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PREVIOUS YEAR PAPER · 2020-21

OLYMPIAD · STAGE I

IOQB

Indian Olympiad Qualifier in Biology (Part I)

2020-21

Question paper, answer key and Zigyan solutions

32	120	60 min	21
Questions	Maximum marks	Time	Paper code

Question paper and official answer key: Indian Association of Physics Teachers (IAPT), IOQB 2020-21, paper code 21.
Solutions and notes: Zigyan. This booklet is not an IAPT publication.

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PART A-1 · ONE CORRECT OPTION

Q. 1 – 24 · +3 for a correct answer, –1 for a wrong one

1. The recombination frequencies of q, r, s and t genes on a chromosome were- t & q= 30%, r & s= 7%, s & t= 25% and r & q= 12%. Arrangement of these genes on the chromosome would be:

(A) q, r, s, t (B) s, q, r, t (C) q, s, r, t (D) t, s, q, r

Solution · Q1 **Answer: (C)**

1% recombination frequency is taken as 1 map unit.

The distance between t and q is the largest, so they lie at the two ends.

With r – q of 12 and r – s of 7 map units, place s between q and r:

$$q - s = 12 - 7 = 5$$

$$\Rightarrow s - t = 30 - 5 = 25$$

This agrees with the given s & t value.

$\therefore$ The order is q – s – r – t.

IAPT answer: (C) | **Zigyan answer:** (C)

2. Flagellum of which of the following has organization different from others?

(A) *Chlamydomonas reinhardtii* (B) *Vibrio cholerae*

(C) *Trypanosoma aruzi* (D) Gametes of *Ulothrix*

Solution · Q2 **Answer: (B)**

Vibrio cholerae is a bacterium. The filament of its flagellum is made of the protein flagellin and has no microtubules.

Chlamydomonas, *Trypanosoma* and the gametes of *Ulothrix* are eukaryotic, with 9 + 2 flagella.

IAPT answer: (B) | **Zigyan answer:** (B)

3. Which of the following polypeptide chain is translated from the following sense strand of 5' ATG AGA GTT GAG GAT TTA TCT 3'?

Ser – UCU; Leu – UUA; Glu – GAG; Met – AUG; Arg – AGA; Asp – GAU; Val – GUU

(A) COOH – Met – Arg – Val – Glu – Asp – Leu – Ser – H_2N

(B) COOH – Met – Glu – Leu – Arg – Asp – Val – Ser – H_2N

(C) H_2N – Met – Arg – Val – Glu – Asp – Leu – Ser – COOH

(D) H_2N – Met – Glu – Leu – Arg – Asp – Val – Ser – COOH

Solution · Q3 **Answer: (C)**

The mRNA reads like the sense strand, with U in place of T:

5' AUG AGA GUU GAG GAU UUA UCU 3'

Translation runs 5' → 3', and the chain grows from the amino end to the carboxyl end:

H_2N – Met – Arg – Val – Glu – Asp – Leu – Ser – COOH

IAPT answer: (C) | **Zigyan answer:** (C)

4. Abundance of trees bearing buttress roots indicates that the soil is:

(A) shallow and nutrient-poor. (B) shallow and dry.

(C) deep and nutrient rich. (D) deep and clayey.

Solution · Q4 **Answer: (A)**

Buttress roots are wide, plank-like roots at the base of tall trees. They spread sideways and support the tree where roots cannot go deep.

They are typical of tropical forests with shallow, nutrient-poor soil, where nutrients stay mainly in the surface layer.

IAPT answer: (A) | **Zigyan answer:** (A)

5. The identification tags on the cell membranes for cell- to-cell recognition are:

(A) Glycoproteins. (B) Lipoproteins. (C) Glycolipids. (D) Nucleoproteins.

Solution · Q5 **Answer: (A)**

Carbohydrate chains of membrane glycoproteins project from the outer cell surface. They serve as identification tags that other cells recognise.

IAPT answer: (A) | **Zigyan answer:** (A)

6. Independent assortment has the possibility of producing different gametes. How many different gametes could possibly be produced in humans?

(A) 2^{46} (B) 23^2 (C) 46^2 (D) 2^{23}

Solution · Q6 **Answer: (D)**

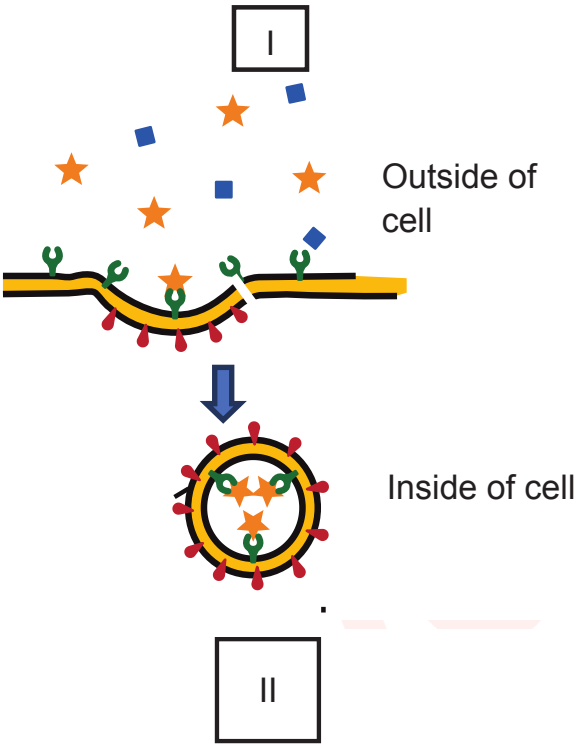
Humans have 23 pairs of homologous chromosomes, and each pair assorts independently.

