

Sundarban Mahavidyalaya

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Intermediate Exam. - 2020

B.Sc General Sem - II.

Sub. - MTMG₁. F.M - 20
(CC2/GE2)

Select the correct option from the following questions
2 × 10 = 20

1. The function $f(x) = x^3 - 9x^2 + 24x - 12$ has a maximum, when the value of x is
(a) 1 (b) 2 (c) 3 (d) 4

2. $\lim_{x \rightarrow 0} \frac{e^x - e^{-x} - 2x}{x - \sin x} =$
(a) 0 (b) 1 (c) -1 (d) 2

3. The critical point of the function $f(x, y) = xy$ is
(a) (1, 1) (b) (1, -1) (c) (-1, 1) (d) (0, 0)

4. The general solution of $\frac{d^2y}{dx^2} + 3\frac{dy}{dx} + 2y = 0$ is
(a) $y = Ae^{-x} + Be^{-2x}$ (b) $y = e^{-x} + e^{-2x}$ (c) $y = e^{-x}(A + Bx)$ (d) none

5. If the vectors $x\vec{i} - 4\vec{j} + 5\vec{k}$, $\vec{i} + 2\vec{j} + \vec{k}$, $2\vec{i} - \vec{j} + \vec{k}$ are coplanar then the value of x is
(a) $\frac{1}{19}$ (b) $\frac{1}{3}$ (c) $\frac{29}{3}$ (d) $\frac{31}{3}$

6. If $P(n) = 11^{n+2} + 12^{2n+1}$ where $n \in \mathbb{N}$ ②
always divisible by

(a) 113 (b) 123 (c) 133 (d) 143

7. The triangle formed by the vectors
 $3\vec{i} - 2\vec{j} + \vec{k}$, $\vec{i} - 3\vec{j} + 5\vec{k}$, $2\vec{i} + \vec{j} - 4\vec{k}$ is a

(a) isosceles (b) equilateral (c) rightangled (d) none

8. If $\lim_{x \rightarrow 0} \frac{\sin 2x + a \sin x}{x^3}$ be finite, then
the value of 'a' is

(a) -1 (b) -2 (c) 0 (d) 2

9. The function $f(x, y) = 2x^2 - xy + 2y^2 - 20x$
is minimum at

(a) $(-\frac{16}{3}, \frac{4}{3})$ (b) $(\frac{16}{3}, \frac{4}{3})$ (c) $(-\frac{16}{3}, -\frac{4}{3})$ (d) none

10. Work done in moving an object along a
straight line from $(3, 2, -1)$ to $(2, -1, 4)$
in the force field given by $\vec{F} = 4\vec{i} - 3\vec{j} + 2\vec{k}$

(a) 13 units (b) 14 units (c) 15 units (d) none