# DIPLOMA – COMMON ENTRANCE TEST-2013

| MN | COURSE | DAY : SUNDAY DATE : 30-JUNE-2013 |
|---|---|---|
| | MINING ENGINEERING | TIME : 9.00 a.m. to 12.00 Noon |

| MAXIMUM MARKS | TOTAL DURATION | MAXIMUM TIME FOR ANSWERING |
|---|---|---|
| 180 | 200 Minutes | 180 Minutes |

| MENTION YOUR DIPLOMA CET NUMBER | QUESTION BOOKLET DETAILS | |
|---|---|---|
| | VERSION CODE | SERIAL NUMBER |
| | A-4 | 134040 |

**DOs :**

1. Check whether the Diploma CET No. has been entered and shaded in the respective circles on the OMR answer sheet.
2. This question booklet is issued to you by the invigilator after the **2nd bell i.e., after 08.50 a.m.**
3. The serial number of this question booklet should be entered on the OMR answer sheet.
4. The version code of this question booklet should be entered on the OMR answer sheet and the respective circles should also be shaded completely.
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 9.00 a.m., till then;**
   - Do not remove the seal / staple present on the right hand side of this question booklet.
   - Do not look inside this question booklet.
   - Do not start answering on the OMR answer sheet.

1. This question booklet contains 180 (items) questions and each question will have one statement and four answers. (Four different options / responses.)
2. After the **3rd Bell is rung at 9.00 a.m.**, remove the paper seal / polythene bag 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.
3. During the subsequent 180 minutes:
   - Read each question (item) carefully.
   - Choose one correct answer from out of the four available responses (options / choices) given under each question / item. In case you feel that there is more than one correct response, mark the response which you consider the best. In any case, choose **only one response** for each item.
   - Completely **darken / shade** the relevant circle with a **blue or black ink ballpoint pen against the question number on the OMR answer sheet.**

**Correct Method of shading the circle on the OMR answer sheet is as shown below :**

① ● ③ ④

4. Use the space provided on each page of the question booklet for Rough Work. Do not use the OMR answer sheet for the same.
5. After the **last bell is rung at 12.00 Noon**, stop marking on the OMR answer sheet and affix your **left hand thumb impression** on the OMR answer sheet as per the instructions.
6. Hand over the **OMR answer sheet** to the room invigilator as it is.
7. After separating the top sheet (KEA copy), the invigilator will return the bottom sheet replica (candidate's copy) to you to carry home for self-evaluation.
8. Preserve the replica of the OMR answer sheet for a minimum period of **ONE year.**

**[P.T.O.**

## PART – A

It consists of **1 – 40** questions.

1. If x cot 45° cos 60° = sin 60° tan 30° then the value of x is

   (1) $\sqrt{3}$ (2) $\sqrt{3}/2$

   (3) 1/2 (4) 1

2. If tan x = 15/8 and x is in the III quadrant then the value of $(2 \sin x - 3 \cos x) / (2 \cos x + 3 \sin x)$ is

   (1) 61/6 (2) – 61/6

   (3) – 6/61 (4) 6/61

3. The value of $\{[\sin(2\pi - \theta) + \cos(-\theta)] / [\tan(-\theta) + \cot(2\pi + \theta)]\} - \{[\sin(\pi/2 + \theta) + \cos(3\pi/2 - \theta)] / [\cot(\pi + \theta) + \tan(2\pi - \theta)]\}$ is

   (1) 0 (2) – 1

   (3) + 1 (4) – 2

4. If sin A = 5/13 and sin B = 4/5 then the value of cos (A – B) is

   (1) 65/56 (2) 56/65

   (3) 16/65 (4) – 16/65

5. On simplification the value of $(\cos^3 A - \cos 3A) / \cos A + (\sin^3 A + \sin 3A) / \sin A$ is

   (1) 3 (2) 1

   (3) 2 (4) 0

6. $d/dx\left(\sqrt{\sin^2 x}\right)$ is

   (1) cos x (2) sin 2x

   (3) $\cos^2 x$ (4) $\sqrt{\cos x / \sin x}$

**SPACE FOR ROUGH WORK**

7. $d/dx \tan^{-1} \sqrt{(1-\cos 2x)/(1+\cos 2x)}$ is

(1) 1 (2) 0

(3) tan x (4) cos x

8. If $y = \sin x^x$ then dy/dx is

(1) x log sin x

(2) cos $x^x$

(3) sin $x^x$ (x cot x + log sin x)

(4) cos $x^x$ (x tan x + log sec x)

9. $d/dx \left(\sin h^{-1} x\right)$ is

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

(3) $1/\sqrt{x^2-1}$ (4) $1/\sqrt{x^2+1}$

10. The equation to the normal to the curve $y = 5x^2 + 4x - 11$ at the point (– 1, 2) is

(1) $x - 6y + 11 = 0$

(2) $x + 6y - 11 = 0$

(3) $6x - y + 11 = 0$

(4) $6x + y - 11 = 0$

11. In solving the equations by Cramer's rule for $5x - 3y = 1$ and $2x - 5y = -11$, the value of x and y is

(1) (3, 2) (2) (– 3, – 2)

