INTERNAL ASSIGNMENT QUESTIONS
B.A.(Maths & Stats) III YEAR

SUPPLEMENTARY - 2024

PROF. G. RAM REDDY CENTRE FOR DISTANCE EDUCATION
(RECOGNISED BY THE DISTANCE EDUCATION BUREAU, UGC, NEW DELHI)

OSMANIA UNIVERSITY
(A University Accredited with A+ by the NAAC - A University with Potential for Excellence, Hyderabad – 7 Telangana State

DIRECTOR
Prof. G.B. Reddy
Hyderabad – 7, Telangana State

PROF.G.RAM REDDY CENTRE FOR DISTANCE EDUCATION
OSMANIA UNIVERSITY, HYDERABAD – 500 007

Dear Students,

Every student of B.A. (Maths & stats) III year has to write and submit **Assignment** for each paper compulsorily. ***Statistics Assignment papers carries 20 marks and *Maths & Applied Mathematics Assignment papers carries 30 marks .** The marks awarded to the students will be forwarded to the Examination Branch, OU for inclusion in the marks memo. If the student fail to submit Internal Assignments before the stipulated date, the internal marks will not be added in the final marks memo under any circumstances. The assignments will not be accepted after the stipulated date. **Candidates should submit assignments only in the academic year in which the examination fee is paid for the examination for the first time.**

NOTE: THE SUPPLEMENTRY CANDIDATES PAYING THEIR EXAMINATION FEE FOR THE FIRST TIME ARE ONLY ELGIBLE TO WRITE AND SUBMIT THEIR ASSIGNMENTS. THE CANDIDATES WHO PAID EXAMINATION FEE EARLIER AND NOT SUBMITTED THEIR ASSIGNMENT ARE NOT ELIGIBLE TO SUBMIT THEIR ASSIGNMENTS NOW.

Candidates are required to submit the Exam fee receipt along with the assignment answers scripts at the concerned counter on or before **25-11-2024** and obtain proper submission receipt.

ASSIGNMENT WITHOUT EXAMINATION FEE PAYMENT RECEIPT (ONLINE) WILL NOT BE ACCEPTED

Assignments on Printed / Photocopy / Typed will not be accepted and will not be valued at any cost. Only HAND WRITTEN ASSIGNMENTS with blue pen will be accepted and valued.

Methodology for writing the Assignments (Instructions) :

1.   First read the subject matter in the course material that is supplied to you.
2.   If possible read the subject matter in the books suggested for further reading.
3.   You are welcome to use the PGRRCDE Library on all working days for collecting information on the topic of your assignments. (10.30 am to 5.00 pm).
4.   Give a final reading to the answer you have written and see whether you can delete unimportant or repetitive words.
5.   The cover page of the each theory assignments must have information as given in FORMAT below.

FORMAT

1.   NAME OF THE STUDENT   :
2.   ENROLLMENT NUMBER   :
3.   NAME OF THE COURSE   :
4.   NAME OF THE PAPER   :
5.   DATE OF SUBMISSION   :

6.   Write the above said details clearly on every subject assignments paper, otherwise your paper will not be valued.
7.   Tag all the assignments paper wise and submit them in the concerned counter.
8.   Submit the assignments on or before **25-11-2024** at the concerned counter at PGRRCDE, OU on any working day and obtain receipt.

DIRECTOR

INTERNAL ASSIGNMENT – 2023-24
Course B.A. III Year (Mathematics)
Paper : III Tittle : Rings And Linear Algebra

Section - A

I : Answer the following short questions   **5x3 =15**

1) Every field is an integral domain

2) To Prove that If T$T: \mathbb{R}^2 \to \mathbb{R}^2 defined\ by\ T\ (a_1,a_2\ ) = (\ a_1 + a_2\ ,\ 0\ ,\ a_1 \dotminus a_2\ )$

   is   a   linear Transformation $\mathbb{R}^2$.

