Roll No.												

GAIN MORE KNOWLEDGE
REACH GREATER HEIGHTS

PRESIDENCY UNIVERSITY
BENGALURU

SCHOOL OF ENGINEERING SET A

TEST - 1

Even Semester: 2018-19 **Date**: 01 March 2019

Course Code: MAT 102 **Time**: 1 Hour

Course Name: Engineering Mathematics-II **Max Marks**: 40

Programme & Sem: B.Tech & II Sem **Weightage**: 20%

Instructions:

(i) *Read the question properly and answer accordingly.*

(ii) *Question paper consists of 3 parts.*

(iii) *Scientific and Non-programmable calculators are permitted.*

Part A

Answer **all** the Questions. **Each** question carries **Six** marks. (2Qx6M=12)

1. Fit a straight line $y = a + bx$ for the data

X:	1	2	3	4	5
Y:	6	5	4	3	2

2. What is the probability of getting a total of 7 or 11 when a pair of fair dice is tossed?

Part B

Answer **all** the Questions. **Each** question carries **Eight** marks. (2Qx8M=16)

3. State and Prove Baye's Theorem.

4. Evaluate $\iint_R xy\,dx\,dy$ where *R* is the region bounded by the coordinate axes and the line $x+y=1$.

Part C

Answer **any One** Question. Question carries **Twelve** marks. (1Qx12M=12)

5. Find the correlation coefficient and the regression lines y on x and x on y for the following data.

X:	1	2	3	4	5
Y:	2	5	3	8	7

OR

6. Evaluate $\int_0^1 \int_x^{\sqrt{x}} xy\,dy\,dx$ by changing the order of integration.

Roll No.												

PRESIDENCY UNIVERSITY
BENGALURU

SCHOOL OF ENGINEERING   SET B

TEST - 1

Even Semester: 2018-19 **Date**: 01 March 2019
Course Code: MAT 102 **Time**: 1 Hour
Course Name: Engineering Mathematics-II **Max Marks**: 40
Programme & Sem: B.Tech & II Sem **Weightage**: 20%

Instructions:

(i) Read the question properly and answer accordingly.
(ii) Scientific and Non-programmable calculators are permitted.

Part A

Answer **all** the Questions. **Each** question carries **Six** marks. (2Qx6M=12)

1. Fit a straight line $y = a + bx$ for the data

x:	1	2	3	4	5
y:	14	13	9	5	2

2. A die is loaded in such a way that an even number is twice as likely to occur as an odd number. If E is the event that a number less than 4 occurs on a single toss of the die. Find P(E).

Part B

Answer **all** the Questions. **Each** question carries **Eight** marks. (2Qx8M=16)

3. (a) State Baye's Theorem. (b) Three machines A, B, C produces 50%, 30%, 20% of the items in a factory. The percentages of defective outputs are 3, 4, 5. If an item is selected at random and is found defective. What is the probability that the item was produced by machine A.

4. Evaluate $\iint_R xy(x+y)dxdy,$ where R is the region bounded by the parabola $y = x^2$ and the line $y = x$.

Part C

Answer **any One** Question. Question carries **Twelve** marks. (1Qx12M=12)

5. Find the correlation coefficient and the regression lines y on x and x on y for the following data.

x:	1	2	3	4	5	6	7
y:	9	8	10	12	11	13	14

OR

6. Evaluate $\int_0^1 \int_x^1 \frac{x}{\sqrt{x^2+y^2}} dy\,dx$ by changing the order of integration.

Roll No.												

PRESIDENCY UNIVERSITY
BENGALURU

SCHOOL OF ENGINEERING — SET A

TEST - 2

Even Semester: 2018-19 — **Date**: 13 April 2019

Course Code: MAT 102 — **Time**: 1 Hour

Course Name: Engineering Mathematics-II — **Max Marks**: 40

Program & Sem: B.Tech & II Sem — **Weightage**: 20%

Instructions:

(i) *Read the question properly and answer accordingly.*

(ii) *Question paper consists of 3 parts.*

(iii) *Scientific and Non-programmable calculators are permitted.*

Part A

Answer **all** the Questions. **Each** question carries **Four** marks. (3Qx4M=12)

1. Evaluate by expressing in terms of gamma function $\int_0^\infty x^6 e^{-2x}\, dx$.
2. If $\vec{F} = 3xyi - y^2 j$ evaluate the line integral $\int_c \vec{F}.\vec{dr}$ where C is the arc of the parabola $y = 2x^2$ from (0, 0) to (1, 2).
3. Solve $\frac{d^3y}{dx^3} - 2\frac{d^2y}{dx^2} - \frac{dy}{dx} + 2y = 0.$.

