1. The value of k for which the system of equations $2x+3y = 5$ and $4x + ky = 10$ has infinite number of solutions, is

   A. 1

   B. 3

   C. 6

   D. 0

   $\begin{vmatrix} 2 & 3 \\ 4 & k \end{vmatrix} = ?$

2. If the system of equations $2x + 3y = 7$ and, $(a + b)x + (2a - b) y = 21$ has infinitely many solutions , then

   A. $a=1, b= 5$

   B. $a= 5, b=1$

   C. $a= -1, b= 5$

   D. $a= 5, b= -1$

   $\begin{vmatrix} 2 & 3 \\ (a+b) & (2a-b) \end{vmatrix}$

   $= ya$

3. If a pair of linear equations in two variables is consistent, then the lines represented by two equations are

   A. intersecting

   B. parallel

   C. always coincident

   D. intersection or coincident

   $x=6$

4. The area of the triangle formed by the lines $y = x$, $x = 6$ and $y = 0$ is

   A. 36 sq. units

   B. 18 sq. units

   C. 9 sq. units

   D. 72 sq. units

5. The area of the triangle formed by the lines $x = 3$, $y = 4$ and $x = y$ is

   A. ½ sq. unit

   B. 1 sq. unit

   C. 2 sq. unit

   D. None of these

6. A vertical stick 20 m long casts a shadow 10 m long on the ground . At the same time, a tower casts a shadow 50 m long on the ground. The height of the tower is:

   A. 100 m

   B. 120 m

   C. 25 m

   D. 200 m

   $\frac{16-9}{2} = \frac{7}{2}$ $\int_3 y\,dy$ $\frac{4^2}{2} =$

7. If E is a point on side CA of an equilateral triangle ABC such that $BE \perp CA$, then $AB^2 + BC^2 + CA^2 =$

   A. $2BE^2$

   B. $3BE^2$

   C. $4BE^2$

   D. $6BE^2$

8. In an isosceles triangle ABC, If $AB = AC= 25$ cm and $BC= 14$cm then the measure of altitude from A on BC is

   A. 20 cm

   B. 22 cm

   C. 18 cm

   D. 24 cm

   $\sqrt{49+625}$

9. If A and B are complementary angles, then

   A. $\sin A = \sin B$

   B. $\cos A = \cos B$

   C. $\tan A = \tan B$

   D. $\sec A = \cosec B$

   $\angle A + \angle B = 90°$

   $A = 60°$

   $\tan 36° =$

10. If θ and $2\theta - 45°$ are acute angles such that $\sin \theta = \cos(2\theta - 45°)$, then $\tan\theta$ is equal t

    A. 1
    B. -1
    C. $\sqrt{3}$
    D. $1/\sqrt{3}$

11. The sum of the exponents of the prime factors in the prime factorization of 196, is

    A. 1
    B. 2
    C. 4
    D. 6

12. If $n = 2^3 \times 3^4 \times 5^4 \times 7$, then the number of consecutive zeros in n, where n is a natural number, is

    A. 2
    B. 3
    C. 4
    D. 7

13. The exponent of 2 in the prime factorization of 144, is

    A. 4
    B. 5
    C. 6
    D. 3

14. If 3 is the least prime factor of number a and 7 is the least prime factor of number b, then the least prime factor of a + b, is

    A. 2
    B. 3
    C. 5
    D. 10

15. The largest number which divides 70 and 125, leaving remainders 5 and 8, Respective

    A. 13
    B. 65
    C. 875
    D. 1750

16. If α, β are the zeros of polynomial $f(x) = x^2 - p(x + 1) - c$, then $(\alpha + 1)(\beta + 1) =$

    A. $c - 1$
    B. $1 - c$
    C. c
    D. $1 + c$

17. If $f(x) = ax^2 + bx + c$ has no real zeros and $a + b + c < 0$, then

    A. $c = 0$
    B. $c > 0$
    C. $c < 0$
    D. None of these

18. If zeros of the polynomial $f(x) = x^3 - 3px^2 + qx - r$ are in A.P., then

    A. $2p^3 = pq - r$
    B. $2p^3 = pq + r$
    C. $p^3 = pq - r$
    D. None of these

19. The product of the zeros of $x^3 + 4x^2 + x - 6$ is

    A. -4
    B. 4
    C. 6
    D. -6

20. If two zeroes of the polynomial $x^3 + x^2 - 9x - 9$ are 3 and -3 then its third zero is

    A. -1
    B. 1
    C. -9
    D. 9

21. If 5θ and 4θ are acute angles satisfying $\sin 5\theta = \cos 4\theta$, then $2\sin 3\theta - \sqrt{3} \tan 3\theta$ is equal to

