ST. JOSEPH'S DEGREE COLLEGESUNKESULA ROAD, KURNOOL.
ADD ON COURSE-2020

DEPARTMENT OF MATHEMATICS

COURSE DETAILS

Title of the Paper	:	Partial Differential Equations
Course Level	:	Under graduate
Course Duration	:	42 hours (7 weeks)
Facutly	:	1. Dr.T.Mohan Reddy
	:	2. P.Vidya Lakshmi
Course Layout		
Week 1	:	Origin of the Partial Differential equations
Week 2	:	Linear Partial Differential Equations of first order
Week3 & 4	:	Non-linear partial differential equations of first order
Week 5 & 6	**:**	Homogenous Linear partial differential equations with constant coefficients
Week 7	:	Non-Homogeneous Linear partial differential equations with constant coefficients.
Course Type	:	Add-on course
Start Date	:	02-01-2020
End Date	:	14-03-2020
Exam Date	:	17-03-2020

ADD ON COURSE
PARTIAL DIFFERENTIAL EQUATIONS

Syllabus:

Unit-I: Origin of Partial Differential Equations:

Introduction-Order & degree-formation of partial differential equations by elimination of arbitrary constants and arbitrary functions.

Unit-II: Linear Partial Differential Equations of first order:

Lagrange's equations-solving Pp+Qq=R by Lagrange's method based on rules.

Unit-III: Non-Linear Partial Differential Equations of first order:

Complete integral, particular integral and singular integral, general integral-compatible system of first order equations-Charpits method-special methods of solutions applicable to certain standard forms

Unit-IV: Homogeneous Linear partial differential equations with constant coefficients:

Solutions of homogeneous linear differential equations with constant coefficients-methods of finding particular integral in certain cases.

Unit-V: Non- Homogeneous Linear partial differential equations with constant coefficients:

Reducible and irreducible linear differential operators- Reducible and irreducible linear partial differential equations with constant Coefficients-Methods of finding C.F of reducible and irreducible P.D.E with constant Coefficients-Particular integral of reducible and irreducible P.D.E with constant Coefficients.

Learning Outcomes:

Upon successful completion, students will have the knowledge and skills to:

1. Apply a range of techniques to find the solutions of standard Partial Differential equations
2. Demonstrate accurate and efficient use of Fourier analysis techniques and their applications in the theory of PDE's
3. Apply problem solving using concepts and techniques from PDE's and Fourier analysis applied to diverse situations in physics, engineering and in financial mathematics.

Reference Books:

1. Ordinary and Partial Differential Equations by Dr. M.D. Raisinghania, S. Chand Publications

Request Letter

Date:23-12-2019,
Kurnool.

To
Dr.C. V. Satya Narayana
SJCQAC Coordinator,
St. Joseph's Degree College,
Kurnool-518004.

Respected sir,

The Department of Mathematics would like to introduce Add On Course on "Partial Differential Equations" for the first year students of mathematics groups. The course duration will be 42 hours. In this regard, I request you to grant permission to go ahead with our proceedings.

Thanking you sir,

Dr.T. Mohan Reddy,
Head of the Department,
Department of Mathematics
St. Joseph's Degree College,
Kurnool.

<u>Circular</u>

Date: 26--12-2019,
Kurnool.

Dear Students,

The Department of Mathematics is going to conduct **"Add On course"** for all first year mathematics students on Partial Differential Equations. It is proposed to conduct classes from January 4th ,2020. This course is scheduled for about 7 weeks. So I request all students to make use of this opportunity. For further information, visit department of Mathematics.

