

# 6th September, 2020

## Shift-2

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### INTEGER TYPE

- 1)  $\lim_{x \rightarrow 0} \frac{ax - (e^{4x} - 1)}{ax(e^{4x} - 1)}$  exists and is equal to  $b$ , then the value of  $a - 2b$  is
- 2) A line is a common tangent to the circle  $(x - 3)^2 + y^2 = 9$  and the parabola  $y^2 = 4x$ . If the two points of contact  $(a, b)$  and  $(c, d)$  are distinct and lie in the first quadrant, then  $2(a + c)$  is equal to
- 3) The value of  $\int_{-2}^2 |3x^2 - 3x - 6| dx$  is
- 4) If the remainder when  $x$  is divided by 4 is 3, then the remainder when  $(2020 + x)^{2022}$  is divided by 8 is
- 5) A line  $L$  passing through origin is perpendicular to the lines

$$L_1 : \vec{r} = (3 + t)\hat{i} + (-1 + 2t)\hat{j} + (4 + 2t)\hat{k}$$

$$L_2 : \vec{r} = (3 + 2s)\hat{i} + (3 + 2s)\hat{j} + (2 + s)\hat{k}$$

If the co-ordinates of the point in the first octant on  $L_2$  at the distance of  $\sqrt{17}$  from the point of intersection of  $L$  and  $L_1$  are  $(a, b, c)$ , then  $18(a + b + c)$  is equal to