(3) (2, 3) (4) (– 2, – 3)

**SPACE FOR ROUGH WORK**

12. If $A = \begin{bmatrix} 2 & 0 & 0 \\ 1 & 2 & 0 \\ 1 & 1 & 2 \end{bmatrix}$ then A adj A is

(1) Diagonal (2) Scalar

(3) Identity (4) Zero matrix

13. The minor of the element 6 in a matrix $A = \begin{bmatrix} 2 & -3 & 0 \\ 4 & 1 & 6 \\ 3 & 2 & 0 \end{bmatrix}$ is

(1) 10 (2) 11

(3) 12 (4) 13

14. The characteristic equation of the matrix $A = \begin{bmatrix} 5 & -3 \\ 2 & 1 \end{bmatrix}$ is

(1) $\lambda^2 - 6\lambda + 11 = 0$ (2) $\lambda^2 - 6\lambda - 11 = 0$

(3) $\lambda^2 + 6\lambda + 11 = 0$ (4) $-\lambda^2 + 6\lambda = 0$

15. The fourth term in the expansion of $\left(\sqrt{3} + 2\right)^7$ is

(1) 2520 (2) – 2520

(3) 1/2520 (4) – 1/2520

16. The value of (sin 100° + sin 20°) / (cos 100° + cos 20°) is

(1) $\sqrt{3}/2$ (2) 1/2

(3) $\sqrt{3}$ (4) 1

17. The value of ($\tan^{-1}$ 5/6 + $\tan^{-1}$ 1/11) is

(1) 30° (2) 60°

(3) 90° (4) 45°

**SPACE FOR ROUGH WORK**

18. If the points (– 3, K), (5, 7) and (– 11, 1) are collinear, then the value of K is

(1) 4 (2) 3

(3) 2 (4) 1

19. The ratio of the line join of the points (2, 3) and (– 5, 6) divided by y – axis is

(1) 5 : 2 (2) 2 : 5

(3) 3 : 2 (4) 2 : 3

20. Three vertices of a triangle are (– 2, 3, 1), (– 1, 4, 2) and (– 6, 5, 2), then the centroid of the triangle is

(1) (– 3, 4, 1) (2) (0, 5/3, 1/3)

(3) (4, 3, 1) (4) (– 3, – 4, – 2)

21. The volume of a sphere is increasing at the rate of $4\pi$ c.c/sec, then the rate of increase of the radius is when the volume is $288\ \pi$ cc