A. 1

B. 0

C. -1

D. $1 + \sqrt{3}$

22. For a frequency distribution ,mean, median and mode are connected by the relation

A. Mode = 3 Mean – 2 Median

B. Mode = 2 Median - 3 Mean

C. Mode = 3 Median - 2 Mean

D. Mode = 3 Median + 3 Mean

23. The mode of a frequency distribution can be determined graphically from

A. Histogram

B. Frequency polygon

C. Ogive

D. Frequency curve

24. If the mode of the data: 16, 15, 17, 16, 15, x, 19, 17, 14 is 15 then x=

A. 15

B. 16

C. 17

D. 19

25. If the mean of 6, 7,x,8,y, 14 is 9 , then

A. $x + y = 21$

B. $x + y = 19$

C. $x - y = 19$

D. $x - y = 21$

26. The positive value of k for which the equation $x^2 + kx + 64 = 0$ and $x^2 - 8x + k = 0$ will both have real roots is

A. 4

B. 8

C. 12

D. 16

27. If the equation $x^2 - bx + 1 = 0$ does not possess real roots, then

A. $-3 < b < 3$

B. $-2 < b < 2$

C. $b > 2$

D. $b < -2$

28. If x = 1 is a common root of the equations $ax^2 + ax + 3 = 0$ and $x^2 + x + b = 0$, then ab =

A. 3 ,

B. 3.5

C. 6

D. -3

29. If p and q are the roots of the equation $x^2 - px + q = 0$, then

A. $p = 1, q = -2$

B. $b = 0, q = 1$

C. $p = -2, q = 0$

D. $p = -2, q = 1$

30. If a and b can take values 1,2,3,4. Then the number of equations of the form $ax^2 + bx + 1 = 0$ having real roots is

31. The number of quadratic equations having real roots and which do not change by squaring their roots is

   A. 4

   B. 3

   C. 2

   D. 1

32. If the sum of n terms of an A.P. be $3n^2 + n$ and its common difference is 6 , then its first term is

   A. 2

   B. 3

   C. 1

   D. 4

33. If the sum of n terms of an A.P. is $3n^2 + 5n$ then which of its terms is 164?

$3n^2 + 5n$

   A. 26 th

   B. 27 th

   C. 28 th

   D. none of these

34. If S_n denote the sum of the first n terms of an A.P. If $S_{2n} = 3 S_n$, then $S_{3n} : S_n$ is equal to

   A. 4

   B. 6

   C. 8

   D. 10

35. In an AP , $S_p = q$, $S_q = p$ and S_r denotes the sum of first r terms. Then, S_{p+q} is equal to

   A. 0

   B. $-(p + q)$

   C. $p + q$

   D. pq

36. If the first term of an A.P. is 2 and common difference is 4, then the sum of its 40 terms is

   A. 3200

   B. 1600

   C. 200

   D. 2800

37. A bag contains 50 coins and each coin is marked from 51 to 100. One coin is picked at random. The probability that the number on the coin is not a prime number, is

   A. $\frac{1}{5}$

   B. $\frac{3}{5}$

   C. $\frac{2}{5}$

   D. $\frac{4}{5}$

38. In a football match, Ronaldo makes 4 goals from 10 penalty kicks. The probability of converting a penalty kick into a goal by Ronaldo, is

   A. $\frac{1}{4}$

   B. $\frac{1}{6}$

   C. $\frac{1}{3}$

   D. $\frac{2}{5}$

39. The probability of an impossible event is

   A. 1

   B. 0

   C. less than 0

   D. greater than 1 ,

40. Which of the following cannot be the probability of an event?

A. $\frac{1}{3}$

B. $\frac{3}{5}$

C. $\frac{5}{3}$

D. 1

41. From a point Q, the length of the tangent to a circle is 24 cm and the distance of Q from the centre is 25 cm. The radius of the circle is

A. 7 cm

B. 12 cm

C. 15 cm

D. 24.5 cm

42. The length of the tangent from a point A at a circle, of radius 3 cm, is 4 cm. The distance of A from the centre of the circle is

A. √7 cm

B. 7 cm

C. 5 cm

D. 25 cm

43. If four sides of a quadrilateral ABCD are tangential to a circle, then

A. AC + AD = BD + CD

B. AB + CD = BC + AD

C. AB + CD = AC + BC

D. AC + AD = BC + DB

44. If radii of two concentric circles are 4 cm and 5 cm, then the length of each chord of one circle which is tangent to the other circle is

A. 3 cm

B. 6 cm

C. 9 cm

D. 1 cm

45. The top of two poles of height 20m and 14m are connected by a wire. If the wire makes an angle of 30° with horizontal, then the length of the wire is

