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29th SCIENCE TALENT SEARCH EXAMINATION - DECEMBER, 2016

Dr. A. S. Rao Awards Council, Hyderabad

SCREENING TEST

Q.P. CODE

A

Max Marks:300

9th Class (E.M)

Time: 3 Hours

READ THE FOLLOWING INSTRUCTIONS BEFORE YOU START ANSWERING

- 1) You have to answer in OMR sheet given to you.
- 2) **Do shading in OMR sheet the correct question paper code as indicated at Right Top corner of this page, otherwise your answers will be valued wrongly.**
- 3) **Write your Hall Ticket Number (6 digit number) clearly in the space provided at top of this page & also in OMR sheet.**
- 4) This paper consists of Multiple Choice Questions in each subject in the order Mathematics, Physics, Chemistry & Biology.
- 5) Total number of questions is 100 (25 in each subject of 4 subjects). Please verify.
- 6) Each question carries THREE (3) Marks. **There may be one or more correct answers to a question.** You have to identify all the correct answers and have to darken/shade the corresponding circle or circles in OMR sheet. **No Marks will be given if you do not identify all the correct answers, if a question has more than one correct answer.**
- 7) You will not be permitted to leave the examination hall till the end of the test, even if you complete your answers before time.
- 8) Please verify for proper printing of all 100 Questions before you start answering
- 9) If there is any kind of misprinting, report to the invigilator and collect corresponding Question Paper Booklet, immediately.
- 10) **No complaints of misprint in Question Paper Booklet will be entertained after 30 Minutes from commencement of examination.**
- 11) **Time for this Test is 3 Hours.**
- 12) You are not allowed to have any kind of **Electronic gadgets of in the examination hall under any Circumstances.** If found you will not be allowed to answer and will be sent out of examination hall.

MATHEMATICS

1) A two digit number xy is such that the sum of the number and the number formed by reversing the digits is a perfect square then the ordered pair (x,y) is

- (A) (3,8) (B) (9,2) (C) (6,5) (D) (9,1)

2) In a right angled triangle ABC, P is a point on the hytenues AC such that

$AP = (x)(PC) = h$; $BC = d$ and $AP + AB = PC + BC$ then

- (A) $x = \frac{h(d-2h)}{d(h-d)}$ (B) $x = \frac{d(d-2h)}{h(h-d)}$
(C) $AB = \frac{2h(d-h)}{(2h-d)}$ (D) $h < d < 2h$

3) If $x = t + \sqrt{t^2 - 1}$ then

- (A) $t = \frac{x^2 - 1}{2x}$ (B) $t = \frac{x^2 + 1}{2x}$
(C) $x = \frac{1}{t - \sqrt{t^2 - 1}}$ (D) $x^2 - 2tx + 1 = 0$

4) Let $a, b \in N$ and $9(a^3 + b) = 10a^2b$ then

- (A) $a + b = 6$ (B) $a + b = 10$ (C) $a^2 + b^2 = 18$ (D) $a - b = 0$

5) Factor of $x^5 - 3x^4 - x + 3$ is

- (A) $(x-1)$ (B) $(x+1)$ (C) $(x+3)$ (D) $(x-3)$

6. If $(x^2 + x + 1)$ is a factor of $(x^4 + 6x^3 + 9x^2 + px + q)$ then

- (A) $p + q = 11$ (B) $p^2 - q^2 = 55$ (C) $\frac{p+1}{q} = 3$ (D) $p^2 + q^2 = 70$

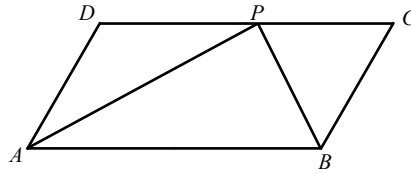
7) If $y = \frac{2^x + 2^{-x}}{2}$, then $x =$

- (A) $\log_2(y + \sqrt{y^2 - 1})$ (B) $\log_2(y + \sqrt{y^2 + 1})$
(C) $\log_2(y - \sqrt{y^2 - 1})$ (D) $\log_2(\sqrt{y^2 + 1} - y)$

