UNIVERSITY OF SARDODHA

DEPARTMENT OF MATHEMATICS

Conduct of Online Mid Term Exam Assignment through zoom. The due date of submission of Mid Term Exam Assignment is 20-04-2020

Subject: Special Function (MATH-434) **Teacher Name: Nida Ibrar**

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GROUP -1 Presentation/Viva on 21-04-2020(Tuesday) through zoom at 08:00 am **Note: Given reason to support your answer and show your work not less than 15 pages, help from mention resource paper**		
Roll no	**Student Name**	**Assignment**
LC-002	Arsalan	**Q 1:** Drive the high order factorials can be expressed in terms of Pochhammer's symbol?
LC-003	Skhawat Ali	**Q 2:** Drive the Euler's gamma function with the help of pochhammer's symbol by the limiting process?
LC-004	Muhammad Azeem	**Q 3:** Generalization the integral form of gamma function in term of Γ_k
LC-005	Ali Nawaz	**Q 4:** Drive the k-Pochhammer's symbol?
LC-006	Hamid Mehmood	**Q 5:** Proof all properties of theorem 3.2 from given source paper?

Source paper [https://www.rgnpublications.com/journals/index.php/jims/article/view/252]

GROUP -2 Presentation/Viva on 21-04-2020(Tuesday) through zoom at 08:30 am **Note: Given reason to support your answer and show your work not less than 15 pages, help from mention resource paper**		
Roll no	**Student Name**	**Assignment**
LC-008	Muhammad Waheed	**Q:** Proof all properties of theorem 3.3 from given source paper?
LC-009	Marataf Rasheed	**Q:** Proof the corollary# 3.4, 3.5 from given source paper?
LC-015	Irfan Hussain	**Q:** Proof the corollary# 3.6 from given source paper?
LC-016	Muhammad Abdullah	**Q:** Proof theorem 3.12 from given source paper?
LC-017	Muhammad Irfan	**Q**: Proof the corollary# 3.14 from given source paper?

Source paper [https://www.rgnpublications.com/journals/index.php/jims/article/view/252]

GROUP -3 Presentation/Viva on 21-04-2020(Tuesday) through zoom at 09:00 am **Note: Given reason to support your answer and show your work not less than 15 pages, help from mention resource paper**		
Roll no	**Student Name**	**Assignment**
LC-018	Farhan Saleem	**Q 1:** Drive the K-hypergeometric function?
LC-019	Fazal Ahmad	**Q 2:** Drive the K-hypergeometric differential equation?
LC-023	Muhammad Aqeel	**Q 3:** Drive the generalized the gamma and beta function? Eqs (18-19) from the given source paper.
LC-024	Ishtiaq Ahmad	**Q 4:** Drive the some properties of Gamma Beta Function (theorem 2.1) from the given source paper.
LC-025	Nasar Iqbal	**Q 5:** Drive the some properties of Gamma Beta Function (theorem 2.3 from) the given source paper.

Source paper of Q (1 -2)

[https://www.researchgate.net/profile/Shahid_Mubeen2/publication/257599158_A_NOTE_ON_k-HYPERGEMETRIC_DIFFERENTIAL_EQUATIONS/links/0046352578f32dd663000000/A-NOTE-ON-k-HYPERGEMETRIC-DIFFERENTIAL-EQUATIONS.pdf]

Source paper of Q (3-5)

[https://lematematiche.dmi.unict.it/index.php/lematematiche/article/view/974/857]

GROUP -4

Presentation/Viva on 25-04-2020(Saturday) through zoom at 02:00 pm

Note: Given reason to support your answer and show your work not less than 15 pages, help from mention resource paper

Roll no	Student Name	Assignment
LC-028	Hafiz Muhammad Umer	**Q1:** Drive the some properties of Gamma Beta Function (theorem 2.4) from the given source paper.
LC-030	Shahid akram	**Q 2:** Drive the some properties of Gamma Beta Function (theorem 2.5) from the given source paper.
LC-032	Muhammad Umair	**Q3:** Integral representation of generalized gamma and beta function (theorem 2.6) from the given source paper.
LC-038	Mudassar Shakeel	**Q 4:** Drive the integral Representation (Theorem 3.1) from the given source paper
LC-051	Jahanzaib khan	**Q 5:** Drive the integral Representation (Theorem 3.10) from the given source paper

Source paper[https://lematematiche.dmi.unict.it/index.php/lematematiche/article/view/974/857**]**

GROUP -5

Presentation/Viva on 25-04-2020(Saturday) through zoom at 02:30 pm

Note: Given reason to support your answer and show your work not less than 15 pages, help from mention resource paper

