

COLLEGE OF ENGINEERING PUNE.

DEPARTMENT OF MATHEMATICS

END SEMESTER Examination

BP - 101 Applied Mathematics I

CLASS: F.Y.B.TECH(Planning)

Max. Marks: 60

TIME: 3hrs 10.00 am - 1.00 pm

DATE: 26 NOV 2014

N.B. 1) All questions are compulsory.

2) Use of No-Programmable calculators is allowed.

3) Answer Any Three subparts from each questions.

Q.1 Find the first order derivatives for the following functions i) $f(x) = \frac{\sin x + \cos x}{\sin x - \cos x}$ 5

ii) $f(x) = \frac{1 - \tan x}{1 + \tan x}$ 5

iii) $f(x) = (3x^4 + x + 5) / \sin x + 4$ 5

iv) $f(x) = x^2 \cos x - 3x^4 \tan x$ 5

Q.2 Use chain rule to differentiate following :

i) $f(x) = x^x$ 5

ii) $f(x) = \tan x^x$ 5

iii) $f(x) = x^{\sin x}$ 5

iv) $f(x) = 10^{3x^2}$ 5

Q.3 Solve the following(Any three)

(i) $\int \frac{\sin x}{1 + \sin x} dx$ 5

(ii) $\int \frac{2 - 6\cos 2x}{\sin^2 2x} dx$ 5

P.T.O.

(iii) $\int \frac{1}{1+e^x} dx$ 5

(iv) $\int \frac{1}{3\sin x + 4\cos x} dx$ 5

Q. 4
(i) Find the inverse of matrix by adjoint Method $A = \begin{bmatrix} 3 & 15 & -1 \\ -1 & 2 & 1 \\ 3 & 12 & -2 \end{bmatrix}$ 5

(ii) Find the minimum and maximum values of the function. $x^3 + y^3 = 1$ 5

(iii) Find rank of Matrix using Normal form $A = \begin{bmatrix} 1 & 2 & 4 \\ 5 & 4 & 0 \\ -1 & 0 & -2 \end{bmatrix}$ 5

(iv) Find the inverse of matrix by Gauss Jordan Method $A = \begin{bmatrix} 1 & 2 & 3 \\ 4 & 4 & 5 \\ 1 & 3 & 4 \end{bmatrix}$ 5