

MOCK TEST - 1

MATHMETICS

- The value of $\cos 1^\circ \cos 2^\circ \cos 3^\circ \dots \cos 179^\circ$ is
 (a) $\frac{1}{\sqrt{2}}$ (b) 0 (c) 1 (d) - 1
- The value of $\tan 75^\circ - \cot 75^\circ$ is equal to
 (a) $2\sqrt{3}$ (b) $2 + \sqrt{3}$ (c) $2 - \sqrt{3}$ (d) 1
- Which of the following is correct?
 (a) $\sin 1^\circ > \sin 1$ (b) $\sin 1^\circ < \sin 1$
 (c) $\sin 1^\circ = \sin 1$ (d) $\sin 1^\circ = \frac{\pi}{18^\circ} \sin 1$
- The minimum value of $3 \cos x + 4 \sin x + 8$ is
 (a) 5 (b) 9 (c) 7 (d) 3
- The value of $\tan 3A - \tan 2A - \tan A$ is equal to
 (a) $\tan 3A \tan 2A \tan A$
 (b) $-\tan 3A \tan 2A \tan A$
 (c) $\tan A \tan 2A - \tan 2A \tan 3A - \tan 3A \tan A$
 (d) None of these
- If $\sin \theta + \cos \theta = 1$, then the value of $\sin 2\theta$ is equal to
 (a) 1 (b) $\frac{1}{2}$ (c) 0 (d) - 1
- If $\alpha + \beta = \frac{\pi}{4}$, then the value of $(1 + \tan \alpha)(1 + \tan \beta)$ is
 (a) 1 (b) 2 (c) - 2 (d) not defined
- The value of $\cos^2 48^\circ - \sin^2 12^\circ$ is
 (a) $\frac{\sqrt{5}+1}{8}$ (b) $\frac{\sqrt{5}-1}{8}$ (c) $\frac{\sqrt{5}+1}{5}$ (d) $\frac{\sqrt{5}+1}{2\sqrt{2}}$
- If $\tan \theta = \frac{a}{b}$, then $b \cos 2\theta + a \sin 2\theta$ is equal to
 (a) a (b) b (c) $\frac{a}{b}$ (d) None
- The value of $\sin 20^\circ \sin 40^\circ \sin 60^\circ \sin 80^\circ$ is
 (a) $\frac{-3}{16}$ (b) $\frac{5}{16}$ (c) $\frac{3}{16}$ (d) $\frac{1}{16}$
- If A, B and C are three sets and U is the universal set such that $n(U) = 700$, $n(A) = 200$, $n(B) = 300$ and $n(A \cap B) = 100$, then what is the value of $(A' \cap B')$?
 (a) 100 (b) 200 (c) 300 (d) 400

12. If ϕ is a null set, then which one of the following is correct?
 (a) $\phi = 0$ (b) $\phi = \{0\}$ (c) $\phi = \{\phi\}$ (d) $\phi = \{ \}$
13. What is the range of $f(x) = \cos 3x - \sin 3x$?
 (a) $[2, 4]$ (b) $[-1, 1]$ (c) $(\sqrt{2}, \sqrt{2})$ (d) $[-\sqrt{2}, \sqrt{2}]$
14. Consider the following with regard to a relation R on a set of real numbers defined by xRy if and only if $3x + 4y = 5$
 I. $0R1$ II. $1R\frac{1}{2}$ III. $\frac{2}{3}R\frac{3}{4}$

Which of the above are correct?

- (a) I and II (b) I and III (c) II and III (d) I, II and III

Direction (Q. Nos. 15 and 16): Read the information carefully and answer the given questions.

In a school, all the students play at least one of three indoor games-chess, carrom and table tennis. 60 play chess, 50 play table tennis, 48 play carrom, 12 play chess and carrom, 15 play carrom and table tennis, 20 play table tennis and chess.

15. What can be the minimum number of students in the school?
 (a) 123 (b) 111 (c) 95 (d) 63
16. What can be the maximum number of students in the school?
 (a) 111 (b) 125 (c) 123 (d) 135

Directions (Q. Nos. 17 and 18): Consider the information given below and answer the two items that follow.

