



# हिन्दुस्तान LYMPIAD 2024

Ignite Your Competitive Spirit

## SAMPLE QUESTIONS (Science)

**Class 11**

### **Important Instructions:**

- There are 50 sample questions for each class while the actual paper will be of 100 questions
- Question paper is divided into 5 sections – Physics, Chemistry, Mathematics/Biology, English & Logical Reasoning
- Every question has 1 correct answer
- There will be no negative marking
- All questions carry equal weightage
- Duration of actual exam (with 100 questions) will be 2 hours
- In the actual exam, please read the instructions given on the OMR sheet carefully and submit the completely filled OMR sheet before leaving the exam hall
- In the actual exam, additional 10 minutes will be provided for reading the instructions and filling the OMR sheet.
- In this sample paper, Mathematics and Biology students should only attempt/refer to Mathematics and Biology sections respectively. Rest of the sections will be common for all students.

Name of the Candidate (in Capital letters): \_\_\_\_\_

Candidate Signature : \_\_\_\_\_ Invigilator's Signature : \_\_\_\_\_





निम्न में से कौन सी सबसे मजबूत ऑक्सीकरण कारक है

- a.  $\text{BrO}_3^- / \text{Br}^{2+}, E^\circ = +1.50 \text{ V}$
- b.  $\text{Fe}^{3+} / \text{Fe}^{2+}, E^\circ = +0.76 \text{ V}$
- c.  $\text{MnO}_4^- / \text{Mn}^{2+}, E^\circ = +1.52 \text{ V}$
- d.  $\text{Cr}_2\text{O}_7^{2-} / \text{Cr}^{3+}, E^\circ = +1.33 \text{ V}$

16. Heavy water freezes at भारी पानी जम जाता है

- a.  $0^\circ\text{C}$
- b.  $3.8^\circ\text{C}$
- c.  $38^\circ\text{C}$
- d.  $-0.38^\circ\text{C}$

17. Setting of plaster of paris is

- a. Oxidation with atmospheric oxygen
- b. Combination with atmospheric  $\text{CO}_2$
- c. Dehydration
- d. Hydration to yield another hydrate

प्लास्टर ऑफ़ पेरिस का जमाव है

(ए) वायुमंडलीय ऑक्सीजन के साथ ऑक्सीकरण

(बी) वायुमंडलीय  $\text{CO}_2$  के साथ संयोजन

(सी) निर्जलीकरण

(डी) एक अन्य हाइड्रेट उपज के लिए जलयोजन

18. The relation between  $\Delta E$  and  $\Delta H$  is  $\Delta E$  and  $\Delta H$  के बीच का संबंध है

- a.  $\Delta H = \Delta E - P \Delta V$
- b.  $\Delta H = \Delta E + P \Delta V$
- c.  $\Delta E = \Delta V + \Delta H$
- d.  $\Delta E = \Delta H + P \Delta V$

19. In the concentration of B is increased at fixed temperature, in the reaction  $A + 2B \rightleftharpoons C + 3D$ , the equilibrium constant of backward reaction –

- a. decreases
- b. increases
- c. remains unchanged
- d. first increases then decreases

अभिक्रिया  $A + 2B \rightleftharpoons C + 3D$  में B की संकेंद्रण में स्थिर तापमान पर वृद्धि हुई है, पश्चवर्ती अभिक्रिया का साम्य स्थिरांक –

(ए) घट जाता है

(बी) बढ़ जाता है

(सी) अपरिवर्तित

(डी) पहले बढ़ जाता है फिर घट जाता है

20. For the following gaseous reaction, the equilibrium constant –

दी गयी गैसीय अभिक्रिया के लिए संतुलन स्थिरांक होगा

- a.  $K_p > K_c$
- b.  $K_p < K_c$
- c.  $K_p = K_c$
- d.  $K_p = 1/K_c$

### FOR NON-MEDICAL STUDENTS ONLY Section C – Mathematics

21. In a triangle, the longest side is 3 times the shortest side. The third side is 10 more than shortest side. If the minimum perimeter of the triangle is 100 cm, then

- a. Longest side  $> 48 \text{ cm}$
- b. Shortest side  $< 16 \text{ cm}$
- c. Third side  $\geq 26 \text{ cm}$
- d. none of these