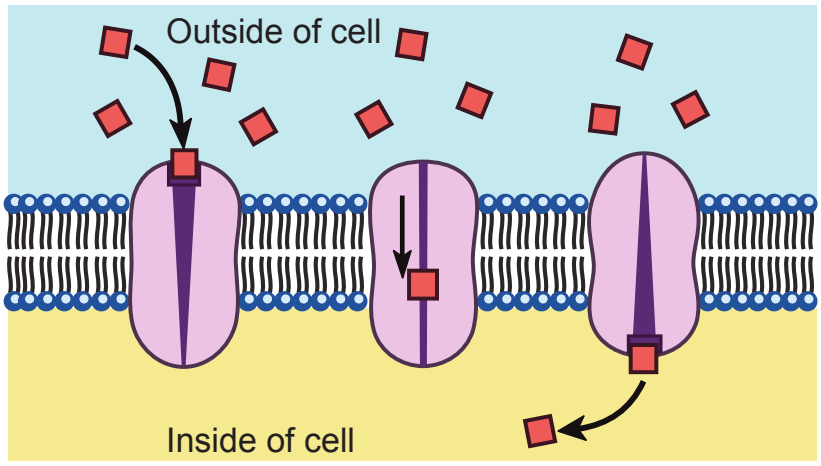
Ignoring crossing over, the number of gamete types is:

$$2^n = 2^{23}$$

IAPT answer: (D) | **Zigyan answer:** (D)

7. Two processes of transport (I and II) are depicted. These processes respectively represent:





(A) Active transport and passive transport.
(B) Active transport for both.
(C) Passive transport for both.
(D) Passive and active transport.

Solution · Q7 **Answer: (A)**

I is receptor-mediated endocytosis: molecules bind receptors, the membrane folds in and forms a vesicle. It uses energy, so it is active transport.

II is facilitated diffusion: the solute passes through membrane proteins from its higher concentration outside to its lower concentration inside. No energy is spent, so it is passive.

IAPT answer: (A) | **Zigyan answer:** (A)

8. The Eastern meadow lark and Western meadow lark are distinct biological species with similar body shape and coloration but different breeding songs which prevents members of these species from mating. This is an example of:

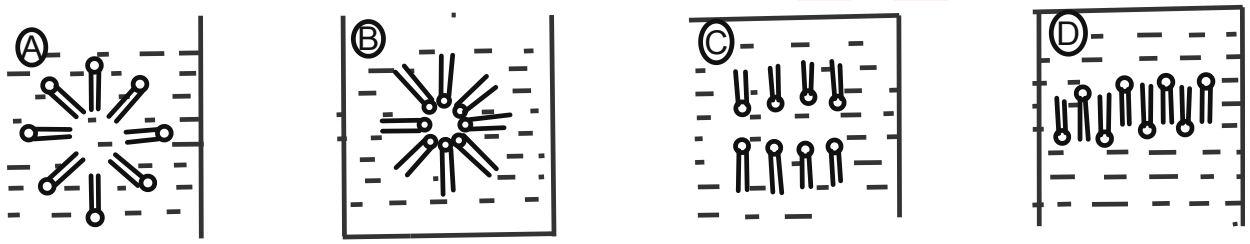
(A) pre-zygotic isolation.
(B) reduced hybrid viability.
(C) hybrid breakdown.
(D) temporal isolation.

Solution · Q8 **Answer: (A)**

The different breeding songs prevent mating, so no zygote is formed. This is behavioural isolation, a type of pre-zygotic isolation.

IAPT answer: (A) | **Zigyan answer:** (A)

9. Which of the following structures represents a stable lipid-water interaction in protoplasm?



(A) Structure A (B) Structure B (C) Structure C (D) Structure D

Solution · Q9 **Answer: (A)**

Membrane lipids are amphipathic. Their polar heads stay in contact with water and their non-polar tails keep away from it.

Only in structure A do all the heads face the surrounding water while all the tails turn inwards, as in a micelle.

IAPT answer: (A) | **Zigyan answer:** (A)

10. A group of hens was observed for 300 minutes and the aggressive pecking behavior was recorded. The numbers indicate the frequency with which the hen in the row pecks the hen in the column.

		P	Q	R	S
Row 1	**P**	-	0	0	0
Row 2	**Q**	59	-	17	92
Row 3	**R**	8	0	-	7
Row 4	**S**	6	0	0	-

The data obtained indicates the correct pecking order as:

(A) P > S > R > Q (B) Q > S > R > P (C) Q > R > S > P (D) S > Q > R > P

Solution · Q10 **Answer: (C)**

Each row shows whom that hen pecks:

Q pecks P, R and S.

R pecks P and S.

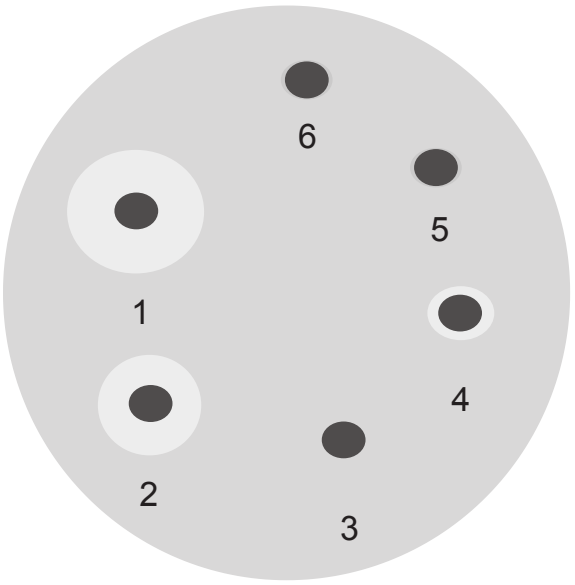
S pecks only P.

P pecks none.

$\therefore Q > R > S > P$

IAPT answer: (C) | **Zigyan answer:** (C)

11. In order to study the digestive activity, samples from different parts of the gastro-intestinal tract were placed on an agar containing crab shell powder. The clearance zones numbered 1, 2, 3 and 4 indicate effect of liquids from stomach, duodenum, ileum and colon respectively of an animal 'X'. Distilled water was added to positions 5 and 6 as control.



The results indicate that the animal X is:

(A) a ruminant
(B) a non-ruminant
(C) a hindgut fermenter
(D) an insectivore

Solution · Q11 **Answer: (D)**

Crab shell contains chitin, so a clearance zone shows chitin-digesting activity. The water controls (5 and 6) give no clearing.

Clearing is largest with stomach liquid (1), smaller with duodenal liquid (2), absent with ileal liquid (3) and very small with colon liquid (4).

Strong chitinase activity in the stomach suits an insectivore, which digests the chitinous exoskeleton of insects.

IAPT answer: (D) | **Zigyan answer:** (D)

12. In 1914, McCollum and his co-workers showed that a factor isolated from butter fat (X) was non-saponifiable and when added to diet, could cure xeropthalmia in young rats and bone deformities in puppies. These conditions could not be cured by yeast suspension (Y) or orange juice (Z) and also by heated butter fat. The likely factors present in X, Y and Z are respectively:

(A) Vitamin (A and D), B, C.
(B) Vitamin A, D, E.
(C) Vitamin B_1, B_2, B_{12}.
(D) Vitamin A, C, D.

