NEW STANDARD ACADEMY

Marks: 150

Date : 12-05-25 **CLASS : 11TH** **Time: $2\frac{1}{2}$ hours**

PHYSICS

1. The pitch of screw gauge is 1 mm and there are 100 divisions on circular scale. Screw gauge is zero error free. While measuring diameter of a wire, the main scale reads 1 mm and 46th division on circular scale coincides with the reference line. The length of wire is 5.0 cm. Find the volume of the wire.
   (a) 2.6 cm³ (b) 0.086 cm³
   (c) 0.026 cm³ (d) 0.036 cm³
2. The velocity of a body which has fallen freely under gravity varies as $g^p h^q$ where g is the acceleration due to gravity and h' is the height through which it has fallen. The value of p and q are
   (a) - 1/2, ½ (b) 1/2, - 1/2
   (c) 1/2, ½ (d) - 1/2, - ½
3. Given: Resistance, $R_1 = (8 \pm 0.4\%)\ \Omega$ and Resistance, $R_2 = (8 \pm 0.6\%)\ \Omega$ What is the net resistance when and R_2 are connected in series? R_1
   (a) $(16 \pm 0.4)\ \Omega$ (b) $(16 \pm 0.6)\ \Omega$
   (c) $(16 \pm 1.0)\ \Omega$ (d) $(16 \pm 0.2)\ \Omega$
4. The van der Waals equation of state for some gases can 4 be expressed as
   $\left(P + \frac{a}{V^2}\right)(V - b) = RT$
   where P is the pressure. V the molar volume and T is the absolute temperature of the given sample of gas and a, b and R are constants. The dimensions of a are
   (a) $M L^5 T^{-2}$ (b) $M L^{-1} T^{-2}$
   (c) L^3 (d) L^6
5. In the relation $\frac{dy}{dx} = 2\omega\sin(\omega t + \phi_0)$ the dimensional formula for $(\omega t + \phi_0)is$
   (a) MLT (b) MLT^0
   (c) $M^0L^0T^0$ (d) M^0LT^0
6. Suppose refractive index $\mu$is given as $\mu = A + \frac{B}{\lambda^2}$ where A and B are constants and λ is wavelength , then dimension of B are same as that of
   (a) wavelength (b) Volume
   (c) pressure (d) area
7. In CGS system the magnitude of the force is 100 dynes. In another system where the fundamental physical quantities are kilogram, metre and minute, the magnitude of the force is
   (a) 0.036 (b) 0.36
   (c) 3.6 (d) 36
8. A physical quantity S is related to four observables a, b, c, d as $S = \frac{\sqrt{ab}}{c^3d^4}$. If the percentage errors of measurement in a, b, c, d are 2%, 1%, 1% and 1% respectively, then persentage error in the quantity S is
   (a) 6% (b) 8%
   (c) 9% (d) 10%
9. The number of significant figures in the measurement of a length 0.079000 m is
   (a) 7 (b) 2
   (c) 5 (d) 4
10. The error in the measurement of the length and the breadth 1 of a rectangular table is 1%. If the length and breadth of the table are 1 m and 50 cm respectively, then the area of the table including error is
    (a) $(0.5 \pm 0.1)\ m^2$ (b) $(0.5 \pm 0.01)\ m^2$
    (c) $(5000 + 10)\ cm^2$ (d) $(5000 \pm 1)\ cm^2$
11. The frequency *f* of vibrations of a mass m suspended from a spring of spring constant K is given by $f = Cm^xk^y$, where C is a dimensionless constant . The value of x and y are respectively
    (a) $\frac{1}{2}, \frac{1}{2}$ (b) $-\frac{1}{2}, -\frac{1}{2}$
    (c) $\frac{1}{2}, -\frac{1}{2}$ (d) $-\frac{1}{2}, \frac{1}{2}$
12. The number of particles crossing a unit area perpendicular to the X-axis in a unit time is given by $n = -D\left(\frac{n_2 - n_1}{x_2 - x_1}\right)$where n_1 and n_2 are the number of particles per unit volume at $x = x_1$ and $x = x_2$ respectively and D is the diffusion constant. The dimensions of D are
    (a) $[M^0LT^{-2}]$ (b) $[M^0L^2T^{-4}]$
    (c) $[M^2L^2T^{-2}]$ (d) $[M^0L^2T^{-1}]$
13. A physical quantity P is given by
    $P = \frac{A^3B^{\frac{1}{2}}}{C^{-4}D^{\frac{3}{2}}}$ The quantity which brings in the maximum percentage error in Pis
    (a) A (b) B
    (c) C (d) D
14. In an experiment, the following observations were recorded*: L = 2.82m , M = 3kg l =*