(1) 6 cm/sec (2) 1/6 cm/sec

(3) 1/36 cm/sec (4) 36 cm/sec

22. $\int \sin^2 x\, dx$ is

(1) $\cos x + c$ (2) $x/2 - (\sin 2x)/4 + c$

(3) $x/2 + (\cos 2x)/4 + c$ (4) $x/2 + (\sin 2x)/4 + c$

23. $\int (3x^2 + x - 1)^6 (6x + 1)\, dx$ is

(1) $6(3x^2 + x - 1)^5 + c$ (2) $(3x^2 + x - 1)^6 + c$

(3) $(3x^2 + x - 1)^7 / 7 + c$ (4) $(3x^2 + x - 1)^7 / 21 + c$

**SPACE FOR ROUGH WORK**

24. $\int \tan^{-1} x \, dx$ is

(1) $x \tan^{-1} x - 1/2 \log (1 + x^2) + c$

(2) $x \tan^{-1} x + 1/2 \log (1 + x^2) + c$

(3) $\tan^{-1} x - 1/2 \log (1 + x^2) + c$

(4) $\tan^{-1} x + 1/2 \log (1 + x^2) + c$

25. $\int_0^{\pi/2} \sin 3x \cos 2x \, dx$ is

(1) 3/5 (2) $-3/5$

(3) 5/3 (4) $-5/3$

26. The constant term in the expansion $(x^2 + 1/x)^{12}$ is

(1) $-495$ (2) 495

(3) 1/495 (4) 945

27. The projection of vector (3, 1, 3) on vector (1, – 2, 1) is

(1) $2\sqrt{6}/5$ (2) $-2\sqrt{6}/3$

(3) $2\sqrt{6}/3$ (4) $-2\sqrt{6}/5$

28. If vector a = (1, 1, 1) and vector b = (2, 2, 1) then magnitude of vector a × b is

(1) $\sqrt{26}$ (2) $\sqrt{28}$

(3) $\sqrt{24}$ (4) 1

29. The cosine of the angle between the vectors (3, – 1, 1) and vector (1, 1, – 1) is

(1) $1/\sqrt{11}$ (2) $-1/\sqrt{33}$

(3) $1/\sqrt{33}$ (4) $-1/\sqrt{11}$

**SPACE FOR ROUGH WORK**

30. The value of $(\sec^6 x - \tan^6 x)$ is

(1) $1 - 3 \sec^2 \times \tan^2 x$

(2) $1 + \tan^2 \times \sec^2 x$

(3) $1 + 3 \sec^2 \times \tan^2 x$

(4) $1 - \tan^2 \times \sec^2 x$

31. The equation to the straight line passing through (3, 2) and perpendicular to the line $5x + 2y - 3 = 0$ is

(1) $2x - 5y - 4 = 0$

(2) $2x - 5y + 4 = 0$

(3) $2x + 5y + 4 = 0$

(4) $5x - 2y + 4 = 0$

32. The slope of a line passing through the points $(-4, -5)$ and $(2, 3)$ is

(1) 3/4 (2) $-3/4$

(3) 4/3 (4) $-4/3$

33. The acute angle between the lines $2x - y + 3 = 0$ and $x - 3y + 2 = 0$ is

(1) 30° (2) 60°

(3) 90° (4) 45°

34. The value of $\lim_{n \to \infty} [(3 - n)(4 - n)(2n - 5)] / (4n^3 - 3)$

(1) $-1/2$ (2) 1/2

(3) 3/2 (4) $-3/2$

35. The value of $\lim_{x \to -3} (x^4 - 81) / (x^3 + 27)$ is

(1) 3 (2) $-3$

(3) 4 (4) $-4$

**SPACE FOR ROUGH WORK**

36. $\int_0^2 (x-1)(x-2)\,dx$ is

(1) 2/3 (2) $-2/3$

(3) 3/2 (4) $-3/2$

37. The area bounded by the curve $y = 2x^2$, the x – axis and the ordinates at $x = -1$ and $x = 2$ is

(1) – 6 sq units

(2) 3 sq units

(3) – 3 sq units

(4) 6 sq units

38. The differential equation formed by eliminating a and b from $x + y = ae^x + be^{-x}$ is

(1) $d^2y/dx^2 + y = 0$

(2) $d^2y/dx^2 - y = 0$

(3) $d^2y/dx^2 - x - y = 0$

(4) $d^2y/dx^2 + x - y = 0$

39. The solution of the differential equation $dy/dx = (1 + y^2) / (1 + x^2)$ is

(1) $\tan^{-1} y + \tan^{-1} x + c = 0$

(2) $\log (1 + y^2) + \log (1 + x^2) + c = 0$

(3) $\tan^{-1} y - \tan^{-1} x + c = 0$

(4) $\log (1 + y^2) - \log (1 + x^2) + c = 0$

40. If $\begin{vmatrix} x+2 & 5 \\ 0 & x-2 \end{vmatrix} = 0$, then x =

(1) 1 (2) 2

(3) 3 (4) 0

**SPACE FOR ROUGH WORK**

## PART – B

It consists of **41 – 80** questions.

41. A bullet of mass 0.01 kg is fired from a rifle of mass 20 kg with a speed of 10 m/s , then the recoil velocity of rifle is _____ m/s.

(1) –1 (2) –0.05

(3) –200.01 (4) –0.005

42. Final velocity of a body thrown downwards is _____

(1) Maximum (2) Minimum

(3) No change (4) Zero

43. A person throws a sand bag from a boat at rest in a pond then boat moves

(1) In the same direction

(2) In the opposite direction

(3) In a perpendicular direction

(4) In circular direction

44. Two equal forces at a point, the square of their resultant is equal to three times the product of the forces. Then the angle between the forces is equal to

(1) 30° (2) 45°

(3) 60° (4) 90°

45. Equilibrant is a force

(1) Which brings a body in equilibrium

(2) Which moves the body along the resultant force

(3) in zig-zag movement of the body

(4) Which moves the body in opposite direction to equilibrant force

46. The best value of reverberation time for speech listener _____

(1) 0.5 to 1.5 s (2) 0.15 to 0.5 s

(3) 0.05 to 0.15 s (4) 0.5 to 5 s

**SPACE FOR ROUGH WORK**

47. 3 strings of equal lengths but stretched with different tensions are made to vibrate, if their masses per unit length are in the ratio 3:2:1 and frequencies are same then the ratio of the tensions _____

