

**IPMAT/JIPMAT/IIM-B PYQ Practice Sheet:****Progression & Series**

**Q1 (IIM Bangalore (BBA-DBE) 2024 Slot 1):** The sum of the first 3 terms of an AP is 6 and that of the last 3 terms is 16. If the AP has 13 terms, what is the Arithmetic mean of the three terms that are exactly at the middle of the progression?

- (a) 22
- (b)  $11/3$
- (c) 11
- (d)  $22/3$

**Q2 (IIM Bangalore (BBA-DBE) 2024 Slot 2):** Let  $m/n = (90^2 + 5 \times 90 + 4)/(90^2 + 5 \times 90 + 6) \times (91^2 + 5 \times 91 + 4)/(91^2 + 5 \times 91 + 6) \times \dots \times (98^2 + 5 \times 98 + 4)/(98^2 + 5 \times 98 + 6)$ , where  $m$  and  $n$  are co-primes. What is the value of  $|m - n|$ ?

- (a) 3
- (b) 4
- (c) 6
- (d) 8

**Q3 (IIM Bangalore (BBA-DBE) 2024 Slot 2):** A boy agrees to work at the rate of one rupee on the first day, two rupees on the second day, four rupees on third day and so on, thus getting on any day twice the amount he received just the day before. How many rupees will the boy earn in all, if he started working on the 5<sup>th</sup> of March and completed the work on the 28<sup>th</sup> of March?

- (a)  $2^{20} - 1$
- (b)  $2^{20} - 2$
- (c)  $2^{24} - 1$
- (d)  $2^{23} - 1$

**Q4 (IIM Bangalore (BBA-DBE) 2025):** What is the sum of the infinite series:  $1 - 1/2 - 1/4 + 1/8 - 1/16 - 1/32 + 1/64 - 1/128 - 1/256 + \dots$ ?

- (a)  $6/7$
- (b)  $27/32$
- (c)  $2/7$
- (d)  $5/8$

**Q5 (IIM Bangalore (BBA-DBE) 2025):** If six arithmetic means are inserted between 3 and  $13/2$ , the ratio of the fifth and the first mean is:

- (a) 3 : 2
- (b) 11 : 7
- (c) 9 : 8
- (d) 8 : 5

**Q6 (2025: Sample Paper):** In a geometric progression, the first term is  $a$  (with  $a \neq 0$ ), the common ratio is  $r$  (with  $r < 1$ ), and the sum to infinity is  $S$ . If the second term of this geometric progression is

equal to the negative of the sum to infinity, what is the value of  $[r]$ , where  $[r]$  denotes the greatest integer function?

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

**Q7 (2025: PYP 2025):** Let  $A = \{a_1, a_2, \dots, a_i, \dots\}$  be an arithmetic progression, and let  $B = \{b_1, b_2, \dots, b_i, \dots\}$  be a geometric progression. The common difference for  $A$  is 2. The common ratio for  $B$  is 0.2, and  $b_1 = 0.8$ . The infinite sum of the products  $a_i b_i$  is 1, where  $i = 1, 2, 3, \dots$ . What is  $a_1$ ?

- (a)  $3/4$
- (b)  $1/4$
- (c)  $2/3$
- (d)  $1/2$

**Q8 (BMSAT Kozhikode 2025):** In a potato race, a bucket is placed at the starting point, which is 5m from the first potato, and the other potatoes are placed 3m apart in a straight line. There are 20 potatoes in the line. Each competitor starts from the bucket, picks up the nearest potato, runs back with it, drops it in the bucket, runs back to pick up the next potato, runs to the bucket to drop it, and continues in the same way until all the potatoes are in the bucket. What is the total distance the competitor has to run?

- (a) 1340m
- (b) 1470m
- (c) 1140m
- (d) None of these



**Q9 (BMSAT Kozhikode 2025):** The sum of 30 terms of the series  $\sqrt{2} + \sqrt{8} + \sqrt{18} + \sqrt{32} + \dots$  is

- (a)  $930/\sqrt{2}$
- (b) 465
- (c)  $465/\sqrt{2}$
- (d) None of these

**Q10 (BMSAT Kozhikode 2025):** A lift carrying 50 passengers from the ground floor of a 100-storeyed building is moving upwards. The lift stops at the 1st, 2nd, and 3rd floor, then skips the 4th floor, again stops at the 5th, 6th, and 7th, then skips the 8th floor, and so on. Passengers get discharged in a pattern: 2, 3, 3, 2, 3, 3,..... On which floor does the lift become empty?

