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#Diego Butler



so many fake sites. this is the first one which worked! Many thanks

Roll No

BE-301
R.E. III Semester
Examination, June 2016
Mathematics - II
(Common for all Branches)
Time: Three Hours

Maximum Marks: 70

Note: i) Answer five questions. In each question part A, B, C is compulsory and D part has internal choice.
ii) All parts of each question are to be attempted at one place.
iii) All questions carry equal marks, out of which part A and B (Max. 50 words) carry 2 marks, part C (Max. 100 words) carry 3 marks, part D (Max. 400 words) carry 7 marks.
iv) Except numericals, Derivation, Diagram and drawing etc.

1. a) Write Fourier series expansion of a periodic function $f(x)$ which is defined in the interval $(-\pi, \pi)$. Write Euler's formula also. ALP/2016/2201
b) Define Fourier transform and inverse Fourier transform.
c) Find the coefficient a_0 in the Fourier expansion of the even function $f(x) = \cos x$ in the interval $(-\pi, \pi)$.
d) Find Fourier sine transform of $\frac{e^{-ax}}{x}$.

OR

Obtain the Fourier series for the function $f(x) = x$ in the interval $(-\pi, \pi)$.

2. a) Find Laplace transform of $f(t) = t^2 e^{-bt}$.
b) Evaluate $L^{-1}\left\{\frac{1}{(s^2+25)}\right\}$.
c) Evaluate $L\{x^n \sin at\}$.
d) Using convolution theorem, find $L^{-1}\left\{\frac{1}{(s^2+a^2)^2}\right\}$.

OR

Using Laplace transform, solve the equation $(D^2 + 8D + 9)y = \sin x$, given that $y(0) = 1$ and $y'(0) = 1$.

3. a) Show that $y = e^x$ is a part of complementary function of the differential equation $(1-x)\frac{d^2y}{dx^2} - (9-4x)\frac{dy}{dx} + (6-3x)y = 0$.
b) Define ordinary point and singular point of a second order linear differential equation with variable coefficients.
c) Using method of removal of first derivative, write the normal form of the equation $\frac{d^2y}{dx^2} + 2x\frac{dy}{dx} + (x^2+1)y = x^2 + 3x$.

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