10214

ROLL No. | | | | | |

TEST BOOKLET No. 277

TEST FOR LATERAL ENTRY PROGRAMMES IN ENGINEERING AND TECHNOLOGY

Time: 3 Hours

Maximum Marks: 600

INSTRUCTIONS TO CANDIDATES

1. You are provided with a Test Booklet and an Optical Mark Reader (OMR) Answer Sheet to mark your responses. Do not soil the Answer Sheet. Read carefully all the instructions given on the Answer Sheet.

2. Write your Roll Number in the space provided on the top of **this page.**

3. Also write your Roll Number and Test Code in the columns provided for the same on the Answer Sheet. Darken the appropriate bubbles with **Ball Point Pen.** Put your signature in the column provided on the Answer Sheet in the presence of the Invigilator.

4. This paper consists of 200 objective type questions as detailed below:-

(i)	English	: 20 Nos. (Serial No. 1 to 20)
(ii)	Mathematics	: 50 Nos. (Serial No. 21 to 70)
(iii)	Engineering Mechanics	: 40 Nos. (Serial No. 71 to 110)
(iv)	Engineering Graphics	: 40 Nos. (Serial No. 111 to 150)
(v)	General Engineering	: 50 Nos. (Serial No. 151 to 200)

5. Each question has four alternative responses marked **A, B, C** and **D** and you have to **darken** the bubble fully by **Ball Point Pen** corresponding to the correct response as indicated in the example shown on the Answer Sheet.

6. Each correct answer carries **3** marks and each wrong answer carries **1** minus mark.

7. Space for rough work is provided at the end of this Test Booklet.

8. You should return the Answer Sheet to the Invigilator before you leave the examination hall. However, you can retain the Test Booklet.

9. Every precaution has been taken to avoid errors in the Test Booklet. In the event of any such unforeseen happenings, the same may be brought to the notice of the Observer/Chief Superintendent in writing. Suitable remedial measures will be taken at the time of evaluation, if necessary.

SEAL

10214

TEST FOR LATERAL ENTRY TO B.TECH. DEGREE PROGRAMMES

ENGLISH

Direction (Qn. Nos. 1 and 2): Select the correct form of Passive Voice for the following.

1. Open the door.

   (A) The door should be opened.
   (B) Let the door be opened.
   (C) The door may be opened.
   (D) The door has to be opened.

2. I will teach him.

   (A) He can be taught by me.
   (B) He should be taught by me.
   (C) He will be taught by me.
   (D) He has to be taught by me.

Direction (Qn. No. 3): Read the given passage carefully and choose the correct statement from the following.

3. Apart from those who are in schools, and yet learning very little, over half of all children out of school are girls. The problem with low quality education is that it compels parents, who believe education could pull them out of poverty, to send their children to private schools. They automatically equate such schools with a better quality of education. In India, the percentage of children enrolled in private schools is steadily increasing, even in the poorer states.

   (A) Parents prefer to send their children to private schools because they think that the students of private schools have a higher social status
   (B) Parents send their children to private schools because they believe that education could pull them out of poverty
   (C) The low quality education offered in ordinary schools compels the parents to send their children to private schools which offer a better quality of education
   (D) Parents send their children to private schools because those schools offer many better facilities to their students

Direction (Qn. No. 4): Pick out the correctly spelt word.

4.

(A) heriditary
(B) hereditery
(C) hereditary
(D) harediatary

Direction (Qn. No. 5): Select the most suitable opposite word for the following.

5. compulsory

(A) willing
(B) voluntary
(C) hesitating
(D) deliberate

Direction (Qn. No. 6): Choose the correct form of reported speech for the following.

6. "Don't run so fast and fall into that ditch" said the teacher.

(A) The teacher asked his student not to run so fast and fell into that ditch
(B) The teacher advised his student not to run so fast and fall into that ditch
(C) The teacher wanted his student not to run so fast to fall into that ditch
(D) The teacher asks his student not to run so fast and fall into that ditch

Direction (Qn. Nos. 7 – 9): Choose the word which is nearest in meaning for the following.

7. expatriate

(A) person living outside one's own country
(B) one who expects help from others
(C) one who does not love his country
(D) one who is expelled from one's own country

8. exigency

(A) excuse
(B) excitement
(C) exhaustion
(D) emergency

9. privilege

(A) support
(B) freedom
(C) privacy
(D) special favour or benefit

Direction (Qn. No. 10): Pick out the mistaken part from the following sentence.

10. What could be worse than raising the hopes of a child and her parents (1)
with the promise of education (2) and all it carries with it (3)
only to have it dashed for the ground (4)

(A) 1
(B) 2
(C) 3
(D) 4

Direction (Qn. Nos. 11 – 16): Fill in the blanks with the correct choice.

