JB Academy, Ayodhya Annual Examination Class-XI Subject-Mathematics

Time: 3:00 Hrs

General Instructions:

1) This question paper contains four sections A, B, C and D.

Each section is compulsory. However, there are internal choices in some questions.

- 2) Section A has 20 multiple choice questions of 1 mark each.
- 3) Section B has 6 very short answer type questions 2 marks each.
- 4) Section C has 8 short answer type questions 3 marks each.
- 5) Section D has 4 long answer type questions 6 marks each.

SECTION A (1 marks)

1) A set contains n element then the no. of proper subset will be? a) 2^n b) 2^n -1 c) 2^{n-1} d) None of these
2)No. of relation from a set A containing 3 elements to another set B containing 2 elements will be a)32 b)16 c)64 d) None of these
3)A wheel male 360 revolutions in 1 minute through how many radians does it turn in 1 second. a) 2π b) 6π c) 12π d) 24π
4)Value of $\sin\left(\frac{-11\pi}{3}\right)$ will be? a) $\frac{-1}{2}$ b)-1 c) $\frac{\sqrt{3}}{2}$ d) None of these
5)Number of nonzero integral solution of equation $ 1 - i ^x = 2$ will be? a)1 b)0 c)2 d) infinite solution
6)value of $(1 - i)^4$ will be – a) 4 b) -4 c) 1 d) None of these
7)solution of inequality $\frac{1}{2}\left(\frac{3x}{5}+4\right) \stackrel{>}{_{-}} \frac{1}{3}(x-6)$ will be a) $x \ge 120$ b) $x \le 120$ c) $x \ge -120$ d) None of the these
8)The octant in which the point $(4,2,-3)$ and $(-4,2,-5)$ lies are? a) V, VI b) V, VIII c) VI, VIII d) II, VIII
9) if 5.P(4, r)= 6.P(5,r-1) then the value of r will be. a)5 b)7 c)9 d) None Of these
10) if the coefficient of x^2 and x^3 in the expansion of $(3 + ax)^9$ are equal then the value of a will be: a) $\frac{2}{9}$ b) $\frac{9}{7}$ c) $\frac{7}{9}$ d) None of these
11) If $\frac{1}{6!} + \frac{1}{7!} = \frac{x}{8!}$ then the value of x will be? a) 64 b) 56 c) 75 d) None of these

M. Marks: 80

12) Using binomial theorem indicate which no. is $large(1.1)^{10000}$ or 1000. a) I b) II c) Both are equal 13) Coordinates of a point in xy plane will be? c) (x, y, 0)a)(0, y, z)b)(x, 0, y)d) None of these 14) If odds against an event is 5:11 then the probability of event will be $(c)\frac{5}{16}$ $(c)\frac{11}{16}$ b) $\frac{11}{5}$ a) $\frac{5}{11}$ 15) Slope of a line which makes an angle of 30degree with positive direction of y axis measured anticlock wise direction will be c) $\sqrt{3}$ b) $-\frac{-1}{2}$ a) $-\sqrt{3}$ d) None of these. 16) What will be the position of the point $\left(\frac{-5}{2}, \frac{7}{2}\right)$ with respect to circle a) inside b) outside c) on the circle d) None of these. 17) $x^2 = -16y$ is equation of a parabola then coordinates of focus and length of latus rectum will be a) (0, -4), 16 b)(-4, 0), -16 c)(0, -4), -16 d) None of these 18) Equation 3x+2y=6 when reduces into intercept form then x and y intercepts will be c)-2, -3a)2,3 b)3.2 d) -3, -2 19) If AM and GM of roots of a quadratic equation are 8 and 5 respectively, the equation will be a) $x^{2} + 16x + 5 = 0$ b) $x^{2} - 16x + 5 = 0$ c) $x^2 - 5x + 16 = 0$ d) $x^2 - 5x - 16 = 0$ 20) If $a_n = \frac{n(n-2)}{n+3}$ then the value of a_{20} will be : a) $\frac{360}{23}$ b) $\frac{603}{23}$ c) $-\frac{360}{23}$ d) None of these

SECTION B (2 MARKS QUESTION)

- 21) Prove that $\cos 4x = 1 8\sin^2 x \cos^2 y$
- 22) convert into polar form -1-i
- 23) Find the ratio in which yz plane divides the line segment formed by joining the points

(-2,4,7) and (3,-5,8).

- 24) Perpendicular from the origin to the line y = mx + c meets it at the point (-1,2). Find the value of m and c
- 25) Find the centre and radius of the circle $2x^2 + 2y^2 x = 0$
- 26) Find the coordinates of a point on y-axis which are at a distance of $5\sqrt{2}$ from the point P (3, -2, 5).

SECTION C (3 MARKS QUESTION)

27) Write the power set of set A = $\{2,3,4,5\}$

28) Find the domain and range of the function $F(x) = (x - 1)^2 + 4$

OR

F(x) = 3sinx + 4cosx, find the domain and range of the function

29)From a class of 25 students 10 are to be choosen for an excursion party. There are 3 students who decides that either all of them will join or none of them will join. In how many ways can the excursion party be choosen.

OR

Find the number of words with or without meaning which can be made using all the letters of the word AGAIN. If these words are written as in a dictionary what will be the 50th word?

30) Find the term independedent of x in the expansion of $\left(\sqrt[3]{x} + \frac{1}{2^{3/x}}\right)^{18}$,x>0

31) Find the sum of n terms of the sequence

7 + 77 + 777 + 7777 + - - - - - upto n terms.

32) Find the equation of the circle passing through (0,0) and making intercepts a and b on coordinate axes.

33) Find the Image of point (3,8) with respect to the line x + 3y = 7 assuming the line to be a plane mirror.

34) Prove that: $(cosx - cosy)^2 + (sinx - siny)^2 = 4 sin^2 \frac{x-y}{2}$

SECTION D (6 MARKS QUESTIONS)

35) If $Cosx = -\frac{3}{5}$, x lies in third quadrant find the values of $Sin\frac{x}{2}$, $Cos\frac{x}{2}$, $tan\frac{x}{2}$

36) Solve the following system of inequality $x + 2y \le 10$, $x + y \ge 1$, $x - y \le 0$, $x \ge 0$, $y \ge 0$.

37) If AM of 2 numbers is three times their G.M Show that the numbers are in the ratio

 $3 + 2\sqrt{2}$) : $(3 - 2\sqrt{2})$

38) IF four digit numbers greater than 5000 are randomly formed from digits 0,1,3,5,7 . What is the probability of forming a number divisible by 5 when,

i) Digits are repeated.

ii) Repetition of digits in not allowed.

Or A and B are events such that P(A) = 0.42, P(B) = 0.48, P(A and B) = 0.16Determine i) P(not A) ii) P(not B) iii) P(A or B)