INDIAN ASSOCIATION OF PHYSICS TEACHERS

NATIONAL STANDARD EXAMINATION IN JUNIOR SCIENCE (NSEJS) 2017-18

Instructions to Candidates – Strictly follow them

1. **Write the question paper code in your answer sheet in the appropriate space provided**, otherwise your answer sheet will **not be assessed**.

2. Carrying and use of mobile phones, smartphones, iPads or any other communication devices or any other objectionable material in examination is **strictly prohibited**.

3. Use only the allowed calculators (non-programmable). List is given on IAPT website.

4. On the answer sheet, make **all** the entries correctly, carefully in the space(s) provided, in **capital letters** as well as by properly darkening the appropriate bubbles using **blue** or **black ball point pen** only. **Incomplete/ incorrect/carelessly filled information may disqualify your candidature.**

5. The email ID and date of birth entered in the answer sheet will be your login credentials for accessing performance report. Please take care while entering.

6. Please **do not** make any mark other than filling the appropriate bubbles properly in the space provided on the answer sheet. Further, do not write on the back side of the answer sheet.

7. As answer sheets are evaluated using machine, **change of entry is not allowed.** Even scratching or overwriting may result in a wrong score.

8. Question paper has 80 multiple choice questions. Each question has four alternatives, out of which only one is correct. Choose the correct alternative and fill the appropriate bubble, as shown: Q. No. ⓐ ⬤ ⓒ ⓓ

9. Correct answer carries 3 marks, wrong answer -1 mark (negative 1), no attempt – zero marks.

10. Rough work should be done in the space provided in the question paper only.

11. Candidates are not permitted to leave the examination hall before the completion of the examination schedule (i.e. before 1200 Hrs).

12. Your answer sheet consists of two pages - original copy and candidate's copy. Do not detach them till the end of the examination. At the end of examination, submit your answer paper- original copy and take away the student's copy for your further reference.

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13. Comments (if any) regarding this question paper, may be sent by **email only** to: iapt.nse@gmail.com till 2359 hrs. of 24 Nov. 2017.

14. The answers/solutions to this question paper will be available at – www.iapt.org.in - by 02 Dec. 2017.

15. For certificates and awards – Please see the website of IAPT: www.iapt.org.in
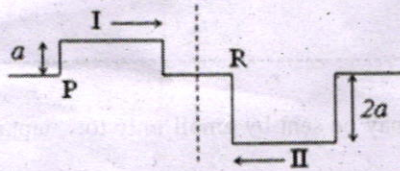
PERIODIC TABLE OF THE ELEMENTS

1	2											13	14	15	16	17	18
1 H 1.008																	2 He 4.00
3 Li 6.94	4 Be 9.01											5 B 10.81	6 C 12.01	7 N 14.01	8 O 16.00	9 F 19.00	10 Ne 20.18
11 Na 22.99	12 Mg 24.30											13 Al 26.98	14 Si 28.09	15 P 30.97	16 S 32.06	17 Cl 35.45	18 Ar 39.95
19 K 39.10	20 Ca 40.08	21 Sc 44.96	22 Ti 47.90	23 V 50.94	24 Cr 52.00	25 Mn 54.94	26 Fe 55.85	27 Co 58.93	28 Ni 58.69	29 Cu 63.55	30 Zn 65.39	31 Ga 69.72	32 Ge 72.59	33 As 74.92	34 Se 78.96	35 Br 79.90	36 Kr 83.80
37 Rb 85.47	38 Sr 87.62	39 Y 88.91	40 Zr 91.22	41 Nb 92.91	42 Mo 95.94	43 Tc (98)	44 Ru 101.1	45 Rh 102.91	46 Pd 106.42	47 Ag 107.87	48 Cd 112.41	49 In 114.82	50 Sn 118.71	51 Sb 121.75	52 Te 127.60	53 I 126.91	54 Xe 131.29
55 Cs 132.91	56 Ba 137.33	57 *La 138.91	72 Hf 178.49	73 Ta 180.95	74 W 183.85	75 Re 186.21	76 Os 190.2	77 Ir 192.2	78 Pt 195.08	79 Au 196.97	80 Hg 200.59	81 Tl 204.38	82 Pb 207.2	83 Bi 208.98	84 Po (209)	85 At (210)	86 Rn (222)
87 Fr (223)	88 Ra 226.02	89 †Ac 227.03	104 Rf (261)	105 Db (262)	106 Sg (266)	107 Bh (264)	108 Hs (277)	109 Mt (268)	110 Ds (271)	111 Rg (272)							

