Group Code	COURSE	
MN	**MINING**	
MAXIMUM MARKS	**TOTAL DURATION**	**MAXIMUM TIME FOR ANSWERING**
180	200 Minutes	180 Minutes

MENTION YOUR DIPLOMA CET NUMBER	BOOKLET VERSION CODE	SERIAL NUMBER
	A1	

233457

DOs:

1. This question booklet is issued to you by the invigilator after the 2nd bell i.e., after 9.50 am.
2. Check whether the DCET Number has been entered and shaded in the respective circles on the OMR answer sheet.
3. The version code and serial number of this question booklet should be entered on the OMR answer sheet and the respective circles should also be shaded completely.
4. The Version Code and Serial Number of this question booklet should be entered on the Nominal Roll without any mistakes.
5. Compulsorily sign at the bottom portion of the OMR answer sheet in the space provided.

DON'Ts:

1. **THE TIMING AND MARKS PRINTED ON THE OMR ANSWER SHEET SHOULD NOT BE DAMAGED / MUTILATED / SPOILED.**
2. The 3rd bell rings at 10.00 am, till then;
   - Do not remove the seal present on the right hand side of this question booklet.
   - Do not look inside this question booklet or start answering on the OMR answer sheet.

IMPORTANT INSTRUCTIONS TO CANDIDATES

1. In case of usage of signs and symbols in the questions, the regular textbook connotation should be considered unless stated otherwise.
2. This question booklet contains 180 (items) questions and each question will have one statement and four different options / responses & out of which you have to choose one correct answer.
3. After the 3rd Bell is rung at 10.00 am, remove the paper seal on the right hand side of this question booklet and check that this booklet does not have any unprinted or torn or missing pages or items etc., if so, get it replaced by a complete test booklet. Read each item and start answering on the OMR answer sheet.
4. Completely **darken / shade** the relevant circle with a **blue or black ink ballpoint pen** against the question number on the OMR answer sheet.

ಸರಿಯಾದ ಕ್ರಮ CORRECT METHOD	ತಪ್ಪು ಕ್ರಮಗಳು WRONG METHOD									
Ⓐ ⬤ Ⓒ Ⓓ	⊗ Ⓑ Ⓒ Ⓓ	Ⓐ Ⓑ Ⓒ ⊘	Ⓐ ⬤ ⬤ Ⓓ							

5. Please note that even a minute unintended ink dot on the OMR answer sheet will also be recognized and recorded by the scanner. Therefore, avoid multiple markings of any kind on the OMR answer sheet.
6. Use the space provided on each page of the question booklet for Rough Work. Do not use the OMR answer sheet for the same.
7. **Last bell will ring at 1.00 pm,** stop marking on the OMR answer sheet.
8. Hand over the **OMR answer sheet** to the room invigilator as it is.
9. After separating the top sheet (Office copy), the invigilator will return the bottom sheet replica (candidate's copy) to you to carry home for self-evaluation.

PART - A

APPLIED SCIENCE

1. Which of the following is the supplementary unit of SI System?

   (A) Candela   (B) Kelvin

   (C) Radian   (D) Mole

2. The main scale of Slide Calipers is divided into millimeter, the length of Vernier is 19 mm and is divided into 20 equal parts. The least count is

   (A) 0.01 cm   (B) 0.001 cm

   (C) 0.05 cm   (D) 0.005 cm

3. Which one of the following is not a vector quantity?

   (A) Velocity   (B) Acceleration

   (C) Speed   (D) Force

4. The magnitude of resultant of two forces $\vec{P}$ and $\vec{Q}$ acting in the same line and in opposite direction is

   (A) $P + Q$ (B) $P - Q$

   (C) $\dfrac{P}{Q}$ (D) $\dfrac{Q}{P}$

5. Two forces 3N and 5N are acting at a point making an angle of 60°. The magnitude of the resultant is

   (A) 15 N   (B) 2 N

   (C) 7 N   (D) 8 N

6. Torque produces

   (A) rotational motion   (B) linear motion

   (C) both rotational and linear motion   (D) neither rotational nor linear motion

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Space For Rough Work

7. Which one of the following is not related to couple?

(A) Kicking of football

(B) Opening and closing of tap

(C) Rotation of steering wheel

(D) Pedalling of bicycle

8. Within elastic limit, stress is

(A) independent of strain

(B) zero

(C) directly proportional to strain

(D) inversely proportional to strain

9. The length of a wire increases by 1% on suspending a load of 2 N from it. The tensile strain in the wire is

(A) 0.01

(B) 0.5

(C) 2

(D) 1

10. Pressure at any point inside a liquid

(A) remains zero

(B) increases with depth

(C) decreases with depth

(D) independent of depth

11. The pressure at the bottom of a swimming pool 20m wide and the water 2m deep (given density of water 1000 Kg/m^3 and g = 10 m/s^2) is

