Roll No. 2182300201

Total No. of Questions : 5] [Total No. of Printed Pages : 3

EW-165

B.E. IIIrd Semester (New Scheme) CSE

Examination, 2021-22

Engineering Mathematics-II

Paper - CS-301

Time : 3 Hours] **[Maximum Marks : 60**

Note :- Attempt all questions. All questions carry equal Marks.

Attempt any two from each question.

1. (a) Solve : $\tan x . \sin^2 y \, dx + \cos^2 x . \cot y \, dy = 0$

(b) Solve : $(D^2 + 4D - 12)y = e^{2x} . (x - 1)$; $D \equiv \frac{d}{dx}$

(c) Solve : $\frac{dx}{dt} - 7x + y = 0$ and $\frac{dy}{dt} - 2x - 5y = 0$.

2. (a) Solve $x^2y^{11} + xy^1 - y = 0$, given that $x + \frac{1}{x}$ is one integral.

(b) Give working rule for solving second order Linear differential equation by the method of variation of parameters.

(c) Solve : $y^{11} - (2\tan x)\,y^1 + 5y = 0$ using normal form.

3. (a) Solve : $p(1 + q) = qz$

(b) Solve : $(Dx^2 + Dy^2)z = x^2y^2$

(c) Solve : $p^2 - q^2 = x - y$

4. (a) Show that the function $z|z|$ is not analytice any where.

(b) Using Cauchys integral formula, evaluate $\int_C \frac{e^{2z}}{(z+1)^4} dz$,

where C is the circle $|z| = 3$.

(c) Explain the concept of analytic functions and harmonic conjugate. Give suitable examples.

5. (a) Explain the concept of divergence of a rector field. Give its physical interpretation.

(b) Find the directional derivative of $f(x, y) = x^2y^3 + xy$ at (2, 1) in the derection of a unit vector which makes an angle of 60^0 with the x-axis.

(c) Find the gradient of $f(x, y, z) = xy + 2yz - 8$ at (3, –2, 1).

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