HARYANA SUPER-100
ENTRANCE TEST (LEVEL-1)

DEPARTMENT OF SECONDARY EDUCATION HARYANA

Date: 2 November 2020

B

Roll Number: [redacted]

Student Name [redacted]

INSTRUCTIONS

Please read the instructions carefully. You are allotted 5 minutes specifically for this purpose.

Things NOT ALLOWED in EXAM HALL : Blank Paper, clipboard, log table, slide rule, calculator, camera, mobile and any electronic or electrical gadget. If you are carrying any of these then keep them at a place specified by invigilator at your own risk

Time Allowed :Two Hours **Maximum Marks : 320**

1. This booklet of 16 pages is your Question Paper. **DO NOT** break seal of Booklet until the invigilator instructs to do so.

2. Fill your Roll No. and Name in the space provided on the top of this page.

3. The Answer Sheet is provided to you separately which is a machine readable Optical Response Sheet **(ORS)**. You have to mark your answers in the **ORS** by darkening bubble, as per your answer choice, by using **black & blue ball point pen**.

4. Total Questions to be Attempted **80**.

5. After breaking the Question Paper seal, check the following :

6. **Marking Scheme :**
a. If darkened bubble is RIGHT answer: 4 **Marks**.
b. If no bubble is darkened against a question: **No Mark**.
c. If darkened bubble is WRONG answer:
–1 Mark (Minus One Mark).

7. Think wisely before darkening bubble as there is negative marking for wrong answer.

8. If you are found involved in cheating or disturbing others then your ORS will be cancelled.

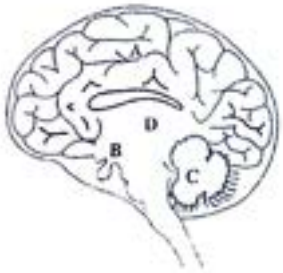
9. Do not put any stain on ORS and hand it over back properly to the invigilator.

10. Your overall score in this paper will matter in the selection process. All questions in the paper are equally important.

Useful Data: Molar Mass in gram/mole of
C=12, O=16, H=1,P=31,He=4,Na=23,Ca=40

BIOLOGY

1. From the given figure identify the part of human brain controlling most of the involuntary actions :



(1) C & D
(2) B & C
(3) A & B
(4) D & A

2. Varieties of vegetables such as cabbage, broccoli and cauliflower have been produced from wildcabbage species. Such process of producing new varieties of living organisms is called

(1) Natural selection
(2) Speciation
(3) Genetic drift
(4) Artificial selection

3. Which of the following are pairs of analogous organs ?

I. Forelimbs of horse—Wings of bat
II. Wings of bat — Wings of butterfly
III. Forelimbs of horse — Wings of butterfly
IV. Wings of bird—Wings of bat

(1) I and II
(2) III and IV
(3) II and III
(4) II and IV

4. Pancreatic juice contains more than one enzyme. Which among the following combination is correct ?

(1) pepsin and lipasse
(2) pepsin and trypsin
(3) trypsin and lipase
(4) amylase and pepsin

5. Every 20 minutes, one bacterium divides into two . How many bacteria will be produced after two hours, if one starts 10 bacteria?

(1) $2^5 \times 10$
(2) $2^6 \times 10$
(3) $2^6 \times 10^6$
(4) $2^5 \times 10^5$

6. Match the items of column-I with column-II and
select the correct option from those given below:

Column-I	Column-II
a) Medulla Oblongata	i) Relay station of impulses
b) Thalamus	ii) Controls involuntary action
c) Cerebellum	iii) Centre of thought and intelligence
d) Cerebrum	iv) Maintains equilibrium ofthe body

(a) (b) (c) (d)

(1) (iii) (ii) (iv) (i)
(2) (ii) (iv) (i) (iii)
(3) (iv) (i) (iii) (ii)
(4) (ii) (i) (iv) (iii)

7. The dead cells of Xylem are :

(1) Tracheid, sieve tubes
(2) Vessels, Companion cells
(3) Sieve tube, companion cells
(4) Tracheid, Vessels

