

(4)

- a) $\frac{1}{2}(AC^2+BD^2)$ b) $2(AC^2+BD^2)$ c) AC^2+BD^2 d) $(AC+BD)^2$
39. If PA and PB are two tangents on a circle with centre O then
 a) $\frac{PA}{OA} = \frac{PB}{OB}$ b) $\frac{PA}{OA} = 1$ c) $\angle OAP = \angle OBP$ d) all of these are true
40. PA and PB are two tangent segments drawn from an external point P to a circle with centre O. If $\angle AOB = 160^\circ$. Then $\angle APB$ is equal to
 a) 20° b) 30° c) 40° d) 60°
41. $\sin(A+B) = 1$ and $\cos(A-B) = 1$ then values of A & B are
 a) $A=0^\circ, B=90^\circ$ b) $A=90^\circ, B=0^\circ$ c) $A=B=45^\circ$ d) none of these
42. The angle of elevation of a pole of height 100m from the opposite sides are 30° and 45° respectively. How far are the two points of observation?
 a) $100\sqrt{3}m$ b) $100(1-\sqrt{3})m$ c) $100(1+\sqrt{3})m$ d) $100\sqrt{2}m$
43. Find the area of a triangle whose vertices are (5,2), (4,7), (7,-4)
 a) -2Sq units b) 2 Sq units c) 4 Sq units d) none of these
44. Find the area of the space between concentric circles of radii 7cm and 14cm.
 a) $442cm^2$ b) $425cm^2$ c) $464cm^2$ d) $462cm^2$
45. Find the area of the space left between four coins of radius 2cm each which are touching each other. (take $\pi=3$)
 a) $4cm^2$ b) $4.36cm^2$ c) $2cm^2$ d) none of these
46. If $P(A) \cdot P(B) = P(AB)$ then the events A and B are said to be
 a) mutually exclusive b) equally like c) independent d) none of these
47. From a pack of cards two cards are drawn at random without replacing. Find the probability that both are aces.
 a) $\frac{1}{3} \times \frac{1}{17}$ b) $\frac{1}{3} \times \frac{1}{17}$ c) $\frac{1}{13} \times \frac{1}{17}$ d) $\frac{1}{13} + \frac{1}{17}$
48. If $\frac{2}{3}, k, \frac{5}{8}$ are in AP then the value of k is
 a) $\frac{31}{24}$ b) $\frac{48}{31}$ c) $\frac{31}{48}$ d) $\frac{24}{31}$
49. If P is the probability of an event. Which of the following is incorrect?
 a) P can be zero b) $P \geq 1$ c) $P \leq 1$ d) a & c above
50. The number of common tangents to any two circles just touching each other is
 a) 0 b) 1 c) 2 d) 3

The End

18th STATE LEVEL COMPETITION - 2017

ORGD. BY: THE UNITED DEVELOPMENT ASSN. (UDA) KHANGABOK

H.Q. KHANGABOK, THOUBAL (MANIPUR)

Regd. No. 3/SR/TH/1999

CLASS-X (MATHS.)

Time: 1½hrs.

INSTRUCTION:

- There are 50 questions with four alternatives of which one is the correct/most appropriate answer. Each question carry 2 marks.
 - The correct/most appropriate choice should be marked in the answer sheet with a ball point pen only, by darkening the circle corresponding to the correct choice.
 - If any candidate is found using unfair means of any kind, he/she shall be expelled from the test without any prior warning.
 - Using any calculator/mobile phone etc. is strictly prohibited in exam. hall.
 - The decision of the Association with regard to the conduct of the Examination shall be final and binding to the candidate.
- A probable statement used in proving another statement is called
 a) Algorithm b) Theorem c) Lemma d) none of these
 - The square of an odd integer is of the form (k =any integer)
 a) $4k+1$ b) $8k+1$ c) $(4k+1)^2$ d) none of these
 - For any natural number n , digital root of 5^n can not be a multiple of
 a) 2 b) 3 c) 4 d) 5
 - Find the least multiple of 11 which when divided by 6, 7 and 10 leaves the remainder 4 in each case.
 a) 1447 b) 1744 c) 1474 d) 7441
 - The multiplicative inverse of any non zero real number, R is
 a) 0 b) 1 c) $\frac{1}{R}$ d) none of these
 - Which of the following system of numbers is not closed under addition?
 a) integers b) rational numbers c) irrational number d) real numbers
 - Which field property is not satisfied by the set of integers?
 a) Closure property of Addition b) distributive property of multiplication
 c) existence of multiplicative inverse d) none of these
 - Which of the following is false?
 a) The set of whole numbers contain additive identity
 b) The set of integers has multiplicative identity
 c) The operation of multiplication in Z is commutative
 d) The operation of division in R is associative.
 - If a polynomial $p(x)$ is divided by the linear polynomial $x-a$ then the remainder is
 a) 0 b) a c) $p(a)$ d) none of these
 - If $p(a)$ is a polynomial of degree ≥ 1 and a is any real number, and if $p(-a)=0$, then the factor of $p(x)$ is
 a) $x-a$ b) $x+a$ c) x^2-a d) none of these

Turn Over

(2)

