

Mathematics & Statistics-I

Time : 2 Hrs.

October - 2010

Marks : 40

Q.1. (A) Attempt any ONE of the following :

(i) Evaluate : $\lim_{x \rightarrow 0} \frac{\cos 5x - \cos 11x}{x^2}$ (2)

(ii) Discuss the continuity of the function f defined as,

$$f(x) = 2x + 3, \text{ if } -1 \leq x \leq 2$$

$$= 6x - 1, \text{ if } 2 < x \leq 3,$$

at $x = 2$

(2)

(B) Attempt any ONE on the following :

(i) Evaluate : $\int \sin^2 3x \, dx$.

(ii) Evaluate : $\int \frac{1}{e^x + 5} \, dx$

(2)

(C) Attempt any ONE of the following :

(i) 'C' denotes the total cost of producing 'x' items. If the rate of change of C with respect to x is $(10x + 5)$ and the fixed cost is Rs. 600, show that the cost of producing 20 items is Rs. 2700. (4)

(ii) Solve the differential equation $(x - y^2x) \, dx - (y - x^2y) \, dy = 0$. Also find its particular solution if $y = 0$ when $x = 2$. (4)

Q.2. (A) Attempt any ONE of the following :

(i) Show that $y \sec x = \tan x + C$ is a solution of the differential equation $\frac{dy}{dx} + y \tan x = \sec x$. (2)

(ii) Form the differential equation by eliminating the arbitrary constants A and B from $y = Ax^2 + B$. (2)

(B) Attempt any ONE of the following :

(2)

(i) Find $\frac{dy}{dx}$, if $x^2 + y^2 = 3axy$.

(ii) Find $\frac{dy}{dx}$, if $y = \tan^{-1} \left(\frac{7x}{1-10x^2} \right)$

(4)

(C) Attempt any ONE of the following :

(i) Evaluate : $\int_0^1 \left(\frac{x}{\sqrt{4-x}} \right) \, dx$.

(ii) Evaluate : $\int_0^{\pi/2} \frac{1}{5+3 \cos x} \, dx$

(2)

Q.3. (A) Attempt any ONE of the following :

(i) Find $\frac{dy}{dx}$, if $y = \cos(x^2 e^x)$

(ii) Find $\frac{dy}{dx}$, if $y = \log_{10}(\sin x)$

(B) Attempt any ONE of the following :

(i) (a) Rewrite the following statement removing the connective 'or' and using the connective 'If ... then.....'. Mumbai is not in Maharashtra or Delhi is in China.

(b) Write the contrapositive of the statement — 'If it rains heavily then the trains stop working.'

(2)

(ii) Write the negations of the following statements without using the phrase 'It is false that' or 'It is not true that' :

(2)

(a) All politicians are honest.

(b) $(\neg p \rightarrow q) \wedge r$

(C) Attempt any ONE of the following :

(4)

(i) Evaluate : $\int \frac{\sec^2 x}{\sec^2 x - 2 \tan x + 1} \, dx$

(ii) Evaluate : $\int \cos^2 \sqrt{x} \, dx$

Hsc 2009 Mathematics Question Paper

Ying Liu



Hsc 2009 Mathematics Question Paper:

Hsc 2009 Mathematics Question Paper: Bestsellers in 2023 The year 2023 has witnessed a remarkable surge in literary brilliance, with numerous captivating novels captivating the hearts of readers worldwide. Let's delve into the realm of bestselling books, exploring the captivating narratives that have captivated audiences this year.

Hsc 2009 Mathematics Question Paper : Colleen Hoover "It Ends with Us" This heartfelt tale of love, loss, and resilience has captivated readers with its raw and emotional exploration of domestic abuse. Hoover skillfully weaves a story of hope and healing, reminding us that even in the darkest of times, the human spirit can triumph.

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These popular novels represent just a fraction of the literary treasures that have emerged in 2023. Whether you seek tales of romance, adventure, or personal growth, the world of literature offers an abundance of compelling stories waiting to be discovered.

The novel begins with Richard Paffen, a bright but troubled young man, arriving at Hampden College. Richard is immediately drawn to the group of students who call themselves the Classics Club. The club is led by Henry Winter, a brilliant and charismatic young man. Henry is obsessed with Greek mythology and philosophy, and he quickly draws Richard into his world. The other members of the Classics Club are equally as fascinating. Bunny Corcoran is a wealthy and spoiled young man who is always looking for a good time. Charles Tavis is a quiet and reserved young man who is deeply in love with Henry. Camilla Macaulay is a beautiful and intelligent young woman who is drawn to the power and danger of the Classics Club. The students are all deeply in love with Morrow, and they are willing to do anything to please him. Morrow is a complex and mysterious figure, and he seems to be manipulating the students for his own purposes. As the students become more involved with Morrow, they begin to commit increasingly dangerous acts.

The Secret History is a brilliant and suspenseful novel that will keep you guessing until the very end. The novel is a warning tale about the dangers of obsession and the power of evil.

<https://staging.conocer.cide.edu/public/Resources/Documents/History%20100%20Western%20Civilization%20Course%20Reader.pdf>

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