No. 1 INSTITUTE FOR IAS/IFOS EXAMINATIONS



OUR ACHIEVEMENTS IN IAS (FROM 2008 TO 2019)



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MAINS TEST SERIES-2021

(OCT. to DEC.-2021)

IAS/IFoS

Under the guidance of K. Venkanna IAS(M)/21-NOV.-2021

FULL SYLLABUS (PAPER-II)

(BATCH-I) TEST-16 & (BATCH-II) Test-6

Time: 3 Hours **Maximum Marks: 250**

INSTRUCTIONS

Each question is printed only in English.

Answer must be written in the medium specified in the admission Certificate issued to you, which must be stated clearly on the cover of the answer-book in the space provided for the purpose. No marks will be given for the answers written in a medium other than that specified in the Admission Certificate.

Candidates should attempt Question Nos. 1 and 5, which are compulsory, and any THREE of the remaining questions selecting at least ONE question from each Section.

The number of marks carried by each question is indicated at the end of the question.

Assume suitable data if considered necessary and indicate the same clearly.

Symbols/notations carry their usual meanings, unless otherwise indicated.

All questions carry equal marks.

Important Note: Whenever a question is being attempted, all its parts/ sub-parts must be attempted contiguously. This means that before moving on to the next question to be attempted, candidates must finish attempting all parts/ sub-parts of the previous question attempted. This is to be strictly followed.

Pages left blank in the answer-book are to be clearly struck out in ink. Any answers that follow pages left blank may not be given credit.



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(18)

SECTION - A

- **1.** (a) If G/Z(G) is cyclic, show that G is abelian. Where Z(G) is centre of G. [10]
- **1.** (b) Prove that a finite integral domain has finite characteristic. Give an example of an integral domain which has an infinite number of elements, yet is of finite characteristic.

[10]

- 1. (c) A twice differentiable function f is such that f(a) = f(b) = 0 and f(c) > 0, for a < c < b. Prove that there is at least one value ξ between a and b for which $f''(\xi) < 0$. [10]
- **1.** (d) Evaluate the following integrals by using Cauchy's integral formula:

integral formula :
(i)
$$\int_C \frac{(\sin z)^6}{\left(z - \frac{\pi}{6}\right)^3} dz$$
, where c is circle $|z| = 1$.

(ii)
$$\int_{C} \frac{e^{3z}dz}{z+i}$$
 if c is circle $|z+1+i| = 2$ [10]

1. (e) A firm makes two types of furniture chairs and tables. The contribution for each product as calculated by the accounting department is Rs. 20/- per chair and Rs. 30/- per table. Both products are processed on three machines M₁, M₂, M₃. The time required in hours by each product and total time available in hours per week on each machine are as follows:

Machine	Chairs	Table	Available Time
$M_{_1}$	3	3	36
M_2	5	2	50
$M_{_3}$	2	6	60

How should the manufacturer schedule his production in order to maximize contribution? Solve graphically. [10]

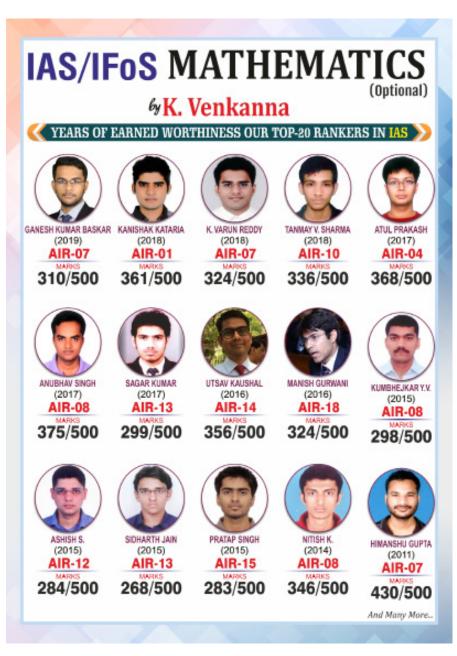


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No.1 INSTITUTE FOR IAS/IFOS EXAMINATIONS **OUR ACHIEVEMENTS IN IFoS (FROM 2008 TO 2019) OUR RANKERS AMONG TOP 10 IN IFoS** AIR-01 AIR-01 AIR-03 IFoS-2016 AIR-03 AIR-04 AIR-04 AIR-05 HEAD OFFICE: 25/8, Old Rajender Nagar, Delhi-60. BRANCH OFFICE: 105-106, Top Floor, Mukherjee Tower Mukherjee Nagar, Delhi-9