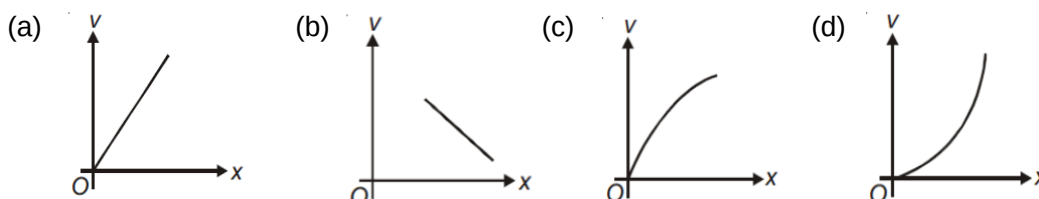
In a class, 54 students are good in Hindi only, 63 students are good in Mathematics only 41 students are good in English only. There are 18 students who are good in both Hindi and Mathematics. 10 students are good in all three subjects.

17. What is the number of students who are good in either Hindi or Mathematics but not English?
 (a) 99 (b) 107 (c) 125 (d) 130
18. What is the number of students who are good in hindi and mathematic but not in English?
 (a) 18 (b) 12 (c) 10 (d) 8
19. If $A = \{x : 0 \leq x \leq 2\}$ and $B = \{y : y \text{ is a prime number}\}$. Then what is $A \cap B$ equal to?
 (a) ϕ (b) $\{1\}$ (c) $\{2\}$ (d) $\{1, 2\}$
20. If $n(A) = 115$, $n(B) = 326$, $n(A - B) = 47$, then what is $n(A \cup B)$ equal to?
 (a) 373 (b) 165 (c) 370 (d) 394
21. What is the solution set for the equation $x^{2/3} + x^{1/3} - 2 = 0$
 (a) $\{-8, -1\}$ (b) $\{-8, 1\}$ (c) $\{8, -1\}$ (d) $\{8, 1\}$
22. How many real value of x of equation $|x| + |x + 1| = 1$
 (a) 0 (b) 1 (c) 2 (d) No value of x

23. If $x = 2 + 2^{1/3} + 2^{2/3}$ then the value of $x^3 - 6x^2 + 6x$ is equal to
 (a) 1 (b) 2 (c) 3 (d) -2
24. If α and β are roots of $ax^2 + bx + c = 0$ then value of $\frac{\sqrt{\alpha}}{\sqrt{\beta}} + \frac{\sqrt{\beta}}{\sqrt{\alpha}} + \frac{\sqrt{b}}{\sqrt{c}}$ is
 (a) 0 (b) 1 (c) 2 (d) 4
25. If one root of $5x^2 + 26x + k = 0$ is reciprocal of the other, then value of k is
 (a) 3 (b) 26 (c) 0 (d) 5
26. The square root of $(-5 - 12i)$ is
 (a) $\pm(3 + 2i)$ (b) $\pm(2 + 3i)$ (c) $\pm(2 - 3i)$ (d) $\pm(3 - 2i)$
27. If $\left(\frac{1+i}{1-i}\right)^x = 1$, then
 (a) $x = 2n + 1$ (b) $x = 4n$ (c) $x = 2n$ (d) $x = 4n + 1$, where $n \in \mathbb{N}$
28. If α and β are different complex number with $|\beta| = 1$, then $\left|\frac{\beta - \alpha}{1 - \alpha\beta}\right|$ is
 (a) 0 (b) $3/2$ (c) $1/2$ (d) 1
29. If $(x + iy)^{1/3} = a + ib$, where $x, y, a, b \in \mathbb{R}$, then $\frac{x}{a} - \frac{y}{b} =$
 (a) $a^2 - b^2$ (b) $-2(a^2 + b^2)$ (c) $2(a^2 - b^2)$ (d) $a^2 + b^2$
30. If $x = 2 + 5i$, then value of the expression $x^3 - 5x^2 + 33x - 49$ equals
 (a) -20 (b) 10 (c) 20 (d) -29

