



## Trinity Entrance Test 2011

### +2 Science

Time: 1 hr 30 mins

Full Marks: 100

Welcome to the Trinity Entrance Test 2011!

This Test assesses a student's competency to undertake a +2 Programme in **Science**. It contains 100 multiple choice questions – Science (50), English (20), Mathematics (20), and General Knowledge (10).

Please **FOLLOW** the **DIRECTIONS** below:

1. Write your **Name** and **Exam Entry Card Number** clearly in the space given in the **Answer Sheet**.
2. During the Test, **do not leave your seat** unless it is necessary for which you would have to take the permission.
3. Please maintain **complete silence** in the examination hall.
4. Do **not** use **calculators**.
5. Questions are self-explanatory. Further **clarification** will **not** be entertained.
6. Do **not write** anything on the **Test Paper**. Use scrap paper provided for **rough work**.
7. **Read the questions carefully**. Mark your **choice** on the answer sheet as shown below in the example:

**Example:** A student divided a number by  $\frac{2}{3}$  when he required to multiply it by  $\frac{3}{2}$ .

Calculate the percentage of error in his result.

- A) 100                      B) 0                      C) 66                      D) 33

The answer is '0'; so, on your answer sheet use a **cross mark** for the correct answer as shown below:

A	B	C	D
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

8. In multiple choice questions, choose the best option marking it carefully. More than one answer to a question or cancellation by over-writing or smudging of answer choices shall entail loss of marks for that question.
9. At the end of the Test, do not leave your seat or the hall until your **test papers** (Question Papers and Answer Sheet) are collected by the Invigilator.

**Science**

1. At a height of 9m from ground if a body of mass 2 kg has gravitational potential energy 36J, what will be its final velocity with which it strikes the ground if it is dropped from there?  
 A. 4m/sec  
 B.  $6\sqrt{5}$  m/sec  
 C. 2m/sec  
 D. 8 m/sec
2. Which of the following is a vector quality?  
 A. Time  
 B. Speed  
 C. Mass  
 D. Plane area
3. A body has K E of 10 J. How much work has to be done on it to stop it?  
 A. 5 J  
 B. 1 J  
 C. 10 J  
 D. 100 J
4. When a force is applied on 2 kg and 4 kg masses one after another, the acceleration produced on them are  $2 \text{ m/s}^2$  and  $1 \text{ m/s}^2$  respectively. What is the magnitude of that force?  
 A. 4 N  
 B. 1 N  
 C. 3 N  
 D. 2 N
5. Which of the following statement is false?  
 A. A magnet cannot have two opposite poles  
 B. A magnet can have an isolated pole  
 C. A magnet cannot have an isolated pole  
 D. None of above
6. A convex lens can \_\_\_\_\_ the light.  
 A. only converge  
 B. only diverge  
 C. neither converge nor diverge  
 D. converge as well as diverge
7. Sound wave is \_\_\_\_\_  
 A. A longitudinal wave.  
 B. A transverse wave.  
 C. An electromagnetic wave.  
 D. Not a wave.
8. The work done on bringing a unit positive test charge from one end of a resistor to another is called \_\_\_\_  
 A. Resistance  
 B. Potential difference  
 C. Emf  
 D. Power
9. Conductivity depends upon  
 A. Resistivity  
 B. Temperature  
 C. Nature of the material  
 D. All of the above
10. For a normal eye, the far distance of distinct vision is  
 A. 25 cm  
 B. infinity  
 C. 50 cm  
 D. 75 cm
11. The lower limit of auditory for human beings is  
 A. 10 Hz  
 B. 100 Hz  
 C. 20 Hz  
 D. 20 KHz
12. To cool a hot body, we use liquid having  
 A. Low specific heat capacity  
 B. Low thermal heat capacity  
 C. High thermal heat capacity  
 D. High specific heat capacity
13. Volume of water will be minimum at  
 A.  $0^\circ\text{C}$   
 B.  $4^\circ\text{C}$   
 C.  $1^\circ\text{C}$   
 D.  $2^\circ\text{C}$
14. The time period of spin of the earth about its own axis is  
 A. 1 year  
 B. 366 days  
 C. 29 days  
 D. 24 hours
15. When a body is negatively charged, its \_\_\_\_  
 A. No. of electrons increases  
 B. No. of electrons decreases  
 C. Mass increases  
 D. Both a and c
16. Which of the following is false in case of an electron?  
 A. It is a particle  
 B. It has wave property  
 C. It emits energy while moving in orbits  
 D. Its motion is affected by magnetic field