(A) 2×10^3 Pa

(B) 40×10^3 Pa

(C) 10×10^3 Pa

(D) 20×10^3 Pa

12. In the case of liquids, as the temperature increases, the surface tension generally

(A) remains constant

(B) decreases

(C) increases

(D) zero

Space For Rough Work

13. The property of a liquid to oppose the relative motion between different layers is called

(A) density

(B) elasticity

(C) viscosity

(D) capillarity

14. An expression for coefficient of viscosity is (if F = viscous force; A = Area, V = difference in Velocity, x = distance between two layers)

(A) $\eta = -\dfrac{FA}{xV}$

(B) $\eta = -\dfrac{FV}{Ax}$

(C) $\eta = -\dfrac{Fx}{AV}$

(D) $\eta = -\dfrac{FxA}{V}$

15. The expression that represents Charle's law is

(A) PV = constant

(B) VT = constant

(C) $\dfrac{P}{V}$ = constant

(D) $\dfrac{V}{T}$ = constant

16. The pressure of a gas at 27°C is one atmospheric pressure. Keeping the volume constant, if the temperature is raised to 60°C, then its pressure will be

(A) 1.11 atmospheric pressure

(B) 1.5 atmospheric pressure

(C) 2.2 atmospheric pressure

(D) 2 atmospheric pressure

17. Hot water at 80°C will exchange heat with surroundings maintained at 25°C till the temperature of water becomes

(A) 80°C

(B) 50°C

(C) 55°C

(D) 25°C

18. Radiator in automobiles works on the principle of

(A) Conduction

(B) Convection

(C) Radiation

(D) Evaporation

Space For Rough Work

19. In the expression $C_p - C_v = R$, notation R represents

(A) Resultant force

(B) Planck's constant

(C) Universal gas constant

(D) Resonance

20. Physical quantity that represents the energy of the mechanical wave is

(A) Wave length

(B) Frequency

(C) Amplitude

(D) Wave period

21. Which one of the following is not an example of simple harmonic motion?

(A) Swinging of cradle

(B) Oscillations of simple pendulum

(C) Vibrations of tuning fork

(D) Motion of hands of clock

22. In the equation for velocity of sound in air, which of the following options does not hold good according to Laplace?

(A) Poor conductivity of air

(B) Rapid pressure changes

(C) Maintaining constant temperature

(D) Rise and fall of temperature

23. Distance between two consecutive nodes in a stationary wave is equal to

(A) Wavelength of individual wave

(B) Difference of wavelengths of two waves

(C) Sum of wavelengths of two waves

(D) Half of wavelength of individual wave

24. When the tension on the sonometer wire is increased by 15 N, its frequency is doubled. The original tension is

(A) Zero

(B) 5 N

(C) 10 N

(D) 15 N

Space For Rough Work

25. Two identical waves superpose on one another, then the beat frequency is

(A) Zero   (B) One

(C) Ten   (D) Infinity

26. Damage to the suspension bridge by marching military troops is due to

(A) Reverberation   (B) Resonance

(C) Beats   (D) Noise

27. A tuning fork produces waves in a medium. The parameter that changes with temperature of the medium is

(A) Wavelength   (B) Frequency

(C) Amplitude   (D) Period

28. The electromagnetic radiation used to detect the artificial gems from the original gems is

(A) Microwave   (B) Radio wave

(C) Ultraviolet ray (UV ray)   (D) X-ray

29. During excitation of an atom from ground state to excited state, the number of photons absorbed by the single atom is

