O. P. JINDAL SCHOOL, SAVITRI NAGAR

Weekly Test -2 (2025 – 2026)

Class : XII | **Max Marks : 20**

Subject: Mathematics | **Time: 1 Hour**

General Instructions:

(i) All the questions are compulsory.

(ii) The question paper consists of 13 questions divided into 3 sections. Section A has 8 questions of 1 mark each, section B has 3 questions of 2 marks and section C has 2 questions of 3 marks each.

(iii) There is no overall choice. However, internal choice has been provided in 2 questions You have to attempt only one of the alternatives in all such questions.

Section - A

1. If x is real, the minimum value of $x^2 - 8x + 17$ is

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

2. The absolute maximum value of the function $y = x^3 - 3x + 2$ in the interval [0,2] is

(a) 2 (b) 4 (c) 6 (d) 0

3. The order and degree of the differential equation $(\frac{d^2y}{dx^2})^3 - 5(\frac{dy}{dx})^4 + 6y = 0$ is

(a) 3 & 2 (b) 2 & 3 (c) 1 & 4 (d) 2 & 4

4. The general solution of the differential equation $ydx - xdy = 0$ *is*

(a) $xy = C$ (b) $x = Cy^2$ (c) $y = Cx$ (d) $y = Cx^2$

5. The order and degree of the differential equation $2(\frac{d^3y}{dx^3})^{3/2} - 7(\frac{d2y}{dx2})^2 - 6y = 0$ is

(a) 3 & 2 (b) 3 & 4 (c) 4 & 3 (d) 3 & Not defined

6. The order and degree of the differential equation $x\cos\left(\frac{dy}{dx}\right) = 3y\frac{dy}{dx} + x\frac{d^2y}{dx^2}$ is

(a) 1,1 (b) 2,1 (c) 1, not defined (d) 2, not defined

7. Which of the following functions is decreasing on $(0,\pi/2)$?

(a) sin 2x (b) tan x (c) cos x (d) sec x

8. Find the maximum profit that a company can make, if the profit function is given by $P(x) = 41 + 24x - 18x^2$.

(a) 25 (b) 43 (c) 62 (d) 49

Section - B

9. A stone is dropped into a quiet lake and waves move in circles at a speed of 5cm/sec. At the instant when the radius of the circular wave is 8cm, how fast is the enclosed area increasing?

10. Find the intervals in which the function $f(x) = 2x^3 - 9x^2 + 12x + 5$ is:

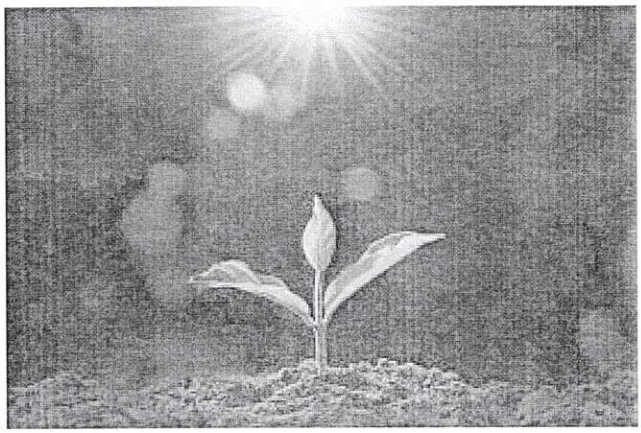
(a) Strictly increasing (b) Strictly decreasing

11. Find the particular solution of the differential equation: $\frac{dy}{dx} = \frac{1+y}{1+x}$, given that y = 0 when x = 0..

Section - C

12. Find the general solution of the differential equation $x\frac{dy}{dx} + 2y = x^2 \log x$.

13. The relation between the height of the plant 'y' (in cms) with respect to exposure to sunlight is governed by the following equation $y = 4x - \frac{1}{2}x^2$, where x is the number of days plant is exposed to sunlight.



Based on above information, answer the following questions:

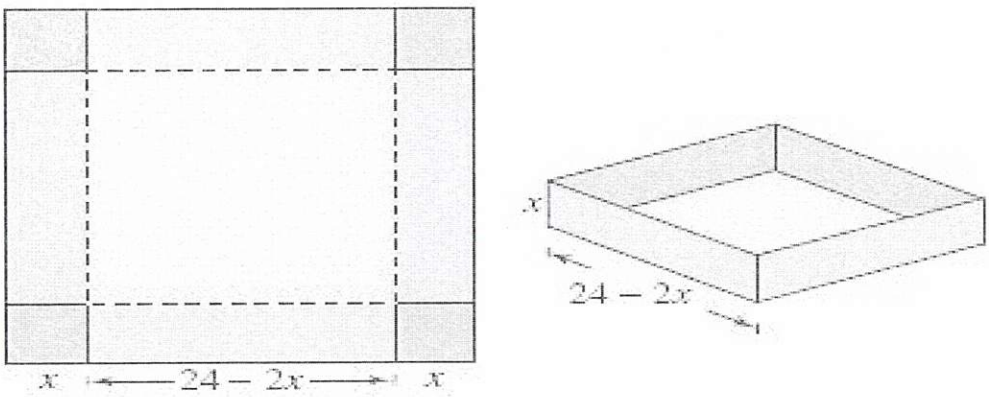
i. Find the rate of growth of the plant with respect to sunlight.

ii. How many days it will take for the plant to grow to the maximum height?

iii. What is the maximum height of the plant?

OR

A man has an expensive square shape piece of golden board of size 24 cm is to be made into a box without top by cutting from each corner and folding the flaps to form a box.



Based on above information, answer the following questions:

i. What is the volume of open box formed by folding up the flap of side x cm.

ii. What should be the side of the square piece to be cut from each corner of the board to have maximum volume?

iii. What is the maximum volume of open box?

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