17. Which of the following forms a colloidal solution in water?  
 A. Glucose  
 B. Starch  
 C. Sodium Chloride  
 D. Urea
18. A compound was found to contain nitrogen and oxygen in the ratio 28 : 64. The formula of the compound is  
 A. NO  
 B. N<sub>2</sub>O<sub>3</sub>  
 C. N<sub>2</sub>O<sub>4</sub>  
 D. N<sub>2</sub>O<sub>5</sub>
19. Chemical formula of a particular compounds reflects  
 A. Shape of its molecule  
 B. Size of its molecule  
 C. Total number of atoms in a molecule  
 D. Number of different types of atoms in a molecule
20. Electronic configuration of M<sup>2+</sup> ion is 2, 8, 14 and its atomic weight is 56 amu. The number of neutrons in its nucleus are  
 A. 30  
 B. 32  
 C. 34  
 D. 42
21. Atoms combine in a small whole number ratio, this concept was proposed by  
 A. Dalton  
 B. Avogadro  
 C. Gay Lussac  
 D. Berzelius
22. Two substance P and Q combine to give a third substance R. The process is exothermic and R has properties different from those of P and Q. Is the substance R  
 A. An element  
 B. A mixture  
 C. A compound  
 D. An atom
23. Which of the following is called Sylvine?  
 A. KCl  
 B. NaCl  
 C. CaCl<sub>2</sub>  
 D. MgCl<sub>2</sub>
24. Liquid silver is  
 A. Ag  
 B. Mg  
 C. Hg  
 D. none
25. The general formula of Paraffin is  
 A. C<sub>n</sub>H<sub>2n+1</sub> · X  
 B. C<sub>n</sub>H<sub>2n</sub>  
 C. C<sub>n</sub>H<sub>2n-2</sub>  
 D. C<sub>n</sub>H<sub>2n+2</sub>
26. In IUPAC system of nomenclature, But in hydrocarbon indicates  
 A. Prefix  
 B. Word root  
 C. Primary suffix  
 D. Secondary suffix
27. Which of the following reaction is acid-base reaction?  
 A. BaCl<sub>2</sub> + H<sub>2</sub>SO<sub>4</sub> → BaSO<sub>4</sub> + 2HCl  
 B. NaCl + AgNO<sub>3</sub> → AgCl + NaNO<sub>3</sub>  
 C. HCl + NaOH → NaCl + H<sub>2</sub>O  
 D. FeCl<sub>3</sub> + NaOH → NaCl + Fe(OH)<sub>3</sub>
28. You are given a mixture of sand and common salt. Which process should apply to get pure common salt?  
 A. Dissolution and Evaporation  
 B. Evaporation and Crystallization  
 C. Evaporation and Sublimation  
 D. Sublimation and Crystallization
29. Two isotonic elements X and Y have atomic masses 54 and 56 respectively. If atomic number of X is 26, the atomic number of Y will be  
 A. 26  
 B. 27  
 C. 28  
 D. 30
30. German silver is an alloy of  
 A. Fe, Cr, Ni  
 B. Cu, Zn, Ag  
 C. Cu, Zn, Ni  
 D. Cu, Sn, Al
31. A gymnosperm is a plant which  
 A. Bears flowers  
 B. Produces seeds in cones  
 C. Does not produce seeds  
 D. Exhibits no vascular tissues

