





CLASS

'B/PCN

GOAL TALENT SEARCH EXAM 2023-24

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MAIN-EXAM

TIME : 2.00 Hrs. | Max. Marks : 400



- 🄄 This paper has 100 questions. All questions are compulsory.
- In this paper Question of Biology is from 71 to 100 which is only for PCB group and in same way Math from 71 to 100 for PCM group. You have to attempt only one segment as per your group.
- 🏷 The maximum marks for each question is 4.
- 🏷 1 mark will be deducted against each negative response from the total marks.
- 😓 Use of calculator, slide rule, graph paper & trigonometric tables is **NOT PERMITTED.**

| Name of the Candidate : |
|-------------------------|
| Class : |
| Roll No. : |
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GOAL TALENT SEARCH EXAM : 24.12.2023

[Time : 2.00 Hours] CLASS : XI MAIN EXAM (PCB / PCM)

01. If charge on capacitor having potential difference V is given by Q = CV, then dimensions of capacitance are :

- (1) $[M^{-1} L^{-3} T^2 A^{-2}]$ (2) $[M^{-1} L^{-2} T^3 A^2]$ (3) $[M^2 L^{-3} T^5 A^3]$ (4) $[M^{-1} L^{-2} T^4 A^2]$
- 02. If $\overrightarrow{\mathbf{A}} = \widehat{\mathbf{i}} + 2\widehat{\mathbf{j}} + 4\widehat{\mathbf{k}}$ and $\overrightarrow{\mathbf{B}} = -2\widehat{\mathbf{i}} + \widehat{\mathbf{j}} + 5\widehat{\mathbf{k}}$, then projection of A on B will be :

| (1) $\frac{2\sqrt{30}}{3}$ | (2) $\sqrt{\frac{20}{3}}$ |
|----------------------------|---------------------------|
|----------------------------|---------------------------|

(3)
$$\frac{40}{\sqrt{30}}$$
 (4) $\frac{10}{\sqrt{30}}$

03. If velocity of particle in (m/s) is related with time in seconds as $v = 3t^2 + 4t^3$ then its average velocity in the time interval t = 0 second to t = 3 seconds.

(1) 18 m/s (2) 9 m/s

- (3) 48 m/s
- 04. Two particles are projected from the two towers simultaneously as shown in figure. What should be value of 'd' for their collision ?

(4) 36 m/s



05. A rocket of mass 12 kg burns 1.5 kg of fuel per sec. If velocity of exhaust gas is 240 m/s, then its lifts with an acceleration of : (g = 10 m/sec²)

(1)
$$30 \text{ m/s}^2$$
 (2) 20 m/s^2
(3) 40 m/s^2 (4) 360 m/s^2

06. If masses of blocks A and B are 4.5 kg and 12.5 kg respectively, then normal reaction between A and B : $(g = 10 \text{ m/s}^2)$



(1) 60 N (2) 45 N (3) 185 N (4) 170 N

07. All surfaces shown in figure are smooth. System is released with the spring unstretched. In equilibrium, compression in the spring will be :

Full Marks : 400



08. Velocity of a particle of mass 2 kg moving retillinearly is given by $v = 40 - 3t + 2t^2$. Find the average power of the force acting on the particle between time interval t = 0 to t = 2 sec.

(1) 107 W (2) 133 W (3) 82 W (4) 156 W

- 09. An object hits a floor and rebounds after an inelastic collision. In this case :
 - (1) the total energy of the object and the earth remains the same.
 - (2) the total momentum of the object and the earth is conserved.
 - (3) the mechanical energy of the object remains the same during the collision
 - (4) the momentum of the object just after the collision is same as that just before the collision.
- 10. A vehicle sometimes overturns while taking a turn. When it overturns, it is :
 - (1) both the wheels leave the ground simultaneously
 - (2) either wheel leaves the ground first
 - (3) the outer wheel which leaves the ground first
 - (4) the inner wheels which leaves the ground first
- 11. A solid cylinder rolls down without slipping along an inclined plane. The frictional force :
 - (1) converts the rotational energy to translational energy
 - (2) decreases the rotational and translational motion
 - (3) converts translational energy to rotational energy
 - (4) dissipates energy as heat

12. A disc of mass 4 kg and radius 1 m is rotating with angular velocity 40 rad s⁻¹. What is angular velocity, if a mass of 0.5 kg is put on periphery of the disc ?

| (1) 32 rad/sec. | (2) 30 rad/sec. |
|-----------------|-----------------|
| (3) 28 rad/sec. | (4) 22 rad/sec. |

- 13. During the journey of space ship from earth to moon and back, the minimum fuel is consumed:
 - (1) in onward journey against the gravitation of moon while leaving the moon in returns journey.
 - (2) against the gravitation of moon while reaching the moon
 - (3) against the gravitation of earth in onward journey
 - (4) against the gravitation of earth in return joueney
- 14. Escape velocity of a 5 kg body on a planet is 30 m/s. Potential energy of body at that planet is :
 - (1) 4500 J (2) -4500 J (3) -2250 J (4) 9000 J
- 15. An object falling vertically downwards under gravity breaks in two parts of unequal masses. The centre of mass of the two parts taken together shifts horizontally towards :
 - (1) lighter piece
 - (2) heavier piece
 - (3) depends on the vertical velocity at the time of breaking
 - (4) does not shift horizontally
- 16. The pressure of a medium is changed from 1.01×10^5 Pa to 1.185×10^5 Pa and change in volume is 5% keeping temperature constant. The bulk modulus of the medium is :
 - (1) 6.75 × 10⁶ Pa (3) 3.5 × 10⁵ Pa

(2) 8.25 × 10⁵ Pa (4) 1.6 × 10⁴ Pa

17. By blowing air in a soap bubble, the radius is increased from r to 4r. Then the percentage increase in the surface energy of the bubble is :

