



The Islamia University of Bahawalpur
Department of Computer Science & IT
BSCS Semester – III

Paper: CSIT-01303 (Differential Equations)

Term: Final

Marks: 20

Name: _____

Roll No: _____ Regular / Repeater

Part – I (20 minutes)

Q.1 Tick the appropriate option. Overwriting and cutting is not allowed.

1) A differential equation $Mdx + Ndy = 0$ is exact if

a) $\frac{\partial M}{\partial x} = \frac{\partial N}{\partial y}$

b) $\frac{\partial M}{\partial y} = \frac{\partial N}{\partial x}$

c) $\frac{\partial M}{\partial y} \neq \frac{\partial N}{\partial x}$

d) none

2) A differential equation of the form $(x^2 + xy + y^2)dx = xydy$ is called

a) homogeneous

b) separable

c) Exact

d) none

3) If roots of linear second order differential equation is real repeated roots then

general solution will contains

a) two constants and two exponentials

b) sinusoidal functions and exponentials

c) two constants and one exponentials

d) none of these

4) If roots of linear second order differential equation is complex conjugate then general

solution will contains

a) two constants and two exponentials

b) two constants and one exponentials

c) sin , cos functions and one exponential

d) none of these

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5) If roots of linear second order differential equation are distinct, then general

solution will contains

- a) two constants and two exponentials b) two constants and one exponentials
c) sinusoidal functions and exponentials d) none of these

6) A differential equation of the form $(x^2 + xy + y^2)dx = xydy$ is called

- a) homogeneous b) separable
c) Exact d) none

7) Differential calculus involves an operator called

- a) differential operator b) integral operator
c) arithmetic operator d) none of these

10) Every homogeneous differential equation can be made separable after a suitable

Substitution e.g $y = vx$.

T / F

11) The homogeneous differential equation is always separable.

T / F

12) Bernoulli's equation can be converted to linear differential equation by a suitable substitution

T / F

13) $\frac{dy}{dt} + p(t)y = q(t)$ is linear in t .

T / F

14) For eq. of orthogonal trajectory, $\frac{dy}{dx}$ is replaced by $-\frac{dy}{dx}$.

T / F

15) For finding the differential eq. of $ax^2 + by^2 = 0$ we shall differentiate this eq. twice.

T / F

16) $x dy + y dx$ is a separable differential eq.

T / F

17) $(D^2 - D - 12)y = 0$ is a differential eq. having repeated roots.

T / F

18) The non homogeneous differential eq. has three solutions.

T / F

19) The Bernoulli studied Bernoulli's eq. in 1796.

T / F

20) $(D + 1)^3 y = 0$ is a differential; eq. with distinct roots.

T / F



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Exam Marks: 30

Time: 80 minutes

Part-II

Q.2 Attempt all parts. Each part carries 03marks. (18)

2.1) Derive the general solution of linear differential eq.

2.2) Solve the differential equation $(3x^2 + 4xy)dx + (2x^2 + 2y)dy = 0$

2.3) Solve the differential equation $(2xy - 3)dx + (x^2 + 4y)dy = 0$, $y(1) = 2$

2.4) Find the differential equation of all circles passing through origin.

2.5) Solve differential equation $(6xy + 2y^2 - 5)dx + (3x^2 + 4xy - 6)dy = 0$

2.6) Solve differential equation $(x^2 + 1)\frac{dy}{dx} + 2xy = 4x^2$

Q.No.3 Attempt all parts. Each part carries 06 marks. (12)

3.1) Solve differential equation $\frac{dy}{dx} + \frac{y}{2x} = \frac{x}{y^2}$, $y(1) = 2$.

3.2) Solve the IVP $y'' - 4y = 2 - 8x$, $y(0) = 0$, $y'(0) = 5$