# Jain College, Jayanagar
## I PUC Mock Paper 2016
## Subject : Basic Maths (75)

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### PART-A

**I Answer all the following questions:** **10×1=10**

1. Give the conical representation of 825.
2. If A = {a,b,c} B={c,d}find B ×A.
3. If f(x) = x-1 and g(x)= $2x^2$-3, find gof (2).
4. Simplify : $(5)^{5^0} + (5^2)^0$.
5. Solve for x ; $\log_{\sqrt{3}} 27 = x$.
6. Find the $9^{th}$ element of G.P 0.3, 0.6, 1.2, .....
7. Solve for x : 2(7+x) – 10 = 16-2(x-24).
8. Find 12 ½ % of 1 hour 40 minutes.
9. Define deferred Annuity.
10. Express 22 ½ $^0$ in Radian measure.
11. Write the slope of x intercept of the line 3x-2y+1=0.
12. The rainfall in a week in Bangalore are 18 mm, 25mm, 20mm, 9mm, 30mm, 15mm. Find the average rainfall.

### PART - B

**II Answer any Ten of the following** **10× 2 = 20**

13. Find the greatest number which when divides 989 and 1327 leaves the remainder 5 and 7 respectively.
14. $A = \{x : x^2 - 9 = 0, x < 0\}$ $B = \{x : x \in N < 3\}$ find a) A×B b) B×A
15. Prove that $\frac{1}{1+x^{p-q}} + \frac{1}{1+x^{q-p}} = 1$
16. Prove that Log $\frac{7}{8} + \log\frac{32}{49} - \log\frac{4}{14} = \log 2$
17. Which term of A P $\frac{1}{2}, 1, \frac{3}{2}, \ldots$ is 5?
18. Find two numbers whose sum is 64 and whose difference is 16.
19. Solve the following by formula method $12x^2 + 23x = 24$.
20. If the simple interest on a certain sum of money for 2 years is one fifth of the sum. Find the rate of interest.
21. The average score of 35 girls is 80 and the average score of 25 boys in 68. Find the average score of both boys and girls together.
22. A man buys an article at ¾ of its cost value and sells it for 20% more than its cost value. What is his profit percentage?
23. Prove that $\frac{Sec\,A + \tan A + 1}{Sec\,A - \tan A + 1} = Sec\,A + \tan A$
24. Find the value of $Sin^2\frac{\pi}{6} + \cos^2\frac{\pi}{4} - \tan^2\frac{\pi}{4} + \cot^2\frac{\pi}{4}$.
25. Find the equation of straight line passing through (-1, -3), (6,11)

## PART-C

**III. Answer any Ten of the following:** **$10\times 3 = 30$**

26. In a certain college with 500 students, 300 take milk and 250 take tea, find how many take :
    a) Milk only b) tea only c)both milk and tea
27. A relation R on a collection of set of integers defined by R={(x,y) : x-y is multiple of 3} show that R is an equivalence relation.
28. The cost of a chair is Rs 600 and the cost of table is Rs 900. Find the least sum of money that a person must possess in order to purchase the whole number of chairs or tables.
29. Solve: log x + log (x-4) – log (x-6) = 0
30. The sum of first eight elements of G.P is five times the sum of the first four terms. Find the common ratio
31. Solve the following equations graphically $3x + 3y \leq 6$, $x+ 4y \leq 4$, $x \geq 0$, $y \geq 0$.
32. Find the present value of annuity due of Rs 8000. for 5 years at 5% p.a
33. In an experiment, a solution of Hydrochloric acid is kept between $30^0$ and $35^0$C. What is the range of temperature in degree Fahrenheit if $C=\frac{5}{9}(f-32)$.
34. Find the point of trisection of the line joining (3,4) and (5,-2).
35. Find x : $x \sin 30.^0 \operatorname{cosec}^2 60^0 = \frac{\cos^2 45^0.\tan 60^0}{\cot 30^0.\sec^2 20^0}$.
36. Savitha sold her bag at a loss of 7% . Had she been able to sell it at a gain of 9% it would have fetched Rs 64 more than it did. What is the cost price of the bag?
37. Find the equation of the perpendicular bisector of the line joining A(3,-2) and B(4,1).
38. Find the distance between the parallel lines 2x-3y+4=0 and 4x-6y-5=0

## PART-D

**IV. Answer any Six of the following: Each question carries Five marks:** **6×5=30**

39. In a college $\left(\frac{2}{5}\right)^{th}$ students play basket ball and $\left(\frac{3}{4}\right)^{th}$ of them play volley ball. If 50 students don't play any game, and 125 plays both, use venn diagram to find the number of students in the college.
40. The first and the last elements of G.P are 4 and 128 respectively and the sum is 252. Find the common ratio and number of elements.
41. If α and β are the root of equations $2x^2 – 5x + 7=0$. Find the value of :
    a) $\frac{\alpha^2}{\beta}+\frac{\beta^2}{\alpha}$ b) $\frac{\alpha}{\beta^2}+\frac{\beta}{\alpha^2}$
42. A sum triples itself in 4 years under compound interest at a certain rate of interest. Find the time it would take to become 9 times of itself.
43. Find the present value of an annuity of Rs 2000 payable at the beginning of each quarter for the next 3 years if the rate of interest is 4% p.a compounded quarterly.
44. A Manufacturer produced and sells balloons at Rs 8 /unit. His fixed cost is Rs 6500 and variable Cost/balloon is Rs 3.5, Calculate:
    a) Revenue function b) Cost function
    c) Profit function d) Break-even point

45. a) Form the quadratic equation whose roots are -3 and 6.

    b) Evaluate using log table: $\frac{0.5634 \times 0.0635}{2.563 \times 12.5}$

46. Find the equation of straight line passing through the point (2, 2) such that the sum of its intercepts on the axes = 9.
47. Find the locus of a point equidistant from (3,0) & (-3,0)
48. If x = a cos $\theta$ + b sin$\theta$, y = a sin $\theta$-b cos $\theta$ s.t $x^2+y^2=a^2+b^2$

## PART-E

**V. Answer any One of the following:** **1×10=10**

49. a) Find the image of the point (2,4) on the line x+y-10 = 0. (4)

    b) prove that $\frac{\cos^3 A + Sin^3 A}{\cos A + \sin A} + \frac{\cos^3 A - Sin^3 A}{\cos A - \sin A} = 2.$ (4)

    c)Evaluate $\frac{(1+2i)}{(3-4i)}$. (2)

50. a) Find the sum to n turns of series 0.7+0.77+0.777+..... (4)

    b) In what time will a sum of money double itself at 10% p.a compounded interest payable half yearly. (4)

    c) HCF of two numbers in 16 and their LCM is 160. If one of the number is 64. Find the other number. (2)

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