(A) 2   (B) 1

(C) 3   (D) 0

30. In Nano-technology, the manipulation of atom is done in the range of

(A) 1 nano meter – 100 nano meter   (B) 1 micro meter – 100 micro meter

(C) 1 pico meter – 100 pico meter   (D) 1 millimeter – 100 millimeter

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Space For Rough Work

31. Live telecast of a programme can be viewed by

(A) Manual communication

(B) X-ray communication

(C) Landline communication

(D) Satellite communication

32. Optical Fibre is used in

(A) Endoscopy

(B) Biometric Machine

(C) Simple Microscope

(D) Simple Telescope

33. Acetic acid is an example for

(A) Strong Electrolyte

(B) Neutral Solution

(C) Weak Electrolyte

(D) Non-Electrolyte

34. The process of coating tin over iron and steel is known as

(A) Alloying

(B) Galvanizing

(C) Tinning

(D) Refining

35. The batteries which are recharged and reused are called

(A) Primary Battery

(B) Secondary Battery

(C) Fuel Cell

(D) Alkaline Battery

Space For Rough Work

36. PAFC is a type of

(A) Primary Cell   (B) Secondary Cell

(C) Solar Cell   (D) Fuel Cell

37. The easily fusible material which is formed when Flux reacts with gangue is

(A) Slag   (B) Alloy

(C) Polymer   (D) Mineral

38. Which of the below given polymers is obtained by condensation polymerization?

(A) Poly ethene   (B) Nylon

(C) PVC   (D) Poly propane

39. Which of the following is not a composite material?

(A) Fibreglass   (B) Concrete

(C) Ceramic   (D) Bronze

40. The pH value of Lemon juice is about

(A) 2.4   (B) 8.2

(C) 10.2   (D) 14

Space For Rough Work

PART – B

ENGINEERING MATHEMATICS

41. The value of $\begin{vmatrix} \cos 50° & \sin 10° \\ \sin 50° & \cos 10° \end{vmatrix}$ is

   (A) $\dfrac{1}{\sqrt{2}}$ (B) $\dfrac{\sqrt{3}}{2}$

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

42. The values of x & y from the simultaneous equations $3x + 4y = 7$ and $7x - y = 6$ are.

   (A) $x = 1, y = 1$ (B) $x = -1, y = -1$

   (C) $x = 1, y = -1$ (D) $x = -1, y = 1$

43. If $\begin{vmatrix} x & 3 \\ 3 & x \end{vmatrix} = 0$ then the value of x is

   (A) ± 1 (B) ± 3

   (C) ± 9 (D) $\pm \sqrt{6}$

44. If $A = \begin{bmatrix} -1 & 3 \\ 4 & -5 \end{bmatrix}$, then $2A^T$ is

   (A) $\begin{bmatrix} -2 & 6 \\ 8 & -10 \end{bmatrix}$ (B) $\begin{bmatrix} -1 & 4 \\ 3 & -5 \end{bmatrix}$

   (C) $\begin{bmatrix} -2 & 8 \\ 6 & 8 \end{bmatrix}$ (D) $\begin{bmatrix} -2 & 8 \\ 6 & -10 \end{bmatrix}$

Space For Rough Work

45. If A is a given square Matrix then

(A) adj A = $\dfrac{A^{-1}}{|A|}$

(B) adj A = $\dfrac{|A|}{|A^{-1}|}$

(C) adj A = $|A| \cdot A^{-1}$

(D) $AA^{-1} = adj\ A . |A|$

46. The characteristic Equation of the Matrix $A = \begin{bmatrix} -5 & 6 \\ -2 & 1 \end{bmatrix}$ is

(A) $\lambda^2 - 6\lambda + 12 = 0$

(B) $\lambda^2 - 4\lambda + 17 = 0$

(C) $\lambda^2 + 4\lambda + 7 = 0$

(D) $\lambda^2 - 4\lambda + 7 = 0$

47. The unit vector in the direction of $\vec{a} = 3i + 4j - 2k$ is

(A) $\hat{a} = \dfrac{3i + 4j - 2k}{\sqrt{26}}$

(B) $\hat{a} = \dfrac{3i + 4j - 2k}{\sqrt{29}}$

(C) $\hat{a} = i + j - 2k$

(D) $\hat{a} = \dfrac{3i + 4j - 2K}{\sqrt{21}}$

48. If $\vec{a} = i + \lambda j$ and $\vec{b} = 2j + 3k$ and $\vec{a} . \vec{b} = 0$ then 'λ' is Equal to

(A) $\dfrac{-2}{3}$

(B) $\dfrac{2}{3}$

(C) $\dfrac{3}{2}$

(D) 0

49. Area of the triangle whose adjacent sides are $\vec{a} = 2i - j + 2k$ and $\vec{b} = 3i - j$ is

(A) $\sqrt{41}$ sq.units

(B) $\dfrac{\sqrt{41}}{2}$ sq.units

(C) $\dfrac{3}{2}$ sq. units

(D) $\dfrac{\sqrt{65}}{2}$ sq.units

Space For Rough Work

50. The number of possible outcomes in the sample space when two dice of different colours are rolled is

(A) 36

(B) 6

(C) 9

(D) 12

51. Sin θ is positive and tan θ is negative when θ is in

(A) I quadrant

(B) II quadrant

(C) III quadrant

(D) IV quadrant

52. The value of

$$\frac{\tan (\pi - \alpha)}{\tan (-\alpha)} + \frac{\cos (\pi/2 - \alpha)}{\sin (2\pi - \alpha)} + \frac{\cosec \left(\frac{3\pi}{2} + \alpha\right)}{\sec (\pi + \alpha)} \text{ is}$$

(A) − 1

(B) 2

(C) − 2

(D) 1

53. The value of sin (105°) is

(A) $\dfrac{\sqrt{3} + 1}{2\sqrt{2}}$

(B) $\dfrac{\sqrt{3} - 1}{2\sqrt{2}}$

(C) $\dfrac{1 - \sqrt{3}}{2\sqrt{2}}$

(D) $\dfrac{\sqrt{3}}{2\sqrt{2}}$

54. The value of $\dfrac{1 - \cos A + \sin A}{1 + \cos A + \sin A}$ is

(A) tan A

(B) tan $\left(A/2\right)$

(C) cot $\left(A/2\right)$

(D) cot A

55. If sin A = $\dfrac{1}{3}$, then the value of sin 3A is

(A) $-{}^{3}/27$

(B) 1

(C) $\dfrac{-4}{27}$

(D) $\dfrac{23}{27}$

Space For Rough Work

56. The value of $2 \cos 3A \cdot \sin 2A$ is

   (A) $\sin 5A + \sin A$ (B) $\cos 5A + \cos A$

   (C) $\sin 5A - \sin A$ (D) $\cos 5A - \cos A$

57. The polar form of $1 + i$ is

   (A) $\sqrt{2} \left[\cos \dfrac{\pi}{4} + i \sin \dfrac{\pi}{4} \right]$ (B) $\sqrt{2} \left[\cos \dfrac{\pi}{4} - i \sin \dfrac{\pi}{4} \right]$