A. 12 m

B. 10 m

C. 8 m

D. 6 m

46. From the top of a cliff 25 m high the angle of elevation of a tower is found to be equal to the angle of depression of the foot of the tower. The height of the tower is

A. 25 m

B. 50 m

C. 75 m

D. 100 m

47. The length of shadow of a tower on the plane ground is √3 times the height of the tower. The angle of elevation of sun is

A. 45°

B. 30°.

C. 60°

D. 90°

48. Water flows at the rate of 10 meter per minute from a cylindrical pipe 5 mm in diameter. How long will it take to fill up a conical vessel whose diameter at the base is 40 cm and depth 24 cm

A. 48 minutes 15 sec

B. 51 minutes 12 sec

C. 52 minutes 01 sec

D. 55 minutes

49. The curved surface area of a cylinder is 264 m^2 and its volume is 924 m^3. The ratio of its diameter to its height is

A. 3 : 7

B. 7 : 3

C. 6 : 7

D. 7 : 6

50. If three metallic spheres of radii 6 cm, 8 cm and 10 cm are melted to form a single sphere, the diameter of the sphere is

A. 12 cm

B. 24 cm

C. 30 cm

D. 36 cm

51. The type of memory that uses in-circuit wiring to erase the content by applying electric field is:

A. PROM

B. Flash memory

C. EAROM

D. EEPROM

52. The storage device that has a high cost per bit of storage:

A. SDRAM

B. Cache Memory

C. Read only memory

D. Hard Disk

53. Which of the following is used for both input and output?

A. computer Terminals

B. pen plotter

C. Dot Matrix printer

D. None of these

54. The ....terminal is referred as non-programmable terminal whereas .... terminal is referred as user-programmable terminal.

A. Dumb, Intelligent

B. Dumb, smart

C. smart, intelligent

D. None of these

55. The operating system that allows only one program to run at a time is:

A. Batch processing

B. Embedded

C. Real Time

D. Multitasking

56. The ....is the "administrative" section of the computer system.

A. input unit

B. output unit

C. memory unit

D. central processing unit

57. The set of wires, which carry information in a compiled manner , is called:

A. System bus

B. Public bus

C. private bus

D. none of these

58. A register that keeps track of next instruction to be executed is called a ....

A. program counter

B. instruction register

C. accumulator

D. data register

59. ....is a type of processor architecture that utilises a small , highly optimised set of instructions.

A. CISC
B. RISC
C. VISC
D. LISC

60. The concept of CISC architecture is to accomplish the task in
....

A. As longer lines of code as possible
B. As few lines of codes as possible
C. both (A) and (B)
D. None of these

61. The memory management scheme that permits the physical –address space of a process to be non-contiguous is:

A. paging
B. spooling
C. swapping
D. none of these

62. An imaginary memory supported by the operating system in conjunction with the secondary memory is:

A. Cache memory
B. primary memory
C. virtual memory
D. none of these

63. To permanently delete a file or folder from the computer, which of the following keys must be pressed?

A. Ctrl+Delete
B. Alt+Delete
C. Delete+Enter
D. Shift+Delete

64. Which of the following options is present in the Display properties dialog box?

A. Desktop
B. Appearance
C. Themes
D. All of these

65. Electronic Bulletin board is an internet service used for:
A.   Accessing internet
B.   Leaving messages and accessing the required information through the software
C.   collecting information using different software on the internet
D. chatting on the internet