32. **Centromere is the part of a chromosome which helps in**  
A. Division of the centrosomes  
B. Formation of spindle fibres  
C. Movement of chromosomes  
D. Reappearance of nuclear membrane
33. **When peacock eats snakes which eat insects thriving on green plants, the peacock is**  
A. A primary consumer  
B. A primary decomposer  
C. Final decomposer  
D. The apex of the food pyramid
34. **A pure tall pea plant can be distinguished from a hybrid tall pea plant by**  
A. Selfing and noting that all progeny are dwarf  
B. Gibberellins treatment  
C. Selfing and noting that all progeny are tall  
D. Measuring its height
35. **Germinations of seed within fruit is**  
A. Ovipary  
B. Vivipary  
C. Hypogeal  
D. Epigeal
36. **Double fertilization and triple fusion is characteristic of**  
A. All Plants  
B. Angiosperms  
C. Gymnosperms  
D. Pteridophytes
37. **Which one of the following is not found in DNA?**  
A. Cytosine  
B. Guanine  
C. Adenine  
D. Uracil
38. **Lysosomes are the**  
A. Digestive centres  
B. Respiratory centres  
C. Excretory centres  
D. Energy centres
39. **Regarding mitosis and cytokinesis, one difference between higher plants and animals is that in plants**  
A. Sister chromatids are identical, whereas in animals they differ from one another  
B. A cell plate begins to form at telophase, whereas in animals a cleavage furrow is initiated at that stage  
C. Chromosomes become attached to the spindle at prophase, whereas in animals chromosomes do not become attached until anaphase  
D. Spindle poles contain centrioles, whereas spindle poles in animals do not
40. **An antiviral substance produced in cell in response to viral infection to prevent the replication of new virus is**  
A. Antibody  
B. Interferon  
C. Vitamin c  
D. Antigen
41. **One of the characteristics of all living beings is that they**  
A. Require oxygen for respiration  
B. Originate from pre-existing life  
C. Carry on heterotrophic nutrition  
D. Carry on autotrophic nutrition
42. **Clotting of blood inside the blood vessels is prevented by**  
A. Fibrinogen  
B. Platelets  
C. Heparin  
D. Prothrombin
43. **Evolution is best defined as**  
A. Inheritance of acquired characters  
B. Descent with modifications  
C. Spontaneous generation  
D. Struggle for existence
44. **When an organism is benefitted without affecting the other, the phenomenon is known as**  
A. Parasitism  
B. Commensalism  
C. Symbiosis  
D. Predation
45. **You are riding a bicycle and take a sudden turn around a sharp corner. The organs involved in the maintenance of balance is**  
A. Medulla oblongata  
B. Semicircular canals  
C. Cerebrum  
D. Optic chiasma
46. **Metabolic processes in the body are catalyzed by**  
A. Enzymes  
B. Hormones  
C. Proteins  
D. Lipids

47. **The intestine of man is very long because**  
 A. It provides larger area for food storage  
 B. The digestive juices are secreted all through its length  
 C. The bacteria contained in the food may gradually be killed  
 D. Its length enables greater scope for food absorption
48. **All of the following are examples of reflex except**  
 A. Sneezing  
 B. Blinking  
 C. Thinking  
 D. Knee jerking
49. **Scientific evidence indicates that an element needed to prevent tooth decay is**  
 A. Chlorine  
 B. Iodine  
 C. Bromine  
 D. Fluorine
50. **All of the following are mammals except**  
 A. Porpoise  
 B. Walrus  
 C. Seal  
 D. Shark