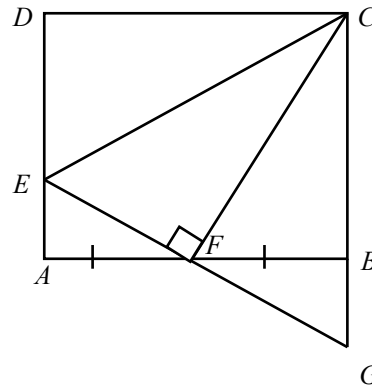
8) If square root of $x^4 - 4x^3 + 10x^2 + ax + b$ is $x^2 - 2x + 3$ then

- (A) $(a+b)^2 = 49$ (B) $(a-b)^2 = 441$ (C) $a^2 - b^2 = 63$ (D) $b^2 - 2a = 105$

- 9) In the given figure ABCD is a parallelogram AP is the bisector of $\angle DAB$ and also $AB = 2AD$



- (A) $\angle ABP = \angle PBC$ (B) AB is diameter of circum circle of $\triangle APB$
 (C) $\angle APB = 90^\circ$ (D) Area of circum circle of $\triangle APB = \frac{\pi}{2}(AD^2)$
- 10) If $x^8 + x^4 + 1 = (x^2 + ax + 1)(x^2 + bx + 1)(x^4 + cx^2 + 1)$ then
 (A) $a + b + c = -1$ (B) $a^2 + b^2 + c^2 = 3$ (C) $a + 2b - c = 0$ (D) $a + 2b + c = 0$
- 11) If $(x - 2)$ and $(x + 1)$ are factors of $(x^3 + ax^2 - x + b)$ then
 (A) the remainder when the given expression is divided by $(x - 1)$ is 0
 (B) $a = -2, b = 2$
 (C) the remainder when the given expression is divided by $(x + 2)$ is -12
 (D) $a + b = 4$
- 12) In the given figure, ABCD is a square and F is the mid-point of AB. $EF \perp CF$ and meets CB produced at G. Then



- (A) $EA = GB$ (B) $CF = AB + AF$
 (C) $CE = CF$ (D) $CE = AB + AE$
- 13) On the sides AB and AC of $\triangle ABC$, equilateral triangles ABD and ACE are drawn. then
 (A) $BC = AD$ (B) $BE = CD$ (C) $\angle CAD = \angle BAE$ (D) $\angle DAB = \angle EAC$
- 14) In an equilateral triangle ABC, P and Q are dividing BC in 1:1 and 1:2 ratios respectively. R is the midpoint of AP. Then
 (A) $9AQ^2 = 7AB^2$ (B) $9AP^2 = 7AB^2$
 (C) $16BR^2 = 7BC^2$ (D) $16BR^2 = 9AQ^2$

- 15) Two parallel chords AB and CD of length 8 cm and 15 cm respectively are drawn in a circle with centre at 'O' and radius 8.5 cm. Then
- (A) distance between chords is 3.5 cm when they are on same side of the centre
 - (B) distance between chords is 11.5 cm when they are on either side of the centre
 - (C) area of trapezium ABCD is 132.25 sq.cm
 - (D) area of ΔOAB is 30 sq.cm
- 16) Lengths of the minute hand and hour hand in a clock are 12 cm and 9 cm respectively. Then
- (A) the area of the region on the clock described by the minute hand in 35 minutes is 264 sq.cm
 - (B) the angle between the hands (minute and hour) after 35 minutes is 192.5°
 - (C) the area of the region on the clock described by hour hand in 56 minutes is $12\frac{3}{8} \text{ sq.cm}$
 - (D) the area of the region on the clock described by hour hand in 56 minutes is $19\frac{4}{5} \text{ sq.cm}$
- 17) Four circles each of radius 7 cm are kept such that each circle touches two of the other 3 circles then
- (A) the area of the space enclosed by the four circles is 42 sq.cm
 - (B) area of the quadrilateral formed by joining the centres of the circles is 196 sq.cm
 - (C) the quadrilateral formed by joining the centres of the circles is a square
 - (D) the quadrilateral formed by joining the centres of the circles is not a square but a rhombus
- 18) The area of a right-angled triangle is 20 sq.cm and one of the sides containing the right-angle is 4 cm then
- (A) the second side containing the right angle is 10 cm
 - (B) hypotenuse = $2\sqrt{29} \text{ cm}$

(C) length of the perpendicular drawn onto the hypotenuse from the opposite vertex is $\frac{20}{\sqrt{29}}cm$

(D) perimeter of the triangle is $(14 + 4\sqrt{7})cm$

19) Which of the following statements is/are **true**?

