1. In mining a group of people living in the geographic region of the operation is called

(A) Community
(B) Mining people
(C) Mining work force
(D) Miners
(E) Answer not known

2. If an opencast coal mine uses a 5 cu.M capacity shovel with a bucket fill factor of 0.9 and the swell factor of coal is 1.2, what is the bank volume handled per cycle of the shovel?

(A) 4.5 m^3
(B) 5.4 m^3
(C) 6.0 m^3
(D) 4.8 m^3
(E) Answer not known

3. As per the DGMS norms, the severity index is a measure of

(A) Fatality rate
(B) Serious injure rate
(C) Number of reportable injuries
(D) Accident proneness of mine
(E) Answer not known

4. The primary objective of a Safety Management System (SMS) in mining from the given under

(A) Increase mineral production
(B) Reduce operating costs
(C) Prevent accidents and ensure safe working conditions
(D) Improve equipment efficiency
(E) Answer not known

5. In PERT, if the optimistic time is t_o, most likely time is t_m and pessimistic time is t_p the expected time is :

(A) $(t_o + 2t_m + t_p)/4$ (B) $(t_o + 4t_m + t_p)/6$

(C) $(2t_o + 4t_m + t_p)/7$ (D) $(t_o + 3t_m + 2t_p)/6$

(E) Answer not known

6. The time interval between placement of order and supply of material is called as

(A) Cycle time (B) Initial time

(C) Lead time (D) Buffer time

(E) Answer not known

7. If a project cannot be completed within the stipulated time, it is said to have?

(A) Project time overrun (B) Project cost overrun

(C) Project resource overrun (D) Project quality overrun

(E) Answer not known

8. In order to understand complexity of worker, the management experts have developed several models. Out of which Edgar H Schein developed concepts on motivation of people. Name the model?

(A) Situational model (B) Behavioural model

(C) Trait model (D) Democratic model

(E) Answer not known

9. The primary purpose of network analysis in project management is to?

(A) Increase inventory level

(B) Plan, schedule and control projects

(C) Determine ore grade

(D) Calculate equipment depreciation

(E) Answer not known

10.

Activity	Predecessor	Duration
A	–	4 days
B	A	6 days
C	A	3 days
D	B	5 days
E	C	4 days
F	D,E	2 days

What is the critical path and project duration?

(A) A – B – D – F, 17 days

(B) A – C – E – F, 13 days

(C) A – B – D – F, 15 days

(D) A – C – E – F, 17 days

(E) Answer not known

11. Risk magnitude decreases when

(A) Likelihood decreases

(B) Severity decreases

(C) Both likelihood & Severity decrease

(D) All of the above

(E) Answer not known

12. Fleet Management Systems (FMS) help to

(A) Increase haulage efficiency
(B) Reduce ventilation cost
(C) Improve explosive detonation speed
(D) Increase stripping ratio
(E) Answer not known

13. In a borehole log of 1.2 m 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

14. In mine water analysis for EMP, the most important parameter for acid mine drainage detection is

(A) Dissolved oxygen
(B) pH
(C) Turbidity
(D) Hardness
(E) Answer not known

15. What is the term for the point beyond which mineral or coal cannot be economically extracted?

(A) Ultimate pit limit
(B) Cut-off grade
(C) Break-even stripping ratio
(D) Recovery factor
(E) Answer not known

16. A mine needs to produce 1,000,000 tonnes annually. If it operates 250 days per year, what should be the average daily production rate?

(A) 2500 tonnes/day
(B) 3500 tonnes/day
(C) 4000 tonnes/day
(D) 5000 tonnes/day
(E) Answer not known

17. Why is a preliminary (or) pre-feasibility study conducted before a full feasibility study?

(A) It assess whether the project justifies detailed feasibility investigation
(B) It provides the final basis for investment decision
(C) It establishes the final mine design and equipment requirements
(D) It verifies project assumptions after construction begins
(E) Answer not known

18. Match the following geostatistical activities with their purpose

Column I – Activity	Column II – Purpose
(a) Study of geological control and zoning	1. Estimate tonnage and grade of an individual blocks
(b) Computation of vario-grams	2. Identify the geological factors controlling mineralization
(c) Division of the ore body into block for kriging	3. Establish the spatial correlation of mineral characteristics
(d) Estimation of block tonnage and grade	4. Obtain block by block estimate using information from adjacent samples

	(a)	(b)	(c)	(d)
(A)	2	3	4	1
(B)	3	2	1	4
(C)	2	4	3	1
(D)	1	3	2	4

(E) Answer not known

19. According to the stable pit slopes values given for different rock types, the indicated stable slope range for very hard metamorphic and igneous rock is?

(A) 25° – 35°
(B) 40° – 50°
(C) 50° – 60°
(D) 60° – 70°
(E) Answer not known

20. Long-range production planning is particularly important for?

(A) Decision-making, feasibility and budget studies
(B) Daily equipment lubrication only
(C) Sampling individual drill cuttings
(D) Determining only bench width
(E) Answer not known

21. Which is not meteorological correction in EDM?

(A) Temperature
(B) Pressure
(C) Water vapour
(D) Multi-pillar baseline
(E) Answer not known

22. Which is part of GNSS?

(A) GPS
(B) Galileo
(C) GLONASS
(D) GIS
(E) Answer not known

23. How many orbital plane in GPS space segment?

(A) 4
(B) 6
(C) 8
(D) 10
(E) Answer not known

24. GPS gives height from

(A) WGS81
(B) WGS82
(C) WGS83
(D) WGS84
(E) Answer not known

25. To determine the coordinates of new point, in total station first the _____ used.

(A) Horizontal circle
(B) Vertical circle
(C) Plummet
(D) Prism Constant
(E) Answer not known

26. Continuous mining cannot be applied to

(A) Salt
(B) Potash
(C) Trona
(D) Gold ore
(E) Answer not known

27. The digital image processing softwares

(i) CAD
(ii) ANISIS
(iii) ELAS
(iv) ERIPS

(A) (ii)-(iii)
(B) (iii)-(iv)
(C) (iv)-(i)
(D) (i)-(ii)
(E) Answer not known

28. If the total length of blast hole drilled is 50 meter, and if the total rock blasted is 35.73 tonnes, then the drilling factor is _____ meter/tonne.