11. A true politician is always indifferent ..... wealth and fame.

(A) to
(B) at
(C) towards
(D) of

12. My daughter has been in France ..... 2004.

(A) before
(B) at
(C) since
(D) in

13. Rome was not built ..... a day.

(A) on
(B) for
(C) in
(D) at

14. I ..... an LIC policy last week.

(A) had taken
(B) have taken
(C) took
(D) take

15. One of her daughters ..... her to do that work.

(A) help
(B) do help
(C) helps
(D) helping

16. The old lady alighted ..... the bus slowly.

(A) at
(B) down
(C) from
(D) of

Direction (Qn. Nos. 17 – 20): Choose the correct question tag for the following.

17. My wife sings well, ...?

(A) didn't she
(B) doesn't she
(C) won't she
(D) hasn't she

18. She has been waiting for a long time, ...?

(A) has she
(B) hasn't she
(C) had she
(D) didn't she

19. You will work hard to pass the test, ...?

(A) will you
(B) won't you
(C) can you
(D) can't you

20. Something is better than nothing, ...?

(A) is it
(B) was it
(C) isn't it
(D) wasn't it

MATHEMATICS

21. If $\sin^{-1} x = \frac{\pi}{4}$ for some x in $(-1, 1)$, then $\cos^{-1} x =$

(A) $\frac{\pi}{5}$ (B) $\frac{\pi}{4}$

(C) $\frac{\pi}{2}$ (D) $\frac{\pi}{3}$

22. If $\frac{\pi}{2} > x > 0$, the minimum value of $\tan x + \cot x$ is

(A) 1 (B) 2

(C) 3 (D) 4

23. If $f(x)$ is defined on $[0, 1]$ by the rule

$$f(x) = \begin{cases} x : x \text{ is rational} \\ 1-x : x \text{ is irrational} \end{cases}, \text{ then } f(f(x)) =$$

(A) constant (B) $1+x$

(C) x (D) None of the above

24. If $f(x) = x^3 + 5x - 8$ is divided by $x-2$, what will be the remainder?

(A) 25 (B) 42

(C) 16 (D) 10

25. The determinant of the matrix $\begin{bmatrix} 1 & 2 & 3 \\ 0 & 1 & 0 \\ 1 & 0 & 1 \end{bmatrix}$ is

(A) 2 (B) 0

(C) -1 (D) -2

26. The function f : R→R defined by $2x^3+1$ is

(A) one-one onto
(B) one-one into
(C) many-one into
(D) many-one onto

27. The maximum and minimum value of the function $f(x) = 1+\sin^2 x$ is

(A) 1, 0
(B) 2, 1
(C) 2, –2
(D) 1, –1

28. The function $f(x) = \tan kx$ satisfies the relation

(A) $f(x+y) = \dfrac{f(x)+f(y)}{1-f(x)f(y)}$
(B) $f(x)+f(y) = f\left(\dfrac{x+y}{1-xy}\right)$
(C) $f(x+y) = \dfrac{f(x)+f(y)}{1+f(x)f(y)}$
(D) $f(x+y) = f(x)f(y)$

29. Which one of the following functions is even?

(A) $f(x) = x^{2n+1}$
(B) $\cos 2x$
(C) $f(x) = \sin x$
(D) $f(x) = \log\left|\dfrac{x-1}{x+1}\right|$

30. If a rectangle has perimeter 24 feet, its area (in square feet) cannot exceed

(A) 28
(B) 14
(C) 36
(D) 20

31. If x tends to zero, $(\sin x \cos x)/x$ tends to

(A) 1
(B) 2
(C) 4
(D) 1/2

32. The value of $\tan^{-1}2+\tan^{-1}3=$

(A) $-\pi/2$ (B) $-3\pi/4$
(C) $\pi/4$ (D) $3\pi/4$

33. If $f: R \rightarrow S$, defined by $f(x)=\sin x-\sqrt{3}\cos x+1$, is onto, then S is the interval

(A) [0, 1] (B) [–1,1]
(C) [0, 3] (D) [–1, 3]

34. The number of curves satisfying $dy/dx=e^x$ and passing through (0,0) and (2, –1) is

(A) 1 (B) 2
(C) 0 (D) 3

35. The number of solutions of the equation $|x-2|+|x-5|=3$ is

(A) 1 (B) 2
(C) 3 (D) infinite

36. If $\int logxdx = xlogx + ax$, then $a=$

(A) –1 (B) 2
(C) 1 (D) 0

37. $\int_0^{\pi/2} 1/(1+\tan x)dx =$

(A) $\frac{\pi}{2}$ (B) $\frac{\pi}{3}$

(C) $\frac{\pi}{4}$ (D) $\frac{1}{2}$

38. If $dy/dx = 2y$, then y may be

(A) $\sin x$ (B) $\cos x$
(C) $\sin 2x$ (D) e^{2x}

39. The rank of an $n \times n$ matrix having all entries 1 is

(A) 0 (B) 1
(C) n (D) $n-1$

40. If a 4×4 matrix A with real entries satisfies the equation $x^3 = I$, where I is a unit matrix, then the rank of A is