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- **2.** (a) (i) Let x belong to a group. If $x^2 \neq e$ while $x^6 = e$, prove that $x^4 \neq e$ and $x^5 \neq e$. What can we say about the order of x?
 - (ii) If |a| = n, show that $\left| a^{t} \right| = \frac{n}{\gcd(n,t)}$. [18]
- **2.** (b) Every bounded infinite subset of \mathbb{R} has at least one limit point (in \mathbb{R}). [15]
- 2. (c) By using contour integration prove that

$$\int_0^{2\pi} \frac{\cos^2 3\theta \, d\theta}{1 - 2p \cos 2\theta + p^2} = \frac{\pi \left(1 - p + p^2\right)}{1 - p}, 0 [17]$$

- **3.** (a) Let *f* be an isomorphism of a ring R onto a ring R'. Show that
 - (i) If R is an integral domain, then R' is also an integral domain.
 - (ii) If R is a field, then R' is also a field. [18]
- **3.** (b) A function f is defined on [0, 1] by

f(x) = x, if x is rational = 1 - x, if x is irrational.

Show that f is not integrable on [0, 1]. [15]

3. (c) Solve the following LPP by using Simplex method. Maximize $z = 8x_2$, subject to the constraints: $x_1 - x_2 \ge 0, \ 2x_1 + 3x_2 \le -6 \ \text{and} \ x_1, \ x_2 \ \text{are unrestricted}.$

- [17] [12]
- **4.** (a) Find the g.c.d. of 11 + 7i and 18 i in **Z** [i].
- **4.** (b) If f(x + y) = f(x) + f(y) for all $x, y \in \mathbb{R}$ and f is continuous at a point of \mathbb{R} ; prove that f is uniformly continuous on \mathbb{R} .
- **4.** (c) (i) If $u v = (x y) (x^2 + 4xy + y^2)$ and f(z) = u + iv is an analytic function of z = x + iy, find f(z) in terms of z.

(ii) The function f(z) has a double pole at z = 0 with residue 2, a simple pole at z = 1 with residue 2, is analytic at all other finite points of the plane and is bounded as $|z| \to \infty$. If f(2) = 5, f(-1) = 2, find f(z).

[12]

4. (d) Five salesmen are to be assigned to five territories. Based on the past performance, the following table shows the annual sales (in rupees lakhs) that can be generated by each salesman in each territory. find the optimum assignment.

Salesman	T ₁	T ₂	T_3	T_4	T_{5}
S	26	14	10	12	9
S ₂	31	27	30	14	16
S_3	15	18	16	25	30
S ₄	17	12	21	30	25
S ₅	20	19	25	16	10

[15]

Anyone who has done B.Tech / M.Tech / B.Sc / M.Sc and has an interest in Maths.

Usually commit and their mitigation measures. For example, I commit a lot of mistakes when doing Integration by parts and usually the error involves missing negative (-) sign etc. Therefore whenever I come across such type of question I try to devote extra 1 minute to re-check all my steps.

Maths.stackexchange.com is the best online resource for preparation. You can create an account and get your maths questions answered within minutes.

Why did I score only 262?

Among all the students in the final list who had Maths as an optional, I have scored the least. My paper - 1 was a complete disaster and I only scored 92 marks in it. In fact I could only attempt 160 marks paper and had to leave 90 marks paper completely.

The reasons for the above situation in Paper - 1 are as follows:

- 1. Lack of written practice: In many topics (especially statics and dynamics) I used to just look at a question and its solution without solving it first. As a result I forgot the exact method in the exam hall!
- **2. Left many topics:** I prepared only 25% 3-D, 80% Calculus and 25% Statics & Dynamics and had to pay a heavy price in the exam.

