FE-II (old)
AM-II

6. (a) Evaluate $\int_0^{\pi} \sin^2\theta\,(1+\cos\theta)^3\,d\theta$ 6

(b) Evaluate $\int\int_R x(x-y)\,dx\,dy$ where R is the triangle with vertices (0,0), (1, 2) (0,4). 6

(c) Solve by mehtod of variation of parameters $(D^2+1)\,y = \cot x$. 8

7. (a) Evaluate $\int_0^1 x^{q-1}\left(\log\frac{1}{x}\right)^{p-1} dx$ 6

(b) Evaluate $\int\int r\sin\theta\,dA$ over the cardiode $r = a(1+\cos\theta)$ above the initial line. 6

(c) The differential equation of motion of a body is $\frac{d^2x}{dt^2} + n^2x = f\cos pt$. Solve this equation. What is the solution if $p = n$? 8