एक त्रिभुज में, सबसे लम्बी भुजा सबसे छोटी भुजा से 3 गुना है। तीसरी भुजा सबसे छोटी भुजा से कम से कम 10cm अधिक है, यदि त्रिभुज का न्यूनतम परिधि 100 सेमी है, तो फिर

(ए) सबसे लम्बी भुजा  $> 48$  सेमी

(बी) सबसे छोटी भुजा  $< 16$  सेमी

(सी) तीसरी भुजा  $\geq 26$  सेमी

(डी) इनमें से कोई नहीं

22. If  $x! = 2.5.8.9.10$ , then the value of  $x$  is:

यदि  $x! = 2.5.8.9.10$ , तो  $x$  का मान निकालिये:

- a. 10
- b. 5
- c. 6
- d. none of these

23. A polygon has 44 diagonals. The number of its sides are:

एक बहुभुज में 44 विकर्ण हैं। इसके भुजाओं की संख्या होगी :

- 24.** The argument of the complex number  $i$  is :  
सम्मिश्र संख्या ' $i$ ' का कोणांक है:

- 25.** Solution set of the inequalities  $2x - 1 \leq 3$  and  $3x + 1 \geq -5$  is

असमिकाये  $2x - 1 \leq 3$  and  $3x + 1 \geq -5$  का हल समुह है

- 26.** The solution of — — lines in

- 27.** The equation of the circle with centre  $(3, -2)$  and passing through  $(1, 2)$  is: a.  $(x + 3)^2 + (y - 2)^2 = 20$

केंद्र  $(3, -2)$  और बिंदु  $(1, 2)$  से गुजरने वाले वृत्त का समीकरण होगा

- 28.** The perpendicular distance of the line  $x - y = 4$  from  $(0, 0)$  is

रेखा  $x - y = 4$  की  $(0, 0)$  से लम्बवत दूरी है

- 29.** If the coefficients of  $x^5$  and  $x^6$  in  $(1 + x)^n$  are equal, then  $n$  is equal to

यदि  $(1 + x)^n$  में  $x^5$  और  $x^6$  के गुणांक बराबर हैं, तो  $n =$

- 30.** If A is the A.M. between a and b. Find the value of

यदि  $a$  और  $b$  का सामानांतर माध्य  $A$  है तो निम्न का मान निकालिये

\_\_\_\_\_

- a.  $-4$                       b.  $4$   
c.  $8$                          d.  $-8$

**FOR MEDICAL STUDENTS ONLY**  
**Section C – Biology**

- 21.** The intermediate between glycolysis and TCA cycle is

- a. Pyruvic acid  
b. Acetyl-CoA  
c. Oxaloacetate  
d. Glucose 1-6 diphosphate
- ग्लाइकोसिस और टीसीए चक्र के बीच मध्यवर्ती है
- a. पाइरूविक एसिड  
b. एसिटाइल- CoA  
c. ऑक्सालोएसिटेट  
d. ग्लूकोज 1-6 डिफोस्फेट

- 22.** Lichens are well known combination of an alga and a fungus where fungus has

- a. An epiphytic relationship with the alga  
b. A parasitic relationship with the alga  
c. A symbiotic relationship with the alga  
d. A saprophytic relationship with the alga
- लाइकेन /शैल , शैवाल और कवक का एक प्रसिद्ध संयोजन हैं, जहां कवक है :

- एल्गा के साथ एक अधिपादपीय संबंध है
- एल्गा के साथ एक परजीवी संबंध है
- एल्गा के साथ एक सहजीवी संबंध है
- एल्गा के साथ एक मृतजीवी संबंध है

- 23.** Phycoerythrin, chlorophyll 'a' and chlorophyll 'd' are characteristics of

