Monthly Progressive Test

Class: XI

Subject: PCMB

Academic Excellence Programme TECHNO ACE

Test Booklet No.: MPT08 **Test Date:** 2 0 1 2 2 0 2 4

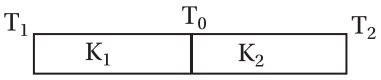
Time: 120 mins **Full Marks: 200**

Important Instructions :

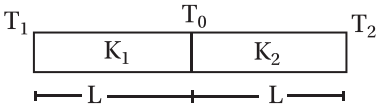
1. The Test is of 120 mins duration and the Test Booklet contains 100 multiple choice questions of single correct option only. There are four sections with four subjects. You have to attempt all 100 questions (Candidates are advised to read all 100 questions). Questions 1 to 25 contain Physics, Questions 26 to 50 contain Chemistry, Questions 51 to 75 contain Mathematics, Questions 76 to 100 contain Biology.
2. Each question carries 2 marks. For each correct response, the candidate will get 2 marks. There is no negative mark for wrong response. The maximum mark is 200.
3. Use Blue / Black Ball point Pen only for writing particulars marking responses on Answer Sheet.
4. Rough work is to be done in the space provided for this purpose in the Test Booklet only.
5. On completion of the test, the candidate must handover the Answer Sheet to the invigilator before leaving the Room / Hall. The candidates are allowed to take away this Test Booklet with them.
6. The CODE for this Booklet is Off Line MPT08 20122024.
7. The candidates should ensure that the Answer Sheet is not folded. Do not make any stray marks on the Answer Sheet. Do not write your UID No. anywhere else except in the specified space. Use of white fluid for correction is NOT permissible on the Answer Sheet. **Do not scribble or write on or beyond discrete bars of OMR Sheet at both sides**.
8. Each candidate must show on-demand his/her Registration document to the Invigilator.
9. No candidate, without special permission of the Centre Superintendent or Invigilator, would leave his/her seat.
10. Use of Electronic Calculator/Cellphone is prohibited.
11. The candidates are governed by all Rules and Regulations of the examination with regard to their conduct in the Examination Hall. All cases of unfair means will be dealt with as per Rules and Regulations of this examination.
12. No part of the Test Booklet and Answer Sheet shall be detached under any circumstances.
13. There is no scope for altering response mark in Answer Sheet.

Space For Rough Works

Physics

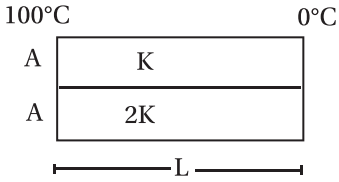
1. For small deformations the stress and strain are proportional to each other. This is known as
   Ⓐ Pascal's law Ⓑ Biot-Savart law
   Ⓒ Equation of continuity Ⓓ Hook's law
2. Stress = K. Strain ; K is called
   Ⓐ constant of proportionality Ⓑ modulus of elasticity
   Ⓒ both Ⓐ and Ⓑ are correct Ⓓ spring variable
3. For material to material, stress- strain curves
   Ⓐ vary Ⓑ remains same Ⓒ sometimes vary Ⓓ no conclusion
4. Even when the stress is zero, the strain is not zero, the material is said to have
   Ⓐ deformation set Ⓑ permanent set Ⓒ elastic set Ⓓ plastic set
5. In stress strain curve, if ultimate strength and fracture point are close, the material is said to be
   Ⓐ ductile Ⓑ malleable Ⓒ brittle Ⓓ sometimes ductile
6. $A_1 . V_1 = A_2 . V_2$ (where in general V is velocity of flow of fluid, and A is area of cross section of flow). The said equation is called
   Ⓐ Bernoulli's equation Ⓑ Pascal's equation
   Ⓒ Torricelli's law Ⓓ equation of continuity
7. When fluid at rest, Bernoulli's equation becomes $P_1 - P_2$ = density of fluid. g. $(h_2 - h_1)$
   Ⓐ true
   Ⓑ false
   Ⓒ variation of pressure with depth when fluid is at rest
   Ⓓ both Ⓐ and Ⓒ are correct
8. If a container is open at the top to the atmosphere, the square of speed of efflux(v) from the side of the container, at a depth h from top free surface is given by
   Ⓐ gh Ⓑ 2gh Ⓒ g.h /2 Ⓓ 2h/g
9. The carburetor of automobile has a venturi channel (nozzle) through which air flows with
   Ⓐ a large speed Ⓑ a low speed
   Ⓒ a large speed sometimes Ⓓ we cannot say as data is insufficient
10. The dynamic lift due to spinning of cricket ball is called
    Ⓐ magnetic effect Ⓑ turning effect Ⓒ dynamic effect Ⓓ magnus effect
11. The SI unit of thermal conductivity is
    Ⓐ W m K Ⓑ W m^{-1} K Ⓒ W $m^{-1}K^{-1}$ Ⓓ W m K^{-1}
12. 