(1) 1:2:3 (2) 2:3:1

(3) 1:3:2 (4) 3:2:1

48. Newton's formula for velocity of sound was corrected by

(1) Boyle (2) Charles

(3) Laplace (4) Hertz

49. Light waves are composed of both electric and magnetic field is proposed by

(1) Newton's corpuscular theory

(2) Huygen's wave theory

(3) Maxwell's theory of light

(4) Plank's theory

50. If 'a' and 'b' are the amplitudes of two interfering waves then for destructive interference the amplitude ' R' is

(1) R = ab (2) R = a/b

(3) R = a – b (4) R = a + b

51. Which of the following is dimensional physical quantity ?

(1) pressure (2) strain

(3) mechanical advantage (4) sp.gravity

52. The principle of vernier is

(1) n VSD = (n + 1) MSD (2) (n – 1) VSD = n MSD

(3) n MSD = (n – 1) V SD (4) (n – 1) MSD = n VSD

**SPACE FOR ROUGH WORK**

53. A screw gauge has a pitch of ½ mm and 50 division on sleeve. The reading when the jaws touch is +5 division. While gripping a wire the reading is PSR = 3 PSD and HSR = 17, then the diameter of wire is

(1) 1.62 cm
(2) 0.162 cm
(3) 0.162 mm
(4) 16.2 mm

54. The extension of the material by itself without increase of load takes place

(1) within elastic limit
(2) beyond elastic limit
(3) beyond yield point
(4) at breaking point

55. If the strain in a wire is 0.1%, then the change in the length of the wire of length 5 m is

(1) $5 \times 10^{-2}$ m
(2) $5 \times 10^{-3}$ m
(3) $5 \times 10^{-4}$ m
(4) $5 \times 10^{-3}$ cm

56. A force of 10 N acting on a body fixed at a point the distance from the fixed point to the line of force is 2 m. Then the moment of the force is _____ N-m.

(1) 0.002
(2) 0.02
(3) 2
(4) 20

57. By Lami's theorem, P Q R are three forces acting in equilibrium and angle between PR, PQ, QR, are $\alpha, \beta, \gamma$ respectively then which of the following is correct ?

(1) $\frac{P}{\sin\beta} = \frac{Q}{\sin\gamma} = \frac{R}{\sin\alpha}$
(2) $\frac{P}{\sin\gamma} = \frac{Q}{\sin\alpha} = \frac{R}{\sin\beta}$
(3) $\frac{P}{\sin\alpha} = \frac{Q}{\sin\beta} = \frac{R}{\sin\gamma}$
(4) $\frac{P}{\sin\alpha} = \frac{Q}{\sin\gamma} = \frac{R}{\sin\beta}$

58. If the line of action of the force passes through the point of rotation, then the moment of force is

(1) Maximum
(2) Less than one
(3) Greater than one
(4) Zero

**SPACE FOR ROUGH WORK**

59. 1 Kilo calorie of heat is equal to _____ joule.

(1) 4.186 (2) 41.86

(3) 418.6 (4) 4186

60. The correct relation between °F and K scale is

(1) $5K = 9\,(F - 32)$

(2) $9K = -5(F - 32)$

(3) $K = \frac{9}{5}\,(F - 32) - 273$

(4) $K = \frac{5}{9}\,(F - 32) + 273$

61. Two coherent sources $2 \times 10^{-4}$ m apart are illuminated by the light of wave length $5000 \times 10^{-10}$m. The distance between the source and screen is 0.2m, then fringe width is

(1) $0.05 \times 10^{-3}$ m

(2) $5 \times 10^{-3}$m

(3) $0.5 \times 10^{-3}$m

(4) $50 \times 10^{-3}$m

62. Resolving power of microscope is

(1) Equal to the resolution of the microscope

(2) Reciprocal to the resolution of the microscope

(3) Reciprocal to the focal length of the microscope

(4) Product of wave length and semi vertical angle

63. Which of the following phenomenon confirm that light is transverse wave ?

(1) Diffraction

(2) Interference

(3) Refraction

(4) Polarization

**SPACE FOR ROUGH WORK**

64. In Field emission

(1) High positive voltage is used

(2) Secondary electrons are used

(3) High energy is used

(4) High radiations are used

65. Which of the following is not true ?

(1) Photoelectric emission is an instantaneous process

(2) Photoelectric emission do not takes place below threshold frequency

(3) The K.E. of the photoelectron depends on the wavelength of incident radiation

(4) Number of photoelectrons emitted is directly proportional to the intensity

66. Poisson's ratio is the ratio of

(1) $\frac{\textit{Lateral strain}}{\textit{Linear strain}}$ (2) $\frac{\textit{Linear strain}}{\textit{Lateral strain}}$

(3) $\frac{\textit{Lateral strain}}{\textit{Volume strain}}$ (4) $\frac{\textit{Volume strain}}{\textit{Lateral strain}}$