   (C) $\sqrt{2} \left[\sin \dfrac{\pi}{4} + i \cos \dfrac{\pi}{4} \right]$ (D) $\sqrt{2} \left[- \cos \dfrac{\pi}{4} - i \sin \dfrac{\pi}{4} \right]$

58. $\displaystyle \lim_{x \to -3} \dfrac{x^2 - 5x + 6}{x^2 - 3x} =$

   (A) $\dfrac{-5}{3}$ (B) $\dfrac{1}{3}$

   (C) $\dfrac{-1}{3}$ (D) $\dfrac{5}{3}$

59. $\displaystyle \lim_{x \to a} \dfrac{\sqrt{x^3} - \sqrt{a^3}}{x - a} =$

   (A) $\dfrac{3}{2} \sqrt{a}$ (B) $\dfrac{3}{2\sqrt{a}}$

   (C) $\sqrt{a}$ (D) $\dfrac{1}{\sqrt{a}}$

60. $\displaystyle \lim_{\theta \to 0} \dfrac{\cos 3\theta - \cos \theta}{\theta \sin 2\theta} =$

   (A) $\tan 2\theta$ (B) 2

   (C) -2 (D) 1

Space For Rough Work

61. Equation of the straight line passing through the point (1, 3) and having slope − 2 is

    (A) $2x - y + 5 = 0$ (B) $x + 2y + 5 = 0$

    (C) $x - 2y - 5 = 0$ (D) $2x + y - 5 = 0$

62. Equation of the straight line passing through the origin and perpendicular to the line $5x - 4y - 1 = 0$ is

    (A) $5x - 4y = 0$ (B) $4x + 5y = 0$

    (C) $5x - 4y + 1 = 0$ (D) $4x + 5y + 1 = 0$

63. If $y = \dfrac{x^2 - 5}{x^2 + 3}$, then $\dfrac{dy}{dx} =$

    (A) $\dfrac{4x^3 - 4x}{(x^2 + 3)^2}$ (B) $\dfrac{16x}{(x^2 + 3)^2}$

    (C) $\dfrac{4x}{(x^2 + 3)^2}$ (D) $\dfrac{-16x}{(x^2 + 3)^2}$

64. If $y = \sin^{-1} (\cos x)$, then $\dfrac{dy}{dx} =$

    (A) $\dfrac{1}{\sqrt{1 - x^2}}$ (B) $\dfrac{-\sin x}{\sqrt{1 - x^2}}$

    (C) 1 (D) -1

65. If $y = \sqrt{y \log x}$, then $\dfrac{dy}{dx} =$

    (A) $\dfrac{1}{x (2y - 1)}$ (B) $\dfrac{1}{x}$

    (C) $\dfrac{1}{x (1 - 2y)}$ (D) $\dfrac{1}{xy}$

Space For Rough Work

66. If $x = a \cos^2\theta$ and $y = b \sin^3\theta$, then $\dfrac{dy}{dx}$ =

(A) $-\dfrac{3b}{2a} \sin\theta$

(B) $-\dfrac{3b}{2a}$

(C) $\dfrac{2a}{b} \cos\theta$

(D) $\dfrac{-2a}{3b\sin\theta}$

67. If $y = x^y$, then $\dfrac{dy}{dx}$

(A) $\dfrac{y^2}{x(1-\log x)}$

(B) $\dfrac{y^2}{x(1+\log y)}$

(C) $\dfrac{y^2}{x(1-y\log x)}$

(D) $\dfrac{y^2}{x(1+\log x)}$

68. If $y = \sin^2 x$, then $\dfrac{d^2y}{dx^2}$ =

(A) 2 cos 2x

(B) 2 sin 2x

(C) 2 sin x cos x

(D) 2x sin x

69. The Equation of tangent to the curve $y = \sin x$ at the point $(\pi, 0)$ is

(A) $x + y + 1 = 0$

(B) $x - y - 1 = 0$

(C) $x + y - \pi = 0.$

(D) $x - y + \pi = 0.$

70. The rate of change of radius of the sphere is 9cm/s. Then the rate of change of volume of the sphere when the radius is 2 cm is equal to