(A) 2.29
(B) 0.29
(C) 1.29
(D) 1.39
(E) Answer not known

29. Drone-based photogrammetry in mining is used for

(A) Ventilation control
(B) Stockpile volume measurement
(C) Blasting pattern design
(D) Root bolt torque measurement
(E) Answer not known

30. Levelling staves are

(A) Dumpy level
(B) Tilting level
(C) Wye level
(D) Target level
(E) Answer not known

31. The Bowditch's rule is based on the assumption that the probable error is proportional to

(A) L
(B) $\sqrt{L}$
(C) L^2
(D) L^3
(E) Answer not known

32. The size of theodolite is defined according to

(A) Length of telescope
(B) Diameter of object glass
(C) Diameter of graduate horizontal circle
(D) Reversing
(E) Answer not known

33. When is direct ranging used in surveying?

(A) When the ground is steep and uneven
(B) When the two ends of the survey lines are intervisible
(C) When obstacles block the line of sight
(D) When chaining is not possible
(E) Answer not known

34. Instruments for the direct measurements of directions

(i) Sextant
(ii) Theodolite
(iii) Prismatic compass
(iv) Surveyors compass

(A) (i) – (iii)
(B) (iii) – (iv)
(C) (iii) – (ii)
(D) (i) – (ii)
(E) Answer not known

35. The magnetic bearing of a line AB is S 28° 30′E. If the magnetic declination is 7° 30′ West, What is the true bearing?

(A) S 21° 00′E
(B) S 36° 00′E
(C) S 28° 30′E
(D) S 35° 00′E
(E) Answer not known

36. What is the basic principle of chain surveying?

(A) Dialing
(B) Chaining
(C) Traversing
(D) Triangulation
(E) Answer not known

37. The magnetic bearing of a line is 48° 24′. Calculate the true bearing if the magnetic declination is 5° 38′ East.

(A) 54° 02′
(B) 48° 02′
(C) 58° 24′
(D) 48° 24′
(E) Answer not known

38. Which of the following is required in scope monitoring?

(A) Compass survey
(B) Levelling
(C) Chain survey
(D) Plane table survey
(E) Answer not known

39. Which method of levelling is used to carry out a quick reconnaissance of an area?

(A) Fly levelling
(B) Check levelling
(C) Barometric levelling
(D) Simple levelling
(E) Answer not known

40. An orthophoto is ————————.

(A) A raw aerial photograph
(B) A geometrically corrected aerial image
(C) A satellite image
(D) A thermal image
(E) Answer not known

41. The safety device which acts when overwind takes place and used only in drum winding is?

(A) Detaching hook
(B) Safety catches
(C) Keps
(D) Rope Break
(E) Answer not known

42. An LHD with an articulated frame offers:

(A) Higher travel speed in straight drifts
(B) Better maneuverability in sharp curves
(C) Reduced tyre wear
(D) Increased bucket volume
(E) Answer not known

43. One of the basic principles of mine pumps is:

(A) Thermal expansion
(B) Positive displacement of liquid
(C) Centrifugal force only
(D) Magnetic induction
(E) Answer not known

44. Spring buffers are provided in special man-riding cars mainly to:

(A) Decrease speed
(B) Reduce fuel consumption
(C) Absorb shocks during braking
(D) Improve ventilation
(E) Answer not known

45. Drag is used in direct haulage roadway to prevent runaway of tubs in ———————— direction.

(A) Backward
(B) Upward
(C) Forward
(D) Downward
(E) Answer not known

46. Run away switch is used in connection with

(A) Gravity Haulage
(B) Endless Haulage
(C) Direct Haulage
(D) Main and Tail Haulage
(E) Answer not known

47. What do you mean by mechanical efficiency of a fan?

(A) The ratio of power actually absorb by impeller and converted into head to the power applied to the shaft
(B) The ratio of power in the air to the input power
(C) The ratio of input head to Euler's head
(D) The ratio of total head developed to the velocity head
(E) Answer not known

48. The maximum gradient continuous miners can work is ———————— degrees.

(A) 25
(B) 15
(C) 10
(D) 5
(E) Answer not known

49. The travel speed of an underground cavo drill is ———————— kilometers per hour.

(A) 3.6
(B) 36
(C) 0.36
(D) 1.8
(E) Answer not known

50. For a fluid flow across a varying cross section, the total energy remains constant is given by ———————— theorem.

(A) Newton's
(B) Navier–Stokes
(C) Bernoulli's
(D) Poiseuille's
(E) Answer not known

51. As per metalliferous mines regulations 1961 the life of a winding rope is

(A) 2 years
(B) 4 years
(C) 3½ years
(D) 1 year
(E) Answer not known

52. Which of the following reason restrict, the use of loco in underground Coal Mine?

(A) Cost
(B) Ventilation
(C) Safety
(D) Output
(E) Answer not known

53. Continuous miners are primarily used to:

(A) Drill blast holes
(B) Cut and load coal continuously
(C) Transport coal to the surface
(D) Pump mine water
(E) Answer not known