67. The pressure at a depth of 100 m below the surface of water density 1000 $kgm^{-3}$ is

(1) $98 \times 10^5\ Nm^{-2}$ (2) $9.8 \times 10^4\ Nm^{-2}$

(3) $980 \times 10^4\ Nm^{-2}$ (4) $98 \times 10^4\ Nm^{-2}$

68. When two capillary tube of different diameters are dropped vertically in a liquid, the height of the liquid is

(1) More in the tube of larger diameter

(2) More in the tube of smaller diameter

(3) Lesser in the tube of smaller diameter

(4) Same in both the tubes

**SPACE FOR ROUGH WORK**

69. The property by virtue of which a liquid opposes relative motion between its different layers is

(1) Viscosity
(2) Elasticity
(3) Surface tension
(4) Inertia

70. The maximum amount of force acting for a short duration is known as

(1) Momentum
(2) Inertia
(3) Power
(4) Impulse

71. Absolute zero is the temperature of a gas at which, the _____ of gas is theoretically zero.

(1) Mass
(2) Weight
(3) Volume
(4) Density

72. When the particle is in SHM having amplitude ' r ' ,then its velocity is

(1) $v = \omega ( r^2 - y^2 )$
(2) $v = \omega\sqrt{r^2 - y^2}$
(3) $v = r\omega^2$
(4) $v = r\omega^3$

73. Ripples in water are the example for

(1) Transverse wave
(2) Longitudinal wave
(3) Sound wave
(4) Ultrasonic wave

74. The length of one ventral segment in stationary wave is equal to

(1) Full wavelength of the wave
(2) Twice the wavelength of the wave
(3) Half a wavelength of the wave
(4) Quarter a wavelength of the wave

**SPACE FOR ROUGH WORK**

75. A stretched string under a tension T vibrates with a frequency f. When the tension is increased by 4 times, then the frequency becomes _____

(1) same
(2) doubled
(3) tripled
(4) zero

76. The appearance of additional frequencies in scattered beam of light is known as

(1) Raman effect
(2) Coherent scattering
(3) Incoherent scattering
(4) Bipolar scattering

77. Two properties of LASER are

(1) Highly monochromatic and extremely intense
(2) Highly chromatic and extremely fast
(3) Very high frequency and extremely high wave length
(4) Very high power and extremely low amplitude

78. To form a galvanic cell

(1) difference in concentration of electrolyte is required
(2) difference in concentration of frequency is required
(3) difference in concentration of amplitude is required
(4) both (2) and (3)

79. pH value is not having its application in

(1) determination of quality of soil
(2) determination of quality of textile dyes
(3) determination of quality of chemicals
(4) determination of quality of electron

80. The prefix "mega" stands for

(1) $10^3$
(2) $10^{-3}$
(3) $10^{-6}$
(4) $10^6$

**SPACE FOR ROUGH WORK**

## PART – C

It consists of **81 – 180** questions.

81. When a roof fall takes place, the air in the goaf area is displaced as the latter is filled by the broken roof rocks, is by

(1) Dredging (2) Air blast

(3) Stoping (4) Stowing

82. A district separated from other district by a coal or brick is known as

(1) Goaf (2) Contagious seam

(3) Pillar (4) Panels

83. In developing a steep seam by Bord and Pillar method, the dip gallery is driven along

(1) The apparent dip (2) True dip

(3) The strike (4) Parallel to level gallery

84. If the seams are separated by a parting of less than 9M they are known as

(1) Thick seam (2) Contiguous seam

(3) Level seam (4) Thin seam

85. The pillars formed during development are split into small pillars are called

(1) Stooks (2) Half moon

(3) Rib (4) Split

86. The explosive for which booster does not require for blasting.

(1) ANFO (2) Ammonium Nitrate

(3) Gun powder (4) LOX

87. Pop shooting is carried out in connection with

(1) Deck loading (2) Primary blasting

(3) Pre Splitting (4) Secondary blasting

**SPACE FOR ROUGH WORK**

88. The minimum distance from the face to the blast hole

(1) Burden
(2) Spacing
(3) Span
(4) Lead

89. Separating the explosive charges into sections by placing a column of stemming in between groups of cartridges in

(1) Plaster shooting
(2) Pop shooting
(3) Deck loading
(4) Bamboo shooting

90. The CO detector which consists a mixture of Iodine pentoxide and Sulphuric acid is

(1) The Hopkalite detector
(2) The Hoolamaite detector
(3) The Drager Multigas detector
(4) The P.S. detector

91. The method of joining two wire ropes permanently without special fittings or attachments

(1) Rope splicing
(2) Re capping
(3) Rope capping
(4) Socketing

92. A retractable supports for cages have to be used at the pit top under mining regulations

(1) Suspension gear
(2) Detaching hook
(3) Keps
(4) Rope capel

93. Buntons throughout the shaft at intervals are not required for

(1) Regid guides
(2) Flexible guides
(3) Steel guides
(4) Wooden guides

94. There is no fleet angle in

(1) Drum winding
(2) Koepe system
(3) Ground mounted drum winding
(4) Direct rope haulage

**SPACE FOR ROUGH WORK**

95. Separate run with one cage is impossible in

(1) Friction winding
(2) Cylindrical drum winding
(3) Drum winding
(4) By-Cylindrico Conical drum winding