    The junction temperature T_0 = (given $T_1 > T_0 > T_2$ in Kelvin)
    Ⓐ $K_1 + K_2$ Ⓑ $T_1 + T_2$
    Ⓒ $(K_1 . T_1 + K_2 . T_2)/(K_1 + K_2)$ Ⓓ $(T_1 + T_2)/2$

13. 

The equivalent thermal conductivity K is

Ⓐ $(K_1 + K_2)$ Ⓑ $(K_1 . K_2)^{1/2}$ Ⓒ $(K_1 + K_2)/2$ Ⓓ $[(2K_1 . K_2)/(K_1 + K_2)]$

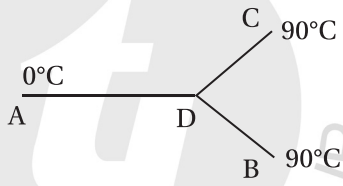
14. 

The equivalent thermal conductivity is

Ⓐ 1.5 K Ⓑ 1.25 K Ⓒ 1.75 K Ⓓ 1.1 K

15. Three rods made of the same material and having the same cross-section, have been joined as shown in the figure below. Each rod is of the same length. The left and right ends are kept at 0°C and 90°C respectively. The temperature of junction of the three rods will be

Ⓐ 45°C Ⓑ 60°C Ⓒ 30°C Ⓓ 20°C



16. Graph showing cooling of hot water in °C along Y-axis and time(minute) along X-axis.

Select the correct option.

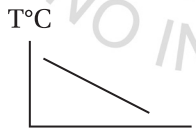


figure A

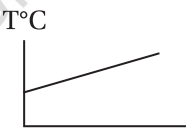


figure B

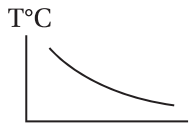


figure C

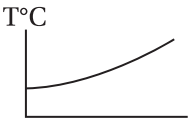


figure D

Ⓐ figure A Ⓑ figure B Ⓒ figure C Ⓓ figure D

17. For a small difference in temperature of the body and surroundings, the rate of loss of heat –dQ/dt of the body is directly proportional to the difference of temperature $T_2 - T_1$. This is called

Ⓐ Maxwell's law Ⓑ Henry's law Ⓒ Zeroth law Ⓓ Newton's law of cooling

18. In cooling law, the loss of heat by radiation depends upon the

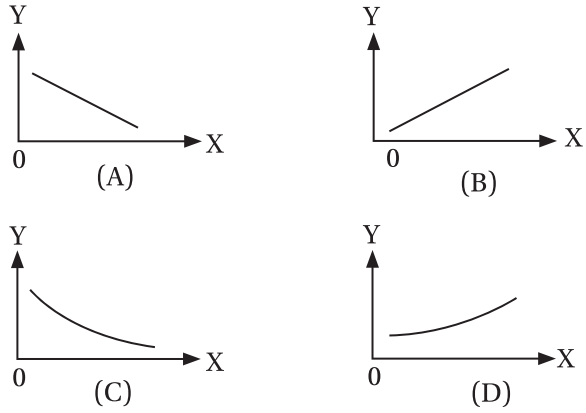
Ⓐ The nature of the surface of the body Ⓑ the area of the exposed surface

Ⓒ both Ⓐ and Ⓑ are correct Ⓓ none of the above

19. Suppose a body of mass m and specific heat capacity s is at temperature T_2. If the temperature falls by a a small amount dT_2 in time dt then rate of heat loss dQ/dt =

Ⓐ $ms(dT_2/dt)$ Ⓑ $(m/s)(dT_2/dt)$ Ⓒ $m(dT_2/dt)$ Ⓓ $s(dT_2/dt)$

20. Select the correct graph, where along Y axis $\log_e(T_2 - T_1)$ and time t along X axis are plotted. (according to Newton's cooling law)



Ⓐ figure A Ⓑ figure B Ⓒ figure C Ⓓ figure D

■ Assertion-Reason type Questions (21–22):

Directions: Read the following questions and choose any one of the following four responses.