11. Find the value of k if $2x+1$ is a factor of $P(x)=4x^3+3x^2-4x+k$.
 a) $\frac{9}{4}$ b) $\frac{4}{9}$ c) $-\frac{9}{4}$ d) $-\frac{4}{9}$
12. If x^2+px+q and x^2+lx+m are both divisible by $x+a$ then a is equal to
 a) $\frac{m-q}{l-p}$ b) $\frac{-m+q}{-l+p}$ c) $\frac{q-m}{p-l}$ d) $\frac{l-p}{m-q}$
13. If $P(-a)$ is zero for a polynomial $P(x)$, then the factor of $P(x)$ will be
 a) $(x-a)$ b) $(x+a)$ c) $(x+1)$ d) none of these
14. Which of the following is cyclic expression
 a) $(a+b)(b+c)(c+a)$ b) abc c) $a+b+c$ d) all of these
15. Which of the following pair of linear equations in two variables will have unique solution?
 a) $x+y-5=0$ b) $3x+2y-12=0$ c) $2x+3y-6=0$ d) none of these
 $3x+2y-12=0$ $6x+4y-24=0$ $2x+3y-12=0$
16. The condition for the graphs of a pair of linear equations in two variables to be coincident (in terms of co-efficients) is
 a) $\frac{a_1}{a_2} \neq \frac{b_1}{b_2} \neq \frac{c_1}{c_2}$ b) $\frac{a_1}{a_2} \neq \frac{b_1}{b_2}$ c) $\frac{a_1}{a_2} = \frac{b_1}{b_2} \neq \frac{c_1}{c_2}$ d) none of these
17. For what values of k does the pair of equations given below have a unique solution?
 $2x+ky+3=0$ and $x+y+2=0$
 a) $k=2$ b) $k=\frac{1}{2}$ c) $k=-2$ d) for all the values k except 2
18. The pair of equations $x+y=0$ and $6x+6y=0$ have
 a) unique solution b) no solution c) infinite solution d) none of these
19. Two numbers are in the ratio 2:3. If 6 is added to each, the ratio is 3:4. Find the numbers.
 a) 6, 9 b) 18, 12 c) 12, 18 d) 9, 6
20. A number of two digits is equal to four times the sum of its digits. If 18 is added to the number, the digits change places, find the number
 a) 42 b) 24 c) 26 d) 62
21. $ax^2+bx+c=0$ is called
 a) linear if $a=0$ b) quadratic if $a=0$ c) linear if $a=b=0$ d) none of these
22. A polynomial equation of the type $ax^2+bx+c=0$ where $a \neq 0$ has no real root if
 a) $b^2-4ac=0$ b) $b^2-4ac>0$ c) $b^2-4ac<0$ d) none of these
23. If the discriminant of a quadratic equation is equal to zero then the given equation has
 a) two unequal real roots b) two roots c) two equal roots d) no root
24. The sum of the roots of a quadratic equation, is given by
 a) $\frac{a}{b}$ b) $\frac{b}{a}$ c) $-\frac{a}{b}$ d) $-\frac{c}{a}$

Turn Over

(3)

25. In the quadratic equation $ax^2+bx+c=0$, if $b=0$ then the roots are
 a) equal in magnitude b) equal in magnitude but opposite in sign
 c) not equal d) imaginary
26. For any quadratic equation $ax^2+bx+c=0$ to have zero as one of its roots
 a) $a=0$ b) $b=0$ c) $c=0$ d) $c>0$
27. If the roots of the equation $x^2+px+q=0$ differ by 1 then
 a) $p=4q+1$ b) $p^2=4q-1$ c) $p^2=4q+1$ d) $p=4q-1$
28. Which of the following is an Arithmetic progression?
 a) 1, 2, 3, 5, 7 b) -3, -1, 1, ... c) -3, -1, 0, 1, ... d) a and b above
29. If the first term is 5 and the common difference is 2, the 10th term of the AP is
 a) 20 b) 10 c) 25 d) 23
30. How many two digit numbers are divisible by 7?
 a) 10 b) 11 c) 12 d) 13
31. The sum of the natural numbers from 100 to 1000 is
 a) 495550 b) 494550 c) 495500 d) 495000
32. Choose the incorrect statement
 a) all circles are similar b) all squares are similar
 c) all cylinders are similar d) all congruent figures are similar
33. Any two polygons are similar if their corresponding
 a) sides are proportional b) angles are equal c) both a & b d) none of these
34. If a line segment DE is drawn parallel to the side BC of a triangle ABC meeting AB at D and AC at E then which of the following is incorrect?
 a) $\frac{AD}{DB} = \frac{AE}{EC}$ b) $\frac{AB}{DB} = \frac{AC}{EC}$ c) $\frac{AB}{AD} = \frac{AC}{AE}$ d) none of these
35. In a triangle ABC, AD is internal bisector of A and meets C at D then
 a) $BD=DC$ b) $\frac{BD}{DC} = \frac{AB}{AC}$ c) $\frac{BD}{DC} = \frac{BC}{AB}$ d) none of these
36. Two triangles ABC and DEF are similar. AP and EQ are the medians of the two triangles respectively then which of the following is /are correct?
 a) $\frac{AP}{DE} = \frac{BC}{DE} = \frac{CA}{ED}$ b) $\frac{AP}{EQ} = \frac{AC}{EF}$ c) $\frac{AP}{EQ} = \frac{BC}{EF}$ d) all the above
37. Triangle DEF is formed by joining mid points of ΔABC then ratio of area of ABC to that of DEF is :
 a) 1:4 b) 1:3 c) 4:1 d) 3:1
38. AC and BD are the two diagonals of a rhombus ABCD. Then sum of square of all the sides of the rhombus is equal to

Turn Over