AP – POLYCET

2016

Time : 2 Hours **Total Marks : 120**

SECTION – I

Mathematics

1. Which of the following is not a linear equation ?
   A. $5+4x=y+3$
   B. $x+2y=2y$
   C. $3-x=y^2+4$
   D. $x+y=0$
2. The solution set {x, y} of the system of. equations x - 2y = 0 and 3x + 4y = 20 is
   A. {2, 4
   B. {4,2}
   C. {1. 2}
   D. {2, 1}
3. The two lines
   $3x+2y-80=0$ *and* $4x+3y-110=0$ *are*
   A. coincident lines
   B. parallel lines

C. intersecting lines

D. None

4. The perimeter of a rectangular plot is 32 m. If the length l is increased by 2 m and the breadth b is decreased by 1 m, the area of the plot remains the same. Then the values of l and b are respectively

A. 6m, 10m

B. 10 m, 6m

C. 10 m, 10m

D. 6m, 6m

5. The solution of the equations $\frac{x+y}{xy}=2$ and $\frac{x-y}{xy}=6$ is

A. $\left\{\left(\frac{-1}{2},4\right)\right\}$

B. $\left\{(2,-1)\right\}$

C. $\left\{\left(\frac{-1}{2},\frac{-1}{4}\right)\right\}$

D. $\left\{\left(\frac{-1}{2},\frac{1}{4}\right)\right\}$

6. The root of $\frac{1}{x+4}-\frac{1}{x-7}=\frac{11}{30}$ are

A. -1, 2

B. 1, 2

C. 1, -2

D. -1, -2

7. If A is the solution set $x^2 - 5x + 6$ and B is the solution set of $x - \sqrt{3x - 6} = 2$, then $A \cap B =$

A. ϕ

B. A

C. B

D. (2)

8. If a and β. Are roots $ax^2 + bx + c = 0$ then $\alpha^3 + \beta^3 =$

A. $\frac{3abc - b^3}{a^2}$

B. $\frac{3abc - b^3}{c^3}$

C. $\frac{b^2 - 3abc}{a^3}$

D. $\frac{b^2 - 3abc}{c^3}$

9. The equation whose roots are obtained by adding 1 to those of $2x^2 + 3x + 5 = 0$ is

A. $2x^2 - x - 4 = 0$

B. $2X^2 + x - 4 =$

C. $2x^2 - x + 4 = 0$

D. None

10. The number of numbers between 100 and 1000 which are divisible by 7 is
    A. 7
    B. 128
    C. 132
    D. None
11. The least value of n for which $1+2+2^2$ + (n terms) is greater than 1000 is
    A. 7
    B. 8
    C. 9
    D. 10
12. If the roots of $a(b-c)x^2+b(c-a)x+c(a-b)=0$ are equal, then a, b, c are in
    A. AP
    B. GP
    C. HP
    D. None
13. If (a, 2) lies in II quadrant, then (-a, -2) lies in the which quadrant?
    A. I
    B. II
    C. III
    D. IV

14. The quadrilateral formed by the points A(Q - 1), B(2, 1), C(0, 3) and D(-2, 1) A taken in the same order is
    A. rectangle
    B. paralleltigrism
    C. square
    D. rhombus
15. If P(3, 4) and Q(7, 7) are two points and PR = 10, where P, Q and R are collinear, then R =
    A. (10, 10)
    B. (11, 11)
    C. (11, 10)
    D. (11, -10)
16. If (-2. 1), (1, 0) and (4, 3) are three consecutive vertices of a parallelogram, then the fourth vertex is
    A. (2. 1)
    B. (1, 4)
    C. (0, 0)
    D. (2, 2)
17. The slope of the line passing through (2, 5) and (4, 7) is
    A. 2
    B. $\frac{5}{6}$
    C. 4
    D. 1

18. A joker's cap is in the form of a right-circular cone whose base radius is 7 cm and height is 24 cm. The area of the sheet required to make 10 such caps is
    A. 550 cm^2
    B. 5500 cm^2
    C. 55000 cm^2
    D. None
19. A right-circular cylinder has base radius 14 cm and height 21 cm. The curved surface area is
    A. 1848 cm^2
    B. 616 cm^2
    C. 3080 cm^2
    D. 12936 cm^2
20. The volume of the sphere of radius 21 cm Is
    A. 5544 cm^3
    B. 38808 cm^3
    C. 1155 cm^3
    D. 8983 cm^3
21. If $\cos A = \frac{12}{13}$, then $\sin A$
    A. $\frac{5}{13}$
    B. $\frac{5}{12}$

