MATHEMATICS

DPP

DAILY PRACTICE PROBLEMS

DPP No. 23

Total Marks : 23

Max. Time : 25 min.

Topic : Sequence & Series

Type of Questions		**M.M., Min.**
Single choice Objective (no negative marking) Q.1,2,3,4,5	**(3 marks, 3 min.)**	**[15, 15]**
Subjective Questions (no negative marking) Q.6,7	**(4 marks, 5 min.)**	**[8, 10]**

1. Find the sum of the sequence : $\frac{1}{9}+\frac{1}{18}+\frac{1}{30}+\frac{1}{45}+\frac{1}{63}+.....\infty$

(A) $\frac{1}{3}$ (B) 1 (C) $\frac{2}{3}$ (D) 2

2. Greatest positive term of a H.P. whose first two terms are 2/5 and 12/23 is–

(A) 6 (B) 5 (C) 1/6 (D) 37/7

3. The value of the sum $\frac{1}{3^2+1}+\frac{1}{4^2+2}+\frac{1}{5^2+3}+\frac{1}{6^2+4}$ .... ∞ is equal to

(A) $\frac{13}{36}$ (B) $\frac{12}{36}$ (C) $\frac{15}{36}$ (D) $\frac{18}{36}$

4. If a, b,c,d, e are five positive numbers, then

(A) $\left(\frac{a}{b}+\frac{b}{c}\right)\left(\frac{c}{d}+\frac{d}{e}\right)\geq 4\sqrt{\frac{a}{e}}$ (B) $\frac{b}{a}+\frac{c}{b}+\frac{d}{c}+\frac{e}{d}+\frac{a}{e}\geq\frac{1}{5}$

(C) $\frac{a}{b}+\frac{b}{c}+\frac{c}{d}+\frac{d}{e}+\frac{e}{a}<5$ (D) None of these

5. Let the n^{th} term of a series be given by $t_n=\frac{n^2-n-2}{n^2+3n}$, $n\geq 3$. The product $t_3\, t_4$ .....t_{50} equals

(A) $\frac{1}{5^2.7.13.53}$ (B) $\frac{1}{5.7^2.12.53}$ (C) $\frac{1}{5^2.7.12.51}$ (D) $\frac{1}{5.7^2.13.53}$

6. If $\sqrt{1+\frac{1}{1^2}+\frac{1}{2^2}}+\sqrt{1+\frac{1}{2^2}+\frac{1}{3^2}}+\sqrt{1+\frac{1}{3^2}+\frac{1}{4^2}}+.....+\sqrt{1+\frac{1}{(1999)^2}+\frac{1}{(2000)^2}}=x-\frac{1}{x}$,

then find the value of x.

7. Find the sum of infinite terms of the series : $\frac{3}{2.4}+\frac{5}{2.4.6}+\frac{7}{2.4.6.8}+\frac{9}{2.4.6.8.10}+.....$

Answers Key

1. (A) **2.** (A) **3.** (A) **4.** (A)

5. (D) **6.** $x = 2000, -\frac{1}{2000}$ **7.** 1/2