SC

[56/A25] No. 3

Sardar Patel University, Vallabh Vidyanagar

B.Sc. Examinations: 2017-18 - V Sem

Subject : Mathematics US05CMTH02 Max. Marks : 70

Real Analysis-II

Date: 09/11/2017, Thursday Timing: 10.00 am - 01.00 pm

Q: 1. Answer the following by choosing correct answers from given choices. 10

[1] Every convergent sequence is
[A] oscillating [B] bounded [C] unbounded [D] none

[2] The sequene $\{(-1)^{n^2+1}\}$
[A] is convergent [B] diverges to ∞ [C] diverges to $-\infty$ [D] oscillates finitely

[3] A sequence $\{S_n\}$; where

$$S_n = \begin{cases} 2 & ; \text{ if } n = 1 \text{ or even} \\ p & ; \text{ where } p \text{ is the smallest prime factor of n.} \end{cases}$$

is
[A] convergent [B] divergent [C] oscillates finitely [D] oscillates infinitely

[4] A positive term series $\sum_{n=1}^{\infty} \frac{1}{n^p}$ is convergent if and only if
[A] $p < 1$ [B] $p > 1$ [C] $p \leqslant 1$ [D] $p \geqslant 1$

[5] The positive term series $1 + r + r^2 + r^3 + ... + r^n + ...$ converges for
[A] $r > 1$ [B] $r \geqslant 1$ [C] $r < 1$ [D] $r \leqslant 1$

[6] If $\sum_{i=1}^{\infty} u_i$ is a positive term series and $\sum_{i=1}^{n} u_i < 100, \forall n$ then the series
[A] is convergent [B] diverges to $+\infty$ [C] diverges to $-\infty$ [D] none

[7] $\lim_{x\to 1} \lim_{y\to 1} \frac{x^2+y^2}{x+y} =$
[A] 1 [B] 2 [C] 3 [D] none

[8] $\lim_{(x,y)\to(6,\pi)} x^2 \tan\frac{y}{x} =$
[A] 36 [B] $36\sqrt{3}$ [C] $12\sqrt{3}$ [D] $3\sqrt{12}$

[9] The necessary condition for a function f to have an extreme value at $(2,4)$ is
[A] $f_x(2,4) = 0,\ f_y(2,4) \neq 0$ [B] $f_x(2,4) \neq 0,\ f_y(2,4) = 0$
[C] $f_x(2,4) \neq 0,\ f_y(2,4) \neq 0$ [D] $f_x(2,4) = 0,\ f_y(2,4) = 0$

[10] For a function f whose domain contains a neighbourhood of $(2,-1)$, if $f(x,y) - f(2,-1)$ assumes positive as well as negative signs in every neighbourhood of $(2,-1)$ then at $(2,-1)$, f has
[A] no extreme value [B] a minimum [C] a maximum [D] none

(PTO)