(A) If diagonals of a parallelogram are equal, then angles of parallelogram are equal

(B) If diagonals of a parallelogram are equal, then it becomes a square

(C) If diagonals of a parallelogram are equal, then it becomes a rectangle

(D) a parallelogram is cyclic quadrilateral

20) Inner and outer radii of a hemispherical shell are r and R respectively then the volume of it is (in cubic units)

(A) $\frac{4}{3}\pi(R^3 - r^3)$

(B) $\frac{4}{3}\pi(R+r)(R^2 - Rr + r^2)$

(C) $\frac{2}{3}\pi(R^3 - r^3)$

(D) $\frac{2}{3}\pi(R-r)(R^2 + Rr + r^2)$

21) A cylindrical tube, open at both ends, is made of a metal. The internal diameter of the tube is 10.4 cm and its length is 25 cm. The thickness of the metal is 8 mm. Then

(A) external radius of the tube is 9.2 cm (B) external radius of the tube is 6 cm

(C) volume of the tube is $704c.cm$ (D) outer surface area is $2828\frac{3}{7}sq.cm$

22) If the mean of the observations

$x, x+3, x+5, x+7, x+10, x+13, x+18, x+20, x+23$ and $x+25$ is 16.4 then

(A) the mean of the last four observations is 25.5

(B) the median of the given data is 15.5

(C) the median of the given data is 14.5

(D) the mean of the first five terms is 9

23) Product of two co-prime numbers is 117. Then

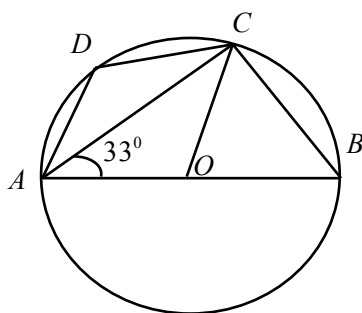
(A) their L.C.M is 1

(B) their L.C.M is 117

(C) their H.C.F is 1

(D) their L.C.M lies between 115 and 120

- 24) If $f(x) = h(x)g(x) + r(x)$ where $f(x), g(x)$ are two polynomials with $g(x) \neq 0$, then
- (A) $r(x) = 0, \forall x \in R$
- (B) power of $r(x) <$ power of $g(x)$
- (C) $r(x) = 0$ or power of $r(x) <$ power of $g(x)$
- (D) $r(x) = g(x)$
- 25) In the given figure, AOB is the diameter and $\angle BAC = 33^\circ$ then



- (A) $\angle ADC = 123^\circ$ (B) $\angle ADC = 57^\circ$
- (C) $\angle AOC = 114^\circ$ (D) $\angle ABC = 66^\circ$

PHYSICS

- 26) A book remains at rest on a table, because of
- (A) gravitational attraction.
- (B) friction between the book and the surface of table.
- (C) force exerted by book on the table, is same as force exerted by table on the book.
- (D) no net force acts on it.
- 27) Select the **correct** statements (s) from the following
- (A) The motion of a body is relative
- (B) The displacement of a body can be less than the distance travelled by the body
- (C) Any physical quantity having magnitude but no direction is a vector quantity
- (D) Slope of distance vs time curve gives its speed at any instant of time
- 28) A body is moving with constant negative acceleration of 4 m/sec^2 in a straight path with initial velocity 9 m/sec and turns back with acceleration 4 m/sec^2 .
- (A) Body turns back after 2.25 sec
- (B) Body travels a distance of $81/8 \text{ m}$ from its initial position before it turns back

