Total No. of Sections: 03Total No. of Printed Pages: 04

Code No. : C-392

Annual Examination - 2019

BCA Part - III

BCA - 301

CALCULUS, DIFFERENTIAL EQUATION

AND COMPUTER ARCHITECTURE

Paper - II DIFFERENTIAL EQUATION AND FOURIER SERIES

Max.Marks: 50 Min.Marks: 20

Time : 3 Hrs.Min.Marks : 20Note : Section 'A', containing 10 very short-answer-type questions, is

questions. Section 'A' has to be solved first.

Section - 'A'

Answer the following very short-answer-type questions in one or two sentences : $(1 \times 10 = 10)$

- Q.1 What is the order of differential equation :
- Q.2 Write the form of Clairant's equation.
- Q.3 Write definition of orthogonal trajectories.
- Q.4 What is the complementary function of given differential

equation
$$\frac{d^2y}{dx^2} - 4\frac{dy}{dx} + 3y = 0.$$
 P.T.O.

OR

(4)

Solve :

Q.3 Solve :

OR

Solve: $\frac{\partial^3 z}{\partial x^3} - 2 \frac{\partial^3 z}{\partial x^2 \partial y} - \frac{\partial^3 z}{\partial x \partial y^2} + 2 \frac{\partial^2 z}{\partial y^3} = e^{x+y}$

Q.4 Find the Fourier series for f(x) in the interval

 $f(x) = \begin{cases} \pi + x , -\pi < x < 0 \\ \pi - x , 0 < x < \pi \end{cases}$ OR

Find the Fourier series for the function |x| in

Hence deduce that $\frac{1}{1^2} + \frac{1}{3^2} + \frac{1}{5^2} + \dots = \frac{\pi^2}{8}$.

Q.5 If u(x, y, z) is function of

, then prove that

OR

Transform the Laplace's equation

into polar

, where

form.

----X----

 $(3 \ 5=15)$

.

- Q.5 Define partial differential equation.
- Find complementary function of given partial differential Q.6 equation :

$$2r + 5s + 2t = 0$$

- Give Bessel's inequality. **O**.7
- Write definition of odd function. Q.8
- Write definition of piecewise smooth function. Q.9
- Q.10 Write formula for one dimensional diffusion equation or heat flow equation.

Section - 'B'

Solve the following questions:

Q.1 Solve the differential equation

OR

Solve the differential equation

Q.2 Solve:
$$\frac{d^2y}{dx^2} - 3\frac{dy}{dx} + 2y = e^{2x}$$

OR

Solve:
$$x^2 \frac{d^2 y}{dx^2} - x \frac{dy}{dx} + y = 2\log x$$

Q.3 Find the partial differential equation by eliminating a and a,

OR

Find the complete solution :

 $yp = 2yx + \log q$

0.4 Find the Fourier series for the function

OR

(3)

Show that

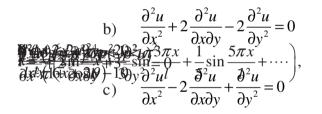
when

Explain Gibbs phenomenon. Q.5

OR

Classify the following partial differential equations :

a)



Section - 'C'

Solve the following questions:

 $(5 \times 5 = 25)$

Solve : **Q.1**

OR

Solve :

Find the equation of the system of orthogonal trajectories of a Q.2 system of confocal and coaxial parabolas

P.T.O.

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