PHYSICS

31. If the energy E of a photon is equal to $h\nu$, where ν is the frequency and h is Planck's constant, then the dimensions of Planck's constant is
 (a) $[ML^2T^{-3}]$ (b) $[M^0L^2T^{-1}]$ (c) $[ML^2T^{-1}]$ (d) $[ML^2T^{-2}]$
32. Which of the following practical units of length is not correct?
 (a) 1 fermi = 10^{-15} m (b) 1 astronomical unit = 1.496×10^{11} m
 (c) 1 parsec = 3.26 light year (d) 1 light year = 9.46×10^{12} m
33. An object travels 4m towards east, and 3m towards south. The displacement of the object from its initial position is:
 (a) 5m (b) 7m (c) 1m (d) $\sqrt{7}$ m
34. For a body moving with uniform acceleration along straight line, the variation of its velocity (v) with position (x) is best represented by



35. An object traveling at 10m/s in north direction suddenly turns in one second towards east and maintains velocity of 10 m/s. The net acceleration of the object is:
 (a) 0 (b) $10\sqrt{2}$ m/s² in S-E direction
 (c) $10\sqrt{2}$ m/s² in N-E direction (d) $10\sqrt{2}$ m/s² in N-W direction
36. Select the incorrect statement using the codes given below
 I. Power is a vector quantity.
 II. Acceleration is a vector quantity
 III. An object resists the change in state of rest or of uniform motion
 (a) Only I (b) I, II and III (c) I and II (d) None of these
37. A car travelling at a speed of 30 km/h is brought to rest in a distance of 8 m by applying brakes. If the same car is moving at a speed of 60 km/h then it can be brought to rest with same brakes in:
 (a) 64 m (b) 32 m (c) 16 m (d) 4 m
38. A car is moving with a uniform speed. However, its momentum is changing. Then, the car
 (a) may be on an elliptical path
 (b) is moving on a straight path without acceleration
 (c) is moving on a straight path with acceleration
 (d) is moving without any acceleration
39. A body of mass 6 kg is rotated in circle of radius 3m with a uniform speed of 10 m/s, the force which must act on the body to maintain the motion is
 (a) 100 N (b) 200 N (c) 300 N (d) 20 N
40. Choose the wrong statement
 (a) Work done is a scalar quantity
 (b) Work done by a body does not depend on the K.E gained by object.
 (c) Work done can never be zero
 (d) SI unit of work is joule
41. In which of the following cases, potential energy decreases?
 (a) Air bubble rising in water column
 (b) Vertical hanging spring is compressed upwards
 (c) Two like charges are brought together
 (d) A ball is thrown upwards
42. Two forces of magnitude 8 N and 15 N respectively act at a point. If the resultant force is 17 N, the angle between the forces has to be:
 (a) 60° (b) 45° (c) 90° (d) 30°
43. Two projectiles A & B are fired with same velocity at angle of 30° and 60°, then chose the "CORRECT" statement:
 (a) A has longer range than B. (b) B has longer range than A.
 (c) B has lesser height than A (c) A and B have same horizontal range.

44. An open container is sliding on frictionless surface at velocity of 10 m/s. If rain starts to fill the container at 0.1Kg/s, then the force needed to keep moving the container at constant velocity of 10m/s is: (Assume rainfall is perfectly vertical)
- (a) 3N (b) 2N (c) 1N (d) 0N
45. Why a fielder in the ground gradually pulls his hands backward while catching the fast moving cricket ball?
- (a) To increase the change in momentum of ball.
(b) To decrease the rate of change of momentum of ball.
(c) To decrease the change in momentum of ball.
(d) To increase the rate of change of momentum of ball.
46. A truck of mass "M" and car of mass "m" travelling with equal kinetic energy ($M > m$), are brought to stop by applying same braking force, then chose the right statement:
- (a) Both truck and car travel same distance before coming to stop
(b) Truck travels further than car, before coming to stop
(c) Car travels further than truck before coming to stop
(d) Cant say, as data is not sufficient
47. A 4 kg mass and a 1 kg mass are moving with equal kinetic energies. The ratio of their momentum is
- (a) 3 : 1 (b) 1 : 1 (c) 4 : 1 (d) 2 : 1
48. If a man sitting on one of the end of floating boat, walks to the opposite end, then: (neglect the friction between boat and water surface):
- (a) boat does not move (b) boat moves in opposite direction to man
(c) boat moves in same direction along man (d) boat first moves forward then backward
49. If two planets A & B have radius in the ratio 1:2, but have same density, then the ratio of escape speed of two planets is:
- (a) $1:\sqrt{2}$ (b) $\sqrt{2}:1$ (c) 2:1 (d) 1:2
50. If acceleration due to gravity at the surface of planet is "g", then the height "h" above the surface where it becomes g/4 is: (R is radius of planet):
- (a) R (b) 2R (c) 3R (d) 4R

CHEMISTRY

51. Two atoms are said to be isobars if
- (a) they have same atomic number but different mass number.
(b) they have same number of electrons but different number of neutrons.
(c) they have same number of neutrons but different number of electrons.
(d) sum of the number of protons and neutrons is same but the number of protons is different.