*Lanthanide Series

58 Ce 140.12	59 Pr 140.91	60 Nd 144.24	61 Pm (145)	62 Sm 150.4	63 Eu 151.97	64 Gd 157.25	65 Tb 158.93	66 Dy 162.50	67 Ho 164.93	68 Er 167.26	69 Tm 168.93	70 Yb 173.04	71 Lu 174.97

†Actinide Series

| 90 Th 232.04	91 Pa 231.04	92 U 238.03	93 Np (237)	94 Pu (244)	95 Am (243)	96 Cm (247)	97 Bk (247)	98 Cf (251)	99 Es (252)	100 Fm (257)	101 Md (258)	102 No (259)	103 Lr (262)

QUESTION PAPER STARTS HERE

1.

Two wave pulses I and II have the same wavelength. They are travelling in the directions as shown by the single headed arrows. The resultant sketch of the two wave pulses at some instant of time when P coincides with R is_____.

(a) (b) (c) (d)
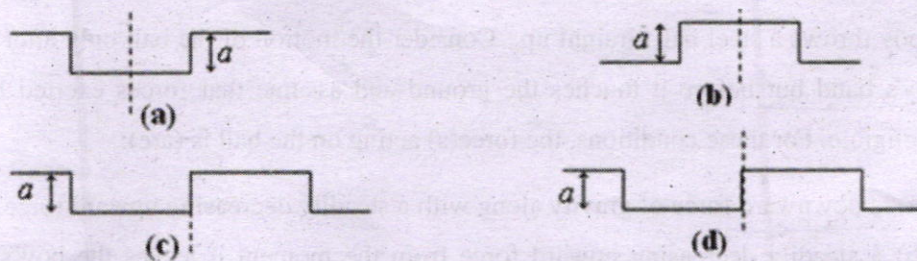
2. The equivalent resistance of two resistances in series is 'S'. These resistances are now joined in parallel. The parallel equivalent resistance is 'P'. If S = n P. Then the minimum possible value of n is:

(a) 2 (b) 4 (c) 3 (d) 5

3.
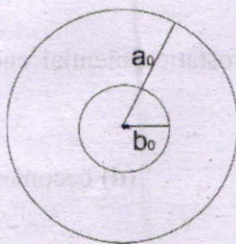
A copper disc of radius a_o has a hole of radius b_o at the centre, at 0°C. The disc is now heated and maintained at 200°C. The new radii of disc and hole are a_t and b_t respectively. For the heated disc it can be concluded that:

(a) $a_0 < a_t$, $b_0 > b_t$ and density of disc increases

(b) $a_0 < a_t$, $b_0 > b_t$ and density of disc decreases

(c) $a_0 < a_t$, $b_0 < b_t$ and density of disc increases

(d) $a_0 < a_t$, $b_0 < b_t$ and density of disc decreases

4.
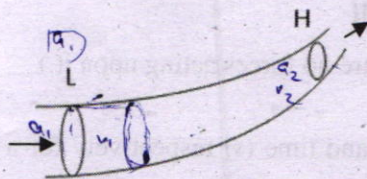
A liquid, whose density doesn't change during the motion, is flowing steadily through a pipe of varying cross sectional area as shown in the adjacent figure. If a_1, a_2 are the cross sectional areas, v_1, v_2 are the values of velocities (or speeds) at L and H respectively, then the correct relation between a_1, a_2 and v_1, v_2 is:

(a) $a_1 v_1 = a_2 v_2$ (b) $a_1 v_2 = a_2 v_1$ (c) $a_1^2 v_2 = a_2^2 v_1$ (d) $a_1 v_1^2 = a_2 v_2^2$

5. A common hydrometer has a uniform scale and its stem is graduated downwards from 0 to 20. While floating in water, it reads 0 and while floating in a liquid of density 1.40 g/cm³, it reads 20. Then the density of the liquid in which it will read 10 is ___.