(A) 144π cm^3/s

(B) 9π cm^3/s

(C) 56π cm^3/s

(D) 64π cm^3/s

Space For Rough Work

71. $\int \dfrac{1}{1 + \cos x}\, dx =$

(A) $\tan x + \sec x + c$

(B) $\tan x - \sec x + c$

(C) $- \cot x + \operatorname{cosec} x + c$

(D) $\cot x - \operatorname{cosec} x + c$

72. $\int \left(\sqrt{x} + \cot x \right) dx =$

(A) $\dfrac{2}{3} x^{3/2} + \log \sin x + c$

(B) $\dfrac{3}{2} x^{2/3} + \log \sec c\, x + c$

(C) $\dfrac{2}{3} x^{3/2} - \log \sin x + c$

(D) $\dfrac{3}{2} x^{2/3} - \log \sec x + c$

73. $\int \dfrac{e^{\log x}}{x}\, dx =$

(A) $e^x + c$

(B) $\log (e^x) + c$

(C) $x \log e^x + c$

(D) $e^{\log x} + c$

74. $\int \log x \cdot dx =$

(A) $x \log x + x + c$

(B) $x \log x - x + c$

(C) $x + \log x + c$

(D) $x - \log x + c$

75. $\int \dfrac{x}{\sqrt{1 + x^2}}\, dx =$

(A) $\sqrt{1 + x^2} + c$

(B) $\sqrt{1 - x^2} + c$

(C) $\dfrac{1}{\sqrt{1 + x^2}} + c$

(D) $\dfrac{1}{\sqrt{1 - x^2}} + c$

Space For Rough Work

76. $\int\limits_{-2}^{1} (x + 1)(x - 1)\, dx =$

(A) 0

(B) 1

(C) -1

(D) -2

77. The area bounded by the curve $y = \sin^2 x$, the x–axis and the ordinates $x = 0$ and $x = \pi/2$ is

(A) $\dfrac{\pi}{4}$ sq. units

(B) $\dfrac{\pi}{2}$ sq. units

(C) $\dfrac{\pi}{3}$ sq. units

(D) $\dfrac{\pi}{6}$ sq. units

78. The order and degree of a differential equation $4\left(\dfrac{dy}{dx}\right)^{3} + 8\,xy + \left(\dfrac{d^{2}y}{dx^{2}}\right)^{2} - 7 = 0$ respectively are

(A) 1 and 3

(B) 2 and 2

(C) 2 and 3

(D) 2 and 1

79. The differential equation formed from the equation $y^{2} = 4ax$ by eliminating arbitrary constant is

(A) $2x\dfrac{dy}{dx} - y = 0$

(B) $2x\dfrac{dy}{dx} + y = 0$

(C) $y\dfrac{dy}{dx} - 2x = 0$

(D) $y\dfrac{dy}{dx} + 2x = 0$

80. For the differential equation $\dfrac{dy}{dx} + (\tan x).\, y = \cos x$, the integrating factor is

(A) $\log x$

(B) $\cot x$

(C) $\operatorname{cosec} x$

(D) $\sec x$

Space For Rough Work

PART – C
MINING ENGINEERING

81. A term used to describe all lung diseases caused by dust is

   (A) Filtration   (B) Radiation

   (C) Pneumoconiosis   (D) Nystagmus

82. In an underground mine, the wetbulb temperature in any working place should not exceed

   (A) 33.5° Centigrade   (B) 34.5° Centigrade

   (C) 35.5° Centigrade   (D) 36.5° Centigrade

83. Aneroid Barometer measures

   (A) Humidity of air   (B) Velocity of air

   (C) Atmospheric air pressure   (D) Cooling power of air

84. Permissible concentration of O_2 in Indian underground mine is

   (A) 17%   (B) 18%

   (C) 19%   (D) 20%

85. Height of air column in the D.C. shaft which causes the NVP is termed as

   (A) Geothermic gradient   (B) Motive column

   (C) Correlation   (D) Variation

86. Which one of the following is used as a reviving apparatus in underground coal mine?

   (A) Draeger BG 172   (B) Pulmotor

   (C) Any open circuit rescue apparatus   (D) MSA self rescuer

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Space For Rough Work

87. In an underground working area, CH_4 and CO_2 are normally expected to be

    (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

88. Taking the intake ventilating air to the lowest point of a district and allow it to travel to higher levels is

    (A) Descensional ventilation
    (B) Ascensional ventilation
    (C) Homotropal ventilation
    (D) Antitropal ventilation

89. White damp is

    (A) Synonymous with Carbon monoxide
    (B) Synonymous with Carbon dioxide
    (C) Synonymous with Hydrogen sulfide
    (D) Synonymous with Sulphuretted hydrogen

90. Which gas has a characteristic and repulsive odour normally found with rotten eggs

    (A) Black damp
    (B) White damp
    (C) Stink damp
    (D) After damp

91. In a Hoolamite co-detector a mixture of _____ is used

    (A) Iodine pentoxide and fumic sulfuric acid

    (B) Potassium pallado-sulphide and iodine pentoxide

    (C) Iodine pentoxide and silica gel

    (D) Silica gel and Manganese dioxide

92. Class 'C' fires involve

    (A) Gaseous fuels like LPG gas, butane etc.
    (B) Melting iron etc.
    (C) Inflammable liquids eg: diesel, petrol etc.
    (D) Electrical fires