(1) 1500% (2) 750% (3) 1800% (4) 900%

- 18. 200 gm of water at 40°C are poured on a large block of ice at 0°C. The mass of ice that melts is :
 (1) 200 gm
 (2) 400 gm
 (3) 100 gm
 (4) 50 gm
- 19. For given series combination of two rods having thermal conductivity $k_1 = 4 \text{ J/m}^2\text{K}$ and $k_2 = 8 \text{ J/m}^2\text{K}$, cross-sectional area of rod is $A = 0.2 \text{ m}^2$ and length of each rod is 4m and temperature of ends of rod are maintained at $120^{\circ}\text{C} & 0^{\circ}\text{C}$ as shown, then rate of heat flow will be :



20. One mole of a gas expands with temperature T such that its volume, $V = kT^2$, where k is a constant. If the temperature of the gas changes by 40°C, then the work done by the gas is :

(1) 110 R (2) 80 R (3) R *l*n 80 (4) 80 KR

21. 2 moles of an ideal gas is contained in a cubical volume V. ABCDEFGH at 303 K figure. One face of the cube (EFGH) is made up of a material which totally absorbs any gas molecule incident on it. At any given time :



- (1) the pressure of EFGH would be half that on ABCD.
- (2) the pressure of EFGH would be double the pressure on ABCD.
- (3) the pressure on all the faces will be equal.
- (4) the pressure on EFGH would be zero.
- 22. A mass of 4 kg is put on a flat pan attached to a vertical spring fixed on the ground as shown in the figure. The mass of the spring and the pan is negligible. When pressed slightly and released the mass executes a simple harmonic motion. The spring constant is 320 N/m. What should be the minimum amplitude of the motion so that the mass gets detached from the pan ?

 $(Take g = 10 m/s^2)$



(1) 12.5 cm (2) 16.5 cm (3) 8 cm (4) 15 cm
23. In the fundamental mode, time taken by wave to reach the closed end of the air filled pipe is 2 × 10⁻³ s. The fundamental frequency is :

(1) 75 Hz (2) 100 Hz (3) 125 Hz (4) 50 Hz

- 24. A stretched wire of length 156 cm is divided into three segments whose frequencies are in the ratio 2 : 3 : 4. Their length must be :
 - (1) 96 cm, 56 cm, 4 cm
 - (2) 84 cm, 48 cm, 24 cm
 - (3) 64 cm, 48 cm, 44 cm
 - (4) 72 cm, 48 cm, 36 cm

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25. An object of size 6 cm is placed at 24 cm infront of a concave mirror of focal length 8 cm. At what distance from the mirror should a screen be placed, so that a sharp focussed image can be obtained?

> (1) 12 cm (2) 6 cm(3) 18 cm (4) 9 cm

A person with a myopic eye cannot see objects 26. beyond 25 cm distinctly. What should be the type of the corrective lens used to restore proper vision ?

> (1) + 4D(2) - 4D(3) + 5D (4) - 5 D

If in Fig below, $R_1 = 5 \Omega$, $R_2 = 20 \Omega$, $R_3 = 20 \Omega$, 27. $R_4 = 60 \Omega$, $R_5 = 30 \Omega$, and a 28 V battery is connected to the arrangement. Calculate the total current flowing in the circuit.



(1) 3.5 A (2) 2 A (3) 1.75 A (4) 1 A An electric heater of resistance 25 Ω draws 6 A 28. from the service mains for 4 hours. Calculate

- the rate at which heat is developed in the heater. (1) 450 W (2) 1200 W (3) 900 W (4) 600 W
- 29 An α -particle is projected with a uniform velocity v along the axis of a current carrying solenoid, then:
 - (1) the α -particles moves along helical path
 - (2) the α -particles will be accelerated along the axis
 - (3) the α -particles path will be circular about the axis
 - (4) the α -particles will continue to move with velocity v along the axis.
- 30. The radius of curvature of each surface of a convex lens of refractive index 1.5 is 50 cm. Its power is :

(2) 4 D (1) 2 D (3) 8 D (4) 1 D

31. Which of the following is example of combination reaction ?

(1) $H_2 + Cl_2 \rightarrow 2HCl$

(2) n – Hexane $\xrightarrow{\text{AlCl}_3}$ neo hexane

(3)
$$\operatorname{Zn} + \operatorname{H}_2 \operatorname{SO}_4 \to \operatorname{Zn} \operatorname{SO}_4 + \operatorname{H}_2$$

(4) $N_2O_4 \rightarrow 2NO_2$

32. When the gases sulphur dioxide and hydrogen sulphide mix in the presence of water, the reaction occurs.

 $SO_2 + 2H_2S \rightarrow 2H_2O + 3S$

Here hydrogen sulphide is acting as :

(1) an oxidising agent

(2) a reducing agent

(3) a dehydrating agent

(4) a catalyst

A pH - 2 solution is more acidic than one with 33. pH 6 by a factor of :

> (1) 4000(2) 2(3) 10000 (4) 8000

- 34. 'Alum' is an example of :
 - (1) single salt (2) double salt
 - (3) acids (4) none of the above
- 35. The first three members of a homologous series are CH_4 , C_2H_6 , C_3H_8 the fifth member of this series will be :

 C_5H_{12} (4) C_5H_8 (1) C_5H_{10} (2) C_5H_{14} 36.

Coal gas is mixture of :

(I)
$$CH_4 + H_2 + CO_2 + H_2S$$

(2)
$$CH_4 + H_2 + CO + H_2S$$

- (3) $CH_4 + H_2 + CO$
- (4) ethane, propane, butane
- Arrange the following in the order of decreasing mass 37. (Atomic mass of O = 16, Cu = 63 and N = 14).

