





Pinnacle EduCare

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## INSTRUCTIONS

## **Duration: 1 Hour**

## Maximum Marks: 240

Please read the instructions carefully. You are allotted 5 minutes specifically for this purpose.

Things NOT ALLOWED in EXAM HALL: Blank Paper, clipboard, log table, slide rule, calculator, camera, mobile and any electronic or electrical gadget. If you are carrying any of these, then keep them at a place specified by invigilator at your own responsibility.

## **I.General Instructions**

- 1. This Booklet is your question paper. Don't break the seal of booklet until the invigilator instructs to do so.
- The answer sheet (ORS) is provided to you separately which is a machine readable optical response sheet. You have to mark your answers in the ORS by darkening bubbles as per your answer choice, by using black or blue ball point pen.
- 3. This question paper contains three sections as follows:
  - a) Section A contains total 15 questions (Q. No. 1 to 15) of Physics.
  - b) Section B contains total 15 questions (Q. No. 16 to 30) of Chemistry.
  - c) Section C contains total 30 questions (Q. No. 31 to 60) of Biology.
- Rough spaces are provided for rough work inside the question paper. No additional sheets will be provided for rough work.
- 5. If you are found involved in cheating or disturbing others, then your ORS will be cancelled.

## **II.Filling of OMR Sheet**

- 1. Ensure matching of OMR sheet with the Question paper before you start marking your answers on OMR sheet.
- On OMR sheet, darken the appropriate bubble with black/blue pen for each character of your Enrollment No. and your Name, Test Code and other details at the designated places.
- 3. Think wisely before darkening bubble as there is negative marking for wrong answer. Answer once marked by pen can't be cancelled.
- 4. Don't put any stain on ORS and hand it over back properly to the invigilator.

## **III.Marking Scheme**

- 1. All the questions of each Part have only one correct answer.
- 2. If darken bubble is RIGHT answer: 4 Marks.
- 3. If darken bubble is WRONG answer: -1 Marks (Minus One Mark).
- 4. If no bubble is darkened in any question: No Marks.





## JEE MAINS & ADVANCE RESULT 2023





Opp. Kidzee School. Dr. DP Singla Road, Guru Nanak Colony, Sangrur, Punjab.

JEE ADV AIR

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# What Makes Pinnacle Unique?

	Best Faculty Team
2	Hi-Tech Classrooms
3	Customized Study materia
4	Personal Attention
5	Unlimited Doubt Sessions
6	Best Testing Methodology

Lecture
Recording
Lab

Student Performance and Analysis Report Revision

Classes & Self Study Zones



Rich Library & Researched Study Modules

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Online Testing Lab (CBT)



Extra Support to weaker students



CCTV

Campus



Objective + Subjective



Biometric Attendance

# **Classroom Program**

## Comprehensive Classroom Lectures

All classes at Pinnacle are conducted by highly qualified and experienced faculty members, mostly IITians. Each chapter is started at the grass root level and is dealt to an extent which is the requirement of competitive examinations, with an aim of enabling the students to develop a comprehensive view of the whole chapter with a thorough understanding.



Doubt

Clearance



"If you ask a question, you may apprear fool for some time, but if you don't, you'll remain a fool for whole life."System at Pinnacle encourages all students to ask their doubts and guestions.

## Regular Tests Online and Offline

As JEE Mains and Advanced have gone completely online and NEET is in the pipeline, we have launched a dedicated online testing platform where students can practise over CBT (Computer Based Tests). The combination of online and offline testing modes based on latest JEE/NEET patterns ensure that students are at par with the recent changes. Students and check their test reports and performance analysis via a unique online login ID. Their results are also communicated to parents via SMS.





Addressing the **Board Exam** 

Pinnacle has a very distinct methodology for preparing the students for competitive examinations while in full synchronization with Board Exams as well. Board level tests are conducted alongside the regular JEE/NEET tests and the copies are graded at very meticulous level by teachers. Students receive methodological tips so as to perform excellent in the board Exams as well.