(A) 1 (B) 2
(C) 3 (D) 4

41. The number of solutions of the equations $2x + 3y = 5$ and $4x + 6y = 9$ is

(A) 0 (B) 1
(C) 2 (D) infinite

42. If a, b, c, d is 1 or -1, then maximum value of the determinant $\begin{vmatrix} a & b \\ c & d \end{vmatrix}$ is

(A) 1 (B) 2
(C) 0 (D) 4

43. If the determinant of a 4×4 matrix A is 1, then the determinant of $-A$ is

(A) 1 (B) 4
(C) -4 (D) -1

44. A triangle is uniquely determined if

(A) lengths of its sides are known
(B) interior angles are known
(C) one angle and one side are known
(D) two sides and one angle are known

45. If the sides of a triangle are a,b,c such that $\begin{vmatrix} a & b & c \\ c & a & b \\ b & c & a \end{vmatrix} = 0$, then the triangle is

(A) right-angled
(B) acute-angled
(C) obtuse-angled
(D) equilateral

46. If the quadratic polynomial $x^2 - y^2 + x - y + c$ has two linear factors, then $c =$

(A) 1
(B) 0
(C) -1
(D) 2

47. If T, S, and C are the area of an equilateral triangle, square and circle respectively all having same parameters, then

(A) T>S>C
(B) T<C<S
(C) T<S<C
(D) C<T<S

48. If ABC is a triangle with right angle at B inscribed in a circle, then the centre of the circle is

(A) mid point of AB
(B) mid point of AC
(C) mid point of BC
(D) centroid of ABC

49. The value of $\int_0^{\pi} |\cos x| \, dx$ is

(A) 1
(B) 2
(C) 0
(D) 3

50. The differential equation $\frac{dy}{dx} = \frac{x}{y}$ represents a family of

(A) straight lines
(B) parabolas
(C) hyperbolas
(D) ellipses

51. An angle between the straight lines $3(x^2 - y^2) + 2(x + y) = 0$ is

(A) 0
(B) $\frac{\pi}{2}$
(C) $\frac{\pi}{3}$
(D) $\frac{\pi}{6}$

52. The system of circles $x^2 + y^2 - 4x - 6y + c = 0$ has centre

(A) $(-2, -3)$
(B) $(4, 6)$
(C) $(1, 1)$
(D) $(2, 3)$

53. If the length of major axis of an ellipse is three times its minor axis, then its eccentricity e is

(A) $2\frac{\sqrt{2}}{3}$
(B) $\sqrt{\frac{2}{3}}$
(C) $2\sqrt{\frac{2}{5}}$
(D) $4\sqrt{\frac{2}{3}}$

54. The radius of the circle passing through the foci of the ellipse $x^2/16 + y^2/9 = 1$ and having its centre at $(0, 0)$ is

(A) $\sqrt{2}$
(B) $2\sqrt{2}$
(C) $\sqrt{7}$
(D) 3

55. The asymptotes of the hyperbola $xy = c^2$ are

(A) $xy = 0$
(B) $x = c, y = c$
(C) $xy = c$
(D) $x = 1, y = 2$

56. The length of the chord of the circle $x^2 + y^2 = 25$ at a distance 3 from its centre is

(A) 8 (B) 4
(C) 5 (D) 10

57. The equation of the common chord of the circles $x^2 + y^2 - 6x = 0$ and $x^2 + y^2 - 4y = 0$ is

(A) $3x+2y+1 = 0$ (B) $3x-2y = 0$
(C) $3x+2y = 0$ (D) $3x-2y-1 = 0$

58. The length of tangent from (5, 1) to the circle $x^2 + y^2 + 6x - 4y - 3 = 0$ is

(A) 81 (B) 49
(C) 7 (D) 21

59. The line $x - y + 2 = 0$ touches the parabola $y^2 = 8x$ at the point

(A) $(2,-4)$ (B) $\left(1, 2\sqrt{2}\right)$
(C) $\left(4, -4\sqrt{2}\right)$ (D) $(2,4)$

60. The points of intersection of perpendicular tangents to the ellipse $\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$ lie on a circle whose radius is

(A) $a+b$ (B) ab
(C) $\frac{b}{a}$ (D) $\sqrt{\left(a^2+b^2\right)}$

61. If the surface area of a cuboid is 36, its maximum volume is

(A) $6\sqrt{6}$ (B) 6
(C) 36 (D) 216

62. A solution of the equation $\nabla^2\varphi = 0$ is called a

(A) Laplace's function
(B) Bessel's function
(C) Legendre polynomial
(D) Harmonic function

63. If $r = xi + yj + zk$, then $\nabla . r =$

(A) 3
(B) $x+y+z$
(C) r
(D) 1

64. If $f(x,y,z) = 0$ be the equation of a surface, then a vector along the normal to the surface at the point (x,y,z) is