I. One atom of oxygen

(3) I > IV > II > III

(4) (a-v),

(b-iv),

- II. One atom of nitrogen
- III. 1×10^{-10} mole of oxyger
- IV. 1×10^{-10} mole of copper

(1) IV > III > I > II(2) IV > III > II > I

(4) IV < II < III < I

38. Match the following Column I and Column II and choose the correct codes from the option given below.

| 1 | Column | ιI | | Colum | n II |
|-----|---------------------|-------------------------|----------|-----------------------|------------------------------|
| (a) | 46 g of 1 | Va | | (i) 0.01 mc | o1 |
| (b) | $6.022 \times$ | $10^{23} {\rm mc}$ | lecules | (ii) 2 mol | |
| | of H ₂ O | | | | |
| (c) | 0.224 L | of O ₂ at \$ | STP (i | ii) 1 mol | |
| (d) | 84 g of N | 1 ₂ | (i | v) 6.022 × similar | 10 ²³ particle |
| (e) | 1 mole o | of any gas | s (v | 7) 3 mol | |
| (1) | (a-ii), | (b-iii), | (c-i), | (d-v), | (e-iv) |
| (2) | (a-i), | (b-ii), | (c-iii), | (d-iv), | (e-v) |
| (3) | (a-iv), | (b-ii), | (c-i), | (d-iii), | (e-iv) |

(c-iii),

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(d-i),

(e-ii)

39. Transition of the electron in the hydrogen atom is shown in the given figure.



Identify I, II, III in the above figure.

- (1) I \rightarrow Lyman series; II \rightarrow Paschen series;
 - III \rightarrow Balmer series
- (2) I → Paschen series; II → Lyman series;
 III → Balmer series
- (3) I → Paschen series; II → Balmer series;
 III → Lyman series
- (4) I → Balmer series; II → Lyman series;
 III → Paschen series
- 40. The correct set of four quantum numbers for the valence electrons of rubidium atom (Z = 37) is :

(1) 5, 0, 0,
$$+\frac{1}{2}$$

(3) 5, 1, 1, $+\frac{1}{2}$

$$4) 5 0 1 + \frac{1}{2}$$

(2) $Na^+ > F^- > O^{2-}$

(4) Both '2' and '3'

- 41. Which of the following orders of ionic radius is incorrectly represented ?
 - (1) $H^- > H > H^+$
 - (3) $F^- > O^{2-} > Na^+$
- 42. Match the Column I with Column II and select the correct answer using given codes.

| | Colum | nI | | Colun | nn II |
|---|-------------------------|----------------------|--|--------------------|--------------------------|
| l | (Eleme | nts) | s and a second s | (Prope | erties) |
| | (a) Li ⁺ < A | 1 ³⁺ < Mg | $^{2+} < K^{+}$ | (i) EA (Ele | ctron affinity) |
| | (b) $Li^+ > A$ | 1 ³⁺ > Mg | $^{2+} > K^{+}$ | (ii) Ionic | radii |
| | (c) C1 > F : | > Br > I | O | (iii) EN | |
| | | C | ~ | (Electi | conegativity) |
| | (d) F > C1 : | > Br > I | | (iv)Zeff nuclea | (Effective ar charge) |
| | (1) (a-ii), | (b-iv), | (c-iii), | (d-i) | |
| | (2) (a-ii), | (b-iv), | (c-i), | (d-iii) | |
| | (3) (a-iv), | (b-ii), | (c-iii), | (d-i) | |
| | (4) (a-iv), | (b-ii), | (c-i), | (d-iii) | |
| | | | | | |

- 43. In which of the following pairs the two species are isostructural ?
 - (1) CO_3^{2-} and NO_3^{-}
 - (2) PCl_4^+ and $SiCl_4$
 - (3) PF₃ and BrF₅
 - (4) Both '1' and '2'
- 44. Which of the following represent positive overlap?

$$(1) \xrightarrow{p_{x}p_{x}} z$$

$$(2) \xrightarrow{p_{z}} (2) \xrightarrow{p$$

(4) Both '1' and '3' 45. Enthalpy change for the reaction, $4H(g) \longrightarrow 2H_2(g)$ is -869.6 kJ The dissociation energy of H—H bond is : (1) -869.6 kJ (2) +434.8 kJ (3) +869.6 kJ (4) -434.8 kJ 46. For the reaction, $X_2O_4(l) \longrightarrow 2XO_2(g)$, $\Delta U = 2.1$ kcal, $\Delta S = 20$ cal K⁻¹ at 27°C. Hence, ΔG is :

> (1) 2.7 kcal (3) 22.1 kcal (4) 20.2 kcal

7. For the reaction, $2SO_2(g) + O_2(g) \longrightarrow 2SO_3(g)$ if $K_p = K_C (RT)^x$ where, the symbols have usual meaning, then the value of x is (assuming ideality)

(1) -1 (2) $-\frac{1}{2}$ (3) $\frac{1}{2}$ (4) 1

8. What is the minimum pH of a solution having concentration 0.10 M of Ca⁺², from which Ca(OH)₂ will not precipitate ? $K = Ca(OH)_0 = 1.2 \times 10^{-11}$

$$K_{sp} Ca(OH)_2 = 1.2 \times 10^{-12}$$

(1) 6.04 (2) 4.96 (3) 9.04 (4) 5.07

- 49. The oxidation number of phosphorus in PCl_5 , P_2O_5 and H_3PO_4 respectively are :
 - (1) +5, +2.5 and +4
 - (2) +5, +5 and +5
 - (3) +5, +4 and +2.5
 - (4) +5, +5 and -5

50. For redox reaction,

 $xMnO_4^- + yC_2O_4^{2-} + zH^+ \longrightarrow Mn^{2+} + CO_2 + H_2O$

the coefficient of reactants in balanced states are :

- (1) $x \rightarrow 2$ $y \rightarrow 5$ $z \rightarrow 16$ (2) $x \rightarrow 16$ $y \rightarrow 5$ $z \rightarrow 2$ (3) $x \rightarrow 5$ $y \rightarrow 16$ $z \rightarrow 2$ (4) $x \rightarrow 2$ $y \rightarrow 16$ $z \rightarrow 5$
- 51. The IUPAC name of iso-octane is :
 - (1) 2,2-dimethylpentane
 - (2) 2,3-dimethylpentane
 - (3) 2,3,3-trimethylpentane
 - (4) 2,2,4-trimethylpentane
- 52. Consider the following compounds,



Which of the following statements is/are true regarding I and II ?