0.087 cm. Diameter D = 0.041cm Taking g = 9.81 m / s ^{2} using the formula, Y = $\frac{4Mg}{\pi D^2 l}$ the maximum permissible error in Y is

(a) 7.96% (b) 4.56%
(c) 6.50% (d) 8.42%

15. A physical quantity A is related to four observable a, b, c and d as follows, A = $\frac{a^2 b^2}{c\sqrt{d}}$ the percentage errors of measurement in a, b, c and d are 1%, 3%, 2% and 2% respectively. What is the percentage error in the quantity A
(a) 12% (b) 7%
(c) 5% (d) 14%
16. A student measured the diameter of a small steel ball using a screw gauge of least count 0.001 cm. The main scale 16 reading is 5 mm and zero of circular scale division coincides with 25 divisions above the reference level. If screw gauge has a zero error of -0.004 cm, the correct diameter of the ball is
(a) 0.521 cm (b) 0.525 cm
(c) 0.053 cm (d) 0.529 cm.
17. The main scale of a vernier callipers has *n* divisions/cm. *n* divisions of the vernier scale coincide with (*n* - 1) divisions of main scale. The least count of the callipers is,
(a) $\frac{1}{(n+1)(n-1)}$ cm (b) 1/n cm
(c) $\frac{1}{n^2}$ cm (d) $\frac{1}{n(n+1)}$cm
18. A dimensional constant is:
(a) Poisson's ratio
(b) Universal gravitational constant
(c) Relative density
(d) Refractive index.
19. If dimensions of critical velocity v_c of a liquid flowing through a tube are expressed as [$\eta^x \rho^y r^z$] where η, ρ and r are coefficient of viscosity of liquid, density of liquid and radius of the tube respectively, then values of x, y and z are given by:
(a)-1,-1,-1 (b) 1,1,1
(c) 1,-1,-1 (d)-1,-1,1.
20. If X = A×B and ΔX ΔA and ΔB are maximum absolute errors in X, A and B respectively, then the maximum relative error in X is given by
(a) ΔX = ΔA + ΔB
(b) ΔX = ΔA - ΔB
(c) ΔX / X = ΔA / A - ΔB / B
(d) ΔX / X = ΔA / A + ΔB / B
21. If X = A/B and ΔX ΔA and ΔB are the maximum absolute errors in X. A and B respectively, then the maximum fractional error in X is given by
(a) ΔX = ΔA + ΔB (2) ΔX = ΔA - ΔB
(c) ΔX / X = ΔA / A - ΔB / B
(d) ΔX / X = ΔA / A + ΔB / B
22. Given: Potential difference, V = (8± 0.5) * V and current, I = (2± 0.2) A. The value of resistance R in Ω is
(a) 4 ± 16.25% (b) 4 ± 6.25%
(c) 4 ± 10% (d) 4 ± 8%
23. The percentage error in the measurement of mass and speed are 2% and 3%, respectively. The maximum percentage error in the estimation of kinetic energy of a body measuring its mass and speed will be
(a) 11% (b) 8%
(c) 5% (d) 1%
24. The following observations were taken for determining surface tension of water by capillary tube method: Diameter of capillary, D = 1.25 × 10 $^{-2}$ m and rise of water in capillary, h = 1.45 × 10 $^{-2}$ m. Taking g = 9.80ms $^{-2}$ and using the relation T = (rgh/2) ×10^3 Nm^{-1}, what is the possible error in measurement of surface tension T?
(a) 2.4% (b) 15%
(c) 1.6% (d) 0.15%
25. If force, velocity and time are taken as fundamental quantities, find the dimensions of work.
(a) FVT (2) FVT^2
(3) F^0 VT^{-1} (4) F V ^{2} T $^{-1}$

