

SAMPLE PAPER

'AVIRAL'
TALENT
SEARCH EXAM

2018

AVIRAL
talent search
EXAM-2018

Let The
World Know
About Your

Talent



AVIRAL TALENT SEARCH EXAM

ATSE - JUNIOR - 2018

Science, Mathematics & Mental Ability

For Class - IX Studying Students

Time : 2 Hr.

M. M. : 320

Roll No :

Date :

Name of Student : _____

Father's Name : _____

Name of School : _____



AVIRAL CLASSES

AVIRAL
talent search
EXAM-2018

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INSTRUCTIONS

1. This question paper contains 80 Questions and Total Max. Marks is 320. Attempt all questions.
2. This question paper contains three Section namely, **Section-1** : Science (Physics, Chemistry & Biology), **Section-2** : Mathematics and **Section-3** : Mental Ability.
3. **Section-1** has 45 questions (15 each from Physics, Chemistry & Biology). **Section-2** has 20 questions and **Section-3** has 15 questions.
4. For each correct answer 4 marks will be awarded and for wrong answer 1 mark will be deducted. No marks will be given for unattempted question.
5. Use only **blue/black pen (avoid gel pen)** for darkening the bubble.
6. The Answer sheet will be checked through computer hence, the answer of the question must be marked by shading the circles against the question by dark **blue/black pen**.
7. Write your name and Roll number carefully on the answer sheet as well as the questions paper.

SECTION - 1 [SCIENCE]

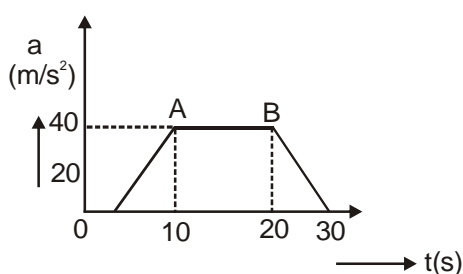
PHYSICS

1. Any solid will sink in water if relative density (R.D) is
 - (1) less than unity
 - (2) equal to unity
 - (3) infinity
 - (4) greater than unity
2. A particle is moving eastward with velocity of 5 m/sec. In ten second the velocity changes to 5 m/sec northwards. The average acceleration is
 - (1) zero
 - (2) $\frac{1}{2}$ m/sec
 - (3) $\frac{1}{2}$ m/sec² towards west
 - (4) $\frac{1}{\sqrt{2}}$ m/sec² towards north east
3. Which of the following statement is true?
 - (1) Weighing machine measures mass only
 - (2) Weighing machine measures mass and weight only
 - (3) Weighing machine measures weight only
 - (4) Weighing machine measures acceleration due to gravity
4. Internal forces are
 - (1) Imbalanced forces
 - (2) balanced forces
 - (3) equilibrant force
 - (4) resultant force
5. The buoyant force depends on the
 - (1) density of liquid
 - (2) depth of liquid
 - (3) acceleration
 - (4) All of the above
6. If the momentum of body is doubled, kinetic energy becomes
 - (1) doubled
 - (2) half
 - (3) remains same
 - (4) 4 times
7. A body of mass M collides against a wall with velocity u and rebounds with same speed. Its change in momentum
 - (1) 2 Mu
 - (2) Mu
 - (3) - Mu
 - (4) zero
8. If a body is moving at constant speed in a circular path, its
 - (1) velocity is constant and its acceleration is zero
 - (2) velocity & acceleration are both changing direction only
 - (3) velocity & acceleration are both increasing
 - (4) velocity is constant & acceleration is changing direction
9. Which of the following can sometimes be 'zero' for a moving body ?
 - (i) average velocity
 - (ii) distance travelled
 - (iii) average speed
 - (iv) displacement
 - (1) Only (i)
 - (2) (i) & (ii)
 - (3) (i) & (iv)
 - (4) only (iv)
10. The SI unit of relative density is
 - (1) g cm⁻³
 - (2) k gm⁻³
 - (3) g cm³
 - (4) none of these

For Rough Work Only



11. The gravitational force of attraction between two bodies at a certain distance is 10 N . If the distance between them is doubled the force of attraction
 (1) decreases by 50 % (2) decreases by 75 %
 (3) increases by 50 % (4) increases by 75 %
12. Consider the quantities, pressure, power energy, impulse gravitational potential, electrical charge, temperature, area. Out of these, the only vector quantities are
 (1) Impulse, pressure & area
 (2) Impulse & area
 (3) Area & gravitational potential
 (4) Impulse & pressure
13. Figure shows the time-acceleration graph for a particle in rectilinear motion .The average acceleration in first twenty seconds is :