96. The sudden voilent failure of rock mass in a mine opening is

(1) Stowing
(2) Rock Burst
(3) Guniting
(4) Pop Shooting

97. The relative proportion of solids and voids in the rock is called

(1) Density
(2) Sp.Gravity
(3) Porosity
(4) Bulk Modulus

98. The depression of the ground surface in the mining areas is called as

(1) Subsidence
(2) Caving
(3) Stowing
(4) Stoping

99. The ratio of lateral strain to the longitudinal strain is called

(1) Young's Modulus
(2) Stripping Ratio
(3) Poisson's Ratio
(4) Modulus of Elasticity

100. As per MMR-1961, the ladder shall be fixed in a shaft, winze or stope at an inclination of not more than

(1) 88°
(2) 82°
(3) 85°
(4) 80°

101. The_____ approach to maintenance reduces the machine or equipment downtime.

(1) Maintenance
(2) Planned
(3) Predictive
(4) None of these

**SPACE FOR ROUGH WORK**

102. Predicting the future trouble through some instrument and taking corrective action is called _____ maintenance.

(1) Predictive
(2) Planned
(3) Periodical
(4) Preventive

103. The _____ is defined as conformance to the requirement.

(1) Quality
(2) Cost
(3) Quantity
(4) Both (1) and (2) above

104. The art of checking the materials parts etc., at various stages in the manufacturing and sorting out the defective items from the good one is called as

(1) Expansion
(2) Inspection
(3) Defection
(4) Registration

105. The _____ separates the defective components from non defective one.

(1) Inspection
(2) Perfection
(3) Specification
(4) All of the above

106. Process of turning the telescope about the vertical axis in a horizontal plane is known as

(1) Reversing
(2) Transiting
(3) Plunging
(4) Swinging

107. The contour interval depends upon

(1) Nature of the ground
(2) Scale of the map
(3) Purpose and extend of survey
(4) All of the above

108. When it is not possible to setup the level midway between the two points, then the difference in elevation between them is measured by

(1) Fly leveling
(2) Precise leveling
(3) Differential leveling
(4) Reciprocal leveling

**SPACE FOR ROUGH WORK**

109. The method of surveying by which the surface survey and underground survey are connected to the same base

(1) Reciprocal leveling
(2) Triangulation
(3) Correlation
(4) Photogrammetry

110. Mechanical weathering which involves breaking of rock by removal of matrix is

(1) Block disintegration
(2) Granular disintegration
(3) Frost action
(4) Frost heaving

111. The vertical distance between two adjacent main levels, main horizons or main drives.

(1) Width of pillar
(2) Long hole drilling
(3) Level interval
(4) Sub level stoping

112. Drilling a vertical holes in the roof and fixing steel bolts grip the strata, and support the immediate roof is

(1) Roof bolting
(2) Hydraulic prop
(3) Stull
(4) Steel arch

113. The _____ runs on the rope supporting the walling scaffold and guides the bucket during its travel.

(1) Bucket
(2) Crab
(3) Rider
(4) Dog catches

114. A spot on the floor from where gravity fed ore of a higher level is loaded into tubs or mine cars.

(1) Ore pass
(2) Draw point
(3) Winze
(4) Stoping

115. The process of removal of blasted rock and cleaning the face is called

(1) Mucking
(2) Tramming
(3) Levelling
(4) Sinking

**SPACE FOR ROUGH WORK**

116. The extraction of coal commences from the vicinity of the shaft pillar and proceeds outwards towards the boundary of the mine or panel.

(1) Long wall retreating

(2) Bord and pillar method

(3) Long wall advancing

(4) Horizon mining

117. If the seam consists of dirt band, the suitable method to extract is

(1) Long wall retreating method

(2) Room and pillar method

(3) Sub level stoping

(4) Harringbone system

118. In horizon mining , roadways driven parallel to strike from the shaft and may be sited in one of the coal seams is known as