52. If travelling at same speeds, which of the following matter waves have the shortest wavelength?
(a) Electron (b) Alpha particle (He^{2+}) (c) Neutron (d) Proton
53. In Hydrogen spectrum which one of the following series lies in the ultraviolet region?
(a) Balmer series (b) Pfund series (c) Bracket series (d) Lyman series
54. Which of the following compound has highest covalent character?
(a) LiCl (b) LiBr (c) LiF (d) LiI
55. Of the following, radiation with maximum wavelength is:
(a) UV (b) Radio wave (c) X-ray (d) IR
56. Which one of the following is a physical change?
(a) Burning of coal (b) Burning of wood
(c) Heating of a platinum crucible (d) Heating of potassium chlorate
57. A measured temperature on Fahrenheit scale is 200°F . What will be this reading on Celsius scale?
(a) 40°C (b) 94°C (c) 93.3°C (d) 30°C
58. Which one of the following is the most characteristic property of an element?
(a) density (b) boiling point (c) mass number (d) atomic number
59. How much CO_2 is produced on heating of 1 kg of carbon?
(a) $11/3$ kg (b) $3/11$ kg (c) $4/3$ kg (d) $3/4$ kg
60. The pressure exerted by a 760 mm column of mercury at 0°C is known as:
(a) 1 Pascal (b) 1 atm (c) 1 bar (d) 1 poise
61. 'Altitude sickness' is caused at high altitude due to
(a) high partial pressure of oxygen
(b) low partial pressure of oxygen
(c) low level of haemoglobin
(d) high partial pressure of carbon dioxide
62. Which of the following properties of atom could be explained correctly by Thomson model of atom?
(a) Overall neutrality of atom
(b) Spectra of hydrogen atom
(c) Position of electrons, protons and neutrons in atom
(d) Stability of atom
63. The quantity of heat needed to change unit mass of a substance from liquid to vapour without changing the temperature, is called
(a) specific heat (b) specific latent heat
(c) thermal capacity (d) heat energy
64. Which one of the following type of medicines is used for treating indigestion?
(a) Analgesic (b) Antiseptic (c) Antibiotic (d) Antacid

65. Match List I with List II and select the answer using the code given below the Lists:

List I

(Element)

- A. Phosphorus
B. Nitrogen
C. Neon
D. Sulphur

List II

(Atomicity)

1. 2
2. 1
3. 8
4. 4

Code:

	A	B	C	D
(a)	4	1	2	3
(b)	4	2	1	3
(c)	3	2	1	4
(d)	3	1	2	4

66. Total number of orbitals associated with third shell will be

- (a) 2 (b) 4 (c) 9 (d) 3

67. Which of the following statements about the electron is incorrect?

- (a) It is a negatively charged particle.
(b) The mass of electron is equal to the mass of neutron.
(c) It is a basic constituent of all atoms.
(d) It is a constituent of cathode rays.

68. What is mass percent of carbon in carbon dioxide?

- (a) 0.034 % (b) 27.27 % (c) 3.4 % (d) 28.7 %

69. Which of the following statements is not correct according to law of conservation of mass?

- (a) $2 \text{ Mg (s)} + \text{O}_2 \text{ (g)} \rightarrow 2 \text{ MgO (s)}$ (b) $\text{C}_3\text{H}_8 \text{ (g)} + \text{O}_2 \text{ (g)} \rightarrow \text{CO}_2 \text{ (g)} + \text{H}_2\text{O (g)}$
(c) $\text{P}_4 \text{ (s)} + 5 \text{ O}_2 \text{ (g)} \rightarrow \text{P}_4\text{O}_{10} \text{ (s)}$ (d) $\text{CH}_4 \text{ (g)} + 2 \text{ O}_2 \text{ (g)} \rightarrow \text{CO}_2 \text{ (g)} + 2 \text{ H}_2\text{O (g)}$