- a. Chlorophyceae
- b. Xanthophyceae

c. Phaeophyceae

d. Rhodophyceae

फैकोइरीथ्रीन, क्लोरोफिल 'a' और क्लोरोफिल 'd' \_\_\_\_\_ की विशेषताएं हैं

a. पर्णहरित

b. पीतहरित शैवाल

c. फिओफाइसी/बभ्रु शैवाल वर्ग

d. रोडोफाइसी/ लाल शैवाल वर्ग

**24.** Sound-producing organ of birds is

a. Syrinx

b. Larynx

c. Pygostyle

d. Synsacrum

पक्षियों का ध्वनि उत्पादन करने वाला अंग है

a. सिरिक्स

b. लैरिक्स

c. पायगोस्टाइल

d. सिंसेक्राम

**25.** The leaves of *Utricularia* plant are modified into

a. Bladders

b. Tendrils

c. Hooks

d. Pitchers

यूट्रिकुलरिया प्लांट की पत्तियाँ किसमें उपांतरित हैं

a. आशायी /थैलीसम

b. प्रतान

c. शूल

d. घट

**26.** Purine bases of DNA include

a. High Uracil and guanine

b. Adenine and cytosine

c. Guanine and adenine

d. none of these

निम्न डीएनए के प्यूरिन में शामिल हैं

a. उच्च यूरासिल और गुआनीन

b. एडिनिन और साइटोसिन

c. गुआनीन और एडिनिन

d. इनमें से कोई नहीं

**27.** The enzyme that fixes atmospheric CO<sub>2</sub> in C<sub>4</sub> plants is

a. RuDP carboxylase

b. RuDP oxygenase

c. PEP carboxylase

d. Hydrogenase

एंजाइम जो C<sub>4</sub> पौधों में वायुमंडलीय CO<sub>2</sub> को नियत करता है

a. RuDP कार्बोक्सिलेज

b. RuDP ऑक्सिजेनेज

c. PEP कार्बोक्सिलेज

d. हाइड्रोजेनेज

**28.** Pineal gland produces

a. Melatonin

b. Aldosterone

c. Cortisone

d. Glucagon

शीर्षग्रंथि \_\_\_\_\_ बनाती है

a. मेलाटोनिन

b. एल्डोस्टेरोन

c. कॉर्टिसोन

d. ग्लूकागन

**29.** The bryophytes lack true

a. Roots

b. Stems

c. Leaves

d. All of these

ब्रियोफाइट्स में ये नहीं होते

a. जड़ें

b. तना

c. पत्तियाँ

d. ये सभी

**30.** The gynoecium in which the carpels are free from each other is said to be

a. Apocarpous

b. Free central

c. Syncarpous

d. Polyandrous

जो जायांगीय (गायनोशियम) जिसमें अंडप (कार्पल्स) एक-दूसरे से जुड़े नहीं होते, उन्हें कहा जाता है

a. वियुक्तांडपि

b. मुक्तस्ताम्भीय

c. युक्तांडपि

d. पॉलींड्रस

## Section D – English

**Directions (Q.nos. 31 to 34)** Complete this passage by selecting the most suitable word/phrase from list to fit the corresponding gap.

The **31.** \_\_\_\_\_ of India as an economic super power is not reflected in the **32.** \_\_\_\_\_ of life enjoyed by its 1.2 billion citizens, according to the Human Development Index, which **33.** \_\_\_\_\_ India very low among 182 countries. In our performance- oriented world, measurement issues have taken on **34.** \_\_\_\_\_ importance as what we measure affects what we do.



31. Which of these fits gap 14?
- |            |           |
|------------|-----------|
| a. quality | b. spirit |
| c. span    | d. joy    |
32. Which of these fits gap 15?
- |           |              |
|-----------|--------------|
| a. scored | b. qualified |
| c. regard | d. ranked    |
33. Which of these fits gap 16?
- |            |                 |
|------------|-----------------|
| a. great   | b. unduly       |
| c. trivial | d. considerably |
34. Which of these fits gap 13?
- |               |               |
|---------------|---------------|
| a. pursuit    | b. perception |
| c. conversion | d. title      |

**Directions (Q.nos. 35 & 40)** Read the following information in passage and answer the questions given below.

**Canopy of Nature**

Dad decided last Sunday that we should all go on a camping trip.

He read an article in the Sunday paper about camping and how it "brings families together under the canopy of nature."

"Overrated," I joked. "What about the canopy of television or the canopy of restaurant food?"

"This will be good for us," Dad said, sliding the magazine across the coffee table. "Let's go next weeked."

I shot quick look over at my little brother, Paul. He gave me a slow eyebrow raise which meant, "This will probably not go off completely as planned."

My smile back said, "But it will surely be fun."

I started to think back. Once Dad decided we should all learn how to canoe. We borrowed two canoes from our friends, hoisted them on the van and drove for three hours to a secluded lake in Virginia. Alone in the middle of nowhere, we discovered that we had forgotten the paddles.