8. Which one of the following is a Genetic disease?

(1) Leprosy
(2) Diabetes
(3) Hemophilia
(4) Tuberculosis

9. Wings of birds and insects are:

(1) Vestigial organs
(2) Paralogous organs
(3) Analogous organs
(4) Homologous organs

10. Mitochondria and Chloroplasts are similar because:

(1) Both have nuclei
(2) Both have 80s ribosomes
(3) Both have single membrane envelope
(4) Both have DNA

11. Cut leaves remain green for longer time if dipped in:

(1) Cytokinins
(2) Ethylene
(3) Gibberellins
(4) Auxins

12. Neurons have a unique property that makes them to communicate with other cells via:

(1) Glial cells
(2) Synapses
(3) Schwann cells
(4) Nerve cords

13. Which layer of planet earth's atmosphere protects it from the harmful UV radiations of the Sun ?

(1) Stratosphere
(2) Troposphere
(3) Ionosphere
(4) Ozonosphere

14. Cramps in the leg muscle after running a long distance are because of:

(1) Build up of acetic acid
(2) Build up of oxalic acid
(3) Build up of pyruvic acid
(4) Build up of lactic acid

15. Vegetative propagation refers to formation of new plants from:

(1) Leaves, flower and seeds
(2) Stem, roots and seeds
(3) Fruits, seeds and spores
(4) Stem, roots and leaves

CHEMISTRY

16. 1.80 g of glucose is dissolved in 36.00 g of water in a beaker. The total number of oxygen atoms in the solution is

(1) 12.405×10^{22}
(2) 6.022×10^{23}
(3) 6.022×10^{22}
(4) 12.405×10^{23}

17. Which one of the following statement is incorrect about graphite and diamond ?

(1) Diamond is good conductor of heat
(2) Graphite is a good conductor of electricity
(3) Physical and chemical properties of graphite and diamond are different
(4) Graphite is smooth and slippery

18. A part of the modern periodic table is presented below in which the alphabets represent the symbols of elements.

Table

Group → / Period ↓	1	2	14	15	16	17
2				M	Q	
3	A	J			R^-	
4	E		L			T
5	G					X

Consult the above part of the periodic table to predict which of the following is a covalent compound

(1) AT
(2) JQ
(3) JX_2
(4) RQ_2

19. Which among the following is not a redox reaction?

(1) $2Na(s) + Cl_2(g) \rightarrow 2NaCl(s)$

(2) $2Pb(NO_3)_2(s) \rightarrow 2PbO(s) + 4NO_2(g) + O_2(g)$

(3) $Cl_2(g) + H_2O(l) \rightarrow HCl(aq) + HClO(aq)$

(4) $Ca(OH)_2(aq) + 2HNO_3(aq) \rightarrow Ca(NO_3)_2(aq) + 2H_2O(l)$

20. Potassium permanganate reacts with concentratedhydrochloric acid based on the equations givenbelow.

$aKMnO_4 + bHCl \rightarrow cKCl + dMnCl_2 + eH_2O + fCl_2$

The value of '*f*' when the above chemical equation
is balanced is:

(1) 3
(2) 4
(3) 6
(4) 5

21. The electronic configuration of an ion M^{2+} is 2, 8, 14. If its mass is 56. The number of neutrons in its nucleus is:

(1) 32
(2) 34
(3) 42
(4) 30

22. The normality of 0.3M phosphoric acid is:

(1) 0.1
(2) 0.3
(3) 0.6
(4) 0.9

23. $H_2S\ (g) + Cl_2\ (g) \rightarrow 2Hcl\ (g) + S(s)$

The reaction is interpreted as:

(1) H_2S is getting reduced and Cl_2 is getting oxidized
(2) Only H_2S is oxidized
(3) Both H_2S and Cl_2 are reduced
(4) H_2S is getting oxidized and Cl_2 is getting reduced

24. Structures of nuclei of three atoms A, B and C are given below:

A has 90 protons and 146 neutrons
B has 92 protons and 146 neutrons
C has 90 protons and 148 neutrons

Based on the above data, Which of these atoms are Isotopes and which are isobars ?