Engineering







### Section – A Physics

- 1. A balloon with mass 'm' is descending down with an acceleration 'a' (where a < g). How much mass should be removed from it so that it starts moving up with an acceleration 'a'?
  - (b)  $\frac{ma}{g-a}$ та (a)
  - g+a2та
  - (d)  $\frac{2ma}{g-a}$ (c) g+a
- 2. Which of the following statements is incorrect w.r.t. an orbiting satellite in circular orbit?
  - (a) Total energy is negative
  - (b) Potential energy is negative
  - (c) Magnitude of kinetic energy is twice the magnitude of potential energy
  - (d) Kinetic energy is positive
- 3. The cubical container ABCDEFGH which is completely filled with an ideal (nonviscous and incompressible) fluid, moves in a gravity free space with a acceleration of

$$\vec{a} = a_o(\hat{i} - \hat{j} + \hat{k})$$

where  $a_0$  is a positive constant. Then the point in the container where pressure is maximum, is



(c) E (d) F

- 4. A particle having a mass 0.5 kg is projected under gravity with a speed of 98 m s<sup>-1</sup> at an angle of 60° with horizontal. The magnitude of change of momentum of the particle during 10 s is
  - (a) 0.5 N s (b) 49 N s
  - (c) 98 N s (d) 490 N s
- 5. There are two potential energy-displacement curves as shown for two different particles (of same mass) doing SHM about same mean position x = 0 on x-axis then we can say.



- (a)  $\omega_1 > \omega_2$
- (b)  $\omega_1 < \omega_2$
- (c)  $\omega_1 = \omega_2$

(a)  $\frac{L}{4}$ 

- (d) no relation can be established
- 6. A mass is whirled in a circular path with constant angular velocity and its angular momentum is L. If the string is now halved keeping the angular velocity the same, the angular momentum is

(b)  $\frac{1}{2}$ 

PSAT (2025-20)			SAIVIPLE PAPER
(c) 2L	(d) 4L	(a) 0	(b) 5 m/s
		(c) 3 m/s	(d) 3.5 m/s
		10. A cylindrical tank has a hole of 1 cm <sup>2</sup> in its be	
7. A block of mass 'm	' is released from height 'h' as	If the water is allo	wed to flow into the tank from a

shown. The horizontal surface is rough having coefficient of friction  $\mu$ . Distance moved by the block on horizontal surface before coming to rest is



(a) h

DCAT (2025 26)

- (b)  $\frac{h}{\mu}$
- (c) µh
- (d) can't be calculated
- A tuning fork of frequency 280 Hz produces 10 beats per sec when sounded with a vibrating sonometer string. When the tension in the string increases slightly, it produces 11 beats per sec. The original frequency of the vibrating sonometer string is
  - (a) 269 Hz (b) 291 Hz
  - (c) 270 Hz (d) 290 Hz
- 9. The displacement-time graphs for two car (A and B) moving on same track is shown in figure. The magnitude of their relative velocity is



(a) 70 km/hr

velocity of

tank is

(a) 4 cm

(c) 6 cm

- (b) more than 70 km/hr
- (c) less than 70 km/hr
- (d) 100 km/hr
- 12. A sample of ideal monoatomic gas is taken round the cycle ABCA as shown in the figure. The work done during the cycle is

(b) 10 cm

(d) 20 cm

tube above it at the rate of 200 cm<sup>3</sup>/sec. then the

maximum height up to which water can rise in the

11. An engine of a train moving with uniform acceleration passes an electric pole with velocity 60 km/hr and the last compartment passes the same pole with a velocity 80 km/hr. The middle