- (C) Body travels 0.5 m in the first 0.5 sec of its return journey
- (D) Distance travelled by the body when it comes back to its initial position is zero
- 29) Feeling of weightlessness in a satellite is due to
- (A) absence of inertia
- (B) absence of gravity
- (C) absence of accelerating force.
- (D) free fall of satellite.
- 30) Choose the correct statement (s) from the following
- (A) A non zero net force acting on a body changes its state of Equilibrium
- (B) Body in motion will have acquires momentum
- (C) The velocity and momentum of a body will be in the same direction
- (D) The momentum of a body is inversely proportional to its mass
- 31) A stretching force of 10 N is applied at one end of a spring balance and an equal force is applied at the other end at the same time. The reading of the balance is.
- (A) 10N (B) 5 N (C) 20 N (D) zero
- 32) A boy goes to school from his house at speed of 6kmph and returns at a speed of 4 kmph. If he takes total one hour in going and coming, then the distance between his house and school is.
- (A) 2 km (B) 10 km (C) 2.4 km (D) 0.24km
- 33) “Force acting on a body causes a change in its velocity”. Based on this statement select the correct choice (s)
- (A) Force and velocity always be in the same direction.
- (B) Force and acceleration always be in the same direction.
- (C) Depending up on situation, the force may be along, opposite or at an angle with, the direction of velocity.
- (D) Unit of force is joule.
- 34) Work done by a force when applied on a body at rest is equal to
- (A) the product of magnitudes of applied force and displacement.
- (B) the product of component of displacement in the direction of force and magnitude of force.

- (C) the product of component of force in perpendicular direction of displacement and magnitude of displacement.
- (D) the product of component of force in the direction of displacement and magnitude of displacement.
- 35) Which of the following pair of physical quantities has the same units ?
- (A) work and energy
- (B) momentum and impulse
- (C) power and work
- (D) force and momentum
- 36) Select the correct choice (s) from the following
- (A) A system is said to be isolated when net external force acting on it is zero
- (B) Impulse is the product of mass and velocity of body
- (C) Impulse is equivalent to the change in momentum
- (D) Momentum and impulse are measured in same units
- 37) A soldier fires a bullet from gun with velocity 720 m/sec. If the length of the barrel of the gun is 60 cm long then
- (A) Average velocity of the bullet in the barrel is 750 m/sec
- (B) Average velocity of the bullet in the barrel is 360 m/sec
- (C) The time taken by bullet to come out is $1/600$ sec
- (D) The time taken by bullet to come out is 0.6 sec
- 38) The pressure at a point at a depth of 10 m in a tin containing an oil of density 2000 kg/m^3 (given that 1atm. approximately equal to $1 \times 10^5 \text{ Pa}$ and acceleration due to gravity $g = 10 \text{ cm / S}^2$) is
- (A) $2 \times 10^{10} \text{ atm}$ (B) $2 \times 10^8 \text{ atm}$
- (C) $2 \times 10^6 \text{ atm}$ (D) $2 \times 10^2 \text{ atm.}$
- 39) If a gun weighing 8 kg fires a bullet of mass 40 gm with velocity 400 m/sec, then
- (A) recoil velocity of the gun is 2 m/sec
- (B) the resultant momentum of gun and bullet after firing is zero
- (C) the resultant momentum of gun and bullet after firing is 100 kg-m/sec
- (D) recoil velocity of the gun is 1 m/sec