66. Which of the following hormones is a derivative of amino acid?

A. Prostaglandin
B. Progesterone

C. Epinephrine
D. Estrogen

67. Starch and Cellulose are the compounds of many units of

A. Amino acids
B. Glycerol

C. Simple sugars
D. Fatty acids

68. Which of the following is not a symptom of Turner's syndrome

A. Transverse palmar crease
B. Slight mental retardation
C. Webbed neck
D. Short stature

69. Inheritance of ABO blood groups is an example of

A. Incomplete dominance

B. Dominance

C. Codominance

D. Both B & C

70. Which of these traits studied by Mendel in 'Pisum sativum' is a dominant trait?

A. Terminal flowers

B. Inflated pod

C. Green colour of seed

D. Yellow colour of pod

71. The cells of connective tissue which produce histamine are

A. Fibroblasts

B. Macrophages

C. Mast cells

D. Plasma cells

72. The DNA site where DNA-dependent RNA-polymerase binds for transcription is

A. operator

B. promoter

C. regulator

D. receptor

73. Epithelial cells of the intestine involved in food absorption are lined by

A. Pinocytic vesicles

B. Phagocytic vesicles

C. Zymogen granules

D. Micro-villi

74. When temperature is increased from 5°C to 55°C, the rate of an enzyme controlled biochemical reaction will

A. Remain same

B. Increase continuously

C. Decrease continuously

D. Increase initially and then decrease

75. Curdling of milk in small intestine occurs due to the action of

A. Rennin

B. Erepsin

C. Trypsin

D. Chymotrypsin

76. Eukaryotic RNA polymerase III catalyses the synthesis of

A. mRNA

B. rRNA

C. hnRNA

D. tRNA

77. An individual's collection of genes is called

A. Genotype

B. Phenotype

C. Trait

D. None of the above

78. The odd one out with respect to their function is

A. Erepsin

B. Trypsin

C. Pepsin

D. Steapsin

79. Which cells possess microvilli and cilia both on their free surface

A. Cells of ependymal layer

B. Cells of internal layer of oviduct

C. Epithelial cells of tracheal layer

D. Internal epithelial cells of vasa deferentia

80. DNA can be formed over RNA through

    A. Ligase   B. Gyrase

    C. Helicase   D. Reverse transcriptase

81. 30, 68, 130, 222, ?, 520, 738

    A. 420   B. 350

    C. 250   D. 280

82. A and B is married couple. C & D are brothers. C is a brother of A. How is D related to B?

    A. Brother-in-law   B. Brother

    C. Son-in-law   D. Cousin

83. Pointing to a gentleman, Deepak said, "His only brother is the father of my daughter's father". How is gentleman related to Deepak?

    A. Grandfather   B. Father

    C. Brother-in-law   D. Uncle

84. Ahmed leaves from his house. He walks 10m in North-West direction and then 20m in South-West direction. Next, he moves 20m in South-East direction. Finally he turns towards his house. In which direction is Ahmed going?

    A. South-East   B. North-West

    C. South-West   D. North-East

85. From his house, Deepak went 25km to North. Then, he turned West and covered 15km. Then, turned South and covered 10km. Finally, turning to East, he covered 15km. in which direction is he from his house?

    A. North   B. South

    C. West   D. East

86. How many such pairs of letters are there in the word 'JOURNEY' each of which has as many letters between them in the word (in both forward and backward directions) as they have between them in the English alphabetical order?

    A. None   B. One

    C. Two   D. Three

87. How many such pairs of letters are there in the word 'CONFUSED" each of which has as many letters between them in the word as in the English alphabet

    A. Nil   B. One

    C. Two   D. More than three.

88. In a certain code, 'SOBER' is written as 'RNADQ'. How 'LOTUS' can be written in that code?

    A. KNSTR   B. MPUWT

    C. KMSTR   D. LMRST
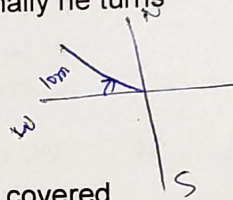
89. If 'WATER' is written as 'YCVGT' then what is written as 'HKTG'?

B. FIRE

A. IRFE

C. REFI

D. ERIF

90. 3, 6, 9, 15, 24, 39, 63, ?

B. 87

A. 100

D. 99

C. 102

Directions (91-92). Select the word or the phrase which is closest to the opposite in meaning of the bold word or phrase.

91. There is not a trace of **vanity** in her behaviour

A. humility

B. selflessness

C. modesty

D. dignity

92. The booking -clerk looked very **grumpy**

A. surly

B. pleasant

C. efficient

D. honest

93. The passive voice of the sentence " Has Mimmy written a letter?" is

A. Has a letter written by Mimmy?   B. Has a letter being written by Mimmy ?
C. Has a letter be written by Mimmy ?   D. Has a letter been written by Mimmy ?

94. "Was he revising his books?" is an example of active voice in

A. Past continuous tense   B. Past perfect tense
C. past perfect continuous tense   D. past indefinite

95. "Medicine will have been taken by the patients." The active voice of this sentence will be changed by adding ....in place of 'will have been taken' is

A. will have taken   B. will have been taken
C. would have taken   D. would has taken

96. Dishonesty is always detrimental .... Progress in life.

A. to

B. or

C. in

D. by

97. Disintegration of the country is inimical ....the progress of the people.

A. to

B. for

C. from

D. at

98. Encouraged by the success of his ventures he has decided to embark ....
the expansion programme.

A. for

B. upon

C. at

D. by

Directions (99-100) choose the word which is most nearly the same in meaning .

99.   The flat has been **refurbished** recently

    A. white-washed   B. painted

    C. renovated   D. demolished

100.   He had **insidiously** wormed his way into her affections.

    A. in a polite manner   B. in a secret manner

    C. in ugly way   D. in a forceful manner