(A) grad f
(B) curl f
(C) div f
(D) None of the above

65. If $\bar{a},\bar{b},\bar{c}$ are unit vectors, then $[\bar{a}-\bar{b},\ \bar{b}-\bar{c},\ \bar{c}-\bar{a}] =$

(A) 1
(B) 0
(C) 3
(D) 6

66. If $\bar{a}$ and $\bar{b}$ are unit vectors and $\bar{a}\cdot\bar{b} = \frac{1}{2}$, then $\left[\bar{a},\bar{b},\bar{a}\times\bar{b}\right] =$

(A) 1/4
(B) 1
(C) 0
(D) 3/4

67. If $\bar{a},\bar{b},\bar{c}$ are unit vectors such that $\bar{a}-\bar{b}+\bar{c} = 0$, then the angle between $\bar{a}$ and $\bar{c}$ will be

(A) $\frac{\pi}{6}$
(B) $\frac{\pi}{3}$
(C) $\frac{\pi}{2}$
(D) $\frac{2\pi}{3}$

68. $Curl\left(grad\ f(x,y,z)\right) =$

(A) 1
(B) 0
(C) 2
(D) 3

69. Which one of the following functions is harmonic?

(A) $x+y+z$
(B) $x^2+y^2+z^2$
(C) $x^3+y^3+z^3$
(D) $x^4+y^4+z^4$

70. If $\bar{r}$ is the vector with components x, y, z, then curl $\bar{r} =$

(A) $3\bar{i}+2\bar{j}+\bar{h}$
(B) $\bar{i}+\bar{j}+\bar{k}$
(C) $\bar{0}$
(D) $\bar{i}+2\bar{j}+3\bar{k}$

ENGINEERING MECHANICS

71. A force system in which the lines of action of all forces lie in a single plane is called as

(A) a collinear force system
(B) a concurrent force system
(C) a parallel force system
(D) a coplanar force system

72. The statement, "the moment of a force is equal to the algebraic sum of the moments of its components" is known as

(A) the Varignon's principle
(B) the St. Venant's principle
(C) the Lami's theorem
(D) the Hooke's law

73. The resultant of two concurrent forces whose lines of action are separated by 60° and magnitudes are 40 kN and 80 kN is

(A) $\sqrt{40 \times 80 \times cos60}$
(B) $\sqrt{40^2+80^2+2\times 40\times 80\times cos60}$
(C) $\sqrt{40^2+80^2-2\times 40\times 80\times cos60}$
(D) $\sqrt{40^2+80^2+2\times 40\times 80\times sin60}$

74. Four forces F, $2F$, $3F$ and $4F$ act along the sides of a square, taken in order. The resultant is

(A) $2\sqrt{3}F$ (B) $3\sqrt{2}F$
(C) $2\sqrt{2}F$ (D) $3\sqrt{3}F$

75. The force of static friction is always

(A) greater than the force of kinetic friction
(B) less than the force of kinetic friction
(C) equal to the force of kinetic friction
(D) None of the above

76. In cone of friction ..... angle is equal to angle of friction.

(A) apex angle (B) twice apex angle
(C) $1/4^{th}$ apex angle (D) half of apex angle

77. If the first moment of an area with respect to an axis is zero, its centroid lies

(A) on the axis (B) on a perpendicular axis
(C) on another axis (D) above the axis

78. Centre of mass and centre of gravity of a body coincide if

(A) the density of the body is constant
(B) the acceleration due to gravity is constant
(C) the body has a regular size and shape
(D) they never coincide

79. Centroid of an ellipse is

(A) at the intersection of its major and minor axes
(B) anywhere inside it
(C) anywhere outside it
(D) None of the above

80. The radius of gyration of a circular area of diameter 'D' with respect to one of its diameter is

(A) $\frac{D}{4}$ (B) $\frac{D}{2}$

(C) $\frac{D}{\sqrt{2}}$ (D) $\frac{D}{2\sqrt{2}}$

81. One of the major assumptions in the analysis of a pin jointed truss is

(A) the loads are acting only at the joints
(B) the centroid of the loads coincides with that of the truss
(C) the forces in the members of the truss are of bending nature
(D) All of the above

82. The acceleration of a particle is defined as the

(A) time derivative of displacement
(B) time derivative of velocity
(C) time derivative of force
(D) time derivative of momentum

83. A block of weight 5 N falls from a distance of 1 m on to a spring. If it compresses by 20 cm and brings the spring momentarily to rest, the spring constant is

(A) $100\ N/m$ (B) $300\ N/m$

(C) $500\ N/m$ (D) $1000\ N/m$

84. If in a body the distance between any two points do not change due to application of external forces, the body is called as a

(A) solid body (B) rigid body
(C) flexible body (D) particle

85. The linear velocity of a particle at a distance of 'r' from the rotating axis is given in terms of the angular velocity, 'ω' as

