JGi **SRI BHAGAWAN MAHAVEER JAIN COLLEGE** Vishweshwarapuram, Bangalore. **MOCK QUESTION PAPER**	**Course:**	I PUC	
	Subject:	Basic Maths	
	Max. Marks:	100	
	Duration:	3 hrs.	

Instructions:
1) **The question paper consists of 5 parts A,B,C,D,E**
2) **Part A carries 10 marks, Part B carries 20 marks, Part C carries 30 marks, Part D carries 30 marks and Part E carries 10 marks.**
3) **Write the question numbers properly as indicated in the question paper.**

PART-A

I **Answer any TEN questions** 10 x 1 = 10
1 Define irrational number.
2 Convert the following set from roster to rule form A = {4,8,12,…...}
3 Simplify $\left(x^{\frac{1}{2}} + y^{\frac{1}{2}}\right)\left(x^{\frac{1}{2}} - y^{\frac{1}{2}}\right)$.
4 Solve for $x : \log_2 \sqrt{32} = x$.
5 Find the 8th term of an A.P -2, -4, -6, …….
6 Find the quadratic equation whose roots are $2 + \sqrt{3},\ 2\text{-}\sqrt{3}$.
7 Calculate the S.I on ₹4,000 at 4% from June 27 to August 29 in the same year.
8 Write the formula to find the future value of annuity due.
9 If a company makes a profit of ₹10,000 by selling goods worth ₹25,000. Find the profit percentage.
10 Express 67 $\frac{1}{2}^{\circ}$ in radian measure.
11 If A = 60° then show that sin 2A = 2sinA cosA.
12 If the slope of the line joining (3, a) and (4, 3) is $\frac{7}{2}$. Find a

PART-B

II **Answer any TEN questions** 10 x 2 = 20
13 Find the number of positive divisors and the sum of divisiors of 6498.
14 Three scales are 65 cm, 85 cm, 95 cm in length. What is the length of the cloth that can be measured exact number of times using any one of these three scales?
15 Find the HCF of $\dfrac{8}{9},\ \dfrac{32}{81},\ \dfrac{16}{27}$.
16 If A = {3, 5, 7}, B = {5, 7, 9}, C ={7, 9, 11}find (i) (A ∩ B) x (B – A), (ii) (A ∩ B ∩ C) x C.
17 Find the three numbers in G.P whose sum is 39 and their product is 729.
18 If α and β are the roots of the equation x^2 + 3x + 7 = 0. Find the vlaue of α^3 + β^3.
19 Two numbers are in the ratio7 : 5 and their difference is 12. Find the numbers.
20 Solve the inequality 2 ≤ 2x – 3 ≤ 5, x ∈ R.
21 The average marks of 15 students of a class is 45. A student who has secured 50 marks leaves the class room. Find the average marks of the remaining 14 students.
22 Find the values of θ such that $(0 < \theta < 360)$ for Sin θ = $\dfrac{1}{\sqrt{2}}$.
23 Find the third vertex of a triangle if two of its vertices are at (-2, 4) and (7, -3) and the centroid at (3, -2).
24 Derive the equation of line in slope point form.
25 Find K so that the distance from (2, 3) to the line 8x + 15y + K = 0 may be equal to 4 units.

PART-C

III **Answer any TEN questions** 10 x 3 = 30
26 Prove that $\sqrt{2}$ is an irrational number.
27 A relation R on a collection of set of integers defined by R = {(x, y) : x – y is a multiple of 3}. Show that R is an equivalence relation on Z.

28   Solve $3^{2x} + 10.3^x + 9 = 0$.

29   Prove that: $\dfrac{1}{\log_{a^2 b^2}(abc)} + \dfrac{1}{\log_{b^2 c^2}(abc)} + \dfrac{1}{\log_{c^2 a^2}(abc)} = 4$.

30   If p^{th} element of an H.P is q and q^{th} element is p. Show that $(pq)^{th}$ element is 1.

31   Find the integral root between -3 and +3 by inspection and using synthetic division
      solve $x^3 - 10x^2 + 29x - 20 = 0$.

32   Solve the inequality by graphical method
      $3x + 3y \le 6$
      $x + 4y \le 4$

33   In what time ₹800 will amount to ₹882 at 10% p a interest compouded half yearly.

34   Nihal 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 the selling price.

35   A batsman find that by getting out for a duck (0 runs) in the 11th innings of his test matches. His
      average of the previous 10 innings decreased by 5 runs. What is the average after 11th innings.

36   Prove that $\sqrt{\sec^2 A + \cos ec^2 A} = \tan A + \cot A$.

37   Prove that $\cos(570^\circ).\sin(510^\circ) - \sin(330^\circ).\cos(390^\circ) = 0$.

38   Find the equation of the locus of points twice as far from (-a, o) as from (a, o).

PART-D

IV   Answer any SIX questions   **6 x 5 = 30**

39   In a college $\left(\dfrac{2}{5}\right)^{th}$ of the students play basket ball and $\left(\dfrac{3}{4}\right)^{th}$ play volleyball. If 50 students play none

      of these two games and 125 play both, use venn diagram to find the number of students in the college.
      Also find the number of students who play atleast one of the two games.

40   Using log tables, find the value of $\dfrac{12.567 \times 15.674}{0.5968 \times 19.78}$.

41   The first and the last element of a G.P are 4 and 128 respectively and the sum is 252. Find the
      common ratio and the numbers of terms.

42   A certain two digit number is 4 times the sum of the digits. If 18 is added to the number, the digits get
      interchanged. Find the number.

43   The difference in C.I and S.I on a sum for 2 years at 10% p.a When C.I is computed annually is 16.
      Find the difference in C.I and S.I if compound interest is computed half yearly.

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

45   A radio is sold at a profit of 25%. Cost price and selling price both are increased by ₹100. If the new
      profit is at a rate of 20%. Find the original cost of the radio.

46   A shoe manufacturer is planning production of new varicties of shoes. For the first year the fixed cost
      of setting up the new production line are ₹1.25 lakhs, variable cost for producing each pair of shoes
      are ₹35. The sales department project that 1500 pair can be sold in the first year at the rate of ₹160 /
      pair. Find the (i) cost function (ii) Revenue function (iii) Profit function for the product for the sale of
      x pair of shoes (iv) If 1500 pairs are actually sold then what profit or loss does the company incurs?
      (v) Determine the BEP.

47   If tan A + Sin A = m and tan A − Sin A = n show that $m^2 - n^2 = 4\sqrt{mn}$.

48   The mid points of the sides of the tringle ABC is given by P (3, 1), Q (5,6) and R (-3, 2). Find the co-
      ordinates of the vertices of the triangle.

PART-E

V   Answer any ONE question   **1 x 10 = 10**

49 a A function f(x) is defined as f(x) = 3x + 5
      Find the values of (i) f (-1), (ii) f (2), (iii) f (3), (iv) f (-2)   4

   b How much should you invest today at 8% p.a C.I computed quarterly so that you get ₹3000 every
      3 months for the next 7 years?   4

   c Find the equation of line parallel to the line 4x + 3y + 2 =0 and passing through (4, 1)   2

50 a   Prove that the lines $x + y + 4 = 0$, $2x = 3y + 7$ and $3x + y + 6 = 0$ are concurrent. Also find the point of cocurrency.   4

   b   Find the sum of n terms of the series $0.3 + 0.33 + 0.333 + \ldots\ldots\ldots$.n terms   4

   c   Find the distance between the parallel lines $x + 2y + 3 = 0$ and $x + 2y - 7 = 0$ 2

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