Solution · Q12 **Answer: (A)**

X, the non-saponifiable part of butter fat, carries the fat-soluble vitamins: A cures xerophthalmia and D cures the bone deformities (rickets).

Y, yeast suspension, is a source of B-complex vitamins, and Z, orange juice, supplies vitamin C.

IAPT answer: (A) | **Zigyan answer:** (A)

13. A comparison of certain cell structures in three types of cells P, Q and R are tabulated below.

	Cell wall	ER	Nucleus	Mitochondria
P	Absent	Present	Present	Present
Q	Present	Absent	Absent	Absent
R	Present	Present	Present	Present

P, Q and R could respectively represent:

(A) Onion cell, *E. coli*, Mushroom cell
(B) Mouse cell, *E. coli*, *Amoeba*
(C) *E. Coli*, Mushroom cell, Onion cell
(D) *Amoeba*, *E. coli*, Onion cell

Solution · Q13 **Answer: (D)**

P: no cell wall, but ER, nucleus and mitochondria are present, so it is an animal-like eukaryotic cell.

Q: cell wall present, but no ER, nucleus or mitochondria, so it is a prokaryote.

R: cell wall and all three organelles, so it is a plant or fungal cell.

Only *Amoeba*, *E. coli* and onion cell fit P, Q and R in this order.

IAPT answer: (D) | **Zigyan answer:** (D)

14. Consider the following situations.

I: Over several generations, *Drosophila* flies are attracted to lower light intensities than higher light intensities.

II: Duck eggs of intermediate weight have the highest hatching success.

The processes of selection underway in I and II respectively are:

(A) Disruptive and Stabilizing
(B) Stabilizing and Directional
(C) Directional and Disruptive
(D) Directional and Stabilizing

Solution · Q14 **Answer: (D)**

I: the preference of the population shifts towards one extreme (low light intensity), which is directional selection.

II: the intermediate egg weight is favoured over both extremes, which is stabilising selection.

IAPT answer: (D) | **Zigyan answer:** (D)

15. If a cell has solute potential of −2000 kPa and water potential of −1600 kPa, what will be the pressure potential of the cell?

(A) −400 kPa (B) 400 kPa (C) −3600 kPa (D) 3600 kPa

Solution · Q15 **Answer: (B)**

Water potential of the cell:

$$\Psi_w = \Psi_s + \Psi_p$$

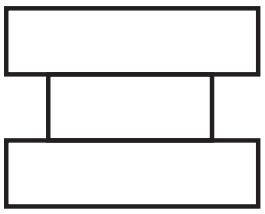
$$\Rightarrow -1600 \text{ kPa} = -2000 \text{ kPa} + \Psi_p$$

$$\Rightarrow \Psi_p = 400 \text{ kPa}$$

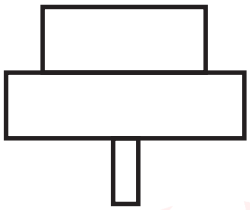
IAPT answer: (B) | **Zigyan answer:** (B)

16. For an ecosystem comprising of a tree, birds and parasites, the biomass pyramid will take the shape of:

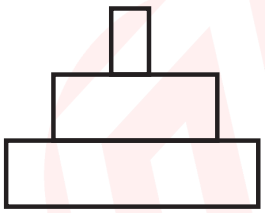
(A)



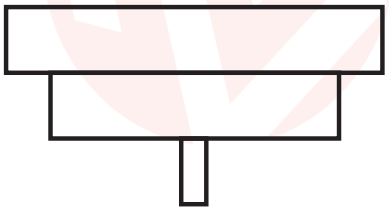
(B)



(C)



(D)



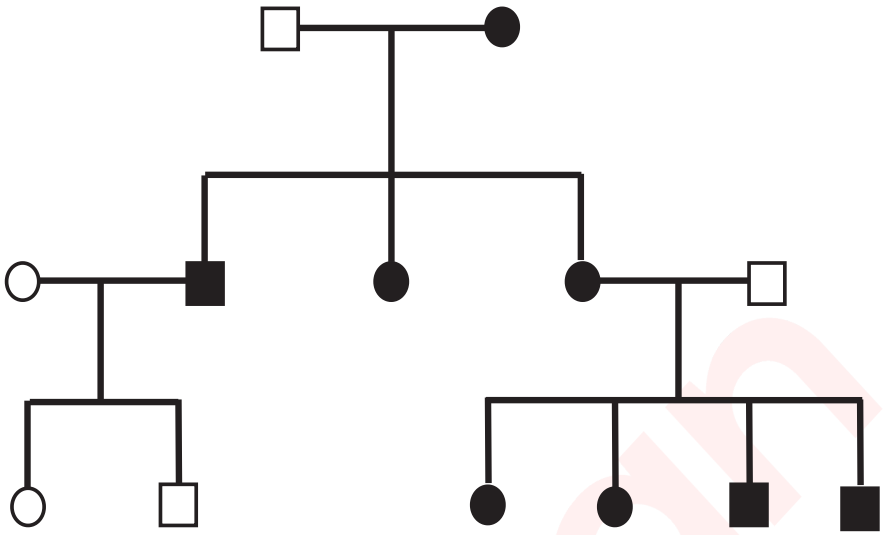
Solution · Q16 **Answer: (C)**

The tree has far more biomass than the birds on it, and the birds have far more biomass than their parasites.

Biomass falls at each higher level, so the pyramid is upright: broad base, narrow top.

IAPT answer: (C) | **Zigyan answer:** (C)

17. Inheritance of a disease trait observed in a family is represented below. It most likely indicates:



(A) Autosomal dominance.
(B) Mitochondrial inheritance.
(C) Autosomal recessive trait.
(D) X- linked recessive trait.

Solution · Q17 **Answer: (B)**

The affected mother passes the trait to all her children, both sons and daughters.

Her affected son has only unaffected children, but her affected daughter has all four children affected.

Transmission only through the mother indicates mitochondrial inheritance.

IAPT answer: (B) | **Zigyan answer:** (B)

18. The drug cytochalasin B blocks the function of actin. Which of the following aspects of the cell cycle would be more disrupted by cytochalasin B?

