



## Santosh Academia Talent Examination

(2024-25)

### CLASS-XII (PCB) STUDYING SAMPLE PAPER

Max. Marks: 120

Time: 1 Hour

#### ***IMPORTANT INSTRUCTIONS:***

##### ***GENERAL***

1. This booklet is your Question Paper.
2. The Test ID is printed on the left-hand top corner of this sheet. If not, contact the invigilator for change of question paper.
3. Use the Optical Mark Recognition (OMR) sheet provided separately for answering the questions. DO NOT FILL till you are told to do so.
4. The test paper SET CODE is printed on the Right-hand top corner of the question paper. Ensure that you fill this in OMR as that on the question paper booklet.
5. Blank spaces are provided within this booklet for rough work. No additional rough sheet will be provided.
6. You are ALLOWED to take away the Question Paper at the end of the examination.

##### ***QUESTION PAPER FORMAT***

7. This Paper contains 30 questions in total.  
*Section-I: Question Number 1 to 5 belongs to Physics.*  
*Section-II: Question Number 6 to 10 belongs to Chemistry.*  
*Section-III: Question Number 11 to 15 belongs to Botany.*  
*Section-IV: Question Number 16 to 20 belongs to Zoology.*  
*Section-V: Question Number 21 to 30 belongs to Mental Ability.*

##### ***MARKING SCHEME:***

8. Each question carries 4 marks. For each correct response, the candidate will get 4 marks.
9. There is a negative marking of –1 mark for incorrect response for section I, II III and IV. No marks will be deducted for unmarked questions.
10. There is no negative marking for incorrect response or unmarked questions for Section V.



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Deemed to be University

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### SECTION-I PHYSICS

- A soap bubble is given a negative charge, then its radius
  - Decreases
  - Increases
  - Remains unchanged
  - Nothing can be predicted as information is insufficient
- Two equally charged identical metal spheres A and B repel each other with a force F. Another identical uncharged sphere C is touched to A and then placed midway between A and B. The net force on C is in the direction
  - F towards A
  - F towards B
  - 2F towards A
  - 2F towards B
- A parallel plate air capacitor with no dielectric between the plates is connected to the constant voltage source. How would capacitance and charge change if dielectric of dielectric constant  $K=2$  is inserted between the plates.  $C_0$  and  $Q_0$  are the capacitance and charge of the capacitor before the introduction of the dielectric.
  - $C=C_0/2$ ;  $Q=2Q_0$
  - $C=2C_0$ ;  $Q=Q_0/2$
  - $C=C_0/2$ ;  $Q=Q_0/2$
  - $C=2C_0$ ;  $Q=2Q_0$
- A proton moves horizontally towards a vertical conductor carrying a current upwards. It will be deflected
  - to the left
  - to the right
  - upwards
  - downwards
- A closely wound solenoid of 800 turns and area of cross section  $2.5 \times 10^{-4} \text{m}^2$  carries a current of 3.0A. What is its associated magnetic moment?
  - $0.5 \text{Am}^2$
  - $0.6 \text{Am}$
  - $0.5 \text{Am}$
  - $0.6 \text{Am}^2$

### SECTION-II CHEMISTRY

- A 0.004 M solution of  $\text{K}_2\text{SO}_4$  is isotonic with a 0.010 M solution of glucose at the same temperature. The apparent percent degree of dissociation of  $\text{K}_2\text{SO}_4$  is
  - 25%
  - 50%
  - 75%
  - 100%
- Electronic configuration of a transition element X in +3 oxidation state is  $[\text{Ar}] 3d^6$ . What is its atomic number?
  - 25
  - 26
  - 27
  - 24
- Which has maximum conductivity?
  - $[\text{Cr}(\text{NH}_3)_3\text{Cl}_3]$
  - $[\text{Cr}(\text{NH}_3)_4\text{Cl}_2]\text{Cl}$
  - $[\text{Cr}(\text{NH}_3)_5\text{Cl}]\text{Cl}_2$
  - $[\text{Cr}(\text{NH}_3)_6]\text{Cl}_3$
- $3\text{A} \rightarrow 2\text{B}$ , rate of reaction  $\frac{+d[\text{B}]}{dt}$  is equal to
  - $-\frac{3}{2} \frac{d[\text{A}]}{dt}$
  - $-\frac{2}{3} \frac{d[\text{A}]}{dt}$
  - $-\frac{1}{3} \frac{d[\text{A}]}{dt}$
  - $+2 \frac{d[\text{A}]}{dt}$
- The standard electrode potentials of the two-half cell are given below:
 
$$\text{Ni}^{2+} + 2\text{e}^- \rightarrow \text{Ni}; \quad E^\circ = -0.25 \text{ V}$$

$$\text{Zn}^{2+} + 2\text{e}^- \rightarrow \text{Zn}; \quad E^\circ = -0.77 \text{ V}$$
 The emf of cell formed by combining the two half cells would be:
  - 1.02 volt
  - +0.52 volt
  - +1.02 volt
  - 0.52 volt