(a) 0.7 g/cm³ (b) 0.85 g/cm³ (c) 1.17 g/cm³ (d) 2.8 g/cm³

6. A boy throws a steel ball straight up. Consider the motion of the ball only after it has left the boy's hand but before it touches the ground and assume that forces exerted by the air are negligible. For these conditions, the force(s) acting on the ball is (are):

   (a) a downward force of gravity along with a steadily decreasing upward force.

   (b) a steadily decreasing upward force from the moment it leaves the boy's hand until it reaches its highest point; on the way down there is a steadily increasing downward force of gravity as the object gets closer to the earth.

   (c) constant downward force of gravity along with an upward force that steadily decreases until the ball reaches its highest point; on the way down there is only a constant downward force of gravity.

   (d) constant downward force of gravity only.

7. In bringing a α-particle towards another α-particle, the electrostatic potential energy of the system _____.

   (a) increases   (b) decreases   (c) remains unchanged   (d) becomes zero

8. An empty office chair is at rest on a floor. Consider the following forces:

   I - A downward force of gravity,

   II - An upward force exerted by the floor,

   III - A net downward force exerted by the air.

   Then, which of the force(s) is (are) acting on the office chair?

   (a) I only   (b) I and II   (c) I, II and III

   (d) none of the forces. (Since the chair is at rest there are no forces acting upon it.)

9. If x, v and t represent displacement (m), velocity (m/s) and time (s) respectively for a certain particle then which pair of the following figures can be best correlated to each other:
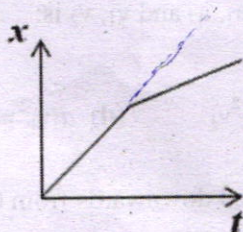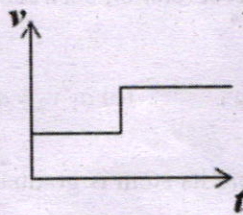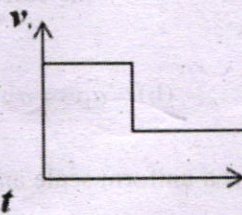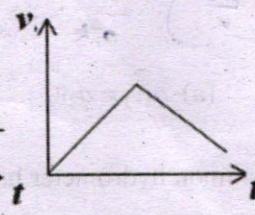
   Fig. I   Fig. II   Fig .III   Fig. IV

   (a) I & II   (b) I & III   (c) I & IV   (d) none

10. In rural areas, an indigenous way of keeping kitchen materials cool is to put them in a box and wrap the box with wet blanket; the blanket is kept wet as tap is allowed to drip in to its corner. Choose the correct statement:

(a) This method works because the water from the tap is cold. If one uses room temperature water, it will not work.

(b) Method will work only if the box is a bad conductor of heat. If one uses tin box, it will not work.

(c) Method doesn't work.

(d) This method works because the latent heat necessary for evaporation of water in the blanket is taken from the box so the box and its content remain cool.

11.
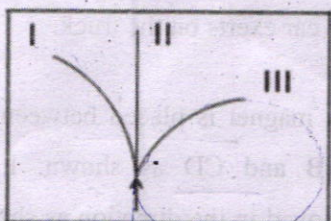
An electron and α-particle enter a region of uniform magnetic field (of induction B) with equal velocities. The direction of B is perpendicular and into the plane of the paper. Then qualitatively identify the direction of paths of electron and the α-particle.

(a) I for α-particle, III for electron

(b) I for electron, II for α-particle

(c) I for α-particle, II for electron

(d) I for electron, III for α-particle

12. A concave mirror of radius of curvature 1 m is placed at the bottom of a water tank. The mirror forms an image of the sun when it is directly overhead. If the depth of water in the tank is 80 cm, then the distance of the image formed is _____. (refractive index of water is 1.33)

(a) 50 cm above mirror

(b) on surface of water

(c) 110 cm above mirror

(d) image cannot be formed

13.
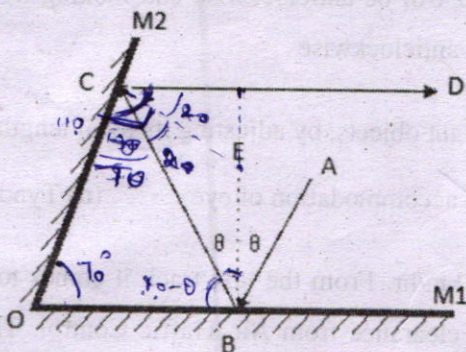
As shown in adjacent figure, two plane mirrors M1 and M2 are inclined to each other at an angle 70° (angle M1OM2). Incident ray AB makes an angle of incidence θ on M1. This ray after reflection at B on M1 and further at C on M2 travels along the direction CD, such that path CD is parallel to M1. Then angle θ is

(a) 45°

(b) 50°

(c) 55°

(d) 60°

14. For the same angle of incidence, the angle of refraction in three different media A, B, C are 15°, 25° and 35° respectively. Then which statement is correct? (μ_A is refractive index of A).