Part B

Answer **both** the Questions. **Each** question carries **Eight** marks. (2Qx8M=16)

4. Verify Green's theorem in the *xy*-plane for $\int_C (xy + y^2)\,dx + x^2 dy$, where C is the closed curve of the region bounded by $y = x$ and $y = x^2$.
5. Find the area enclosed by the curve $r = a(1+\cos\theta)$ between $\theta = 0$ *to* $\theta = \pi$ by double integration.

Part C

Answer **any one** Question. Question carries **Twelve** marks. (1Qx12M=12)

6. Show that $\int_0^\infty x\, e^{-x^8}\, dx \times \int_0^\infty x^2\, e^{-x^4}\, dx = \frac{\pi}{16\sqrt{2}}$.

OR

If $\vec{F} = (2x^2 - 3z)i - 2xyj - 4xk$ Evaluate $\iiint_V \nabla.\vec{F}\; dv$ where V is the region bounded by the planes $x=0,\ y=0,\ z=0\ and\ 2x+2y+z=4$.

Roll No. | | | | | | | | | | | | |

PRESIDENCY UNIVERSITY
BENGALURU

SCHOOL OF ENGINEERING   SET B

TEST - 2

Even Semester: 2018-19   **Date**: 13 April 2019

Course Code: MAT 102   **Time**: 1 Hour

Course Name: Engineering Mathematics-II   **Max Marks**: 40

Program & Sem: B.Tech & II Sem   **Weightage**: 20%

Instructions:

(i) Read the question properly and answer accordingly.
(ii) Question paper consists of 3 parts.
(iii) Scientific and Non-programmable calculators are permitted.

Part A

Answer **all** the Questions. **Each** question carries **Four** marks. (3Qx4M=12)

1. Evaluate $\int_0^\infty x^{\frac{3}{2}} e^{-x}\, dx$.
2. If $\vec{F} = 3xy\hat{\imath} - y^2\hat{\jmath}$, evaluate $\int_C \vec{F}.d\vec{r}$ where C is the arc of the parabola $y = 2x^2$ from $(0,0)$ to $(1,2)$.
3. Find the general solution for the differential equation $y''' - 2y'' + 4y' - 8y = 0$.

Part B

Answer **both** the Questions. **Each** question carries **Eight** marks. (2Qx8M=16)

4. Find by double integration the area bounded between the parabolas $y^2 = 4ax$ and $x^2 = 4ay$.
5. Evaluate $\oint_C (xy - x^2)dx + x^2y\, dy$, where C is the closed curve bounded by $y = 0, x = 1$ and $y = x$ by Green's theorem.

Part C

Answer **any one** Question. Question carries **Twelve** marks. (1Qx12M=12)

6. Prove that $\int_0^1 \frac{x^2dx}{\sqrt{1-x^4}} \times \int_0^1 \frac{dx}{\sqrt{1+x^4}} = \frac{\pi}{4\sqrt{2}}$.

OR

Verify Gauss Divergence Theorem for the vector function $\vec{F} = (x^2 - yz)\hat{\imath} + (y^2 - xz)\hat{\jmath} + (z^2 - xy)\hat{k}$ taken over the rectangular parallelepiped $0 \le x \le a, 0 \le y \le b, 0 \le z \le c$.