A. Assertion is true and reason is true, reason is correct explanation of assertion.
B. Assertion is true and reason is true, reason is not correct explanation of assertion.
C. Assertion is true and reason is false.
D. Assertion is false and reason is true.

21. **Assertion:** In conduction, heat is transferred between neighbouring parts of a body.

Reason: In conduction heat is transferred through molecular collisions, without any flow of matter.

Ⓐ A Ⓑ B Ⓒ C Ⓓ D

22. **Assertion:** Newton's cooling law is related to rate of cooling of a body.

Reason: The three modes of heat transfer are conduction, convection and radiation.

Ⓐ A Ⓑ B Ⓒ C Ⓓ D

■ Case Based Questions (23–25):

Heat is a form of energy that flows between a body and its surrounding medium by virtue of temperature difference between them. The degree of hotness of the body is quantitatively represented by temperature. A temperature–measuring device (thermometer) makes use of some measurable property (called thermometric property) that changes with temperature. Different thermometers lead to different temperature scales. To construct a temperature scale, two fixed points are chosen and assigned to some arbitrary values of temperature.

23. T(in Kelvin) – T(in °C) =

Ⓐ 273.15 Ⓑ 270 Ⓒ 273 Ⓓ 275

24. Heat required to convert ice at –12°C to ice at 0°C (specific heat of ice is 2100 J Kg^{-1} K^{-1}) is

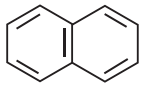
Ⓐ 70kJ Ⓑ 75.6 KJ Ⓒ 80 KJ Ⓓ 40 KJ

25. The specific heat capacity of water is(in J $Kg^{-1}K^{-1}$)

Ⓐ 3186 Ⓑ 2186 Ⓒ 1186 Ⓓ 4186

Chemistry

26. Which of the following is not aromatic?

Ⓐ  Ⓑ  Ⓒ  Ⓓ 

27. In Friedel craft's alkylation, besides $AlCl_3$, the other reactants are

Ⓐ $C_6H_6 + NH_2$ Ⓑ $C_6H_6 + CH_4$ Ⓒ $C_6H_6 + CH_3Cl$ Ⓓ $C_6H_6 + CH_3COCl$

28. The correct order of C–C bond lengths in benzene (I), ethane (II), ethylene (III) and acetylene (IV) is:

Ⓐ II > III > IV > I Ⓑ IV > III > II > I Ⓒ II > I > III > IV Ⓓ IV > III > I > II

29. For a compound to be aromatic, which of the following is/are true:

Ⓐ Obey (4n + 2) electron Huckel rule Ⓑ Molecule must be planar with sp^2 hybridisation

Ⓒ High resonance energy Ⓓ All of these

30. The gas which is used for the artificial ripening of fruits is:

Ⓐ C_2H_6 Ⓑ C_2H_2 Ⓒ C_2H_4 Ⓓ Marsh gas

31. Kolbe's electrolysis reaction goes through which intermediate?

Ⓐ Carbene Ⓑ Carbocation Ⓒ Carbanion Ⓓ Free radical

32. Consider the following reaction:

$CH_3 - C \equiv CH \longrightarrow CH_3CH_2 - CH_3$

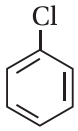
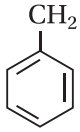
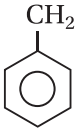
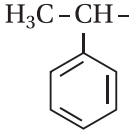
I. H_2/Ni II. H_2/Pd III. Na/NH_3

This reaction takes place by:

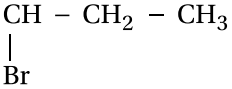
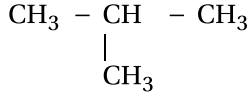
Ⓐ I or II only Ⓑ I or III only Ⓒ II or III only Ⓓ I, II or III

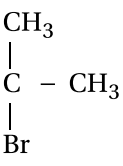
33. Predict structure of 'X' in the following reaction:

 $+ CH_3 - CH_2 - CH_2 - Cl \xrightarrow{AlCl_3}$ 'X' is

Ⓐ  Ⓑ  Ⓒ  Ⓓ 

34. $CH_3CH_2CH_2CH_3 \xrightarrow[HBr]{AlCl_3}$ Product . Product is:

Ⓐ  Ⓑ 

Ⓒ  Ⓓ All of these

35. Acetylene gives:

Ⓐ White ppt with $AgNO_3$ and red ppt with Cu_2Cl_2 Ⓑ White ppt with Cu_2Cl_2 and red ppt with $AgNO_3$

