

SECOND PUC PREPARATORY EXAMINATION - 2020

Time : 3 hr. 15 min.

BASIC MATHEMATICS (75)

Max Marks : 100

No. of Pages : 02

Total No. of Ques. : 50

PART - A

I Answer ALL the following ten questions :

10x1=10

- 1) If $A = \begin{bmatrix} 1 & -5 & 4 \\ 2 & 3 & 6 \end{bmatrix}$ find $4A'$
- 2) If ${}^5P_r = 60$ find the value of 'r'.
- 3) Symbolise the proposition :
"2 + 5 = 6 or all integers are rationals".
- 4) Find the fourth proportional to 4, 5, 24.
- 5) Find the income obtained by investing ₹ 3600 in 5% stock at 90.
- 6) Write the value of $\cos 75^\circ$.
- 7) Find the equation of directrix for a given parabola $x^2 = 6y$.
- 8) Evaluate $\lim_{x \rightarrow 0} \frac{e^{3x} - 1}{x}$
9. $y = \sec(\sec x)$ find $\frac{dy}{dx}$
- 10) Evaluate : $\int_0^{\frac{\pi}{2}} (\sin x) dx$

PART - B

II Answer any Ten of the following questions :

10x2=20

- 11) Solve by Cramer's Rule $3x + 4y = 7$ and $7x - y = 6$.
- 12) In how many ways the word "CARROM" be arranged such that the 2R's are always together?
- 13) If $P(A) = 0.5$, $P(B) = 0.6$ and $P(A \cup B) = 0.8$ find $P(A/B)$.
- 14) If the truth values of propositions p, q, r are T, T, F respectively then find the truth values of the compound propositions $(p \vee r) \wedge q$.
- 15) Find the ratio between two numbers such that their sum is 40 and this difference is 8.
- 16) Banker's gain on a bill due after 6 months at 4% P.A. is 24. Find TD and BD.
- 17) If $A + B + C = \pi$. Prove that $\tan A + \tan B + \tan C = \tan A \cdot \tan B \cdot \tan C$.
- 18) If $\tan A = \frac{1}{2}$, $\tan B = \frac{1}{3}$ then find $\tan(A + B)$.
- 19) Find the equation of Parabola given that vertex is (0,0) and directrix $y = -4$.
- 20) Find K if the function $f(x) = \begin{cases} \frac{e^{2x} - 1}{x} & x \neq 0 \\ k & x = 0 \end{cases}$ is continuous at $x = 0$.
- 21) With usual notation if $S = 10t^3 - 12t^2 + 20t + 7$. Find the velocity and acceleration when $t = 4$ sec.
- 22) Differentiate $\sqrt{\cot(x^2)}$ with respect to x.
- 23) Evaluate $\int_1^2 \frac{1}{x} dx$.
- 24) Evaluate $\int \frac{1}{x(2 \log x + 5)} dx$.

PART - C

III Answer any ten questions :

10x3=30

- 25) If $A = \begin{bmatrix} -1 & 2 \\ 3 & 4 \end{bmatrix}$. Show that $A(\text{adj } A) = (\text{adj } A)A = |A|I$

(P.T.O.)

