



**NATIONAL HSS  
 MODEL QUESTIONS  
 SCIENCE**

Time: 2 hrs

F.M.: 100

Shade the appropriate circle ( ● ) using black ink in the answer sheet.

SUBJECT: ENGLISH

F.M.:20

P.M.: 10

Choose the correct answer:

- What is the synonym of 'perennial'?  
a. Frequent    b. Regular    c. Lasting    d. Rare
- Live a fast life means  
a. live in pain    b. live in pleasure  
c. live in pressure    d. live in hope
- If ..... hard, he would have succeeded .....  
a. he worked    b. he was worked    c. he had worked    d. he would have worked
- .....there is traffic jam, you can go through short-cut  
a. what    b. in case    c. as though    d. also
- Ashoka's pillar in Lumbini is .....  
a. old    b. ancient    c. worn    d. fade
- The Atlantic Ocean is ..... biggest ocean.  
a. a    b. an    c. the    d. no article
- Neither he nor they..... going on the picnic.  
a. is    b. are    c. was    d. am
- One of the men ..... walking at night.  
a. is    b. are    c. have been    d. had been
- Ram is accused ..... theft.  
a. at    b. in    c. of    d. from
- She sometimes phones me ..... midnight.  
a. in    b. on    c. at    d. for
- Before the policeman came, the thief.....p  
a. run away    b. had run away    c. runs away    d. will run away
- The argument took place between.....  
a. him and I    b. me and she    c. you and him    d. you and he
- Someone is calling me. In other words, .....  
a. I am call.    b. I am being called.  
c. Somebody is being called by me.    d. I am calling someone

- What would you do if you ..... the Principal?  
a. are    b. was    c. had been    d. were
- Water ..... into steam if it is boiled.  
a. changes    b. changed    c. will change    d. will have changed
- We made the gardener ..... out the grass.  
a. to cut    b. cut    c. cutting    d. cut
- Select the correct spelling from amongst the given alternatives.  
a. neibur    b. neighbour    c. neighbor    d. neihbour
- The odd word/man out among "a. Kettle b. milk c. hammer d. cup" is.....  
a. ....    b. ....    c. ....    d. ....
- Choose the wrong collective noun phrase among the list.  
a. a staff of teachers    b. a staff of officials  
c. a staff of servants    d. a staff of labours
- Find an error in one of the parts of the sentence. The letter of that part is your answer.  
He (A) / does not (B) / know (C) / to swim (D).

SUBJECT: SCIENCE

F.M.: 40

P.M.: 20

- In the SI-system, the unit of temperature is  
a. Degree Centigrade    b. Kelvin    c. Degree Celsius    d. Degree Fahrenheit
- A man pushes a wall but he fails to displace it. He does  
a Negative work    b. Maximum positive work  
c. Positive work but not maximum    d. No work
- Which of the following is incorrect?  
a. Plane mirror gives real image.    b. Concave lens gives real image.  
c. Concave mirror gives real as well as virtual image.  
d. Convex mirror gives virtual image
- A crane can lift 5000 kg mass to the height 10m in 10 sec. What is its power?  
a.50 Kw    b. 5 Kw    c. 500 Kw    d. 0.5 Kw
- The numerical ratio of displacement to distance is  
a. always <1    b. always = 1    c. always >1    d. ≤1
- Critical angle of light passing from glass to air is minimum for  
a. Red    b. Green    c. Yellow    d. Violet
- A permanent magnet .....  
a. attracts all substances    b. attracts only magnetic substance  
c. attracts magnetic substances    d. attracts some substances and repels other.
- What is meant by the statement "Pressure of gas is 13.6 cm of Hg"?