Ⓒ White ppt with both Ⓓ Red ppt with both

36. 1, 1, 2, 2 – tetrabromoethane on heating with Zn powder in alcohol finally gives:

Ⓐ methane Ⓑ ethane Ⓒ ethyne Ⓓ ethene

37. What is the product when 2-butyne is treated with liquid NH_3 in presence of lithium?

Ⓐ n-butane Ⓑ cis-2-butene Ⓒ trans-2-butene Ⓓ 1-butene

38. Alkynes can be reduced to alkenes by hydrogenation in presence of:

Ⓐ Raney Ni Ⓑ Anhydrous $AlCl_3$ Ⓒ Pd Ⓓ Lindlar's catalyst

39. The reaction of an aromatic halogen compound with an alkyl halide in presence of sodium in ether is called.

Ⓐ Sandmeyer's reaction Ⓑ Wurtz's reaction

Ⓒ Kolbe's reaction Ⓓ Wurtz-Fittig's reaction

40. Ozonolysis of an organic compound 'A' produces acetone and propionaldehyde in equimolar mixture. Identity 'A' from the following compounds.

Ⓐ 2-methyl-1-pentene Ⓑ 1-pentene Ⓒ 2-pentene Ⓓ 2-methyl-2-pentene

41. When n-hexane/n-heptane is passed through Cr_2O_3 supported over alumina at 600°C gives:

Ⓐ Hexane Ⓑ Hexyne Ⓒ Benzene, Toluene Ⓓ None of these

42. Oxidation number of Cr in K_3CrO_8 is:

Ⓐ +13 Ⓑ –13 Ⓒ +5 Ⓓ +6

■ **Assertion Reason Type Question (43–45):**

Read the two statements carefully and select the correct option given below.

A: Assertion and Reason both are correct and Reason is the correct explanation of Assertion

B: Assertion and Reason both are correct and Reason is not the correct explanation of Assertion

C: Assertion is correct but Reason is wrong

D: Assertion is wrong but Reason is correct

43. **Assertion (A):** n-pentane has higher-boiling point than neopentane.

Reason (R): Larger surface area is responsible for greater Vanderwaal's force of attraction.

Ⓐ A Ⓑ B Ⓒ C Ⓓ D

44. **Assertion (A):** Addition of HBr on $CH_2 = CH–NO_2$ follows anti Markonikov's rule

Reason (R): Electron withdrawing NO_2 group destabilizes Carbocation on the adjacent carbon.

Ⓐ A Ⓑ B Ⓒ C Ⓓ D

45. **Assertion (A):** Anthracene and phenanthene are isomers.

Reason (R): Anthracene and phenanthrene both have 14π-electrons each.

Ⓐ A Ⓑ B Ⓒ C Ⓓ D

■ **Case Based Questions (46–48):**

Redox is a reaction in which both oxidation and reduction will take place simultaneously. It is obvious that if one substance gives electron there must be another substance to provide these electron. In some reaction same substance is reduced as well as oxidised, these reactions are termed as disproportion reactions. For calculating equivalent mass in redox reaction change in oxidation number is related to n-factor or valence factor which is reciprocal of molar ratio. Choose the correct answer.

46. What is the oxidation number of chromium (Cr) in CrO_5?

Ⓐ $+13$ Ⓑ $+3$ Ⓒ $+5$ Ⓓ $+6$

47. Oxidation number of iron in $Fe_{0.94}O$ is:

Ⓐ $+2$ Ⓑ $+3$ Ⓒ $+\frac{200}{94}$ Ⓓ $+\frac{8}{3}$

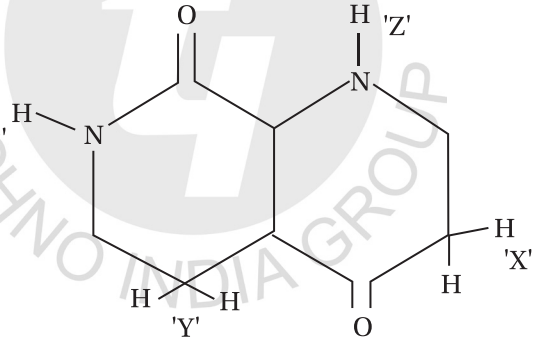
48. How many moles of $KMnO_4$ reacted with one mole of ferrous oxalate in acidic medium?