point of the train passes past the same pole with a



PSAT (2025-26)			SAMPLE PAPER
13. A stone is shot	straight upward with a speed of 20	(c) 6 RT	(d) 9 RT
m/sec from a t	ower 200 m high. The speed with	15. A train is movin	ig with a velocity of 100 km $h^{-1}$ in
which it strikes	the ground is approximately	the North-East o	direction. If another train is moving
(a) 60 m/sec	(b) 66 m/sec	with a velocity	of 50 km $h^{-1}$ in the North-West
(c) 70 m/sec	(d) 76 m/sec	direction, then	what is the relative velocity of the
14. A gas mixture of	consists of 1 mole of oxygen and 3	second train w.r	t. the first train?
moles argon	at temperature T. Neglecting all	(a) 150 km/hr	
vibrational mod	des, the total internal energy of the	(b) 50 km/hr	
system is	<i></i>	(c) 112 km/hr	
(a) 4 RT	(b) 7 RT	(d) 84 km/hr	
16. SnCl <sub>2</sub> acts as a r (a) SnCl <sub>2</sub> can a (b) Sn <sup>2+</sup> is more (c) Sn <sup>4+</sup> is more	reducing agent because ccept electrons readily e stable than Sn <sup>4+</sup> e stable than Sn <sup>2+</sup>	(a) $\frac{15N}{7}$ (c) $\frac{11N}{9}$ 20. N <sub>2</sub> (g) + 2O <sub>2</sub> (g) - 2NO (g) + O <sub>1</sub> (g)	(b) $\frac{714}{15}$ (d) $\frac{9N}{11}$ $\Rightarrow 2NO_2 + Xkj$ $\Rightarrow 2NO_2 (g) + Yki$
(d) Sn <sup>2</sup> can be	easily converted to metallic tin	The enthalpy of	formation of NO is
17. Hybridisation o (a) $cn^3$	(b) $cn^2$	(a) (2X – 2Y)	(b) X – Y
(a) sp (c) sp	$d^{2}(d)$ $d^{2}(d)$	(c) $\frac{1}{2}(Y - X)$	(d) $\frac{1}{2}(X - Y)$
18. The ratio of vel 5th orbit of Li <sup>2+</sup> (a) 3:5 (c) 25:9	ocity of the electron in the 3rd and is (b) 5 : 3 (d) 9 : 25	21. For the reaction forward reaction (a) introducing (b) increasing the	n PCl <sub>5</sub> (g) $\rightleftharpoons$ PCl <sub>3</sub> (g) + Cl <sub>2</sub> (g) the n is favoured by PCl <sub>5</sub> at constant volume he volume of container
$\begin{array}{c} \text{HCl} \\ \text{HCl} \\ \text{M=2} \\ \text{V=5L} \end{array} + \begin{array}{c} \text{H}_2 \\ \text{V} \end{array}$	SO <sub>4</sub> NaOH = $1.5 + M = 2.5$ mixed Resulting = $2L$ V = $2L$ Solution	<ul> <li>(c) introducing</li> <li>(d) all of these</li> <li>22. If the solubility</li> <li>dm<sup>-6</sup> then pH of</li> </ul>	an inert gas at constant pressure product of MOH is $1 \times 10^{-10} \text{ mol}^2$ its aqueous solution will be

What is the normality of hydrogen ion in resulting solution?

(c) 6 (d) 3

(b) 9

(a) 12

23. Which can be used to generate  $H_2?$ 

- (a) AI + NaOH (b) Zn + NaOH
- (c)  $LiH + H_2O$  (d) All of these
- 24. For the titration of 100 cc of 0.1 M Sn<sup>2+</sup> to Sn<sup>4+</sup>, 50 cc of 0.4 M Ce<sup>4+</sup> solution was required. The oxidation state of Ce in the reduction product is
  - (a) +1 (b) +2
  - (c) + 3 (d) Zero
- 25. Which of the following is responsible for depletion of ozone layer in the upper strata of the atmosphere
  - (a) Polyhalogens (b) ferrocene
  - (c) Fullerenes (d) freons
- 26. Which of the following is the most volatile?



