JAIN COLLEGE

463/465, 18th Main Road, SS Royal, 80 Feet Road, Rajarajeshwari Nagar,

Bangalore - 560 098

Date: ***II PUC*** ***SUBJECT: BASIC MATHS***

MOCK - I

Timings Allowed: 3 Hrs 15 Minutes ***Total Marks: 100***

PART - A

I.ANSWER ALL THE QUESTIONS:- **1x10=10**

1.Find x if $\begin{matrix} 8 & x \\ -2 & 1 \end{matrix} = 0$

2.Find the number of permutation of the letter of the word "MATHS".

3.Negate "If he is CLEVER then he is happy".

4.If a: b=12:14 and b: c=13:15 then find a: c.

5.What rate of interact is realized by investing in 17.5% p.a at 6?

6.Find the value of sin 15^0

7.Find equation of circle with center at (8, 1)

8.Evaluate$\lim_{x\to 0} \frac{3x^2-4x+5}{2x^2+5x-1}$

9.Differentiate w.r.t $x_1 e^x \log \bar{x}$

10. Evaluate $\frac{x}{x^2+1} dx$

II.ANSWER ANY TEN QUESTIONS:- **2x10=20**

11.If two rows or columns of a determinant are interchanged prove that value of the determinant is changes by a sign.

12.There are 12 points in a plane of which 8 are collinear. Find the number of straight lines can be formed.

13.If P (A) =0.7,P (B) =0.4 and P (AΠB) =0.3 find value of P (A/B).

14. Write the converse and inverse of "if two integers are equal then their squares are equal".

15.If 5mens take 18 days to complete a work how many men are required to complete the work in 10 days.

16.Find banker's discount on a bill of Rs4150 due 9 months hence at 15% pa.

17.Find the value of $4\,cos^3 10 - 3cos10$

18.Show that $\frac{1+cos2A+sin2A}{1-cos2A+sin2A} = cotA$

19.Find the equation of the circle two of the diameter are x+y=6 and x+2y=4 and its radius is 5 units.

20.F(x)= $\begin{matrix}\frac{x^2-9}{x-3} \\ k\end{matrix}$ if x≠3 if x=3 is continous at x=3,find value of k

21.If x=e^{2t} and y=log(2t+1) find $\frac{dy}{dx}$

22.Find a point on the parabola y^2=8x at which ordinate increases at twice the rate of the abscissa

23.Evaluate $\frac{e^x+e^{-x}}{e^x-e^{-x}}dx$

24.Evaluate $\int_1^2 8x\ \sqrt{5x-x^2}\ dx$

PART-C

III.ANSWER ANY TEN QUESTION:- **3x10=30**

25.Solve using Cramer's rule

4x+5=7 , 3y+4z=5 , 3z+5x=2

26.Using properties of determinants show that $\begin{vmatrix} x & p & q \\ p & x & q \\ p & q & x \end{vmatrix}$ = (x-p)(x-q)(x+p+q)

27.In how many ways can 8 students and 4 teachers be seated in a row such that no two teachers are together.

28.A box has 12 white and 10 red and 8 green marbles. 2 marbles are randomly drawn from the box.
Find the probabilities that
a)both are of the same colour
b)both are of the different colour .

29.300 workers can finish a work in 8 days. How many workers will finish the same in 5 days.

30.The bankers discount and their discount on a sum of many due 3 months hence are Rs 154.50 and Rs 150 respectively. Find the sum of money and rate of interest.

31.What is the quoted value of 12% stock if it earns an interest of 8% after deducting the income tax of 8%.
32.Veena buys 100 shares of Karnataka bank at Rs 108 per share. She pays Rs 10,130.3 to her broker. What is the total brokerage she paid and calculated the percentage rate of brokerage.
33.Find the equation of parabola with vertex is origin passing through the point P (3,-4) and symmetric about y axis.

34.If x=e^t(cost+sint) , y=e^t(cost-sint) show that $\frac{dy}{dx} = -tant.$

35.The side of an equilateral triangle is increasing at the rate $\overline{3}$cm/sec .find rate at which its area is increasing when its side is 2 meters.

36.Integrate $\frac{2x}{2x+3}$

37.Evaluate $\frac{sin2x}{1+\cos^2 x}$

38. Find the maxima and minima of the function f(x)=3x^3-9x^2-27x+30.

PART-D

IV. Answer any six questions :- **5x6=30**

39.Find the coefficient of x^{11} in expansion of $(2x-8)^{15}$

40.Resolve into partial fractions $\frac{x+1}{x\ x+2\ (x+4)}$

41.Prove that [pv(p∧r)]↔[(pvq)∧(pvr)] is a tautology.

42.If 8 men and 16 boys can do a piece of work in 6 days and 12 men and 24 boys can do the same work is 8 days in how many days can 16 men and 20 boys do it.

43.The dem and function of a firm is p=500-0.2q and the total cost c=25q+10000.Find the output at which the profit of the firm is maximized .What is the charged price.

44. Solve LPP using graphical method.
Maximize z=60x+15y subject to x+y ≤50, 3x+y≤90 x,y≥0.

45. The angles of elevation of the top of a tower from the bare and the top of a building are $60^0$and 30^0.The building is 20 meter high. Find the height of the tower.

46. Find k ,if the lines 4x-y+k=0 touches the circle x^2-y^2+4x-8y+3=0.

47.If e^{x+y}=xy show that $\frac{dy}{dx} = \frac{y(1-x)}{x(y-1)}$

48.Find the area of the region between the parabolas y^2=4ax and $x^2 = 4ay$.

PART-E

V. ANSWER ANY ONE QUESTION:- **1x10=10**

49.(a) A shopkeeper buys a mobile set at discount rate of 20% from the wholesaler the printed price of the mobile set being Rs 1,600 and rate of the sales tax is 6%

(b) Find the value of $(0.98)^3$ using binomial theorem up to 5 places of decimals.

50.(a)prove that $\lim_{\theta \to 0} \frac{\sin \theta}{\theta} = 1$ and hence reduce that $\lim_{\theta \to 0} \frac{\tan \theta}{\theta}$ =1 (θ in radian).

(b) Arjun wants to invest at most Rs 12,000 in bonds A and B .According to therule, he has to invest at leastRs 2000 in bond A and at leastRs 400 in bond B. If the rates of interest on bond A and bond B are 8% and 10% per annum formulate the product as L.P.P and solve it graphically for maximize income.

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