Space For Rough Work

93. To start a fire, the presence of combustible material, source of ignition and _____ are essential.

   (A) Nitrogen

   (B) Carbon monoxide

   (C) Fire damp

   (D) Oxygen

94. A cooling chamber in a self-contained breathing apparatus contains

   (A) Sodium phosphate

   (B) Sodium chloride

   (C) Sodium carbonate

   (D) Iodine Pentoxide

95. In a gas mask silica gel removes

   (A) Ammonia and water vapour

   (B) Carbon dioxide

   (C) Carbon monoxide

   (D) Smoke

96. Specific gravity of H_2S is

   (A) 1.175

   (B) 0.559

   (C) 0.070

   (D) 2.264

97. Permissible concentration of _____ in Indian underground mines is 50 ppm.

   (A) CO

   (B) CO_2

   (C) H_2S

   (D) SO_2

98. Kata thermometer is used to measure

   (A) Cooling power of air

   (B) Velocity of air

   (C) Temperature of air

   (D) Humidity of air

99. The Ringrose-alarm type detector is used to detect

   (A) Fire damp

   (B) Black damp

   (C) White damp

   (D) Stink damp

Space For Rough Work

100. The inflammability limit 5.4% and 14.8% is for which gas?

(A) Fire damp

(B) CO

(C) H_2S

(D) NO_2

101. Which one of the following does not belong with the others?

(A) Gypsum

(B) Sandstone

(C) Marble

(D) Limestone

102. The broken surface of the mineral is known as

(A) Fracture

(B) Crack

(C) Cleavage

(D) Joints

103. _____ is the angle of Inclination of fault plane measured from the vertical

(A) Hade

(B) Throw

(C) Heave

(D) Dip angle

104. The rocks which are formed by accumulation of bigger rock fragments such as gravel, pebbles, boulders are _____ group of rocks.

(A) Carbonate

(B) Rudaceous

(C) Arenaceous

(D) Argillaceous

105. On Mohr's Scale of Hardness, the rating of Appatite is

(A) 6

(B) 10

(C) 3

(D) 5

106. A coarse grained Igneous rock made of mostly feldspar, quartz crystals, and a few ferromagnetic crystals are

(A) Gabbro

(B) Basalt

(C) Dunite

(D) Granite

Space For Rough Work

107. The term "tenor" describes the _____ content of an Ore

    (A) Mineral   (B) Metallic

    (C) Ore   (D) Gangue

108. Which Ore Forming Mineral exhibits Greenish black colour streak?

    (A) Hematite   (B) Magnetite

    (C) Chalcopyrite   (D) Galena

109. In any sedimentary rocks, the deposition of sediments is characterized into layers (or) beds by

    (A) Stratification   (B) Lamination

    (C) Graded bedding   (D) Cross bedding

110. Which one of the following maps shows the configuration of the land surface, drainage details and man-made features of an area?

    (A) Geological map   (B) Geographical map

    (C) Topographical map   (D) Contour map

111. Increase in moisture content of rock, the effect on bearing capacity of the rock

    (A) Decreases   (B) Increases

    (C) Depends on the rock type   (D) No relation with the moisture content.

112. The term RQD/Jn expressed in Q system refers to

    (A) Sizes of Joint Block

    (B) Shear Strength of Block surfaces

    (C) Environmental conditions influencing the behaviour of the rock mass

    (D) Roughness of Joint Surfaces

Space For Rough Work

113. Flat Jack is used for measuring the _____

(A) Load

(B) Bed separation resistance

(C) Roof convergence

(D) In-Situ stress in rock

114. Tape extensometer is used for measuring the _____

(A) Roof convergence

(B) Load

(C) Bed separation resistance

(D) In-Situ stress in rock

115. The classification of rock mass on the basis of rock is given by

(A) Barton

(B) Gamble

(C) Bieniawski

(D) Deere

116. In a compression strength test, the ratio of confining pressure leads to a reduction in the rock

(A) Ultimate bearing load

(B) Ductility

(C) Angle of internal friction

(D) Brittleness

117. The ratio of specific weight of an intact rock to that of loose rock is _____

(A) Compaction factor

(B) Swell factor

(C) Loose density

(D) Fill factor

118. Mechanical properties which are of interest in rock mechanics are Strength, Deformability, Elasticity and _____

(A) Hardness

(B) Moisture content

(C) Porosity

(D) Swelling

119. Poisson's ratio is a relationship between

(A) Load and Area

(B) Stress and Strain

(C) Longitudinal strain and lateral strain

(D) Longitudinal strain and stress

Space For Rough Work

120. The branch of mechanics concerned with the response of rock and rock masses to the force fields of their Physical environment

(A) SOM

(B) Applied Mechanics

(C) Engineering Mechanics

(D) Rock Mechanics

121. As per the Mines Act, week means a period of seven days beginning at midnight on _____ or such other night as may be approved by Chief Inspector

(A) Sunday night

(B) Monday night

(C) Saturday night

(D) Friday night

122. No adult employed above ground in mine shall be required (or) allowed to work for more than _____ in any week or for more than _____ in any day

(A) 48 hours, 9 hrs

(B) 47 hours, 8 hrs

(C) 46 hours, 7 hrs

(D) 49 hours, 8 hrs

123. No woman shall, notwithstanding anything contained in any other law, be employed in any part of a mine which is below ground and in any mine above ground except between the hours of

(A) 6 A.M. and 7 P.M.