(A) Spindle attachments to kinetochores.
(B) DNA synthesis.
(C) Cell elongation during anaphase.
(D) Cleavage furrow formation.

Solution · Q18 **Answer: (D)**

In animal cells, cytokinesis occurs by a cleavage furrow, which is pulled inwards by a contractile ring of actin and myosin.

Spindle attachment and elongation in anaphase depend on microtubules, and DNA synthesis does not need actin.

IAPT answer: (D) | **Zigyan answer:** (D)

19. A mixture of samples containing DNA fragments a, b, c and d with molecular weights a + b = c, a > b and d > c, was subjected to agarose gel electrophoresis. What would be the sequence of bands from anode to cathode?

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

Solution · Q19 **Answer: (A)**

Given:

$$c = a + b$$

$$\Rightarrow c > a > b$$

$$\Rightarrow d > c > a > b$$

DNA is negatively charged and moves towards the anode, and the smallest fragment travels farthest.

So the bands from anode to cathode are b, a, c, d.

IAPT answer: (A) | **Zigyan answer:** (A)

20. Lack of permeability to water is very rare among biological membranes but is critical to the functioning of which of the following regions of a nephron?

(A) Descending limb of the loop of Henle.
(B) Ascending limb of the loop of Henle.
(C) Distal tube.
(D) Collecting duct.

Solution · Q20 **Answer: (B)**

The ascending limb of the loop of Henle is impermeable to water but lets electrolytes pass out. This dilutes the filtrate and helps to keep the medullary interstitium concentrated.

The descending limb is permeable to water, and the distal tubule and collecting duct also reabsorb water, under hormonal control.

IAPT answer: (B) | **Zigyan answer:** (B)

21. This fruit is a rich source of lycopene, contains 92% water by weight and pH of its pulp varies between 5 to 7. This fruit is likely to be:

(A) Lime (B) tomato (C) apple (D) watermelon

Solution · Q21 **Answer: (D)**

Watermelon is rich in lycopene, contains about 92% water and has a weakly acidic pulp with pH above 5.

Tomato is more acidic (pH below 5) and has about 94% water. Lime and apple are also more acidic and are not rich sources of lycopene.

IAPT answer: (D) | **Zigyan answer:** (D)

22. Shingle beaches (or pebble beaches) have low animal biodiversity mainly because of:

(A) very high wave effects.
(B) high salinity.
(C) unstable substratum.
(D) steep slope.

Solution · Q22 **Answer: (C)**

The pebbles of a shingle beach are constantly moved by waves and rub against one another.

This mobile, unstable substratum abrades organisms, gives them no firm surface or lasting burrow, and drains quickly. So very few animal species can live there.

IAPT answer: (C) | **Zigyan answer:** (C)

23. In flowering plants, self-pollination is often prevented through self-incompatibility. It is controlled by multiple alleles. Assuming that there are three alleles S_1, S_2 and S_3 for this and that self-incompatibility occurs if the pollen and tissue of stigma-style have an allele in common, what proportion of pollen produced by S_1S_2 plant would germinate on plants with genotype S_2S_3?

(A) 0% (B) 25% (C) 50% (D) 75%

Solution · Q23 **Answer: (C)**

The S_1S_2 plant makes S_1 pollen and S_2 pollen in equal numbers.

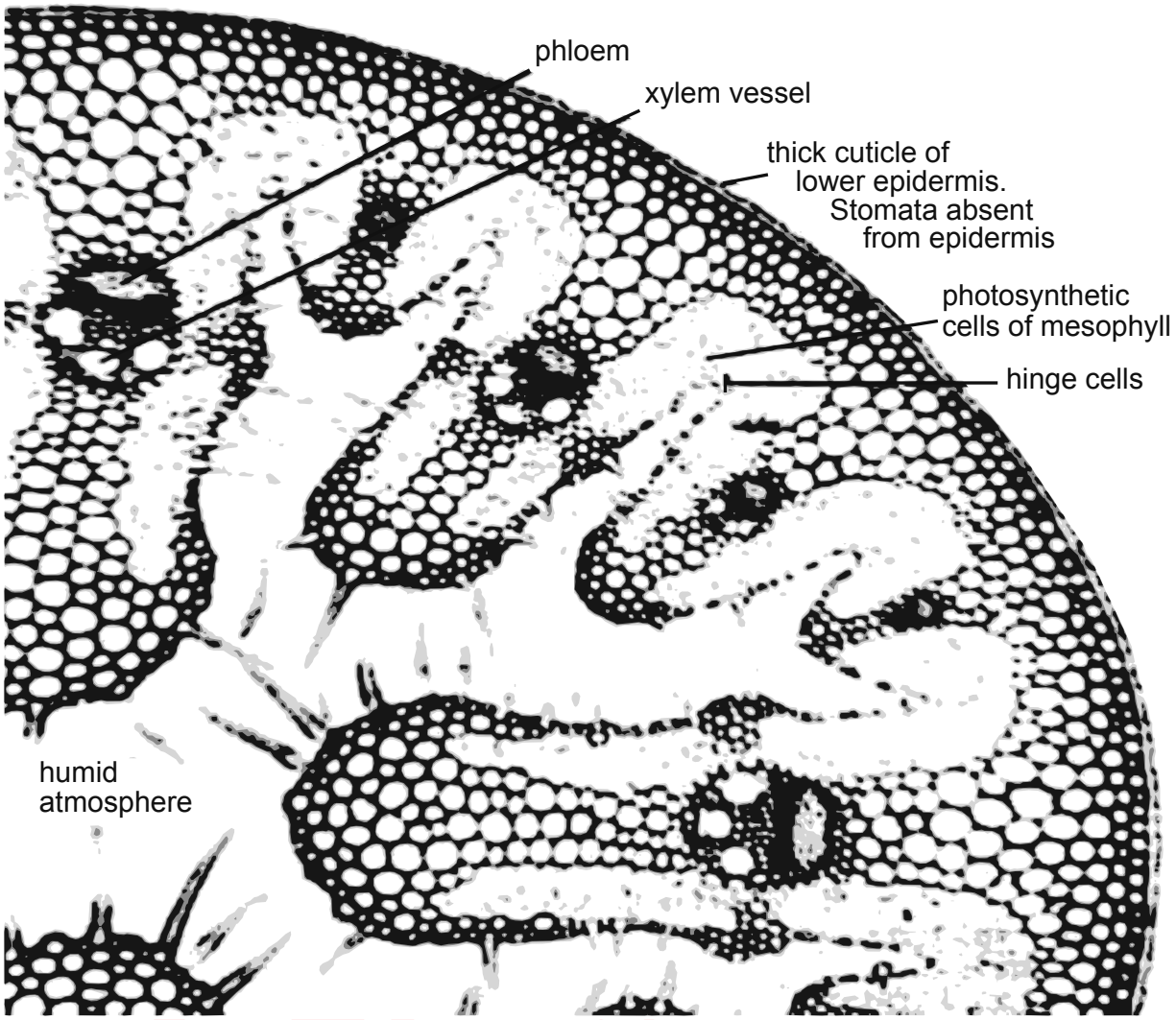
S_2 pollen shares an allele with the S_2S_3 stigma-style, so it is rejected.

