

**FIFTH SEMESTER B.Sc. DEGREE (U.G.—CCSS) EXAMINATION  
NOVEMBER 2014**

(SDE)

Mathematics

MM 5B 07—BASIC MATHEMATICAL ANALYSIS

**Part A**

	DD	MM	YEAR	
<b>Date of Examination :</b>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
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<b>Time : 15 Minutes</b>	<b>Total No. of Questions : 20</b>			

**INSTRUCTIONS TO THE CANDIDATE**

1. This Question Paper carries Multiple Choice Questions from **1** to 20.
2. Immediately after the commencement of the examination, the candidate should check that the question paper supplied to him/her contains all the 20 questions in serial order.
3. Write the Name, Register Number and the Date of Examination in the space provided.
4. Each question is provided with choices (A), (B), (C) and (D) having one correct answer. Choose the correct answer and enter it in the main answer-book.
5. **Candidate should handover this Question paper to the invigilator after 15 minutes and before receiving the Question paper for Part B Examination.**

## Part A

## Multiple Choice Questions

1. Find the number of elements in the power set of the set (positive divisors of 12)

(A) 6.

(B) 2.

(C) 64. \_\_\_\_\_

(D) 16.

2. Find the value of  $1 + 4 + 7 + \dots + (3n-2)$

(A)  $n(n+1)$ .(B)  $\frac{n(3n-1)}{2}$ (C)  $\frac{1}{2n+1}$ .(D)  $2n(3n+1)$ .

3. Find the No. of relations from  $A = \{a, b, c\}$  to  $B = \{1, 2\}$  :

(A) 6.

(B)  $2^6$ .(C)  $2^3$ . \_\_\_\_\_(D)  $2^2$ .

4. Let A and B be any sets  $A \subset B$  if

(A)  $A \cap B^c = \phi$ .(B)  $A^c \subset B$ .(C)  $A^c \cup B = B$ .(D)  $A \setminus B = \phi$ .

5. Let the function  $f: \mathbb{R} \rightarrow \mathbb{R}$  be defined as

$$f(x) = \begin{cases} 3x-1 & \text{if } x > 3 \\ x^2-2 & \text{if } -x \leq x \leq 3; \text{ find } f(-1) \\ 2x+3 & \text{if } x < -2 \end{cases}$$

(A) -4.

(B) 1.

(C) -1.

(D) 0.

6. Let  $f: \mathbb{R} \rightarrow \mathbb{R}$  defined  $f(x) = x^2 + 2x$  find (f.o.f.) (2)

(A) 80,

(B) 82.

(C) 8.

(D) 64.

7. Countable union of countable sets is

- (A) Countable. (B) Uncountable.  
(C) Cannot be determine. (D) Finite.

8. The set of natural numbers has ➤

- (A) Upper bound. (B) Lower bound.  
(C) Maximal element. (D) None of these.

9. Are the following statements always true ?

- (A) If A is finite, A is bounded. (B) If A is a subset of  $[-6, 10]$ , A is finite.  
(C) If A is infinite, A is bounded. (D) If A is subsets of  $[-6, 10]$ , A is unbounded.

10. Write which of the following set/s are unbounded

$$E = \left\{ x/x = \left( \frac{1}{n} \right); n \in \mathbb{N} \right\}$$

$$F = \left\{ x/x = 3^n; n \in \mathbb{N} \right\}$$

$$G = \left\{ x/x = \left( \frac{1}{2} \right)^n; n \in \mathbb{N} \right\}$$

$$H = \{ x/x \in \mathbb{R} < 2576 \}$$

- (A) E. (B) G.  
(C) H. (D) F.

11. Let  $f: X \rightarrow Y$  be a function,  $A \subset X$  and  $B \subset Y$  which of the following is true ?

- (A)  $f^{-1}(f(A)) \subseteq A$ . (B)  $B \subset f(f^{-1}(B))$   
(C)  $f(f^{-1}(B)) = B$  if  $f$  is onto. (D)  $f(f^{-1}(B)) = B$  if  $f$  is one to one

12. The set of all real numbers  $x$  satisfying the inequality  $x^2 - 3 \leq 0$  is given by

- (A)  $\{x \in \mathbb{R} \mid -2 \leq x \leq 2\}$ . (B)  $\{x \in \mathbb{R} \mid -\sqrt{3} \leq x \leq \sqrt{3}\}$ .

$$\bullet \quad x \quad \bullet$$

13. If two sets W and V are bounded. Then  $W \cup V$  is

- (A) Bounded. (B) Unbounded.  
(C) Either unbounded or bounded. (D) Cannot be determine.

**Turn over**

14.  $\lim_{n \rightarrow \infty} \left(1 + \frac{2}{n}\right)^n = \text{_____}$

$n \rightarrow \infty$

(A)  $e^2$ .

(B)  $2e$ .

(C) 4.

(D) 2.

15. Let  $R = \{(1, 5), (4, 5), (3, 7), (7, 6)\}$ . Then the range of R is :

(A) {5, 6, 7}.

(B) {1, 4, 3, 7}.

(C) {1, 4, 3, 7,  $\phi$ }.

(D)  $\phi$ .

16. Which of the following set is bounded ?

(A)  $\{x \in \mathbb{R} : x < 3\}$ .

(B)  $\{x \in \mathbb{R} : x = 2^k\}$  for a positive number of k.

(C)  $\{1, 3, 5, \dots\}$ .

(D)  $1/2, 1/3, 1/4, \dots$ .

17. Which of the following set is non-denumerable ?

(A) Set of all polynomials with integer coefficients.

(B) The set of all algebraic numbers.

(C) The closed interval [0, 1].

(D) The set of all points in the plane with rational co-ordinators.

18. The power set of Z is :

(A) Countable.

(B) Uncountable.

(C) Finite.

(D) Countably infinite.

19. Let A = {all real numbers that are not integers}

B = {all integers that are multiple of 31 then :

(A) There is a one-one function from A to B but not from B to A.

(B) There is a one-one function from B to A but not from A to B.

(C) There is a one-one function from A to B and also from B to A.

(D) There is a one-one function neither from A to B nor from B to A.

20. Which of the following sets is uncountable ?

(A) The set of all natural numbers.

(B) The set of all irrational numbers.

(C) The set of all integers.

(D) The set of all finite subsets of the set of all rationales.