Thanking you,

Dr.T. Mohan Reddy,
Head of the Department,
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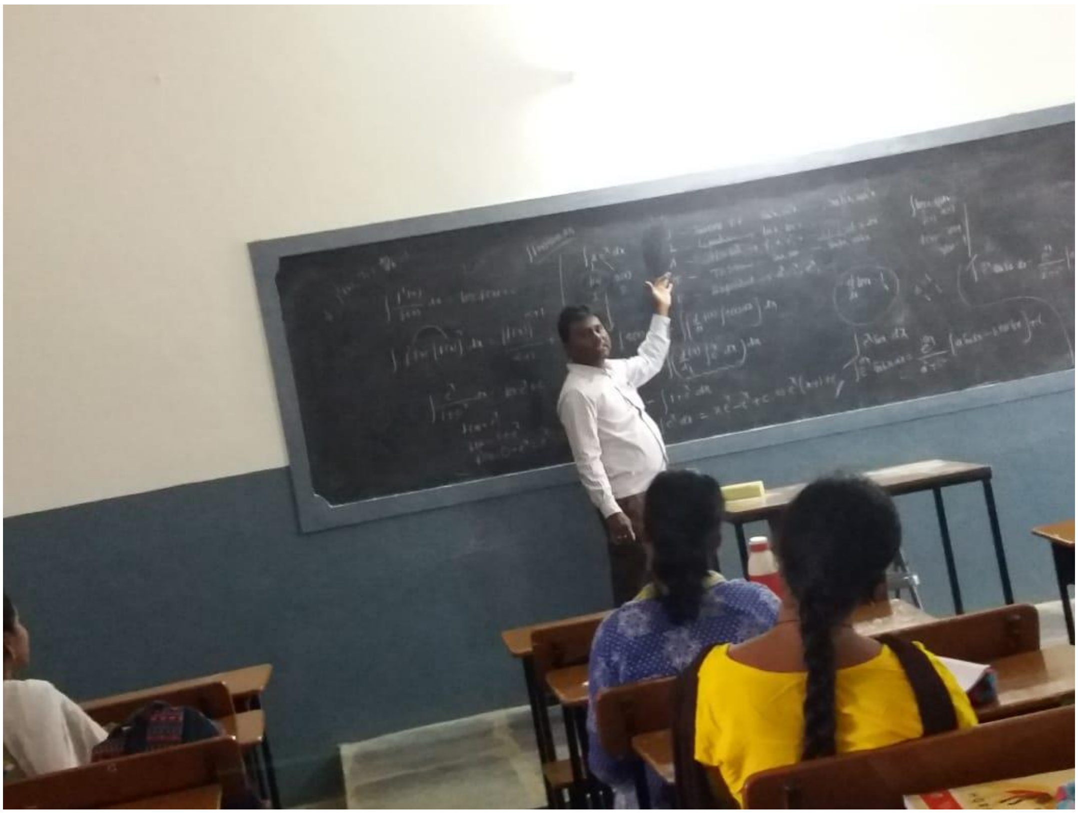


Partial Differential Equation's


1094

ST. JOSEPH’S DEGREE COLLEGE

SUNKESULA ROAD, KURNOOL.

ADD ON COURSE EXAM

PARTIAL DIFFERENTIAL EQUATIONS

Max.Time: 30 min **Date: 17-03-2020**

1) 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

2) A solution to the partial differential equation.
   $\frac{\partial^2 u}{\partial x^2}=\frac{\partial^2 u}{\partial y^2}$ is
   (A) cos (3x − y)
   (B) $x^2 + y^2$
   (C) sin (3x − y)
   (D) $e^{-3\pi x}$ sin(πy)

3) Variables that derivatives are taken with respect to are called
   (A) dependent variables
   (B) independent variables
   (C) multi variables
   (D) singular variable

4) Which is the partial differential equation by eliminating the arbitrary constants $a \; and \; b$ from $z = ax + by + a^2 + b^2$
   (A) $z = px - qy + p^2 - q^2$
   (B) $z = px + qy + p^2 + q^2$
   (C) $z = px + qy - p^2 - q^2$
   (D) $z = px + qy - p^2 + q^2$

5) If we eliminate h, k from $(x- h)^2 +(y- k)^2 +z^2 = a^2$ then which is the partial differential equation
   (A) $z^2(p^2 + q^2 +1) = a^2$
   (B) $z^2 (p^2 + q^2+1) = a^2$
   (C) $z^2(q^2 -p^2 -1) = a^2$
   (D) $z^2 (a^2 + q^2 +1) =p^2$

6) which is the partial differential equation by eliminating the arbitrary constants $a \; and \; b$ from log (az -1) = x +ay +b
   (A) q (p +1) = pz
   (B) p(q+1) =qz
   (C) pz = q (p +1)
   (D) q(p-1) = pz

7) which is the partial differential equation by eliminating the arbitrary function from $z = f(x^2 + y^2)$

(A) $py - qx = 0$
(B) $py + qx = 0$
(C) $qy + py = 0$
(D) $px - qy = 0$

8) which is the partial differential equation for $f(x + y + z, x^2 + y^2 + z) = 0$