- (1) I shows +R-effect, whereas II shows -R-effect
- (2) I shows -R -effect, whereas II shows +R-effect
- (3) Both I and II show +R -effect
- (4) Both I and II show -R -effect
- 53. How many chain isomers are given by the compound, C_5H_{12} ?
 - (1) Three

(3) Four

(2) Five(4) Only one

cis-alkene

(2) Pd/C

llowing reaction

54. Consider the following reaction,

 $CH_3C = CCH_2CH_3 + H_2 - A$

What does A refers to ?

(1) Na/liq. NH₃

(3) Both '1' and '2'

(4) None of these

CH CH

- 55. In the reaction, CH_3 — $CH_-CH_2CH_3$ $\xrightarrow{(CH_3)_3CO'K'}$ A, A is:
 - (1) $CH_2 = CH CH_2CH_3$ (2) $CH_3CH_2 CH_3$
 - (3) $CH \equiv C CH_3$ (4) Both '1' and '2'
- 56. Observe the given boundary surface diagrams of two orbitals I and II and choose the correct option.



(1)
$$1 - d_{x^2 - y^2}$$
, $II - d_{yz}$ (2) $1 - d_{yz}$, $II - d_{x^2 - y^2}$

(3) $I - d_{xz}$, $II - d_{z^2}$ (4) $I - d_{xy}$, $II - d_{xz}$

57. Identify the incorrect match.

58.

59.

| | 5 | | | |
|--|------------------|----------------------------|---------------------|----------------------|
| | Name | | IUPAC Of | ficial Name |
| A. | Unniluni | ium | (i) Mende | levium |
| В. | Unniltriu | ım | (ii) Lawren | ncium |
| C. | Unnilhex | kium | (iii) Seaborgium | |
| D. | Ununun | nium 🔪 | (iv)Darma | stadtium |
| (1) | (B-ii) | (2) (C-iii) | (3) (D-iv) | (4) (A-i) |
| Wł | nich one o | f the following | molecules | is expected |
| to | have zero | dipole mome | nt? | |
| (1) | H ₂ O | | (2) CO ₂ | |
| (3) | SO3 | | (4) Both '2 | ?' and '3' |
| For the reaction $2NO(\alpha) \longrightarrow NO(\alpha)$ when | | | | |
| 10. | i the read | 2100_{20} | $\sim 10^{\circ}$ | $\gamma_4(g)$, when |
| $\Delta S = -176.0 \text{ JK}^{-1} \text{ and } \Delta H = -57.8 \text{ kJ mol}^{-1}, \text{ the}$ | | | | |
| magnitude of ΔG at 298 K for the reaction is | | | | |
| | kJ m | ol ⁻¹ . (Neares | t integer) | |
| | | | | |

60. K_{a_1}, K_{a_2} and K_{a_3} are the respective ionization constants for the following reactions (A), (B) and (C).

A.
$$H_2C_2O_4 \xleftarrow{Ka_1} H^+ + HC_2O_4^-$$

B. $HC_2O_4^- \xleftarrow{Ka_2} H^+ + C_2O_4^{2--}$

C.
$$H_2C_2O_4 \xrightarrow{Ka_3} 2H^+ + C_2O_4^{2-1}$$

The relationship between K_{a_1}, K_{a_2} and K_{a_3} is given as :

(1)
$$K_{a_3} = K_{a_1} + K_{a_2}$$
 (2) $K_{a_3} = K_{a_1} - K_{a_2}$

- (3) $K_{a_3} = K_{a_1} / K_{a_2}$
- 61. In a certain language, TRANSMISSION is written as RTANMSISISON. How will COMMUNICATIONS be written in same language.
 - (1) OCMMUNCIATOINS
 - (2) OCMMNUCTAIONS
 - (3) OCMMNUICTAIONS
 - (4) OCMMNUICTAIOSN

(4) $K_{a_3} = K_{a_1} \times K_{a_2}$

62. B, D, F, H, K, W, M and T are sitting around a circular table facing the centre. F is third to the left of D, who is second to the left of H. B is fourth to the right of H. K is third to the right of M, who is not an immediate neighbour of F. T is not an immediate neighbour of B or D.

Who is second to the left of B?

(1) K (2) F

(3) H

- (4) Data inadequate
- 63. Pointing to a man in a photograph, a woman said, "His brother's father is the only son of my grandfather". How is the woman related to the man in the photograph ?
 - (1) Mother (2) Niece
 - (3) Sister (4) Daughter
- 64. Insert the missing character ?



- (1) A (2) B (3) D (4) G
- 65. Which of the following meanings of the arithmetical signs will yield value "Zero" for the expression given below ?

 $200 \times 100 + 300 \times 200 - 10 \div 2 + 40$

- (1) + means -, means ×, × means ÷ and ÷ means +
- (2) + means -, means ÷, × means + and ÷ means ×
- (3) + means ×, means -, × means ÷ and ÷ means +
- (4) + means ÷, means +, × means and ÷ means ×
- 66. Study the diagram consisting of a circle, a rectangle and a triangle and answer the question given below it.