3) Reduce the matrix $\begin{bmatrix} 1 & 2 & 3 \\ 4 & 6 & 8 \\ 3 & 4 & 5 \end{bmatrix}$ to normal from and hence find its rank.

4) Find the Eigen values of the matrix A = $\begin{bmatrix} 1 & 1 & 3 \\ 1 & 5 & 1 \\ 3 & 1 & 1 \end{bmatrix}$

5) In any inner product space V , the norm satisfies the parallelogram law :

$$\|x + y\|^2 + \|x - y\|^2 = 2\|x\|^2 + 2\|y\|^2 \ for\ all\ x,y \in V$$

Section -B

II : Answer the following Long questions   **3x5= 15**

1) State And Prove Fundamental theorem of homomorphism

2) State and Prove Cayley-Hamilton Theorem and Using this theorem

$$find\ A^{-1}\ if\ A = \begin{bmatrix} 1 & 2 & -1 \\ 3 & 1 & 0 \\ -2 & 1 & 4 \end{bmatrix}$$

3) $Let\ V\ be\ a\ finite - dimensional\ inner\ product\ space\ and$

   $T_1\ ,T_2\ \ be\ linear\ operators\ on\ V.Then\ Prove\ that$

   $(i)\ (\ T_1 + T_2\ )^* = T_1^* + T_2^*$
   $(\ ii)\ (\ cT_1\ )^* = cT_1^*\ \ for\ c \in F$
   $(iii)\ (\ T_1\ o\ T_2\ )^* = T_2^* o T_1^*$

Name of the Faculty : V. Venkateshwarlu
Department : Mathematics

INTERNAL ASSIGNMENT QUESTION PAPER – 2023-2024

Course : BA (Maths & Applied Maths) III Year

Paper : __IV__   Title : __Numerical Analysis__   Year : __BA-III__

Section – A

Unit – I Answer the following short questions (each question carries to three marks)   5x3=15

1 Explain an Errors with examples.

2 Explain the Bisection method.

3 Derive the Lagrange's interpolation formula.

4 Derive Simpson's $\frac{1}{3}^{rd}$ rule.

5 Solve by Euler's method $\frac{dy}{dx} = x\,y^{1/3}$ and given that $y(1) = 1$ taking $h = 0.01$.

Section – B

Unit – II Answer the following Questions (each question carries to five marks)   3x 5=15

1 Solve the following system of equations by Gauss – seidel method.
$8x - y + z = 18$, $2x + 5y + 2z = 3$, $x + y - 3z = -6$.

2 Use Runge – Kutta fourth order method to find $y(0.2)$, $y(0.4)$ if $y' = 1 + y^2$, $y(0) = 1$

3 Construct the forward difference table and find interpolating polynomial for following data

x	0	5	10	15	20	25
$f(x)$	7	11	14	18	24	32

Name of the Faculty :

Dept. __Mathematics__,
UCE(A), OU
Ramalingaiah. Badavi.

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INTERNAL ASSIGNMENT QUESTION PAPER – 2023-2024

Course : BA (Maths & Applied Maths) III Year

Paper : __III__ Title : __INTEGRAL TRANSFORMS AND COMPLEX ANALYSIS__ Year : __2023-2024__.

Section – A

Unit – I Answer the following short questions (each question carries to three marks) 5x3=15

1. Find $L(t\,e^{-3t}\sin^2 t)$

2. Solve $y'' - 3y' + 2y = e^{2t}$, $y(0) = -3$, $y'(0) = 5$.

3. Using Fourier integrals show that $\int_0^\infty \dfrac{1-\cos\pi\lambda}{\lambda}\sin\lambda x\,d\lambda = \begin{cases} \dfrac{\pi}{2}, & 0 < x < \pi \\ 0, & x > \pi \end{cases}$

4. Solve $\dfrac{\partial u}{\partial x} + \dfrac{\partial u}{\partial y} = 0$, $u(x,0) = 4e^{3x}$

5. If $u + v = (x-y)(x^2 + 4xy + y^2)$ Find analytic function $f(z) = u + iv$

Section – B

Unit – II Answer the following Questions (each question carries to five marks) 3x 5=15

1) Expand $f(x) = x + x^2$ in $-\pi < x < \pi$ in a Fourier series, Hence show that $1 + \dfrac{1}{2^2} + \dfrac{1}{3^2} + \dfrac{1}{4^2} + - - - = \dfrac{\pi^2}{6}$.