Only S_1 pollen germinates.

$\therefore$ 50%

IAPT answer: (C) | **Zigyan answer:** (C)

24. The accompanying diagram represents a cross section of leaf blade of a grass. The anatomical features suggest it to be a:



(A) xerophyte (B) hydrophyte (C) hygrophyte (D) mesophyte

Solution · Q24 **Answer: (A)**

The section shows a rolling leaf with hinge cells, a thick cuticle, no stomata on the exposed lower epidermis, and hairs in the enclosed humid space.

All these cut down water loss.

∴ It is a xerophyte.

IAPT answer: (A) | **Zigyan answer:** (A)

PART A-2 · ONE OR MORE CORRECT OPTIONS

Q. 25 – 32 · 6 marks only if all correct options are marked · no negative marking

25. Birdwatchers often take the count of different birds in the area to comment upon its biodiversity. The accompanying table gives such a data for three regions 1, 2 and 3. Assume that the three regions match in terms of environmental factors and equal time is spent for watching for all the three plots.

	Plot 1	Plot 2	Plot 3
Magpie Robin	2	2	2
Indian Robin	3	2	4
Ring Dove	2	2	2
Drongo	3	1	2
Sparrow	4	25	6
Crow	1	18	3
Oriole	0	1	2
Minivet	0	1	1
Flycatcher	0	1	1

Which of the following statements is correct?

(A) Greater variety of resources is available in plot 2 than plot 3.

(B) Biodiversity of plots 2 and 3 is the same.

(C) Resource utilization is more even in plot 3 than plot 2.

(D) More reliable data can be obtained if observations are made during nesting season of the birds.

Solution · Q25 **As per Zigyan: (C), (D)**

Plot 1 has 6 species; plots 2 and 3 have 9 each.

(A) Plots 2 and 3 have equal species numbers; greater variety of resources in plot 2 is not shown. ∴ false.

(B) Equal richness but unequal evenness; biodiversity is not the same. ∴ false.

(C) Sparrows and crows are 43 of 53 birds in plot 2, but 9 of 23 in plot 3. Plot 3 is more even. ∴ true.

(D) In the nesting season, birds stay in their breeding areas and call often, so resident birds are counted more reliably. ∴ true.

Check: The commonest species forms 25 of 53 birds in plot 2, but only 6 of 23 in plot 3.

IAPT answer: (C), (D) | **Zigyan answer:** (C), (D)

26. Within a population's geographic range, local densities may differ substantially creating contrast patterns of dispersion. Which of the following examples represent clumped dispersion?

(A) Mushrooms growing on rotting log.

(B) Birds nesting on small islands exhibiting territoriality.

(C) Mayfly adult populations which survive only for a day or two.

(D) Growth of dandelion plants from wind-blown seeds.

Solution · Q26 **Answer: (A), (C)**

(A) Mushrooms crowd on a patchy resource, the rotting log. ∴ clumped.

(B) Territoriality spaces the nests evenly. ∴ uniform.

(C) Short-lived mayfly adults swarm together for mating. ∴ clumped.

(D) Wind drops the seeds by chance. ∴ random.

IAPT answer: (A), (C) | **Zigyan answer:** (A), (C)

27. In nature, species interact with its abiotic as well as biotic components. Biological *interactions can be classified into different categories based on whether they are beneficial (+), harmful (-) or neutral (0) to each of the participating member. In*teractions of two species are depicted at positions P and Q in the table.

Interaction	+	–	0
+			
–	P	Q	
0			

P and Q respectively indicate:

(A) Competition, parasitism

(B) Predation, parasitism

(C) Predation, competition

(D) Parasitism, competition

Solution · Q27 **Answer: (C), (D)**

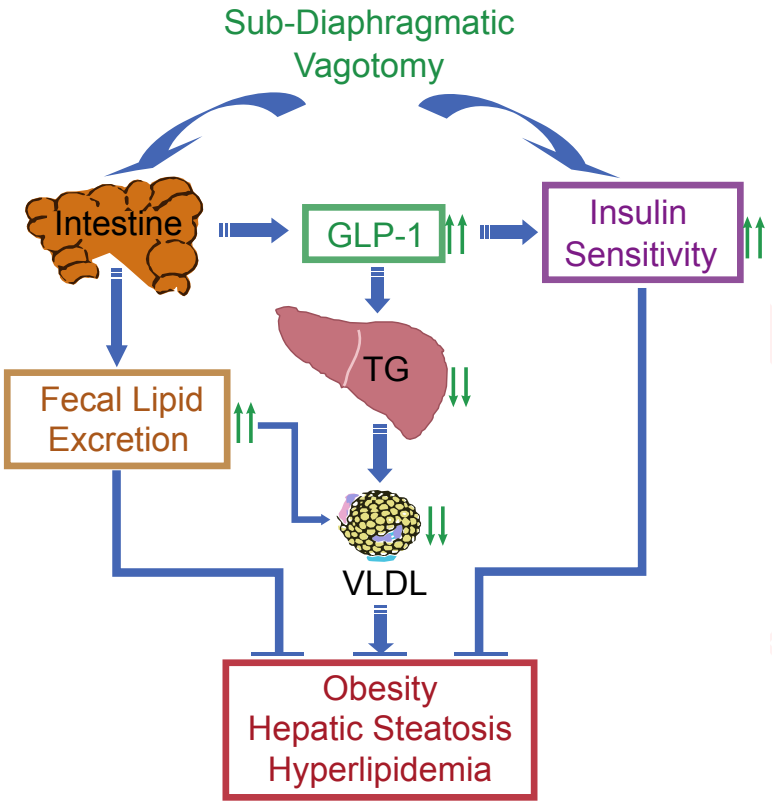
P lies in the "–" row and "+" column: one species is harmed and the other benefits, as in predation or parasitism.