(A) $\frac{\omega}{r}$ (B) $r\omega$

(C) $r\omega^2$ (D) $r^2\omega$

86. Forces are called concurrent when their lines of action meet in

(A) one point (B) two points
(C) plane (D) perpendicular planes

87. If two equal forces of magnitude P act at an angle θ, their resultant will be

(A) $P \cos \theta/2$ (B) $2P \sin \theta/2$
(C) $2P \tan \theta/2$ (D) $2P \cos \theta/2$

88. Which of the following do not have identical dimensions?

(A) Momentum and impulse
(B) Torque and energy
(C) Torque and work
(D) Moment of a force and angular momentum

89. D'Alembert's principle is used for

(A) reducing the problem of kinetics to equivalent statics problem
(B) determining stresses in the truss
(C) stability of floating bodies
(D) solving kinematic problems

90. A framed structure is perfect if it contains members equal to

(A) $2n-3$ (B) $n-1$
(C) $2n-1$ (D) $3n-2$

91. Centre of gravity of a solid cone lies on the axis at the height

(A) one-fourth of the total height above base
(B) one-third of the total height above base
(C) one-half of the total height above base
(D) three-eighth of the total height above base

92. The centre of percussion of the homogenous rod of length L suspended at the top will be

(A) $L/2$ (B) $L/3$
(C) $3L/4$ (D) $2L/3$

93. The ratio of limiting friction and normal reaction is known as

(A) coefficient of friction (B) angle of friction
(C) angle of repose (D) sliding friction

94. The escape velocity from the surface of Earth is approximately equal to

(A) 9.81 km/s (B) 11.2 km/s
(C) 14 km/s (D) 22 km/s

95. A projectile is fired at an angle θ to the vertical. Its horizontal range is maximum when θ is

(A) 0 (B) 30
(C) 45 (D) 60

96. For perfectly elastic bodies, the value of the coefficient of restitution is

(A) zero (B) 0.5
(C) 1.0 (D) between 0 and 1

97. If the momentum of a given body is doubled, its kinetic energy will

(A) increase by 2 times (B) increase by 4 times
(C) remain same (D) get halved

98. Two pieces of steel and brass having mass of 2 kg and 1 kg respectively, fall freely under action of gravity from a tower. After a distance, which of the following will be identical?

(A) acceleration
(B) momentum
(C) kinetic energy
(D) potential energy

99. A ship will sink if it does not displace water equal to its own

(A) volume
(B) density
(C) surface area
(D) weight

100. In order to double the period of simple pendulum

(A) the mass of its bob should be doubled
(B) the mass of its bob should be quadrupled
(C) its length should be doubled
(D) its length should be quadrupled

101. In case of Simple Harmonic Motion the period of oscillation is given by

(A) $T = 2\omega/\pi^2$
(B) $T = 2\pi/\omega$
(C) $T = \omega/2\pi$
(D) $T = \pi/2\omega$

102. A body in Simple Harmonic Motion will have maximum velocity when its amplitude is

(A) maximum
(B) –ve maximum
(C) zero
(D) average

103. Angular speed of a second's hand of a clock is

(A) π rad/s
(B) $\pi/6$ rad/s
(C) $\pi/15$ rad/s
(D) $\pi/30$ rad/s

104. Distance of the centroid of a semi circle of radius R from its base is

(A) $4R/3\pi$
(B) $3\pi/4R$
(C) $4\pi/3R$
(D) $2\pi/3R$

105. Ratio of Moment of Inertia of a rectangle and that of a triangle, having same base and height with respect to their bases will be

(A) 2:1
(B) 3:1
(C) 4:1
(D) 5:1

106. A bullet of mass 0.03 kg moving with a speed of 400 m/s penetrates 12 cm into a fixed block of wood. The average force exerted by the wood on the bullet will be

(A) 10 *kN*
(B) 20 *kN*
(C) 30 *kN*
(D) 40 *kN*

107. A motorbike starts from rest and accelerates at a rate of 4 m/s^2 for 10 seconds and then decelerates at 8 m/s^2 until it stops. The total distance covered is

(A) 100 *m*
(B) 200 *m*
(C) 300 *m*
(D) 500 *m*

108. A body of mass 10 kg moving with a velocity of 1 m/s is acted upon by a force of 50 N for 2 seconds. The final velocity will be

(A) 22 *m/s*
(B) 10 *m/s*
(C) $\sqrt{21}$ *m/s*
(D) 11 *m/s*

109. Two metallic blocks having masses in the ratio 2:3 are made to slide down a frictionless inclined plane starting initially from rest position. When these blocks reach the bottom of the inclined plane, they will have their kinetic energies in the ratio

(A) 2:3
(B) 3:5
(C) 3:2
(D) 7:4

110. The displacement-time graph for two particles *A* and *B* are straight lines inclined at angles of 30° and 45° with the time axis. The ratio of velocities $V_A : V_B$ will be

