Jain College, Jayanagar
Mock Paper Jan - 2020
I PUC – Subject: Basic Maths-75

Duration: 3hr 15 min **Max.Marks: 100**

PART A

I. Answer any TEN of the following: **10 × 1 = 10**

1. Find the imaginary part of 3-5i.
2. Find AxB if A={a, b, c} and B={a, c}
3. If f(x) = 2x+3 find f(-2).
4. Simplify $\sqrt[4]{x^{\frac{-4}{3}}}$
5. Solve for x if $\log\log_{\sqrt{3}} 27 = x$.
6. Find the 13th term of A.P $\frac{1}{3}, \frac{2}{3}, 1$ ……...
7. Form the quadratic equation whose roots are 2, 3.
8. What is the present value of an income of Rs.3000 to be received forever if the interest rate is 14% p.a.
9. The average age of 12 boys is 8 years. Another boy 21 years join the group. Find the average of the new group.
10. What percent is 64m of 12 km?
11. Convert $\frac{7\Pi}{8}$ to degrees.
12. Find the distance of the point (-1, 2) from origin.

PART B

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

13. Find the sum of all positive divisors of 768.
14. Find the number which when divided by 36, 40 and 48 leaves the same remainder 5.
15. If f(x) = 2x+1, g(x) = x^2+2x+1 find i) fog(2) ii) gof (3)
16. Simplify $\frac{3^{n+1}+3^n}{3^n-3^{n-1}}$
17. Insert 3 G.M'S between -4 and -64.
18. Solve by Formula method: $2x^2$-7x = -3.
19. Solve 3(1-x) < 2 (x+4) ($x \in R$). Represent on the number line.
20. Find the simple interest on Rs.600 for 3 years 3 months at 4% p.a simple interest.
21. The average height of a group of people is 6ft. 10 more people are added with an average height of 5ft, find the average height of the group of people consisting of 60 people.
22. Find the cost price of an article which is sold for Rs.220 at a loss of 12%.
23. Prove that cosecA-sinA = cotA cosA.
24. Find the coordinates of the point of trisection of the medians of the triangle whose vertices are
(-2, -3) (-1, 7) and (5, 2).
25. Using slopes, prove that the points (1, 1) (-2, 4) and (3, -1) are collinear.

PART C

III. Answer any TEN questions: 10 × 3 = 30

26. Find HCF of 45, 90, 180 by division method.
27. Let f = {(1, 1) (2, 3) (0, -1)} be a function from Z **to Z** defined by f(x) = ax+b some integers a and b, determine a and b.
28. If $a^{\frac{1}{3}}+b^{\frac{1}{3}}=c^{\frac{1}{3}}$ prove that $(a+b+c)^3 = 27abc$.
29. If $x^2+y^2 = 12xy$ show that $2\log(x-y) = \log 2+\log 5+\log x+\log y$.
30. Find the three numbers which are in AP. Whose sum is 12 and sum of their cubes is 408.
31. Find nature of the roots of the equation $2x^2-5x+7=0$ without solving. If $\propto$ and β are roots of that equation find the value of $\frac{\propto^2}{\beta}+\frac{\beta^2}{\propto}$
32. Solve the linear inequalities $x+3y\leq 3$, $2x+y\leq 2$, $x,y\geq 0$ graphically.
33. In how many years an annuity of Rs.100 amounts to Rs.3137.12 and 4.5% p.a compand interest?
34. 3 tests in Economics, 2 in Kannada, 4 in accounts and 5 in English are conducted. The average mark scored by Mr. Suresh in Economics is 60, in Kannada 56 and that of account is 45. If the average marks of all the test taken together is 48 find the average marks secured by him in English?
35. A watch is sold for Rs.150, at a profit of 25% . At what price should it be sold in order to have 50% profit.
36. Find x if $\frac{x\cos ec^2 30°\sec^2\frac{\Pi}{4}}{\sin^2 45°\cos^2 60} = \tan^2\frac{\Pi}{3}-\cot^2 60°$
37. Show that the points (2, -1) (3, 4) (-2, 3) and (-3, -2) form a rhombus.
38. Find the equation of the line which passes through (5, 2) and cutting off intercepts which are equal in magnitude but opposite in sign.

PART D

IV. Answer any SIX questions: 6 × 5 = 30

39. In a college $2/5^{th}$ of the students play basket ball and $3/4^{th}$ play volley ball. If 50 students play none of these two games and 125 play both. Find the numbers of students who play.
    (a) atleast one of the two games
    (b) exactly one
    (c) Represent the result, using venn diagram
40. Using logarithmic tables, find the value of $\frac{0.5634\,X\,0.0635}{2.563\,X\,12.5}$.
41. Find the sum of all integers between 60 and 400 which are divisible by 13.
42. A number consists of two digits, and whose sum is 3, if 9 is added to the number the digits get interchanged. Find the number.
43. A machine worth of Rs.12000 is depreciated at the rate of 10% a year. It was sold eventually as waste metal for Rs.200. Find the number of years the machine was in use.
44. A company needs Rs.1,00,000, 7 years from now. It would like to set aside an equal amount at the beginning of each year out of its profits. If the interest rate is 16% compounded semi-annually, how much should be invested annually.
45. By how many percent should the use of tea be increased if the price of tea is decreased by 10% so that the expenditure remains unchanged.

46. Prove that

$\sin 480^\circ, \cos 690^\circ + \cos 780^\circ \sin 1050^\circ = 1/2$

47. In what ratio is the line segment joining the points (4, 5) and (1, 2) divided by the y-axis? Find also the coordinates of the point of division.

48. Find the coordinate of the foot of the perpendicular from (-6, 2) on the line $3x-4y+1 = 0$.

PART E

V. Answer any ONE question: **1 × 10 = 10**

49. (a) If A={4, 6} B={6, 8, 10} C= {8, 10, 12} then verify Ax(B-C)=(AxB) – AxC (4)

(b) Find the equation of the locus of the point which moves such that its distance from 3x-4y+1=0 is equal to its distance from (1, -1) (4)

(c) Find the number of zeros between the decimal point and the first significant figure in $(0.\ 7)^{55}$ using long table. (2)

50. a) Find the sum to n terms of 4+44+444+……. (4)

b) If the sale price per unit is Rs.3, the variable cost per unit is Rs.2 and the total fixed cost is Rs.4500 find the

i) Break even quantity.

ii) total Revenue function and total cost function at BEP

iii) If a profit of Rs.10,000 is desired the volume of output to be produced and sold. (4)

iv) sketch the Break even chart.

c) Find the LCM of $\frac{1}{3}, \frac{5}{6}, \frac{2}{9}$ (2)

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