³
(E) Answer not known
166. The vehicle transporting the explosives in Bulk shall not be driven at a speed exceeding.
- (A) 20 kmph (B) 30 kmph
(C) 25 kmph (D) 35 kmph
(E) Answer not known
167. What does DGMs (Tech) circular No. 10 of 2020 dated 23/06/2020 provide for?
- (A) Guidelines to prevent occurrence of incidents due to vehicle in mines
(B) Guidelines to prevent occurrence of incidents due to explosives in mines
(C) Guidelines to prevent occurrence of incidents due to HEMM in mines
(D) Guidelines to prevent occurrence of incidents due to lightning in mines
(E) Answer not known
168. A Safety committee must be constituted in every mine where more than _____ no. of people are ordinarily employed.
- (A) 500 (B) 1000
(C) 100 (D) 300
(E) Answer not known

169. In mine, the electrical supervisor is appointed by
- (A) DGMS
 - (B) Electrical Inspector
 - (C) Owner, Agent or Manager of the Mine
 - (D) Chief Engineer
 - (E) Answer not known
170. What type of switch gear is required for disconnection of power supply in mines?
- (A) Manual fuse box
 - (B) Properly constructed switch gear
 - (C) Circuit breakers only
 - (D) Residual current devices
 - (E) Answer not known
171. In a coal mine, if 1800 tonnes were produced in a day with an oms of 6 tonnes, how many man shifts were worked?
- (A) 200
 - (B) 250
 - (C) 300
 - (D) 400
 - (E) Answer not known
172. What is the main objective of a Truch Dispatch System (TDS) in surface mining?
- (A) To increase drilling efficiency
 - (B) To improve are blending
 - (C) To optimize haulage operation and deduce idle time
 - (D) To monitor explosive usage
 - (E) Answer not known

173. In an opencast mine, 38 levels and 12 dumpers are working. Each dumper carries 15 tonnes per trip and makes 8 trips per shift. Calculate daily output assuming 1 shift per day.
- (A) 1460 tones/day (B) 1480 tones /day
 (C) 1490 tones /day (D) 1440 tones/day
 (E) Answer not known
174. A dragline is required to remove 3,00,000 m³ of rock per month on the bank volume basis. Consider the following data for the dragline operation.
- Effective working hour per month = 450
 Bucket fill factor = 0.8
 Cycle time = σ 5 S
 Swell factor of the rock = 1.25
- The minimum bucket capacity of the dragline in m³ is :
- (A) 7.70 (B) 9.63
 (C) 12.04 (D) 18.80
 (E) Answer not known
175. An opencast mine has four benches. The height, width and face angle for each bench are 13 m, 30 m and 70° respectively. The overall slope angle of the benches in degree is
- (A) 25.5° (B) 20.7°
 (C) 33.4° (D) 19.7°
 (E) Answer not known

176. In placer mining in the technique of hydraulicking the following is an optional parameter in that process
- (A) Adequate water supply
 - (B) Material disintegrated by water action
 - (C) Independent of hydraulic gradient
 - (D) Space for waste disposal
 - (E) Answer not known
177. Productivity of machine is depend on
- (A) Available hour
 - (B) Utilization hour
 - (C) Breakdown hour
 - (D) Repair hour
 - (E) Answer not known
178. The major reason for converting under ground mine to surface mine is
- (A) Highly mechanized machinery availability
 - (B) Gases
 - (C) Ventilation
 - (D) Roof problem
 - (E) Answer not known

179. In ultimate pit limit analysis, the most widely used method is

- (A) Dynamic programming
- (B) Linear programming
- (C) Simulation
- (D) Heuristic technique
- (E) Answer not known

180. Which is not stabilization strategies?

- (A) Flattening of overburden slope
- (B) Scaling of loose material
- (C) Providing drain pipes or holes
- (D) Blasting
- (E) Answer not known

181. Which not example of placer mining

- (A) Gold
- (B) Gemstone
- (C) Alluvial deposit
- (D) Diamond
- (E) Answer not known

182. Slope failure at bench in surface mining is

- | | |
|----------------------|--------------|
| (A) Circular | (B) Toppling |
| (C) Earthquake | (D) Wedge |
| (E) Answer not known | |

