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RNTSE : 2024-25
Resonance Nashik Talent Search Exam

QUESTION PAPER

For Students of Class 9th Std.

Exam Date : 29th Oct 2023 **Duration : 90 Min.** **Max. Marks : 210**

CITY RANK - 1

AIR-166
ABHISHEK GUPTA
IIT-DELHI

AIR-1042
KAUSHAL MORANKAR

CITY RANK - 2

AIR-536
ARYA JOSHI
IIT-BOMBAY

AIR-609 (cat)
ANKUR BORSE
KEM-MUMBAI

Instructions :
1) Paper contains four sections (I) Physics (II) Chemistry (III) Maths (IV) Biology.
2) Total number of questions 70. (Physics-15, Chemistry-15, Maths-25, Biology-15)
3) Single correct option type : out of four options given, only one option will be correct.
4) All questions are compulsory.
5) Each question carry +3 marks for correct option marked and -1, if incorrect option is marked. Zero mark if not attempted.
6) Use black / blue ball pen for filling OMR.
7) You must fill your enrollment number in the given appropriate box in the OMR.

JEE 2023 RESULTS @ NASHIK

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ABHISHEK GUPTA
IIT-Delhi
Computer Science(Dual)
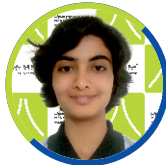
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IIT-BOMBAY
Engineering Physics

KAUSHAL MORANKAR
IIT - Hydrabad
Computer Science(B.Tech)

TANISHA HASE
IIT - BOMBAY
Electrical Engineering(Dual)

OJAS PATHAK
IIT - BOMBAY
Chemical Engineering (B.Tech)

SHIVAM SHANKAR
IIT - BOMBAY
Engineering Physics

ASHISH MORE
IIT - GUWAHATI
Energy Engineering

RUSHAD TIDAKE
IIT - Delhi
Production & Industrial Eng.
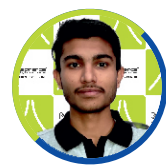
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IIT - ROORKEE
Geophysical Technology
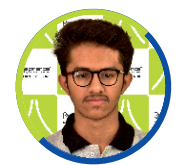
AYUSH PAWAR
IIT - BOMBAY
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Applied Geology 4 Yrs. B.Sc.

SHANESHRAJE KADU
IIT - BHU (VARANASI)
Industrial Chemistry
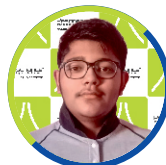
PAWAN BHATKAR
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IIT - DHANBAD
Petroleum Engineering
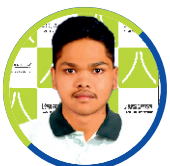
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NIT - TRICHY
Instrumentation Engineering
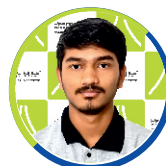
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Electronics & Communication

YASH GOHIL
NIT - SURAT
Electrical Engineering

ABHISHEK KUMBHAR
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NIT - NAGPUR
Metallurgical Engineering

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1. Starting from stationary position **Kaushal Morankar** paddles his bicycle to attain a velocity 6m/s in 30 sec, then move with the constant speed for next 2 minutes. C onsider the following statements
    I. His average acceleration during 1st 30 sec motion is 0.2 m/s²
    II. He travels a total distance 900 m in 1st two and half minutes
    III. He travels a total distance 810 m in 1st two and half minutes
    .