- a. Density of mercury is  $13.6 \text{ g cm}^{-3}$   
 b. At sea level mercury barometer reads 13.6 cm.  
 c. Pressure is equivalent to that of 13.6 cm mercury column.  
 d. Pressure is equal to 13.6 atmospheres.
29. One coulomb of charge contains  
 a.  $3.5 \times 10^{18}$  electrons                      b.  $4.25 \times 10^{18}$  electrons  
 c.  $6.25 \times 10^{18}$  electrons                      d.  $8 \times 10^{18}$  electrons
30. A stone is dropped from the height of 90m, with what velocity does it reach to the ground?  
 a. 26.6 m/s                      b. 36.6 m/s                      c. 42.4 m/s                      d. 46.4 m/s
31. When water at  $4^\circ\text{C}$  taken in a glass is cooled to  $1^\circ\text{C}$ , the level of water .....  
 a. increases.                      b. decreases.                      c. remains the same                      d. none of them.
32. Density of four substances A, B, C and D are  $13.6 \text{ g/cm}^3$ ,  $2.7 \text{ g/cm}^3$ ,  $19 \text{ g/cm}^3$  and  $1.59 \text{ g/cm}^3$  respectively. Which substance will have the maximum volume if equal masses of all are taken?  
 a. A                      b. B                      c. C                      d. D
33. What is the gravitational field intensity on the surface of a planet if its mass is doubled and radius is four times that of the earth?  
 a.  $2/4$  times that of the earth                      b. 8 times that of the earth  
 c.  $1/8$  times that of the earth                      d.  $1/16$  times that of the earth
34. A man can lift a mass of 60 kg on the earth's surface. Then, the mass can be lifted by him on the moon is .....  
 a. 360 kg                      b. 60 kg                      c. 150 kg                      d. 65.4 kg
35. The correct order of reactivity of element is .....  
 a.  $\text{Mg} > \text{Be} > \text{Ca}$                       b.  $\text{Be} > \text{Mg} > \text{Ca}$                       c.  $\text{Ca} > \text{Mg} > \text{Be}$                       d. None of the above
36. Valency of Fe is  
 a. 1 and 2                      b. 2 and 3                      c. 2 and 4                      d. 1 and 3
37. Which one of the following is radical?  
 a.  $\text{NH}_4^+$                       b.  $\text{CuSO}_4$                       c.  $\text{CH}_4$                       d.  $\text{NH}_3$
38. Tick the correct pair of isotopes.  
 a.  ${}_6\text{C}^{13}$  and  ${}_5\text{B}^{11}$                       b.  ${}_6\text{C}^{13}$  and  ${}_6\text{C}^{12}$                       c.  ${}_6\text{C}^{12}$  and  ${}_7\text{N}^{14}$                       d.  ${}_6\text{C}^{14}$  and  ${}_7\text{N}^{14}$
39. Bakelite is an example of .....  
 a. synthetic fibre                      b. thermosetting plastic  
 c. thermoplastic                      d. None of the above
40. The molecular formula of magnesium nitride is .....  
 a.  $\text{Mg}(\text{NO}_3)_2$                       b.  $\text{Mg}_3\text{N}_2$                       c.  $\text{Mg}(\text{NO}_3)_2$                       d.  $\text{Mg}(\text{NO}_2)_2$
41. Which is liquid non-metal?  
 a.  $\text{Br}_2$                       b.  $\text{Cl}_2$                       c. Hg                      d.  $\text{F}_2$
42. Which one of the following gases is the chief source of "green house effect"?  
 a. CFCs                      b.  $\text{NH}_3$                       c.  $\text{CO}_2$                       d. CO
43. The electronic configuration of calcium is .....  
 a.  $1s^2, 2s^2 2p^6, 3s^2 3p^6, 4s^1$                       b.  $1s^2, 2s^2 2p^6, 3s^2 3p^6, 4s^2 4p^1$   
 c.  $1s^2, 2s^2 2p^6, 3s^2 3p^6, 4s^2$                       d.  $1s^2, 2s^2 2p^6, 3s^2 3p^6$
44. Nickel oxide is used in making .....  
 a. black glass                      b. red glass                      c. green glass                      d. blue glass
45. 56 grams of calcium oxide contains .....  
 a.  $60.23 \times 10^{23}$  atoms of calcium oxide                      b.  $0.6023 \times 10^{23}$  molecules of calcium oxide  
 c.  $6.023 \times 10^{23}$  molecules of calcium oxide                      d.  $0.06023 \times 10^{23}$  molecules of calcium oxide
46.  $\text{Cl}^-$  has .....  
 a. 18 protons                      b. 18 electrons                      c. 17 electrons                      d. 16 electrons
47. Major ore of silver is .....  
 a. Argentite                      b. Silver Copper glance                      c. Horn silver                      d. Ruby silver
48. Chitin is found in cell wall of  
 a. Algae                      b. Fungi                      c. Bryophyta                      d. Gymnosperm
49. Ichthyology is the branch of Science which deals with the study of .....  
 a. Snake                      b. Fish                      c. Bird                      d. Insect
50. Pyramid of energy in an ecosystem is always.....  
 a. Upright                      b. Inverted                      c. Spindle-shaped                      d. b and c
51. Sea-horse belongs to.....  
 a. Pisces                      b. Aves                      c. Mammals                      d. Arthropods
52. Nitrogen base found in DNA but not in RNA is .....  
 a. Adenine                      b. Guanine                      c. Uracil                      d. Thymine
53. *Rhizobium* is found in the root nodules of.....  
 a. Pea                      b. Mustard                      c. Wheat                      d. Rice
54. Which one of the following is first vascular plant?  
 a. Bryophyta                      b. Pteridophyta                      c. Gymnosperm                      d. Angiosperm
55. Homeothermic animals are those animals in which .....  
 a. temperature of the body remains constant  
 b. blood is warm  
 c. temperature of the body changes with the change in temperature of surrounding  
 d. blood is cold
56. The reproduction that takes place in *Plasmodium* is .....  
 a. binary fission                      b. fragmentation and regeneration  
 c. multiple fission                      d. budding
57. The study of internal structure of various organs of living beings is known as .....  
 a. morphology                      b. taxonomy                      c. physiology                      d. anatomy