183. The side casting system adopted by draglines can be broadly classified into which of the following groups?
- (A) Cross-pit, rotary, twin bucket, overhead
 - (B) Simple, extended bench, horseshoe, Tandens
 - (C) Inclined, Horizontal, vertical, spiral
 - (D) Offset, swinging, oscillating, circular
 - (E) Answer not known
184. A haul ramp of 6% grade is to be constructed connecting a bench of 15 m height to the surface. If the cost of ramp construction is 1 million rupees per km, the cost of this ramp construction in million rupees will be?
- (A) 0.25
 - (B) 0.10
 - (C) 2.50
 - (D) 0.50
 - (E) Answer not known
185. Which of the following is an excavator which has a boom one end of which is attached with the revolving unit of the machine and the hanging end in the other side carrier a large sheave for the cable attached with the bucket?
- (A) Dragline
 - (B) Shover
 - (C) Backhoe excavator
 - (D) Bucket wheel excavator
 - (E) Answer not known

186. Which type of rock is most suitable for ripping operations?
- (A) Very hard igneous rock
 - (B) Stratified rocks with hardness below 5 on Mohr's scale
 - (C) Mohr's crystalline rocks above 7 on Mohr's scale
 - (D) Unweathered quartzite
 - (E) Answer not known
187. Why it is essential to extend vertical or inclined blast holes slightly beyond the bench floor in hard rock?
- (A) To reduce drilling time
 - (B) To allow for drainage
 - (C) To ensure proper fragmentation of the toe
 - (D) To reduce fly rock generation
 - (E) Answer not known
188. What is the term used to describe the proportion of overburden to coal/mineral removed in mining?
- (A) Recovery factor
 - (B) Stripping ratio
 - (C) Grade
 - (D) Yield
 - (E) Answer not known

189. For OB removal with shovel dumper combination, the optimum size of the dumper depends on
- (A) Distance of the haul
 - (B) Size of the shovel
 - (C) Distance of the haul and size of the shovel
 - (D) Tonnage to be handled
 - (E) Answer not known
190. The mining method that defines the production of a stone/aggregate is
- (A) Quarrying
 - (B) Dimension stone mining
 - (C) Small scale mining
 - (D) Open cast mining
 - (E) Answer not known
191. A bucket wheel excavator has 14 buckets rotating at 15 revolutions per minute. Each bucket has a capacity of 700 liters with a fill factor of 0.8. The hourly production with an efficiency of 90% and mineral density of 1.2 meter cube/Tonne is
- (A) 762.048 Tonnes/hour
 - (B) 7620.48 Tonnes/hour
 - (C) 76.2048 Tonnes/hour
 - (D) 7.62048 Tonnes/hour
 - (E) Answer not known

192. A 60 meter cube shovel is to be used with a 400 Tonne truck for a material density of 2.5 Tonnes/Meter cube. The number of shovel cycles to load the truck with a fill factor of 0.8
- (A) 3 (B) 2
(C) 4 (D) 5
(E) Answer not known
193. A dragline has a bucket capacity of 50 m³ and completes 4 cycles per hour. How much material will it move in a 10 hour-shift?
- (A) 1500 (B) 1800
(C) 2000 (D) 2500
(E) Answer not known
194. In a mine for one shovel six trucks are assigned. The shovel loading time per truck is 5 min, and truck cycle time is 20 min. Calculate match factor
- (A) 0.66 (B) 1
(C) 1.2 (D) 1.5
(E) Answer not known
195. In shovel loading of broken iron ore, if loading cycle time-of the shovel of 5 m³ bucket capacity, is 60 seconds, bucket fill factor is 0.8, rock looseness coefficient is 1.5 and shovel working time utilization factor is 0.6, then the hourly output of the shovel, m³/hr would be
- (A) 93 (B) 94
(C) 95 (D) 96
(E) Answer not known

196. Which is not surface mining method?

- (A) Opencast method
- (B) Bord and pillar method
- (C) Strip mining
- (D) Quarry
- (E) Answer not known

197. What should be Idle stripping ratio for mechanised surface mine using shovel-dipper/Dumper combination

- (A) 1 : 1.5
- (B) 1 : 2.0
- (C) 1 : 3.0
- (D) 1 : 4.0
- (E) Answer not known

198. The maximum Haul-Road gradient in India

- (A) 1 : 10
- (B) 1 : 12
- (C) 1 : 14
- (D) 1 : 16
- (E) Answer not known

199. “Which is the continuous surface miner?”

- (A) Shovel
- (B) Dragline
- (C) Ripper dozer
- (D) Bucket wheel excavator
- (E) Answer not known

200. Layout of mechanized surface mine is not depend on

- (A) Dip of deposit
 - (B) Thickness of overburden
 - (C) Shape of the deposit
 - (D) Compressive strength of deposit
 - (E) Answer not known
-