54. Which of the following is an advantage of belt conveyor haulage?

(A) High dependence on fuel availability
(B) Greater labor requirement than truck haulage
(C) Reliable operation with an availability of about 90-95%
(D) Performance significantly increases during rainy weather
(E) Answer not known

55. The angle between the vertical plane of the pulley and the rope is called as

(A) Angle of fleet
(B) Angle of repose
(C) Angle of reflection
(D) Angle of deviation
(E) Answer not known

56. Which of the following haulages is preferred for undulating roadways?

(A) Direct rope haulage
(B) Endless haulage
(C) Main and tail rope haulage
(D) Tail rope haulage
(E) Answer not known

57. In winding operations, rope slip on the drum can be minimised by

(A) Increasing drum diameter
(B) Using grooved drum lagging
(C) Increasing winding speed
(D) Using heavier cages
(E) Answer not known

58. The device which is used in the endless haulage track to prevent the backward movement of tubs in case of rope breaks is?

(A) Back catch
(B) Drop Warrick
(C) Runaway switch
(D) None of the above
(E) Answer not known

59. Match the following safety arrangements for a surface-to-underground shaft hoist with their corresponding safety functions.

Hoisting safety arrangement	Safety function
(a) Detaching hook	1. Over winding safety on surface
(b) Narrowing rigid guides	2. Resting cages
(c) Keps	3. Over-winding safety at underground

	(a)	(b)	(c)
(A)	1	2	3
(B)	3	1	2
(C)	2	3	1
(D)	1	3	2

(E) Answer not known

60. When two wheels are meshed with each other, having diameters D_1 and D_2, rotating at RPM's of N_1 and N_2 then

(A) $N_1/N_2 = D_2/D_1$ (B) $N_1/N_2 = D_1/D_2$

(C) $N_1/D_1 = N_2/D_2$ (D) $N_1 \times N_2 = D_1 \times D_2$

(E) Answer not known

61. Which of the following is not a type of slope failure?

(A) Plane failure (B) Circular failure

(C) Wedge failure (D) Tensile failure

(E) Answer not known

62. The line connecting the boundary of excavation to the boundary of subsidence influence at the surface is called

(A) Angle of draw (B) Angle of break

(C) Final line of break (D) Final line of draw

(E) Answer not known

63. When there is a strong floor, sagging of the roof is called

(A) crush (B) creep

(C) bending (D) sinking

(E) Answer not known

64. To minimize the environmental impacts of waste rock disposal, excavated rock should be:

(A) Dumped directly into nearby rivers
(B) Burned before disposal
(C) Hauled to designated waste sites
(D) Spread uniformly over the hill side
(E) Answer not known

65. Rock slopes may occur

(A) Only naturally
(B) Only as a result of mining
(C) Either naturally or as engineered excavations
(D) Only in mountaneous regions
(E) Answer not known

66. The roof bolt that follows the principle of point anchorage is

(A) Expansion shell bolt
(B) Full column grounded bolt
(C) Split set bolt
(D) Swellex bolt
(E) Answer not known

67. Roof is categorized on RMR

	RMR		Roof category
(a)	Less than 20	1.	Fair
(b)	20 to 40	2.	Good
(c)	40 to 60	3.	Very good
(d)	60 to 80	4.	poor
(e)	80 to 100	5.	very poor

	(a)	(b)	(c)	(d)	(e)
(A)	1	2	4	3	5
(B)	3	4	1	2	5
(C)	5	3	4	1	2
(D)	5	4	1	2	3

(E) Answer not known

68. The property that cannot be determined from uniaxial compressive strength test of a rock sample fitted with strain gauges is

(A) Cohesion
(B) Poisson's ratio
(C) Modulus of elasticity
(D) Dilation
(E) Answer not known

69. A cylindrical rock specimen is uniaxially loaded under compression and falls at 50 MPa. The fracture plane is inclined at an angle of 45° with the axial direction. The normal and shear stresses respectively on the failure plane in MPa are

(A) 50, 50
(B) 0, 50
(C) 50, 0
(D) 25, 25
(E) Answer not known

70. Which of the following test may be used to provide an indirect estimate of uniaxial compressive strength?

(A) Point load test
(B) Servo controlled test
(C) Displacement test
(D) Post peak test
(E) Answer not known

71. Find the shear modulus for E = 30 GPa and V = 0.25 in GPa.

(A) 10
(B) 30
(C) 45
(D) 12
(E) Answer not known

72. Find FoS for V = 20 KN/m^3, H = 10m, $\beta = 30°$, $C' = 10$ KPa, $\gamma' = 30°$ pore pressure u = 50 Kpa.

(A) 0.55
(B) 0.78
(C) 1.05
(D) 1.30
(E) Answer not known

73. Slicken sides are

(A) Polished and striated rock surfaces produced by friction between two sides of a faulted rock
(B) Coal pillar sides which are prone to spalling
(C) Slack side of belting of a belt conveyor
(D) Polished and striated black surfaces produced by slow burning of coal
(E) Answer not known

74. Convergence in underground mining refers to:

(A) Increase in the excavation size after blasting

(B) Relative movement of roof and floor, causing reduction in the excavation opening