(1) Level gallery (2) Dip gallery

(3) Lateral drift (4) Cross cut

119. If the coal is available in one shift in a day of three shift in

(1) Cyclic B & P Method (2) Cyclic L W Method

(3) During depillaring (4) Non- Cyclic long wall method

120. The best excavator for digging below the level on which it stands is

(1) Pull shovel or hoe (2) Dipper shovel

(3) Bull dozer (4) Ripper

121. The gas which has more affinity for the Haemoglobin of the blood is,

(1) $CO_2$ (2) CO

(3) $H_2S$ (4) $CH_4$

**SPACE FOR ROUGH WORK**

122. Spiralarm F.D. detector is used to detect

(1) $N_2$ (2) CO

(3) $O_2$ (4) $CH_4$

123. Anemometer is used to determine

(1) Quantity of air flow (2) Quality of air flow

(3) Humidity of air (4) Cooling power of mine air

124. A device which can be used to measure the static pressure, the velocity pressure or the total pressure.

(1) Kata thermometer (2) Hygromweter

(3) The Pitot tube (4) Barometer

125. The construction where intake air and return air currents have to cross each other is

(1) Air crossing (2) Regulator

(3) Door (4) Stopping

126. This is a haulage without any motor or external sources of power and consists of cast iron pulley

(1) Main and Tail Rope haulage (2) Endless Rope haulage

(3) Gravity Rope haulage (4) Double Drum Rope haulage

127. A safety device used behind an ascending set of tubs on a direct haulage road or on an endless haulage

(1) Back Stay (2) Rope Capel

(3) Stop Block (4) Detaching Hook

128. Armoured chain conveyors are also called

(1) Belt Conveyor (2) Python Conveyor

(3) Scraper Chain Conveyor (4) Shaker Conveyor

**SPACE FOR ROUGH WORK**

129. A locomotive haulage can be used in a mine, where the gradient is not more than

(1) 1 in 32 (2) 1 in 30

(3) 1 in 15 (4) 1 in 35

130. The property of rock to permit fluid/gas to pass through it is

(1) Plasticity (2) Elasticity

(3) Ductility (4) Permeability

131. As per MMR-1961, the man holes in the haulage roadways shall be

(1) 1.2M Height, 1.0M Depth, 05M width

(2) 1.1M Height, 1.0M Depth, 055M width

(3) 1.8M Height,1.2M depth, 0.75M width

(4) 1.9M Height,1.8M depth, 077M width

132. To avoid the danger from surface water, No working shall be made in any mine vertically below or any spot within a horizontal distance of _____ from either bank of a river or coal.

(1) 10 M (2) 12 M

(3) 15 M (4) 0.95 M

133. As per MMR-1961, the percentage of Carbon di oxide should not be more than _____ percent.

(1) 0.5 (2) 1.0 (3) 2.0 (4) 1.5

134. As per MMR-1961, Regulation 157, No case or container shell contains more than _____ Kg. of explosives and shall have in his possession at a time more than one such container.

(1) 5 (2) 10 (3) 15 (4) 25

**SPACE FOR ROUGH WORK**

135. If in a mine below ground at any one time. If 30 or more persons are employed under the charge of mine mate in accordance with Reg. No. 116 of MMR then blasting shall be done only by

(1) Mate
(2) Foreman
(3) Blaster
(4) Bell Men

136. The _____ refers to the quality involvement of staff in an organization together.

(1) TQM
(2) ESM
(3) PCM
(4) MCT

137. To make clear the relationships between the cause and result in manufacturing process _____ diagram is used.

(1) Scatter
(2) Converge
(3) Spectra
(4) None of these

138. Control charts are a method of _____ to find the variation in the process.

(1) SQC
(2) PCQ
(3) CTP
(4) TPQ

139. Section means _____

(1) Cleanliness
(2) Orderliness
(3) Proper implementation
(4) None of these

140. If W is the weight of the chain, L is the span and P is the Pull, the sag correction for a chain line will be

(1) $W^2L^2/24P^2$
(2) $W^2L/24P$
(3) $W^2L/24P^2$
(4) $W^2L^2/24$

141. The luster of broken glass is

(1) Resinous
(2) Vitreous
(3) Silky
(4) Adamantine

**SPACE FOR ROUGH WORK**

142. The vertical displacement of a fault is

(1) Throw
(2) Hade
(3) Heave
(4) Dip

143. Lamination is characteristic of _____ rocks.

(1) Igneous
(2) Sedimentary
(3) Metamorphic
(4) Volcanic

144. In Gneiss _____ colored minerals alternate.

(1) White and Grey
(2) White and Block
(3) White and Green
(4) White and Light Pink

145. The phenomenon of occurrence of similar and identical fossils is

(1) Contemporarily
(2) Correlation
(3) Homogenetic
(4) Homeostasis

146. The method of shaft sinking involves formation of a large block of frozen ground in the water bearing strata

(1) The piling system
(2) Forced drop shaft method
(3) Cementation process
(4) Freezing method

147. The stopping operation proceeds from lower main level towards the upper main level

(1) Underhand stoping
(2) Breast stoping
(3) Overhand stoping
(4) Open stoping

148. Working on the temporary accumulation of the broken ore in the stope is called

(1) Shrinkage stoping
(2) Long wall mine
(3) Cut and fill method
(4) Room and pillar method

**SPACE FOR ROUGH WORK**

149. The excavation made to collect the water below ground is

(1) Chute (2) Bin

(3) Sump (4) Tank

150. A coal seam is assumed to be very thick if its thickness is beyond

(1) 7 M (2) 8M

(3) 9M (4) 6M

151. The diesel operated machine with pneumatic tyred wheels and has at the centre a bowl fitted with a cutting blade at bottom.

(1) Drag line (2) Ripper

(3) Back hoe (4) Scraper

152. A tractor with pusher blade attached to the front portion is

(1) Bucket wheel Excavator (2) Dumper

(3) Bull dozer (4) Scraper

153. An oily fluid with specific gravity of 1.6 and freezing point at 13°C. It is insoluble in water and is very sensitive to explosion by shock of any nature.