   (a) μ_A is maximum and velocity of light is minimum in medium A.

   (b) μ_A is minimum and velocity of light is maximum in medium A.

   (c) μ_A is maximum and velocity of light is maximum in medium A.

   (d) μ_A is minimum and velocity of light is minimum in medium A.

15. A large truck collides head-on with a small compact car. During the collision:

   (a) the truck exerts a greater force on the car than the car exerts on the truck.

   (b) the car exerts a greater force on the truck than the truck exerts on the car.

   (c) the truck exerts a force on the car but the car does not exert a force on the truck.

   (d) the truck exerts the same force on the car as the car exerts on the truck.
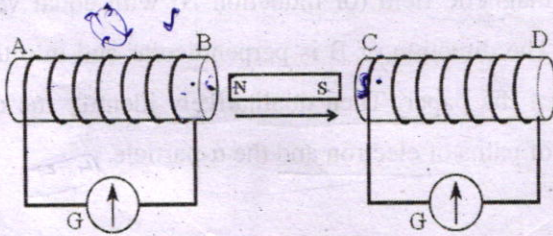
16. A magnet is placed between two coils AB and CD as shown. It is being moved in the direction as shown by the arrow, then which of the following statements is correct:

   (a) looking from end A, current in coil AB will be anticlockwise and looking from end D, the direction of current in coil CD will be clockwise

   (b) looking from end A, current in coil AB will be clockwise and looking from end D, the direction of current in coil CD will be clockwise

   (c) looking from end A, current in coil AB will be clockwise and looking from end D, the direction of current in coil CD will be anticlockwise

   (d) looking from end A, current in coil AB will be anticlockwise and looking from end D, the direction of current in coil CD will be anticlockwise

17. The ability of eye to focus both near and distant objects, by adjusting its focal length, is called

   (a) Myopia   (b) Presbyopia   (c) accommodation of eye   (d) Tyndall effect

18. The take-off speed of Airbus A340 is 288 km/hr. From the taxi track it comes to the main runway and waits for a while for the final clearance from Air Traffic Control. The aircraft then achieves this speed within 50 seconds. Neglecting the effect of the wind direction and friction, what should be the minimum length of main runway decided by civil engineers for this aircraft for a take-off?

   (a) 1800 m   (b) 2000 m   (c) 2200 m   (d) 2400 m

19.
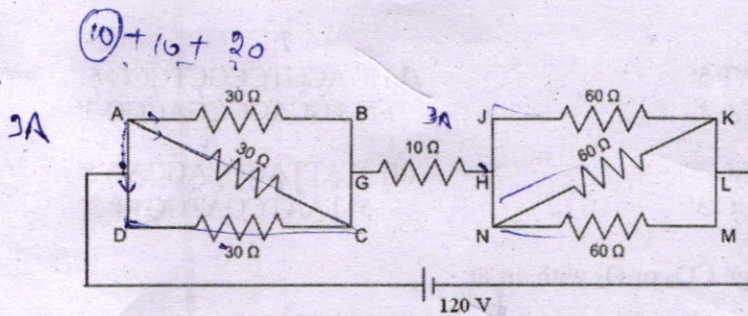
In the adjacent circuit what is the current flowing from N to K?
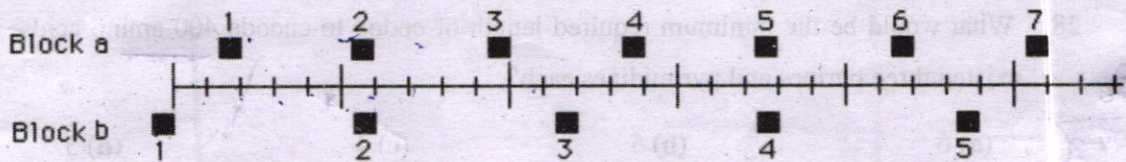
(a) 3 A   (b) 2 A   (c) 1 A   (d) 0.5 A

20. The positions of two blocks at successive 0.20-second time intervals are represented by the numbered squares in the figure below. The blocks are moving towards right.

