

SECTION – A (1 × 5 = 5)

- 1) $-47 \pmod{9}$ is:
(A) 5 (B) 4 (C) 3 (D) 0
- 2) If $a > b$ and $c < 0$, then which of the following is true?
(A) $a + c < b + c$ (B) $a - c < b - c$ (C) $ac > bc$ (D) $a - c > b + c$
- 3) In an LPP, the maximum value of $Z = 3x + 4y$
subject to the condition $x + y \leq 40$,
 $x + 2y \leq 60$
 $x, y \geq 0$ is:
(A) 120 (B) 140 (C) 150 (D) 130
- 4) In a 1 km race, player P beats player Q by 18 metres or 9 seconds. What is P's time to complete the race?
(A) 512 s (B) 502 s (C) 492 s (D) 491 s
- 5) The last (unit) digit of $(22)^{22}$ is:
(A) 2 (B) 4 (C) 6 (D) 8

SECTION – B (2 × 2 = 4)

- 6) Pipe A can fill a tank in 1 hour and Pipe B can fill it in $1\frac{1}{2}$ hours. If both the pipes are opened in the empty tank, how much time will they take to fill the tank?
- 7) Solve for x: $\frac{(x + 3)}{(x + 2)} \leq 2$

SECTION – C (3 × 2 = 6)

- 8) A boat goes 3.5 km upstream and then returns. Total time taken is 1 hour and 12 minutes. If the speed of the current is 1 km/h, then find the speed of the boat in still water.
- 9) In a one-kilometre race, A beats B by 30 seconds and B beats C by 15 seconds. If A beats C by 180 metres, then find the time taken by A to run 1 kilometre.

SECTION – D (1 × 5 = 5)

- 10) Maximise $Z = 300X + 190Y$
Subject to the Condition
 $X + Y \leq 24$
 $2X + Y \leq 32$
 $X, Y \geq 0$