Printed page: 02 **Subject Code:AAS0103/AMIAS0103**

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NOIDA INSTITUTE OF ENGINEERING AND TECHNOLOGY, GREATER NOIDA

(An Autonomous Institute Affiliated to AKTU, Lucknow)

B.Tech. (CSE/ME) /M.Tech. (Integrated)

SEM I, SESSIONAL EXAMINATION- III (2020-2021)

Subject Name: Engineering Mathematics I

Time: 1.15Hours **Max. Marks: 30**

General Instructions:

- All questions are compulsory. Answers should be brief and to the point.
- This Question paper consists of 2 pages & 5 questions.
- It comprises of three Sections, A, B, and C. You are to attempt all the sections.
- Section A -Question No- 1 is objective type questions carrying 1 mark each, Question No- 2 is very short answer type carrying 2 mark each. You are expected to answer them as directed.
- Section B - Question No-3 is Short answer type questions carrying 5 marks each. You need to attempt any two out of three questions given.
- Section C -Question No. 4 & 5are Long answer type (within unit choice) questions carrying 6marks each. You need to attempt any one part *a* or *b*.
- Students are instructed to cross the blank sheets before handing over the answer sheet to the invigilator.
- No sheet should be left blank. Any written material after a blank sheet will not be evaluated/checked.

		SECTION – A	**[8]**	
1.	**Question – Attempt all parts**		**(4×1=4)**	**CO**
	a.	Evaluate $\int_1^0 \int_0^1 (x+y)\,dx\,dy$ a) 2 b) -2 c) -1 d) 1	**(1)**	**4**
	b.	Compute $\Gamma\left(-\frac{1}{2}\right)$	**(1)**	**4**
	c.	In a certain code language, 'no more food' is written as 'ta ka da' and 'more than that' is written as 'sa pa ka'. How is 'that' written in that code language? a) sa b) ka c) sa or pa d) data inadequate	**(1)**	**5**
	d.	Find the missing term : 1, 3, 7, 15, 31,____.	**(1)**	**5**

2.	**Questions- Attempt all parts**		**(2×2=4)**	**CO**
	a.	Evaluate $\int_0^\infty x^{1/4} e^{-\sqrt{x}} dx$	**(2)**	**4**
	b.	A got 46,5 % marks less than B, then by what percent the marks of B is more than the marks of A?	**(2)**	**5**
		SECTION – B		
3.	**Question- Answer any two of the following-**		**[2×5=10]**	**CO**
	a.	A shopkeeper uses weight of 460 gram instead of 500 gram and the sells the articles at the cost price. What is the profit percentage?	**(5)**	**5**
	b.	Evaluate $\int\int (x^2 + y^2) dxdy$ over the region in the positive quadrant for which $x + y \leq 1$.	**(5)**	**4**
	c.	Prove that $\int_0^{\frac{\pi}{2}} \sqrt{tan\,\theta}\ d\theta = \int_0^{\frac{\pi}{2}} \sqrt{cot\,\theta}\ d\theta = \frac{\pi}{\sqrt{2}}$	**(5)**	**4**
		SECTION – C		
4	**Answer any one of the following-(Any one can be applicative if applicable)**		**[2×6=12]**	**CO**
	a.	Change the order of integration and evaluate $\int_1^4 \int_1^{\sqrt{x}} (x + y^2) dydx$	**(6)**	**4**
	b.	Apply Dirichlet's integral to find the volume and mass contained in the solid region in the first octant of the ellipsoid $\frac{x^2}{a^2} + \frac{y^2}{b^2} + \frac{z^2}{c^2} = 1$, if the density at any point is ρ (x,y,z) = kxyz.	**(6)**	**4**
5.	**Question- Answer any one of the following-**			
	a.	**i)** The average age of 14 girls and their teacher's age is 15 years. If the teacher's age is excluded, the average reduces by 1. What is the teacher's age? **ii)**In certain code, RELATION is written as ZKDQMNHS and NOSE is written as NMDR. How will MISTER be written in that code?	**(6)**	**5**
	b.	**i)**A single discount equivalent to three successive discounts of 5%, 10%, 20% is? **ii)**Reduction in price of sugar by 20% allows a household to buy 45 kg more for Rs.450. Find the original price of the sugar.	**(6)**	**5**