- (1) 45 m/s² (2) 40 m/s²
 (3) 30 m/s² (4) 20 m/s²
14. Wind is blowing west to east along two parallel tracks two trains moving with same speed in opposite directions have the steam track of one double than other. The speed of each train is
 (1) equal to that of wind
 (2) double that of wind
 (3) three times that of wind
 (4) half that of wind
15. A body of mass, m collides against a wall with the velocity v & rebounds with the same speed. Its change of momentum is
 (1) -2mv (2) m v
 (3) -mv (4) zero

CHEMISTRY

16. A bottle of dry ammonia (NH₃) and a bottle of dry hydrogen chloride (HCl) connected through a long tube are opened simultaneously at both the ends. The white fumes (ring) first formed will be
 (1) at the centre of the tube
 (2) near the HCl bottle
 (3) near the ammonia bottle
 (4) throughout the length of the tube
17. Which of the following characteristic of iron sulphide and mixture of iron filling and sulphur powder is correct?
 (1) Both are heterogeneous
 (2) Both are homogenous
 (3) A mixture of iron filling and sulphur powder may be heterogeneous or homogeneous but iron sulphide is always homogeneous.
 (4) Iron sulphide is heterogeneous but the mixture of iron filling and sulphur powder is homogeneous.
18. A beam of light is passed through soap solution, sugar solution and starch solution. In which of the following the path of light be visible ?
 (1) Soap solution only
 (2) Starch solution only
 (3) Starch & Sugar solution
 (4) Soap & Starch solution
19. Which of the following statement is incorrect ?
 (1) Evaporation takes place on its own
 (2) Latent heat does not increases the kinetic energy of the particles
 (3) At higher altitudes, water boils at a slower rate
 (4) The total amount of mass and energy together remains constant throughout a chemical reaction
20. An atom of an element 'X' contains 29 electrons and 35 neutrons. The correct representation of the element 'X' will be
 (1) ${}_{29}^{35}X$ (2) ${}_{35}^{64}X$
 (3) ${}_{64}^{29}X$ (4) ${}_{29}^{64}X$

For Rough Work Only



21. Which of the following pair of molecules have same molecular masses ?

(Given : C = 12, H = 1, O = 16, K = 39, Cu = 63.3, S = 32, Ca = 40, P = 31, Al = 27, Mn = 55)

- (1) $C_{12}H_{22}O_{11}$ & $CuSO_4$ (2) $Ca_3(PO_4)_2$ & $Al_2(SO_4)_3$
(3) $C_{12}H_{22}O_{11}$ & $Al_2(SO_4)_3$ (4) $Ca_3(PO_4)_2$ & $KMnO_4$

22. The mass of CO_2 gas released when 6.3 g of sodium carbonate is added to 15.0 g of acetic acid solution is (the mass of residue left is 18.0 g)

- (1) 22.3 g (2) 3.3 g
(3) 24.3 g (4) None of these

23. Choose the correct option from the following

<u>Method of separation</u>				<u>Principle</u>			
A.	Fractional crystallisation	(i)	Difference in rate of adsorption	A	B	C	D
B.	Fractional distillation	(ii)	Difference in solubility	(1)	(ii)	(iv)	(i)
C.	Chromatography	(iii)	Difference in mass of particles	(3)	(iv)	(i)	(iii)
D.	Centrifugation	(iv)	Difference in Boiling point				

24. Which of the following substances in the gaseous state is called a vapour?

- (1) Carbon dioxide (2) Iodine
(3) Sulphur (4) Nitrous oxide

25. Which of the following is a pure substance?

- (i) Milk (ii) Sea-water
(iii) Brass (iv) Copper sulphate solution
(v) Copper (vi) Sucrose
(1) (i), (ii), (iv) only (2) (v) and (vi) only
(3) (iv), (v) and (vi) only (4) (v) only

26. The process of respiration is

- (1) an oxidation reaction which is endothermic
(2) a reduction process which is exothermic
(3) a combination reaction which is endothermic
(4) an oxidation reaction which is exothermic

27. The reaction between zinc and hydrochloric acid is

- (1) combination reaction
(2) displacement reaction

- (3) decomposition reaction
(4) double decomposition reaction

28. The bulb of a thermometer is dipped in petrol and then taken out. The level of the mercury thread in the thermometer

- (1) starts falling
(2) starts rising
(3) remains at the same level
(4) initially falls and then rises

