S.S.R. DEGREE COLLEGE, (AUTONOMOUS)

NIZAMABAD (C.C:5029)

I - SEMESTER INTERNAL ASSESSMENT – II EXAMINATIONS

MATHEMATICS

QUESTION BANK

I. Multiple Choice Questions

1. If the auruillary equation has complex conjugate roots then the complementary function is _____ (A)

   a)e^{ax} (C_1Cos βx+C_2 Sin βx) b)e^{-ax} (C_1 Cos βx +C_2 Sinβx)

   c)$e^{\beta X}$ (C_1Cos$\propto$ βx+C_2 Sin $\propto$x) d) $e^{\beta X}$ (C_1Cos$\propto$ βx+C_2 Sin $\propto$x)

2. The complementary function of an equation having the roots 1,2 is _____(B)

   a)$C_1e^x + C_2 e^x$ b)$C_1 e^x + C_2e^{2X}$

   c)$C_1e^{-x} + C_2 e^{2X}$ d) $C_1e^{-x} + C_2 e^{-2X}$

3. The complementary function of an equation having the roots -1,-1, 4 is ____(C)

   a) $C_1e^x + C_2 e^X C_3 e^{4X}$ b) $C_1e^{-x} + C_2 e^{-X} + C_3e^{4X}$

   c)$C_1 + C_2$ X) $e^{-X} + C_3 e^{4X}$ d) None

4. The G.S of nth order non homogeneous D.E is _____ (A)

   a)Y= Y_C + yP b)y=y_C. y_p c) Y=y_C - y_P d)Y= Y_C ($1/yp$)

5. The complementary function of an equation having the roots 2+3i is _____(B)

   a)$Y_C = C_1 e^{2X} + C_2 e^{3X}$ b)e^{2X}(C1Cos 3X + C_2 Sin3X) c)y=y_C- yp d)y=y_C ($1/yp$)

6. The particular integral of (D^2 – 5D + 6) y = 0 is (D)

   a)1 b)5 c)6 d)0

7. The particular integral of $\frac{1}{D^2-1}$ Cos 3X is _____ (C)

   a)$\frac{1}{10}$Cos3x b) $\frac{1}{10}$Sin3x c)$\frac{-1}{10}$ Cos3x d) $\frac{-1}{10}$ Sin3x

8. The Complementary function of (D^2 – 1) is _____ (D)

   a)$C_1 e^X + C_2e^X$ b)C_1 Cos hx + C_2 Sin hx c) Both (a) & (b) d) $C_1 e^{2X} + C_2 e^{2X}$

9. The particular integral of $\frac{9}{D^2+5D+4}$ is _____ (D)

   a)0 b)1 c)$\frac{4}{9}$ d)$\frac{9}{4}$

10. The complementary function of (D^2 + 4) y is _____ (A)

    a) C_1 Cos2X + C_2Sin2X b)C_1Cosh2X+ C_2 Sinh2x

    c) (C_1 + C_2X) e2x d)$C_1 e^{2X} + C_2 e^{-2X}$

11. The Particular integral of $4X^2$ Can be written (A)

    a)AX^2 + BX+C b) A X^2- BX+C c) Ax^2 + BX – C d)- (A)

