

SCIENCE

- A body, initially at rest, given a spin of 1 rpm about a given axis. If the angular momentum acquired about that axis is $0.24 \text{ kg-m}^2/\text{s}$, its rotational kinetic energy is...
 - $0.008 \pi^2 \text{ J}$
 - $2 \pi \times 10^{-3} \text{ J}$
 - $0.004 \pi^2 \text{ J}$
 - $0.12 \pi \text{ J}$
- An air bubble just inside a soap solution and a soap bubble blown using the same solution have the same radii. The ratio of the excess pressure inside the air bubble to that inside the soap bubble is...
 - 1 : 4
 - 1 : 2
 - 2 : 1
 - 4 : 1.
- Superconductors exhibit...
 - Ferrimagnetism
 - Anti-ferromagnetism
 - Perfect ferromagnetism
 - Perfect diamagnetism.
- The speed corresponding to the peak of Maxwell-Boltzmann molecular speed distribution curve is....
 - The root-mean-square speed of the gas molecules.
 - The speed possessed by the largest number of gas molecules.
 - The maximum speed possessed by the gas molecules.
 - The average speed of the gas molecules.
- In the formation of beats, the resultant amplitude varies with a frequency equal to....
 - The beat frequency.
 - The average frequency.
 - Half the beat frequency.
 - Double the beat frequency.
- The nuclear radius of the tungsten nuclide ${}_{74}\text{W}$ is twice that of the sodium nuclide ${}_{11}^{23}\text{Na}$. The neutron number of the tungsten nuclide is....
 - 82
 - 100
 - 110
 - 184
- In measuring a resistance using a meter bridge, the resistances in the gaps are interchanged to minimize error due to....
 - the yielding or the supports.
 - non-uniformity of the bridge wire.
 - the contact or end resistances.
 - Joule heating of the bridge wire.
- If the photon has the same wavelength as the De-Broglie wavelength of an electron they have the same...
 - velocity
 - energy
 - momentum
 - angular momentum
- Complete the following reaction :

$$\text{Cl}_2\text{O}_7 + \text{H}_2\text{O} \longrightarrow ?$$
 - 2HClO_4
 - $\text{HCl}_2(\text{O})_4$
 - $2\text{HCl}_1(\text{O})_4$
 - HClO_4
- The most acidic oxide among the following is....
 - CaO
 - SO_2
 - Al_2O_3
 - K_2O
- Crude metals like Si, Ge, etc. are refined by....
 - benefaction
 - froth floatation
 - zone refining
 - leaching
- Match Column1 With Column 2:

Column 1		Column 2	
A	Preparation of glucose	P	Vitamin B2
B	Rice	Q	Globular proteins
C	Haemoglobin	R	Chalk Powder
D	Egg Yolk	S	Vitamin B

 - A-S, B-R, C-P, D-Q
 - A-R, B-S, C-P, D-Q
 - A-R, B-S, C-Q, D-P
 - A-Q, B-P, C-R, D-S
- Volume of H_2 , liberated when 1 Faraday of electricity is passed through 1M HCl solution at NTP is....
 - 22.4 dm^3
 - 11.2 dm^3
 - 5.6 dm^3
 - 12.4 dm^3
- The order of a reaction having following rate law is,

$$\text{Rate} = K[\text{NO}]_2 \times [\text{H}_2]$$
 - 3
 - 2
 - Zero
 - 1
- The name of carbonate minerals of zinc is....
 - Calamine
 - Zincite
 - Zinc blende
 - Willemite
- Which of the following exist as Zwitter ion?
 - Salicylic acid
 - Sulphanilic acid