70. Which of the following options does not represent ground state electronic configuration of an atom?

- (a) $1s^2 2s^2 2p^6 3s^2 3p^6 3d^8 4s^2$ (b) $1s^2 2s^2 2p^6 3s^2 3p^6 3d^9 4s^2$
(c) $1s^2 2s^2 2p^6 3s^2 3p^6 3d^{10} 4s^1$ (d) $1s^2 2s^2 2p^6 3s^2 3p^6 3d^5 4s^1$

ENGLISH

71. I did not beat her. –

- (a) She is not beaten by me. (b) She has not been beaten by me.
(c) She was not beaten by me. (d) She had not been beaten by me.

72. I will never forget this experience. –

- (a) This experience is not forgotten by me.
(b) This experience would never be forgotten by me.
(c) This experience will never be forgotten by me.

73. Mother made a cake yesterday. –
 (a) A cake made by mother yesterday. (b) A cake is made by mother yesterday.
 (c) A cake was made by mother yesterday. (d) A cake had been made by mother yesterday.
74. The boy teased the girl. –
 (a) The girl was teased by the boy. (b) The girl had teased by the boy.
 (c) The girl is teased by the boy. (d) The girl had been teased by the boy.
75. Did she do her duty? –
 (a) Was she done her duty? (b) Was her duty done by her?
 (c) Had her duty done by her? (d) Had her duty been done by her?

IDIOMS

76. A movement for world unity is in the offing. –
 (a) at the end (b) about to start (c) on decline. (d) in the air
77. In the armed Forces, it is considered a great privilege to die in harness. –
 (a) die with honour (b) die on a horse back
 (c) die while working (d) die in the battlefield
78. Niharika is not a cut out for this kind of work. –
 (a) trained (b) suitable (c) recommended (d) considered
79. His most trusted friend proved to be a snake in the grass. –
 (a) cowardly and brutal (b) an unreliable person
 (c) a treacherous person (d) low in morals
80. The politician was able to sway the mob with his gift of the gab. –
 (a) fluency of speech (b) flattering words –
 (c) abundance of promises (d) political foresight

ORDERING OF WORDS

81. Of many artists
 P : those who impressed me the most Q : when I was a child
 R : but those with unique personalities off stage S : were not always the successful ones
 (a) SRQP (b) QRSP (c) RSPQ (d) PQSR
82. As a disease
 P : and breaks up marriages Q : accidents and suicides
 R : alcoholism leads to S : affecting all ages
 (a) SRPQ (b) RPSQ (c) SRQP (d) RQPS
83. It is easy to excuse
 P : but it is hard Q : in a boy of fourteen
 R : the mischief of early childhood S : to tolerate even unavoidable faults
 (a) RPQS (b) QRSP (c) QRPS (d) RPSQ

84. The majestic mahogany table
 P : belongs to an old prince Q : which has one leg missing
 R : who is impoverished S : but is not without some pride
 (a) PQSR (b) QRSP (c) PRSQ (d) QPRS
85. Education is
 P : of the proper sense of responsibilities Q : the first need
 R : in a citizen S : for the development
 (a) SQPR (b) QSRP (c) QSPR (d) PQRS

FILL IN FLANK

86. He did not-----her name.
 (a) know (b) knowing (c) known (d) Knows
87. They are looking forward to-----you.
 (a) meets (b) to meeting (c) for meeting (d) meeting
88. She is interested-----dancing.
 (a) at (b) to (c) in (d) for
89. He did not-----the party.
 (a) attended (b) attend (c) attending (d) attends
90. This car runs the-----.
 (a) fasts (b) fast (c) fastest (d) very fastly

IDENTIFICATION OF PARTS OF SPEECH

91. A drowning man catches at a straw—
 (a) Preposition (b) Conjunction (c) Adverb (d) Noun
92. The man repeated the same thing thrice.—
 (a) Pronoun (b) Adjective (c) Adverb (d) Noun
93. Please walk forward and down.—
 (a) Preposition (b) verb (c) Adverb (d) Noun
94. The mangoes are almost ripe.—
 (a) Adjective (b) Conjunction (c) Adverb (d) Noun
95. Are you keeping well?—
 (a) verb (b) Adjective (c) Adverb (d) Noun