Paul and I got in a canoe with Dad and our

two younger sisters got in a canoe with Mom. We floated aimlessly around the lake for hours. Then, we all jumped in with our life jackets on. We pushed the canoes back to shore. It was a fantastic trip.

Another time, Dad decided we should all learn how to ski. All of us hate the cold so we spent the weekend huddled by the fire, drinking hot coca in the ski lodge and playing board games. It was great. We had a blast.

When I stopped day dreaming, Mom was saying, "Sweetheart, we don't have a tent."

"We don't need one!" Dad said happily. "We'll take all the seats out the van when we get to the campsite and put in an air mattress."

I don't know what the punch line will be on this excursion, but I am sure with Mom, Dad and the four of us kids scrunched in a van at some national park, we are bound to have a good time.

35. Which best describes the narrator's tone?
- |                  |              |
|------------------|--------------|
| a. Condescending | b. Sarcastic |
| c. Jovial        | d. Annoyed   |
36. The narrator probably says the camping trip will have a punch line because he or she feels it will
- |                                  |
|----------------------------------|
| a. be expensive                  |
| b. have difficulties             |
| c. have a funny ending           |
| d. involve fighting and turmoils |
37. As used in the middle of the story, which of the following could accurately be described as **secluded**?
- |   |
|---|
| I. A hiking trail known only to a few.        |
| II. A crowded movie theater.                  |
| III. A popular beach on the California coast. |
- |               |                 |
|---------------|-----------------|
| a. Only I     | b. I and II     |
| c. II and III | d. All of these |
38. As used at the end of the story, which is the best synonym for **excursion**?

- a. Evolution  
b. Exodus  
c. Expedition  
d. Hiatus
39. What lesson does the narrator's family seem to live by?  
a. Camping is sure to be an adventure  
b. Danger is only in the imagination  
c. Things don't need to go as planned to have fun  
d. Reading the newspaper is a recipe for trouble
40. Which alternate title fits this passage best?  
a. "No Paddles"  
b. "Never as Planned"  
c. "Hot Coca by the Fire"  
d. "Van Camping for Beginners"

## Section E – Logical Reasoning

*In the following questions 41 to 45 questions numbers are arranged in a series with some principles understanding it. One term in the series is missing as shown by . This term is given as one of the alternative amongst the four numbers given below it. Find this term and show your answer against the question number on the answer sheet.*

निम्नलिखित प्रश्नों में प्रश्न संख्याएं 41 से 45 एक श्रृंखला में व्यवस्थित की गयी हैं। श्रृंखला में एक अंक गायब है। यह अंक नीचे दिए गए चार विकल्पों में से एक है। इसे ढूँढ़ें और उत्तर पत्र में प्रश्न संख्या के सामने उत्तर इंगित करें

41. 1, 12, 18, 25, , 52  
a. 32  
b. 33  
c. 35  
d. 34
42. 9, 16, 25, 36, , 64, 81

- a. 407  
b. 427  
c. 467  
d. 49
43. 2, 2, 4, 12, 48, .777777  
a. 2407  
b. 2207  
c. 1927  
d. 200
44. 25, 22, 18, 13, 7, .  
a. 17  
b. 727  
c. 737  
d. 70
45. 8, 27, 64, 125, , 343, 512  
a. 150  
b. 220  
c. 216  
d. 180

***In question 46 to 50, English alphabets are given digital numbers. Using them, find the correct code of other English words from the alternatives.***

प्रश्न 46 से 50 में, अंग्रेजी वर्णों को अंकीय संख्या में कोडित किया गया है। कोड का प्रयोग कर, दिए गए अंग्रेजी वर्णों का विकल्पों से सही कोड निकालें

46. TAKE = 3456, KAML = 5479, MAKE = ?  
a. 7465  
b. 7456  
c. 7546  
d. 7564
47. DOG = 467, CAT = 321, GOT = ?  
a. 716  
b. 761  
c. 671  
d. 617
48. A = 1, B = 2, C = 3, D = 4, E = 5, F = 6, G = 7, H = 8, I = 9 and BCGH = 2378, CDHI = ?  
a. 3498  
b. 3849  
c. 3489  
d. 3894
49. CAMEL = 34567, METAL = 56847, LEMAT = ?  
a. 76584  
b. 76458  
c. 76548  
d. 76854
50. HIDE = 8945, BDAF = 2416, DIBF = ?  
a. 4962  
b. 4692  
c. 4296  
d. 4926