2) A tightly stretched string with fixed end points $x=0$ & $x=l$ is initially in a position given by $y(x,0) = y_0 \sin^3\left(\dfrac{\pi x}{l}\right)$. If it is released from rest from this position, Find the displacement 'y' at any distance 'x' from one end and at any time 't'.

3) Find Cauchy – Riemann Equations in polar Form.

Name of the Faculty :
Dr. P. Thirupathi
Dept. __MATHEMATICS__

17/12/2023

INTERNAL ASSIGNMENT QUESTION PAPER

Statistics – III

Section – A

Answer the following short questions $5 \times 2 = 10$

1) What is the significance of Cochran's theorem in Design of Experiments

2) Write the statistical basis for control charts for variables and control charts for attributes

3) Show that the maximum and or minimum value are only at the extreme points of a convex set. And how the steepest ascent rule is used in solving a linear programming problem

4) Establish the relation between Gross Reproductive Rate and Net Reproductive Rate

5) What are the difficulties involved in evaluating National Income?

Section – B

Answer the following question $2 \times 5 = 10$

1) How the randomization, replication and local control will serve the purpose of an Experimental Design? Explain in Detail.

2) (a) How the principles of experimental designs are involved in Latin Square Design

(b) How can you detect in solving a Linear programming problem using simplex method having

(i) Unbounded solution (ii) Multiple solution (iii) Infeasible solution

Illustrate with examples

Name: R. Lakshmi Himaja

Himaja

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INTERNAL ASSIGNMENT QUESTION PAPER – 2023-2024

Course : BA (Statistics) III Year

Paper : **IV**   Title : **Applied Statistics – II**   Year : **III**

Section – A

Unit – I Answer the following short questions (each question carries to two marks)   5x2=10

1. Explain the methods of obtaining simple random sample.

2. Explain sampling and non-sampling errors.

3. Define Time series. Explain components of time series.

4. Explain mathematical tests of Index numbers.

5. Explain Leontief's method for constructing demand curve.

Section – B

Unit – II Answer the following Questions (each question carries to five marks)   2x5=10

1. Show that in SRSWOR, the sample mean square is an unbiased estimate of the population mean square.

2. Explain Ratio to moving average and Ratio to trend methods for measuring seasonal indices.

Name of the Faculty : M. Anitha

Dept. Statistics

A|12|23.

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INTERNAL ASSIGNMENT QUESTION PAPER – 2023-2024

Course : BA (Maths & Applied Maths) III Year

Paper : IV   Title : Differential Geometry   Year : 2024

Section – A

Unit – I Answer the following short questions (each question carries to three marks) 5x3=15

① Express The Tangent line at a point on a space curve ?

② Define Curvature, Torsion, Serret-Frenet Formulae ?

③. Show that The necessary and sufficient condition for a curve to be a helix is that its curvature and torsion are in a constant ratio. ?

④ Show that F=0 is the necessary and sufficient condition for The parametric curves on a surface to be orthogonal

⑤ Find out curvature of Normal section

Section – B

Unit – II Answer the following Questions (each question carries to five marks) 3x 5=15

① Define Different Forms of Curvature and Torsion

② Find the Involutes and evolutes of the circular helix $x=a\cos\theta$, $y=a\sin\theta$, $z=a\theta\tan\alpha$,

③. State and prove that Euler's Theorem on Normal Curvature

Name of the Faculty :

Dept. Dept of Mathematics
OUCS.