CHEMISTRY

26. Highest number of molecules are present in:
(a) 44 gram CO_2 (b) 48 gram O_3
(c) 8 gram H_2 (d) 64 gram SO_2
27. Which law of chemical combination is shown by water and hydrogen peroxide?
(a) Law of constant proportions
(b) Law of multiple proportions
(c) Law of conservation of mass
(d) Law of reciprocal (equivalent) proportions
28. On rounding off the values 2.645 and 2.643, values obtained respectively are:
(a) 2.64, 2.64 (b) 2.65, 2.64
(c) 2.66, 2.64 (d) 2.64, 2.63
29. Which contains lowest number of molecules?
(a) 10 mole CO_2
(b) 100 litre of H_2 at STP
(c) 100 gram N_2
(d) 100 gram NH_3
30. Electrons present in 1.6 gram of methane :
(a) 6.02 × 10^{21} (b) 6.02 × 10^{22}
(c) 6.02 × 10^{23} (d) 6.02 × 10^{24}
31. Mass ratio of O_2 : N_2 in its gaseous mixture is 1: 4. Ratio of their molecules is :
(a) 1:4 (b) 1:8
(c) 7:32 (d) 3:16

32. 0.50 mole of $BaCl_2$ and 0.20 mole of Na_3PO_4 are made to react, moles of $Ba_3(PO_4)_2$ formed are:
(a) 0.10 (b) 0.70
(c) 0.20 (d) 0.50

33. Density of water is one gram per mL. What is the number of molecules in 18 mL of water?
(a) 6.02×10^{22} (b) 3.02×10^{23}
(c) 6.02×10^{23} (d) 12.04×10^{23}

34. What volume of CO_2 is obtained at STP on complete decomposition of 9.85 gram $BaCO_3$, (Molar mass of $BaCO_3$=197)
(a) 0.84 L (b) 2.24 L
(c) 4.06 L (d) 1.12 L

35. Which will contain highest number of nitrogen atoms?
(a) one mole of NH_4Cl
(b) 500 mL of 2M NH_3
(c) 6.02×10^{23} molecules of NO_2
(d) 22.4 litre of N_2 gas at STP

36. For a solution, which does not depend upon temperature?
(a) Molarity (b) Normality
(c) Formality (d) Molality

37. Equal volumes of all the gases at equal T and P contain:
(a) equal density (b) equal mass
(c) equal atoms (d) equal number of molecules

38. Mole fraction of methanol (CH_3OH) in its 5.2 molal aqueous solution:
(a) 0.10 (b) 0.086
(c) 0.19 (d) 0.05

39. One gram Mg and 0.56 gram O_2 are heated together in a closed vessel. Which reactant and how much of it is left behind unreacted?
(a) 0.44 gram of Mg (b) 0.28 gram O_2
(c) 0.16 gram of Mg (d) 0.16 gram O_2

40. $Fe_2O_3 + 3H_2 \rightarrow 3H_2O + 2Fe$
Mass of iron obtained by the reduction of one kilogram of ferric oxide: (Fe_2O_3 = 160 , Fe = 56)
(a) 0.7 kg (b) 0.07 kg
(c) 0.14 kg (d) 0.28 kg

41. Mass of an aqueous solution of sugar is 214.2 gram and it contains 34.2 gram dissolved sugar. Mole fraction of sugar is: (molar mass of sugar = 342)
(a) 0.0099 (b) 0.099
(c) 0.99 (d) 0.01

42. $2A + 3B \rightarrow A_2B_3$
One mole of A and one mole of B are made to react according to the above chemical equation. Moles of A_2B_3 formed are:
(a) 0.5 (b) 0.33
(c) 1.5 (d) 1

43. Which is used as standard for atomic mass?
(a) $_1H^1$ (b) $_6C^{12}$
(c) $_6C^{14}$ (d) $_8O^{16}$

44. Ratio of C, H and N in a compound is 9: 1:35. Molar mass of compound is 108. Molecular formula of compound is:
(a) $C_2H_6N_2$ (b) C_3H_4N
(c) $C_6H_8N_2$ (d) $C_9H_{12}N_3$

45. 2.5 L of 1M NaOH and 3.0 L of 0.5 NaOH are mixed together. Molarity of resulting NaOH solution is :
(a) 0.80M (b) 1.0M
(c) 0.73M (d) 0.50M

46. CO_2 gas is passed in 500 mL of 0.5M$Ca(OH)_2$. Mass of $CaCO_3$ formed is :
(a) 25 g (b) 50 g
(c) 20 g (d) 10 g

47. Under identical condition of T and P, 30 mL of H_2 and 20 mL of O_2 are made to react to form water. Which will be left behind after the reaction?
(a) 10 mL H_2 (b) 5 mL H_2
(c) 10 mL O_2 (d) 5 mL O_2