Which is the largest number among those which are there in the rectangle but not in the circle ?

(4) 17

(1) 27 (2) 40 (3) 15

67. Select a figure from amongst the answer figures which will continue the same series as given in the problem figure.





68. There is a definite relationship between figures (A) and (B), establish a similar relationship between figure (C) and (D) by choosing a suitable figure from answer set.

Problem Figure





One out of the four answer figures (1), (2), (3) and (4) can complete the same. You have to locate the answer figure which if inserted in the problem figure, without changing the direction.

Problem Figure



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THIS SEGMENT IS ONLY FOR PCB **GROUP STUDENTS**

Match the Column I and Column II 71

| /1. | Match the Column I a | ina Colu | imn II. |
|-----|--|--------------------------------|---|
| | Column I | | Column II |
| | (a) Euglenoids | (i) | Cell wall embedded with silica |
| | (b) Slime mould | (ii) | Cellulose plates in the cell wall |
| | (c) Diatoms | (iii) | Spores with true walls. |
| | (d) Dinoflagellates | (iv) | Protein-rich layer of pellicle |
| | Select the correct an below : | swer fro | om the code given |
| | (1) (a-iii), (b-iv), (c- | ·i), (d- | ii) |
| | (2) (a-iv), (b-iii), (c- | -i), (d- | ii) |
| | (3) (a-iv), (b-iii), (c- | -ii), (d- | i) |
| | (4) (a-iii), (b-ii), (c- | -i), (d- | iv) |
| 72. | Axile placentation is o | observed | l in : |
| | (1) Dianthus, tomato a | and Pea | |
| | (2) Mustard, Primrose | and Cu | cumber |
| | (3) Petunia, China ros | se and I | emon |
| | (4) Lupin, Beans and | China r | ose. |
| 73. | Which of the following feature of a dicot ster | ng is n n? | ot an anatomical |
| | (1) Pericycle semiluna | r patche | es of parenchyma. |
| | (2) Vascular bundle – | conjoint | and open. |
| 1 | (3) Hypodermis of coll | enchym | a. 💦 |
| | (4) Endodermis also c | alled the | e starch sheath. |
| 74. | How many plants am Guava, <i>Calotropis</i> , S and Petunia have opp | ong Chi Sunflow osite ph | na rose, <i>Alstonia</i> , er, Mustard, Pea yllotaxy? |
| | (1) Three (2) Five | (3) | One (4) Two |
| 75. | Which of the following root ? | g is not a | a feature of a dicot |
| | (1) Absence of conjunt of pith. | ctive tis | sue and presence |
| | (2) Absence of hypode | rmis. | |
| | (3) Presence of rac exhibiting tetracl xylem. | dial va 1 condi | scular bundles tion with exarch |
| | (4) Presence of pericyc | le made | up of parenchyma. |
| 76 | A | | 1 -1 |

76. Arrange the following formed elements in the decreasing order of their abundance in blood in humans.

- II. Eosinophils **IV. Platelets**
- III. Monocytes V. Erythrocytes

Choose the most appropriate answer from the option given below

| (1) I, II, III, IV, V | (2) II, III, IV, V, I |
|-----------------------|-----------------------|
| (3) V, II, III, I, IV | (4) V, IV, I, III, II |

- 77. Select the incorrect statement among the following.
 - (1) In asthma, there is inflammation of bronchi and bronchioles.
 - (2) In emphysema, alveolar walls are damaged leading to increase in respiratory surface.
 - (3) Asthma is an allergic condition characterised by difficulty in breathing and accompanied by wheezing sounds.
 - (4) Pheumoconiosis is an occupational disease caused due to inhalation of coal dust particles into lungs.
- 78. Consider the following statements.
 - I. Vasa recta is absent (or) highly reduced in juxtamedullary nephrons.
 - II. Glomerulus is a tuft of capillaries formed by the efferent arterioles.
 - III. Afferent arteriole forms the peritubular capillary network.
 - (1) Only II is correct.
 - (2) All are correct except
 - (3) Both II and I are correct
 - (4) All are incorrect.

Select the circulatory disorder in which heart muscles are suddenly damaged by inadequate blood supply :

- (1) Cardiac arrest (3) Heart attack
- (2) Heart failure
- (4) Atherosclerosis

Which of the following group of animals respire through the lungs ?

- (1) Amphibians, birds, mammals and reptiles.
- (2) Flatworm, Coelenterates and sponges.
- (3) Earthworm and insect.
- (4) Aquatic arthropods, aquatic amphibia, fishes.
- 81. Which of the following statement is incorrect?
 - (1) Auxin promotes flowering in pineapple.
 - (2) Gibberellin increase in the length of grape stalks.
 - (3) Ethylene promote female flower formation in cucumber.
 - (4) Cytokinin exhibit apical dominance.

82. **Statement I :** Protonema develops directly from spores produced in seta.

Statement II : The first stage of gametophyte in the life cycle of moss is protonema stage.

In the light of the above statements. Choose the most appropriate answer from options given below.