29. Which among the following statements is true?

- (1) The rate of evaporation in a coastal area is less when compared to a non-coastal area
(2) The rate of evaporation in a non-coastal area is less when compared to a coastal area
(3) In both the areas the rate of evaporation is the same
(4) None of the above

30. Identify a physical change among the following

- (1) Respiration
(2) Digestion of food
(3) Burning of wax
(4) Glowing of an electric bulb

BIOLOGY

31. The type of ribosomes found in prokaryotes is

- (1) 80s type (2) 70s type
(3) 30s type (4) 50s type

32. Nasal and genital tracts are lined by

- (1) Simple columnar
(2) Stratified columnar epithelium
(3) Pseudostratified epithelium
(4) Stratified cuboidal epithelium

33. Match column-I with column-II and select the correct option from the codes given below :

<u>Column-I</u>	<u>Column-II</u>
(A) Porifera	(i) Jointed appendages
(B) Annelida	(ii) Canal system
(C) Arthropoda	(iii) Water-vascular system
(D) Echinodermata	(iv) Muscular phaynx

(1) A(iii), B(iv), C(ii), D(i) (2) A(ii), B(iv), C(i), D(iii)
(3) A(iii), B(ii), C(i), D(iv) (4) A(ii), B(i), C(iv), D(iii)

For Rough Work Only



34. A true species consists of a population which is
 (1) sharing the same niche (2) interbreeding
 (3) feeding over the same food
 (4) reproductively isolated
35. Choose the incorrect statement regarding cell membrane
 (1) Generally smaller molecules pass easily and readily than large molecules
 (2) Water soluble substance pass through it less readily than lipid soluble substances.
 (3) Membranes are selectively permeable
 (4) None of these
36. Collenchyma mainly forms
 (1) hypodermis (2) epidermis
 (3) phloem (4) sclereids
37. Arthropods are characterised by
 (1) Jointed legs
 (2) Jointed appendages
 (3) Chitinous exoskeleton
 (4) All the above
38. Nucleolus is a site of
 (1) Protein synthesis
 (2) Ribosome synthesis
 (3) mRNA synthesis
 (4) Enzyme synthesis
39. The compound plants composed of algae and fungi are called
 (1) Algae (2) Lichens
 (3) Pteridophytes (4) Bryophytes
40. Lateral line sense organs occur in
 (1) Fishes
 (2) Amphibian larva
 (3) Reptiles
 (4) Both 1 & 2

41. True coelom appeared for first time in
 (1) Mollusca (2) Nematoda
 (3) Annelida (4) Arthropoda
42. Which of the following group of plants is called vascular cryptogams ?
 (1) pteridophyta
 (2) Thallophyta
 (3) Bryophyta
 (4) Angiospermae
43. Match the column and select the correct option from the codes given below

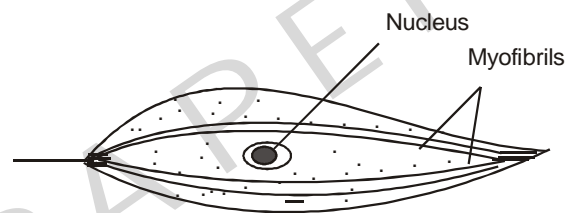
Column I

Column II

- | | |
|--------------------------|--------------------------|
| A. Endoplasmic reticulum | (i) Secretory functions |
| B. Cell wall | (ii) Mechanical strength |
| C. Golgi bodies | (iii) Transportation |
| D. Cell membrane | (iv) Shape of the cell |

- (1) A - (iv) , B - (iii), C - (ii), D - (i)
 (2) A - (iii) , B - (iv), C - (i), D - (ii)
 (3) A - (iii) , B - (i), C - (iv), D - (ii)
 (4) A - (iii) , B - (ii), C - (i), D - (iv)

44. Identify the type of tissue given below in the figure



This is the structure of :

- (1) Cardiac Muscle fibre
 (2) striated Muscle fibre
 (3) Non-striated muscle fibre
 (4) Cartilage
45. Which among the following have open circulatory system ?
 (i) arthropoda (ii) Mollusca
 (iii) annelida (iv) Coelenterata
 (1) (i) and (ii) (2) (iii) and (iv)
 (3) (i) and (iii) (4) (ii) and (iv)

For Rough Work Only



SECTION - 2 [MATHEMATICS]

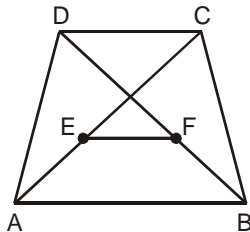
46. If $x + 1$ is a factor of the polynomial $3x^2 - kx$ then $k = ?$