On the other hand my preparation for paper - 2 was excellent and therefore I scored an amazing 170 marks in it

BHAVESH MISHRA AIR-58 in CSE-2014





Easy paper: The difficulty level of paper is quite moderate and almost all questions are directly picked from the IMS Test Series / Standard Textbooks.

WHO SHOULD TAKE IT?

Myths around science subjects.

Coaching institutions have mastered the art of brainwashing students and creating an atmosphere of gloom and doom around science subjects. There are lots of myths circulating among students. Let's bust these myths.

- 1. Maths optional is only for students from IITs: Definitely not. Anyone willing to put in hard work can easily score very high marks. The best example being Nitish K (Rank 8) who is not from any IIT.
- **2. There is heavy scaling:** Let the data speak for itself. I attempted 240 marks in Paper 2 and got 170 marks. Now would you call it a scaling?
- 3. It plays no role in GS: Yes it's true that science optional subjects don't overlap with GS but it's equally true that GS has never been a rank decider in UPSC IAS.
- **4.** There are 3 major things that decides your rank: Essay, Optional and Interview. Even if one puts in 5 years of efforts in GS the advantage in terms of marks would be around 30 marks or so but 1 year of dedicated effort in maths would give you 50+ marks advantage straightaway.

Do's and Dont's:

- Practice, Practice and Practice. The key to success in maths is filling up as many notebooks as you can, during the preparation stage. The more you sweat during preparation the less you will bleed in the battlefield!
- 2. Don't read Maths book / notes like GS. It is a recipe for disaster. Rather always study with pen, paper and calculator.
- While solving examples don't jump to see solution first. Try giving your best shot and after making sure that you are not able to solve it using your present knowledge then only look at the answer. This will ensure that better retention.
- 4. Generally we make lots of silly mistakes while solving a question. It is best to catch these errors early and not repeat them in exam hall. The best strategy for this is to maintain a notebook of errors that you



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SECTION - B

- **5.** (a) Solve $(D^2 4D'^2)z = (4x/y^2) (y/x^2)$. [10]
- **5.** (b) Reduce $y^2(\partial^2 z/\partial x^2) + x^2(\partial^2 z/\partial y^2) = 0$ to canonical form

[10]

[10]

- 5. (c) The equation $2e^{-x} = \frac{1}{x+2} + \frac{1}{x+1}$ has two roots greater than 1. Calculate these roots correct to five decimal
- **5.** (d) Convert the following:

places.

- (i) $(41.6875)_{10}$ to binary number
- (ii) (101101)₂ to decimal number
- (iii) (AF63)₁₆ to decimal number
- (iv) $(1011110111111)_2$ to hexadecimal number [10]
- **5.** (e) A velocity field is given by $\mathbf{q} = -x\mathbf{i} + (y + t)\mathbf{j}$. Find the stream function and the stream lines for this field at t = 2.
- **6.** (a) Form partial differential equation by eliminating arbitrary functions f and g from $z = f(x^2 y) + g(x^2 + y)$.

[80]

- **6.** (b) Find a complete integral of $16p^2z^2 + 9q^2z^2 + 4z^2 4 = 0$. [08]
- 6. (c) Find the characteristics of the equation pq = xy and determine the integral surface which passes through the curve z = x, y = 0. [16]
- 6. (d) A thin rectangular homogeneous thermally conducting plate lies int he xy-plane defined by $0 \le x \le a$, $0 \le y \le b$. The edge y = 0 is held at the temperature Tx(x a), where T is a constant, while the remaining edges are held at 0° . The other faces are insulated and no internal sources and sinks are present. Find the steady state temperature inside the plate. [18]

7. (a) Find the solution of the following system of equations

$$x_{1} - \frac{1}{4}x_{2} - \frac{1}{4}x_{3} = \frac{1}{2}$$

$$-\frac{1}{4}x_{1} + x_{2} - \frac{1}{4}x_{4} = \frac{1}{2}$$

$$-\frac{1}{4}x_{1} + x_{3} - \frac{1}{4}x_{4} = \frac{1}{4}$$

$$-\frac{1}{4}x_{2} - \frac{1}{4}x_{3} + x_{4} = \frac{1}{4}$$

using Gauss-Seidel method and perform the first five iterations. [15]

7. (b) The velocities of a car (running on a straight road) at intervals of 2 minutes are given below.