### Mathematics

51. **Grace has 16 jellybeans in her pocket. She has 8 red ones, 4 green ones, and 4 blue ones. What is the minimum number of jellybeans she must take out of her pocket to ensure that she has one of each color?**  
 A. 4  
 B. 8  
 C. 12  
 D. 13
52. **The function  $f(x) = -3x + 12$  on  $R$  is**  
 A. Increasing  
 B. Decreasing  
 C. Constant  
 D. None of these
53. **The system of the equation  $x + 2y = -1$ ,  $-2x - 4y = 2$  has**  
 A. Only one solution  
 B. Finitely many solutions  
 C. No solution  
 D. Infinitely many solutions
54. **The area of the triangle formed by the lines  $y - x = 0$ ,  $y + x = 0$  and  $x = c$  is**  
 A.  $c$  sq. units  
 B.  $c^2$  sq. units  
 C.  $\frac{1}{2}c$  sq. units  
 D.  $\frac{1}{2}c^2$  sq. units
55. **If  $A$  is an  $m \times n$  matrix and  $B$  is a matrix given in such a way that  $AB$  and  $BA$  are both defined, then the size of the  $B$  matrix is**  
 A.  $m \times n$   
 B.  $n \times n$   
 C.  $m \times m$   
 D.  $n \times m$
56. **Let  $\vec{a}$  and  $\vec{b}$  be two given vectors such that  $|\vec{a}| = \sqrt{3}$ ,  $|\vec{b}| = 2$  and  $\vec{a} \cdot \vec{b} = \sqrt{6}$ , then the angle between  $\vec{a}$  and  $\vec{b}$  is**  
 A.  $\frac{\pi}{3}$   
 B.  $\frac{\pi}{4}$   
 C.  $\frac{\pi}{2}$   
 D. 0
57. **The value of  $p$  for which the vectors  $\vec{a} = p\vec{i} + \vec{j} - 2\vec{k}$  and  $\vec{b} = \vec{i} + \vec{j} - 3\vec{k}$  are perpendicular to each other is**  
 A. 9  
 B. -9  
 C. 7  
 D. -7
58. **A can solve 90% of the problems given in a book and B can solve 70%. What is the probability that at least one of them will solve a problem selected at random from the book?**  
 A. 0.63  
 B. 0.16  
 C. 0.97  
 D. 1.60
59. **The number of non-empty proper subsets of order 6 is**  
 A. 64  
 B. 63  
 C. 62  
 D. 60

60. If common difference is 5, then the total number of arithmetic means between 10 and 50 is  
 A. 8 B. 9  
 C. 5 D. 7
61. The area of triangle formed by the line  $2x + 3y = 12$  with the co-ordinate axes is  
 A. 24 B. 12  
 C. 6 D. 3
62. In a race of 1 km. A beats B by 100m. B beats C by 50 m. C beats D by 40 m then A beats D by  
 A. 190 m B. 820.8 m  
 C. 179.2 m D. none
63. If  $m^{\text{th}}$  term of an AP be  $\left(\frac{1}{n}\right)$  and its  $n^{\text{th}}$  term be  $\left(\frac{1}{m}\right)$  then its  $(mn)^{\text{th}}$  term is  
 A. mn B.  $\frac{1}{mn}$   
 C. 1 D.  $\frac{m}{n}$
64. If the AM and GM of the roots of a quadratic equation be 8 and 5 respectively then the equation is  
 A.  $x^2 + 6x + 25 = 0$  B.  $x^2 - 16x + 25 = 0$   
 C.  $x^2 - 16x - 25 = 0$  D.  $x^2 - 13x + 40 = 0$
65. The value of  $\frac{\cos 11^\circ + \sin 11^\circ}{\cos 11^\circ - \sin 11^\circ}$  is equal to the value of  
 A.  $\tan 56^\circ$  B.  $\sin 56^\circ$   
 C.  $\cot 56^\circ$  D.  $\tan 79^\circ$
66. Two cyclists start biking from a trail's start 3 hours apart. The second cyclist travels at 10 miles per hour and starts 3 hours after the first cyclist who is traveling at 6 miles per hour. How much time will pass before the second cyclist catches up with the first from the time the second cyclist started biking?  
 A. 2 hours B.  $4\frac{1}{2}$  hours  
 C.  $5\frac{3}{4}$  hours D. 6 hours
67. In the figure, each of the four white "petals" is formed by the intersection of two semicircles. Each of the four semicircles is drawn with its center at the midpoint of each side of the square. If the length of the side of the square is 2, what is the total area of the shaded region excluding the petals?  
 A.  $8 - 2\pi$  B.  $4 - \pi$   
 C.  $1 - \pi/4$  D.  $16 - 4\pi$
68. The sum of the first n terms of the series:  $\frac{n-1}{n}, \frac{n-2}{n}, \frac{n-3}{n}, \dots$  is  
 A.  $\frac{n-1}{2n}$  B.  $\frac{n-1}{2}$   
 C.  $\frac{n(n+1)}{2}$  D.  $\frac{n}{2}$
69. If  $(a+b+c)(a-b+c) = 3ac$ , then angle B is equal to  
 A.  $\frac{\pi}{9}$  B.  $\frac{\pi}{2}$   
 C.  $\frac{\pi}{3}$  D.  $\frac{\pi}{4}$
70. The circles  $x^2 + y^2 + 2ax + c = 0$  and  $x^2 + y^2 + 2by + c = 0$  will touch each other if  
 A.  $\frac{1}{a^2} - \frac{1}{b^2} = \frac{1}{c^2}$  B.  $\frac{1}{a^2} + \frac{1}{b^2} + \frac{1}{c^2} = 0$   
 C.  $\frac{1}{a^2} + \frac{1}{b^2} = \frac{1}{c^2}$  D.  $\frac{1}{a} + \frac{1}{b} = \frac{1}{c}$