(B) 5 A.M. and 8 P.M.

(C) 4 A.M. and 9 P.M.

(D) 6.5 A.M. and 8 P.M.

124. As per the Mines Rules 1955, the quantity of drinking water to be provided in a mine or any part thereof shall be on a scale of at least _____ for every person employed at any one time

(A) 2

(B) 1

(C) 1.5

(D) 0.5

125. As per the Mines Rules 1955, the scale of latrine accommodation shall be at least one seat for every _____ males and at least one seat for every 50 females employed at one time

(A) 60

(B) 50

(C) 55

(D) 65

Space For Rough Work

126. First aid room shall be provided at every mine employing _____ persons on any one day of the preceding calendar year

(A) more than 180

(B) more than 170

(C) more than 160

(D) more than 150

127. Notice of disease shall be informed to the Chief Inspector or Regional Inspector within _____ days in form-V of First Schedule

(A) 3

(B) 4

(C) 5

(D) 6

128. Duties and responsibilities of blasters is given in _____ of MMR-1961

(A) 46

(B) 47

(C) 48

(D) 49

129. As per MMR-1961, inclination of ladder shall not be more than _____ from the horizontal

(A) 80 degrees

(B) 90 degrees

(C) 85 degrees

(D) 82 degrees

130. No winding rope shall be used or continued in use, if its safely factor is or becomes less than _____ in the case of a shaft exceeding 300 meters in depth

(A) 9

(B) 10

(C) 11

(D) 12

131. In a haulage roadways, every manhole shall be kept clean and clear of obstruction, and whitewashed both inside and for a distance of not less than _____ around the aperture

(A) 0.3 meter

(B) 0.2 meter

(C) 0.25 meter

(D) 0.15 meter

Space For Rough Work

132. No shot hole shall be fired by a fuse less than _____ in length

   (A) 0.5 meter   (B) 1.15 meter

   (C) 1.2 meter   (D) 1.0 meter

133. First aid room shall have floor space not less than

   (A) 7   (B) 8

   (C) 9   (D) 10

134. As per MMR-1961, where the inclination of ladder is more than _____ from the horizontal, the platform or sollar shall be provided at an interval of not more than 10 meters

   (A) 60 degrees   (B) 50 degrees

   (C) 40 degrees   (D) 30 degrees

135. Regulation number 46 of MMR 1961 deals with duties and responsibilities of

   (A) Blaster   (B) Mine mate

   (C) Mine Foreman   (D) Mine Manager

136. A person who has completed his _____ years is called adult

   (A) 18   (B) 16

   (C) 17   (D) 15

137. Self rescuer can be used upto _____ percentage of Carbon Monoxide

   (A) 3   (B) 4

   (C) 5   (D) 6

138. The _____ is submitted to the DGMS as per First Schedule in Form-III

   (A) Notice of opening   (B) Quarterly section

   (C) Annual section   (D) Notice of reopening

Space For Rough Work

139. Any place in a mine to which any person has lawful access is termed as

(A) Magazine

(B) First aid room

(C) Loading place

(D) Working place

140. A part of a shot-hole remaining after being charged with explosive and blasted is called

(A) Socket

(B) Blown out shot

(C) Scraper

(D) Primer

141. The openings in the mine, which serve as a means of entry is known as

(A) Goaf

(B) Gallery

(C) Shaft

(D) Stope

142. Exploration means

(A) Opening up of deposit

(B) Estimation of reserves

(C) Shaft sinking to access the deposit

(D) Search of ore

143. Gestation period is

(A) The time interval between the mining start and production start

(B) The time interval between the mining start and mining close

(C) Lag on ignition period

(D) Time to reach the break-even point

144. A charge of explosive is laid on the surface of the boulder, then covered with a clay and blasted in

(A) Pop shooting

(B) Plaster shooting

(C) Coromant cut

(D) Line drilling

Space For Rough Work

145. In a mine for one shovel, six trucks are assisted. The shovel loading time per truck is 5 min, and truck cycle time is 20 min. Calculate the match factor

(A) 1.50

(B) 0.66

(C) 1.00

(D) 1.20

146. Maximum permissible gradient for the haul road in open cast mines is

(A) 14°

(B) 13°

(C) 12°

(D) 11°

147. In case of open cast blasting, the danger zone comprises area within the radius of _____

(A) 400 meters from the blasting site

(B) 300 meters from the blasting site

(C) 500 meters from the blasting site

(D) 600 meters from the blasting site

148. For overburden removal with Shovel-Dumper combination, the optimum size of the dumper depends on

(A) Distance of the haul

(B) Tonnage to be handled

(C) Distance of the haul and size of the shovel

(D) Size of the shovel

149. In Bord and Pillar panels worked in conjunction with hydraulic stowing, extraction line preferred is

(A) Straight line

(B) Steep diagonal

(C) Step diagonal

(D) Diagonal

150. Coalification has taken place in the order of

(A) Lignite-Peat-Anthralite-Bituminous

(B) Bituminous-Anthralite-Lignite-Peat

(C) Peat-Lignite-Anthralite-Bituminous

(D) Peat-Lignite-Bituminous-Anthralite

151. For hydraulic transportation of solids in pipelines, the ratio of the size of solids to the pipe diameter should not be more than