(1) A and B are isotopes; A and C are isobars
(2) B and C isobars; A and B are isotopes
(3) A and C are isotopes; A and B are isobars
(4) A and C are isotopes; B and C are isobars

25. Which one of the following metal oxides shows both acidic and basic characters ?

(1) K_2O
(2) Cu O
(3) Al_2O_3
(4) Na_2O

26. Mg has three natural isotopes whose isotopes masses and relative abundances are respectively 23.98 (78.60%), 24.98 (10.11%) and 25.98 (11.29%). The atomic mass of Mg will be:

(1) 24.31
(2) 24.95
(3) 23.95
(4) 23.42

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

(1) The mass of electron is equal to the mass neutron.
(2) It is a basic constituent of all atoms.
(3) It is constituent of cathode rays.
(4) It is a negatively charged particle

28. If 500 ml of a 5M solution is diluted to 1500 ml, what will be the molarity of the solution obtained?

(1) 1.66 M
(2) 0.017 M
(3) 1.59 M
(4) 1.5 M

29.The number of atoms present in one mole of an element is equal to Avogadro number. Which of the following contains the greatest number of atoms?

(1) 46g Na
(2) 0.40g Ca
(3) 12g He
(4) 4g He

30. What is the mass percent of carbon in carbon dioxide?

(1) 27.27%
(2) 3.4%
(3) 28.7%
(4) 0.034%

PHYSICS

31. To read a poster on a wall, a person with defective vision needs to stand at a distance of 0.4 m fromthe poster. A person with normal vision can read the poster from a distance of 2.0 m. Which one ofthe following lens may be used to correct the defective vision?

(1) A concave lens of 0.5 D
(2) A concave lens of 1.0 D
(3) A convex lens of 2.0 D
(4) A concave lens of 2.0 D

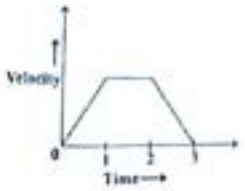
32. An object falls a distance H in 50 s when dropped on the surface of the earth. How long would it takefor the same object to fall through the same distance on the surface of a planet whose mass andradius are twice that of the earth? (Neglect air resistance.)

(1) 35.4 s
(2) 50.0 s
(3) 100.0s
(4) 70.7 s

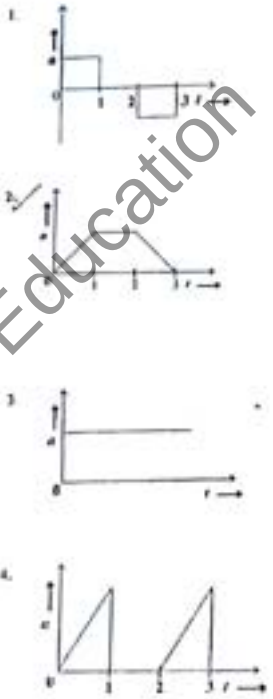
33. The diameter of a wire is reduced to one-fifth of its original value by stretching it. If its initial resistanceis R, what would be its resistance after reduction of the diameter ?

(1) $\frac{R}{625}$
(2) $\frac{R}{25}$
(3) 625 R
(4) 25 R

34.The velocity-time graph of an object moving along a straight line is shown below :



Which one of the following graphs represents the acceleration (a) - time (t) graph for the above
motion?



35. When a stone is thrown vertically upwards :

(1) Its acceleration is zero at the highest point
(2) Its velocity and acceleration are zero at thehighest point
(3) Neither the velocity nor the acceleration iszero at the highest point.
(4) Its velocity is zero at the highest point.

36. An electric iron draws a current of 15A from a 220V supply. What is the costof using iron for 30 min everyday for 15 days if the cost of unit (1 unit = 1 kW/hr) is 2 rupees ?

