Paper Id: | 154101 | **Roll No:** | | | | | | | | | | | | |

B. TECH.
(SEM-I) THEORY EXAMINATION 2019-20
ELEMENTARY MATHEMATICS- I

Time: 3 Hours   *Total Marks: 100*

Note: 1. Attempt all Sections. If require any missing data; then choose suitably.

SECTION A

1.   **Attempt *all* questions in brief.**   **2 x 10 = 20**

Qno.	Question	Marks	CO
a.	Define linear inequality in one variable.	2	CO1
b.	Solve $x^2-1 = 0$	2	CO1
c.	Is 184 a term of the sequence 3,7,11,…?	2	CO2
d.	Find the sum of 2+4+6+…+20.	2	CO2
e.	Write the condition of perpendicularity of two lines.	2	CO3
f.	Write the equation of straight line in point slope form.	2	CO3
g.	Evaluate $\lim_{x \to 0} \frac{3x^2 - 2x + 1}{x-1}$.	2	CO4
h.	Discuss the differentiability of $f(x) = x^2$ at $x = 1$.	2	CO4
i.	State Mean value theorem.	2	CO5
j.	Find the equation of normal to the curve $y = x+ \sin x \cos x$ at $x = \pi/2$.	2	CO5

SECTION B

2.   **Attempt any *three* of the following:**   **3 x 10 = 30**

Qno.	Question	Marks	CO
a.	Exhibit graphically the solution set of linear inequalities 3x+4y≥12, x≥0, y≥1.	10	CO1
b.	Find three numbers in G.P. whose sum is 38 and their product is 1728.	10	CO2
c.	Find the equation of circle passes through the points (1,0), (-1,0) and (0,1).Also find its centre and radius .	10	CO3
d.	Differentiate $(\cos x)^x$ with respect to x.	10	CO4
e.	Find the maximum and minimum values of function f(x)= sin 3x+4 $\forall$ x$\epsilon(-\pi/2, \pi/2)$.	10	CO5

SECTION C

3.   **Attempt any *one* part of the following:**   **1 x 10 = 10**

Qno.	Question	Marks	CO
a.	Solve $x^2-5ix – 6 = 0$ by factorization method.	10	CO1
b.	Solve the inequality graphically$|y - x| \le 3$.	10	CO1

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4. Attempt any *one* part of the following: 1 x 10 = 10

Qno.	Question	Marks	CO
a.	Find four numbers in A.P. whose sum is 20 and sum of whose square is 120.	10	CO2
b.	The third term of G.P. is 4. Find the product of its first five terms.	10	CO2

5. Attempt any *one* part of the following: 1 x 10 = 10

Qno.	Question	Marks	CO
a.	Find the equation of straight line joining the points (-1,3) and (4,-2) .	10	CO3
b.	Find the equation of parabola whose focus is the point (-1,-2) and whose directrix is straight line x-2y+3 = 0.	10	CO3

6. Attempt any *one* part of the following: 1 x 10 = 10

Qno.	Question	Marks	CO
a.	A function is defined as $f(x) = \begin{cases} x^2 - 9 & if\ x \neq 3 \\ 6 & if\ x = 3 \end{cases}$. Show that f(x) is continuous at x =3.	10	CO4
b.	If $y = \sin^{-1}(m \sin x)$, find dy/dx.	10	CO4

7. Attempt any *one* part of the following: 1 x 10 = 10

Qno.	Question	Marks	CO
a.	Verify LMVT for the function $f(x) = x^3 - 18x^2 + 99x - 162$ on [3,5].	10	CO5
b.	If $y = x^4 - 10$ and if x changes from 2 to 1.99, what is approximate change in y.	10	CO5