Q lies at "–, –": both species are harmed, as in competition.

∴ (C) and (D) both fit.

IAPT answer: (C), (D) | **Zigyan answer:** (C), (D)

28. The diagram depicts the regulatory mechanism mediated through Glucagon like Peptide1 (GLP-1) in a mouse in which the vagus connection to hepatic – gut region has been severed.



Which of the following can be correctly deduced from the diagram?

(A) GLP-1 antagonists can increase steatorrhea (excretion of abnormal quantities of fat with the feces).

(B) GLP-1 agonists can reduce post-prandial hyperglycemia.

(C) GLP-1 agonists can reduce VLDL in the plasma.

(D) GLP-1 antagonists can decrease fasting blood sugar.

Solution · Q28 **Answer: (B), (C)**

In the diagram, a rise in GLP-1 raises insulin sensitivity and lowers liver TG and VLDL.

(A) Fecal lipid excretion is shown coming from the intestine, not through GLP-1. ∴ cannot be deduced.

(B) Agonist ⇒ higher insulin sensitivity ⇒ better glucose uptake after meals. ∴ true.

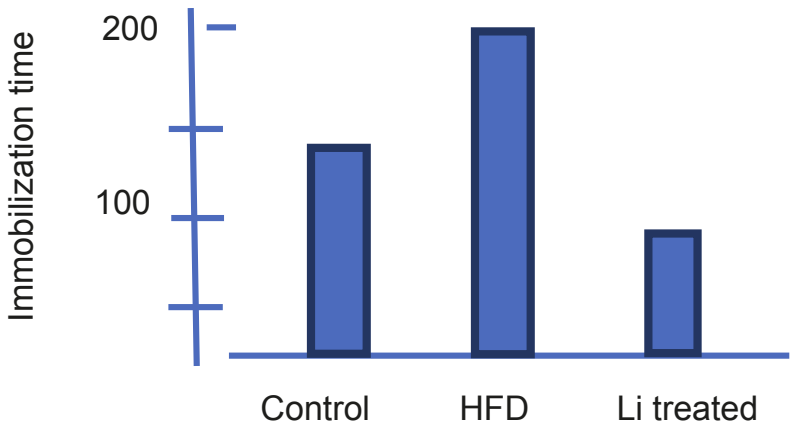
(C) Agonist ⇒ less liver TG ⇒ less VLDL. ∴ true.

(D) An antagonist would lower insulin sensitivity, so blood sugar would not fall. ∴ false.

IAPT answer: (B), (C) | **Zigyan answer:** (B), (C)

29. The *tail suspension test* (TST) is developed to study the effect of drugs or chemicals on the behavior of rats. The test involves suspending mice above the ground by their tails for a period of 6 minutes. The time spent by the mouse to show any escape related activity is measured. It is subtracted from the total time to get immobilization time. It is based on the assumption that an animal will actively try to escape an aversive stimulus. If escape is impossible, the animal will eventually stop trying ("give up").

When rats fed with high fat diet (HFD) and those fed with lithium were tested using TST, the following results were obtained.



Which of the following statements are true?

(A) High caloric value of HFD provided more energy to the mice.

(B) Li proves toxic to brain tissues and increases stress of mice.

(C) High fat content in the diet led to less agility and lesser efforts to escape the aversive situation.

(D) Li has improved the stress overcoming efforts of the mice.

Solution · Q29 **As per Zigyan: (C), (D)**

Longer immobility means less effort to escape.

Immobility time: HFD > control > Li treated.

(A) The HFD group struggled least; extra energy is not seen. ∴ false.

(B) Li gave the least immobility; the graph shows no toxicity or added stress. ∴ false.

(C) HFD gave the most immobility, that is, less agility and less effort to escape. ∴ true.

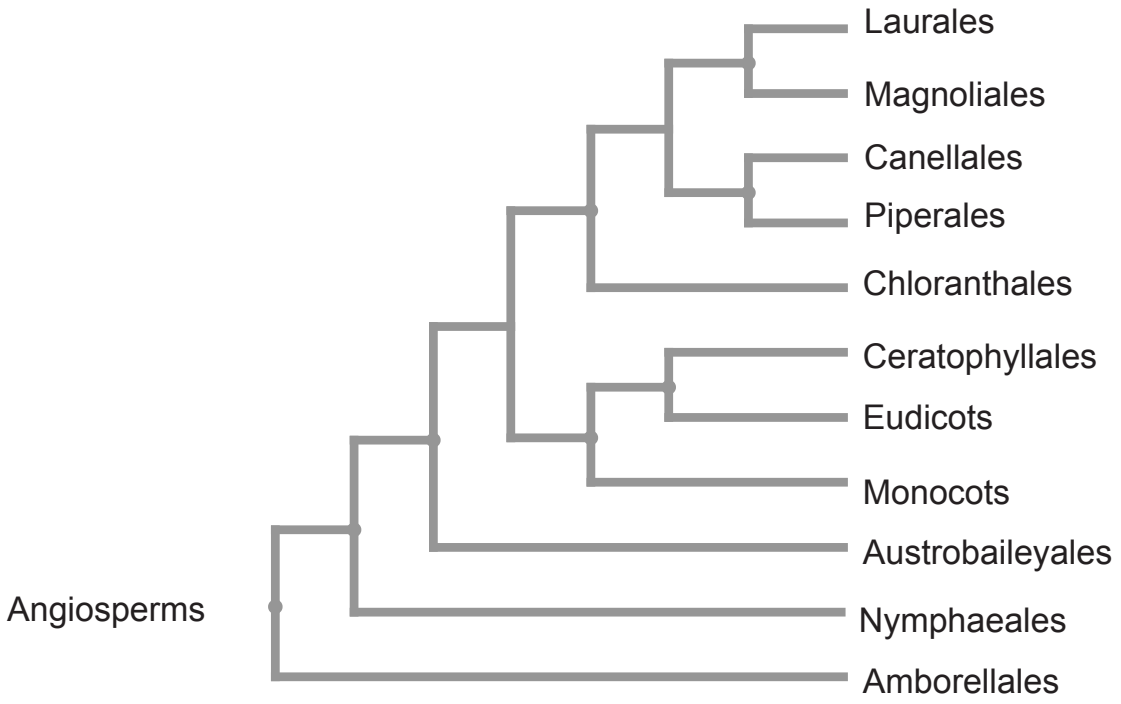
(D) Li gave more escape effort than control. ∴ true.