    (A) Only I correct   (B) Only II correct   (C) Only I &II correct   (D) Only I & III correct

2. **Tanisha Hase**, student of IIT Bombay electrical engineering department Completes one round of **SAC**(Student Activity Center) ground in 9 min 10 sec on her bicycle then find her Average speed , If diameter of the ground is 700 meter
    (A) 2 m/s   (B) 3 m/s   (C) 4 m/s   (D) 5 m/s

3. The Odometer of car reads 2005 Km at the start of trip and 2293Km at the end of the trip. If the trip took 8 hour then average speed of car will be

    (A) 36 m/s   (B) 10m/s   (C) 12m/s   (D) $\dfrac{2293}{8}$ km/h

4. A source of sound produces waves of wavelength 0.80m in air. The same source of sound produces waves of wavelength 4.0m in water . If the velocity of sound in air = 332 m/s
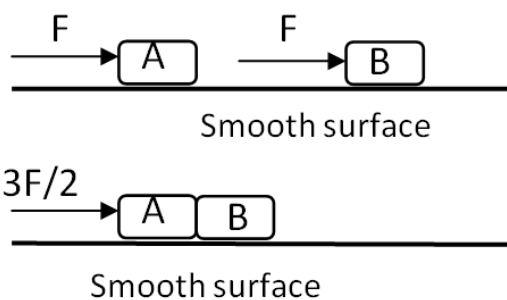   Find the velocity of sound in water.
    (A) 1500 m/s   (B) 1450m/s   (C) 1660 m/s   (D) None of these

5.   The characteristics which helps us to distinguish one sound from another sound having the same pitch and loudness is
    (A) velocity   (B) amplitude   (C) quality or Timbre   (D) None of the above

6.   Two wires are made of the same material and have the same volume. However wire 1 has cross sectional area A and wire 2 has cross sectional are 3A .
     If the length of wire 1 is increased by Δx on applying force F, how much force is needed to stretch wire 2 by the same amount ?
    (A) 4F   (B) 6F   (C) 9F   (D) F

7. A sound wave has a frequency 2 KHz and wavelength 7 cm . How long will it take to travels 2.8 km distance?
    (A) 2 sec   (B) 200 sec   (C) 40 sec   (D) 20 sec

8.   A boy starts from rest is accelerated Uniformly for 30 sec. IF x_1, x_2, x_3 are the distances travelled in first 10 sec, next 10 sec, and last 10 sec respectively, then $x_1 : x_2 : x_3$ is
    (A) $1:2:3$ (B) $1:1:1$ (C) $1:3:5$ (D) $1:4:9$

9. A stone falls freely from rest ,and the total distance covered by it in last second of its motion equals the distance covered by it in the first three second of its motion. Find the time for which the stone remains in the air
    (A) 10 sec   (B) 5 sec   (C) 3 sec   (D) None of these

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10. Two places *A* and *B* are connected by a straight road. **Om deore** and **Rushad Tidake** start by motorbikes respectively from *A* and *B* at the same time; after meeting each other, they complete their journey in 90 minutes and 40 minutes respectively. If the speed of **Om's** bike is 30 *km*/hr., then the speed of Rushad's bike (in *km*/hr.) is …
(A) 45   (B) 24   (C) 20   (D) 67.5

11. The elastic potential energy of a stretched given by $E = 50x^2$ where 'x' is of the elongation of the spring in meter and 'E' is in joule, then the force constant of the spring is
(A) 50N.m   (B) 100N.m^{-1} (C) 10N/m^2 (D) 1000 N/m^2

12. A particle of mass 0.3kg starts moving from rest, in one dimension, under a force that delivers constant power p = 1.5 watt. The kinetic energy of the particle will be 15Joule after a time of
(A) 5 sec   (B) 10 sec   (C) 12 sec   (D) 15 sec

13. An engine approaches a vertical cliff with constant speed 72km/hr. When the engine is at a distance 0.7 km from the cliff, it blows a whistle. The driver hears the echo after time … (speed of sound in air is 330 m/s)
(A) 3.88 sec   (B) 4.00 sec   (C) 4.12   (D) 4.24 sec