- 40) If a light ray is incident on air-liquid interface from air at 45° and is refracted at 30° , then
- (A) the critical angle for this interface is $\sin^{-1}\left(\frac{1}{\sqrt{3}}\right)$
 - (B) the critical angle for this interface is $\sin^{-1}\left(\frac{1}{\sqrt{2}}\right)$
 - (C) The refractive index of liquid is $\sqrt{2}$
 - (D) The refracted ray will be at 90° to the incident ray if the angle of incidence is 60°
- 41) All the isotopes of an element show the same chemical properties because
- (A) the electrons in outer shell contribute for chemical properties of atoms.
 - (B) the number of protons in atom contribute for chemical properties of atoms.
 - (C) Isotopes have same atomic number(Z) but different mass number (A).
 - (D) Isotopes have same mass number(A) but with different atomic number(Z).
- 42) Select the correct statement (s) from the following
- (A) Gravitational force increases with increase in distance between the bodies
 - (B) Gravitational force between any two masses is directly proportional to the product of the two masses
 - (C) Gravitational force between any two masses is independent of distance between the masses
 - (D) Gravitational force between any two masses is inversely proportional to the square of the distance between the masses
- 43) Following is/are the findings of Rutherford's alpha-particle scattering experiment.
- (A) Most of the space in the atom is empty.
 - (B) The nucleus of atom consists of positive charge.
 - (C) The radius of the atom is of the order 10^{-15} m, while that of the nucleus is of the order 10^{-10} m.
 - (D) The radius of the atom is of the order 10^{-10} m, while that of the nucleus is of the order 10^{-15} m.
- 44) Which of the following substances is called as liquid gold?
- (A) Mercury
 - (B) Petroleum
 - (C) Kerosine
 - (D) Diesel

- 45) If the mass of earth is M , radius is R , the universal gravitational constant is G and the time period of a satellite near the surface of earth is T , then
- (A) the velocity of the satellite is $\frac{2\pi R}{T}$
 - (B) The time period of satellite is equal to $2\pi\sqrt{\frac{R^3}{GM}}$
 - (C) The time period of satellite is independent of its mass
 - (D) The time period of satellite is proportional mass of the satellite
- 46) A body is thrown up vertically from ground with speed $10\sqrt{2}$ m/sec and at the same time another body is dropped from a height of 20 m . If the two bodies meet after $\sqrt{2}$ sec,
- (A) the freely falling body travelled a distance of 10 m when it meets the second body
 - (B) the upcoming body is 15 m when it meets the body coming down
 - (C) the two bodies meet exactly at half way of their paths
 - (D) the two bodies meet at 5 m height from ground
- 47) Refractive index of water is $\frac{4}{3}$ and that of glass is $\frac{3}{2}$. A ray of light in water is incident at 30° on water-glass interface and velocity of light in glass is 2×10^8 m/sec.
- (A) The refractive index of glass with respect to water is $\frac{9}{8}$
 - (B) The refractive index of glass with respect to water is $\frac{8}{9}$
 - (C) Velocity of light in water is 2.25×10^8 m/sec
 - (D) Velocity of light in water is 2.0×10^8 m/sec
- 48) According to Pascal's principle,
- (A) the excess pressure per unit area of a fluid is different
 - (B) the upward force acting on the surface of fluid is proportional to surface area
 - (C) the magnitude of upward force is larger than that of acting force
 - (D) the Hydraulic Jack works on the Pascal's principle
- 49) A ray of light is incident on a transparent plate of refractive index 1.5. If the reflected and refracted rays are mutually perpendicular,
- (A) the angle of incidence is $\sin^{-1}(1/3)$
 - (B) the angle of incidence is $\tan^{-1}(1/2)$
 - (C) the angle of reflection is $\tan^{-1}(1.5)$
 - (D) angle of incidence is $\sin^{-1}(1.5)$

50) Select the **correct** statement (s) from the following three statements.

- (I) When a ray of light travels from rarer medium to denser medium, the refracted ray bends away from the normal
- (II) When a ray of light travels from denser medium to rarer medium then the refracted ray bends away from the normal
- (III) When a light ray is incident normally on the surface of a medium it travels in medium without deviation

- (A) I and III are correct
- (B) I and II are correct
- (C) II is correct
- (D) III is correct

CHEMISTRY

51) Which of the following statements is (are) **correct** regarding properties of matter?

- (A) Solids are highly compressible
- (B) Liquids have fixed volume
- (C) Gases are highly compressible
- (D) Gases have fixed volume

52) The process of diffusion can occur in the following ways

- (A) Solids diffuse into liquids
- (B) Smoke moves from one place to another
- (C) Liquids diffuse into liquids
- (D) Gases diffuse into gases

53) Which of the following statements is (are) **not correct**?