Ⓐ $\frac{2}{5}$ Ⓑ $\frac{1}{5}$ Ⓒ $\frac{3}{5}$ Ⓓ $\frac{5}{3}$

49. Total number of structural isomers in C_5H_{10} are:

Ⓐ 5 Ⓑ 6 Ⓒ 8 Ⓓ 10

50. Which of the indicated 'H' in the following is most acidic?



Ⓐ 'X' Ⓑ 'Y' Ⓒ 'Z' Ⓓ 'P'

Mathematics

51. If x and y are two sets and x′ denote the complement of x, then $x \cap (x \cup y)'$ is equal to

Ⓐ X Ⓑ Y Ⓒ ϕ Ⓓ $X \cap Y$

52. The domain of the function f defined by $f(x) = \frac{1}{\sqrt{x-|x|}}$ is

Ⓐ R Ⓑ R^+ Ⓒ R^- Ⓓ ϕ

53. The range of the function $f(x) = \sqrt{3-x} + \sqrt{2+x}$ is

Ⓐ $\left[2\sqrt{2}, \sqrt{11}\right]$ Ⓑ $\left[\sqrt{5}, \sqrt{10}\right]$ Ⓒ $\left[\sqrt{5}, \sqrt{13}\right]$ Ⓓ $\left[\sqrt{2}, \sqrt{7}\right]$

54. Find the equation of the ellipse whose foci are $(\pm 2, 0)$ and ecentricity $= \frac{1}{2}$.

Ⓐ $\frac{x^2}{16}+\frac{y^2}{12}=1$ Ⓑ $\frac{x^2}{12}+\frac{y^2}{16}=1$ Ⓒ $\frac{x^2}{4}+\frac{y^2}{6}=1$ Ⓓ none of these

55. Find the ecentricity of an ellipse $\frac{x^2}{a^2}+\frac{y^2}{b^2}=1$ whose latus rectum is half of its major axis.

Ⓐ $\frac{1}{2}$ Ⓑ $\frac{1}{\sqrt{2}}$ Ⓒ $\frac{1}{4}$ Ⓓ $\frac{1}{\sqrt{3}}$

56. Find the equation of the curve whose parametric equation are $x = 1 + 4\cos\theta$, $y = 2 + 3\sin\theta$

Ⓐ $\frac{(x-2)^2}{16}+\frac{(y-1)^2}{9}=1$ Ⓑ $\frac{(x-1)^2}{16}+\frac{(y-2)^2}{9}=1$ Ⓒ $\frac{(x-1)^2}{9}+\frac{(y-2)^2}{16}=1$ Ⓓ none of these

57. In question number (56) find the eccentricity of the curve.

Ⓐ $\frac{1}{2}$ Ⓑ $\frac{1}{\sqrt{2}}$ Ⓒ $\frac{\sqrt{7}}{2}$ Ⓓ none of these

58. If e_1 and e_2 are the eccentricities of the hyperbola and its conjugate then $e_1^{-2}+e_2^{-2}=?$

Ⓐ 1 Ⓑ 0 Ⓒ $\frac{1}{2}$ Ⓓ 2

59. Eccentricity of the rectangular hyperbola is

Ⓐ 1 Ⓑ $\sqrt{2}$ Ⓒ $\sqrt{3}$ Ⓓ none of these

60. The point $\left\{\frac{a}{2}\left(t+\frac{1}{t}\right), \frac{b}{2}\left(t-\frac{1}{t}\right)\right\}$ lies on

Ⓐ a circle Ⓑ Parabola Ⓒ Ellipse Ⓓ Hyperbola

61. Write the equation of directrix of $16x^2 - 9y^2 = -144$.

Ⓐ $x=\pm\frac{16}{5}$ Ⓑ $y=\pm\frac{16}{5}$ Ⓒ $x=\pm\frac{5}{16}$ Ⓓ $y=\pm\frac{5}{16}$

62. If the foci of the ellipse $\frac{x^2}{16}+\frac{y^2}{b^2}=1$ and hyperbola $\frac{x^2}{144}-\frac{y^2}{81}=\frac{1}{25}$ coincide, then the value of b^2 is

Ⓐ 1 Ⓑ 5 Ⓒ 7 Ⓓ 9

63. Choose the incorrect option

The equation $16x^2 - 3y^2 - 32x + 12y - 44 = 0$ represents a hyperbola

Ⓐ the length of whose transverse axis is $2\sqrt{3}$ Ⓑ the length of whose conjugate axis is 8

Ⓒ whose centre is (1, 2) Ⓓ whose eccentricity is $\frac{\sqrt{19}}{3}$

64. Find the coordinates of the point which divides the line joining points (2, 3, 4) and (3, –4, 7) in the ratio 5 : 3 internally.