(C) Expansion of the roadway due to tensile stresses

(D) Increase in pillar width during mining

(E) Answer not known

75. In rock mechanics, the shear behaviour of discontinuities is important because it governs?

(A) Thermal conductivity of rocks

(B) Slip along faults and sliding of rock blocks

(C) Rock density

(D) Water absorption of rocks

(E) Answer not known

76. Which of the following elastic constants are obtained from the uniaxial compression test?

(A) Bulk modulus and shear modulus only

(B) Young's modulus and Poissons ratio

(C) Tensile modulus only

(D) Cohesion and friction angle

(E) Answer not known

77. Cavability of roof strata I

(A) $\frac{SL^n + 1}{7}$ (B) $\frac{SL^n + 0.5}{10}$

(C) $\frac{SL^n + 1.5}{9}$ (D) $\frac{SL^n + 0.5}{5}$

(E) Answer not known

78. A pressure of 20,000 pounds/square inch(PSI) is equal to _____ mega pascals (MPA)

(A) 170 (B) 138

(C) 150 (D) 160

(E) Answer not known

79. The modern rock testing machines use _____ loop servo controlled testing system.

(A) Closed (B) Open

(C) Open/Closed (D) Circular

(E) Answer not known

80. The most dangerous roof in a coal mine is

(A) Shale (B) Sandstone

(C) Limestone (D) Fireclay

(E) Answer not known

81. As per CMR 2017, the trailing cable of a coal cutting machinery shall be

(A) Two core

(B) Three-core with one pilot core for earth continuity monitoring

(C) Single-core with steel tape armour

(D) Any type if mechanically protected

(E) Answer not known

82. As per Mines Act 1952, A person shall be allowed to work below ground for a maximum period of

(A) 48 hours per week

(B) 12 hours per day

(C) 6 hours per day

(D) 60 hours per week

(E) Answer not known

83. As per Regulation 4 of CMR 2017, on or before _____ in 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 preceding year?

(A) 1st day of January

(B) 1st day of April

(C) 15th day of February

(D) 1st day of February

(E) Answer not known

84. As per mines rules 1955, a weekly day of rest means, a consecutive period of

(A) 24 hours

(B) 36 hours

(C) 48 hours

(D) 12 hours

(E) Answer not known

85. As per mines Act 1952, the owner and agent of every mine shall not be responsible for

(A) Financial provisions

(B) Compliance with rules

(C) Compliance with bye-laws

(D) Criminal proceedings in disciplinary action

(E) Answer not known

86. An estimate of risk in mining industry is defined as estimate of an individual dying at the rate of 1 in × (Multiples of 10) in

(A) 1 month

(B) 1 year

(C) 10 years

(D) 100 years

(E) Answer not known

87. Injuries Frequency Rate (IFR) is computed as

(A) $\frac{\text{Total no. of injuries in six months}}{\text{Total no. of man hours worked in six months}} \times 100$

(B) $\frac{\text{Total no. of injuries in a year}}{\text{Total no. of man hours worked in a year}} \times 100$

(C) $\frac{\text{Total no. of injuries in a month}}{\text{Total no. of man hours worked in a month}} \times 100$

(D) $\frac{\text{Total no. of injuries in a week}}{\text{Total no. of man hours worked in a week}} \times 100$

(E) Answer not known

88. National mineral policy 2019 introduced auctioning of virgin areas via

(A) A ban on private exploration
(B) A composite RP-Cum-PL-Cum-ML licence
(C) Public sector only exploration
(D) Abolishing exploration licences
(E) Answer not known

89. Committees on health, safety and welfare are constituted under which section of the mines Act, 1952

(A) 12 (B) 19
(C) 28 (D) 46
(E) Answer not known

90. The National Mineral Exploration Trust (NMET) is established under section

(A) 9B (B) 10B
(C) 18 (D) 9C
(E) Answer not known

91. MCDR-2017 requires mine closure plan of

(A) One type only
(B) Two types (Progressive and Final)
(C) Three types
(D) No mandatory plan
(E) Answer not known

92. What is the minimum age for a person to be appointed as a mine manager?

(A) 23 years
(B) 24 years
(C) 25 years
(D) 26 years
(E) Answer not known

93. As per Rule 29Q of mines Rules 1955, workman's inspectors are mandated in mines if the number of persons ordinarily employed in the mine in equal to or exceeds?

(A) 500
(B) 1000
(C) 1500
(D) 2000
(E) Answer not known

94. What is the frequency of dust sampling as required under Regulation 143 of CMR 2017?

(A) Atleast once in every 3 months
(B) Atleast once in every 6 months
(C) Atleast once in every month
(D) Atleast once in a year
(E) Answer not known

95. As per 10th National Conference on safety in mines, what is the periodicity of conducting eye refraction test for employees engaged in driving / HEMM operation jobs in mines?

(A) Once in six months
(B) Once in a year
(C) Once in two years
(D) Once in three years
(E) Answer not known

96. As per mines Act 1952, the extra wages for overtime shall be _____ compared to regular wages.

(A) Double
(B) Same
(C) Triple
(D) Half
(E) Answer not known

97. As per mines Act 1952, adult is the person who has completed _____ years.

(A) 18
(B) 21
(C) 16
(D) 14
(E) Answer not known

98. As per metalliferous mines regulations 1961, in case of abandonment of mine operations, the notice should be given to the chief inspector prior to _____ days.

(A) 30
(B) 60
(C) 120
(D) 15
(E) Answer not known

99. For a project requiring environmental clearance, a public hearing shall be completed within a period of _____ days from the date of receipt of complete documents.

(A) 60
(B) 120
(C) 180
(D) 30
(E) Answer not known

100. An industrial operation shall be established at a distance of _____ kilometer from the flood plane.

(A) 1.5 (B) 2.0

(C) 1.0 (D) 0.5

(E) Answer not known

101. CPCB stands for

(A) Central Power Control Board

(B) Central Pollution Control Body

(C) Central Pollution Committee Board

(D) Central Pollution Control Board

(E) Answer not known

102. When does the mine closure process begin?

(A) After mineral extraction

(B) During feasibility report / study

(C) After environmental clearance

(D) During Reclamation

(E) Answer not known

103. As per water Act - prevention and control of pollution 1974, A person empowered by _____ of the act shall have the right at any time to enter a place for the purpose of the Act.