- (A) Water exists in three states
- (B) Camphor directly changes into gas
- (C) Coconut oil becomes solid on heating
- (D) Moth (naphthalene) balls changes from solid to gas

54) Choose the **correct** statement(s) of the following:

- (A) Rate of diffusion of liquids is higher than gases
- (B) Rate of diffusion of liquids is higher than solids
- (C) Rate of diffusion of gases is higher than liquids
- (D) Rate of diffusion of solids is higher than liquids

55) The molecular weight of ammonium chloride is

- (A) 50.5
- (B) 87
- (C) 51.5
- (D) 53.5

- 56) Choose the **correct** statements about evaporation:
- (A) High humidity decreases the rate of evaporation
 - (B) It is a change of liquid to vapour at temperature above its boiling point
 - (C) It is a surface phenomenon
 - (D) Increase in wind speed decrease the evaporation
- 57) Mixtures are:
- (A) Always homogenous
 - (B) Always in solid state
 - (C) The samples with same composition through out
 - (D) Made up of two or more components that are not chemically combined
- 58) The molecular formula of potassium dichromate is:
- (A) KCr_2O_6
 - (B) $\text{K}_2\text{Cr}_2\text{O}_7$
 - (C) K_2CrO_4
 - (D) KCrO_4
- 59) The factors which increase the solubility are:
- (A) stirring
 - (B) decrease in temperature
 - (C) increase in solute particle size
 - (D) increase in temperature
- 60) A solution contains 30gm of sugar in 90gm of water. Calculate the mass percentage (%) of the solution.
- (A) 15
 - (B) 20
 - (C) 25
 - (D) 30
- 61) Colloidal solutions are:
- (A) The suspensions
 - (B) With particle size 1nm to 100nm
 - (C) Homogenous in nature
 - (D) With particles which easily scatter beam of visible light
- 62) An example for a Foam is:
- (A) Rubber
 - (B) Fog
 - (C) cheese
 - (D) shaving cream
- 63) Which of the following are the techniques used in the separation of components in a mixture?
- (A) chromatography
 - (B) filtration
 - (C) evaporation
 - (D) distillation

64) The technique used to separate the liquids with close boiling points to each other:

- (A) Fractional distillation (B) evaporation
(C) distillation (D) sublimation

65) Which of the following Latin names of the elements are **correct**?

- (A) Silver – Argentum (B) Lead – Plumbum
(C) Potassium – Potassium (D) Tungsten – Wolfram

66) Match the following elements with their atomicity

<u>Element</u>	<u>Atomicity</u>
a) Iron	1) Tetratomic
b). Sulphur	2) Triatomic
c). Phosphorous	3) Monatomic
d). Oxygen	4) Diatomic
	5) Octatomic

	a	b	c	d
(A)	4	5	2	3
(B)	2	5	1	4
(C)	3	5	2	1
(D)	3	5	1	4

67) Which of the following elements show multiple valency?

- (A) Copper (B) Aluminium
(C) Sulphur (D) Iron

68) Choose the correct postulates of Dalton's Atomic theory:

- (A) Matter consists of divisible particles called atoms
(B) Atoms of different elements have same mass
(C) Chemical reaction involves destruction of atoms
(D) When atoms of different elements combine in different ratios, they form different compounds

69) A mole consists of

- (A) 6.022×10^{23} atoms of hydrogen
(B) 2gm of hydrogen atoms
(C) 2gm of hydrogen molecules
(D) 6.022×10^{23} molecules of hydrogen

- 70) The atomic number of an element is 15. The valency exhibited by it is
 (A) 5 (B) 3 (C) 4 (D) 6
- 71) Rutherford's conclusions from the alpha particles scattering experiment are:
 (A) Electrons revolve round the nucleus
 (B) A very small fraction of alpha particles were deflected right back
 (C) Nucleus of the atom is positively charged
 (D) Most space in the atom is occupied by nucleus
- 72) The maximum number of electrons in shell number 5 is:
 (A) 10 (B) 20 (C) 40 (D) 50
- 73) The number of protons, neutrons and electrons in Boron are respectively:
 (A) 8,8,8 (B) 5,6,5 (C) 6,5,5 (D) 6,5,6
- 74) Which of the following elements have same number of neutrons?
 (A) Magnesium (B) Aluminium
 (C) Sodium (D) Neon
- 75) Which of the values of protons and neutrons indicate isotopes of chlorine?
 (A) 17, 18 and 17, 20 (B) 17, 17 and 18, 18
 (C) 17, 19 and 17, 18 (D) 19, 20 and 18, 20