**English**

Questions given below are incomplete sentences. Beneath each sentence you will see four words or phrases marked A, B, C and D. Choose the word or phrase that best completes the sentence.

71. **Jason, the only intrepid one, struggled barehanded with the beast. It means Jason is \_\_\_\_.**  
 A. frightened  
 B. masculine  
 C. thoughtful  
 D. fearless
72. **That is the town \_\_\_\_\_ we will have to drive to reach the destination.**  
 A. from which  
 B. of which  
 C. at which  
 D. through which
73. **What does the word 'aural' correspond to?**  
 A. Hearing  
 B. Speech  
 C. Air  
 D. Heat
74. **Find the odd man out in the given set of words**  
 A. Eleven  
 B. Nine  
 C. Thirteen  
 D. Eighteen
75. **'Incredible' means what is \_\_\_\_.**  
 A. Not excitable  
 B. Not true  
 C. Trustworthy  
 D. Not believable
76. **His \_\_\_\_\_ handwriting resulted from haste and carelessness.**  
 A. Careful  
 B. Beautiful  
 C. Unreadable  
 D. Lucid
77. **Microscopically thin means:**  
 A. as slender as a microscope  
 B. so thin that they can be just seen by the naked eye  
 C. so slender that they have to be seen through a microscope  
 D. all of these
78. **When people suffer from a sense of doom, they think that**  
 A. the world is coming to an end  
 B. the world is progressing day by day  
 C. people are getting more and more intelligent  
 D. the gap between the poor and rich is widening
79. **Science has given the nations new occasions for falling out. Falling out means**  
 A. quarrelling  
 B. making friends  
 C. disintegrating into smaller parts  
 D. becoming poorer and poorer
80. **A war of nerves means:**  
 A. an attempt to defeat enemies by putting pressure for losing courage or confidence  
 B. war fought with nuclear weapons  
 C. a guerrilla war  
 D. nervous system
81. **Expectation of life means**  
 A. their life time achievements  
 B. their average life span  
 C. the number of years people lived  
 D. the things people hope to achieve
82. **An insomniac is a person who:**  
 A. enjoys sleeping  
 B. lacks respect for maniacs  
 C. finds it difficult to sleep  
 D. Sleeps more than others
83. **Hamlet was reluctant to \_\_\_\_\_ the murder of his father.**  
 A. avenge  
 B. revenge  
 C. vengeance  
 D. none
84. **Predictable means**  
 A. we are not at all sure what will happen  
 B. it is cautious  
 C. it is safe  
 D. we can guess what will happen
85. **Silver is a good investment. \_\_\_\_\_, gold is a better one**  
 A. Although  
 B. However  
 C. While  
 D. On the other hand