(1) Ammonium Nitrate (2) Nitroglycerene

(3) Gun power (4) ANFO

154. A cord consists of a core of fine grained gunpowder wrapped with layers of a tape or textile yarn and water proof coating.

(1) Detonating cord (2) Detonating relay

(3) Safety fuse (4) None

**SPACE FOR ROUGH WORK**

155. A non electric initiating device combining the versatility and advantages of electric detonator and detonating cord.

(1) Raydet
(2) Neoprene plug
(3) Detonating fuse
(4) PIC

156. In the Air Conditioning plant, the Brine is cooled in the Evaporator by

(1) Liquid Ammonia
(2) Calcium chloride solution
(3) Water
(4) Air

157. The fire extinguisher in which, the blanket on the flame and smothers effects produced

(1) Foam extinguisher
(2) $CO_2$ extinguisher
(3) Water-$CO_2$ extinguisher
(4) Soda acid extinguisher

158. A flame proof enclosure is used for electrical apparatus at higher voltage exceeding

(1) 5V
(2) 10V
(3) 15V
(4) 25V

159. In a Self Contained Breathing Apparatus, Cooling chamber of copper contains

(1) Calcium Hydroxide
(2) Sodium Phosphate in Crystal form
(3) Caustic soda
(4) Silica gel

160. While recapping the coned socket type capel, the poring temperature of molten white metal should not exceed

(1) 370°
(2) 400°
(3) 365°
(4) 375°

**SPACE FOR ROUGH WORK**

161. Property of solid material to deform continuously and permanently without rupture under stress exceeding the yield value of the material

(1) Porosity
(2) Plasticity
(3) Elasticity
(4) Deformability

162. Shear strength of rock is a function of

(1) Cohesion
(2) Internal friction
(3) Dilatancy
(4) All of three

163. Uniaxial strength of rock is _____ times the point load strength.

(1) 10 – 20
(2) 15 – 20
(3) 20 – 25
(4) 50 – 75

164. The injection of a liquid of variable velocity under pressure into rock mass is called

(1) Stitching
(2) Grouting
(3) Plastering
(4) Foaming

165. Physical properties of rock are also called as

(1) Physico-Mechanical properties
(2) Chemical properties
(3) Mechanical properties
(4) Index properties

166. As far as possible, a shot hole shall be fired by

(1) The same blaster who has charged it
(2) Agent of the mine
(3) Managing Director
(4) Personnel Manager

167. According to mines Act Sec. 19 following facilities are to be provided to the persons employed in mine

(1) Drinking water
(2) Conservancy
(3) Medical appliances
(4) All the above

**SPACE FOR ROUGH WORK**

168. Any place in a mine to which any person has law full access is called

(1) Landing
(2) Danger zone
(3) Stope
(4) Working place

169. Inhaling Silica dust results in

(1) Silicosis
(2) Asbestosis
(3) Nystagmus
(4) Siderosis

170. The life of the machine will be increased by

(1) Planning
(2) Maintenance
(3) Prevention
(4) None of these

171. Departure of a survey line is

(1) Measured length corrected for tape/Chain correction
(2) Measured length
(3) Orthographic projection of E-W line
(4) Orthographic projection of N-S line

172. The bearing of a line AB is 200° and that of CB is 270°, the included angle ABC is

(1) 70°
(2) 80°
(3) 90°
(4) 100°

173. The whole circle bearing 338° 42' converted into quadrant form is given as

(1) N21° 18'W
(2) S21°18'E
(3) W21°18'N
(4) N21°18'E

174. A well conditioned triangle has angles not less than and more than respectively

(1) 10° and 90°
(2) 30° and 120°
(3) 90° and 120°
(4) 45° and 90°

**SPACE FOR ROUGH WORK**

175. Parallax may be eliminated by

(1) Focusing the eye piece
(2) Focussing the objective
(3) Both (1) and (2) above
(4) None of the above

176. Tenor is expressed in terms of

(1) $Kg/cm^2$
(2) Metre/Ton
(3) Pounds/Yard
(4) Grams/Ton

177. One of the important characters of Placer mineral is

(1) High hardness
(2) High specific gravity
(3) Low specific gravity
(4) Low hardness

178. Chemical composition of Cuprite is

(1) $Fe_2O_3$
(2) $Fe_3O_4$
(3) $CuFeS_2$
(4) $Cu(CO_3)_2$

179. Hot magmatic water liberated during igneous activity is

(1) Connate water
(2) Meteoric water
(3) Juvenile water
(4) Ground water

180. A level roadway leads from the inclined shaft and passes through the country rock in order to cut across the load at an angle to the strike.

(1) Cross-cut
(2) Foot wall drive
(3) Raise
(4) Winze

**SPACE FOR ROUGH WORK**

MN

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# A-4