Time in minutes	0	2	4	6	8	10	12
Velocity in km/hr.	0	22	30	27	18	7	0

Apply Simpson's rule to find the distance covered by the car. [10]

- **7.** (c) Solve the initial value problem $u' = -2tu^2$, u(0) = 1 with h = 0.2 on the interval [0, 0.4]. Use the fourth order classical Runge-Kutta method. Compare with the exact solution. [12]
- **7.** (d) Develop an algorithm for Regula Falsi method to find a root of f(x) = 0 starting with two initial iterates x_0 and x_1 to the root such that sign $(f(x_0)) \neq \text{sign } (f(x_1))$. Take n as the maximum number of iterations allowed and eps be prescribed error. [13]
- **8.** (a) A rough solid circular cylinder rolls down a second rough cylinder which is fixed with its axis horizontal. If the plane through their axis makes an angle α with the vertical when first cylinder is at rest, show that the cylinders will separate

when this angle of inclination is $\cos^{-1}\left(\frac{4}{7}\cos\alpha\right)$. [16]



Irrespective of whether you are very happy or deeply unsatisfied about paper 1, try to forget about it and stay calm for paper 2.

INTERVIEW

In the interview, you can expect some questions related to mathematics optional. Generally you won't be asked to solve a problem because that ability has been tested in mains. They would like to see whether you have a genuine curiosity regarding mathematics outside what is mentioned in syllabus. In both my UPSC interviews, I was asked about Ramanujan's work. There were questions on Vedic Mathematics, National Mathematics Day, important Indian Mathematical Institutions, Field medalist Manjula Bhargava etc. Hence while preparing for interview, try to be aware about these non-theorotical aspects of maths as well.

I hope above tips provide some clarity regarding maths optional to UPSC aspirants.

All the best!

Bhavesh Mishra (AIR-58) in IAS-2014 Examination CLASSROOM STUDENT

Why Maths?

Simply because it is the best performing optional subject in UPSC/IAS.

Extremely high scoring: If you get your maths optional right then you will make it to the final list. This year one of my batch mate in IMS **Nitish K (Rank 8)** has got a mind boggling 346 marks.

Certainty: If you have attempted your paper well then you are sure that you will get good marks. For example this year just by attempting 400 marks paper you could get a decent 260+ marks. Even if you don't get good marks in first attempt but you can be sure that you will increase your marks in subsequent attempt(s).

Fun: Mathematics is a delightful subject and therefore doing maths takes you away from somewhat boring humanities.

Good Impression: The fact that you have taken Maths makes a good impression on interview board members

(it happened in my case!). They are very pleased to see that you have opted for a tough optional.

PRACTICE

Just knowing theory is not enough. It needs to be accompanied by consistent problem solving practice. It is best to solve questions that have already been asked in mains. If some problem seems very non-intuitive, it would help if the trick to solve such problem is written in your notebook.

TEST SERIES

Test series is very important for this optional. I had joined IMS test series which helped me in identifying my weak areas. In both CSE and IFoS mains, there were many questions similar to those covered in IMS test series. With enough practice, a candidate can achieve the ability to complete the maths paper in 3 hours. It is important to assess your performance after each test. Necessary steps should be taken to rectify common mistakes that you are committing in the test series. You should be alert not to repeat the same mistakes again & again. As your performance improves with every test, the actual mains paper will seem just like any other test & you will be able to comfortably complete it. Presentation of your answer matters a lot. Your aim should be to make examiner's life as easy as possible so that he/she will award you maximum marks. Only the final answer doesn't matter. Writing proper steps is also imortant to show the logical flow with which you arrived at the solution. Specifically mention whichever theorem or property you are using in a particular step. Wherever possible, draw neat diagrams with proper labelling. Such small things will collectively fetch you the extra marks that you are expecting from this optional. The habit of writing such detailed answers will not develope overnight and hence you have to consciously work through the test series in this direction.