(A) State Board

(B) Central Board

(C) State/Central Government

(D) NGO

(E) Answer not known

104. If the burning of any fuel is likely to cause pollution, then the state government shall prohibit such burning in consultation with (As per Air Act 1981)

(A) State Board
(B) Central Board
(C) NGO
(D) Central Government
(E) Answer not known

105. Under the AIR prevention and control of pollution Act 1981, a laboratory can be established by the

(A) State Board
(B) Central Board
(C) Private Agency
(D) NGO
(E) Answer not known

106. Which of the following quarries cause more water pollution?

(A) Granite
(B) Basalt
(C) Laterite
(D) Limestone
(E) Answer not known

107. Wet drilling is adopted to _____

(A) Increase drilling rate
(B) Protection of drill bit
(C) To reduce dust emission
(D) For ease of drilling
(E) Answer not known

108. Green belt development around mines is to reduce _____

(A) Mineral loss
(B) Dust to Noise pollution
(C) Fuel consumption
(D) Water demand
(E) Answer not known

109. Which of the following is a primary air pollution?

(A) CO_2
(B) Peroxy Acetyl Nitrate (PAN)
(C) SO_2
(D) Photochemical fog
(E) Answer not known

110. Which of the following is a line source of dust?

(A) Drilling
(B) Blasting
(C) Loading
(D) Transportation
(E) Answer not known

111. For a noise level of 85 dBA the maximum exposure time in hours are

(A) 4
(B) 8
(C) 12
(D) 16
(E) Answer not known

112. The maximum exposure concentration of mercury in milligram/metre^3 can be

(A) 0.01
(B) 0.05
(C) 1
(D) 2
(E) Answer not known

113. The maximum exposure concentration of vanadium in milligram/meter^3 is

(A) 0.1
(B) 0.2
(C) 0.3
(D) 0.5
(E) Answer not known

114. Assertion [A] : Open pit mining can reduce ground water levels.
Reason [R] : Mine dewatering removes ground water to keep the pit dry.

(A) Both [A] and [R] are true and [R] is the correct explanation
(B) Both [A] and [R] are true, but [R] is not the correct explanation
(C) [A] is true, but [R] is false
(D) [A] is false, but [R] is true
(E) Answer not known

115. The faintest sound pressure a normal healthy individual can hear is _____ pascals.

(A) 2×10^{-6}
(B) 2×10^{-5}
(C) 2
(D) 2×10^{-3}
(E) Answer not known

116. The gram molar weight of sulphur dioxide (SO_2) is

(A) 32
(B) 128
(C) 64
(D) 256
(E) Answer not known

117. Noise is distinguished from a desirable sound based primarily on its

(A) High frequency
(B) Unwanted (or) undesirable nature
(C) High amplitude
(D) Machine-generated origin
(E) Answer not known

118. A drinking-water sample contains fluoride of 1.3 mg/L. According to the specified standards, this concentration is

(A) Within the acceptable limit

(B) Above the acceptable limit but the cause for rejection limit

(C) Equal to the acceptable limit

(D) Automatically acceptable because fluoride is below 1.5 mg/L

(E) Answer not known

119. According to BIS water-quality classification, the pH range for Class-A, surface water is

(A) 5.5 – 7.5

(B) 6.5 – 8.5

(C) 7.0 – 9.0

(D) 6.0 – 9.0

(E) Answer not known

120. Under the revised national Ambient Air Quality Standards, the prescribed annual average concentration of PM_{10} for residential area is approximately

(A) 20 $\mu g/m^3$

(B) 40 $\mu g/m^3$

(C) 60 $\mu g/m^3$

(D) 100 $\mu g/m^3$

(E) Answer not known

121. A push-pull fan system combines

(A) A single fan at the return only

(B) A forcing fan at the intake & exhausting fan at return

(C) Fans alternating directions daily

(D) Only auxiliary fans, no main fans

(E) Answer not known

122. A mine rescue apparatus is designed to carry oxygen at 150 atmospheric pressure with a cylinder capacity of 2 liters. The amount of oxygen contained is _____ liters.

(A) 2
(B) 150
(C) 300
(D) 600
(E) Answer not known

123. In a mine fan using a D.C. Motor the possible speed regulation is _____%.

(A) 50
(B) 45
(C) 35
(D) 75
(E) Answer not known

124. An investigation after an explosion of coal dust shows that, the crust on the timber/steel supports is deposited almost equally on both the sides of the support. From this it may be inferred that

(A) Explosion wave is of lower speed
(B) Explosion wave is of medium speed
(C) Explosion wave is of high speed
(D) It does not give any indication about the speed
(E) Answer not known

125. Buttressing of single brick stopping is used where

(A) The surrounding strata is extremely weak
(B) There is no shortage of bricks
(C) The surrounding strata is very strong
(D) There is risk of crushing or where the openings in which the stopping are erected is wide and high
(E) Answer not known

126. In case of "Hudspeth's Arrangement" of bore holes approaching old water logged workings, Heading "B" is in advance of Heading "A" and "C" by

(A) 3.5 m
(B) 4.5 m
(C) 9.0 m
(D) 18.0 m
(E) Answer not known

127. Match the following in the context of underground mine environment.

(a)	Haldane apparatus	1.	Humidity
(b)	Godbert-Greenwald apparatus	2.	Air velocity
(c)	Hygrometer	3.	Mine air composition
(d)	Anemometer	4.	Ignition point temperature