The accelerations of the blocks are related as follows:

(a) acceleration of ´a´ is greater than acceleration of ´b´.

(b) acceleration of ´a´ equals acceleration of ´b´. Both accelerations are greater than zero.

(c) acceleration of ´b´ is greater than acceleration of ´a´.

(d) acceleration of ´a´ equals acceleration of ´b´. Both accelerations are zero.

21. Panting is a means of thermoregulation in dogs. This is due to:

(a) high specific heat of water   (b) high vapour pressure of water

(c) high specific gravity of water   (d) high latent heat of vapourization

22. In a dihybrid cross, what is the proportion of organisms with dihybrid genotype?

(a) 2/16   (b) 6/16   (c) 4/16   (d) 9/16

23. A mammal adapted to desert conditions is likely to have large:

(a) Nostrils   (b) Muzzle   (c) Pinnae   (d) Nails

24. If a flower is producing a large number of minute and smooth pollen, the agency for cross pollination is most likely to be:

(a) Bats   (b) Water   (c) Insects   (d) Air

25. When heated, the hydrogen bonds between the complementary strands of DNA break and the 2 strands separate in a process called melting. Which of the following pieces of DNA will require maximum temperature for melting?

(a) 3′ AAGGTATACAAT 5′
    5′ TTCCATATGTTA 3′

(b) 3′ ACGTCCGCTGCG 5′
    5′ TGCAGGCGACGC 3′

(c) 3′ GAGCUAUCCGAG 5′
    5′ CUCGAUAGGCUC 3′

(d) 3′ ATTAGCTAGCAA 5′
    5′ TAATCGATCGTT 3′

26. A plant may not exchange CO_2 or O_2 with air at:

    (a) twilight   **(b)** mid-night   **(c)** late hours in the morning   **(d)** noon

27. Metamerism is a characteristic of

    (a) *Hirudinaria*   **(b)** *Taenia*   **(c)** *Asterias*   **(d)** *Pila*

28. What would be the minimum required length of codon to encode 400 amino acids, if there existed three purines and pyrimidines each?

    (a) 6   **(b)** 5   **(c)** 4   **(d)** 3

29. During a study the number of cells was recorded to increase as follows:

    $64 \rightarrow 128 \rightarrow 256 \rightarrow 512 \rightarrow 1024$. This represents:

    (a) Budding   **(b)** Meiosis   **(c)** Binary fission   **(d)** Fragmentation

30. Which amongst the following shows the characters of both plants and animals:

    i. *Anabaena*   ii. *Paramecium*   iii. *Euglena*   iv. *Amoeba*

    (a) i and iv   **(b)** iii   **(c)** ii   **(d)** i and iii

31. If the cell is using less oxygen molecules than the molecules of carbon dioxide evolved in respiration, the substrate for respiration has to be:

    (a) simple sugars   **(b)** organic acids   **(c)** fatty acids   **(d)** cholesterol

32. Which of the following feature indicates omnivorous feeding of human species?

    (a) Presence of canines as well as premolars and molars   **(b)** Presence of appendix
    (c) Presence of 11th and 12th pair of ribs   **(d)** Presence of opposable thumb

33. To meet the increasing demand for food, there have been several 'revolutions'. Which of the following revolutions is likely to have contributed most to global warming?

    (a) Green   **(b)** White   **(c)** Blue   **(d)** Silver

34. In a self-pollinated plant, what would be minimum number of meiotic divisions required for setting 400 seeds?

(a) 500   **(b)** 400   **(c)** 200   **(d)** 100

35. If a small part of the esophagus of a person is excised, the consequence would be:

    (a) larger portion of food with large time interval

    (b) small portions of food at small time interval

    (c) small portions of food at large time interval

    (d) majorly subsist on liquid diet

36. Health is all about 'eating-fasting' balance. When you fast for extended periods, your cells clean out and recycle the intracellular garbage. The organelles responsible for this are:

    (a) Microtubules   **(b)** Microfilaments   **(c)** Golgi Apparatus   **(d)** Lysosomes