Roll No											

PRESIDENCY UNIVERSITY
BENGALURU

SCHOOL OF ENGINEERING

SET B

END TERM FINAL EXAMINATION

Even Semester: 2018-19 **Date**: 20 May 2019

Course Code: MAT102 **Time**: 3 Hours

Course Name: Engineering Mathematics-II **Max Marks**: 80

Program & Sem: B.Tech & II Sem (All Program) **Weightage**: 40%

:tructions:

(i) *Read the question properly and answer accordingly.*

(ii) *Question paper consists of 3 parts.*

(iii) *Scientific and Non-programmable calculators are permitted.*

Part A

Answer **all** the Questions. **Each** question carries **one** mark. (20Qx1M=20M)

1.

i. If a coin is flipped, what is the probability it will land on heads

a) $\frac{1}{2}$ b) $\frac{4}{2}$ c) $\frac{3}{2}$ d) $\frac{3}{4}$

ii. A bag contains 6 black and 8 white balls. One ball is drawn at random. What is the probability that the ball drawn is white?

a) $\frac{3}{4}$ b) $\frac{4}{7}$ c) $\frac{1}{8}$ d) $\frac{3}{7}$

iii. Correlation Coefficient values lies between

a) -1 and +1 b) 0 and 1 c) -1 and 0 d) None of these

iv. Write the sample space when a coin is tossed twice

(a) S = {H, T , HH, HT}
(b) S={HH, HT, TH, TT}
(c) S=(TT, TH, T, HT}
(d) S={HH, TT, H, T}

v. Using volume integral, which quantity can be calculated

a) Area of cube b) Area of cuboid
c) Volume of cube d) Distance of vector

vi. The value of $\int_0^\infty e^{-x} x^7 dx$ is

a) 7! b) 6! c) 8! d) 7

vii. The value of $\Gamma\left(\frac{1}{2}\right)$ is given by

a) $\sqrt{\pi}$ b) π c) 2 d) 2π

viii. The value of $\int_0^1 x^{\frac{3}{2}} (1-x)^{\frac{1}{2}}$ is given by

a) $\beta(\frac{5}{2},\frac{3}{2})$ b) $\beta(\frac{1}{2},\frac{3}{2})$ c) $\beta(\frac{5}{2},\frac{1}{2})$ d) $\beta(\frac{7}{2},\frac{3}{2})$

ix. The divergence theorem converts

a) Line to surface integral b) Surface to volume integral
c) Volume to line integral d) Surface to line integral

x. The area of region R is given by $\iint_R dxdy$

a) True b) False

xi. The volume integral is three dimensional

a) True b) False

xii. The line integral is used to calculate

a) Force b) Area
b) Volume d) Length

xiii. If the roots of Auxillary equations are (-2, -2), then the Complementary function is

a) $(A+Bx)e^{-2x}$ b) $(A-Bx)e^{-2x}$
c) $(A+B)e^{-2x}$ d) $(A-B)e^{-2x}$

xiv. The complementary function of $(D^2+4)y = tan200x$ is

a) A cos 2x-Bsin 2x b) A cos 2x+Bsin 2x
c) A cos h2x+Bsinh 2x d) A cos h2x-Bsinh 2x

xv. Particular integral of ODE $(D^2+D-2)y = e^x$ is

a) $\frac{xe^2}{3}$ b) $\frac{xe^2}{4}$ c) $\frac{xe^2}{5}$ d) $\frac{xe^2}{6}$

xvi. If $Q(x) = e^{100x}V(x)$ then Particular Integral is

a) $e^{-100x}\frac{1}{f(D-100)}V(x)$ b) $e^{200x}\frac{1}{f(D+200)}V(x)$
c) $e^{100x}\frac{1}{f(D+100)}V(x)$ d) $e^{-200x}\frac{1}{f(D-200)}V(x)$

xvii. A partial differential equation has

a) One independent variable
b) Two or more independent variables
c) More than one dependent variable
d) Equal number of dependent and independent variables

xviii. The order of ordinary differential equation is always

a) Whole number b) Negative integer
c) Rational number d) Positive integer

xix. What is the order of the following partial differential equation $u_{xx} + 2u_{xy} + 75u_{yy} = 10y$.

a) Second order b) Third order c) First order d) Linear

xx. The standard notation for the partial derivative $\frac{\partial^2 z}{\partial x^2}$ is

a) p b) r c) s d) q

Part B

Answer **all** the Questions. **Each** question carries **eight** marks. (5Qx8M=40M)

2. a. Form the partial differential equation by eliminating arbitrary constants *a* and *b* for $z=(x^2+a)(y^2+b)$.

   b. Solve: $(D^2-2D+4)y = e^x cosx$.