### SECTION-III BOTANY

11. The term linkage was given by  
(a) Robert Hooke (b) T.H. Morgan (c) Schwann (d) De Bary
12. RNA can acts as  
(a) Adapter molecule (b) Catalytic molecule (c) Genetic molecule (d) All of the above
13. Water is absorbed in seed by  
(a) Hilum (b) Micropyle (c) Chalaza (d) Root cortex
14. The tendency of an offspring to resemble its parent is known as  
(a) Variation (b) Heredity (c) Resemblance (d) Inheritance
15. Flowers with both androecium and gynoecium are called  
(a) Bisexual flowers (b) Anther  
(c) Stamens (d) Unisexual flowers

### SECTION-IV ZOOLOGY

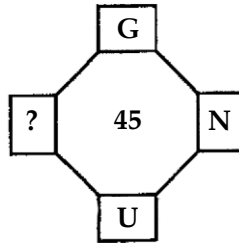
16. One of the following is not the causal organism of ringworm disease  
(a) *Microsporium* (b) *Trichophyton* (c) *Epidermophyton* (d) *Macrosporium*
17. Widal test is carried out to test  
(a) Malaria (b) HIV (c) Typhoid (d) Diabetes
18. Each seminiferous tubule is lined on its inside by  
(a) Spermatogonia (b) Primary spermatocytes  
(c) Sertoli cells (d) Both 1 and 3
19. Curd forming bacteria is  
(a) *Lactobacillus* (b) *Pseudomonas*  
(c) *Pneumococcus* (d) *Mycobacterium*
20. Microorganisms can be grown in the bioreactors by  
(a) Support growth system (b) Agitated growth system  
(c) Suspended growth system (d) Both (a) and (c)

### SECTION-V MENTAL ABILITY

21. Which group of letter is different from others?  
(a) LAZO (b) HCXS (c) GHIJ (d) FEVU
22. If in a certain code language 'POEM' is written as 'OQNPDFLN', how would 'WIND' be written as same code?  
(a) VXHJMOCE (b) ECDGJLA (c) LMNOPABC (d) ECOMJHXV
23. Some words are translated from an artificial language below  
'goh rat pee' is 'my school bag'.  
'nie jee goh' is 'black colour bag'  
'pee jee goh' is 'my black bag'  
Which word could possibly mean 'colour'?  
(a) Pee (b) Nie (c) Jee (d) Goh



24. Find the missing character in the following figure.



- (a) A (b) D (c) B (d) C

25. Find the next number in the given sequence.

1000, 100, 729, 81, 512, 64, 343, ?

- (a) 25 (b) 49 (c) 64 (d) 36

26. Find out the number in the position of 'question mark'.

A <sub>2</sub>	C <sub>4</sub>	E <sub>6</sub>
G <sub>3</sub>	I <sub>5</sub>	?
M <sub>5</sub>	O <sub>9</sub>	Q <sub>14</sub>

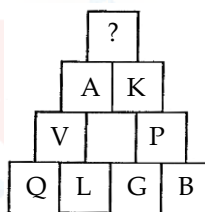
- (a) K<sub>5</sub> (b) K<sub>12</sub> (c) K<sub>7</sub> (d) K<sub>8</sub>

27. Find the next number in the series.

1, 2, 6, 15, 31, 56, 92, ?

- (a) 49 (b) 56 (c) 92 (d) 141

28. Which number will replace the question mark?



- (a) G (b) H (c) F (d) E

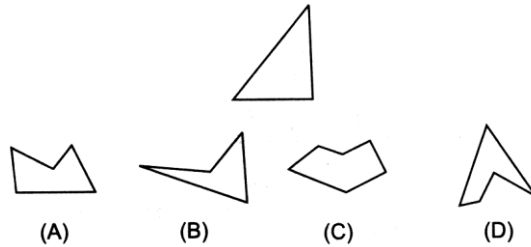
29. Sara lives in a large city on the East coast. Her younger cousin Marlee lives in the Midwest in a small town with fewer than 1000 residents. Marlee has visited Sara several times during the past 5 yrs. In the same period of time, Sara has visited Marlee only once. Find the correct statement from given alternatives, according to the passage.

- (a) Marlee likes Sari better than Sara likes Marlee  
 (b) Sara thinks small towns are boring  
 (c) Sara is older than Marlee  
 (d) Marlee wants to move to the East coast





30. Identify which would among the pieces given will not be required to complete the triangular pattern shown below.



(a) A

(b) B

(c) C

(d) D





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**ROUGH WORK**

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