The stem names rats as well as mice; the bars are read the same way for either.

Check: Active time is the 6 minute test minus immobilization time, so it is longest with Li and shortest with HFD.

IAPT answer: (C), (D) | **Zigyan answer:** (C), (D)

30. Study the given cladogram and state which of the following statements is/are true.



(A) Laurales cannot be considered as an outgroup.

(B) Austrobaileyales and Nymphaeales are polyphyletic groups.

(C) Eudicots and Monocots are paraphyletic orders.

(D) Chloranthales are more closely related to Piperales than to Canellales.

Solution · Q30 **As per Zigyan: (A)**

(A) For the angiosperms shown, the outgroup is the first branch, Amborellales. Laurales is nested deep inside. ∴ true.

(B) Each is shown as a single lineage, not as a group of separate origins. ∴ false.

(C) Eudicots and Monocots are not orders, and each is monophyletic. ∴ false.

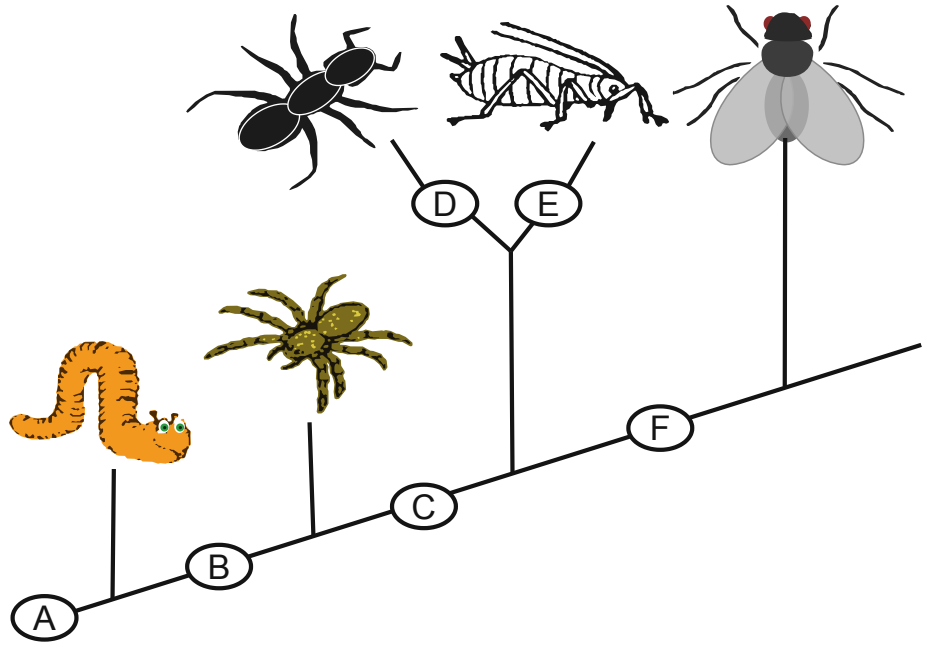
(D) Chloranthales is sister to the whole clade holding Piperales and Canellales, so it is equally related to both. ∴ false.

Why Zigyan differs from IAPT: monocots and eudicots are each monophyletic groups containing many orders, so neither is a paraphyletic order.

Reference: Digital Atlas of Ancient Life (Paleontological Research Institution), 'Overview of Angiosperm Phylogeny': monocots and eudicots are each monophyletic, with 11 and 44 orders respectively; the traditional dicots are the paraphyletic group.

IAPT answer: (A), (C) | **Zigyan answer:** (A)

31. Based on the cladogram given below, match the following derived characteristics listed in the table with the alphabets A – D and choose the correct option/s.



Number	Characteristic
1	Legs
2	Cerci
3	Segmented Body
4	6 legs
5	Wings
6	Crushing Mouthparts

(A) A: 6; C: 5; F: 2 (B) B: 2; D: 4; E: 6 (C) B: 1; E: 2; F: 5 (D) A: 3; C: 4; D: 6

Solution · Q31 **Answer: (C), (D)**

A trait marked on the main line is shared by all branches beyond it; a trait on a side branch belongs to that animal.

A: segmented body (3); B: legs (1); C: 6 legs (4).

D (ant): crushing mouthparts (6); E: cerci (2); F (only the fly lies beyond it): wings (5).

The diagram and options use the letters A to F.

∴ (C) and (D) match.

IAPT answer: (C), (D) | **Zigyan answer:** (C), (D)

32. Which of the following are the possible agents of change in allele frequency?

(A) Random mating.
(B) Gene flow.
(C) Genetic drift.
(D) Assortative mating.

Solution · Q32 **As per Zigyan: (B), (C)**

(A) Random mating keeps allele frequencies unchanged. ∴ false.

(B) Gene flow adds or removes alleles. ∴ true.

(C) Genetic drift changes allele frequencies by chance. ∴ true.

(D) Assortative mating (like with like) regroups the same alleles into more homozygotes and fewer heterozygotes. ∴ false.

Why Zigyan differs from IAPT: assortative mating is non-random mating that changes genotype proportions; by itself it adds or removes no allele.

Reference: NCERT Biology Class XII, Chapter 6 'Evolution', section 6.7: gene flow and genetic drift disturb Hardy-Weinberg equilibrium by changing allele frequencies.

Reference: OpenStax Concepts of Biology, section 11.1 'Discovering How Populations Change': non-random mating shifts genotype frequencies, not allele frequencies.

Check: With complete selfing, Aa parents give 1 AA, 2 Aa and 1 aa, so their A and a alleles stay half each.

IAPT answer: (B), (C), (D) | **Zigyan answer:** (B), (C)

ANSWER KEY

IOQB 2020-21 · PAPER CODE 21

32
QUESTIONS · 120 MARKS

IAPT final answer key for paper code 21. ★ marks an answer given as per Zigyan.