3. a. Solve: $\frac{d^3y}{dx^3} - 2\frac{d^2y}{dx^2} + 4\frac{dy}{dx} - 8y = 0$.

   b. Solve $\frac{\partial^2 z}{\partial x \partial y} = sinx\, siny$, for which $\frac{\partial z}{\partial y} = -2siny$ when $x=0$ and $z=0$ when $y=0$.

4. Solve: $(D^3+1)y = \cos\left(\frac{\pi}{2}-x\right) + e^x$.

5. Solve: $x^2\frac{d^2y}{dx^2} - x\frac{dy}{dx} + 2y = \log x + xsin(logx)$.

6. Solve $\frac{\partial^2 z}{\partial x^2} + z = 0$ given that when $x = 0$, $z = e^y$ and $\frac{\partial z}{\partial x} = 1$.

Part C

Answer **any two** Questions. **Each** question carries **ten** marks. (2Qx10M=20M)

7. Find the correlation coefficient and the regression lines of y on x and x on y for the following data:

x	2	4	6	8	10
y	5	7	9	8	11

8. Solve $\frac{d^2y}{dx^2} - 2\frac{dy}{dx} + y = \frac{e^x}{x}$ by the method of variation of parameters.

9. Discuss the various possible solutions of one dimensional heat equation $\frac{\partial u}{\partial t} = c^2\frac{\partial^2 u}{\partial x^2}$ by the method of separation of variables.

Roll No

PRESIDENCY UNIVERSITY
BENGALURU

SCHOOL OF ENGINEERING

SET A

END TERM FINAL EXAMINATION

Even Semester: 2018-19

Course Code: MAT102

Course Name: Engineering Mathematics-II

Program & Sem: B.Tech & II Sem (All Program)

Date: 20 May 2019

Time: 3 Hours

Max Marks: 80

Weightage: 40%

Instructions:

(i) *Read the question properly and answer accordingly.*

(ii) *Question paper consists of 3 parts.*

(iii) *Scientific and Non-programmable calculators are permitted.*

Part A

Answer **all** the Questions. **Each** question carries **one** mark. (20Qx1M=20M)

1.

i. The value of Correlation coefficient ranges between
a) -1 & 1 b) 1 & 0 c) 0 & 1 d) -2 & 2

ii. If A and B are two events such that P(A) = 0.4, P(B)=0.2 and P(A U B) = 0.2, then P(A ∩ B) is equal to
a) 0.4 b) 0.2 c) 0.6 d) 0.8

iii. If a dice is tossed, what is the probability of getting a prime number
a) 1/6 b) 3/6 c) 4/6 d) 5/6

iv. The auxiliary equation of $4x^2y'' + y = 0$ is
a) $4m^2 + 4m + 1 = 0$ b) $4m^2 + 1 = 0$
c) $4m^2 - 4m + 1 = 0$ d) $4m^2 - 1 = 0$

v. The line integral of f(x, y) along C is denoted by
a) $\int_C f(x,y)\, dA$ b) $\oint_C f(x,y)\, dA$
c) $\iint f(x,y)\, dA$ d) $\int_A f(x,y)\, dA$

vi. $\iint \vec{F}\cdot\hat{n}\,ds = \iint div\,\vec{F}\,dv$. Say True (or) False

a) True b) False

vii. $\int(Mdx+Ndy) = \ldots\ldots\ldots$

a) $\iint_R\left(\frac{\partial M}{\partial x}+\frac{\partial N}{\partial y}\right)dxdy$ b) $\iint_R\left(\frac{\partial M}{\partial x}-\frac{\partial N}{\partial y}\right)dxdy$

c) $\iint_R\left(\frac{\partial N}{\partial x}-\frac{\partial M}{\partial y}\right)dxdy$ d) $\iint_R\left(\frac{\partial N}{\partial x}+\frac{\partial M}{\partial y}\right)dxdy$

viii. The roots of auxiliary equation of $x^2y''+xy'-9y=0$ are

a) 3,3 b) -3, -3 c) -3, 3 d) 3,2

ix. Which of the following is an integral representation of the beta function?