14. A stone is thrown horizontally and follows the XYZ path in vertical plane as shown in figure below. The direction of the acceleration of the stone at point Y is
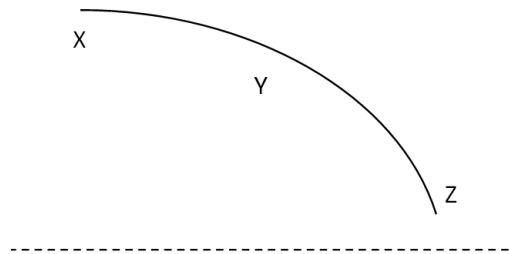
(A)   (B)   (C)   (D)

15. There are two blocks A and B placed on smooth surface separately. If a Horizontal force F applied on blocks they accelerate with acceleration 6 m/s^2 and 2 m/s^2 respectively. Now they placed touching each other and a force $\dfrac{3F}{2}$ is applied on A as shown then its acceleration will be

(A) 9 m/s^2 (B) $\dfrac{9}{4}$ m/s^2 (C) $\dfrac{11}{4}$ m/s^2 (D) 4 m/s^2

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16. The class teacher conducted an experiment in the class to separate the constituent of a mixture. The flow chart of the process is shown here, what are Y and Z respectively ?

```
                Magnate              Filtration
 ┌─────────┐  ┌──────────┐        ┌──────────────┐
 │ Mixture ├──┤ Add water├────────┤ Salt solution│
 └────┬────┘  └────┬─────┘        └──────┬───────┘
      │            │                     │
   ┌──┴──┐      ┌──┴──┐              ┌────┴────┐
   │  Y  │      │     │              │    Z    │
   └─────┘      └─────┘              └─────────┘
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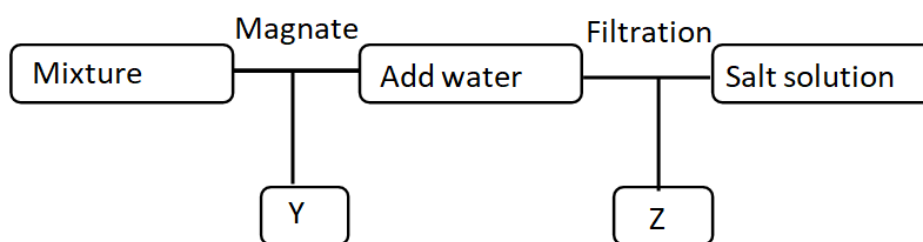
(A) Iron Nails and Sugar   (B) Sugar and Salt   (C) Iron Nails and Sand   (D) Sand & Salt

**17.** A thermometer is inserted into a beaker filled with ice at 0°C. The beaker is heated slowly. The temperature does not rise for some time, this is because.
(A) Ice is very cold
(B) Heat was used for changing ice at 0°C to water at 0°C
(C) The density of water is more than ice.
(D) The density of water is less than ice

18. Melting point of a substance is 100°C what does this mean ?
(A) The substance is a liquid at 100°C
(B) The substance is 50% solid & 50% liquid at 100°C
(C) There is an equilibrium between solid phase and liquid phase at 100°C
(D) The substance is a solid at 100°C

19. The weight percentage $\left(\frac{w}{w}\%\right)$ and weight by volume percentage $\left(\frac{w}{v}\%\right)$ of solution are 22 and 44 respectively. What is the density of the solution ?
(A) 0.5 g/ml   (B) 1 g/ml   (C) 2 g/ml   (D) 2.5 g/ml

20. Calculate the percent composition in terms of the mass of a solution obtained by mixing 300g of a 25% and 400g of a 40% solution by
(A) 65%   (B) 32.5   (C) 33.57   (D) 30%

21. Cheese is a colloid system of
(A) Gas in solid   (B) Gas in liquid   (C) Liquid in Gas   (D) Liquid in solid

22. Soham's teacher asked to identify the correct order of the processes listed below to purify water and make it safe for drinking.
(i) Filtration   (ii) Sedimentation   (iii) Chlorination   (iv) Addition of chemicals