86. The conditional clause 'If she were rich, \_\_\_\_\_? is completed by
- |                                   |                          |
|-----------------------------------|--------------------------|
| A. She would buy that car.        | B. She will buy the car. |
| C. She was going to buy that car. | D. She bought that car.  |

Read the following passage and answer the questions given:

I believe that both these feelings do equal harm: the feeling of marvel as much as the fear. Because they have this in common that they both want to persuade the layman that there is nothing he can do for himself. Science is the new magic, they whisper; it is out of your hands; for good or ill, your salvation or your doom is the business of others.

87. What makes us think that science is the new magic?
- |                                   |                  |
|-----------------------------------|------------------|
| A. The harm                       | B. Belief        |
| C. The feeling of marvel and fear | D. Our stupidity |
88. Why does a layman think that he can do nothing for himself?
- |                       |   |
|-----------------------|---|
| A. Lack of experience | B. Lack of education                    |
| C. Helplessness       | D. Influence of feeling marvel and fear |
89. Why do they have to whisper?
- |  |
|--|
| A. Because they are cunning.                   |
| B. Because they do not want others to know it  |
| C. The sense of marvel and fear overpower them |
| D. It is a great secret                        |
90. The author seems to suggest that \_\_\_\_\_
- |   |
|---|
| A. our doom is the business of others                         |
| B. our salvations is the business of others                   |
| C. science is the new magic                                   |
| D. our irrational feelings cause the loss of faith in science |

### General Knowledge

91. What is the minimum age requirement of a person in Nepal to be eligible to vote in the national election?
- |             |             |
|-------------|-------------|
| A. 16 years | B. 18 years |
| C. 19 years | D. 21 years |
92. One tola of gold is equivalent to
- |                 |                 |
|-----------------|-----------------|
| A. 10 grams     | B. 10.54 grams  |
| C. 12.353 grams | D. 11.664 grams |
93. Who is known as 'Yubak Kabi' of Nepal?
- |                           |                          |
|---------------------------|--------------------------|
| A. Bhanubhakta            | B. Moti Ram Bhatta       |
| C. Shambhu Prasad Dhungel | D. Madhav Prasad Ghimire |
94. The largest and smallest districts of Nepal are
- |                        |                        |
|------------------------|------------------------|
| A. Dolpa and Lalitpur  | B. Kailali and Nuwakot |
| C. Dolpa and Bhaktapur | D. Syanja and Pyuthan  |
95. Amsterdam is the capital of
- |            |                    |
|------------|--------------------|
| A. Denmark | B. the Netherlands |
| C. Myanmar | D. Belgium         |
96. The headquarter of World Trade Organization is located at
- |                    |             |
|--------------------|-------------|
| A. Washington D.C. | B. New York |
| C. Geneva          | D. London   |
97. 'SPSS' a computer application is mainly used for
- |                              |                         |
|------------------------------|-------------------------|
| A. Business applications     | B. Word processing      |
| C. Statistical data analysis | D. Data base management |
98. The World Environment Day is celebrated on
- |             |                |
|-------------|----------------|
| A. June 5   | B. December 10 |
| C. April 23 | D. January 1   |
99. Cartography is
- |                         |                                 |
|-------------------------|---------------------------------|
| A. Science of vehicles  | B. Art of beautiful handwriting |
| C. Science of palmistry | D. Art of making maps           |
100. Which of the following is not listed as an endangered animal in Nepal?
- |             |              |
|-------------|--------------|
| A. Tiger    | B. Yak       |
| C. Elephant | D. Crocodile |