(A) $(y + z)p + (z + x)q = x + y$
(B) $(y - z)p + (z - x)q = x - y$
(C) $(z - y)p + (y - x)q = x - y$
(D) $(y + z)p - (z + x)q = x + y$

9) which is the partial differential equation by eliminating arbitrary function f from $z = xy + f(x^2 + y^2)$

(A) $x^2 - y^2 = qx - py$
(B) $x^2 - y^2 = qx + py$
(C) $x^2 + y^2 = qx + py$
(D) $x^2 - y^2 = px + qy$

10) which is the partial differential equation by eliminating arbitrary constants a, b, c from

$\frac{x^2}{a^2} + \frac{y^2}{b^2} + \frac{z^2}{c^2} = 1$

(A) $px = zp^2 + xpy$
(B) $pz = xp^2 + xpr$
(C) $xz = yp^2 - xzr$
(D) $pz = xp^2 - xzr$

11) Which is the solution for the partial differential equation $px + qy = z$

(A) $f(\frac{x}{y}, \frac{y}{z}) = 0$
(B) $g(\frac{y}{x}, \frac{z}{y}) = 0$
(C) $f(-\frac{x}{y}, \frac{y}{z}) = 0$
(D) $f(\frac{x}{y}, -\frac{y}{z}) = 0$

12) Which is the solution for the partial differential equation $p\sqrt{x} + q\sqrt{y} = \sqrt{z}$

(A) $\phi(\sqrt{x} + \sqrt{y}, \sqrt{z} + \sqrt{y}) = 0$
(B) $\phi(\sqrt{x} - \sqrt{y}, \sqrt{y} - \sqrt{z}) = 0$
(C) $\phi(\sqrt{z} + \sqrt{y}, \sqrt{x} - \sqrt{y}) = 0$
(D) $\phi(\sqrt{y} - \sqrt{x}, \sqrt{y} - \sqrt{z}) = 0$

13) Choose the general solution for the equation $(x^2 - y^2 - yz)p + (x^2 - y^2 - xz)q = z(x - y)$

(A) $f(x - y - z, \frac{x^2 - y^2}{z^2}) = 0$
(B) $f(x + y + z, \frac{x^2 - y^2}{z^2}) = 0$
(C) $f(x - y - z, \frac{x^2 + y^2}{z^2}) = 0$

(D) $f(x+y+z, \frac{x^2+y^2}{z^2})$ = 0

14) Which is the solution for the partial differential equation p tanx + q tany = tanz

(A) $\Phi(\frac{sinx}{siny}, \frac{siny}{sinz}) = 0$
(B) $\Phi((\frac{siny}{sinx}, \frac{siny}{sinz}) = 0$
(C) $\Phi((\frac{siny}{sinx}, \frac{sinx}{sinz}) = 0$
(D) None of the above

15) The general solution of pq = 1 is

(A) z = ax - $\frac{y}{a}$ + c
(B) z = ax + $\frac{y}{a}$ + c
(C) z = by - $\frac{x}{b}$ + c
(D) z = by + $\frac{x}{b}$ + c
(E)

16) The general solution of $p^2 + q^2 = m^2$ is

(A) z = ax ± $\sqrt{m^2 - a^2}$ y +c
(B) z = bx ± $\sqrt{m^2 - b^2}$ y +c
(C) z = ax ± $\sqrt{m^2 + a^2}$ y +c
(D) z = bx ± $\sqrt{m^2 + b^2}$ y + c

17) The order and degree of the partial differential equation $x\frac{\partial^2 z}{\partial x^2} + \frac{\partial^2 z}{\partial x \partial y} + \frac{\partial^2 z}{\partial y^2}$ = 0 is

(A) 1,2
(B) 3,4
(C) 2,1
(D) 4,3

18) The solution of partial differential equation is a function of
(A) Dependent variables which satisfies differential equation
(B) Independent variables which satisfies differential equation
(C) Dependent variables which do not satisfies differential equation
(D) Independent variables which do not satisfies differential equation

19) The general solution of partial differential equation contain
(A) Arbitrary constants
(B) Arbitrary functions
(C) constants and functions and sometimes both
(D) Arbitrary constants and Arbitrary functions and sometimes both

20)The standard form of Lagrange s linear equation is
(A) p + q = 0
(B) p+ q = r

(C) Pp +Qq = 0
(D) Pp +Qq = R

21) $\frac{dx}{P} = \frac{dy}{Q} = \frac{dz}{R}$ is
(A) Clairaut's equation
(B) Lagrange's equation
(C) Lagrange's auxiliary equation
(D) Bernoulli's equation