DURING MAINS

The mains exam schedule does not provide much gap between General Studies & Maths papers. You will generally have 1 day in between. Your notebook containing important formulae & theorems will be very useful at such times. You will be able to go through this summary of each chapter and it will provide much needed confidence before the actual paper. During the main exam, I would advise completing the compulsory questions 1 & 5 first. Then you can choose 3 out of remaining 6 questions. Easier questions like those from topics like linear programming, numerical analysis, linear algebra etc. should be the priority. Even if you don't know the complete answer to any question, write as many steps as you can since partial marks also matter. Once you finish paper 1, don't start immediately analyzing your performance.



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- **8.** (b) Use Hamilton's equations to find the carterian equations of motion of a particle moving in three dimensions in a force field of potential V. [16]
- **8.** (c) When an infinite liquid contains two parallel equal and opposite vortices at a distance 2b, prove that the stream lines relative to the vortices are given by the equation

$$\log \left[\frac{x^2 + (y - b)^2}{x^2 + (y + b)^2} \right] + \frac{y}{b} = c,$$

the origin being the middle point of the join which is taken for the axis of y. [18]

OUR TOPPER'S MARKS LIST (IAS-2019)

- For your final selection, optional subject marks are crucial.
- Choose Optional Subject based on Your Graduation Studies & Score Highest Marks.
- Now Mathematics has become one of the most Cherished Optional Paper among Science Graduates, especially Students with Mathematics background including B.Tech.
- In the new pattern of exam, the average marks of successful candidates in Maths is more than 300 out of 500.
- Mathematics (Opt.) has proven to be the Most Reliable and High Scoring Subject in IAS/IFoS.
- IMS has been successfully providing consistent results since its inception.