37. A 'life- style' disorder among these is:

    (a) Hypertension   **(b)** Presbyopia   **(c)** Herpes   **(d)** Scurvy

38. A plant kept in a box with only a hole for entry of light shows bending, the process called phototropism. It occurs due to:

    (a) Synthesis and diffusion of cytokinin in the leaves **(b)** Breakdown of auxin in the shoot

    (c) Synthesis and diffusion of auxin in the shoot   **(d)** Synthesis and diffusion of abscisic acid

39. Which amongst the following are not plastids:

    (a) Leucoplasts   **(b)** Chromoplasts   **(c)** Amyloplasts   **(d)** Tonoplasts

40. Ravi mixed two substances A and B in a vessel and left it as it is. After few hours he detected an alcoholic smell emanating from the vessel. Identify what A and B are:

    (a) Salt solution and *Lactobacillus*   **(b)** Fruit juice and *Saccharomyces*

    (c) Fruit juice and *Lactobacillus*   **(d)** Salt solution and *Saccharomyces*

41. If $x^2 - 3x + 2$ is a factor of $x^4 - px^2 + q$, then p, q are:

    (a) 0, 0   **(b)** 2, 3   **(c)** 4, 5   **(d)** 5, 4

42. If the roots of the equation $\dfrac{x^2 - bx}{ax - c} = \dfrac{m-1}{m+1}$ are equal and of opposite signs, then the value of 'm' is _____.

    (a) $\dfrac{ab}{a+b}$ **(b)** $\dfrac{a+b}{ab}$ **(c)** $\dfrac{a-b}{a+b}$ **(d)** $\dfrac{a+b}{a-b}$

43. If $p + q + r = 2$, $p^2 + q^2 + r^2 = 30$ and $pqr = 10$, the value of $(1-p)(1-q)(1-r)$ will be_____.

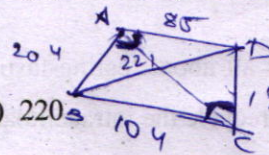(a) -18   (b) -24   (c) -27   (d) -35

44. What is the radius of the circumcircle of a triangle whose sides are 30 cm, 36 cm and 30 cm.

(a) 15 cm   (b) 16 cm   (c) 17 cm   (d) 18 cm

45. If ABCD is a cyclic quadrilateral, AB = 204, BC = 104, CD= 195, DA = 85 and BD = 221, then AC = _____.

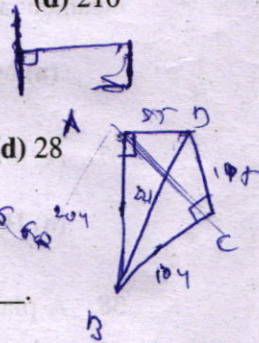(a) 240   (b) 225   (c) 220   (d) 210

46. By which smallest number we should divide 198396198 to get a perfect square?

(a) 14   (b) 18   (c) 22   (d) 28

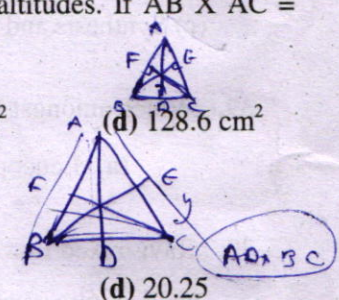**47.** If $(a + b + c + d) = 4$, then

$$\frac{1}{(1-a)(1-b)(1-c)} + \frac{1}{(1-b)(1-c)(1-d)} + \frac{1}{(1-c)(1-d)(1-a)} + \frac{1}{(1-d)(1-a)(1-b)} = \underline{\quad}.$$

(a) 0   (b) 0.25   (c) 1   (d) 4

48. In triangle ABC, segment AD, segment BE and segment CF are altitudes. If AB X AC = 172.8 cm^2 and BE X CF = 108.3 cm^2 then AD X BC = _____.