- c) p-Aminophenol
d) p-Amino acetophenone
17. The metabolism of carbohydrate is controlled by hormone....
- a) insulin b) thyroxine
c) adrenaline d) progesterone
18. Leaves have maximum chloroplasts in....
- a) mesophyll cells b) epidermal cells.
c) conducting tissue d) bundle sheath.
19. The net primary productivity of an ecosystem is....
- a) total weight of green plants – respiratory losses.
b) total weight of green plants + respiratory losses.
c) respiratory losses alone.
d) none of the above.
20. Sewage water cannot be discharged directly into river because....
- a) it contains very low level of organic matter.
b) it contains pathogenic microbes.
c) its bod is very less
d) all the above.
21. Which of the following is without exception seen in angiosperms?
- a) Secondary growth
b) Presence of vessels
c) Double fertilization
d) Autotrophic nutrition
22. The function of suspensor is to....
- a) suspend growth of embryo.
b) hang embryo.
c) push developing embryo in deeper layers of endosperm.
d) protect the embryo.
- 23 Hypophysis is an alternative name for....
- a) thyroid gland b) pituitary gland
c) thymus gland d) pineal gland
24. Respiration occurs....
- a) only in non-green cells in light.
b) only in non-green cells both in light and dark.
c) in all living cells both in light and dark.
d) in all living cells only in light.
25. Ecosystem is....
- a) Open
b) closed
c) both open and close
d) neither open nor closed

MATHEMATICS

26. Which of the following is a singleton set?
- a) $\{x/x \text{ is divisible by } 10, x \in N\}$
b) $\{x: x^2 = 9, x \in Z\}$
c) $\{x: x \text{ is even prime number, } x \in N\}$
d) $\{x: x+5 < 10, x \in N\}$
27. The axis of the parabola $y^2 - 10x = 0$ is
- a) $x = 0$ b) $y = 0$
c) $x = 5$ d) $y = 5$
28. The equation of circle with radius 4 and centre (2, 3) is
- a) $x^2 + y^2 + 2x + 3y - 16 = 0$
b) $x^2 + y^2 - 4x - 6y - 3 = 0$
c) $x^2 + y^2 + 4x + 6y - 16 = 0$
d) None of these
29. Let set $A = \{a, b, c, d\}$ and $B = \phi$ then $n(A \times B) = ?$
- a) 0 b) 1
c) 2 d) 3
30. If $\tan \theta = -\frac{3}{4}$, ($0 > \theta > \pi$) then $\sin \theta = ?$
- a) $\frac{3}{5}$ b) $\frac{4}{5}$ or $-\frac{4}{5}$
c) $\frac{3}{5}$ or $-\frac{3}{5}$ d) $\frac{4}{5}$ but not $-\frac{4}{5}$
31. Consider the following statements.
- I. $\cot x$ decreases from 0 to $-\infty$ in first quadrant and increases from 0 to ∞ in third quadrant.
II. $\sec x$ increases from $-\infty$ to -1 in second quadrant and decreases from ∞ to 1 in fourth quadrant.
III. $\operatorname{cosec} x$ increases from 1 to ∞ in second quadrant and decreases from -1 to $-\infty$ in fourth quadrant. Choose the correct option.
- a) I is incorrect
b) II is incorrect
c) III is incorrect
d) II and III is incorrect

- a) $0, 2, 2\sin\theta$ b) $2, 0, 2\sin\theta$
 c) $2, 0, -2\sin\theta$ d) $-2\sin\theta, 2, 0$
48. If $y = \log \tan \sqrt{x}$ then the value of $\frac{dy}{dx}$ is:
- a) $\frac{1}{2\sqrt{x}}$ b) $\frac{\sec^2 \sqrt{x}}{\sqrt{x} \tan x}$
 c) $2\sec^2 \sqrt{x}$ d) $\frac{\sec^2 \sqrt{x}}{2\sqrt{x} \tan \sqrt{x}}$
49. The relationship between a and b, so that the function $f(x) = \begin{cases} ax+1, & \text{if } x \leq 3 \\ bx+3 & \text{if } x > 3 \end{cases}$ is continuous at

$x = 3$, is

- a) $a = b + \frac{2}{3}$ b) $a - b = \frac{3}{2}$
 c) $a + b = \frac{2}{3}$ d) $a + b = 2$

50. A right circular cylinder which is open at the top and has a given surface area, will have the greatest volume if its height h and radius r are related by

- a) $2h = r$ b) $h = 4r$
 c) $h = 2r$ d) $h = r$

ENGLISH

Directions (Qns. 51-53): Read each of the following sentences to find out if there is any error in it. The error, if any, will be in one part of it. The number of that part is the answer.