Ⓐ $\left(\frac{21}{8}, \frac{11}{8}, \frac{47}{8}\right)$ Ⓑ $\left(\frac{-21}{8}, \frac{11}{8}, \frac{47}{8}\right)$ Ⓒ $\left(\frac{21}{8}, \frac{-11}{8}, \frac{47}{8}\right)$ Ⓓ $\left(\frac{21}{8}, \frac{11}{8}, \frac{-47}{8}\right)$

65. Let P = (1, 2, 3), Q = (–1, –1, –1), R = (3, 5, 7)

Choose the correct option

Ⓐ PQR is an equilateral triangle Ⓑ RQR is a right angle triangle

Ⓒ PQR is an isosceles triangle Ⓓ none of these

66. Find the ratio in which $2x + 3y + 5z = 1$ divides the line joining the points (1, 0, –3) and (1, –5, 7).

Ⓐ 2 : 3 Ⓑ 3 : 2 Ⓒ – 2 : 3 Ⓓ –3 : 2

67. In 3D, equation of x axis is

Ⓐ $y = 0 = z$ Ⓑ $z = 0 = x$ Ⓒ $x = 0 = y$ Ⓓ $x = y = z = 0$

68. Find the ratio in which the line joining of (2, 1, 5) and (3, 4, 5) is divided by the plane $2x + 2y - 2z - 1 = 0$

Ⓐ 5 : 7 Ⓑ 7 : 5 Ⓒ –5 : 7 Ⓓ none of these

69. If A(3, 2, –4), B(5, 4, –6) and C(9, 8, –10) are three collinear points, then find the ratio in which point C divides AB.

Ⓐ –3 : 2 Ⓑ –2 : 3 Ⓒ 3 : 2 Ⓓ 2 : 3

70. The maximum distance between the points $(3\sin\theta, 0, 0)$ and $(4\cos\theta, 0, 0)$ is

Ⓐ 3 Ⓑ 4 Ⓒ 5 Ⓓ 6

■ Assertion Reason based Questions (71–72):

Directions: In the following questions, a statement of assertion (A) is followed by a statement of Reason (R). Choose the correct answer out of the following choices.

(a) Both assertion (A) and reason (R) are true and reason (R) is the correct explanation of assertion (A).

(b) Both assertion (A) and reason (R) are true but reason (R) is not the correct explanation of assertion (A).

(c) Assertion (A) is true but reason (R) is false.

(d) Assertion (A) is false but reason (R) is true.

71. **Assertion (A) :** The derivative of $f(x) = x^3$ is x^2

Reason (R) : The derivative of $f(x) = \frac{1}{x^3}$ is $\frac{-3}{x^4}$

Ⓐ A Ⓑ B Ⓒ C Ⓓ D

72. **Assertion (A) :** $\lim\limits_{n\to\infty}\left(\cos\frac{x}{2}.\cos\frac{x}{2^2}.\cos\frac{x}{2^3}.....\cos\frac{x}{2^n}\right)=\frac{\sin x}{x}$

Reason (R) : $\cos A \cdot \cos 2A \cdot \cos 2^2A \ldots \cos 2^{n-1}A = \frac{\sin 2^n A}{2^n.\sin A}$ and $\lim\limits_{x\to 0}\frac{\sin x}{x}=1$

Ⓐ A Ⓑ B Ⓒ C Ⓓ D

■ Case Study Based Questions (73–75):

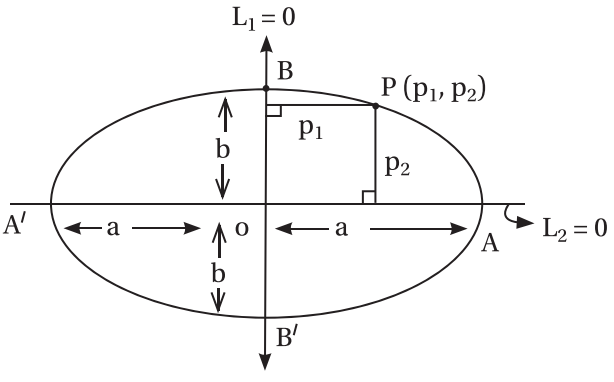
Let, p_1, p_2, be the respective perpendicular distances of a point P.(x, y) from two mutually perpendicular coplanar straight lines.