a) $\int_0^1 x^{m-1}(1-x)^{n-1}dx$ b) $\int_1^0 x^{m-1}(1-x)^{n-1}dx$

c) $\int_{-\infty}^{\infty} x^{m-1}(1-x)^{n-1}dx$ d) $\int_{-\infty}^{0} x^{m-1}(1-x)^{n-1}dx$

x. Using the factorial representation of the gamma function, which of the following answers is the solution for the gamma function Γ(*n*) when *n* = 8?

a) 5040 b) 4225

c) 5000 d) 3070

xi. The probability of getting two heads while tossing two coins is

a) 1/4 b) 1/2 c)3/4 d) 1

xii. If the roots of Auxilary equations are -2, -2 then the complementary function

a) $(A+Bx)e^{-x}$ b) $(A-Bx)e^{-x}$

c) $(A+Bx)e^{-2x}$ d) $(A-Bx)\,e^{-2x}$

xiii. The complementary function of $(D^7+9)y=\sin 2x$

a) A cos 2x-Bsin 2x b) A cos 2x+Bsin 2x

c) A cosh 2x+B sinh 2x d) A cosh 2x-Bsinh 2x

xiv. Particular integral of ODE $(D^2+D-2)y=e^{2x}$ is

a) $\frac{xe^2}{4}$ b) $\frac{e^{2x}}{4}$ c) $\frac{xe^{2x}}{4}$ d) $\frac{xe^2}{6}$

xv. The order of the differential equation $(D^2+1)(D-5)y=0$ is

a) 1 b) 2 c) 3 d) 4

xvi. Two or more independent variables are used in...

a) ODE b) PDE c) ODE and PDE d) None of the above

xvii. The order of differential equation is always

a) Positive integer b) Negative integer

c) Rational number d) Whole number

xviii. What is the order of the following partial differential equation

$$u_{xxx}+65u_{xxy}+34u_{yyy}=10y.$$

a) Second order b) Third order c) First order d) Linear

xix. The standard notation for $\frac{\partial^2 z}{\partial x\partial y}$ is

a) p b) r c) s d) t

xx. The value of $\beta\left(\frac{7}{2},\frac{-1}{2}\right)=\ldots\ldots\ldots$

a) $\frac{-15\pi}{8}$ b) $\frac{15\pi}{8}$ c) $\frac{-8\pi}{15}$ d) $\frac{8\pi}{15}$

Part B

Answer **all** the Questions. **Each** question carries **eight** marks. (5Qx8M=40)

2 a. Form a partial differential equation by eliminating the arbitrary constants *a* and *b* from

$$z=a^2x+ay^2+b.$$

b. Solve: $(D^2-2D+5)y=e^{2x}\sin x$.

3 a. Solve: $(D^3-3D^2+4D-2)y=0$.

b. Solve $\frac{\partial^2 u}{\partial x\partial t}=e^{-t}\cos x$ subject to the conditions u=0 when t=0 and $\frac{\partial u}{\partial t}=0$ at x=0.

4. Solve: $(D^2-4D+4)y=e^{2x}+\cos 2x$.

5. Solve: $(x^2D^2+xD+4)y=cox(\log x)+x\sin(\log x)$.

6. Solve $\frac{\partial^2 z}{\partial x^2}+3\frac{\partial z}{\partial x}-4z=0$ subject to the conditions that z=1 and $\frac{\partial z}{\partial x}=y$ when x=0.

Part C

Answer **any two** Questions. **Each** question carries **ten** marks. (2Qx10M=20)

7. Find the co-efficient of correlation and the regression line y on x and x on y for the following data.

X:	1	2	3	4	5
Y:	2	5	3	8	7

8. Solve $\frac{d^2y}{dx^2}+y=\tan x$ by the method of variation of parameters.

9. Discuss the various possible solutions of wave equation $\frac{\partial^2 u}{\partial t^2}=c^2\frac{\partial^2 u}{\partial x^2}$ by the method of separation of variables.

