THE SINGARENI COLLIERIES COMPANY LIMITED (SCCL) Management Trainee (MT) – MINING

SAMPLE / MODEL Question Paper

General Instructions to candidates :

1.   All questions carry equal marks.

2.   No negative marks.

3.   Answer All questions.

4.   Every question has 4 options and only ONE is CORRECT answer.

5.   Use OMR sheet for marking the correct answer by bubbling with BLUE or BLACK ballpoint pen only.

1: Run away switch is used in connection with
A. Direct rope Haulage
B. Endless Haulage
C. Gravity Haulage
D. Tail rope Haulage

2: Side Discharge Loader is a
A. Crawler mounted machine
B. Tyre mounted machine
C. Both A and B
D. Rail mounted machine

3: In a surface mine, sound pressure level at a location generated by operation of a dozer and a drill respectively are 80 dBA and 60 dBA, when operated independently. The sound pressure generated by the dozer compared to the drill is higher by a factor of
(A) 10
(B) 20
(C) 100
(D) 200

4: As per the Indian Electricity Rules 1956, the maximum permissible length of a flexible cable used with an electric rope shovel in m is
(A) 100
(B) 200
(C) 300
(D) 500

5: The equipment that is NOT used in hard rock metal mining drivage is
(A) road header
(B) drill jumbo
(C) jack hammer
(D) dint header

6: The roof bolt that follows the principle of point anchorage is
(A) expansion shell bolt
(B) full column grouted bolt
(C) split set bolt
(D) swellex bolt

7: Equipment used in mining of placer deposits is
(A) auger
(B) wagon drill
(C) rope saw
(D) riffle box

8: A dump truck powered by 350 kW engine is running at a speed of 35 km/h. Considering the transmission efficiency of the truck as 85%, the rim pull of the truck in kN is
(A) 21
(B) 31
(C) 41
(D) 51

9: Nystagmus is a miner's disease associated with
(A) lever
(B) lung
(C) eye
(D) stomach

10: Apart from mining of coal, the longwall mining method has been practiced for mining the deposits of
(A) copper
(B) lead and zinc
(C) manganese
(D) pyrite and phosphate

11: The three segments, whose synchronous functioning is essential for GPS operations, are
(A) space, control and user
(B) signal, control and user
(C) space, control and geo-registration
(D) signal, control and geo-registration

12: When a double ended ranging drum shearer cuts coal in a longwall face,
(A) both the drums rotate in the same direction keeping the front drum up and the rear drum down
(B) both the drums rotate in the opposite direction keeping the front drum up and the rear drum down
(C) both the drums rotate in the opposite direction keeping the front drum down and the rear drum up
(D) both the drums rotate in the same direction keeping the front drum down and the rear drum up

13: Continuous miner and shuttle car combination is NOT applicable in mining with
(A) rib pillar extraction technique
(B) Wangawilli system
(C) room and pillar method
(D) longwall method

14: Contours in a topographic map
(A) are not closed upon themselves although the earth is a continuous surface
(B) are not perpendicular to the direction of maximum slope
(C) provide an indication of presence of valley or ridge in the area
(D) are the lines joining the points of same declination at different elevations

15: A Dragger Gas Mask DOES NOT filter
(A) water vapour
(B) nitrous fumes
(C) carbon monoxide
(D) carbon dioxide

16: A system consists of four elements A, B, C and D which are connected functionally in a parallel configuration. The individual reliability of the elements is 0.80, 0.82, 0.85 and 0.90 respectively. The reliability of the system is
(A) 0.498
(B) 0.602
(C) 0.750
(D) 0.999

17: The blasting technique used for controlled throw of overburden is known as
(A) cast blasting
(B) coyote blasting
(C) plaster shooting
(D) pop shooting

18: The stoping method, where a large part of blasted ore is allowed to accumulate in the stope to serve the purpose of providing working platform for stoping as well as to support the wall-rock, is known as
(A) shrinkage stoping
(B) cut and fill stoping
(C) square-set stoping
(D) sublevel stoping

19.

If the slope of a diagonal of a rectangle is m the slope of the other diagonal is

(A) $\dfrac{1}{2m}$
(B) $-\dfrac{1}{2m}$
(C) $\dfrac{1}{m}$
(D) $-\dfrac{1}{m}$

20.

Bulk modulus of rock is defined as

(A) $\dfrac{\text{shear stress}}{\text{volumetric strain}}$

(B) $\dfrac{\text{hydrostatic pressure}}{\text{shear strain}}$

(C) $\dfrac{\text{hydrostatic pressure}}{\text{volumetric strain}}$

(D) $\dfrac{\text{shear stress}}{\text{shear strain}}$

21

Radial stress on the excavation boundary of a circular tunnel is

(A) always zero
(B) always positive
(C) always negative
(D) positive in some area and negative in some area

22.

Which one of the following supports does NOT require a power pack for its operation

(A) chock shield support
(C) close circuit hydraulic prop
(B) open circuit hydraulic prop
(D) Alpine breaker line support

23.

In a centrifugal flow fan the conversion of velocity pressure to static pressure is accomplished with the help of

(A) impeller　　　(B) curved blades　　　(C) hub　　　(D) casing

24.

The amount of total stone dust required in kg for a secondary/heavy type stone dust barrier in a roadway of size $4.0 \text{ m} \times 3.0 \text{ m}$ is

(A) 1320   (B) 4680   (C) 5200   (D) 6600

25.

A 3.3 kV, 3-phase AC motor having a PF of 0.85 draws current at 95 A. The motor input power in kW is

(A) 266.5   (B) 461.5   (C) 543.0   (D) 799.5

26.