Let, $L_1 = a_1x + b_1y + C_1 = 0$,

$L_2 = b_1x - a_1y + C_2 = 0$

and, $\frac{p_1^2}{a^2}+\frac{p_2^2}{b^2}=1$

$$\Rightarrow \frac{\left(\frac{a_1x+b_1y+C_1}{\sqrt{a_1^2+b_1^2}}\right)^2}{a^2}+\frac{\left(\frac{b_1x-a_1y+C_2}{\sqrt{a_2^2+b_1^2}}\right)^2}{b^2}=1$$



Then the point P describes an ellipse such that

(i) Centre = Intersection of $L_1 = 0$ and $L_2 = 0$

(ii) a > b then $L_2 = 0$ is the major axis.

(iii) If a > b then length of major axis is 2a.

On the basis of this answer the following questions .

For the ellipse $4(x - 2y + 1)^2 + 9(2x + y + 2)^2 = 180$

73. Find the centre of the ellipse.

Ⓐ (–1, 0) Ⓑ (1, 0) Ⓒ (0, 1) Ⓓ (0, –1)

74. Find the equation of major axis.

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

75. Find the length of minor axis :

Ⓐ 6 Ⓑ 4 Ⓒ $6\sqrt{5}$ Ⓓ $4\sqrt{5}$

Biology

76. Ethylene is used for—

Ⓐ retarding ripening of tomatoes Ⓑ hastening ripening of fruits

Ⓒ slowing ripening of apples Ⓓ both B and C

77. Plasticity in plant growth means that—

Ⓐ Plant roots are extensible Ⓑ Plant development is dependent on the environment

Ⓒ Stems can extend Ⓓ None

78. The net gain of ATP molecules in glycolysis is—

Ⓐ 2 Ⓑ 4 Ⓒ 8 Ⓓ 38

79. The ultimate electron acceptor of respiration in an aerobic organism is :

Ⓐ Cytochrome Ⓑ Hydrogen Ⓒ Oxygen Ⓓ Glucose

80. Which of the following biomolecules is common to respiration mediated breakdown of fats, carbohydrates and proteins?

Ⓐ Glucose 6-phosphate Ⓑ Fructose 1,6-bisphosphate

Ⓒ Pyruvic acid Ⓓ Acetyl Co A

■ **Assertion – Reason Based Questions: (81-86):**

A: Assertion and Reason both are correct and Reason is the correct explanation of Assertion.

B: Assertion and Reason both are correct but Reason is not the correct explanation of Assertion.

C: Assertion is correct but Reason is wrong.

D: Assertion is wrong but Reason is correct.

81. **Assertion:** Carbohydrates are used primarily by most cells during respiration.

Reason: Lipids are never used in respiration.

82. **Assertion:** Aerobic respiration is bioenergetically more efficient than anaerobic glycolysis.

Reason: Aerobic respiration occurs in the presence of oxygen, while fermentation occurs in the absence of oxygen.

83. **Assertion:** GTP is also an energy carrier like ATP.

Reason: GTP is the only high energy phosphate produced in Kreb's cycle.

84. **Assertion:** Auxins promote apical dominance.

Reason: Apical dominance is the suppression of growth of apical buds to promote the growth of lateral buds.

85. **Assertion:** The growth that makes plants thicker is secondary growth.

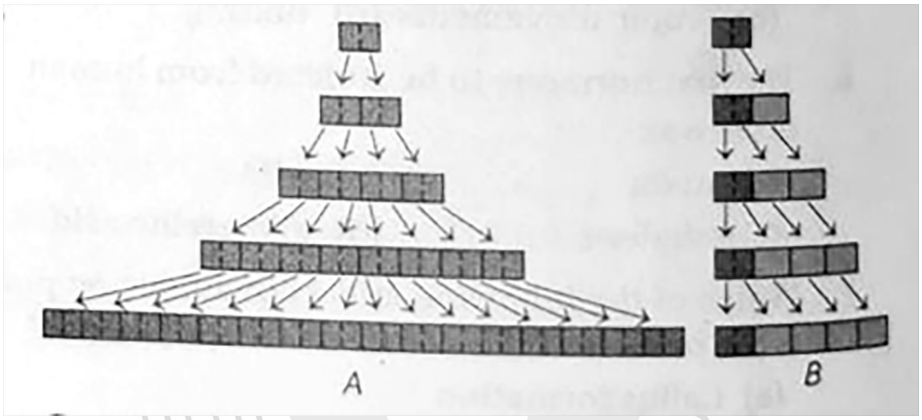
Reason: Secondary growth is absent in monocots.