(a) 1 (b) 2

(c) 3

- (d)Equally volatile
- 27. Consider this equation and the associated value of  $\Delta H^0$  :

 $2H_2(g) + 2CI_2(g) \rightarrow 4HCI(g); \Delta H^0 = -92.3 \text{ kJ}$ 

Which statement about this information is incorrect?

- (a) If the equation is reversed, the  $\Delta H^0$  value equals + 92.3 kJ
- (b) The four HCl bonds are stronger than four bonds in  ${\rm H}_2$  and  ${\rm Cl}_2$
- (c) The  $\Delta H^0$  value will be 92.3 kJ if HCl is produced as a liquid
- (d) 23.1 kJ of heat will be evolved when 1 mole of HCl (g) is produced
- 28. Formula of chloride of element A whose I.E., I.E<sub>2</sub>, I.E<sub>3</sub> and I.E<sub>4</sub> are respectively 4.5 eV, 11eV, 78 eV and 110 eV
  - (a) ACI (b) ACI<sub>2</sub>
  - (c)  $A_2Cl_3$  (d)  $A_3Cl_2$
- 29. In which of the following set of compounds, bond angle remains same for all members?
  - (a) NH<sub>3</sub>, PH<sub>3</sub>, AsH<sub>3</sub>
  - (b) PF<sub>3</sub>, PCI<sub>3</sub>, PBr<sub>3</sub>
  - (c)  $OH_2$ ,  $OF_2$ ,  $OCI_2$
  - (d) BF<sub>3</sub>, BCI<sub>3</sub>, BBr<sub>3</sub>
- 30. Heavier elements in carbon family do not form  $P\pi$   $P\pi$  bonds because
  - (a) their atomic orbitals are too large and diffuse to have effective overlapping
  - (b) inert pair effect is more prominent
  - (c) heavier elements have more atomic mass
  - (d) heavier elements has less penetration power

Space for Rough Work

#### SAMPLE PAPER

## Section – C Biology

- 31. What is common between *Ascaris* and *Periplaneta*?
  - (a) Hibernation
  - (b) Metamerism
  - (c) Sexual dimorphism
  - (d) Anaerobic respiration
- 32. What is common about *Trypanosoma*, *Plasmodium*, *Amoeba* and *Trichomonas* 
  - (a) These are all parasites
  - (b) They have flagella
  - (c) They produce spores
  - (d) These are all unicellular protists
- 33. Which one of the following biomolecule is correctly characterized?
  - (a) Palmitic acid an unsaturated fatty acid with 16 carbon atoms
  - (b) Guanylic acid guanosine with a glucose phosphate molecule
  - (c) Alanine contains an amino group and an acidic group anywhere in the
  - molecule (d) Lecithin — a phosphorylated glyceride found in cell membrane

- 34. In humans, blood passes from inferior vena cava to the diastolic right atrium of heart due to
  - (a) pushing open of venous valve
  - (b) suction pull
  - (c) stimulation of sino auricular node
  - (d) pressure difference between the inferior vena cava and atrium
- 35. Which of the following is the least likely to be involved in stabilizing the 3 D folding of most proteins?
  - (a) Electrostatic and hydrophobic interactions
  - (b) Hydrogen bonds and disulphide bonds
  - (c) Ester bonds and glycosidic bonds
  - (d) Hydrogen bonds and peptide bonds
- 36. Which of the following sets of diseases is associated with muscular system?
  - (a) Myasthenia gravis and gout
  - (b) Dystrophy and tetany
  - (c) Osteoporosis and slipped disc
  - (d) All of these
- 37. Set of unpaired bones of skull is
  - (a) Mandible, Zygomatic, Nasal, Vomer
  - (b) Ethmoic, Occipital, Sphenoid, Mandible
  - (c) Frontal, Sphenoid, Ethmoid, Hyoid
  - (d) Both (b) and (c)