(A) (i), (iii), (iv), (ii)   (B) (iv), (ii), (i), (iii)   (C) (ii), (iv), (i), (iii)   (D) (iii), (i), (iv), (ii)

23. Carbon tetra chloride and benzene are –
(A) Immiscible liquids   (B) Miscible liquids   (C) Both A and B   (D) None of these

24. A liquid disturbed by stirring comes to rest after some time due to its property of –
(A) Compressibility   (B) Diffusion   (C) Viscosity   (D) All of these

25. Which of the following condition is most favourable for converting a gas into liquid
(A) High pressure, low temperature   (B) Low pressure, high temperature
(C) Low pressure, low temperature   (D) High pressure, high temperature

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26. The increasing order of intermolecular space in the following is
(A) Air, iron, milk, oil   (B) Iron, oil, milk, air   (C) Iron, milk, oil, air   (D) Oil, iron, air, milk

27. When a beam of light is passed through a colloidal solution, it gets –
(A) Reflected   (B) Absorbed   (C) Scattered   (D) Refracted

28. Which of the following is chemical change
(A) Boiling egg   (B) Dissolving sugar in water
(C) Melting ice   (D) None of these

29. All gases will occupy zero volume when the temperature is reduced to
(A) $273^{O}C$ (B) 273 K   (C) $-273^{O}C$ (D) $100^{O}C$

30. An atom has net charge of -1, it has 18 electrons and 20 neutrons, its mass number is.
(A) 37   (B) 38   (C) 35   (D) 20


Section-III (Math)

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31. Find the distance between points A (9,-12) and B (-3,23).
(A) 36   (B) 37   (C) 38   (D) 39

32. If one of the angles of a triangle is 130°, then the angle between the bisectors of the other two angles can be:
(A) 50°   (B) 65°   (C) 145°   (D) 155°

33. If $x - y = 4$ and $xy = 21$ then $x^3 - y^3$ will be:
(A) 316   (B) 225   (C) –225   (D) –316

34. The coefficient of x^2 in the product of $(x - 5)(x + 3)(x + 7)$ is :
(A) 105   (B) 100   (C) 5   (D) –29

35. The difference between two numbers is 140. When the larger is divided by the smaller one the quotient is 10 and the remainder is 5. Find value when twice of bigger number is added with smaller number
(A) 315   (B) 325   (C) 295   (D) 335

36. If $x = \sqrt{5}, y = \sqrt[3]{11} \ and \ z = \sqrt[6]{124}$ then consider the following

I. 2x>y+z   II. z< y   III. $xz > y^2$
(A) All correct   (B) only I correct   (C) only I&III correct   (D) only II and III correct

37. In the diagram shown below line 1 and 2 are parallel while non parallel lines 2,3 and 4 are passing through a common point. Angles are shown in diagram in two unknown number x and y then find value of $(y^2-x^2)=$?
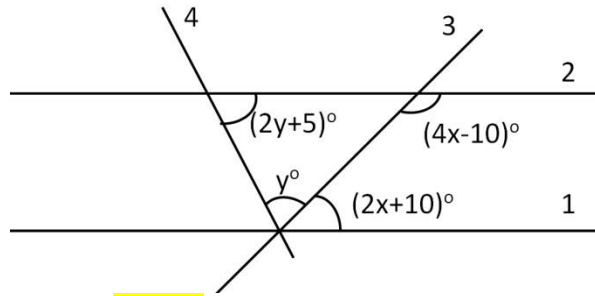
(A) 315   (B) 325   (C) -325 (D) -315