(1) Rs. 60
(2) Rs. 40
(3) Rs. 10
(4) Rs. 49.5

37. The distance covered by a body moving along X- axis with initial velocity 'u' and uniform acceleration 'a' is given by $x = ut + \frac{1}{2}at^2$. This result is consequence of:

(1) Newton's 1st law
(2) Newton's 2nd law
(3) Newton's 3rd law
(4) None of the above

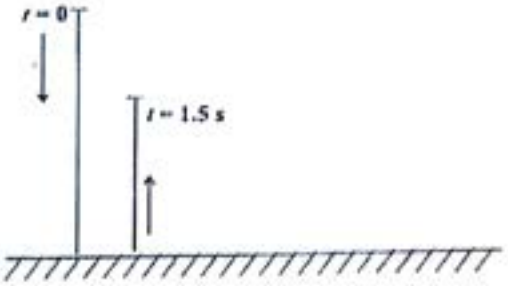
38. Three equal resistors connected in series across a source of e.m.f. dissipate 10 watts of power. What will be the power dissipated in watts if the same resistors are connected in parallel across the same source of e.m.f. ?

(1) 10W
(2) 30W
(3) 10/3W
(4) 90W

39. Two masses of 1 gm and 4 gm are moving with equal kinetic energies. The ratio of the magnitudes of their linear moments is:

(1) 4:1
(2) $\sqrt{2}:1$
(3) 1:6
(4) 1:2

40. A ball released from rest at time = 0 hits the ground. It rebounds in elastically with a velocity 5 ms^{-1} and reaches the top at t = 1.5s, what is the net displacement of the ball from its initial position after 1.5 s ? ($g = 10\ ms^{-2}$)



(1) 1.25 m
(2) 5.00 m
(3) 6.25 m
(4) 3.75 m

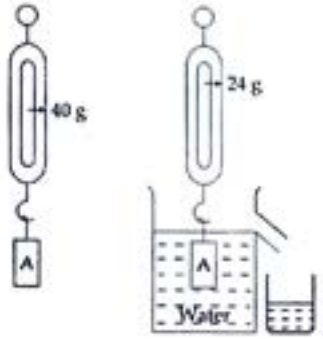
41. A breaker half–filled with water is put on a platform balance which is then set to zero. A 800 g mass is immersed partially in water using a spring balance as shown in figure. If the spring balance reads 300 g. What will be the reading on the platform balance ?

(1) 200 g
(2) 300 g
(3) 800 g
(4) 500 g

42. A technician has 10 resistors each of resistance 0.1Ω. The largest and smallest resistance that he can obtain by combining these resistors are:

(1) 10 Ω and 1 Ω resp.
(2) 1 Ω and 0.1 Ω resp.
(3) 0.1 Ω and 0.01 Ω resp.
(4) 1 Ω and 0.01 Ω resp

43. Analyse the figure and find out relative density of solid :



(1) 1.66
(2) 1.33
(3) 0.6
(4) 2.5

44. A body on a inclined plane slides down $\frac{1}{4}$th of distance in 2 seconds. It will slide down the complete distance along the plane in (the inclined plane have zero friction) approximately in time.

(1) 5s
(2) 2s
(3) 3s
(4) 4s

45. Pick out the correct pair/pairs:

a) Radiation – Heat is transferred in the form of waves. It can occur even in vaccum.
b) Conduction – Transfer of heat in fluids. It doesn't take place in vaccum.
c) Convection – Transfer of heat in solids. It can occur in vaccum.

(1) (a) only
(2) (a) and (c) only
(3) (c) only
(4) (b) and (C) only

MATHEMATICS

46. The average temperature for Wednesday, Thursday and Friday was 20 °C. The average for Thursday, Friday and Saturday was 21 °C. If the temperature on Saturday was 22°C, what was the temperature on Wednesday?

(1) 19 °C
(2) 24 °C
(3) 21 °C
(4) 18 °C

47. Aman can type a sheet in 10 minutes, Baman in 20 minutes and Chaman in 30 minutes. The average number of sheets typed per hour per typist for all three typists is

(1) $\frac{30}{7}$
(2) $\frac{55}{9}$
(3) $\frac{32}{11}$
(4) $\frac{11}{3}$

48. In the Delhi zoo, there are lions and there are hens. If the heads are counted, there are 180, while the legs are 448. What will be the number of lions in the zoo?