GAT

96. The Viceroy who carried out the Partition of Bengal was:
 (a) Lord Curzon (b) Lord Minto (c) Lord Hardinge (d) Lord Ripon
97. The slogan "Boycott of foreign goods" was first raised during:
 (a) Swadeshi Movement (b) Non-Cooperation Movement
 (c) Civil Disobedience Movement (d) Quit India Movement



98. The Harappan Civilization is also known as:
(a) Vedic Civilization (b) Indus Valley Civilization
(c) Gupta Civilization (d) Mauryan Civilization
99. Articles 12 to 35 deal with:
(a) Fundamental Rights (b) Directive Principles of State Policy
(c) Fundamental Duties (d) Emergency Provisions
100. Which of the following is NOT a Fundamental Right?
(a) Right to Freedom of Speech (b) Right to Property (post 44th Amendment)
(c) Right against Exploitation (d) Right to Constitutional Remedies
101. Article 370, before its abrogation, allowed:
(a) Separate constitution for J&K (b) Special taxation rights
(c) Separate flag (d) All of the above
102. State Legislative Assembly is also called:
(a) Vidhan Parishad (b) Vidhan Sabha (c) Rajya Sabha (d) Lok Sabha
103. Legislative Assembly is the:
(a) Upper House (b) Lower House (c) Unicameral (d) Advisory body
104. What is the point inside the Earth where an earthquake originates?
(a) Epicenter (b) Hypocenter (c) Crater (d) Mantle
105. The point on the surface directly above the origin of the earthquake is:
(a) Focus (b) Fault (c) Epicenter (d) Ridge
106. Which planet is farthest from the Sun?
(a) Uranus (b) Neptune (c) Pluto (d) Saturn
107. Lines of longitude are also known as:
(a) Parallels (b) Meridians (c) Equators (d) Circles
108. Longitude lines meet at:
(a) Equator (b) North Pole only (c) Both Poles (d) Nowhere
109. What is the longitudinal extent of India?
(a) $68^{\circ}7'E$ to $97^{\circ}25'E$ (b) $66^{\circ}7'E$ to $99^{\circ}25'E$ (c) $67^{\circ}7'E$ to $96^{\circ}25'E$ (d) $69^{\circ}7'E$ to $95^{\circ}25'E$
110. Which of the following is the southernmost point of India?
(a) Kanyakumari (b) Indira Point (c) Minicoy Island (d) Great Nicobar
111. Which of the following is part of the secondary sector?
(a) Fishing (b) Mining (c) Manufacturing (d) Agriculture
112. Which sector provides job security and fixed working hours?
(a) Organised (b) Unorganised (c) Primary (d) Secondary
113. A market in economics refers to:
(a) A place where goods are sold (b) A system of exchange of goods & services
(c) Only physical shops (d) Only online platforms

114. In which market form are there many buyers and many sellers dealing in homogeneous products?
- (a) Monopoly (b) Oligopoly
(c) Perfect competition (d) Monopolistic competition
115. Which organization is responsible for conducting the Census in India?
- (a) Planning Commission
(b) Registrar General & Census Commissioner of India
(c) National Sample Survey Office
(d) Ministry of Statistics & Programme Implementation
116. Poverty line is defined as:
- (a) Minimum income needed to satisfy basic needs
(b) Average income of citizens
(c) Median income in the economy
(d) Per capita GDP
117. National income is the:
- (a) Total money supply in the country
(b) Total value of all final goods & services produced in a year
(c) Total tax collected by the government
(d) Total exports of a country
118. The Planning Commission was set up by:
- (a) Constitutional provision
(b) Act of Parliament
(c) Executive Resolution of the Government
(d) Supreme Court order
119. Who was the first Chairman of the Planning Commission?
- (a) Sardar Vallabhbhai Patel (b) Jawaharlal Nehru
(c) Dr. Rajendra Prasad (d) Lal Bahadur Shastri
120. PM Gram Sadak Yojana was launched in:
- (a) 2000 (b) 2004 (c) 1999 (d) 2002