48. 100 mL of urea solution contains 6.022×10^{20} molecules of urea. Molar concentration of urea solution is:
(a) 0.001 M (b) 0.01 M
(c) 0.02 M (d) 0.1 M

49. 6.5 g PbO and 3.2 g HCl are made to react. Moles of Pb(II) Chloride obtained is:
(Molar mass Pbo is 224; HCI: 36.5)
(a) 0.011 (b) 0.029
(c) 0.044 (d) 0.333

50. How many moles of $Mg_3(PO_4)_2$ will contain 0.25 moles of oxygen atom?
(a) 0.02 (b) 3.125×10^{-2}
(c) 1.25×10^{-2} (d) 2.5×10^{-2}

BIOLOGY

51. The products of mitosis are -
(a) One nucleus containing twice as much DNA as the parent nucleus
(b) Two genetically identical cells
(c) Four nuclei containing half as much DNA as the parent nucleus
(d) Two genelically identical nuclei

52. DNA replication occurs -
(a) During both mitosis and meiosis
(b) Only during mitosis
(c) Only during meiosis
(d) During the S phase

53. During meiosis, the sister chromatids separate during -
(a) Anaphase II (b) Anaphase I
(c) The S phase (d) Synapsis

54. The number of chromosomes is reduced to half during -
(a) Anaphase of mitosis and meiosis
(b) Meiosis II

(c) Meiosis I (d) Fertilization

55. During mitotic anaphase, chromatids migrate -
(a) From the metaphase plate towards the poles
(b) Towards the nuclear envelope
(c) Along with their sister chromatids toward one pole
(d) Along with the other member of the homologous pair toward the metaphase plate

56. What happens in S-phase?
(a) DNA replication
(b) in animal cell replication of centriole
(c) Both a and b
(d) Separation of replicated DNA

57. Which is called quiescent stage?
(a) G_o (b) G2
(c) G_1 (d) S-phase

58. Cells in G_o-stage -
(a) Are metabolically more active
(b) Are metabolically inactive
(c) Remain metabolically active but no longer proliferate in normal condition
(d) None

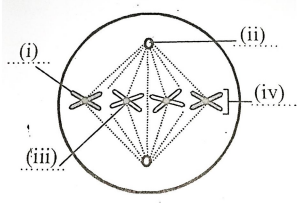
59. Which one is the correct sequence of a cell cycle?
(a) $G_2 \rightarrow M \rightarrow G_1 \rightarrow S$ (b) $S \rightarrow G_2 \rightarrow M \rightarrow G_1$
(c) $G_1 \rightarrow S \rightarrow G_2 \rightarrow M$ (d) $M \rightarrow G_1 \rightarrow S \rightarrow G_2$

60. Which one is the longest phase?
(a) G_1 (b) G_2
(c) Interphase (d) Prophase

61. Which is the correct order of cell cycle
(a) $G_1 \rightarrow S \rightarrow G_2 \rightarrow$ $prophase$ →Metaphase→Anaphase→Telophase →Cytokinesis
(b) $G_2 \rightarrow G_1 \rightarrow S \rightarrow P - M \rightarrow A \rightarrow T \rightarrow$ Cytokinesis
(c) S→G_1→G_2→P-M→A→ T → Cytokinesis
(d) $prophase$ → Metaphase→ Anaphase→Telophase →Cytokinesis→ S → G_2→G_1

62. Synaptonemal complex is more conspicuous at
(a) Zygotene (b) Pachytene
(c) Diplotene (d) Leptotene

63. Label the structure indicated by lines (i), (ii), (iii) and (iv) –

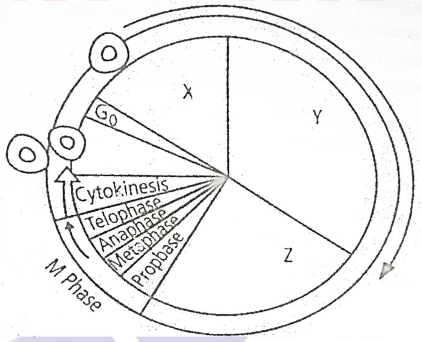


(a) (i)- Chromatid, (ii) Centriole, (iii) Centromere, (iv) Chromosome
(b) (1) - Chromomosome, (ii) Centriole, (iii) Centromere, (iv) Chromatid
(c) (1) - Chromatid, (ii) Centromere, (ii) Centriole, (iv) Chromosome
(d) (1) - Chromomosome, (ii) Centromere, (iii) Centriole (iv) Chromatid