- (1) 0 (2) ± 5
(3) -11 (4) -3

47. Bisectors of $\angle B$ and $\angle C$ in $\triangle ABC$ at O the $\angle BOC = ?$

- (1) $90 + \frac{1}{2} \angle A$
(2) $90 - \frac{1}{2} \angle A$
(3) $180 + \frac{\angle A}{2}$
(4) $180 - \frac{\angle A}{2}$

48. In a trapezium ABCD, If E and F be the mid points of the diagonals AC and BD respectively then $EF = ?$



- (1) $\frac{1}{2}(AB + CD)$ (2) $\frac{1}{2}CD$
(3) $\frac{1}{2}AB$ (4) $\frac{1}{2}(AB - CD)$

49. The radius of a wire is decreased to one third. If volume remains the same the length will become

- (1) 2 times (2) 3 times
(3) 6 times (4) 9 times

50. If each edge of a cube is increased by 50% then the % increase in its surface area is

- (1) 150% (2) 125%
(3) 100% (4) None of these

51. The radius and height of a right circular cone are in the ratio 3 : 4. If its volume is $96 \pi \text{ cm}^3$. What is its slant height

- (1) 8 cm (2) 9 cm
(3) 27 cm (4) 10 cm

52. In $\triangle ABC$ the medians AD, BE, and CF pass through G. If $BG = 6$ then BE is _____

- (1) 9 (2) 6
(3) 3 (4) 1

53. In $\triangle ABC$ the altitude from A to BC meets BC at D and the altitude from B to CA meets AD at H. If $AD = 4 \text{ cm}$

$BD = 2 \text{ cm}$ if $\frac{AB}{BD} = \frac{AH}{HD}$ then the length of HD is

- (1) $\frac{\sqrt{5}}{2} \text{ cm}$ (2) $\frac{3}{2} \text{ cm}$
(3) $\sqrt{5} \text{ cm}$ (4) $\frac{5}{2} \text{ cm}$

54. If $2x = t + \sqrt{t^2 + 4}$ and $3y = t - \sqrt{t^2 + 4}$ then value of y when $x = \frac{2}{3}$ is

- (1) -2 (2) $+1$
(3) -1 (4) 2

55. If $x + K$ is a common factor of $(x^2 + px + q)$ and $(x^2 + lx + m)$ then the value of k is _____

- (1) $l + p$ (2) $m - q$
(3) $\frac{l - p}{m - q}$ (4) $\frac{m - q}{l - p}$

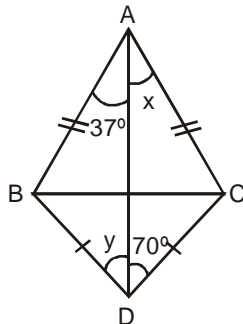
56. The product of two irrational numbers is always irrational. This statement is

- (1) True (2) False
(3) True only when both irrational numbers are positive
(4) None of these

For Rough Work Only



57. $P = 2 \times 4 \times 6 \times 8 \times \dots \times 20$ and $Q = 1 \times 3 \times 5 \times 7 \times \dots \times 19$. HCF of P and Q is
 (1) $3^3 \cdot 5 \cdot 7$
 (2) $3^4 \cdot 5$
 (3) $3^4 \cdot 5^2 \cdot 7$
 (4) $3^3 \cdot 5^2$
58. The degree of polynomial $\sqrt[3]{x^3} \cdot \sqrt{x^{-2}} + 7$ is
 (1) 3 (2) 1
 (3) 0 (4) -2
59. In the given figure x and y are



- (1) $x = 70^\circ, y = 37^\circ$
 (2) $x + y = 117^\circ$
 (3) $x = 37^\circ, y = 70^\circ$
 (4) $x - y = 100^\circ$
60. Two adjacent sides of a parallelogram are 24 cm and 18 cm. If the distance between the longer side is 12 cm. Find the distance between shorter sides
 (1) 12 cm (2) 16 cm
 (3) 24 cm (4) 8 cm