	(a)	(b)	(c)	(d)
(A)	2	1	3	4
(B)	3	4	1	2
(C)	4	2	3	1
(D)	1	3	4	2

(E) Answer not known

128. The maximum wet bulb temperature in U/G mines is

(A) 30° C
(B) 30.5° C
(C) 33° C
(D) 33.5°C
(E) Answer not known

129. In an underground working area, CH_4 and CO_2 are normally expected to be found respectively.

(A) Near the floor and along the roadway
(B) Near the floor and near the roof
(C) Near the roof and near the floor
(D) Along the roadway and near the floor
(E) Answer not known

130. Eddy losses for fan is significant when

(A) Fan runs at its full capacity
(B) Fan operates at low volumes
(C) The fan drift cross section is very high
(D) The fan drift cross section is very less
(E) Answer not known

131. Mine climate simulation programs are used to

(A) Predict airflow, temperature & humidity
(B) Permanently replace physical surveys
(C) Calculate fan power draw
(D) Design surface buildings
(E) Answer not known

132. Mine ventilation thermodynamics is essential mainly for analyzing

(A) Airflow, pressure and pressure across mine life cycle
(B) Fan selection cost only
(C) Ore grade variation
(D) Blasting round patterns
(E) Answer not known

133. Convert a methane reading of 2500 ppm to a percentage by volume.

(A) 0.025%
(B) 0.25%
(C) 2.5%
(D) 25%
(E) Answer not known

134. If the length of an airway is tripled, with all other factors unchanged, resistance becomes

(A) The same
(B) 3 times
(C) 9 times
(D) One third
(E) Answer not known

135. When two fans are installed in parallel, the combined capacity is

(A) Sum of individual quantities at same head
(B) Sum of individual heads at same quantity
(C) Product of heads and quantities divided by total
(D) Always twice the capacity of the larger fan
(E) Answer not known

136. Chemicals used in "Hoolamite" tube for the detection of CO is

(A) Iodine pentaoxide and sulphuric acid
(B) Ammonium molybdate and silica gel
(C) Potassium tetrachloride and sulphuric acid
(D) Potassium tetrachloride and silica gel
(E) Answer not known

137. If the volatile matter in coal is more than 14%, the flammability of coal dust is

(A) Non-flammable
(B) Less flammable
(C) Highly flammable
(D) Independent of volatile matter
(E) Answer not known

138. The units of coefficient of friction of the mine airway (K) is

(A) $NS^2\,m^{-4}$
(B) $NS^2\,m^{-8}$
(C) $S^2\,m^{-4}$
(D) $S^2\,m^{-8}$
(E) Answer not known

139. The air after a methane or coal dust explosion is referred to as

(A) Stink damp
(B) Black damp
(C) After damp
(D) White damp
(E) Answer not known

140. Cross measure borehole method is a _____ drainage method.

(A) Methane
(B) Carbon monoxide
(C) Ethane
(D) Oxygen
(E) Answer not known

141. Given

Value of ore	:	Rs. 600 per tonne
Production cost	:	Rs. 600 per tonne
Cost of overburden Removal	:	Rs. 50 per m^3

The break even stripping ratio in m^3/tonne is

(A) 4 : 1 (B) 3 : 1

(C) 1 : 3 (D) 1 : 4

(E) Answer not known

142. For aqueous surface mining. which pairing correctly matches subclass to method?

(A) Placer mining → Frasch method

(B) Solution mining → Hydraulic king

(C) Placer Mining → Dredging (Shallow water & Deepsea)

(D) Solution Mining → Sluicing only

(E) Answer not known

143. Typically what is the percentage of coal recovery using drag – bit drilling under a highwall? (Approximately)

(A) 10 – 20%

(B) 70 – 85%

(C) 90 – 95%

(D) 40 – 65%

(E) Answer not known

144. In mechanised opencast benches in coal or hard rock shall have height not more than

(A) 3.0 m

(B) The digging height/reach of the excavation in use

(C) Truck body height

(D) 6.0 m

(E) Answer not known

145. Which power source is primarily used to operate a bucket wheel excavator (BWE)?

(A) diesel powered engines

(B) solar power

(C) electricity operated

(D) hydraulic motors

(E) Answer not known

146. Which of the following excavator will be used for a bench height of 20m to 30m in soft rock formation?

(A) Dragline

(B) Shovel

(C) Pay Loader

(D) Bucket wheel excavator

(E) Answer not known

147. In manual opencast workings in the above soft formation, if benched, the maximum bench height and minimum breadth shall be

(A) 1.5 m height, breadth ≥ height

(B) 2.5 m height, breadth ≥ height

(C) 3.0 m height, breadth ≥ 1.5 × height

(D) 6.0 m height, breadth ≥ 3.0 m

(E) Answer not known

148. A higher percentage of ore is recovered in which of the following underground metal mining method?

(A) Shrinkage stoping
(B) Sub level stoping
(C) Rill stoping
(D) None of the above
(E) Answer not known

149. Which of the following is an excavator that has a boom one end of which is attached with the revolving unit of the machine and the hanging end in the other side carries a large sheave for the cable attached with the bucket?