(1) 88
(2) 44
(3) 136
(4) 36

49. A person who has a certain amount with him goes to the market. He can buy 50 oranges Or 40 mangoes. He retains 10% of the amount for taxi fare and buys 20 mangoes and of the balance he purchases oranges. Number of oranges he can purchase is

(1) 40
(2) 15
(3) 20
(4) 36

50. After three successive equal percentage rise in the salary the sum 1000 rupees turned into 1331 rupees. Find the percentage rise in the salary.

(1) 22%
(2) 66%
(3) 82%
(4) 10%

51. The cost of manufacturing an article is made up of materials, labour and overheads in the ratio 6 : 7 : 2 . If the cost of labour is $ 350, find the profit percent if the article is sold for $ 900.

(1) 30%
(2) 20%
(3) 25%
(4) 33.33%

52. Sambhu buys rice at $ 10/kg and puts a price tag on it so as to earn a profit of 20%. However, his faulty balance shows 1000gm when it is actually 800gm. What is his actual gain percentage?

(1) 40%
(2) 18%
(3) 10%
(4) 50%

53. Two dealers *P* and *Q* selling the same model of TV set mark them under the same selling prices. *P* gives successive discounts of 20% and 15% and *Q* gives successive discounts of 18% and 17%. From whom is it more profitable to purchase the TV set?

(1) From *P*(b)
(2) From *Q*
(3) Indifferent between the two
(4) Cannot be determined

54. If the difference between compound and simple interest on a certain sum of money for 3 years at 2% p.a. is $ 604, what is the sum?

(1) 5,00,000
(2) 4,50,000
(3) 5,10,000
(4) None of these

55. A sum of money invested at simple interest triples itself in 8 years. How many times will it become in 20 years time?

(1) 7 times
(2) 6 times
(3) 9 times
(4) 8 times

56. The monthly salaries of two persons are in the ratio of 1:7.If each receives an increase of 2500 in the salary, the ratio is altered to 4:13. Fine their respective salaries.

(1) $1600, $10500
(2) $1700, $10500
(3) $1400, $10500
(4) $1500, $10500

57. Concentrations of three type of milks *X*, *Y* and *Z* are 10%, 20% and 30% respectively. They are mixed in the ratio 2:3:*P* resulting in a 23% concentrations solution. Find *P*.

(1) 6
(2) 5
(3) 4
(4) 7

Which of the following will have the ium change in their values if 5 is added to he numerator and denominator of all the ons?

) $\frac{3}{4}$
) $\frac{2}{3}$
) $\frac{4}{7}$
) $\frac{5}{7}$

women can paint a building in 30 working s. After 16 hours of work, 2women decided ave. How many hours will it take for the to be finished?

) 40
) 50
) 49.33
) 39.33

hat is time takes by Chandu to cover a ce of 360 km by a motorcycle moving at a d of 10m/s?

) 5 h
) 8 h
) 6 h
) 10 h

he difference between the times takes by buses to travel a distance of 350 km is 2 s 20 minutes. If the difference between speeds is 5 kmph, find the slower speed.

) 30 kmph
) 25 kmph
) 20 kmph
) 35 kmph

irst term of an arithmetic progression is 2. sum of its first five terms is equal to one- h of the sum of the next five terms, then um of its first 30 terms is

(1)
(2)
(3)
(4)

63. I riminates of two qu
equati ual and the equations
comm hen the other roots

(1) e always equal
(2) r equal or their sum is 1
(3) r sum equal to 1.
(4) r equal or their sum is 2

64. Le n equilateral triangle. If
ordina e (1, 2) and co-ordina
are(2,

(1) lie in the second quadra
(2) origin
(3) lie in the third quadrant
(4) lie in the first quadrant

65. Sh ts to make a solid brick
structu 400 wooden cubes
volum the sides of the solid bri
the ra 3, then the maximum nur
cubes, n be used will be

(1)
(2)
(3)
(4)

66. W verage of the cubes of f
counti rs?

(1)
(2)
(3)
(4)

67. A circle of radius 3 units is divided into 3 regions using two semicircles of radius 1 unit and 2 units as shown in the figure. What is the ratio of area of the region marked A,B and C?