(a) 136.8 cm^2 (b) 132.4 cm^2 (c) 129.2 cm^2 (d) 128.6 cm^2

49. $1\frac{1}{2} + 1\frac{1}{6} + 1\frac{1}{12} + 1\frac{1}{20} + 1\frac{1}{30} + \ldots\ldots\ldots\ldots + 1\frac{1}{380} = \underline{\quad}$

(a) 19.85   (b) 19.95   (c) 20.05   (d) 20.25

50. If $x = (\sqrt{21} - \sqrt{20})$ and $y = (\sqrt{18} - \sqrt{17})$, then

(a) $x = y$ (b) $x + y = 0$ (c) $x > y$ (d) $x < y$

51. If $\left(x + \frac{1}{x}\right) = 5$, then $\left(x^3 + \frac{1}{x^3}\right) - 5\left(x^2 + \frac{1}{x^2}\right) + \left(x + \frac{1}{x}\right) = \underline{\quad}$.

(a) 0   (b) 5   (c) -5   (d) 10

52. The mean of the following frequency distribution is _____

Class interval	0-10	10-20	20-30	30-40	40-50
Frequency	4	6	8	10	12

(a) 25   (b) 28   (c) 30   (d) 32

53. On seventy first 'Independence day' there was Tuesday. After how many years there will be Tuesday on 'Independence day'?

(a) 4 yrs.   (b) 5 yrs.   (c) 6 yrs.   (d) 7 yrs.

54. If $x^2 + xy + xz = 135$, $y^2 + yz + xy = 351$ and $z^2 + xz + yz = 243$, then $x^2 + y^2 + z^2 = $ _____.

(a) 225   (b) 250   (c) 275   (d) 300

55. What will be the remainder if the number $(7)^{2017}$ is divided by 25?

(a) 1   (b) 7   (c) 18   (d) 24

56. The sum of two numbers is 13 and the sum of their cubes is 1066. Find the product of those two numbers.

(a) 26   (b) 27   (c) 28   (d) 29

57. Diagonals of a quadrilateral bisect each other. Therefore the quadrilateral must be a _____.

(a) parallelogram   (b) rhombus   (c) rectangle   (d) square

58. A train is running at a speed of 54 km/hr. It is not stopping at a certain station. It crosses the person showing green flag in 20 seconds and crosses the platform in 36 seconds. What is the length of the train?

(a) 240 m   (b) 300 m   (c) 320 m   (d) 360 m

59. What is the sum of all odd numbers between 500 and 600?

(a) 29500   (b) 27500   (c) 27000   (d) 26000

60. How many four digit numbers are there such that when they are divided by 101, they have 99 as remainder?

(a) 90   (b) 98   (c) 100   (d) 101

61. During a meteorite shower a few meteorites fell into a water body having pH around 7. The pH of the water body was measured after meteorite shower and found to be

(a) > 7   (b) < 7   (c) = 7   (d) no change in pH of water due to the meteorite shower

62. Arun needs 1.71 g of cane sugar ($C_{12}H_{22}O_{11}$) to sweeten his tea. What would be the number of carbon atoms consumed through sugar in the tea?

(a) 5×10^{21} (b) 7.2×10^{21} (c) 3.66×10^{22} (d) 6.6×10^{22}

63. Harsha was trying to neutralize phosphoric acid using various bases. Those available were caustic soda, lime water and hydrated alumina. If Harsha took 1 equivalent of phosphoric acid each time, what will be the ratio for moles of each of the above bases required for complete neutralization?

(a) 1: 1: 1   (b) 1: 0.5: 0.33   (c) 1: 2: 3   (d) 1: 0.33: 0.5

64. What would be the atomic number of the next halogen element, if discovered in future? (Periodic table provided- page 2)

(a) 103   (b) 115   (c) 117   (d) 121

65. An open vessel contains air at 27°C. The vessel is heated till two-fifth of the air in it has been expelled. Assuming the volume of the vessel remains constant, find the temperature to which the vessel has to be heated?

(a) 500 K   (b) 550 K   (c) 700 K   (d) 750 K

66. Neeta mixed 10 mL of 0.1 M HCl solution with 15 mL of 0.067 M NaOH solution. She checked the pH of the resulting solution using pH paper. The colour obtained was

Red	Orange	Yellow	Green	Pale blue	Dark blue	Violet
Strong acid ⟵		Weak acid	Neutral	Weak alkali ⟶		Strong alkali

