SRI BHAGAWAN MAHAVEER JAIN COLLEGE

Vishweshwarapuram, Bangalore 560004

Mock Examination Question Paper - January 2019

Course:	I PUC	**Subject:**	Basic Maths
Max. Marks:	100	**Duration:**	3:15 hrs.

Instructions:

1) The question paper consists of five parts A,B,C, D and E.
2) Part A carries 10 marks, Part B consists 20 marks, Part C carries 30 marks, Part D carries 30 marks and Part E carries 10 marks.
3) Write the question number properly as indicated in the question paper.

PART-A

I **Answer any TEN questions:** **10 x 1 = 10**

1 Find the least number divisible by 18, 24 and 36.
2 If A has five elements how many elements will p(A) have.
3 Simplify: $(3^0)^2 + (3^2)^0$.
4 Express $\log_2 \frac{1}{4} = -2$ in exponential form.
5 Find the 30^{th} term of A.P -2, -5, -8----------.
6 Form a quadratic equation whose roots are $\frac{3}{2}, \frac{-5}{2}$.
7 If A = {1,2,3,4,5} find the relation from A to B defined by R = {(x,y) / x > y].
8 What is the present value of an income of ₹10,000 a year to be received forever at 10% p.a.
9 Convert $22\frac{1}{2}^{\circ}$ into radians.
10 Find the y intercept of straight line 6x – y + 7 = 0.
11 If the distance between the points (3, -2) and (-1, k) is 5 units find k.
12 Find the value of tan (-855°).

PART-B

II **Answer any TEN questions:** **10 x 2 = 20**

13 Find the sum of divisiors of 1024.
14 The three bells call at intervals 30 sec, 40 sec, 50sec respectively. They start together, after how many minutes will next bell fall together?
15 If A = {x, y, z} write all proper sbusets of A.
16 If K + 9, -6 and 4 are in G.P find the value of K.
17 If $3^x = 5^y = 15^z$ show that z(x+y) = xy.
18 Evaluate $\log_3[\log_3 (\log_3 27)]$.
19 Find x if $\frac{2x-7}{2x+7} = \frac{x-3}{x+3}$.
20 Find the value of a house in the purchase of which the broker was paid 2% brokerage which amounted to ₹80,000.
21 Solve the inequalities $\frac{2x+3}{4} > 3$ and $\frac{x-y}{-3} < 2$.
22 What is the present value of an perpetuity of ₹5000 to be received forever if the first receipt at the end of the sixth year from now interest rate being 8% p.a.,

23 The average age of 15 boys is 6 years. If a boy of 20 years leaves find the average of age of remaining boys.

24 Reduce the equation to slope intercept form $8x + y - 4 = 0$.

25 Find the equation of the locus of the point which moves such that its distance from the point (-4, 0) is 4 times its distance from (0, -2).

PART-C

III Answer any TEN questions: 10 x 3 = 30

26 In a college $\left(\frac{2}{5}\right)^{th}$ of the students play basket ball and $\left(\frac{3}{4}\right)^{th}$ play volley ball. If 50 play none of these two games and 125 play both use venn diagram to find the number of students in the college.

27 If A ={1,3,5} B = {5}, C = {7} verify A x (B – C) = (A x B) – (A x C).

28 Find the greatest integer which divides 42, 52, 86 leaving remainder 6, 4, 2 respectively.

29 Solve: $2\log_2 x + 3\log_4 x + 5\log_8 x = 62$.

30 The first term of G.P exceeds the second term by $\frac{1}{2}$ and the sum to infinity is 2. Find G.P.

31 The annual birth and death rate per 1500 are 30.5 and 12.5 respectively if the present population is 2,45,000, find the population after 10 years.

32 Solve the inequality graphically $x + 2y \le 8$, $2x + y \le 8$, $x \ge 0$, $y \ge 6$.

33 An aeroplane flies once round a square whose side is 100 km long taking the first at 100 kmph, second at 200 kmph third at 300 kmph and the fourth at 400 kmph. Find the average speed of the plane in its flight along the square?