#### SAMPLE PAPER

- 38. Contraction of which of the following muscles help in normal inspiration?
  - (a) Phrenic muscles, External intercostal muscles
  - (b) External intercostal muscles, Abdominal muscles
  - (c) Phrenic muscles, internal intercostal muscles
  - (d) only phrenic muscles
- 39. Which of the following proteins help in fibrinogenesis and fibrinolysis respectively?
  - (a) Thrombin and thrombokinase
  - (b) Thrombokinase and statin
  - (c) Streptokinase and fibrins
  - (d) Thrombin and streptokinase
- 40. Which of the following part of nephron shows maximum reabsroption and minmum reabsorption, resepctively?
  - (a) PCT and DCT
  - (b) PCT and collecting duct
  - (c) DCT and LOH
  - (d) PCT and LOH
- 41. Which of the following are antagonistic hormones produced by same endocrine gland?
  - 1. insulin and glucagon
  - 2. somatotropin and somatostatin
  - 3. PRL-RH and PRL-IH
  - 4. RAAS and ANF
  - (a) 1, 2, 3, 4 (b) 1, 3, 4
  - (c) 1, 4 (d) 1, 3
- 42. Basic chordate characters are
  - 1. dorsal hollow nervous system
  - 2. pharyngeal gill slits that are ventral
  - 3. post anal tail
  - 4. solid, jointed notochord
  - 5. lateral pharyngeal gill slits

- 6. ectodermal notochord
- (a) 1, 2, 3, 4 (b) 1, 3, 4, 5
- (c) 2, 3, 4, 6 (d) 1, 3, 5
- 43. How many of the following are non tetrapod vertebrates

Carcharodon, Hydrophis, Aptenodytes, Pristis, Mackeral, Struthio, Calotes, Ascidia

- (a) 3 (b) 4
- (c) 5 (d) 6
- 44. One of the constituents of the pancreatic juice while poured into the duodenum in human is
  - (a) Enterokinase
  - (b) Trypsinogen
  - (c) Chymotrypsin
  - (d) Both (b) and (c)
- 45. The partial pressure of oxygen in alveoli of the lungs is
  - (a) more than that in the blood
  - (b) less than that in the blood
  - (c) less than that of carbon dioxide
  - (d) equal to that in the blood
- 46. People living at sea level have around 5 million RBC per cubic millimeter of their blood whereas those living at an altitude of 5400 metre have around 8 million. This is because at high altitude
  - (a) There is more nutritive food, therefore more RBCs are formed
  - (b) Atmospheric O<sub>2</sub> level is less and hence, more RBCs are needed to absorb the required amount of O<sub>2</sub> to survive
  - (c) Kidneys secrete more erythropoietin at higher altitude
  - (d) Both (b) and (c)

## 47. The formation of oxyhaemoglobin in capillaries of alveoli favours the

- (a) displacement of carbondioxide from blood
- (b) shifting of oxyhaemoglobin curve to right
- (c) saturation of carbaminohaemoglobin
- (d) loading of  $HCO_3^-$  ions in plasma
- 48. The activation of mechanism of coagulation is by
  - (a) Thrombin and Ca<sup>2+</sup>
  - (b) Factors released by platelets and injured tissue
  - (c) Fibrinogen and fibrins
  - (d) Thrombin and fibrins
- 49. Match the different items given in column-I with respective examples in column-II
  - Column I Column II
  - 1. Venous heart p. Periplaneta
  - 2. Neurogenic heart q. Aptenodytes
  - 3. Incomplete double r. *Exocoetus* circulation
  - 4. Complete double s. *Bufo* circulation
  - (a) 1-r, 2-p, 3-s, 4-q
  - (b) 1-p, 2-q, 3-r, 4-s
  - (c) 1-r, 2-p, 3-q, 4-s
  - (d) 1-q, 2-p, 3-s, 4-r

#### 50. Find incorrect match

Regulatory mechanism		Mode of action
(a) ADH	1.	Vasoconstrictor
	2.	In summer months,
		its secretion is
		increased