58. In which division does liverwort lie?  
 a. Thallophyta    b. Bryophyta    c. Pteridophyta    d. Gymnosperm
59. The exchange of genetic materials between homologous chromosomes is called .....  
 a. synapsis    b. chiasmata    c. crossing over    d. cytokinesis
60. Physical appearance of an organism is .....  
 a. phenotype    b. genotype    c. heterozygous    d. homozygous

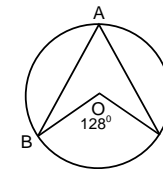
**SUBJECT: MATHEMATICS**

**F.M.: 40**

**P.M.: 20**

61. A train of length  $l$  passes through a pole in  $t$  seconds. What is the length of the platform which it passes in  $3t$  seconds  
 a.  $3l$     b.  $2l$     c.  $4l$     d.  $5l$
62. The square of  $\frac{x}{2}+1$  is  
 a.  $\frac{x}{3}+x+1$     b.  $\left(\frac{x^2}{2}+2x+1\right)^2$     c.  $\frac{x^2}{4}+x+1$     d. none of these
63. Set A and B have 3 and 6 elements each, what can be the minimum number of elements is  $A \cup B$  ?  
 a. 3    b. 6    c. 9    d. 18
64. There are 9 ponds in a certain place. Each pond contains 9 buffaloes and on the body of each buffalo, there are 9 frogs. How many animals are there altogether?  
 a. 819    b. 729    c. 810    d. none
65. The perimeter of a square is 36cm, what is its area?  
 a.  $81\text{cm}^2$     b.  $64\text{cm}^2$     c.  $72\text{cm}^2$     d.  $324\text{cm}^2$
66. The volume of a sphere is  $\frac{4\pi}{3}\text{cm}^3$ . What is its diameter?  
 a. 6cm    b. 3cm    c. 2cm    d. 5cm
67. The unit vector along  $x\vec{i}+y\vec{j}$  is  
 a. 1    b.  $\sqrt{x^2+y^2}$     c.  $\frac{x\vec{i}+y\vec{j}}{\sqrt{x^2+y^2}}$     d.  $\frac{x}{\sqrt{x^2-y^2}}\vec{i}+\frac{y}{\sqrt{x^2-y^2}}\vec{j}$
68. Deepak bought a bag for Rs.320 and sold it at 15% profit, find its selling price.  
 a. Rs.480    b. Rs.368    c. Rs335    d. Rs.350
69. If 7 is the mean of 3, 6, a, 9 and 10, find a.  
 a. 6    b. 5    c. 8    d. 7

70. What is the probability of getting a king or a queen from a well shuffled pack of 52 cards?  
 a.  $\frac{2}{13}$     b.  $\frac{1}{13}$     c.  $\frac{2}{52}$     d.  $\frac{1}{26}$
71.  $f^{-1}$  exists if  $f$  is  
 a. one to one    b. surjective    c. bijective    d. into
72. If  $f(x) = x+1$  and  $g(x) = 2x^2+1$  then  $\text{gof}$  is  
 a.  $2x^2+2$     b.  $2x^2$     c.  $2x^2+4x+3$     d.  $x^2+1$
73. If  $\begin{pmatrix} -2 & -4 \\ 7 & x \end{pmatrix}$  is a singular matrix then  $x$  equals  
 a. 1    b. 3    c. 14    d. 28
74. The number of terms in the series  $2+8+14+20+\dots+80$  is  
 a. 12    b. 14    c. 16    d. 20
75. The points  $(a, 0)$ ,  $(0, b)$  and  $(1, 1)$  are collinear if  
 a.  $a+b=ab$     b.  $a-b=ab$     c.  $b-a=ab$     d.  $a+b+ab=0$
76. The angle between the lines given by  $ax^2+2hxy+by^2=0$  is  $90^\circ$ , if  
 a.  $a-b=0$     b.  $b-a=1$     c.  $a+b=0$     d.  $a=0$
77. When  $P(x, y)$  is rotated about origin through  $+90^\circ$  then the coordinates of image of  $P$  is  
 a.  $(y, -x)$     b.  $(-x, -y)$     c.  $(-y, x)$     d.  $(x, -y)$
78. The length of chord which is at a distance of 6cm from the centre of the circle of radius 10cm is  
 a. 8cm    b. 32cm    c. 64cm    d. 16cm
79. In the figure,  $\angle BOC = 128^\circ$ , what is the measure of angle  $\angle BAC$  ?