86. **Assertion:** ABA acts as an anti transpirant.

Reason: ABA promotes leaf senescence.

■ **Case Based Questions (87-90):**

Two types of growths in living organisms are given below:



Consider the two types of growth patterns and answer the following questions:

87. The basis to the phenomenon of growth is—

Ⓐ Formation of new protoplasm Ⓑ Formation of new cell wall material

Ⓒ Formation of a central vacuole Ⓓ Both A and C

88. In growth of an organ or a part of a plant, constant rate is shown by—

Ⓐ B Ⓑ A Ⓒ None Ⓓ Both

89. Growth rate is slow but not constant in—

Ⓐ Stationary phase Ⓑ Log phase Ⓒ Lag phase Ⓓ Exponential phase

90. Plotting growth against time in case of B yields-

Ⓐ Sigmoid curve Ⓑ Hyperbola

Ⓒ Linear curve Ⓓ A straight line parallel to the X-axis

91. Complete oxidation of pyruvic acid, by stepwise removal of all hydrogen atoms, releases _____ molecules of CO_2.

Ⓐ One Ⓑ Two Ⓒ Three Ⓓ Four

92. During glycolysis, 'A' molecules of ATP are synthesised and 'B' molecules of ATP are lost. So the net gain of ATP in glycolysis is 'C', for every molecule of glucose. A, B and C respectively, are-

Ⓐ 10, 2 and 8 Ⓑ 10, 4 and 6 Ⓒ 10, 6 and 4 Ⓓ 10, 8 and 2

93. GA acts antagonistic to

Ⓐ Cytokinin Ⓑ ABA Ⓒ IAA Ⓓ Ethylene

94. Cytokinins cause opening of stomata, while _____ results in their closure.

Ⓐ IAA Ⓑ ABA Ⓒ Ethylene Ⓓ None

■ **Assertion – Reason Based Questions(95–97):**

Directions: Read the following questions and choose any one of the following four responses.

A: Assertion and Reason both are correct and Reason is the correct explanation of Assertion.

B: Assertion and Reason both are correct but Reason is not the correct explanation of Assertion.

C: Assertion is correct but Reason is wrong.

D: Assertion is wrong but Reason is correct.

95. **Assertion:** Ethephon is the most widely used compound as a source of ethylene.

Reason: Ethylene is the most widely used PGR in agricultural fields.

96. **Assertion:** If gibberellin is sprayed on rosette plants like cabbage, the plant will show extensive internodal growth and profuse leaf development.

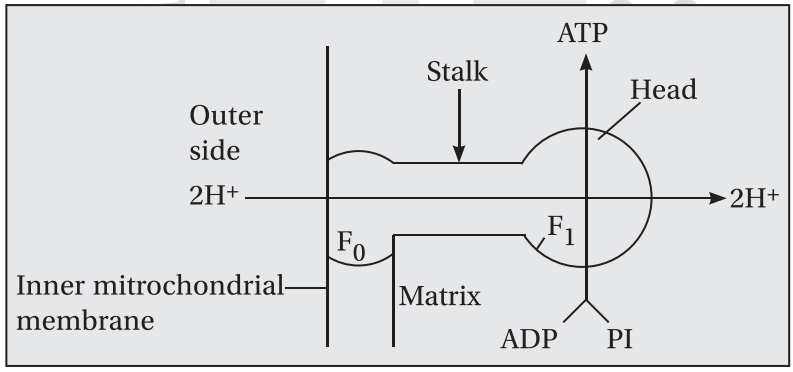
Reason: Gibberellin promotes bolting.

97. **Assertion:** A ripe banana, present in a lot of unripe bananas, will hasten the ripening of the unripe bananas.

Reason: The ripe banana produces auxin.

■ **Case based Question (98-100):**

Study the picture given below and answer the following questions:



98. Which reaction is shown in the above diagram?

Ⓐ Oxidative phosphorylation Ⓑ Glycolysis

Ⓒ Kreb's Cycle Ⓓ ETC

99. Name the enzyme that catalyses the above reaction.

Ⓐ Phosphofructo kinase Ⓑ Pyruvate dehydrogenase

Ⓒ ATP synthase Ⓓ ATPase

100. How many molecules of ATP are produced for every $2H^+$ that passes through F0 down the electrochemical proton gradient?

Ⓐ 1 Ⓑ 2 Ⓒ 3 Ⓓ 4