MARKS ARE BEFORE YOU AND YOU SHOULD ANALYZE YOURSELF

SUBJECT	Nor. North.	Morks, Obtained		SUBJECT	Mon. Morbic.	Marks, Obtain
DOSAY (MAPER I)	250	122		SSUP MARKE	350	132
GENERAL STUDIES-I PAPER-ID	250	097	(E) (E)	GENEVAL STUDIES I/INVESTIG	250	099
GENERAL STUDIES II PARENTO	250	100		GENERAL ETUDISM (PARKETIN	350	091
GENERAL STUDIES-III (PAVER-IN)	250	081	1000	GENERAL ETUDIES III (RAPER M)	350	085
OSVERAL STUDIES-IN (EMPER-IO)	250	131	aurest.	GENERAL STUDIESN (NJESU)	350	143
OPTIONAL-I (MATHEMATICS) (PAPER-VI)	162/250		BANSAL	OPTIONAL-I DIMINIMATICS) (PAPER-VI)	149/258	
OPTIONAL-II (MATHEMATICS) (PAPER-VIII)	148/250	310/500		OPTOWAL-II (MATHERIKTICS) (PAPCE-III)	167/258	316/50
WINTENTOTAL	1750	841	AIR-23	WILLIAM TODAL	1750	865
PERSONALITY TEST	275	205		PERONAUTITIST	275	163
TOTAL PINAL	2025	1046	IAS-2019	TOTAL PINAL	2025	1028
10 METHOR	2020	1990		10 Mc Hope	2023	1020
SUBJECT	Non Rents.	Marks, Ottoined		SUBJECT	Mer. Nerlo.	Marks Otto
CDAY (BYTS-)	250	123		COSAT (MATELA)	250	118
GENERAL STUDIES-I (PAREK-II)	250	081	(010)	GENERAL STUDIESH (BAPERHI)	250	100
GEVERAL STUDIES-II (PAPEN-III)	250	091		GENERAL STUDIES-I (RAFES-III)	250	095
GENERAL STUDIES-II (PAPENIN)	250	000		GENERAL STUDIES-II (ENPER-M)	250	085
CONSTAN. STUDIES IN (BAPER IN)	250	133	DWWASHI	GENERAL ETLEDIES-IV (MARK-V)	358	122
OPTIONAL I (MATHEMATICS) (PAPER 41)	154/250	204 1500	DIYYAASHU	OPTIONAL I DIMERRATICS) (PAPER VI)	152/250	
OPTIONAL II (MATHEMATICS) (PAPER VII)		321/500		OPTIONAL II (MATHEMATICS) (PAPER III)	154/250	
WETTENTON.	1750	829	AIR-60	WRITIN TOOK	1750	826
PERSONALITY TEST	275	104		PERSONAUTY TEST	275	182
TOTAL FINAL	2025	1013	IAS-2009	TOTAL RINAL	2025	1000
10000000	2020			1000000	2023	1000
SUBJECT	Noc. Note:	Mortic Obtained		SUBJECT	Moo. Morbo.	Marks, Obtain
SSSAL (BROSE-I)	250	126		SSSAT (PAJER-I)	250	143
GRANNY SLYDISP I MANNY III	250	095	0.111	GENERAL STUDIES I (RAPER II)	350	095
GENERAL STUDIES-II (PAPER-III)	250	094	400	GENERAL STUDIES-I (RAFER-II)	390	083
GENERAL STUDIES-III (PARER-IV)	250	077		GENERAL STUDIES-III (BAPER-IV)	350	083
GENERAL STUDIES-IN (BAPER-10)	250	101	HARDIK	CENERAL STUDIES IV (NJESUV)	350	134
OPPORAL (TUDISLE (NATELY) OPPORAL I (MATHEMATICS) (PAPER 41)	159/250		ASARWAL	OPTIONAL I (MATHEMATICS) (PAPER-VI)	152/258	
OPTIONAL-II (MATHERIATIES) (PAPER-VIII)	150/250	317/500	-	OPTIONAL-II (MATHEMATICS) (PAPER-III)	142/258	
WRITTENTOTAL	1750	810	AIR-96	WILITENTOTAL	1750	832
PERSONALITYTEST	275	193		PERSONAUT1 TEST	275	165
TOTAL PINAL	2025	1003	IAS-2009	TOTAL RINKL	2025	997
SUBJECT		Marks, Obtained		SUBJECT		Marks Ottale
CSAF (BAPER-I)	250	138	1 200	CSSAT (PAPER-I)	250	131
GENERAL STUDIES-I (PAREK-II)	250	094	1000	CENERAL STUDIES (SAFER-II)	250	089
GEVERAL STUDIES-II (PAPER-III)	250	086		CENEVAL STUDIESH (RVYENII)	250	985
GENERAL STUDIES-II (PAPEN-V)	250	074		GENERAL STUDIES-II (RAPER-IV)	250	075
GENERAL STLDIES-N (NOTE-V) OPTIONAL I OMETHEMATICS I PROFES ATE	250	120	MAYUR	GENERAL STUDIES-IV (NATER-Y)	390	115
OPTIONAL I (MATHEMATICS) (PAPER 41)	143/250	300/500	KHANDELWAL	OPTIONAL-I (MATHEMATICS) (PAPER-VI)	174/258	343/50
OPTIONAL-II (MATHEMATICS) (PAPER-VII)	157/250	900/300	AID 400	OPTIONAL-II (MATHERWITES) (PAPER-III)	199/250	343/300
WRITISHTOTAL	1750	812	AIM-106	WRITTEN TOTAL	1750	838
PERSONALITY TEST	275	185	IAS-2009	PERSONAUTY TEST	275	157
TOTAL FINAL	2025	997	185-2015	TOTAL RINAL	2025	995
					-	
SUBJECT		Marks, Obtained		SUBJECT		Marks, Obtain
SSSAY (BNPSR-I)	250	139	Total Control	COSAY (PAJER-I)	250	103
GBVBALSTUDIES-I (PAPER-II)	250	093	1,000	CENSUL STUDIES I (EMPER II)	250	087
GENERAL STUDIES-II (FARISI-III)	250	095		GENERAL STUDIES-I (RAFER-II)	250	100
GENERAL STUDIES-III (PARER-IV)	250	085	450	GENERAL STUDIES-III (RAPER-IV)	390	129
GENERAL STUDIES IN (INVESTIG	250	124	SULT SHARBAR	GENERAL STUDIES IV (PAPERA)	150	129
H OPTIGNAL-I (MATHEMATICS) (PAPER-VI)	139/250			OPTIONAL-I (HATHEMATICS) (PAPER-VI)		002 (54)
OPTIONAL ALIMATERMATICS (PAPER AND	126/250	265/500	Charles Co.	OPTIONAL-II (MATHERWITCS) (PAPER III)	134/258	277/50
WELLHALDEN	1750	801	AIR-122	WALTEN TOTAL	1750	925
				CONTRACT TOTAL		
PERSONALITYTISST	275	193		PERSONALITYTHE	275	166