64. Which one is correct about meiosis?
(a) First division is reduction and second division is equational
(b) The best material for the study of meiosis is microspore (pollen) mother cell in microsporangium of anther
(c) The importance of meiosis lies in maintaining the chromosomal number from generation to generation in sexually reproducing organisms
(d) All

65. Anaphase I is marked by -
(a) Movement of homologous chromosomes toward their respective pole
(b) Centromere division
(c) Sister chromatids remain associated at centromere
(d) a and c

66. The following diagram refers to a typical cell cycle.



Identify the parts marked as X,Y and Z
(a)X-G_1;Y-S;Z-G_2 (b) X-G_2;Y-S;Z-G_1
(c) X-G_0;Y-S;Z-G_2 (d) X-G_1;Y-G_2;Z-G_0

67. Meiosis results in
(a) Productiori of gametes
(b) Reduction in the number of chromosomes
(c) Introduction of variation
(d) all of the above

68. During anaphase-I of meiosis
(a) Homologous chromosomes separate
(b) Non-homologous autosomes separate
(c) Sister chromatids separate
(d) Non-sister chromatids separate

69. During which phase(s) of cell cycle, amount of DNA in a cell remains at 4C level if the initial amount is denoted as 2C?
(a) G_o and G_1 (b) G_1 and S
(c) Only G_2 (d) G_2 and M

70. The enzyme recombinase is required at which stage of meiosis
(a) Pachytene (b) Zygotene

(c) Diplotene (d) Diakinesis

71. During the metaphase stage of mitosis spindle fibres attach to chromosomes at
(a) Centromere (b) Kinetochore
(c) Both centromere and kinetochore
(d) Centromere, kinetochore and areas adjoining centromere

72. During meiosis I, the chromosomes start pairing at
(a) Leptotene (b) Zygotene
(c) Pachytene (d) Diplotene

73. Arrange the following events of meiosis in correct sequence
I. Terminalization II. Crossing over
III. Synapsis IV. Disjunction
(a) 4, 3, 2, 1 (b) 3, 2, 1, 4
(c) 2, 1, 4, 3 (d) 1, 4, 3, 2

74. During cell division the process that causes failure of separation of sister chromatids is called
(a) Coincidence (b) Interference
(c) Non-disjunction (d) Complementation

75. Which of the following is not true for meiosis?
(a) Production of genetic variability
(b) Maintaining constancy of chromosome number during sexual reproduction
(c) Reduction of chromosome number to one half
(d) Production of diploid cell

MATH

51. Which of the following is a null set?
(a) (x: x ∈ N, 2x - 1 = 3}
(b) {x: x ∈ N, $x^2 < 20$}
(c) (x: x is an even prime greater than 2}
(d) {x: x ∈ I, 3x + 7 = 1}

52. Number of proper subsets of a set containing 4 elements is
(a) 4^2 (b) $4^2 - 1$
(c) 2^4 (d) $2^4 - 1$

53. On real axis if A = [1, 5] and B = [3, 9], then A-B is
(a) (5,9) (b) (1,3)
(c) [5,9) (d) [1,3)

54. Two finite sets have *m* and *n* elements respectively. The total number of subsets of the first set is 192 more than the total number of subsets of the second set. The values of *m* and *n* respectively are
(a)7,6 (b) 8,6
(c) 8, 5 (d) 9, 7

55. For any two sets A and B, ((A'∪B') - A)' is equal to
(a) A (b) B
(c) ϕ d) A ∩ B

56. In a class of 80 students, 39 students play football and 45 students play cricket and 15 students play both the games. Then the number of students who play neither is
(a) 11 (b) 14
(c) 16 (d) 18

57. Which of the following collection of objects is not a set?
(a) The collection of all even integers.
(b) The collection of all months of a year beginning with letter J.
(c) The collection of most talented writers of India.
(d) The collection of all prime numbers less than 20.