(1) 2:1:2
(2) 4:3:4
(3) 1:2:1
(4) 1:1:1

68. What is the value of $\frac{1}{1X4}+\frac{1}{4X7}+\frac{1}{7X10}+\ldots\ldots+\frac{1}{16X19}$?

(1) $\frac{9}{19}$

(2) $\frac{4}{19}$

(3) $\frac{8}{19}$

(4) $\frac{6}{19}$

69. In an arithmetic sequence, if 17 is the 3rd term, -25 is the 17th term, then which term is -1?

(1) 10
(2) 11
(3) 12
(4) 9

70. A shopkeeper mixes 80 kg sugar worth of Rs. 6.75 per kg with 120 kg sugar worth of Rs. 8 per kg. He earns a profit of 20% by selling the mixtures. He sells it at the rate:

(1) Rs. 7.50 per kg
(2) Rs. 8.20 per kg
(3) Rs. 8.85 per kg
(4) Rs. 9 per kg

71. A shopkeeper prefers to sell his goods at the cost price but uses a weight of 800 gm instead of 1kg weight. He earns a profit of:

(1) 2%
(2) 8%
(3) 25%
(4) 20%

72. The compound interest on a certain sum for two years is Rs. 618 whereas the simple interest on the same sum at the same rate for two years is Rs. 600. The rate of interest per annum is:

(1) 18%
(2) 9%
(3) 3%
(4) 6%

73. If $x+\frac{1}{x}=3$, then the vaue of $x^6+\frac{1}{x^6}$ is :

(1) 114
(2) 364
(3) 322
(4) 927

74. A bag contains 20 balls out of which x are black if 10 more black balls are put in the box, the probability of drawing a black ball is double of what it was before. The value of x is:

(1) 0 (2) 5

(3) 10 (4) 40

75. The sum of all two digit numbers each of which leaves remainder 3 when divided by 5 is:

(1) 952 (2) 999

(3) 1064 (4) 1120

76. If $\cos A + \cos^2 A = 1$, then the value of $\sin^2 A + \sin^4 A$ is :

(1) $\frac{1}{2}$
(2) 2
(3) 3
(4) 1

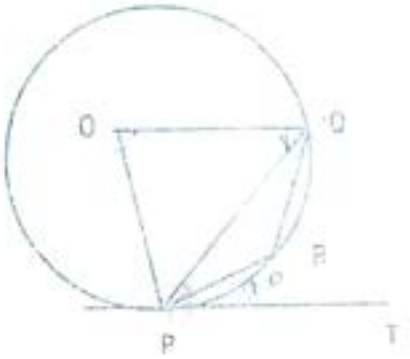
77. Four circular cardboard pieces, each of radius 7 cm. are placed in such a way that each piece touches the two other pieces. The area of the space enclosed by the four pieces is:

(1) 21 cm^2
(2) 84 cm^2
(3) 168 cm^2
(4) 42 cm^2

78. E and F are respectively, the mid point of the sides AB and AC of ΔABC and the area of the quadrilateral BEFC is k times the area of ΔABC. The value of k is:

(1) $\frac{1}{2}$
(2) 3
(3) $\frac{3}{4}$
(4) 4

79. In the figure, PQ is a chord of a circle with centre O and PT is the tangent at P such that $\angle QPT = 70^\circ$ then the measure of $\angle PQR$ is equal to



(1) 135°
(2) 120°
(3) 110°
(4) 150°

80. AB and CD are two parallel chords of a circle such that AB = 10 cm and CD = 24 cm. If the chords are on the opposite sides of the centre and the distance between them is 17 cm, the radius of the circle is:

(1) 14 cm
(2) 10 cm
(3) 15 cm
(4) 13 cm