

BHARATI VIDYAPEETH COLLEGE OF ENGG.

TERM TEST - II (2014-2015)

Class-FE SEM-II

SET(A)

Marks-20

Sub-Applied Maths II

Time-1 H

Note: Question no.1 is compulsory.

Answer Q no. 2 or 3 completely.

Q1)a) Prove that $\int_0^{\frac{\pi}{2}} \sqrt{\tan \theta} d\theta \int_0^{\frac{\pi}{2}} \sqrt{\cot \theta} d\theta = \frac{\pi^2}{2}$ (5)

b) Evaluate $\int_0^{\frac{\pi}{4}} \int_0^{\sqrt{\cos 2\theta}} \frac{r dr d\theta}{(1+r^2)^2}$ (5)

Q 2)a) Evaluate $\iint (x^2 + y^2) dx dy$ over the triangle with vertices (0,0), (1,0) & (1,2). (5)

b) Using D.U.I.S. prove that $\int_0^{\infty} \frac{\tan^{-1}\left(\frac{a}{x}\right) - \tan^{-1}\left(\frac{x}{b}\right)}{x} dx = \frac{\pi}{2} \log\left(\frac{b}{a}\right)$, $a>0, b>0$. (5)

Q3)a) Find the total length of the curve $x^{\frac{2}{3}} + y^{\frac{2}{3}} = a^{\frac{2}{3}}$ (5)

b) Change the order of $\int_0^a \int_y^{\sqrt{ay}} f(x, y) dx dy$ (5)