BIOLOGY

- 76). Find out which characters are common in chloroplast and mitochondria.
 (A) Present in all types of cells
 (B) Double membrane wall
 (C) Helps in generation of energy
 (D) Floats outside the nuclear membrane
- 77) By matching the following list –I with List-II: select the **correct** answer(s)

List - I	List - II
I. Camillo Golgi	a) Cell has a nucleus
II. M.J. Schleider	b) Package materials in the cell
III. C.V. Linnaeus	c) Study of Tissues
IV. N. Grow	d) Organism is named with 2 names
	e) Origin of species

- (A) I - b (B) II - d
 (C) III - e (D) IV – a

- 78) Identify statements which are correct for xylem as well as for phloem.
- (A) Fibers and parenchyma are present
 - (B) Helps in conduction
 - (C) Sieve cells and sieve tubes are present
 - (D) Appear red when kept in red colored water
- 79) Which are not the functions of bark?
- (A) Protection from loss of water
 - (B) Storage of water
 - (C) Transportation
 - (D) Absorption of water
- 80) The basis of classification of organisms according to Whittaker is
- (A) Nuclear character
 - (B) Acquiring food
 - (C) Distribution of organisms
 - (D) External characters of plants
- 81) Woese system of classification has following domains
- (A) Arachea
 - (B) Protista
 - (C) Monera
 - (D) Eukarya
- 82) Identify the correct statements
- (A) Spongilla is a motile animal
 - (B) Tapeworm body is made up of two layers of cells
 - (C) Sea Urchins has spiny skin
 - (D) Vertebrates have segmented body
- 83) The receptor cells in the taste buds are
- (A) Thick and flat
 - (B) Thin and flat
 - (C) Thin and round
 - (D) Absent in filiform papillae
- 84) Which of the following are **not** the functions of tissue that joins different tissues of a human body?
- (A) Secretion of fibrous material
 - (B) Repair of damaged tissues
 - (C) Movements of the body
 - (D) Transmitting stimulus
- 85) The angiospermic plant having single seed leaf generally show
- (A) Unspecialized vascular tissues
 - (B) Leaves with reticulate venation
 - (C) Leaves with parallel venation
 - (D) Production of seeds

- 86) The tissue with cutaneous receptors
 (A) Regulate body temperature (B) Provides protection
 (C) Stores waste materials (D) Made up of connective tissue
- 87) Karl von Frisch got noble prize while working with
 (A) Cell biology (B) Animal behavior
 (C) Ethology (D) Plant classification
- 88) Which of the following sense organs depend on hypothalamus for relay of signals?
 (A) Nose (B) Ear (C) Eye (D) Skin
- 89) Which essential nutrients in the food decreases with the use of excessive K_2O fertilizer?
 (A) Vitamin C (B) Carotene (C) Vitamin B₆ (D) Vitamin D
- 90) Which of the following do not show nucleus that guard against foreign substances enter into the blood?
 (A) Neutrophils (B) Lymphocytes
 (C) Platelets (D) Monocytes
- 91) Which characters found in Pinworm are absent in Planaria?
 (A) Flat body (B) Round body
 (C) Pseudocoelom (D) Parasitism
- 92) What are the properties of the physical barrier that separates the organelles of a cell and the cytoplasm of a cell?
 (A) Both solute and solvent passes through it
 (B) It is permeable to solvent but passage of selected solutes
 (C) It is made up of proteins and lipids
 (D) It is rigid
- 93) The color is not detected by the eye if
 (A) Cones are dysfunctional (B) Rods are dysfunctional
 (C) Iodopsin is absent (D) Rhodopsin is absent

94) By matching the following List-1 with List-2, choose the **correct** answer (s)