(A) 1 : 4

(B) 1 : 3

(C) 1 : 2

(D) 1 : 1

152. Contiguous Seams means, the parting between two seams is within _____ m

(A) 12

(B) 11

(C) 10

(D) 9

Space For Rough Work

153. To prevent slope failure, the blasting system selected should be

(A) Deck charging (B) Pre-split

(C) Muffled (D) All of the above

154. The ratio of length of explosive column to the hole diameter which will work as a spherical charge is

(A) $L/D > 4$ (B) $L/D < 4$

(C) $L/D > 6$ (D) $L/D < 6$

155. The place in mine, where explosive is stored is called

(A) Magazine (B) Shelter

(C) Reserve station (D) All of the above

156. Which of the following is Plutanic igneous rock?

(A) Basalt (B) Pumice

(C) Dunite (D) Granite

157. Blasting of stope in VCR method consists of

(A) Blasting one column after another

(B) Blasting one row after another

(C) Blasting all the holes in slices

(D) Creating initial slot and going for mass blast

158. Best suited mining method for thick massive deposit with strong ore, strong walls and steep dip is

(A) Shrinkage stope (B) Block caving

(C) Cut and fill (D) Open stope

159. A narrow vertical or inclined excavation made in the ore block along the width and the height of a stope to continue stoping is termed as

(A) Undercut (B) Trough

(C) Slot (D) Ore pass

Space For Rough Work

160. If the RQD of the ore and wall rock are low, the stoping method suitable is

(A) Block caving

(B) Cut and Fill

(C) Sub level

(D) Shrinkage

161. What will be the quadrantal bearing of a line whose whole circle bearing is 236°25'?

(A) S 56°25' W

(B) N 56°25' W

(C) S 56°25' E

(D) S 43°45' E

162. The forebearing of a line AB is N36°W. What will be the backbearing of the line AB?

(A) N 36° W

(B) S 36° E

(C) N 54° W

(D) S 54° E

163. The forebearing of a line AB is 136°, what will be the bearing of the line AB?

(A) 144°

(B) 54°

(C) 316°

(D) 44°

164. What will be the angle between the two lines OA and OB whose bearings are 56° and 154° respectively?

(A) 98°

(B) 82°

(C) 210°

(D) 18°

165. The combined effect of curvature and refraction in levelling is an error which is

(A) Additive

(B) Subtractive

(C) Multiplicative

(D) Divisive

166. In co-planning method of correlation, number of plumb bob required for suspensions

(A) One

(B) Two

(C) Three

(D) Four

Space For Rough Work

167. In Weissbach triangle method of correlation, number of shaft used for correlation

(A) One
(B) Two
(C) Three
(D) Four

168. The basic concept behind GPS is

(A) Triangulation
(B) Trilateration
(C) Traverse
(D) Tacheometry

169. The minimum number of satellites required to locate the position of any object on the surface

(A) 2
(B) 3
(C) 4
(D) 5

170. Prismatic compass gives the

(A) Quadrantial bearing
(B) Reduced bearing
(C) Whole circle bearing
(D) True bearing

171. When the vertical circle of the theodolite is on the right of the observer when taking reading, the position is called

(A) Face Right
(B) Face Left
(C) Both Face Left and Face Right
(D) Telescope Normal

172. The direction indicated by a freely suspended magnetic needle at a place free from local attraction is called

(A) True meridian
(B) Magnetic meridian
(C) Arbitrary meridian
(D) Assumed meridian

173. In a vernier theodolite, the imaginary line joining the intersection of the cross-hairs of the diaphragm to the optical center of the object glass and its continuation is

(A) Trunion axis
(B) Horizontal axis
(C) Axis of telescope
(D) Line of collimation

Space For Rough Work

174. GIS stands for

(A) Global Information System
(B) Geological Information System
(C) Geographical Information System
(D) Group Information System

175. For a well-conditioned triangle, no angle should be less than

(A) 20°
(B) 25°
(C) 15°
(D) 30°

176. The correction for sag in baseline measurement is

(A) always additive
(B) always subtractive
(C) always zero
(D) sometimes additive and sometimes subtractive

177. The angle between the prolongation of the preceding line and the forward line of a traverse is called

(A) Direct angle
(B) Deflection angle
(C) Included angle
(D) Exterior angle

178. The horizontal angle between the true meridian and magnetic meridian at a place is called

(A) Azimuth
(B) Declination
(C) Local attraction
(D) Magnetic bearing

179. The process of turning the telescope about the vertical axis in horizontal plane is known as

(A) Traversing
(B) Reversing
(C) Plunging
(D) Swinging

180. The following sights are taken on a "turning point":

(A) Foresight only
(B) Backsight only
(C) Foresight and backsight
(D) Intermediate sight only

Space For Rough Work

A1