- (1) Both **Statement I** and **Statement II** are correct.
- (2) Both **Statement I** and **Statement II** are incorrect.
- (3) Only Statement I is correct.
- (4) Only Statement II is correct.
- 83. Observe the diagram given below and identify the labelling (i), (ii) and (iii).



| | (1) | (11) | (111) |
|-----|------------------------|--------------------------------|--------------------------|
| (1) | Glyceraldehyde | 3-Phosphoglyceric | Phosphoenol |
| | 3-phosphate | acid | pyruvic acid |
| (2) | Phosphoenol | Glyceral | 3-Phosphoglyceric |
| | pyruvic acid | dehyde-3-phosphate | acid |
| (3) | 3-Phosphoglyceric acid | Glyceral dehyde-3-phosphate | Phosphoenol pyruvic acid |
| (4) | 3-Phosphoglyceric | Phosphoenol | Glyceral |
| | acid | pyruvic acid | dehyde-3-phosphate |

84. Which of the following metabolite is common to respiration mediated breakdown of protein and carbohydrates ?

(1) Acetyl CoA only

- (2) Fructose-6-phosphate
- (3) Pyruvic acid & Acetyl coA
- (4) Glyceraldehyde-3-phosphate
- 85. How many ATP and NADPH₂ are required for the synthesis of 4.5 molecule of glucose during calvin cycle ?
 - (1) 72 ATP and 48 NADPH $_2$
 - (2) 81 ATP and 54 NADPH_2
 - (3) 27 ATP and 72 NADPH $_2$
 - (4) 90 ATP and 60 NADPH $_2$

- 86. Which of the following statement is not incorrect ?
 - (1) Both ATP and NADPH + H⁺ are synthesized during both cyclic and non-cyclic photo phosphorylation.
 - (2) Cyclic photophosphorylation involves only PS-II.
 - (3) Grana have both PS-I and PS-II
 - (4) Stroma lamellae have PS-II only and lack NADP reductase
- 87. Osteoporosis is a type of disorder which leads to:
 - (1) inflammation of joints due to accumulation of uric acid crystals.
 - (2) age-related disorder characterised by decreased bone mass.
 - (3) weakening of bones due to low calcium level
 - (4) inflammation of joints due to cartilage degeneration.
- 88. Select the correctly match pair terms.
 - (1) Scapula Located between second and seventh ribs.
 - (2) Glenoid cavity Head of the femur.
 - (3) Floating ribs Connect with the sternum.
 - (4) Pivot joint Between carpal and meta carpal of thumb.
- 89. Which of the following statement are incorrect with respect to the hormone and its function ?
 - (1) Thyrocalcitonin (TCT) regulates the blood glucose level not Ca^{2+} level.
 - (2) Parathyroid hormone is regulated by circulating level of Ca^{2+} ions.
 - (3) Glucocorticoids are secreted in adrenal cortex.
 - (4) In males, LH act on leydig cell to secrete androgen.
- 90. Identify the hormone with its incorrect matching of source and function.
 - (1) ANF Atrial wall, decreases the blood pressure.
 - (2) Oxytocin Hypothalamus, it stimulates a vigorous contraction of uterus at the time of child birth.
 - (3) GIP GIT, inhibit gastric secretion and motility.
 - (4) Progesterone— Corpus-luteum, stimulation of growth and activities of female secondary-sex organs.

91. Select the answer which correctly matches the endocrine gland with the hormone it secretes and its function.

| | Endocrine gland | Hormone | Function |
|--------------|--------------------|---------------|----------------------|
| (1) | Thymus | Thymosin | Differentiation |
| (1) | gland | THYMOSIM | of B-lymphocytes |
| | Adropol | | Increase alertness, |
| (2) Ad me | | Catecholamine | break down of |
| | medulla | | glycogen |
| (2) | Pineal | Melatonin | Differentiation |
| (3) | gland | | of T-lymphocytes |
| r | Antonion | | Synthesis of peptide |
| (4) | Anterior | АСТН | hormone called |
| | pituitary | | glucocorticoids |

- 92. Which of the following statement/s is/are correct?
 - (1) Basophils are involved in inflammatory response.
 - (2) Basophils are granulocytes.
 - (3) Eosinophills secrete histamine, serotonin and heparin.
 - (4) All except (3)
- 93. What would be the heart rate of 'Mohan' if the cardiac output is 6 L, blood volume in the ventricles at the end of diastole is 120 ml and at the end of ventricular systole is 60 ml?

| (1) 120 beat | (2) 110 beat |
|--------------|--------------|
|--------------|--------------|

- (3) 100 beat (4) 95 beat
- 94. Dr. Reddy use stethoscope to hear the sound produced during each cardiac cycle. The first sound is heard when :
 - (1) Tricuspid and semilunar valves close down after the blood flow into ventricle from atrium.
 - (2) Tricuspid and bicuspid valves close down after the blood flows into ventricle from atria.
 - (3) Semilunar valves close down after the blood flows into vessels from ventricle
 - (4) Both '2' and '3'
- 95. Select the correct statement regarding phycomycetes.
 - (1) The mycelium is aseptate and coenocytic.
 - (2) Asexual reproduction takes place by zoospores (non-motile) and aplanospores (motile)
 - (3) The gametes are always dissimilar (anisogamous)
 - (4) A zygospore is formed by meiosis of sporangium.