(A) 0.33
(B) 0.52
(C) 0.577
(D) 0.877

ENGINEERING GRAPHICS

111. What grade of pencil is used for drawing the construction lines?

(A) H pencil
(B) HB Pencil
(C) 2H pencil
(D) 2B pencil

112. What is the BIS code recommended for engineering drawing?

(A) BIS 696-1972
(B) BIS 456-1978
(C) BIS 696-2000
(D) BIS 696-1964

113. The size of drawing sheet as per Indian Standard for the sheet designation A3 is

(A) 841×1189 mm
(B) 594×841 mm
(C) 420×594 mm
(D) 297×420 mm

114. When 10 m length of a building is drawn as 20 mm in the plan of the building, what is the scale of the drawing?

(A) 1:50
(B) 1:500
(C) 1: 2
(D) 1: 20

115. An object having 30 m height is drawn as 3 cm in a drawing. Find the R.F.

(A) 1/1000
(B) 1/100
(C) 1/10
(D) 1/50

116. R.F. of a scale is 1/1000. Maximum length of object is 50 m. What is the length of a scale?

(A) 100 mm
(B) 50 mm
(C) 5 mm
(D) 10 mm

117. The value of eccentricity of ellipse is

(A) less than 1.0
(B) equal to 1.0
(C) more than 1.0
(D) equal to 2.0

118. The latus rectum of a parabola is the double ordinate passing through the

(A) focus
(B) directrix
(C) apex
(D) vertex

119. The angle of inclination of hatching lines is

(A) 30 degrees
(B) 45 degrees
(C) 60 degrees
(D) 90 degrees

120. The length obtained on 30 degrees inclined line by drawing vertical projector from the true length laid on a 45 degrees inclined line is called

(A) Isometric projection
(B) Isometric length
(C) Isometric scale
(D) Isometric drawing

121. The shape of a square in isometric view is

(A) rhombus
(B) parallelogram
(C) cube
(D) prism

122. The shape of a sphere in isometric view is

(A) sphere
(B) ellipse
(C) circle
(D) parabola

123. If R is the radius of a cone and L is the slant height of the cone, then the formula to calculate the included angle of development of a cone is given by

(A) (R/L)×180 degrees
(B) (L/R)×360 degrees
(C) (R/L)×360 degrees
(D) (L/R)×180 degrees

124. Hidden lines are drawn as

(A) dashed narrow lines
(B) dashed wide lines
(C) long-dashed dotted wide line
(D) long-dashed double dotted wide line

125. The line connecting a view to a note is called

(A) dimension line
(B) projection line
(C) leader line
(D) arrowheads

126. Methods of arrangement of dimensions includes

(A) parallel, continuous and combined
(B) perpendicular, parallel and combined
(C) perpendicular, continuous and combined
(D) perpendicular, parallel and continuous

127. A curve drawn for Boyle's law (PV = constant) on a P-V chart has a characteristic shape of

(A) ellipse
(B) parabola
(C) oblique hyperbola
(D) rectangular hyperbola

128. The profile of a gear teeth is in the form of

(A) parabola
(B) involute
(C) circle
(D) helix

129. The included angle of a hexagon is

(A) 30°
(B) 60°
(C) 120°
(D) 150°

130. The curve generated by a point on the circumference of a circle, which rolls without slipping on the outside of another circle is known as

(A) Hypocycloid
(B) Epicycloid
(C) Cycloid
(D) Trochoid

131. In orthographic projections, the rays are assumed to

(A) diverge from station point (B) converge from station point
(C) be parallel (D) None of the above

132. If an object lies in third quadrant, its position with respect to reference planes will be

(A) infront of V.P., above H.P. (B) behind V.P., above H.P.
(C) behind V.P., below H.P. (D) infront of V.P., below H.P.

133. If the Vertical Trace (V.T.) of a line lies 30 mm above reference line (XY), then its position will be

(A) 30 mm infront of V.P. (B) 30 mm behind V.P.
(C) 30 mm above H.P. (D) 30 mm below H.P.

134. When an object is cut by a section plane parallel to H.P. and perpendicular to V.P., then the true shape of the section is obtained in

(A) top view (B) front view
(C) left side view (D) right side view

135. Which of the following object gives a circular section, when it is cut completely by a section plane irrespective of the inclination of the section plane?

(A) Cylinder (B) Sphere
(C) Cone (D) Circular lamina

136. Which of the following is an enlargement scale?

(A) 10:1 (B) 1:1
(C) 1:10 (D) 10:100

137. Which of the following scale represents 0.125mm to a metre?

(A) 8000:1 (B) 1:125
(C) 0.125:1 (D) 1:8000

138. As per BIS standard, the surface area of the A_0 sheet is

(A) $0.1\ m^2$
(B) $10\ m^2$
(C) $0.01\ m^2$
(D) $1\ m^2$

139. A chain line is used to represent

(A) visible edges
(B) invisible edges
(C) dimension line
(D) axis of a solid

140. The ratio of the distance on the drawing to the actual distance is known as

(A) representative fraction
(B) least count
(C) resolution
(D) accuracy

141. A plane scale with RF 1:40 to show decimetre and metre and long enough to measure 5 m. What is the length of the scale?