C. $\frac{12}{13}$

D. $\frac{13}{5}$

22. $\frac{\sin 30^o \tan 45^o - \cos ec 60^o}{\cot 45^o + \cos 60^o - \sec 30^o} =$

A. 0

B. 1

C. -1

D. $\frac{1}{2}$

23. If tan2A = cot (A – 18°), where 2A is an acute angle, then A =

A. 6°

B. 18°

C. 36°

D. 54°

24. If x = a cosec θ and y = b cot θ, then $b^2x^2 - a^2y^2 =$

A. $a^2 + b^2$

B. a^2b^2

C. $\frac{a^2 + b^2}{a^2 - b^2}$

D. None

25. tan 30°, tan 45°, tan 60° are in

A. $1 - 2\sin^2 \theta$

B. $2\sin^2\theta$

C. $\sec\theta$

D. $\cos ec\theta$

26. $\cos^4\theta - \sin^4\theta$

A. $1 - 2\sin^2\theta$

B. $2\sin^2\theta$

C. $\sec\theta$

D. $\cos ec\theta$

27. A boy observes the top of an electric nole at an angle of elevation of 60^o, when the observation point is 8 m away from the foot of the pole. Then the height of the pole is

A. $6\sqrt{3}\,m$

B. $8\sqrt{3}\,m$

C. $10\sqrt{3}\,m$

D. $16\sqrt{3}\,m$

28. Rajender observes a person standing on the ground from a helicopter at an angle of depression 45^o If the helicopter flies at a height of 50 m from the ground; Then the distance of the person from Rajender is

A. $25\sqrt{2}$

B. $50\sqrt{2}$

C. $75\sqrt{2}$

D. None

29. From a ship masthead 150 ft high, the angle of depression of a boat is observed to be 45° Its distance from the ship is
    A. 150 ft
    B. 75 ft
    C. $150\sqrt{3}$ ft
    D. $\frac{150}{\sqrt{3}}$
30. A ladder of 19 m is leaning to a wall making an angle of 60* with the ground. The distance from the foot of the wall to the foot of the ladder is
    A. 18 m
    B. 19 m
    C. 9 m
    D. 9.5 in
31. The probability of getting a head when a coin is tossed once is
    A. 0
    B. $\frac{1}{2}$
    C. $\frac{1}{3}$
    D. 1
32. Rahim takes out all the 'hearts from a deck of 52 cards. The probability of picking a diamond is

A. $\frac{1}{13}$

B. $\frac{1}{39}$

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

D. $\frac{1}{52}$

33. The probability of an impossible event is

A. 0

B. $\frac{1}{2}$

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

D. 1

34. The arithmetic mean of 12, 15, 13, 20, 25 is

A. 17

B. 20

C. 18

D. None

35. If 5 is added to each and every item of a data, then the arithmetic mean is

A. 5 times to the first arithmetic mean

B. increased by 5 to the first arithmetic mean

C. equal to the first arithmetic mean

D. None

36. The median of 24, 20, 32, 18, A 14 25 is

A. 18

B. 16

C. 24

D. 32

37. The median. of the following distribution is

Class internal	0-9	10-19	20-19	30-39
Frequency	10	16	24	29

A. 23.75

B. 23.25

C. 25.125

D. None

38. For the data 9, 8, 7, 7, 6, 3, 7, 2, 1, 7, 9, the mode is

A. 9

B. 7

C. 3

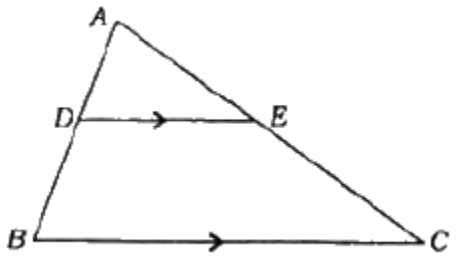
D. 2

39. The modal class of the following distribution is

Family size	1-3	3-5	5-7	7-9
Frequency`	7	8	2	1

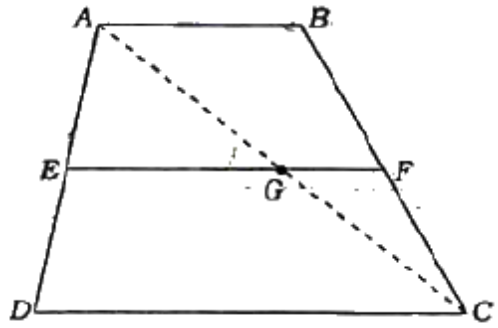
A. 1-3
B. 3-5
C. 5-7
D. None

40. In $\Delta ABC, DE \| BC$ and $\frac{AD}{DB} = \frac{3}{5}$. If $AC = 5.6cm$, then $AE =$



A. 2cm
B. 2.1 cm
C. 2.2 cm
D. 2.5 cm

41. In a trapezium $ABCD$, AB||DC E and F are points on non-parallel side§ AD and BC respectively such that $\frac{AE}{ED} =$