51. He asked (a) / that why (b) / he shall (c) / be punished (d).
52. They give us (a) / such troubles (b) / which we cannot (c) / endure them (d).
53. I have (a) / not seen (b) / you (c) / long since (d).
54. He left for Mumbai by the ... train.
 a) half past eight
 b) eight thirty
 c) eighty - thirty o' clock
 d) thirty minutes past eight
55. Everyone wonders why you took such a risk. I wish that they would....
 a) stop to guess.
 b) stop in their guessing.
 c) stop guessing.
 d) stop from guessing.
56. The party comprises..... Ram, Mohan, Sita and myself.
 a) for b) of
 c) in d) about
 e) none of these
57. I wonder if I shall get ... the history examination.
 a) about b) out
 c) through d) upon
 e) none of these

Directions (Qns58-59): In the following questions choose the word which is most nearly the same in meaning as the word or group of words given in bold.

58. Science of good births...

- a) eugenics b) heredity
 c) genealogy d) biology

59. Indifferent

- a) antipathetic b) pathetic
 c) apathetic d) apostle

Directions (Qns60-61): In the following questions choose the word which is most opposite in meaning to the word given in bold.

60. Abhor

- a) hate b) like
 c) love d) kill

61. Abiding

- a) Permanent b) Existing
 c) Passing d) Running

Directions (Qns. 62-65): Read the following passage carefully and answer the questions given below it on the basis of what is said or implied in the passage.

Many critics of our public schools maintain that far more stress is placed upon achievements in athletics than in the academic sphere and in particular complain against games being compulsory. They maintain that it is tyranny to compel boys with no athletic bent to spend hours of misery on a cricket or football field. These should be left to themselves, when they would occupy their time more usefully and enjoyably on some profitable creative hobby. The drawback to this argument lies in the facile assumption that every non-athlete has a profitable hobby. This is not true; even if it were, model engineering or stamp collecting is no substitute for being out in the fresh air exercising the muscles and having contact with other human beings. I would compel all boys to play games, but I would protect them

fiercely from the heresy that it was their duty to be good at games.

62. What is the complaint of critics against public schools?

- That public schools give importance more to all-round development of the student than to more academic progress.
- That public schools lay more stress on athletic achievement than academic attainment, making games & sports compulsory.
- That public schools ensure academic excellence at the expertise of games and sports.
- That public schools does not give to all-round development of the student than to more academic progress.

63. Why do they say that boys should not be compelled to play games?

- They maintain that it is not necessary to compel boys to play games when, by themselves, they are very much interested to playing.
- Forcing someone to do something is a tyranny and therefore it should be discouraged.
- Some boys may not have any inclination to play games and to insist that such of them should participate in games is nothing short of tyranny.
- Compelling children would make them more disturbed and would make them lose their self-confidence.

64. What according to them is the alternative for playing games?

- According to the critics, the alternative for playing games is studying subjects seriously and sincerely.
- Building engineering models and collecting stamps are the alternatives for playing games.
- Engaging one-self in some creative pursuit of one's own choice is the alternative, according to the critics.
- According to them the alternative for playing game is to go out and breathe some fresh air.

65. Which is better-enjoying a hobby or being out in the fresh air? Why?

- Being out in the air is better enjoying for it offers an opportunity to exercise the muscles, to breathe fresh air and to come into contact with other people.

- A hobby is better enjoying for it gives an opportunity to give shape to one's creative talents and therefore more rewarding.
- A hobby is better enjoying for you are alone deeply absorbed in your thoughts, doing something which you yourself have chosen, free from any external compulsion.
- Being out in the fresh air intakes more oxygen and maintains a happy mind, whereas only gives pleasure for a short period of time.

Directions (Qns66-67): In each of the following questions there is a sentence with a blank space followed by four options. Choose the option which can fill up the blank most effectively.

66. Why are you always so ar... (fond of arguing)

- argumental
- argumentative
- arraigning
- arguing

67. Most people are repelled by his ob... (stubbornness)

- obstinacy
- obduracy
- obstinence
- obedience

Directions (Qns 68-69): In the following questions, a sentence has been given in direct/indirect speech. Out of the four alternatives suggested, select the one which best expresses the same sentence in indirect/direct speech.

68 My brother will say, "I did not like to play cricket."

- My brother will be saying that he did not like to play cricket.
- My brother will say that he did not like to play cricket.
- My brother will say that he does not like to play cricket.
- My brother will be saying that he will not like to play cricket.