38. ABCD and CEFG are two Squares such that the extension of GE (diagonal) of CEFG passes through B. Given BE =8 cm and CG= $6\sqrt{2}$ cm. Then the area of Square ABCD (in cm²) is = ?
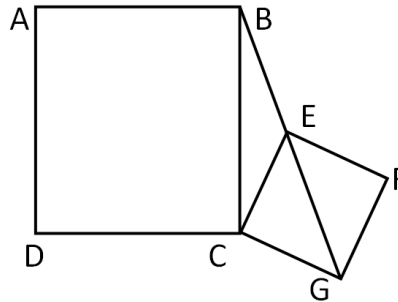
(A) 196   (B) 162   (C) 232   (D) 212

39. If the point (3b - 4,3b+ 15) lie on the Y axis then distance of the point from origin will be
(A) 5   (B) 11   (C) 19   (D) 15

40. If $x-2$ is a factor of $x^4 - 2x^3 - 4x^2 + 8x - a$ then a is equal to
(A) 2   (B) -1   (C) -2   (D) 0

41. If $\angle B, \angle D \, \& \, \angle F$ are right angled and AD=DG, also it is given that $\angle$ BAD=37^o then find $\angle$ FGA

(A) 100^o (B) 95^o (C) 98^o (D) 82^o
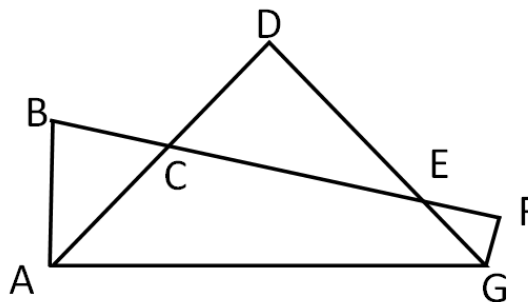
**42.** The average marks of students in his ten papers are 73. If the highest and the lowest scores are not considered, the average becomes 75. If his highest score is 93, then the lowest score is:
(A) 55　　　　　　(B) 60　　　　　　(C) 37　　　　　　(D) 42

43. In the figure given below, the area of square MNOP is twice that of the square ABCD. The Triangle AOR is a right angled triangle having AO = RO. Find Ratio of the area of the triangle AOR to that the area of square ABCD.
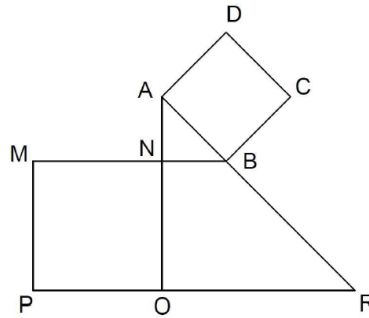
(A) 2.25　　　　　　(B) 2.5　　　　　　(C) 1.75　　　　　　(D) 3.0

44. The radii of two closed cylinders are in the ratio 2 : 3 and their heights are in the ratio 5 : 3, then the ratio of their volumes is :
(A) 4:9　　　　　　(B) 15:16　　　　　　(C) 20:27　　　　　　(D) 14:17

45. In the adjoining figure, Δ ABC is an isosceles right-angled triangle. BE is perpendicular to AD.
IF the BE = 2 cm, then the area (in cm²) of the quadrilateral ABCD is –
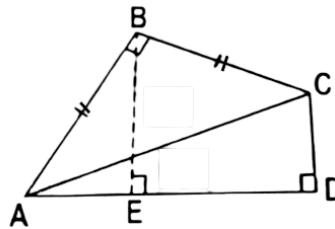
(A) 2　　　　　(B) $\dfrac{3}{2}$　　　　　(C) $\dfrac{7}{2}$　　　　　(D) 4

46. If $\dfrac{1}{1\times 3}+\dfrac{1}{2\times 4}+\dfrac{1}{3\times 5}+---+\dfrac{1}{n(n+2)}=\dfrac{3553}{4830}$, then $(n-3)=?$
(A) 68　　　　　　(B) 65　　　　　　(C) 73　　　　　　(D) 90

47. A polynomial of degree 2 is divided respectively by $x-1$, $x-2$ and $x-3$. The remainders obtained are 1,2 and 3 respectively. The Polynomial is-
(A) x^2-1　　　　　(B) x^2+1　　　　　(C) x^2+x-1　　　　　(D) None of these

48. How many four digit numbers divisible by twenty nine have the sum of their digits 29?
(A) 4　　　　　　(B) 5　　　　　　(C) 13　　　　　　(D) none of these

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49. Two circles A and B, overlap each other are shown. The area of the common part is $\frac{2}{5}$ of the area of circle A, and $\frac{5}{8}$ of the area of circle B. The ratio of the radius of circle A to the radius of B.
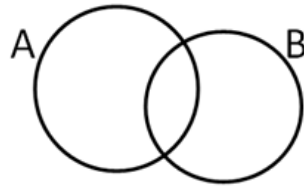
(A) $\frac{5}{4}$　　　(B) $\frac{6}{5}$　　　(C) $\frac{4}{3}$　　　(D) $\frac{3}{2}$

50. Let r and s be integer. The $\dfrac{6^{r+s} \times 12^{r-s}}{8^r \times 9^{r+2s}}$ is an integer if :

(A) $r \leq 0$　　　(B) $r+s \leq 0$　　　(C) $s \geq 0$　　　(D) $s \leq 0$