12. In cauchy Eular equation, 'X' is substuted as

    a) + b) Log + c)e^+ d)None of these

13. The two linearly independent solutions of $(D^2 - 3D+2)$ Y is (D)
    a) e^{-X}, e^{-2X} b) e^{-X}, e^{2X} c) e^{X}, e^{-2X} d) e^{X}, e^{2X}
14. If $\emptyset(x) = x+\log x$ by Cauchy Euler Equation $\emptyset(x)$ becomes (A)
    a) $e^{+}+t$ b) $e^{+}- t$ c) $e^{+}.t$ d) $t\, e^{+}$
15. In legendre's linear equation ax+b substitutedas (B)
    a) Log t b) e^{t} c) e^{-t} d) None
16. Which of the following is miscellaneous D.E (C)
    a) $\frac{d^2y}{dx^2} = f(x)$ b) $\frac{dx}{dy} = f^1(x)$ c) $\frac{d^2y}{dx^2} = f(x)$ d) None
17. which of the following is partial differential equation (D)
    a) $\frac{\partial^2}{\partial x} = p$ b) $\frac{\partial^2}{\partial y} = q$ c) $\frac{\partial^2 z}{\partial x^2} = r$ d) All
18. the solution obtained from complete integral through assigning particular values to constants is (B)
    a) complete solution b) particular solution c) both d) None
19. If one of the solution of differential equation is known then the second solution can be determined by using (C)
    a) method of undetermined coeffitient b) variation of parameter
    c) Reduction of order method d) None of these
20. If $y_2 = y_1 \int u(x)dx$ then $u(x)$ =_____ (B)
    a) $\frac{e^{\int \frac{f_1(x)}{f_2(x)}dx}}{y_1^2}$ b) $\frac{e^{-\int \frac{f_1(x)}{f_2(x)}dx}}{y_1^2}$ c) $\frac{e^{\int \frac{f_2(x)}{f_1(x)}dx}}{y_1^2}$ d) $\frac{e^{-\int \frac{f_2(x)}{f_1(x)}dx}}{y_1^2}$

II. Fill In The Blanks

1. The general solution of n^{th} order homogeneous differential equation is **complement** function.
2. The auxillary equation $(D^2 - 3D + 2)y$ = **m^2-3m+2 .**
3. The roots of $(D^2 -5D+6)y$ are **2,3 .**
4. If the roots of auxillary equation are real then complementary function is **$C_1e^{m1x}+C_2e^{m2x+\ldots.}$**
5. The particular integral for f(D)y = e^{ax},f(a) $\neq 0$ is **e^{ax}/f(a)**
6. The value of $\frac{e^{2x}}{D^2+4D+3}$ is **e^{2x}/15.**
7. The auxillary equation having the roots 2,3 is **m^2-5m+6=0.**
8. The complementary function of (D+2)(D-2) is **$c_1e^{-2x}+c_2e^{2x}$**
9. The particular integral of differential equations depends on **Q(x)**
10. in method of undetermined coeffitients f(D)y = **$f(D)y_p$**
11. if 'y_1' is known solution then 'y_2' can be determined by formula **$y_2+y_1\int 4(x)dx$**
12. By substuting X= e^{t} Cauchy euler equation is converted in to linear equation with constant coeffitients.
13. The particular integral of $(D^2+4D+4)y = 6e^{x}$ is **$\frac{2}{3}e^{x}$**
14. In method of variation of parameters, the two linearly independent solutions can be determined from **complem entary**.

15. If Q(x) = x^2 in Cauchy –euler equation reduced to linear order differential equation the x^2 becomes **e^{2t}**.
16. The two linearly independent solution of $(D^2+4D+4)y$ are **$e^{-2x}.xe^{-2x}$**
17. **Partial differential equation** can be obtained by eliminating arbitrary constants (or) orbitrary functions in valuing two or more variables.
18. The solution of first order PDE that has two arbitrary can stants is called as c**omplete integara**l.
19. The linear PDE of first order is also called as **Lagranges linear** PDE.
20. The equation of the form $\frac{dx_1}{p_1} = \frac{dx_2}{p_2} \ldots\ldots\ldots \frac{dx_n}{p_n} = \frac{dz}{R}$ is called as **subsidiary equation**.

III. Descriptive Questions

1. Solve $(D^2+4D+4)y = 4x^2 +6e^x$ by method of undetermined coeffitient.
2. $(D^2+4D+4)y = n3x^{-2x}$ by the method of undetermined coeffitient.
3. Solve $(D^2-3D+2)y = sine^{-x}$ using the method of variation of parameter.
4. Solve $x^2\frac{d^2y}{dx^2} - x\frac{dy}{dx} + y = 2logx.$
5. Solve $x^2y^{11} - xy^1+y=0$ given $y_1=x$ as a solution