(A) Dragline
(B) Shovel
(C) Backhoe Excavator
(D) Bucket wheel Excavator
(E) Answer not known

150. A dragline excavator is best suited for which type of material?

(A) Hard, compact rock
(B) Medium hard fractured rock
(C) Soft, unconsolidated material
(D) Reinforced concrete
(E) Answer not known

151. In a sublevel stoping, horizontal pillar left for support of the upper level is called _____?

(A) Sill pillar
(B) Board and pillar
(C) Open pillar
(D) Crown pillar
(E) Answer not known

152. Select the appropriate option in place of underlined part of a sentence <u>increased productivity necessary</u> reflects great efforts made by the employees

(A) Increases in productivity necessary
(B) Increases productivity is necessary
(C) Increases in productivity necessarily
(D) No improvement required
(E) Answer not known

153. In sub level stoping, the variation in which miners first create a vertical slot at one end of the stope and then drill from sub levels within the ore block is called the

(A) Open ended method
(B) Blast-hole method
(C) Shrinkage method
(D) Square-set method
(E) Answer not known

154. Cut and fill stoping is normally conducted in which orientation

(A) Underhand
(B) Overhand
(C) Horizontal
(D) Diagonal
(E) Answer not known

155. Even though the auger machine physically bores underground, auger mining is classified as _____

(A) Underground
(B) Hybrid
(C) Surface
(D) Solution
(E) Answer not known

156. Which of the following is a likely consequence of inadequate drainage on high OB dump slopes?

(A) Improved compaction
(B) Spontaneous heating
(C) Pore pressure buildup leading to slope failure
(D) Stabilization due to water saturation
(E) Answer not known

157. In bord and pillar method, roadways are mainly supported by

(A) Steel arches
(B) Timber supports
(C) Solid coal pillars
(D) Hydraulic props
(E) Answer not known

158. In shrinkage stoping, the percentage of ore to be left in the stope as a working platform for mining activities is

(A) 60 – 70
(B) 70 – 80
(C) 50 – 60
(D) 40 – 50
(E) Answer not known

159. The mining method used in thick and steep coal seam, where the slices are neither horizontal nor parallel to the inclination of the seam is called

(A) Transverse slicing
(B) Inclined slicing
(C) Horizontal slicing
(D) Integral caving
(E) Answer not known

160. In Indian bord-and-pillar workings, the maximum gallery width permitted for depillaring with caving in thick seams is :

(A) 4.0 m
(B) 4.8 m
(C) 5.0 m
(D) 5.5 m
(E) Answer not known

161. The location of a box cut in surface mining depends upon which of the following factors

(A) Type of minerals, fuel cost and manpower availability
(B) Depth of water table, wind direction and proximity to roadways
(C) Topography, dip of the deposit and thickness of overburden
(D) Weather conditions, vegetation type and soil colour
(E) Answer not known

162. What is the portable apparatus called that provides the current necessary for firing electric detonators?

(A) Crimper
(B) Safety fuse
(C) Exploder
(D) Blasting cap
(E) Answer not known

163. P5 Explosive is used for

(A) Dry blasting
(B) Liquid blasting
(C) Wet blasting
(D) Solid blasting
(E) Answer not known

164. In rock blasting the term "Impedance of medium" is the product of

(A) Wave pressure and Poisson's ratio
(B) Wave pressure and density of medium
(C) Propagation velocity and Poisson's ratio
(D) Propagation velocity and density of medium
(E) Answer not known

165. What does the term "NONEL" stand for in blasting technology?

(A) Non-licensed explosive
(B) Non-elemental explosive
(C) Non-electric detonator
(D) Non-explosive line initiator
(E) Answer not known

166. 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

167. In the context of explosives safety, what is the term used to refer to a building specifically designed for the storage of explosives and detonators

(A) Warehouse
(B) Magazine
(C) Depot
(D) Storage facility
(E) Answer not known

168. What is the term for a cartridge that has a detonator inserted into it?

(A) Blasting Cartridge
(B) Primer Cartridge
(C) Detonator Cartridge
(D) Fuse Cartridge
(E) Answer not known

169. To use ammonium nitrate as an explosive it should be used with

(A) Sulphuric acid
(B) Diesel oil
(C) Water
(D) Charcoal
(E) Answer not known

170. If the total explosives consumed is 68 Kg, and if the weight of the broken rock is 35.73 tonnes, then the powder factor is _____ Kg/tonne.

(A) 1.90
(B) 2.90
(C) 0.90
(D) 3.90
(E) Answer not known

171. 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, Sodium fluoride
(D) Diesel Oil
(E) Answer not known

172. Which of the following statement is true about efficient blasting in mining?

(A) Efficient blasting should result in excessive fragmentation, requiring secondary blasting

(B) Efficient blasting should give rock fragmentation, that eliminates the need for secondary blasting

(C) Efficient blasting always requires secondary blasting for better results

(D) Efficient blasting has no impact on the need for secondary blasting

(E) Answer not known

173. The delay interval in short delay detonator is

(A) 25 ms (B) 30 ms

(C) 35 ms (D) 40 ms

(E) Answer not known

174. Seismic explosive

(A) Not flexible

(B) High powered

(C) Flexible and high powered

(D) Low flexible and low powered

(E) Answer not known

175. Chemical formula of Ammonium Nitrate

(A) NH_2NO_2 (B) NH_4NO_3

(C) NH_4NO_4 (D) NH_3NO_2

(E) Answer not known

176. Among the following options, the specific energy for rock-drilling is lowest in

(A) Rotary diamond drilling
(B) Rotary roller drilling
(C) Percussive drilling
(D) Jet piercing
(E) Answer not known

177. Bucket capacity of SDL vs LHD

(A) 0.1 m^3 vs 1.0 m^3
(B) 0.9 m^3 vs 1.9 m^3
(C) 0.6 m^3 vs 1.8 m^3
(D) 0.6 m^3 vs 1.5 m^3
(E) Answer not known

178. 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 shockwave
(E) Answer not known

179. DGMS recommends that area having cover less than _____ should not be developed?

(A) 7.5 m
(B) 15 m
(C) 10 m
(D) 20 m
(E) Answer not known

180. Equipment used in mining of placer deposits is

(A) Auger
(B) Wagon drill
(C) Rope saw
(D) Riffle box
(E) Answer not known

181. A horizontal sheet of igneous rock, which extends laterally into the strata usually intruding between the bedding planes. It may be found on the coal bed or below the coal bed in horizontal sheet.