51. Abhishek Gupta, **Nashik Topper in IIT JEE Advanced 2023** had solved $\frac{3}{8}$ of a math assignment on Sunday and $\frac{4}{5}$ of the remaining questions on next day. If 22 numbers of questions still remained to solve then how many questions were in the assignment.

(A) 204　　　(B) 240　　　(C) 184　　　(D) 176

52. There are 3 real positive numbers. The second is greater than the first by the amount the third is greater than the second. The product of the two smaller numbers and that is 85 and that of the two bigger number is 115. Then the sum of smallest and greatest numbers is –

(A) 3　　　(B) 10　　　(C) 20　　　(D) 15

53. Find value of $0.12\bar{5} + 0.3\bar{5}$ =?

(A) $\dfrac{431}{900}$　　　(B) $\dfrac{433}{900}$　　　(C) $\dfrac{433}{9000}$　　　(D) $\dfrac{231}{900}$

54. A Square board side 15 cm, standing vertically, is tilted to the left so that the bottom-right Corner is raised 9 cm from the ground(dotted square is representing initial position). By what distance is the top-left corner lowered down from its original position?

(A) 9 cm　　　(B) 3 cm　　　(C) 1.5 cm　　　(D) 4.5 cm

55. Two parallel chord 96 cm and 28 cm long are on the opposite side of center of the circle with radius 50 cm. find the area of the quadrilateral whose vertices are the end points of the chords

(A) 3488　　　(B) 3848　　　(C) 3844　　　(D) 3484

56. New cell generate from
(A) Bacterial fermentation   (B) regeneration of old cells
(C) pre-existing cells   (D) Abiotic materials

57. Find out wrongly match pair.
(A) Columnar epithelium- peritoneum of body cavity   (B) ciliated epithelium - Bronchioles
(C) stratified cuboidal epithelium   - oesophagus   (D) glandular epithelium   - salivary gland

58. Which one of following is absent in human RBC
(A) Bio membrane   (B) enzyme   (C) cytoplasm   (D) kreb's cycle

59. The flowering plant which is biggest in plant kingdom is
(A) Fern   (B) gymnosperm   (C) Angiosperm   (D) moss

60. Which of following statement true for eukaryotic cells?
i. They do not have a nuclear membrane .   ii. They have well organised nucleus
iii. They have nuclear membrane   iv. Blue green algae are eukaryotic cells.
(A) ii and iv   (B) ii and iii   (C) ii, iii , iv   (D) I and iv

61. Characteristics of smooth muscle fibres are
(A) spindle shaped , unbranched, nonstriated, uninucleated and involuntary
(B) spindle shaped, unbranched ,nonstriated , multinucleate and involuntary
(C) cylindrical , unbranched, striated , multinucleate and voluntary
(D) cylindrical, unbranched, striated, uninucleated, voluntary

62. The endosperm of gymnosperm develops _____fertilization whereas the endosperm of an angiosperm develops_____ fertilization.
(A) before, before   (B) after, after   (C) after, before   (D) before, after

63. Pectin deposited plant cell wall is