(a) Green   (b) Yellow   (c) Pale blue   (d) Violet

67. Tooth decay starts when the pH around tooth is around:

(a) 7.5   (b) 7   (c) 6.5   (d) 5.5

68. The molecular formulae of some organic compounds are given below, which of these compounds contains a Ketone group?

(a) $C_3 H_6 O_2$ (b) $C_3 H_8 O$ (c) $C_3 H_4 O$ (d) $C_3 H_6 O$

69. The average atomic mass of an element X is 80u. The percent of isotopes $^{79} X_{35}$ and $^{82} X_{35}$ in the sample is:

(a) 50 and 50   (b) 90. 99 and 9.01   (c) 80.8 and 19.2   (d) 66.67 and 33.34

70. The ratio of atoms present in 4 g of magnesium and 4 g of sulphur is (Mg = 24; S = 32)

(a) 1:1   (b) 2 : 1   (c) 3 : 2   (d) 3: 4

71. Choose the correct sets which represent the oxides as → Acidic: basic: neutral: amphoteric respectively (i) CO_2: MgO: N_2O: H_2O (ii) SO_2: NO: CO: Al_2O_3 (iii) P_2O_5: ZnO: NO: Al_2O_3 · (iv) SO_3: CaO: N_2O: PbO

(a) i & ii   (b) ii & iii   (c) iii & iv   (d) i & iv

72. A flask containing SO_2 gas was weighed at a particular temperature and pressure. The flask was then flushed and filled with oxygen gas at the same temperature and pressure. The weight of SO_2 in the flask will be about:

(a) same as that of oxygen,   (b) one-fourth that of oxygen,

(c) four times that of oxygen,   (d) twice that of oxygen

73. A white solid known to be a compound of sodium, gives rise to water vapour and a colourless gas on heating. The residual white powder is dissolved in water and when the solution is added to alum solution, a white gelatinous precipitate is obtained. The original solid was:

(a) Sodium carbonate   (b) Sodium nitrate   (c) Sodium hydroxide   (d) Sodium bicarbonate

74. A teacher wanted to give acid base titration to her students. For that she prepared (i) HCl solution by dissolving 73 g of hydrochloric acid in one litre of water and (ii) sodium hydroxide solution by dissolving 0.46 g of sodium metal in one litre of water. Find the volume of the hydrochloric acid solution required for complete neutralisation of sodium hydroxide solution. (Cl = 35.5; Na = 23.0; O = 16.0)

(a) 5 mL   (b) 10 mL   (c) 20 mL   (d) 46 mL

75. I)   Zn + $CuSO_4$ (aq) → Reaction occurs

    II)   Zn + $Al_2(SO_4)_3$ (aq) → Reaction does not occur

    III)   Zn + $AgNO_3$ (aq) → Reaction does not occur

    IV)   Zn + $PbNO_3$ (aq) → Reaction occurs

    Which of the above statements is not correct?

(a) I   (b) II   (c) III   (d) IV

76. What will happen if a copper piece is dipped in aqueous solution of silver nitrate for quite some time?

(i) Solution will remain colourless (ii) Solution will turn blue (iii) Silver will deposit on the copper piece (iv) Bubbles of brown gas will be formed around copper piece

(a) i and iv   (b) ii and iv   (c) ii and iii   (d) iii and iv

77. 'Duralumin' is an alloy of aluminium with:

(a) iron, manganese and magnesium   (b) copper, manganese and magnesium

(c) copper, chromium and magnesium   (d) iron, nickel and magnesium

78. An aqueous solution used to preserve biological specimen is:

(a) Methane   (b) Methanol   (c) Methanal   (d) Methanoic acid

79. If Z = 10 the valency of the element is ....

(a) zero   (b) one   (c) two   (d) three

80. Rajiv, Nikhil, Shubha and Nilima wanted to establish a relationship between loss in weight of a solid with weight of water displaced by immersing it in tap water and sea water. After performing their experiment, they noted their observations for the same solid as follows:

Rajiv: Loss of weight of solid is more in tap water.

Nikhil: Loss of weight of solid is more in sea water.

Shubha: Loss of weight of solid is equal in the tap water and the sea water.

Nilima: Loss of weight of solid may be more in tap water or sea water, depending upon how deeply it is immersed,

identify the correct observation.

(a) Nikhil   (b) Nilima   (c) Shubha   (d) Rajiv

QUESTION PAPER ENDS HERE

ROUGH WORK BELOW THIS LINE

PAGE FOR ROUGH WORK

PAGE FOR ROUGH WORK