69. She said, "We will be going to the aquarium, tomorrow."

- She asked, "We will be going to the aquarium, the next day"
- She told that, "We will be going to the aquarium, tomorrow".
- She said that they would be going to the aquarium, the next day.
- She said she would be going to the aquarium tomorrow.

Directions (Qns70-71): A sentence has been given in Active/Passive Voice. Out of the four alternatives suggested, select the one which best expresses the same sentence in Passive/Active Voice.

70. Call in the next candidate.

- Let the next candidate be call.

- c) Uttar Pradesh d) Rajasthan
- 87. Jamshedpur is located on the bank of....**
 a) Damodar b) Ganges
 c) Subarnarekha d) Musi
- 88. What is earlier name of the present 'National Library in Kolkata'?**
 a) Imperial library b) British library
 c) Royal library d) Albert library
- 89. The capital of Mauritius is....**
 a) Port Louis b) Male
 c) Suva d) Kabul
- 90. The ball used in which of the games is usually oval in shape?**
 a) Rugby b) Golf
 c) Polo d) Volleyball
- 91. Which is correct order?**
 a) Babur, Humayun, Jahangir, Akbar, Shahjahan, Aurangzeb
 b) Babur, Humayun, Akbar, Jahangir, Shahjahan, Aurangzeb
 c) Babur, Akbar, Humayun, Shahjahan, Jahangir, Aurangzeb
 d) Babuar, Humayun, Shahjahan, Akbar, Jahangir, Aurangzeb
- 92. Which cricket playing countries fight for the 'ASHES'?**
 a) India and Pakistan
 b) Australia and South Africa
 c) Australia and England
 d) England and West Indies
- 93. Who was the women President of the United Nations General Assembly?**
 a) Sarojini Naidu
 b) Vijaya Lakshmi Pandit
 c) Golda Mayer
 d) Margaret Thatcher
- 94. Lucknow is situated on the banks of river...**
 a) Yamuna b) Tapti
 c) Shipra d) Gomti
- 95. What will be the next term of the given series? 17, 23, 19, 25, 21, 27...?**
 a) 22 b) 23
 c) 24 d) 29
- 96. Agriculture, Irrigation and Power Projects were given highest priority in which among the following plans?**
 a) First Five Year Plan
 b) Second Five Year Plan
 c) Third Five Year Plan
 d) Fourth Five Year Plan
- 97. Interest Rate Policy is a part of which of the following?**
 a) Fiscal Policy b) Monetary policy
 c) Industrial Policy d) All the above
- 98. Which of the following organizations provides Buffer Stock Financing Facility?**
 a) Reserve Bank of India
 b) Asian Development Bank
 c) International Monetary Fund
 d) World Bank
- 99. The Farmers' Innovation Fund, which was seen in news, is proposed to be set up by which organisation?**
 a) World Food Programme.
 b) Food and Agricultural Organisation.
 c) National Bank for Agriculture and Rural Development.
 d) Indian Council of Agricultural Research.
- 100. Recently the Election Commission of India has renewed the MoU on electoral Co-operation with which country?**
 a) Mauritius b) Maldives
 c) Malaysia d) Myanmar



ANSWER KEY

1. c)	21. c)	41. d)	61. c)	81. c)
2. b)	22. c)	42. d)	62. b)	82. b)
3. d)	23. b)	43. a)	63. c)	83. b)
4. b)	24. c)	44. a)	64. c)	84. b)
5. c)	25. a)	45. c)	65. a)	85. d)
6. c)	26. c)	46. b)	66. b)	86. d)
7. c)	27. b)	47. a)	67. a)	87. c)
8. c)	28. b)	48. d)	68. b)	88. a)
9. a)	29. a)	49. a)	69. c)	89. a)
10. b)	30. a)	50. d)	70. d)	90. a)
11. c)	31. d)	51. b)	71. a)	91. b)
12. c)	32. a)	52. d)	72. a)	92. c)
13. b)	33. d)	53. d)	73. d)	93. b)
14. a)	34. d)	54. b)	74. a)	94. d)
15. a)	35. a)	55. c)	75. c)	95. b)
16. b)	36. c)	56. e)	76. c)	96. a)
17. a)	37. c)	57. c)	77. b)	97. b)
18. a)	38. b)	58. a)	78. c)	98. c)
19. a)	39. d)	59. c)	79. a)	99. d)
20. a)	40. d)	60. b)	80. b)	100. a)