In the Gaussian plume model, the dispersion coefficients are function of

(A) distance from source and stability class
(B) stack height and distance from source
(C) stability class and source coordinates
(D) source coordinates and distance from source

27.

The measurement of distances from a position on the earth to artificial satellites is known as

(A) astronomical ranging   (B) pseudo ranging
(C) satellite ranging   (D) celestial ranging

28.

In opencast mining, the width which is extracted from the working bench is termed as

(A) cut   (B) bench width   (C) bank width   (D) bench face

29.

The most recent model of self-contained compressed-oxygen breathing apparatus is

(A) Proto-IV   (B) BG-174   (C) BG-4   (D) BG-174A

30.

The rachet-and-pawl arrangement in percussive drill machine helps in

(A) providing required rotational speed
(B) indexing at the bit rock interface
(C) regulating air flow in forward and return strokes of the piston
(D) engaging the bit with the rock between the blows

31.

The angular (horizontal/vertical) observation made by a transit theodolite with the face of the vertical circle on the right of the observer is called

(A) face right observation   (B) face left observation
(C) normal observation   (D) reciprocal observation

32.

A 15 yd^3 dragline is deployed in an overburden bench of an opencast mine. It works for 40 days at the rate of 6 hours per shift and 3 shifts a day. The cycle time, bucket fill factor, and operating efficiency of the dragline are respectively 50 s, 0.8, and 75%. The total volume of overburden in m^3 handled by the dragline is
(1 yd^3 = 0.765 m^3)

(A) 356918   (B) 634521   (C) 557685   (D) 991440

33.

In an underground opening, the immediate roof strata consists of two rock layers with the following properties:

Property	Layer-1	Layer-2
Modulus of elasticity (GPa)	60.0	40.0
Modulus of rupture (MPa)	20.0	10.0
Unit weight (kN/m^3)	25.0	20.0
Thickness (m)	5.0	2.5

Considering a factor of safety of 4.0, the length of safe span in m is

(A) 27.82   (B) 34.06   (C) 36.54   (D) 39.34

34.

In an opencast mine, a centrifugal pump is required to lift water at the rate of 60 l/s to a height of 80 m above the pump level. The vertical suction head is 4 m. The total friction head including shock and energy loss is 10 m. If the pump runs at an efficiency of 80%, the brake power of the motor in kW is

(A) 70.50   (B) 67.50   (C) 63.00   (D) 57.55

35.

Match the following

	Support system		Support principle
P	Shotcrete	1	reinforces rock mass by binding them together
Q	Backfill	2	acts as link between two layers of rock to transfer load between them
R	Bolt	3	imposes kinematic constraints on key pieces in a stope boundary
S	Prop	4	prevents spatially progressive disintegration of near field rock mass

(A) P-3, Q-4, R-2, S-1   (B) P-2, Q-1, R-4, S-2
(C) P-4, Q-3, R-1, S-2   (D) P-3, Q-4, R-1, S-2

36. In the Coward flammability diagram, the respective percentages of methane and oxygen at the nose limit are

(A) 14.2, 0.0
(B) 14.1, 18.2
(C) 5.8, 12.1
(D) 5.0, 19.2

37. In the Moh's scale of hardness, the minerals in increasing sequence of hardness are

(A) calcite, gypsum, topaz, diamond
(B) topaz, gypsum, calcite, diamond
(C) calcite, gypsum, diamond, topaz
(D) gypsum, calcite, topaz, diamond

38. Long-hole drilling with crater blasting is used for the construction of
(A) winze

(B) shaft

(C) raise

(D) decline

39. 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

40. In a belt conveyor system, function of the snub pulley is to

(A) clean the inner surface of the belt
(B) clean the outer surface of the belt
(C) increase the angle of contact of belt with drive drum
(D) decrease the belt tension

General Aptitude (GA) Questions:

01. The Headmaster _____ to speak to you.
      Which of the following options is incorrect to complete the above sentence?
          (A) is wanting
          (B) wants
          (C) want
          (D) was wanting

02. Mahatama Gandhi was known for his humility as

          (A) he played an important role in humiliating exit of British from India.
          (B) he worked for humanitarian causes.
          (C) he displayed modesty in his interactions.
          (D) he was a fine human being.

03. All engineering students should learn mechanics, mathematics and how to do computation.

                       I   II   III   IV
Which of the above underlined parts of the sentence is not appropriate?
  (A) I

   (B) II

   (C) III

   (D) IV

04. Select the pair that best expresses a relationship similar to that expressed in the pair:

water: pipe::

(A) cart: road
 (B) electricity: wire
(C) sea: beach
(D) music: instrument

05.   All professors are researchers
        Some scientists are professors
Which of the given conclusions is logically valid and is inferred from the above arguments:

(A) All scientists are researchers
(B) All professors are scientists
(C) Some researchers are scientists
(D) No conclusion follows

06. **Find the average of the following set of scores.216, 463, 154, 605, 446, 336**

(A) 387

(B) 379

(C) 380

(D) None of these

07. The average of four consecutive even numbers A, B, C and D respectively is 55. What is the product of A and C?

(A)   2652

(B)   3248

(C)   3024

(D)   None of these

08. The average of odd numbers up to 100 is-

(A)   50.5

(B)   49.5

(C)   49

(D)   None of these

09. **The average of five numbers is 49. The average of the first and the second numbers is 48 and the average of the fourth and fifth numbers is 28. What is the third number?**

(A)   92

(B)   95

(C)   91

(D)   None of these

10. **The average marks of a student in seven subjects is 41. After reevaluation in one subject the marks were changed to 42 from 14 and in remaining subjects the marks remain unchanged. What are the new average marks?**

(A)   45

(B)   46

(C)   47

(D)   48