Roll no	Student Name	Assignment
LC-045	Muzafar Hussain	**Q 1:** Drive the theorem 3.14 from the given source paper
LC-046	Waqas Sharif	**Q 2:** Drive the integral representation of gamma in K form the Given source paper?
LC-048	Abdul Ghafar	**Q 3:** Drive the relation between Pochhammer's k-system and k- gamma function?
LC-044	Muhammad Yasir Jabbar	**Q 4:** Why we study special function and also describe the applications?
LC-011	Ahmed Farhan	**Q 5:** Solve Q 9 from chapter #2

Source paper Q 1
[https://lematematiche.dmi.unict.it/index.php/lematematiche/article/view/974/857**]**

Source paper Q(2-3)[
http://downloads.hindawi.com/journals/isrn.mathematical.analysis/2014/410801.pdf**]**

GROUP -6

Presentation/Viva on 27-04-2020(Monday) through zoom at 11:00 am

Note: Given reason to support your answer and show your work not less than 15 pages, help from mention resource paper

Roll no	**Student Name**	**Assignment**
F-16-03	Muhammad Qasir	**Q 1.** Solve Q 15 from chapter #2
F-16-05	Kashif Nadeem	**Q 2.** Proof of kummer theorem from chp #4
F-16-06	Muhammad Afnan Azmat	**Q 3.** Prove that $s = 0F_{1,k}(-;(\beta,k);u)$ is the solution of second order linear differential equation $ku\,s'' + \beta\,s' - s = 0$.
F-16-07	Muhammad Mohsan	**Q 4.** Drive the definition # 3 from the given source paper
F-16-16	Mirza Imran Ali	**Q 5.** Drive the gamma integral presentation from the given source paper **(eq #3)**

Source paper
[http://downloads.hindawi.com/journals/isrn.mathematical.analysis/2014/410801.pdf**]**

GROUP -7

Presentation/Viva on 27-04-2020(Monday) through zoom at 11:30 am

Note: Given reason to support your answer and show your work not less than 15 pages

Roll no	**Student Name**	**Assignment**
F-16-18	Zia ur Rehman	**Q 1.**Show that K- hypergeometric function is convergent or not?
F-16-19	Abdul Qadeer Malik	**Q 2.** Use the Definition of the gamma function with a suitable change of variable to prove that i) $\int_0^\infty e^{-ax}x^n dx = \frac{1}{a^{n+1}}\Gamma(n+1),\ n > -1, a > 0$
F-16-20	Arsalan Ahmad	**Q 3.** Use the Definition of the gamma function with a suitable change of variable to prove that $\int_a^\infty \exp(2ax - x^2)\,dx = \frac{\sqrt{\pi}}{2}\exp(a^2)$
F-16-24	Muhammad Aitazaz	**Q 4.** Prove that $\int_0^{\pi/2} sin^n\theta\,d\theta = \int_0^{\pi/2} cos^n\theta\,d\theta = \frac{\pi}{2}\frac{\Gamma(1+n/2)}{\Gamma(\frac{2+n}{2})}$
F-16-26	Hamza Iqbal	**Q5.** Show that $\Gamma\left(\frac{1}{2}+x\right)\Gamma\left(\frac{1}{2}-x\right) = \frac{\pi}{cos\pi x}$ plot your result over the range -10$\leq x \leq$ 10

GROUP -8 Presentation/Viva on 27-04-2020(Monday) through zoom at 12:00 pm **Note: Given reason to support your answer and show your work not less than 15 pages.**		
Roll no	**Student Name**	**Assignment**
F-16-30	Yasir Arfat	**Q 1**.Evaluate $\Gamma\left(-\frac{1}{2}\right)\Gamma\left(-\frac{7}{2}\right)$
15-ugle-725	Muhammad Ahmed	**Q 2.** Express each of the following integral in terms of gamma and beta function and simplify when possible $$\int_0^1 \left(\frac{1}{x}-1\right)^{1/4} dx$$
142(main campus)	M Amjad Abbas	**Q 3.** Express each of the following integral in terms of gamma and beta function and simplify when possible $$\int_a^b (b-x)^{m-1}(x-a)^{n-1}dx$$
15-uglc-741	Muhammed Naeemullh **(Repeater)**	**Q 4.** Find the solution of 2^{nd} order linear differential equation?
15-uglc-731	Tahir Shahzad **(Repeater)**	**Q 5.** What is the difference between Recurrence relation, duplication and reflection formula?