A. $\frac{EC}{BF}$

B. $\frac{ED}{AE}$

C. $\frac{BF}{PC}$

D. None

42. Given that Δ ABC - Δ DEF and their areas are 64 cm^2 and 121 cm^2 respectively. If EP = 15.4 cm, then BC =

A. 2.11 cm

B. 21.1 cm

C. 1.21 cm

D. 11.2 cm

43. If BL and CM are the medians of a triangle ABC right angled at A, then the value of 4 (BL^2 + CM^2)=

A. $3BC^2$

B. $5BC^2$

C. $7BC^2$

D. BC^2

44. If ABD is a triangle right angled at A and AC$\perp$BD, then AC^2 =

A. BC.BD

B. BD .CD

C. BC.DC

D. AD.AB

45. The number of pairs of parallel tangents to a circle is
    A. 2
    B. 4
    C. 1
    D. infinitely many
46. The length of the tangent to a circle whir centre 0 and radius = 6 cm from a point P outside the circle such that OP = 10 cm is
    A. 6 cm
    B. 8 cm
    C. 4 cm
    D. 5 cm.
47. If PA and PB are the lengths of tangents drawn from an external point P to a circle, then
    A. $PA \neq PB$
    B. $PA > PB$
    C. $PA < PB$
    D. $PA = PB$
48. The area of the sector, whose radius is 7 cm with angle 60°, is
    A. 52.66 cm^2
    B. 25.66 cm^2
    C. 62.56 cm^2
    D. 65.62 cm^2

49. 49. The number of circles passing through three collinear points in a plane is

A. 1
B. 0
C. 9
D. 12

50. The LCM of the number $2^7 \times 3^4 \times 7$ and $2^3 \times 3^3 \times 11$is

A. $2^3 \times 3^4$
B. $2^7 \times 3^4$
C. $2^7 \times 3^4 \times 7 \times 11$
D. $2^3 \times 3^4 \times 7 \times 11$

51. The number of rational numbers exist between any two distinct rational numbers is.

A. 0
B. 1
C. 2
D. infinite

52. The prime factorization of 163800 is

A. $2^2 \times 3^3 \times 5^5 \times 7 \times 13$
B. $2^2 \times 3^3 \times 5^2 \times 7 \times 13$
C. $2^3 \times 3^2 \times 5^5 \times 7 \times 13$
D. Noe

53. $\frac{1}{\log_x xy} + \frac{1}{\log_y xy} =$

A. 0

B. 1
C. -1
D. 2

54. If $\log_{10} 3 = 0.4771$, then the value of $\log_{15} + \log 2 =$
A. 47.71
B. 1.4771
C. 4.77
D. 0.4771

55. If A = {1, 2, 3, 4, 5} and B = {4, 5, 6, 7}, then A – B =
A. {4, 5}
B. {6, 7}
C. {1, 2, 3}
D. {1, 2, 3, 4, 5, 6, 7}

56. Among the following a null set (where N is the set of natural number)
A. $x : x^2 < 5$ and $x \in N$
B. $x : x^2 = 4$ and $x \in N$
C. $x : x^2 + 1 = 0,\ x \in N$
D. $x : x$ is even prime

57. If $A \subset B$, then A – B =
A. B
B. ϕ
C. A
D. B - A

58. The length of a rectangular dining hall is twice of its breadth. If x represents the breadth of the hall and its area is 5 sq. units, then the polynomial equation which represents the situation is

A. $5x^2 - 2 = 0$

B. $2x^2 - 5 = 0$

C. $x^2 - 25 = 0$

D. None

59. The sum of the zeros of the polynomial $p(x) = x^2 + 7x + 10$ is

A. 7

B. -7

C. 10

D. -10

60. If $p(x) = 2x^2 + 3x - 5$ then $p(2) =$

A. 2

B. 9

C. 0

D. -5