The above description refers to:

(A) Syncline
(B) Reverse fault
(C) Sill
(D) Dyke
(E) Answer not known

182. Which of the following is a primary effect of an earthquake?

(A) Change in geological structures such as creation of slopes (or) fissures
(B) Animal behavioural changes
(C) Tsunami only
(D) Breaking of electric cables only
(E) Answer not known

183. A geological formation contains a large intrusive igneous mass with an irregular outlines and no known floor. Which structures best fits the description?

(A) Laccolith
(B) Batholith
(C) Sill
(D) Dyke
(E) Answer not known

184. Which group of observations is specifically associated with geological prospecting?

(A) Rock types, structural mapping, mineralogic and petrographic analysis

(B) Fuel consumption, haulage cycle time, and equipment utilization

(C) Ventilation, quantity, methane concentration and fan pressure

(D) Crusher capacity, screen efficiency, and grinding power

(E) Answer not known

185. Two folds are observed in a sequence of strata. In fold "x", the bed dip away from the axis; in fold "y", the bed dip towards the axis, which identification is correct?

(A) x-Syncline; y-Anticline

(B) x-Anticline; y-Syncline

(C) x-Fault; y-Washout

(D) x-Sill; y-Dyke

(E) Answer not known

186. Folds are the structural features resulting from

(A) Ductile deformation of earth crust

(B) Brittle deformation of earth crust

(C) High impact techtonic stresses of earth crust

(D) Fracturing of earth crust

(E) Answer not known

187. Most fault planes are associated with a zone of crushed or altered rock is known as

(A) Fault plane

(B) Fault scrap

(C) Fault zone

(D) Normal fault

(E) Answer not known

188. Match the rock with its metamorphosed form :

Igneous rock/sedimentary rock	Metamorphic rock
(a) Granite	1. Quartzite
(b) Limestone	2. Gneiss
(c) Sandstone	3. Schist
(d) Gabbro	4. Marble

	(a)	(b)	(c)	(d)
(A)	2	4	1	3
(B)	3	1	4	2
(C)	4	3	1	2
(D)	2	3	4	1

(E) Answer not known

189. Which mineral is particularly associated with automotive components, transport and defence manufacturing machinery, electronics and telecommunications equipment

(A) Bismuth
(B) Beryllium
(C) Cadmium
(D) Antimony
(E) Answer not known

190. Which of the following mineral is obtained as a by-product during beneficiation of heavy mineral sands in Manavalakurichi, Tamil Nadu and has applications including nuclear fuel-rod cladding and refractory materials.

(A) Titanium
(B) Hafnium
(C) Zircon
(D) Monazite
(E) Answer not known

191. Which of the following mineral is associated with electrolytic, manganese and glass pigments and is used in photocells, solar cells and photocopiers.

(A) Selenium
(B) Tellurium
(C) Gallium
(D) Silicon
(E) Answer not known

192. Consider the following applications of cobalt

(i) Electric vehicles batteries

(ii) Corrosion-resistant alloys

(iii) Aerospace applications

(iv) Pigments and dyes

(v) Optical fibres

Which are the above are associated with cobalt?

(A) (i), (ii) and (iii) only
(B) (i), (ii), (iii) and (iv) only
(C) (i), (iii), (iv) and (v) only
(D) (ii), (iii), (iv) and (v) only
(E) Answer not known

193. Which combination correctly matches the mineral with it's Mohs hardness?

(A) Quartz-6
(B) Orthoclase-7
(C) Topaz-8
(D) Corundum-10
(E) Answer not known

194. Which one of the following statement is incorrect?

(A) Country rock contains the ore body

(B) Country rock forms the footwall and hanging wall

(C) Gangue refers to uneconomic material associated with useful mineral in metal mining practice

(D) Every mineral-bearing rock is necessarily an ore irrespective of economic extraction

(E) Answer not known

195. Quartz, muscovite and rock salt are cited as examples of crystals belonging respectively to

(A) Cubic, hexagonal and monoclinic systems

(B) Hexagonal, monoclinic and cubic systems

(C) Monoclinic, cubic and hexagonal systems

(D) Hexagonal, cubic and monoclinic systems

(E) Answer not known

196. The Cauvery basin is described as a pericratonic rift basin formed due to

(A) Fragmentation of Gondwana land

(B) Folding of the Himalayan sediments

(C) Weathering of Deccan volcanic rocks

(D) Erosion of the Eastern Ghats

(E) Answer not known

197. The estimated reserves of Quartz and Feldspar in Tamilnadu are respectively

(A) 9 and 228.5 million tonnes
(B) 670 and 200 million tonnes
(C) 200 and 670 million tonnes
(D) 228.5 and 9 million tonnes
(E) Answer not known

198. Bauxite is best described as a mixture of

(A) Hydrated aluminium oxide
(B) Hydrated calcium oxides
(C) Hydrated magnesium oxides
(D) Hydrated iron oxides
(E) Answer not known

199. Which of the following is a Government of Tamilnadu undertaking involved in the limestone sector?

(A) TAMIN
(B) TANMAG
(C) DALMIA BHARAT
(D) TANCEM
(E) Answer not known

200. In India, the mining engineer is responsible for which of the following in mineral exploration?

(A) Mineral marketing
(B) Environmental audit
(C) Planning core drilling and logging
(D) Equipment procurement
(E) Answer not known