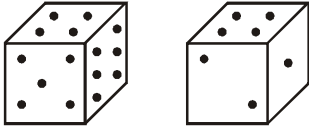
61. Calculate the area of quadrilateral ABCD in which $\angle A = 90^\circ$, $AB = 32$ cm, $AD = 24$ cm and $BC = CD = 25$ cm
 (1) 864 cm² (2) 486 cm²
 (3) 648 cm² (4) 684 cm²
62. The area of a rhombus is 20 cm². If one of its diagonals is 5 cm, the other diagonal is
 (1) 5 cm (2) 6 cm
 (3) 8 cm (4) 10 cm
63. The perimeter of a rectangular plot is 120 m. If the length of the plot is twice its width, find the area of the plot
 (1) 700 cm² (2) 800 cm²
 (3) 800 m² (4) 900 m²
64. If the curved surface area of a right circular cone is 12320 cm² and its base radius 56 cm then its height is
 (1) 48 cm (2) 42 cm
 (3) 36 cm (4) 50 cm
65. The ratio of radii of two cylinders is $1 : \sqrt{3}$ and heights are in the ratio $2 : 3$. The ratio of their volumes is
 (1) $1 : 9$ (2) $2 : 9$
 (3) $4 : 9$ (4) $5 : 9$

For Rough Work Only



SECTION - 3 [MENTAL ABILITY]

66. Here two positions of dice are shown. If there are two dots in the bottom, then how many dots will be on the top?



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

67. In a certain code, OVER is written as \$ # % * and VIST is written as # + x -, then how SORE will write in that code?

- (1) x \$ * % (2) % x \$ *
(3) x * \$ % (4) None of these

68. Choose the odd one out

- (1) Kelvin (2) Watt
(3) Celcius (4) Fahrenheit

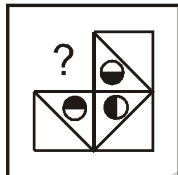
69. If south east becomes North, North-East becomes West and so on, what will West become ?

- (1) North-East (2) North-West
(3) South-East (4) South-West

70. NOTE : RSXI :: RISK : ?

- (1) VMXP (2) VMWO
(3) VJMP (4) VMWP

71. Select a figure from the options which completes the given figure



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

72. If the digits in the number 5734629 are arranged in ascending order from left to right, how many digits will remain at the same position?

- (1) None (2) One
(3) Two (4) Three

73. 'MORE' is related to 'EORM' in the same way as 'SUIT' is related to

- (1) TIUS (2) ISTU
(3) IUST (4) TUIS

74. Choose the odd one out

- (1) Floppy (2) Mother board
(3) Pen drive (4) Hard disk

75. If C = 3 and FEAR is coded as 30 then what will be the code number of HAIR?

- (1) 35 (2) 36
(3) 30 (4) 33

76. MAHESH : 152362 :: SHAME : ?

- (1) 65231 (2) 65213
(3) 62513 (4) 62351

77. Choose the odd one out

- (1) 8 - 27 (2) 125 - 216
(3) 343 - 512 (4) 1009 - 1331

Directions (Q.No. 78 - 79)

Some digits are coded as letter or symbols. Find the correct code for following numbers.

Digits	3	9	4	8	0	6	7	5	2
Letter/Symbols	T	E	R	J	\$	L	U	@	M

78. 754209

- (1) U@R\$ME (2) U\$RM@E
(3) U\$MR@E (4) U@RM\$E

79. 427509

- (1) RMU@\$E (2) RM@U\$E
(3) RM@U\$E (4) RM@UE\$

80. Among P, Q, R, S and T, S is older than R but not as old as T, Q is older than only P, who among them is the youngest?

- (1) P (2) Q
(3) R (4) Can't be determined

For Rough Work Only



ANSWER KEY

**SECTION-1
SCIENCE**

PHYSICS

1. (4)
2. (4)
3. (3)
4. (2)
5. (1)
6. (4)
7. (1)
8. (2)
9. (3)
10. (4)
11. (2)
12. (2)
13. (3)
14. (3)
15. (1)

CHEMISTRY

16. (2)
17. (3)
18. (4)
19. (3)
20. (4)
21. (3)
22. (2)
23. (4)
24. (2)
25. (2)
26. (4)
27. (2)
28. (1)
29. (1)
30. (4)

BIOLOGY

31. (2)
32. (1)
33. (2)
34. (2)
35. (4)
36. (1)
37. (4)
38. (1)
39. (2)
40. (4)
41. (3)
42. (1)
43. (4)
44. (3)
45. (1)

**SECTION-2
MATHEMATICS**

46. (4)
47. (1)
48. (1)
49. (4)
50. (2)
51. (4)
52. (1)
53. (2)
54. (3)
55. (4)
56. (2)
57. (3)
58. (3)
59. (3)
60. (2)
61. (4)
62. (3)
63. (3)
64. (2)
65. (2)

**SECTION-3
MENTAL ABILITY**

66. (3)
67. (1)
68. (2)
69. (3)
70. (2)
71. (1)
72. (3)
73. (4)
74. (2)
75. (2)
76. (3)
77. (4)
78. (4)
79. (1)
80. (1)