(A) 100 mm
(B) 125 mm
(C) 150 mm
(D) 130 mm

142. The shape of the section obtained by cutting a right circular cone by a section plane inclined to the axis of the cone and parallel to one of the generators is

(A) circle
(B) ellipse
(C) parabola
(D) hyperbola

143. For a conic section, the ratio of the distance of the point P from the focus F to its perpendicular distance from the directrix is called

(A) Focal length
(B) Eccentricity
(C) Radius of curvature
(D) Pitch

144. For a hyperbola, the eccentricity is

(A) equal to 1
(B) less than 1
(C) greater than1
(D) 0

145. Two fixed points are 100 mm apart. A point P moves in such a way that the sum of its distances from the two fixed points is always constant and is equal to 152 mm. The locus of the point is

(A) ellipse
(B) parabola
(C) hyperbola
(D) helix

146. A point P moves radially outward from the center of a circular disc with uniform velocity to its periphery when the disc rotates at a uniform rate. The locus of the point will be

(A) helix
(B) Archimedian spiral
(C) logarithmic spiral
(D) cycloid

147. A line AB 40 mm long is lying on H.P. and perpendicular to V.P. The nearest end is 10 mm from the V.P. The front view will be

(A) a point 10 mm above the reference line
(B) a point 10 mm below the reference line
(C) a line perpendicular to the reference line
(D) a point on the reference line

148. The isometric length = ... × True length

(A) 0.82
(B) 1.82
(C) 1.225
(D) 0.5

149. In a perspective view, the position of the observer's eye from where the object is viewed is known as

(A) station point
(B) central plane
(C) vanishing point
(D) center

150. In an oblique perspective, the number of vanishing points are

(A) 1
(B) 2
(C) 3
(D) 4

GENERAL ENGINEERING

151. Vicat Apparatus is to determine which property of cement?

(A) Fineness
(B) Soundness
(C) Normal consistency
(D) Setting time

152. Which piles are also called spur piles?

(A) Bearing piles
(B) Batter piles
(C) Friction piles
(D) Fender piles

153. Efflorescence in cement is caused due to excess of

(A) alumina
(B) iron-oxide
(C) silica
(D) alkalies

154. Compared to mild steel, cast iron has
i) High compressive strength
ii) High tensile strength
iii) Low compressive strength
iv) Low tensile strength

The correct answer is

(A) (i) and (ii)
(B) (ii) and (iii)
(C) (iii) and (iv)
(D) (i) and (iv)

155. Crushing strength of a first class brick should not be less than

(A) 3.5 N/mm^2
(B) 7.0 N/mm^2
(C) 10.5 N/mm^2
(D) 14.0 N/mm^2

156. As per 1S: 456-2000, minimum grade of concrete in sea water constructions is

(A) M20
(B) M25
(C) M30
(D) M50

157. In case of foundations on black cotton soils, the most suitable method to increase the bearing capacity of soils is to

(A) increase the depth of foundation
(B) drain the soil
(C) compact the soil
(D) replace the poor soil

158. Workability of concrete is inversely proportional to the

(A) time of transit
(B) water-cement ratio
(C) air in the mix
(D) size of aggregate

159. Slump test of concrete is a measure of its

(A) consistency
(B) compressive strength
(C) tensile strength
(D) impact value

160. A 'level line' is a

(A) horizontal line
(B) line parallel to the mean spheroidal surface of earth
(C) line passing through the centre of cross hairs and the centre of eye piece
(D) line passing through the objective lens and the eye-piece of a dumpy or tilting level

161. Two gases at same temperature T, pressure P and volume V are mixed. The mixture has volume V and temperature T. What is the pressure of the mixture?

(A) P/2
(B) P
(C) 2P
(D) 4P

162. NTP corresponds to temperature of

(A) 0K
(B) −273K
(C) 273K
(D) None of the above

163. A metallic ball has spherical cavity at its centre. If the ball is heated, what happens to the cavity?

(A) Its volume increases
(B) Its volume decreases
(C) Its volume remains unchanged
(D) Its volume may decrease or increase depending upon the nature of metal

164. In which of the following processes the internal energy of the system remains constant?

(A) Adiabatic
(B) Isochoric
(C) Isobaric
(D) Isothermal

165. If the temperature of sink is absolute zero, the efficiency of the heat engine should be

(A) zero
(B) 50%
(C) 100%
(D) None of the above

166. The door of a refrigerator is kept open. Which of the following is true?

(A) Room is cooled
(B) Room is heated
(C) Room neither cooled nor heated
(D) Room will be cooled in summer and heated in winter

167. In which stroke the useful work is done in case of the petrol engine?

(A) Suction
(B) Compression
(C) Expansion
(D) Exhaust

168. No heat engine can operate by exchanging heat with single temperature source. This statement refers to

(A) Joule Law
(B) Carnot Theorem
(C) Clausius statement
(D) Kelvin Plank statement