34 Find the equation of line through the intersection of the lines $x - 8y + 11 = 0$ and $4x - 7y + 3 = 0$ and perpendicular to the line $3x + 2y + 5 = 0$.

35 A person refused to sell his book for ₹726 because there was a loss of 12%. If he sold the book at a profit of 5% find selling price.

36 If $\tan A = \frac{-12}{5}$ and $270 < A < 360$ find the value of $\frac{3\sin A - 2\cos A}{9\cos A + 4\sin A}$.

37 Show that the points (1, 1), (4, 1) (4, 4) and (1, 4) are the vertices of a square and hence find area.

38 If α, β are the roots of equation $3x^2 + 2x + 1 = 0$ then find (a) $\alpha\beta^2 + \alpha^2\beta$ (b) $\frac{1}{\alpha + 2\beta} + \frac{1}{\beta + 2\alpha}$.

PART-D

IV Answer any SIX questions: 6 x 5 = 30

39 If $f(x) = x^3 + 1$ find $g(x) = x - 5$
a) fog (x), b) gof (x) c) fof (x) d) gog (x) e) fog (0).

40 The sum to infinity of geometric series is 6 and the sum of first two terms is $\frac{9}{2}$ .Find the first term and common ratio.

41 Find the integral root between -3 and 3 by inspection and then using synthetic division solve the equation $x^3 - 3x^2 - 28x + 60 = 0$.

42 Find the value of $\frac{\sqrt{0.5634} \times 0.0635}{2.563\ (12.5)^{3/2}}$ using log tables.

43 A sum of ₹75,000 is to be divided between two persons aged 16 and 19 years in such a way that if their shares are invested at 6% p.a. compound interest they shall receive equal amounts on attaining the age of 21 years. How the sum will be divided and how much will they receive when they are 21 years old?

44 A person purchases a house for ₹25 lakhs with ₹5 lakhs as down payment. The rest of the amount he loans from a bank which offers 16% p.a. compound interest and has to repay the loan in 20 equal annual installments. If the first installment is paid at the end of the third year. Find how much he has to pay each year?

45 Find the circumcentre of the triangle whose vertices are (1,2) (2, 1) and (2, 3) also find circumradius.

46 a) Find the equation of the locus of a point which moves so that its distance from (3, 2) is equal to its distance from $2x + y = 3$. **3**

b) Find K if the line $(K+1)x + (2K + 3)y + 3 = 0$ and $2x - 5y + 1 = 0$ are perpendicular to each other. **2**

47 Find the area of the quadrilateral whose vertices are (-3, 2) (7, -6) (-5, -4) and (5, 4).

48 Find the rate percent p.a. if ₹2,00,000 amounts to ₹2,31,525 in 1.5 years interest being compounded half yearly.

PART-E

V Answer any ONE question: 10 x 1 = 10

49 a) Find the co-ordinates of the foot of the perpendicular from (-6, 2) on the line $3x - 4y + 1 = 0$. **4**

b) If $\tan\theta + \sec\theta = \frac{5}{2}$ then find sin θ. **4**

c) Find the number of digits in the integral part of $(3.546)^{20}$. **2**

50 a) The first and the last elements of a G.P are 4 and 128 respectively and the sum is 252. Find the common ratio and the number of terms. **4**

b) A company sells 'x' tins of talcum powder per day at ₹10 per tin the cost of manufacturing is ₹6 per tin and the distributor charge ₹1 per tin. Besides the daily overhead cost comes to ₹600.
(i) Determine the profit function.
(ii) What is the profit if 500 tins are manufactured and sold per day.
(iii) How do you interpret the situations if the company manufacturer and sells 100 tins per day.
(iv) What is the B.E.P. **4**

c) Write the real and imaginary part of $(i - \sqrt{3})^3$. **2**

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