96. In the enzyme which catalyses the given reaction alcohol dehydrogenase

Pyruvic acid \longrightarrow Ethanol + CO₂

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the 'cofactor' group is :
```

- (1) Haem and Niacin (2) Zinc and Niacin
- (3) Only Haem (4) Only Zinc
- 97. Which of the following statement is false ?
 - (1) Uracil & thymine are pyrimidine.
 - (2) Adenine & thymine are purines.
 - (3) Sucrose, maltose & lactose are disaccharide.(4) Tyrosine, phenylalanine & tryptophan are aromatic amino acids.
- 98. The appearance of X-shaped structures called chiasmata occurs at which sub stage of prophase-I in meiosis ?
 - (1) Diplotene
 - (3) Pachytene (4) Zygotene
- 99. Select the correct statements.
 - (a) During anaphase, the centromeres split and chromatids separate.
 - (b) Crossing over takes place between sister chromatids of homologous chromosome.
 - (c) Tetrad formation is seen during zygotene.
 - (d) During G_0 phase of cell cycle, the cell is metabolically inactive.
 - (e) Four haploid cells are formed at the end of meiosis-II

Choose the correct answer from the option given below :

- (1) a, c and d
- (2) a, c and e(4) a, c and e

(2) Diakinesis

- 100. Which of the following is important site of formation of glycoproteins and lipid respectively?(1) DED 1 OPD
 - (1) RER and SER

(3) c, d and e

- (2) RER and Golgi bodies
- (3) Golgi bodies and SER
- (4) Only Golgi bodies

THIS SEGMENT IS ONLY FOR PCM GROUP STUDENTS

71. The set $\left\{\frac{1}{2}, \frac{2}{3}, \frac{3}{4}, \frac{4}{5}, \frac{5}{6}, \frac{6}{7}\right\}$ in the set-builder form is

(1)
$$\left\{ x : x = \frac{n}{n+1}, \text{ where } n \in \mathbb{N} \text{ and } 1 < n < 6 \right\}$$

(2)
$$\left\{ x : x = \frac{n}{n+1}, \text{ where } n \in \mathbb{N} \text{ and } 1 \le n < 6 \right\}$$

- (3) $\left\{ x : x = \frac{n}{n+1}, \text{ where } n \in \mathbb{N} \text{ and } 1 \le n \le 6 \right\}$
- (4) None of the above

72. Let N be the set of natural numbers and the relation R be defined such that $\{R = (x, y) : y = 2x, x, y \in N\}$. Then,

- (1) R is a function
- (2) R is not a function
- (3) Domain, range and co-domain is N
- (4) None of the above
- 73. The domain and range of the function f given by f(x) = 2 |x 5| is
 - (1) Domain = \mathbb{R}^+ , Range = $(-\infty, 1]$
 - (2) Domain = R, Range = $(-\infty, 2]$
 - (3) Domain = R, Range = $(-\infty, 2)$
 - (4) Domain = \mathbb{R}^+ , Range = $(-\infty, 2]$
- 74. The number of values of x in the interval [0, 3π] satisfying the equation
 2sin²x + 5sin x 3 = 0 is
 - $2\sin^2 x + 5\sin x 3 = 0$ is
- (1) 4 (2) 6 (3) 1 (4) 2 75. For natural number n, $(n!)^2 > n^n$, if (1) n > 3 (2) n > 4 (3) n \ge 4 (4) n \ge 3
- 76. If the roots of the equation $px^2 + 2qx + r = 0$ and $qx^2 2(\sqrt{pr})x + q = 0$ real, then
 - (1) p = q (2) $q^2 = pr$ (3) $p^2 = qr$ (4) $r^2 = pq$
- 77. Given that the two curves $\arg(z) = \frac{\pi}{6}$ and

 $|z - 2\sqrt{3}i| = r$ intersect in two distinct points then ([r] represents integral part of r) which of the following is correct ?

(2) r = 6

(4) [r] = 2

- (1) r > 3
- (3) $3 < r < 2\sqrt{3}$
- 78. Which of the following linear inequalities satisfy the shaded region of the given figure ?

| | (1) $2x + 3y \ge 3$ | (2) $3x + 4y \le 18$ |
|-----|---|--|
| | (3) $x - 6y \le 3$ | (4) All of these |
| 79. | If $[x]^2 = [x + 2]$, where $[x]$ less than or equal to x, the | = the greatest integer en x must be such that |
| | (1) $x = 2, -1$ | (2) $x \in \{2, 3\}$ |
| | (3) $\mathbf{x} \in [-1, 0) \cap [2, 3)$ | (4) None of these |

- 80. Let 1 ≤ m < n ≤ p. The number of subsets of the set A = {1, 2, 3, ...p} having m, n as the least and the greatest elements respectively, is
 (1) 2^{n -m 1} 1
 (2) 2^{n m 1}
 - (3) 2^{n-m} (4) $2^{p-n+m-1}$

81. Let $f(x) = a_0 + a_1x + a_2x^2 + \dots + a_nx^n + \dots$ and

$$\frac{f(\mathbf{x})}{1-\mathbf{x}} = \mathbf{b}_0 + \mathbf{b}_1 \mathbf{x} + \mathbf{b}_2 \mathbf{x}^2 + \dots + \mathbf{b}_n \mathbf{x}^n + \dots$$

If $a_0 = 1$ and $b_1 = 3$, then find the unit digit of $b_{10} =$

Given that $\frac{a_0}{a_1} = \frac{a_1}{a_2} = \dots = \text{constant}$

(1) 5

82. If the arithmetic, geometric and harmonic means between two distinct positive real numbers be A, G and H respectively, then the relation between them is

- (1) A > G > H(2) A > G < H(3) H > G > A(4) G > A > H
- 83. The point (x, y) lies on the line with slope m and through the fixed point (x_0, y_0) if and only if its coordinates satisfy the equation $y y_0$ is equal to _____
 - (1) $m(x x_0)$ (3) m(y - x)(2) $m(y - x_0)$ (4) $m(x - y_0)$
- 84. A bar of given length moves with its extremities on two fixed straight lines at right angles. Any point of the bar describes

 $O \xrightarrow{\theta} P(x, y)$

(2) ellipse

- (4) circle
- I. 37 terms are there in the sequence 3, 6, 9, 12, ... 111.
