

#Jenny



Finally I get this ebook, thanks for all these I can get now!

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Cool! I'am really happy

#Markus Jensen



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My friends are so mad that they do not know how I have all the high quality ebook which they do not!

#Diego Butler



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

C' Cycle
CBCS Scheme

SSN SMATH

First Semester B.E. Degree Examination, Dec. 2015/Jan. 2016
Engineering Mathematics - I

Time: 3 hrs. Max. Marks: 80

Note: Answer any FIVE full questions, choosing one full question from each module.

Module-1

1. a. Find the n^{th} derivative of $\frac{x^2}{2x^2 + 7x + 6}$. (08 Marks)
- b. Find the angle between the curves $r^2 \sin 2\theta = 4$ and $r^2 = 16 \sin 2\theta$. (08 Marks)
- c. Find the radius of curvature of the curve represented by $x = a\theta + \sin \theta$, $y = a(1 - \cos \theta)$. (08 Marks)

OR

2. a. If $y = (x + \sqrt{x^2 - 1})^n$ then prove that $(x^2 - 1)y_{n+2} + (2n + 1)xy_{n+1} - (n^2 - 1)y_n = 0$. (08 Marks)
- b. Find the pedal equation of $r^n = a(1 + \cos \theta)$. (08 Marks)
- c. Find the radius of curvature of the curve $r^n = a^n \sin n\theta$. (08 Marks)

Module-2

3. a. Expand $\sin x$ in powers of $(x - \frac{\pi}{2})$ upto fourth degree term. (08 Marks)
- b. Evaluate $\lim_{x \rightarrow 0} \frac{x^2 - \ln(1+x)}{x^2}$. (08 Marks)
- c. If $u = x + y + z$, $uv = y + z$, $aw = z$ then find $\frac{\partial^2(u, v, w)}{\partial(x, y, z)}$. (08 Marks)

OR

4. a. Find the Maclaurin's series expansion of $\sec x$ upto x^4 term. (08 Marks)
- b. If $V(x, y) = (1 - 2xy + y^2)$ and $\frac{\partial V}{\partial x} = \frac{\partial V}{\partial y} = 0$, then find K. (08 Marks)
- c. If $u = \sin^{-1} \left(\frac{x + 2y + 3z}{\sqrt{x^2 + y^2 + z^2}} \right)$ then find $\frac{\partial u}{\partial x} + 2\frac{\partial u}{\partial y} + 3\frac{\partial u}{\partial z}$. (08 Marks)

Module-3

5. a. A particle moves along the curve whose parametric equations are $x = t^2 - 1$, $y = t^2 - 2t + 5$ where t is the time. Find the component of its velocity at $t = 1$ in the direction of $i + j + 3k$. Find also the component of its acceleration at $t = 1$ along the normal to $i + j + 3k$. (08 Marks)
- b. Verify whether $\vec{A} = (2x + y^2)i + (4y + xz)j - (xz - y^2)k$ is irrotational or not. And find the scalar potential of \vec{A} . (08 Marks)
- c. If \vec{A} is a vector point function and \vec{a} is a scalar point function then prove that $\text{div}(\vec{A} \times \vec{a}) = \text{grad} \phi \cdot \vec{A}$. (08 Marks)

OR
1 of 2

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