Shree Nepal National Secondary School
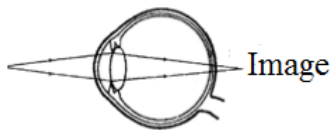## Simara, Bara
Model Question for Science Entrance

Physics   10

1. State Newton's law of gravitation.   1
2. Why is it easier to pull a bucket of water from the well until it is inside the water but difficult when it is out of water.   2
3. Look at the given figure and answer the following questions.   3

   Image

   a. Which type of defect of vision is shown in diagram?
   b. Write one cause of it.
   c. Which lens is used to correct this defect?
   d. Draw the corrected diagram?
4. Radius of earth is 6.4 x 10^3 km and height of the Mount Everest is 8848. If the value of g at the surface of the earth is 9.8 m / s^2, calculate the value of g at the top of the Mount Everest. If the body has mass 50 kg at the Biratnagar, find the mass of body at the top of Mt. Everest.   4

Chemistry   10

5. Write the electronic configuration of gold.   1
6. Write a chemical reaction carried out by catalyst.   2
7. Write the conditions required for the formation of ammonia gas in Haber's process.   3
8. Draw labelled diagram of laboratory preparation of carbon dioxide gas. Carbon dioxide gas is used in fire extinguisher and cold storage, why?   4

Biology   10

9. Write the hormones secreted by adrenal gland.   1
10. Write any two differences between sensory nerve and motor nerve.   2
11. Describe the method of air layering with figure.
12. Show a chart with Mendel's result of cross between long winged drosophila (LL) and short winged drosophila (II) up to second generation showing phenotype and genotype.   4

Mathematics   15

13. Find the value of x if the matrix $A = \begin{pmatrix} x & 2 \\ 4 & 8 \end{pmatrix}$ is singular.   1
14. Find $\vec{a}.\vec{b}$ when $\vec{a} = 4\vec{i} + 6\vec{j}$ and $\vec{b} = 7\vec{i} - 3\vec{j}$.   1
15. Prove that $\frac{Sin3A}{SinA} - \frac{Cos3A}{CosA} = 2$ 1
16. Define functions. if $f(x) = 4x + 5$ and $g(x) = 2x^2 + x$ then find the value of $f^{-1}g(2)$.   4
17. In an arithmetic series, the sum of first 10 terms is 520. If its 7th term is double of its 3rd term. Calculate the first term and common ratio.   4
18. Write the condition for general equation of second degree $ax^2 + 2hxy + by^2 + 2gx + 2fy + c = 0$ represent a circle. Find the equation of circle whose centre is $(7, -5)$ and passes through the centre of the circle $2x^2 + 2y^2 + 4x + 6y - 14 = 0$.   4

English   7.5

19. Do as indicated.   [5×0.5=2.5]
    a. The building was built in----------6th century. (Use correct article)
    b. She has resigned herself----------fate. (Use appropriate preposition)
    c. The telephone----------several times before it was answered. (Supply correct form of 'ring' verb)
    d. She said to her sister, "Did you have dinner?" (Change into indirect speech)
    e. The meaning of 'to bell the cat' is ----------.
    (Areas to be asked: Article, Preposition, Tag question, Subject Verb Agreement, Transformation of Sentence, Tense, Voice, Reported Speech, Connectives, Conditional Sentences, Causative Verbs, Synonyms, Antonyms, meaning of idioms and phrases)
20. Write a short paragraph on 'Women Empowerment' in about 100 words. [5]
    (Areas to be asked: paragraph, essay, letter, email, news article, Book/film review)

Nepali   7.5

१. तलका शब्दहरुलाई अर्थ स्पष्ट हुने गरी वाक्यमा प्रयोग गर्नुहोस् ।   २.५
    परिवर्तन, खेदो खन्नु, जुन गोरुको सिङ छैन उसको नाम तिखे, पो, लम्पसार
२. "विज्ञानको चमत्कार" शीर्षकमा १०० शब्द नघटाई एक अनुच्छेद लेख्नुहोस् ।   ५