1	(C)	2	(B)	3	(C)	4	(A)	5	(A)
6	(D)	7	(A)	8	(A)	9	(A)	10	(C)
11	(D)	12	(A)	13	(D)	14	(D)	15	(B)
16	(C)	17	(B)	18	(D)	19	(A)	20	(B)
21	(D)	22	(C)	23	(C)	24	(A)	25	(C), (D)★
26	(A), (C)	27	(C), (D)	28	(B), (C)	29	(C), (D)★	30	(A)★
31	(C), (D)	32	(B), (C)★						

★ Answers as per Zigyan

- **Q25** — As per Zigyan: (C), (D); IAPT key (C), (D).
- **Q29** — As per Zigyan: (C), (D); IAPT key (C), (D).
- **Q30** — As per Zigyan: (A); IAPT key (A), (C).
- **Q32** — As per Zigyan: (B), (C); IAPT key (B), (C), (D).

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OLYMPIADS · 2026

Olympiad results



TOP ACHIEVEMENT · CHEMISTRY

Qualified the Chemistry Olympiad twice, and selected for the HBCSE camp.

Saksham Bishnoi reached the national stage of the Chemistry Olympiad in two consecutive years and was selected for the Orientation-cum-Selection Camp at HBCSE, Mumbai. 4 Years Classroom - the same student who took AIR 168 in JEE Advanced 2026.

Qualified twice | HBCSE selection camp | Only student from Faridabad

Above MAS means above the **Minimum Admissible Score**: clearing it puts a student in the national band for their subject. It is a real threshold, not a participation marker.

CHEMISTRY · ABOVE MAS



Sulokya Bibhuty
Class XII
3 Years Classroom
Above MAS



Anay Gupta
Class XI
3 Years Classroom
Above MAS



Akshat Khator
Class XI
3 Years Classroom
Above MAS



Harshit Goyal
Class XII
4 Years Classroom
Above MAS



Hardik Sharma
Class XI
3 Years Classroom
Above MAS



Aarush Kumar
Class XII
1 Year Classroom
Above MAS

PHYSICS · ASTRONOMY · MATHEMATICS

PHYSICS



Sulokya Bibhuty
Class XII
3 Years Classroom
Above MAS

PHYSICS



Saksham Bishnoi
Class XII
4 Years Classroom
Above MAS

ASTRONOMY



Sulokya Bibhuty
Class XI
3 Years Classroom
Above MAS

MATHEMATICS · IOQM



Priyanshi
Class XI
4 Years Classroom
IOQM Qualifier

OLYMPIADS WE PREPARE STUDENTS FOR

NSEP	NSEC	NSEB	NSEA	IOQM	NSEJS
Physics	Chemistry	Biology	Astronomy	Mathematics	Class X and below

The olympiad pathway starts in Class 8.

NSEJS is open to Class 10 and below - the habit of staying with one hard problem is the one JEE Advanced rewards.

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RESULTS · 2021 – 2026

Our toppers, year by year

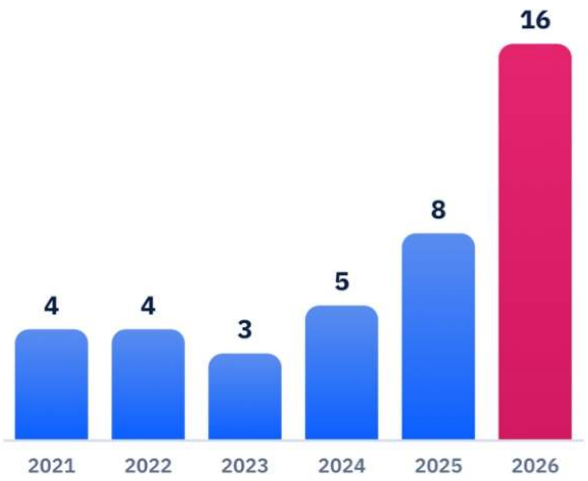
40
JEE Advanced selections in 6 years

AIR 168
best rank — Saksham Bishnoi, 2026

16 of 35
students selected, JEE Advanced 2026

14 of 35
above 98 percentile, JEE Main 2026

JEE ADVANCED SELECTIONS PER YEAR



BEST RANK EACH YEAR

YEAR	JEE ADVANCED	JEE MAIN
2026	**Saksham Bishnoi** AIR 168 · 4 Years Classroom	**Saksham Bishnoi** AIR 811 · 99.95 %ile
2025	**Chakshu** AIR 4,233 · 2 Years Classroom	**Chakshu** AIR 8,538 · 99.44 %ile
2024	**Harshit** AIR 777 · 2 Years Classroom	**Harshit** AIR 1,473 · 99.91 %ile
2023	**Aditya Jain** AIR 2,373 · 2 Years Classroom	**Aditya Jain** AIR 2,503 · 99.79 %ile
2022	**Rachit Sharma** AIR 698 · 1 Year Classroom	**Rachit Sharma** AIR 1,016 · 99.90 %ile
2021	**Sparsh Mittal** AIR 2,237 · 1 Year Classroom	**Sparsh Mittal** AIR 1,562

JEE ADVANCED 2026 — THIRTEEN NAMED SELECTIONS



Saksham Bishnoi
AIR 168
4 Years Classroom



Sulokya Bibhuty
AIR 1,315
3 Years Classroom



Aarush
AIR 2,699
1 Year Classroom



Manishka
AIR 2,869
4 Years Classroom



Oojit Kumar
AIR 5,765
4 Years Classroom



Harshit Goyal
AIR 6,407
4 Years Classroom



Pranab Sharma
AIR 6,750
3 Years Classroom



Aditya Dhar
AIR 15,183
3 Years Classroom



Arpit Anshuman
AIR 19,308
4 Years Classroom



Lokesh
AIR 22,857
3 Years Classroom



Arjun
AIR 24,674
3 Years Classroom



Sanyam Gulyani
AIR 25,123
1 Year Classroom



Saket
AIR 27,628
3 Years Classroom

Sixteen students of the 2026 batch were selected in JEE Advanced; the thirteen above are named with their All India Rank.

JEE MAIN 2026 — TOP SIX, WITH PERCENTILE



Saksham Bishnoi
AIR 811
99.95 %ile
4 Years Classroom



Sulokya Bibhuty
AIR 1,095
99.94 %ile
3 Years Classroom



Harshit Goyal
AIR 2,662
99.83 %ile
4 Years Classroom



Manishka
AIR 4,817
99.70 %ile
4 Years Classroom



Oojit Kumar
AIR 5,040
99.69 %ile
4 Years Classroom



Aarush
AIR 5,276
99.67 %ile
1 Year Classroom

14 of the 35 students in the 2026 batch scored above the 98th percentile in JEE Main.

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