 - II. General term of the sequence 9, 12, 15, 18, ... 3n + 6.
 - Choose the correct option.
 - (1) Only I is true

(1) parabola

(3) hyperbola

- (2) Only II is true
- (3) Both I and II are true
- (4) Both I and II are false

86. If $f(x) = \lim_{n \to \infty} n(x^{1/n} - 1)$, then for x > 0, y > 0, f(xy) equal is

| (1) $f(x) f(y)$ | (2) $f(x) + f(y)$ |
|-------------------|-------------------|
| (3) $f(x) - f(y)$ | (4) None of these |

Class-XI Main (PCB/PCM)/012

- 87. Let r be the range and $S^2 = \frac{1}{n-1} \sum_{i=1}^{n} (x_i \overline{x})^2$ be the S.D. of a set of observations x_1, x_2, \dots, x_n , then
 - (1) $S \le r\sqrt{\frac{n}{n-1}}$ (2) $S = r\sqrt{\frac{n}{n-1}}$ (3) $S \ge r\sqrt{\frac{n}{n-1}}$ (4) None of these
- 88. If a > 2b > 0 then the positive value of m for which $y = mx - b\sqrt{1 + m^2}$ is a common tangent to $x^2 + y^2 = b^2$ and $(x - a)^2 + y^2 = b^2$, is

(1)
$$\frac{2b}{\sqrt{a^2 - 4b^2}}$$
 (2) $\frac{\sqrt{a^2 - 4b^2}}{2b}$
(3) $\frac{2b}{a - 2b}$ (4) $\frac{b}{a - 2b}$

- 89. If two sets A and B are having 44 elements in common. Number of elements common to A × B and B × A is—
 - (1) 44 (2) 1900 (3) 1936 (4) 1976
- 90. A student was asked to prove a statement p(n) by induction. He proved that p(n) = p(n + 1) for all n ∈ N and also that p(3) is true on the basis of this he could conclude that p(n) is true—

| (1) for all $n \in N$ | (2) for all n > 3 |
|-----------------------|-------------------|
| (3) for all $n \ge 3$ | (4) for no n |
| | |

91. The inequality |z - 4| < |z - 2| represents the region given by

 (1) Re(z) > 0
 (2) Re(z) < 0</td>

 (3) Re(z) > 2
 (4) None of these

- 92. If $x^{\overline{3}} 7x^{\overline{3}} + 10 = 0$, then the value of x is— (1) {125} (2) {8} (3) ϕ (4) {125, 8}
- 93. If the function f(x) satisfies $\lim_{x \to 1} \frac{f(x) 3}{x^2 1} = \pi$, then

(4) π

(2) 02

 $\lim_{x \to 1} f(x)$ is _(1) 01

- 94. The mean deviation from the median is-
 - (1) equal to that measured from another value
 - (2) maximum if all observations are positive
 - (3) greater than that measured from any other value
 - (4) less than measured from any other value

95. If A and B are mutually exclusive events with

 $P(A) = \frac{1}{2}P(B)$ and $A \cup B = S$, the sample space then P(A) =

(1) $\frac{2}{3}$ (2) $\frac{1}{3}$ (3) $\frac{1}{4}$ (4) $\frac{3}{4}$

96. All the values of m for which both roots of the equation $x^2 - 2mx + m^2 - 1 = 0$ are greater than -2 but less than 4; lie in the interval

- (1) -2 < m < 0(2) m > 3(3) -1 < m < 3(4) 1 < m < 4
- 97. If z is a complex number such that Re(z) = Im(z), then
 - (1) $\operatorname{Re}(z^2) = 0$ (2) $\operatorname{Im}(z^2) = 0$

(3) $\operatorname{Re}(z^2) = \operatorname{Im}(z)^2$ (4) $\operatorname{Re}(z^2) = -\operatorname{Im}(z)^2$

- 98. If the vertex of the parabola $y = x^2 16x + K$ lies on x-axis, then the value of K is
 - (1) 16 (2) 8 (3) 64 (4) -64
- 99. In an arithmetic progression, the 24th term is 100. Then the sum of the first 47 terms of the arithmetic progression in
 - (1) 2300 (2) 2350 (3) 2400 (4) 4700
- 100. For the curve $7x^2 2y^2 + 12xy 2x + 14y 22 = 0$, which of the following is true ?

(1) A hyperbola with eccentricity $\sqrt{3}$

(2) A hyperbola with directrix 2x + y - 1 = 0

(3) An hyperbola with focus (1, 2)

(4) All of these

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|---|-------|--|------------|-------------------------|---------------|-------|-----|-----------|-----------------------------------|-------------|-----|-------|
| GTSE - Main Exam (24.12.2023) ANSWER KEY CLASS - 11 (PCB PCM) PHY. + CHEM. + REAS. BIO MATH 1. (4) 31. (1) 61. (4) 71. (2) 71. (3) 2. (1) 32. (2) 62. (1) 72. (3) 72. (1) 3. (4) 33. (3) 65. (2) 75. (1) 75. (4) 6. (1) 36. (3) 65. (2) 75. (1) 75. (4) 6. (1) 36. (3) 66. (1) 76. (4) 78. (4) 9. (2) 39. (3) 69. (2) 79. (3) 79. (3) 10. (4) 40. (1) 70. (1) 80. (1) 80. (2) 11. (3) 41. (4) 83. (1) 83. (1) 83. (1) 12. (1) 42. (2) 83. (1) 83. (1) 84. (2) 13. (2) 43. (4) 83. (1) 83. (1) 84. (2) 14. (3) 44. (4) 83. (1) 84. (2) 85. (2) 15. (4) 44. (4) 83. (1) 84. (2) 85. (2) 16. (3) 46. (2) 85. (2) 85. (2) 85. (2) | | Educational Services Pvt. Ltd. Nation's Leading Institute | | | | | | | | | | |
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Correction and Modification

Though every caution has been taken in preparing question and their answer of GTSE Main-Paper, if you find any error in our question or answer or in both of them, then suggest the correct one with reference of book and explanation. Your suggestion will be sent to expert of respective subject and may be corrected in case of right claim. You can go either on the following two links

- (i) www.gtse.in and click on correction and modification button
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No further request can be entertained in any cases after said time.