169. In a Carnot Cycle the heat rejection is

(A) at constant temperature
(B) at constant volume
(C) at constant pressure
(D) at adiabatic process

170. Which of the following is not a part of steam engine?

(A) Crosshead
(B) Cam shaft
(C) Crank
(D) Eccentric

171. Why we prefer constantan wire for making standard resistors?

(A) Low resistivity
(B) High resistivity
(C) High temperature coefficient of resistance
(D) Low temperature coefficient of resistance

172. Two 2 kilo ohm and 0.5W resistors are connected in parallel. Their combination is equivalent to

(A) 4 kilo ohm and 0.5W
(B) 4 kilo ohm and 1W
(C) 1 kilo ohm and 1W
(D) 1 kilo ohm and 0.5W

173. To increase the range of an ammeter, we need to connect a suitable

(A) low resistance in parallel
(B) low resistance in series
(C) high resistance in parallel
(D) high resistance in series

174. The coupling coefficient of perfectly coupled coils is

(A) zero
(B) 1
(C) more than 1
(D) infinite

175. Resistivity of a wire depends on

(A) length
(B) material
(C) cross section area
(D) None of the above

176. Two bulbs marked 200 watt-250 volts and 100 watt-250 volts are joined in series to 250 volts supply. Power consumed in the circuit is

(A) 33 watt
(B) 67 watt
(C) 100 watt
(D) 300 watt

177. Ampere second could be the unit of

(A) power
(B) conductance
(C) energy
(D) charge

178. An ideal liquid insulating material should have low

(A) heat conductivity
(B) dielectric strength
(C) mechanical strength
(D) volatility

179. Which of the following is a gaseous insulating material?

(A) Teflon
(B) Sulphur hexafluoride
(C) Stealite
(D) Phologopite mica

180. Three equal resistance of magnitude 5 Ohm each are connected in delta. The resistance between any two pair of terminals of the delta will be

(A) 5 Ohm
(B) 5/3 Ohm
(C) 10/3 Ohm
(D) 3/5 Ohm

181. Most commonly used material in the manufacture of electronic solid state device is

(A) silicon
(B) germanium
(C) copper
(D) aluminium

182. Transistor can be used as

(A) full wave rectifier
(B) half wave rectifier
(C) filter
(D) amplifier

183. The devices which convert information into electrical signal is called

(A) Transmitters
(B) Receivers
(C) Transducers
(D) Modulators

184. Which type of data does optical fibre deal with?

(A) Analog
(B) Digital
(C) Modulated
(D) Un-modulated

185. Each diode in a centre tapped full wave rectifier is ..... biased and conducts for ..... degree of the input cycle.

(A) forward, 90
(B) reverse, 180
(C) forward, 180
(D) reverse, 90

186. The d.c. resistance of a diode ..... with increase in diode current or voltage

(A) increases
(B) decreases
(C) does not change
(D) increases first and then decreases

187. For amplifier applications, a BJT is operated in

(A) active mode
(B) cut off mode
(C) saturation mode
(D) both saturation and active mode

188. A bypass capacitor produces

(A) d.c ground
(B) a.c ground
(C) both a.c and d.c ground
(D) None of the above

189. Given a carrier frequency of 100 KHz and a modulating frequency of 5 KHz, the bandwidth requirement of AM transmission is

(A) 5 KHz
(B) 10 KHz
(C) 20 KHz
(D) 200 KHz

190. Crossover distortion occurs in

(A) push-pull amplifiers
(B) class A amplifiers
(C) class B amplifiers
(D) class AB amplifiers

191. Which of the following process is used to trace and eliminate mistakes in programme or faults in equipments?

(A) House keeping
(B) Editing
(C) Debug
(D) Desk check

192. The language mainly used for business data processing is

(A) FORTAN
(B) PASCAL
(C) COBOL
(D) ALGOL

193. In compilers, the syntax analysis is done by

(A) lexical analyzer
(B) scanner
(C) parser
(D) code generator

194. The instructions constituting a programme are executed in

(A) the chipset
(B) processor
(C) RAM
(D) ROM

195. The CPU fetches instructions from

(A) pen drive
(B) hard disk
(C) cache/RAM
(D) CD

196. Which of the following is not an output device?

(A) LCD monitor
(B) Pen drive
(C) SD card
(D) Chipset

197. The primary memory of a PC is usually

(A) Dynamic RAM
(B) EPROM
(C) Magnetic core
(D) Tapes

198. The internet is a type of

(A) LAN
(B) MAN
(C) WAN
(D) internal network

199. The output of a compiler is in

(A) high level language
(B) assembly language
(C) machine language
(D) natural language

200. The break statement is used to

(A) terminate loops or to exit from a switch
(B) stop execution of a program
(C) break the rules
(D) slow down execution

***

SPACE FOR ROUGH WORK

SEAL