#### (b) Angiotensin-II 1. Increases GFR 2. Powerful vasoconstrictor (c) ANF 1. Vasodilator 2. Increases the volume of blood flow to atria of heart (d) Renin 1. Increases GFR 2. Increases glomerular blood

51. How many of the following can increase the heart rate?

Adrenaline, Acetyl choline, vagus nerve stimulation, sympathetic nervous system, nor

flow

- epinephrine, sympathetin
- (a) five (b) four
- (c) three (d) two
- 52. In human there are 23 bivalents in metaphase I what will be the number of chromosomes in daughter cells after meiosis I and meiosis II?
  - (a) 46 and 46
  - (b) 92 and 46
  - (c) 23 and 23
  - (d) 46 and 23
- 53. Choose the incorrect statement
  - (a) interzonal spindle fibers are observed at anaphase and telophase between the daughter chromosomes
  - (b) kinetochores serve as the sites of attachment of spindle fibres to the chromosomes

Space for Rough Work

#### SAMPLE PAPER

- (c) at the beginning of the final stage of mitosis of chromosomes condense to form discrete elements
- (d) cell growth results in disturbing the nucleocytoplasmic ratio
- 54. Which of the following is correct?



- (a) X is larger than muscle
- (b) X is smaller than muscle
- (c) A number of Y are held together by a proteinaceous layer
- (d) Both (b) and (c)
- 55. An endocrinologist obtained the following graphs after checking the level of parathormone in 2 patients \_\_\_\_\_ X and Y\_\_\_\_ over a certain period of time



Which of the following observations will be seen in X and Y?

- (a) Bones of Y are likely to be softer and more fragile than those of X
- (b) The excitability of nerves and muscles is increased in Y
- (c) Sustained contractions of muscles is seen in the limbs of X
- (d) Chances of fracture of bones are higher in Y
- 56. The cells that are involved in resorption of bone fragments called osteoclasts are generally rich in
  - (a) R.E.R only
  - (b) R.E.R and S.E.R
  - (c) Lysosomes
  - (d) Golgi apparatus
- 57. Which of the following represents the correct combination without any exception?

	Characteristic	Class
(a)	Open circulation, jointed	Arthropoda
	appendages, calcareous	
	Shell	
(b)	Visceral hump covered by	Mollusca
	mantle, feather-like gills,	
	triploblastic	
(c)	Complete alimentary	Aschelminthes
	tract, acoelomate	
(d)	Exoskeleton of calcareous	Echinodermata
	ossicles, organ system	
	level of organization,	
	watervascular system	

- 58. Read the following statements
  - 1. Tendons are tough, inelastic, white fibrous cords, that connect smooth muscles to bones

#### SAMPLE PAPER

- Ligaments are strong, elastic cords which are made up of yellow elastic fibres only Mark the correct option
- (a) Both 1 and 2 are correct
- (b) Both 1 and 2 are incorrect
- (c) 1 is correct, 2 are incorrect
- (d) 1 is incorrect, 2 is corrrect
- 59. What is common to Ichthyophis and Hydrophis?
  - (a) both are limbless
  - (b) both have 10 pairs of cranial nerves

- (c) both have glandular skin without scales
- (d) both excrete uric acid
- 60. Epithelium of which of the following structures provides protection against chemical and mechanical stress?
  - (a) Skin (b) Pharynx
  - (c) Buccal cavity (d) All of these

1	с	21	d	41	d
2	с	22	b	42	d
3	a	23	d	43	a
4	b	24	с	44	b
5	a	25	d	45	а
6	a	26	а	46	d
7	b	27	С	47	а
8	d	28	b	48	b
9	b	29	d	49	а
10	d	30	а	50	с
11	b	11	с	51	b
12	а	12	d	52	с
13	b	13	d	53	с
14	b	14	d	54	d
15	с	15	с	55	b
16	с	16	b	56	с
17	b	17	d	57	b
18	b	18	а	58	b
19	с	19	d	59	a
20	С	20	d	60	d

### ANSWER KEY