H.O.: 25/8, Old Rajinder Nagar Market, Delhi-60. B.O.: 105-106, Top Floor, Mukherjee Tower, Mukherjee Nagar Delhi-9 Ph. 9999197625, 011-45629997. Website: www.ims4maths.com || Email: ims4maths@gmail.com R.O.: 1-10-237, 2nd Floor, Room N. 020 R.KY-Sancham's Blue Sapphire Ashok Nagar Hyderabad-20. Ph.: 09652351152 am awaiting the Mains result. This article is a humble attmept to share my experience of maths optional preparation for CSE/IFoS exam. I would be glad if it helps any UPSC aspirant who is undecided about choosing the optional or those who are already preparing with mathematics as their optional.

WHY MATHEMATICS

It is very important for a UPSC aspirant to have genuine interest in mathematics if he/she wants to choose this optional. Maths used to be my favourite subject in school and in IITB also I had pursued additional courses in mathematics out of interest. Since the syllabus is large & requires considerable practice, it is necessary to have a genuine interest. Apart from my inherent inclination, this optional offers certain advantages which made it an obvious choice. In this optional, the marks you get are almost proportional to your efforts. With proper hard work, a candidate can comfortably attempt all the questions in exam and expect to score around 50% marks even after heavy scaling which can offer the necessary edge in this intense competition. Such candidate generally would not find any question surprising in mains. This kind of certainity is not present in humanities optionals.

THE SYLLABUS

The prescribed syllabus for maths is quite large which makes it necessary to stick to limited sources. I relied on notes provided by Venkanna Sir at IMS for covering the syllabus. Since these notes were very comprehensive, I didn't have to spend time scanning reference books for relevant material. Venkanna Sir's classroom coaching helped me in completing the syllabus in a disciplined manner. Initially I would underline important theorems, formulae, results mentioned in the notes. Then i used to compile them in a notebook and this was useful for revision. So eventually i had a notebook with just the crux of the matter. I would advise all candidates with maths optional to prepare such a summary for all topics. Due to large syllabus, there is a natural tendancy to skip a few chapters. But for the sake of compulsory questions, it is necessary to know at least basics of each chapter. The physics related chapters of statics, dynamics, mechanics are generally left untouched while preparing maths optional. Regarding these chapters, my preparation was such that i would be able to solve the compulsory 10 mark questions. They are quite manageable once you know the basic theory and there is no point in unnecessarily losing marks. The real analysis/calculus & modern algebra chapters are time consuming but candidates can't afford to skip them.



the best mode of judging your preparation. You can fairly evaluate your performance with your marks and then focus on the weak topics. Secondly, its a rehearsal of Mains Exam and thus helps you greatly in time management.

Mains exam is nearly a marathon for your hand and thus you get very much trained for facing them.

Test Series also provided me another pool of questions to practise. They also helped in developing the ability of answer writing which definitely can't be developed overnight. I attended Test Series of IMS and luckily many questions of Test Series appeared in both IFoS Exam and CSE. I would also request all the candidates to give the test series by coming to classroom if possible and stick to the timelines as it really helps in completion of syllabus.

I hope this writeup clears some of the doubts and gives clarity on maths optional to UPSC IAS aspirants. All the Best

If anyone wants to contact me, please drop me an email - parthjaiswal512@gmail.com. I will be more than happy to help you.