22) Working rules for solving Pp +Qq = R are
(A) Method of grouping and method of multipliers
(B) Method of dependency
(C) Method of independency
(D) None

23) A solution in which the number of arbitrary constants is equal to number of independent variables P called
(A) Particular integral
(B) Complete integral
(C) Singular integral
(D) None

24) A Solution got by giving particular values to the arbitrary constants in the complete integral is called
(A) Particular integral
(B) Complete integral
(C) Singular integral
(D) None

25) The standard form of clairaut's form is
(A) z = px + qy
(B) z = px +qy +f (p, q)
(C) z = p +q + f (p, q)
(D) z = px +qy + f (x, y)

KEY

1	B	6	B	11	A	16	A	21	C
2	D	7	A	12	B	17	C	22	A
3	B	8	B	13	A	18	B	23	B
4	B	9	A	14	A	19	D	24	A
5	A	10	B	15	B	20	D	25	B

Number of Students enrolled in Course: 160

Number of Students appeared for the exam: 100

St. Joseph's Degree College, Sunkesula Road, Kurnool-4

Programme: Add On Course (partial Differential Equations)

Date:

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St. Joseph's Degree College, Sunkesula Road, Kurnool-4

Programme: Add on Course (partial Differential Equations) List of students attending Date:

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Programme: Add on Course (Partial Differential Equations) Date:

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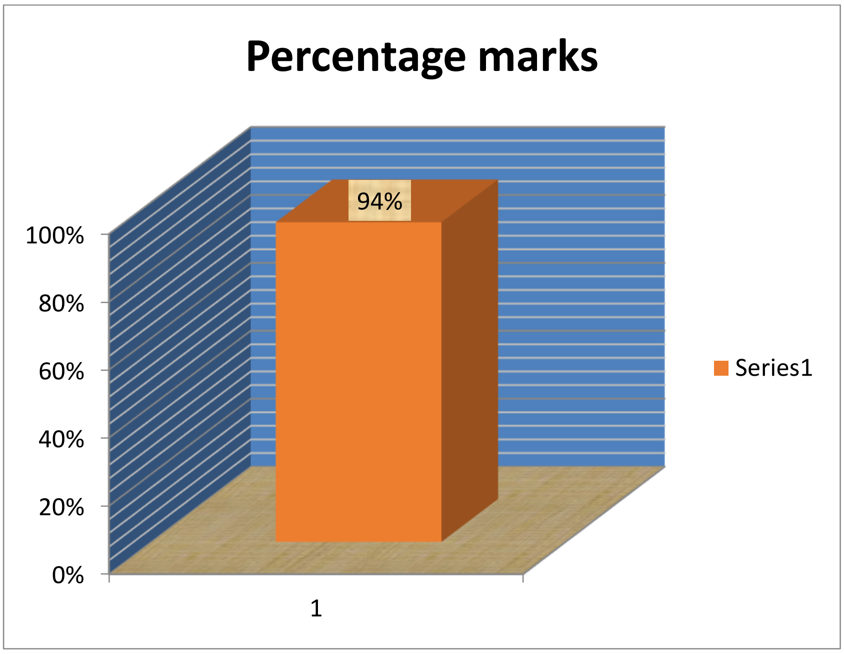
36.	K.Devi Sri Keerthi	I Mpcs	9390531535	keerthikollavari@gmail.com	K.Devi Sri Keerthi
37.	B.Suseela	I Mpcs	9949192193	suseelab193@gmail.com	B.Suseela
38.	B. Renuka	I Mpcs	8688442577	boyarenuka281@gmail.com	B. Renuka

Results:

Total number of students appeared:	100
Total number of students passed:	94
Pass percentage:	94%



COURSE TOPPERS:

1. B. Thulasi Tanmai
2. S. Divya
3. G. Sai Sri Harsha

St. Joseph's Degree College

Sunkesula Road, Kurnool – 4

Certificate of Completion

This is to certify that Mr./Ms. ***B. Thulasi Thanmai*, I-MPCs** has successfully completed ***Add on course*** **entitled " Partial Differential Equations" conducted by the Department of Mathematics, St.Joseph's Degree College, Kurnool during the period 2nd January-13th March 2020.**

Dr. T. Mohan Reddy
HOD, Dept. of Mathematics

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20-03-2020

Shantha

Dr. K. Shantha
Principal