Paper Id: 180102 Roll No:

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

Time: 3 Hours *Total Marks: 70*

Note: 1. Attempt all Sections. If required any missing data, then choose suitably.

SECTION A

1. Attempt all questions in brief. **2 x 7 = 14**

a. Find the median of the following data:3000,2180,2785,2500,1560,1782,2200,1385,2123,1222.

b. Write the normal equations: $y = ax + bx + c$.

c. Define the differentiability of function at $x = x$.

d. Find— $for\ y = x\ secx$.

e. Find—— $for\ u = x\log(x + y)$.

f. Evaluate $sin\ x\ dx$

g. Define the order and degree of differential equation.

SECTION B

2. Attempt any *three* of the following: **7 x 3 = 21**

a. Find the measures of skewness for the following distribution:

x	1	3	5	7	9
f	1	4	6	4	1

b. Find — $for\ y =$ ——.

c. Examine $f(x, y) = x + y - 3axy$ for maximum and minimum values.

d. Evaluate $\frac{}{(\quad)(\quad)}dx$

e. Solve the differential equation $3 — + xy = —$.

SECTION C

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

(a) By the method of least squares, find the curve $y = ax + bx$ that best fits the following data:

x	1	2	3	4	5
y	1.8	5.1	8.9	14.1	19.8

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(b) Obtain the median for the following frequency distribution:

x	1	2	3	4	5	6	7	8	9
f	8	10	11	16	20	25	15	9	6

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

(a) Find — $for\ y = logloglog(tanx)$.

(b) Show that f (x) given by

$$f(x) = \begin{matrix} 5x - 4 & if\ 0 < x \leq 1 \\ 4x\ -3x & if\ 1 < x < 2 \end{matrix}$$ is continuous at x = 1.

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

(a) If $u = f(r), where\ r\ = x\ + y$, prove that— + — $= f\ (r) + f\ (r)$.

(b) If u,v w are the roots of the equation $(\lambda - x)\ + (\lambda - y)\ + (\lambda - z)\ = 0\ in\ \lambda$, find $\frac{(\ ,\ ,\ )}{(\ ,\ ,\ )}$.

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

(a) Evaluate $x\ sinx\ dx$.

(b) Evaluate $\frac{(\quad)}{\quad}dx$.

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

(a) Solve the differential equation $(D + 4\ )y = sin3x + cos2x$.

(b) Solve$(D + 9\ )y = tanx$ differential equation by the method of variation of parameters.