Thank You
Parth Jaiswal
AIR-5 in IFoS-2014,
AIR-299 in CSE-2014

KUMBHEJKAR YOGESH VIJAY (AIR-08 in IAS-2015)

(AIR-13 IFoS) & (AIR-143 IAS)

in IFoS-2014 & IAS-2014 Examinations
CLASSROOM STUDENT

MY BACKGROUND

I am Yogesh Kumbhejkar. I am an Electrical Engineer from IIT Bombay. I secured AIR 13 in Indian Forest Service Exam (IFoS) 2014 with Mathematics & Physics as the optional subjects. For Civil Service Exam (CSE) also, my optional is Mathematics. In IFoS exam, I scored 231/400 (118 + 113) in maths. In 2013 CSE Mains, my maths score was 250/500 (109 + 141). Hence mathematics has helped me in clearing mains in both CSE and IFoS. I was not selected in the final list of CSE 2013. In my second CSE attempt also I appeared for mains in 2014 with Maths as the optional subject. Now i



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PREPARATION STRATEGY

for IAS/IFoS MATHEMATICS

(Optional)

by Successful Candidate
PARTH JAISWAL
(AIR-5 IFOS) & (AIR-299 IAS)
in IFoS-2014 & IAS-2014 Examinations
CLASSROOM STUDENT

MY BACKGROUND

Hello,My name is Parth Jaiswal. I come from Jaipur, Rajasthan. I completed my graduation in Computer Science discipline from IIT Delhi in 2013. Soon afterwards I started preparing for Civil services and Indian Forest Service, aiming for the attempt of year 2014.

Luckily I was able to clear both the examinations in my first attempt. I secured AIR-5 in IFoS-2014 and AIR-299 in CSE-2014. My optional subject was Mathematics. In case of Forest Service Examination, candidate is required to choose 2 Optionals, thus my second optional was Forestry with Mathematics as my first optional. I secured 250/400 (125+125) marks in IFoS Exam and 300/500 (147+153) marks in CSE in Maths. Thus I would give much credit for my success to my correct choice of optional as well as performance in it. I am writing this to share my experience with Maths as an optional subject and would feel happy if I am able to clear some of the doubts as well as apprehensions regarding it which many UPSC aspirants possess.

Why I Chose Mathematics?

I chose **Mathematics** because of my inherent interest in it from childhood. I have performed well in this in my throughout education and thus was confident enough to handle it well. Another reason for choosing it was, I wanted to have my optional from my background and thus Maths proved to be appropriate choice. Having a science background, I found it much easier to study than any other subject, many of which we have to study for GS prep.

I would like to assert few points regarding it very clearly.

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- This subject is vast in syllabus and takes more time to study than other optionals.
- It also requires consistent practise. But the positive part is If you are thorough with the subject and have practised it well, you can comfortably attempt complete paper with correct answers and thus gives you a great opportunity to score well in your optional (inspite of the scaling often carried out in it) pushing you above the list.
- In this way, this optional gives a bit of security as well as certainty which again comes at a price i.e great amount of hard work. Also IFoS Exam prescribes certain optionals only and Mathematics is one of them. Not all optionals are available for this exam.
- So again it gives you the flexibility of giving IFoS Exam.

From where to study?

I attended classroom coaching of IMS, Rajinder Nagar. I restricted my preparation to the handouts provided by Venkanna Sir. Because of the voluminous syllabus, it is necessary to gauge the point where you have to stop. I found that the notes quite comprehensive and provided me a holistic coverage of the syllabus in a highly structured manner. I believe that those notes are sufficient from the theory point of view.

For practising questions which is of utmost importance, I solved all the questions given in the notes (whether solved or unsolved) multiple times in my registers. Besides that, I solved the questions of previous year papers provided by sir, again multiple times. I restricted my preparation upto this point. But if any student faces difficulty in understanding any particular topic or finds notes insufficient for it or wants to practise more, he/she can use any reference book for any particular topic which can easily be found on internet or available in market.

But again a word of caution, try to limit your preparation to the concepts relevant to the syllabus and don't delve into unnecessary theorems or proofs otherwise its a slippery slope to a massive ocean. We tend to skip the proofs of various theorems provided in the syllabus while studying them as they are of not much use. Proofs of theorems are generally not asked in the exams. But still I used to go through each and every proof in a brief manner provided in the notes. The reason being it would give me a better insight of the topic and often helped in me developing solutions of questions.

Test Series:

No optional is complete without writing a test series and it holds true in Maths also. Test Series is as important in your preparation as your notes + books. Firstly, Test Series is

