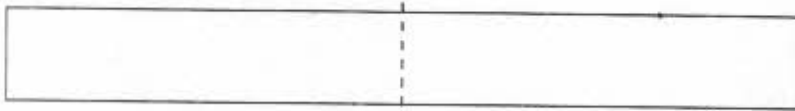


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**ENTRANCE EXAMINATION, 2018**

**Ph.D. IN  
MATHEMATICAL SCIENCES**

[ Field of Study Code : MATH (897) ]

Time Allowed : 3 hours

Maximum Marks : 100

**INSTRUCTIONS FOR CANDIDATES**

- (i) All questions are compulsory.
- (ii) There are 10 questions in **Section—A** and 8 questions in each of **Sections B** and **C**.
- (iii) Answers must be written in the space provided after each question. Answers that are written elsewhere will not be evaluated.
- (iv) A question in **Section—A** may have more than one true option. Your answer will be considered correct provided it consists only of all the true options. A correct answer will be awarded +2 marks and an incorrect/incomplete answer or an unattempted question will get 0 mark.
- (v) Each question in **Section—B** carries 4 marks; each question in **Section—C** carries 6 marks. Answers to all the questions in **Sections B** and **C** must be **justified with mathematical reasoning**.
- (vi) In the following,  $N, Z, Q, R, C$  denote, respectively, the set of natural numbers, the set of integers, the set of rational numbers, the set of real numbers and the set of complex numbers.
- (vii)  $C^n, R^n$  and its subsets are assumed to have the usual topology arising from the usual Euclidean norm unless mentioned otherwise.
- (viii) For sets  $A$  and  $B$ , let  $A \setminus B := \{x \in A \mid x \notin B\}$ . For  $a, b \in R$ , let  $[a, b] := \{x \in R \mid a \leq x \leq b\}$ ,  $(a, b) := [a, b] \setminus \{a\}$  and  $(a, b) := [a, b] \setminus \{b\}$ .
- (ix) Extra pages are attached at the end of the question paper for Rough Work.
- (x) **Use of calculator, smart phone, mobile phone or any other digital device is strictly not permitted.**

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**ENTRANCE EXAMINATION, 2018**

**Ph.D. IN  
MATHEMATICAL SCIENCES**

SUBJECT .....  
(Field of Study/Language)

FIELD OF STUDY CODE .....

NAME OF THE CANDIDATE .....

REGISTRATION NO. 

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CENTRE OF EXAMINATION .....

DATE .....

.....  
(Signature of Candidate)

.....  
(Signature of Invigilator)

.....  
(Signature and Seal of  
Presiding Officer)

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For Official Use Only  
 Not to be filled in by the candidate  
 Final Grading Table for Sections A, B and C

<b>For Official Use Only</b>	
Not to be filled in by the candidate	
<b>Final Grading Table</b>	
<b>Total of Section—A</b>	<b>1A</b>
<b>Total of Section—B</b>	<b>2A</b>
<b>Total of Section—C</b>	<b>3A</b>
<b>Grand Total</b>	<b>7A</b>
<b>Total (Out of 20)</b>	<b>7A</b>

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