58. In a town of 840 persons, 450 persons read Hindi, 300 read English and 200 read both. The number of persons who read neither is
(a) 210 (b) 290
(c) 180 (d) 260

59. AT.V survey gives the following data for T.V. watching 59% of the people watch program A, 67% of the people watch program B and x% of the people watch both the program, then
(a) x = 26 (b) x = 59
(c) 26 ≤ x ≤ 59 (d) x ≥ 59

60. If A = $\{(x,y) : y = \frac{1}{x}, 0 \neq x R\}$, B= $\{(x,y): y = -x, x \in R\}$, then
(a) A∩B = A (b) A∩B=B
(c)A∩B = ϕ (d) A∪B = A

61. If A = {1,2,3,4,5,6} then the number of subsets of A which contains at least two elements is
(a) 63 (b) 57
(c) 58 (4) 64

62. If A = {1,2,3,…10 } then the number of subsets of A containing only odd numbers is
(a) 31 (b) 32
(c) 27 (d) 30

63. If A = {(a,b) : 4a =5b:a,b∈{1,2,3, ... 30} *then the number of such ordered pair* (a,b) Is
(a) 4 (b) 6
(c) 8 (d) 10

64. The set $\left\{x \in R: 16(2^x) > 16^{-\frac{1}{x}}\right\}$ =
(a) {x∈ $R: x > 0$} (b) {x∈ $R: x < 0$}
(c) R (d) {x∈ $R: x > 2$}

65. When A =ϕ, *then number of elements in* P(A)is
(a) 0 (b) 1
(c) 2 (d) 3

66. Let F_1be the set of parallelograms, F_2 the set of rectangles F_3 the set of rhombuses F_4 the set of squares and F_5 the set of trapeziums in a plane .

then F_1 may be equal to

(a) $F_2 \cap F_3$ (2) $F_3 \cap F_4$

(c) $F_2 \cup F_5$ (d) $F_2 \cup F_3 \cup F_4 \cup F_1$

67. If sets A and B are disjoint sets such that $n(A \cup B) = 30$ and n(A) = 14, then n(B) =

(a) 15 (b) 16

(c) 20 (d) can't say anything

68. If a = { 1,3,5,7,9,11,13,15,17} , b ={2,4,…,18} and n the set of natural numbers is the universal set , then $(A' \cup (A \cup B) \cap B')$ is equal to

(a) ϕ (b) N

(c) A (d) B

69. Let A = {1,2,11} and B= {5,6,7,11,10}. If N is universal set then A'-B'=

(a) {1,2} (b) {11}

(c) {5,6,7,10} (d) none of these

70. Consider the following relations

(i) $A-B = A - (A \cap B)$

(ii) $A = (A \cap B) \cup (A - B)$

(iii) $A- (B \cup C) = (A - B) \cup (A - C)$

Which of these is /are correct ?

(a) (i) and (iii) (b) (ii) only

(c) (ii) and (iii) (d) (i) and (ii)

71. Suppose $A_1, A_2, \ldots A_{30}$ are thirty set each having 5 elements and $B_1, B_2, \ldots B_n$ are n sets each with 3 elements. Let

$$\bigcup_{i=1}^{30} A_i = \bigcup_{i=1}^{n} B_j = S$$

and each element of S belongs to exactly 10 of the A_i s and exactly 9 of the $B_j's$. Then n is equal to

(a) 15 (b) 3

(c) 45 (d) 35

72. If $A \equiv [-3,6), B \equiv [4,18] and\ c \equiv (-\infty, -1)$. Then $A \cap (B \cup C)$ does not contain the Interval

(a) [-3,-1) (b) [4,6)

(c) [-3,-1] (d) none of these

73. Let A and B be two finite sets with m and n elements respectively. The total number of subsets of the set A is 56 more than the total number of subsets of B. Then the distance of the point P(m, n) from the point Q(-2, -3) is

(a) 10 (b) 6

(c) 4 (d) 8

74. A group of 40 students appeared in an examination of 3 subjects Mathematics, Physics and Chemistry. It was found that all students passed in at least one of the subjects, 20 students passed in Mathematics, 25 students passed in Physics, 16 students passed in Chemistry, at most 11 students passed in both Mathematics and Physics, at most 15 students passed in both Physics and Chemistry, at most 15 students passed in both Mathematics and Chemistry. The maximum number of students passed in all the three subjects is

(a) 0.01 (b) 100

(c) 10 (d) 0.1

75. In a survey of 220 students of a higher secondary school, it was found that at least 125 and at most 130 students studied Mathematics; at least 85 and at most 95 studied Physics; at least 75 and at most 90 studied Chemistry; 30 studied both Physics and Chemistry; 50 studied both Chemistry and Mathematics, 40 studied both Mathematics and Physics and 10 studied none of these subjects. Let m and n respectively be the least and the most number of students who studied all the three subjects. Then m + n is equal to

(a) 35 (b) 25

(c) 45 (d) 55