Roll No												

PRESIDENCY UNIVERSITY
BENGALURU

SCHOOL OF ENGINEERING

MAKE UP EXAMINATION JULY 2019

Semester: Summer Term 2019
Date: 22 July 2019
Course Code: MAT102
Time: 3 Hours
Course Name: Engineering Mathematics-II
Max Marks: 80
Program & Sem: B.Tech & 2[nd] Sem (2018 Batch)
Weightage: 40%

Instructions:

(i) *Read the question properly and answer accordingly.*
(ii) *Question paper consists of 3 parts.*
(iii) *Scientific and Non-programmable calculators are permitted.*

Part A

1. Answer **all** the Questions. **Each** question carries **twenty** marks. (20Qx1M=20M)

a) Correlation Coefficient 'r' lies between
a)-1 and +1 b) 0 and 1 c) -1 and 0 d) None of these

b) A ball is drawn at random from a bag contains 6 black and 8 white balls, what is the probability that it is white?
a) $\frac{3}{4}$ b) $\frac{4}{7}$ c) $\frac{1}{8}$ d) $\frac{3}{7}$

c) If A and B are mutually exclusive events then P(AUB) =__________

d) If two regressions lines are parallel then correlation coefficient 'r' is
a) 1 b) 0 c) ∞ d) None of these

e) The value of $\int_0^a \int_0^b \int_0^c xyz\, dxdydz$ =
a) $\frac{a^2b^2c^2}{8}$ b) $\frac{\text{abc}}{4}$ c) $\frac{\text{abc}}{8}$ d) 0

f) Gamma of 1/2 is
a) 1 b) 0 c) $\sqrt{\pi}$ d) $\sqrt{\frac{\pi}{2}}$

g) The area of an ellipse is ________

h) Volume integral is used to calculate
a) Area of cube b) Area of cuboid
c) Volume of cube d) Distance of vector

i) The Green's theorem converts
a) Line integral to surface integral b) Surface integral to volume integral
c) Volume integral to line integral d) Surface integral to line integral

j) Using Green's theorem $\frac{1}{2}\int x\, dy - y\, dx$ is
a) Volume b) Area c) 0 d) ½

k) The volume integral is three dimensional
a)True b) False

l) If the roots of Auxiliary equations are (-1, -1) the Complementary function

a) $(A+Bx)e^{-x}$ b) $(A-Bx)e^{-x}$
c) $(A+B)e^{-x}$ d) $(A-Bx)e^{-x}$

m) The complementary function of $(D^2+16)y = sin20x$
a) A cos 4x-Bsin 4x b) A cos 4x+Bsin 4x
c) A cos h4x+Bsinh 4x d) A cos h4x-Bsinh 4x

n) If $\emptyset(x) = e^{100x}V(x)$ then Particular Integral is
a) $e^{-100x}\frac{1}{f(D-100)}V(x)$ b) $e^{200x}\frac{1}{f(D+200)}V(x)$
c) $e^{100x}\frac{1}{f(D+100)}V(x)$ d) $e^{-200x}\frac{1}{f(D-200)}V(x)$

o) Particular integral of ODE $(D^2+D-2)y = e^x$ is
a) $\frac{xe^x}{3}$ b) $\frac{xe^x}{4}$ c) $\frac{xe^x}{2}$ d) $\frac{xe^x}{6}$

p) If the equation is $(x^2D^2+xD+1)y = logx$, then
a) $x = e^t$ b) $x = e^{-t}$ c) $x = e^{mt}$ d) $x = e^{-mt}$

q) The equation $\frac{\partial^2 u}{\partial x \partial y} = xy$ is
a) Homogeneous b) Non homogeneous
c) Non-linear d) None of these

r) The order of differential equation is always
a) Positive integer b) Negative integer
c) Rational number d) All of these

s) The PDE of the equation $z = (x+a)(y+b)$ is
a) $z = \frac{p}{q}$ b) $z = p+q$ c) $z = p-q$ d) $z = pq$

t) A partial differential equation has
a) One independent variable
b) Two or more independent variables
c) More than one dependent variable
d) Both b and c

