امام علی(ع): شرافت به خرد و ادب است نه به دارایی و نژاد.

Choose the best answer (a , b , c , d).

1. What is the meaning of the prefix " circum" of the word " circumference" ?

   a. together   b. around   c. out of   d. under

2. What is the stem of the word " reaction" ?

   a. react   b. action   c. act   d. actor

3. What is the noun of " attract"?

   a. attraction   b. attractive   c. attracted   d. be attract

4. How many hexagons is surrounded for each corner point in the honeycomb?

   a. 5   b. 4   c. 6   d. 3

5. What is the name of a triangle with all sides equall?

   a. right- angled   b. triangular   c. isosceles   d. equilateral

6. . . . . is an associative operation in the set of complex numbers.

   a. subtraction   b. addition   c. division   d. Summarization

7. The well- ordering principle for natural numbers is used frequently in the development of . . . . . .

   a. the real number system.   b . the rational number system

   c. the complex number system   d. the integer number system.

8. The Euclid's proof states that the sequence of positive integers contains . . . . many primes.

   a. definite   b. definitely   c. infinitely   d. finite

9. The deficiency in the system of . . . . numbers is called completeness.

   a. real   b. rational   c. integer   d. irrational

10. . . . . . . is applied in economics and politics.

    a. combination   b. logic   c. chemistry   d. probablity

11. Who introduced the Hindu system?

    a. Khayyam   b. Biruni   c. Khwarizmi   d. Fibonacci

12. . . . . . . is a statement which we accept it without proof.

    a. An axiom   b. A theorem   c. A proof   d. An expression

13. The set Q of all rational numbers is . . . .

    a. uncountable infinite set.   b. countably infinite set.

    c. countably finite set.   d. uncountable finite set.

14. polar gragh paper is ruled with concentric . . . . . . and radial lines emanating from the origin.

   a. squars   b. lines   c. points   d. circles

15. The first step of Ganssian elimination is

   a. Write down the augmented matrix of the system of linear equation.

   b. Find an echelon form of the augmented matrix .

   c. Write down the system of equations corresponding to the echelon form.

   d. Use back substitution to arrive at the solution.

16. The . . . . . . of the numbers 2 and 3 is equal to 6.

   a. addition   b. gcd   c. lcm   d. subraction.

17. It was . . . . . . easy to solve the equation.

   a. appearance   b. apparently   c. appeared   d. apparent

18. Both differentiation and integration are defind in terms of a new mathematical operation called " . . . . .."

   a. calculus   b. limit   c. motion   d. addition

19. Omar Khayyam attempted to classify all . . . . up to the fourth degree.

   a. terms   b. coefficients   c. zeros   d. equations

20. A relation R on a set A is called . . . . . . if for every $x \in A, x R x$.

   a. associative   b. transitive   c. reflexive   d. empty.

سؤالات تشریحی

(بارم هر سؤال ۱ نمره می‌باشد)

متون زیر را به فارسی روان ترجمه کنید.

1. Pappus has observed that the bees use the regular hexagon exclusively for the shape of the cells in the honeycomb. The photograph shows that the arrangement of the cells looks like. When you are building three walls around a point. you have to waste more space compared with constructing six walls around that point.

2. Give all the permutation of {1 , 2 , 3} and indicate wether each of the permutations is even or odd. Solution: Consider the permutations that have 1 as the first element . then those that have 2 as the first element and finally those that have 3 as the first element.

3. When you ask the question " What is mathematics? " you will get a lot of different answers. For example, some people say mathematics is working with figures . Even professional mathematicians would give different answers. Some would say mathematics is an art that lets them express their feelings about order and form.

4. The symbol for zero was first a dot (.) and later a circle (0) . The meaning of " nothing " for zero was apparently added later on. From this point it was possible to formulate the method of writing and solving equations that known as algebra.

5. A partition of set X is a decomposition of the set into non-empty subsets , no two of which overlap and whose union is all of X . The proof of Lagrange's theorem involved partitioning a group into subsets, each of which had the same number of elements as the given subgroup.

6. The graph of an equation of the form r= f(θ) is called the polar graph of the function f. Some polar graphs can be recognized easily if the polar equation is transformed to rectangular form. For other, this transformation does not help.

7. If X is a nonempty set and ~ is any equivalence relation in X , let C be the set of all equivalence classes arising from the equivalence relation. We define $\varphi : C \to X$ by choosing a single element x from each equivalence class $E \in C$ and defining $\varphi(E) = x$.

8. The general study of curves and surfaces obtained as graphs of polynomials are known as algebraic geometry

9. The following property of R. Known as the least – upper- bound property, is equivalent to Dedekind's theorem . Every nonempty set $S \subseteq R$ which is bounded above has a least upper bound.

10. One can prove the following assertion by mathematical induction.