(A) excretory product   (B) secretory product   (C) both   (D) never deposited

64. Which statement is wrong for viruses
(A) All are parasites   (B) All of them have helical symmetry
(C) They have ability to synthesize nucleic acid and protein   (D) Antibiotics have no effect on them

65. Which one is living fossil
(A) Pinus   (B) Cycas   (C) Selaginella   (D) none

66. Simple epithelium is a tissue in which the cells are
(A) Hardened and provide support to the organ
(B) cemented directly to one another to form single layer
(C) continuously diving to form organ
(D) loosely connected to form irregular organ

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Que.67,68,69 & 70 the following questions consist of two statement one labelled
ASSERTION (A) and other labelled
REASON(R) Select the correct answer to these questions from the codes given below:
(A) Both A and R are true and R is correct explanation of A
(B) Both A and R are true but R is not correct explanation of A
(C) A is true but R is false
(D) A and R are false

67.   **ASSERTION:** cartilage and bone are rigid connective tissue
        REASON: Blood is connective tissue in which plasma is the matrix.
        ANS -B

68.   **ASSERTION:** WBC accumulate at the site of wound by diapedesis
        REASON: It is squeezing of leucocyte by endothelium.
        ANS -B

69.   **ASSERTION:** Red algae contribute in algae producing coral reefs.
        REASON: some red algae secrets and deposit calcium carbonate over their walls
        ANS -A

70.   **ASSERTION:** brown algae vary in colour from olive green to shades of brown
        REASON: brown algae possess chlorophyll a, c, carotenoids and xanthophylls
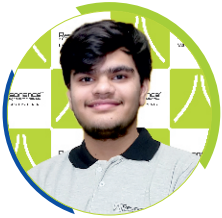   ANS -A

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KOTA 2023 RESULTS

JEE (Main) 2023 RESULT

AIR **5**	AIR **26**	AIR **29**	AIR **31**	AIR **34**	AIR **50**
300/300 Marks	100%ile	100%ile	100%ile	100%ile	100%ile (Maths)
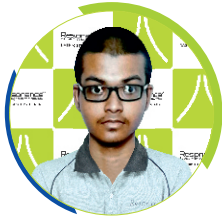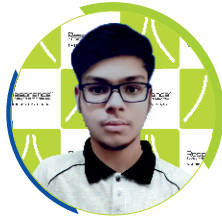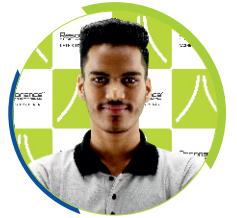
KAUSHAL VIJAYVERGIYA	SOHAM DAS	ASHIK STENNY	KRISH GUPTA	MAYANK SONI	HARSHAL LASOD

JEE (Adv.) 2023 RESULT

8 STUDENTS IN TOP-50 AIRs | 15 STUDENTS IN TOP-100 AIRs

AIR **7**	AIR **22**	AIR **26**	AIR **29**	AIR **32**	AIR **33**	AIR **37**	AIR **44**
BIKKINA A. CHOWDARY	DESHANK P. SINGH	MAYANK SONI	TANISHQ M MANDHANE	KRITIN GUPTA	NAMAN GOYAL	S S SUMEDH	KAUSHAL VIJAYVERGIYA

NEET (UG) 2023 RESULT

7 Students ≥ 700 Marks

710/720	705/720	705/720	705/720	705/720	701/720	700/720
AIR (UR) **60**	AIR (UR) **89**	AIR (UR) **98**	AIR (UR) **135**	AIR (UR) **150**	AIR (UR) **197**	AIR (UR) **258**
SRIJAN M H	SHIVAM KUMAR RAI	AIJAZ AARYAN JUMKHAN	SAYALI MAHINDRAKAR	PRANJAL SINGH	ARMAN MITTAL	KRISHNA AGARWAL