List 1

I. Neuron

II. Striated muscles

III. Osteocyte

IV. Myocytes

List 2

a. Sarcolemma

b. Cardiac muscles

c. Cross striations

d. Myelin sheath

(A) I - b

(B) II - a

(C) III - d

(D) IV - c

- 95) The legumes are grown after a cereal crop because
- (A) It increases quantity of nitrogenous salts in the soils
 - (B) Atmospheric N_2 is made available to the cereal crop too
 - (C) Less water is required for cereal crop
 - (D) More "K" is available for cereal crop
- 96) Which of the cultures are used to increase the efficiency of plants to absorb nutrients quickly?
- (A) Pseudomonas
 - (B) Cyanobacteria
 - (C) Azotobacter
 - (D) Penicillium
- 97) What are the reasons for exchange of gases that takes place in the lungs?
- (A) Selective permeability of membranes of cells which are lining the alveoli
 - (B) Presence of collagen in the cells that are lining the alveoli
 - (C) Squamous epithelium lining the alveoli
 - (D) Cuboidal epithelium lining the alveoli
- 98) The largest connective tissue present in the largest organ of the human body contains
- (A) Sweat pores
 - (B) Myofibrils
 - (C) Hair follicles
 - (D) Sebaceous gland
- 99) What happens if plasma membrane in the kidney cells is damaged?
- (A) Filtration of blood is proper
 - (B) Selective absorption of solutes is improper
 - (C) There is no effect on the filtration of blood
 - (D) The process of osmosis is impaired
- 100) What will happen if chemical fertilizers are used for a longer time?
- (A) Soil always stays fertile for plant growth
 - (B) Soil fertility is damaged
 - (C) Soil stops responding to fertilizers
 - (D) Soil health is maintained

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Dr. A S RAO AWARDS COUNCIL (Regd. No. 2326/89)

(A Voluntary Organization formed to spot and nurture Talent in Science)

Balavikasa Kendra, Dr. A S Rao Nagar, ECIL Post, Hyderabad - 500 062.

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The Council

The aim of school education is reduced to one of obtaining good marks, leading to over-emphasis on bookish knowledge. It was felt that an independent voluntary organisation could provide suitable direction to enthusiastic and talented students. Thus, a non-profit voluntary society under title “Dr A S Rao Awards Council” was founded in 1988(registered in 1989) in the name of first MD of ECIL Hyderabad. The aims of the council are (i) to spot and nurture talented students, and (ii) to promote excellence in teaching science and mathematics.

STSE

The Council conducts a unique yearly Science Talent Search Examination (STSE) to spot talent in high school students. As part of nurturing the talented students, the Council organises a week long Residential Science Workshop (RSW) for the awardees of 9th standard, *free of cost* to the participants, in April-May. Each participant does project work, writes a report and makes an oral presentation. This helps the participants develop initiative, to innovate and to critically analyse the experimental data. Participants are exposed to lectures-demonstrations on diverse topics by senior faculty drawn from Universities and committed educational institutions.

CETSAM

The Council recognised the great need to help science teachers from schools in rural and semi-urban areas to cope up with the upgraded syllabi. The Council focused its efforts through CETSAM (Capacity Enhancement of Teachers in Science And Mathematics) to help physical science and mathematics teachers of govt schools in Mahaboobnagar District with active cooperation of the erstwhile Govt of Andhra Pradesh. Sir Ratan Tata Trust funded this project (2005-09). In July 2014, the Council on its own organised and conducted a similar 2-day CETSAM in Bhimavaram.



Significance of Dr A S Rao

Ayyagari Sambasiva Rao (1914-2003), was the founding Managing Director of Electronics Corporation of India Limited, Hyderabad.

Born in a poor family, Shri Rao evolved into a man of simplicity and humility, with a fine human touch. He is recognised as a man, not merely of strong beliefs, but of action in the philosophy of technological self-reliance Shri Rao was a physicist by training, but studied later Electrical Engineering in Stanford University. He was associated with Dr Homi Bhabha, the well-known nuclear scientist. Shri Rao helped build our country’s first atomic reactor, *Apsara*, based on ‘self-reliance’. Shri Rao was closely involved in formulating policies for development of electronics in the country.

Shri Rao was conferred Honorary Doctorate by Andhra University. Shri Rao was also recipient of *Padamasri* and *Padma Bhushan* awards.