- (a) 25th floor
- (b) 28th floor
- (c) 23rd floor
- (d) None of these

**Q11 (BMSAT Kozhikode 2025):** If  $p$ ,  $q$ , and  $r$  are in geometric progression, which of the following is true about  $qr$ ,  $pr$ , and  $pq$ ?

- (a) they are in arithmetic progression
- (b) they are in geometric progression

- (c) they are in harmonic progression
- (d) None of these

Q12 (IPMAT Indore 2019): Assume that all positive integers are written down consecutively from left to right as in 1234567891011..... The 6389th digit in this sequence is

[Integer type]

Q13 (IPMAT Indore 2019): Let  $\alpha, \beta$  be the roots of  $x^2 - x + p = 0$  and  $\gamma, \delta$  be the roots of  $x^2 - 4x + q = 0$  where  $p$  and  $q$  are integers. If  $\alpha, \beta, \gamma, \delta$  are in geometric progression then  $p + q$  is

- (a) -34
- (b) 30
- (c) 26
- (d) -38

Q14 (IPMAT Indore 2019): If  $(1 + x - 2x^2)^6 = A_0 + \sum_{r=1}^{12} A_r x^r$ , then the value of  $A_2 + A_4 + A_6 + \dots + A_{12}$  is

- (a) 31
- (b) 32
- (c) 30
- (d) 29

Q15 (IPMAT Indore 2019): The number of terms common to both the arithmetic progressions 2, 5, 8, 11, ..., 179 and 3, 5, 7, 9, ..., 101 is

- (a) 17
- (b) 16
- (c) 19
- (d) 15

Q16 (IPMAT Indore 2019): There are numbers  $a_1, a_2, a_3, \dots, a_n$  each of them being +1 or -1. If it is known that  $a_1 a_2 + a_2 a_3 + a_3 a_4 + \dots + a_{n-1} a_n + a_n a_1 = 0$  then

- (a)  $n$  is a multiple of 2 but not a multiple of 4
- (b)  $n$  is a multiple of 3
- (c)  $n$  can be any multiple of 4
- (d) The only possible value of  $n$  is 4

Q17 (IPMAT Indore 2020): If  $1/1^2 + 1/2^2 + 1/3^2 + \dots$  up to  $\infty = \pi^2/6$ , then the value of  $1/1^2 + 1/3^2 + 1/5^2 + \dots$  up to  $\infty$  is

- (a)  $\pi^2/8$
- (b)  $\pi^2/16$
- (c)  $\pi^2/12$
- (d)  $\pi^2/36$

Q18 (IPMAT Indore 2021): It is given that the sequence  $\{x_n\}$  satisfies  $x_1 = 0, x_{n+1} = x_n + 1 + 2\sqrt{1 + x_n}$  for  $n = 1, 2, \dots$ . Then  $x_{31}$  is \_\_\_\_\_

[Integer type]

**Q19 (IPMAT Indore 2021):** The sum up to 10 terms of the series  $1 \cdot 3 + 5 \cdot 7 + 9 \cdot 11 + \dots$  is  
*[Integer type]*



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## Answer Key

### Progressions & Series — Sheet 1

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**Q1:** (d)

**Q4:** (c)

**Q7:** (d)

**Q10:** (a)

**Q13:** (a)

**Q16:** (c)

**Q19:** 5310

**Q2:** (b)

**Q5:** (b)

**Q8:** (a)

**Q11:** (b)

**Q14:** (a)

**Q17:** (a)

**Q3:** (c)

**Q6:** (d)

**Q9:** (a)

**Q12:** 8000

**Q15:** (a)

**Q18:** 960



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\* Q1 TSD Sheet 2: calculated 46 kmph (not in options) — please verify against official key.