Part B

Answer **all** the Questions. **Each** question carries **eight** marks. (5Qx8M=40M)

2. a) Form the Partial differential equation by eliminating arbitrary function to the following equation $z = f(x^2+y^2)$

b) Solve $(D^2-2D+5)y = e^{2x}\sin x$

3. a) Solve the equation $(D^3-3D^2+4D-2)y = 0$

b) Solve $\frac{\partial^2 u}{\partial x \partial t} = e^{-t}\cos x$ subject to the condition u=0 when t=0 and $\frac{\partial u}{\partial t} = 0$ at x=0.

4. Solve the equation $(D^2-4D+4)y = e^{2x}+\cos 2x$

5. Solve $x^2\frac{d^2y}{dx^2} - x\frac{dy}{dx} + 2y = x\sin(\log x)$

6. Solve $\frac{\partial^2 z}{\partial x^2} + 3\frac{\partial z}{\partial x} - 4z = 0$ subject to the conditions that z=1 and $\frac{\partial z}{\partial x} = y$ when x=0.

Part C

Answer **any Two** Questions. **Each** question carries **ten** marks. (2Qx10M=20M)

7. Find the Correlation Coefficient 'r' and the lines of regressions for the following data

X	1	3	4	6	8	9	11	14
y	1	2	4	4	5	7	8	9

8. Solve $\frac{d^2y}{dx^2} + y = \tan x$ by the method of variation of parameters.

9. Find the various possible solution of one dimensional wave equation by the method of separation of variables.

Roll No. | | | | | | | | | | | |

PRESIDENCY UNIVERSITY , BENGALURU

SCHOOL OF ENGINEERING

SUMMER TERM / MAKE-UP END TERM EXAMINATION

Semester: Summer Term 2019 — **Date**: 22 July 2019

Course Code: MAT102 — **Time**: 2 Hours

Course Name: Engineering Mathematics-II — **Max Marks**: 80

Program & Sem: B.Tech & 2nd Sem (2017 batch) — **Weightage**: 40%

Instructions:

(i) *Read the question properly and answer accordingly.*

(ii) *Question paper consists of 3 parts.*

(iii) *Scientific and Non-programmable calculators are permitted.*

Part A

Answer **all** the Questions. **Each** question carries **Five** marks. (4Qx5M=20)

1. Solve: $\frac{\partial^2 u}{\partial x^2} = x + y$.

2. Obtain the Laplace Transform of $Coshat$.

3. Find $L\left[e^{-2t}\left(2Cos5t - Sin5t\right)\right]$.

4. Find the $L^{-1}\left[\frac{2s-5}{8s^2-50} + \frac{4s}{9-s^2}\right]$.

Part B

Answer **all** the Questions. **Each** question carries **Ten** marks. (3Qx10M=30)

5. Solve: $\frac{\partial^2 z}{\partial x^2} + z = 0$, given that, when $x = 0$, $z = e^y$ *and* $\frac{\partial z}{\partial x} = 1$.

6. Find L[f(t)], if $f(t) = \begin{cases} t & 0 < t < 4 \\ 5 & t > 4 \end{cases}$.

7. Find the $L^{-1}\left[\frac{s+5}{s^2-6s+13} + \frac{4}{s^5}\right]$.

Part C

Answer **any two** Question. **Each** question carries **Fifteen** marks. (2Qx15M=30)

8. Find the Laplace Transform of the full-wave rectifier $f(t) = ESin\omega t,\ 0 < t < \frac{\pi}{\omega}$, having the period $\frac{\pi}{\omega}$.

9. Find a) $L[tCosat]$ b) $L\left[\frac{Cosat - Cosbt}{t}\right]$

10. Solve $y''' + 2y'' - y' - 2y = 0\ \ given\ \ y(0) = y'(0) = 0\ \ and\ \ y''(0) = 6$ by using Laplace Transform method.