- a.  $52^\circ$     b.  $70^\circ$     c.  $64^\circ$     d. none
80. What is the slope of y-axis?  
 a. 1    b. 0    c.  $m$     d.  $\infty$
81. Which one of the following equations is linear?  
 a.  $(x+3)^2$     b.  $3x^2+5x-7$     c.  $\sqrt{x^2+5x+6}$     d. None
82. What is the slope and x-intercept of the line  $2x+3y+5=0$ ?  
 a.  $\frac{2}{3}, -\frac{5}{2}$     b.  $-\frac{2}{3}, \frac{5}{2}$     c.  $-\frac{2}{3}, -\frac{5}{2}$     d.  $-\frac{3}{2}, -\frac{2}{5}$

83. What is the equation of the circle which touches x-axis and has its centre at (2, 3)?

- a.  $(x+3)^2 + (y-2)^2 = 9$                       b.  $(x-2)^2 + (y-3)^2 = -9$   
c.  $(x-2)^2 + (y+3)^2 = 25$                       d.  $(x-2)^2 + (y-3)^2 = 9$

84. If  $f = \{(1, 2), (2, 2), (3, 3), (4, 4)\}$ , then range of f is

- a. {2, 3, 4}                      b. {2, 2, 3, 4}                      c. {1, 2, 3}                      d. {1, 2, 3, 4}

85. The sum of first n natural numbers is

- a.  $\frac{n(n+1)}{2}$                       b.  $n(n+1)$                       c.  $\frac{n(n+1)}{n}$                       d.  $\frac{n(n+1)(2n+1)}{6}$

86. The co-ordinates of the vertex of the parabola  $y = ax^2 + bx + c$  is

- a.  $(-\frac{b}{2a}, \frac{4ac - b^2}{4a})$                       b.  $(-\frac{b}{2a}, \frac{b^2 - 4ac}{4a})$                       c.  $(-\frac{b}{2a}, \frac{4ac - b^2}{2a})$                       d. (h, k)

87. If  $\sin A = \frac{1}{2}$  and A is acute, then the value of  $\tan A$  is

- a.  $\frac{1}{\sqrt{3}}$                       b. 1                      c. 0                      d.  $\sqrt{3}$

88. The value of  $\tan 15^\circ$  is

- a.  $2 + \sqrt{3}$                       b.  $2 - \sqrt{3}$                       c.  $\sqrt{3} - 2$                       d. undefined

89. The value of the determinant of  $\begin{pmatrix} 3 & 5 \\ 2 & 2 \end{pmatrix}$  is

- a. 4                      b. -4                      c. 16                      d. -16

90. The formula of  $2 \sin A \cos A$  is:

- a.  $\sin(A+B) + \sin(A-B)$                       b.  $\sin(A+B) - \sin(A-B)$                       c.  $\sin 2A$                       d.  $\cos 2A$

91. The radius of cylinder of height 5cm and the area of curved surface  $110 \text{ cm}^2$  is

- a. 3.5 cm                      b. 4 cm                      c. 3 cm                      d. 5 cm

92. The cost of carpeting a room at Rs.50 per sq. meter is Rs.1,000, find the breadth of the room if its length is 5m.

- a. 2 m                      b. 3 m                      c. 2.5 m                      d. 4 m

93. The formula of  $(a + b)^2$  is

- a.  $(a - b)^2 + 2ab$                       b.  $(a - b)^2 + 4ab$                       c.  $(a + b)^2 - 2ab$                       d.  $(a + b)^2 - 4ab$

94. The value of x in the equation  $3^{x+2} + 3^x = 30$  is

- a. 0                      b. 1                      c. 2                      d. 3

95. The area of parallelogram in which the base is 6cm and the height 4.5cm is

- a.  $27 \text{ cm}^2$                       b.  $13.5 \text{ cm}^2$                       c.  $54 \text{ cm}^2$                       d.  $10.5 \text{ cm}^2$

96. If set  $A = \{a, b\}$ , then the possible number of subsets of A is

- a. 1                      b. 2                      c. 3                      d. 4

97. If  $x(x - 3) = x$ , then the possible values of x are

- a. 4, 0                      b. 4                      c. 4, 4                      d. 0, 0

98. The probability of 53 Saturdays in a leap year selected at random is

- a.  $\frac{1}{7}$                       b.  $\frac{2}{7}$                       c.  $\frac{53}{365}$                       d.  $\frac{53}{366}$

99. If  $3 \tan \theta = -\sqrt{3}$  and  $\theta$  is obtuse, then the value of  $\theta$  is

- a.  $30^\circ$                       b.  $60^\circ$                       c.  $120^\circ$                       d.  $150^\circ$

100. The solution of the quadratic equation  $x^2 - 4x + 4 = 0$  is

- a. 2, 2                      b. 2                      c. -2, 2                      d. -2, -2

**The End**