INTERNAL ASSIGNMENT QUESTIONS

Advanced Diploma in Mathematics

Semester - II

2025

PROF. G. RAM REDDY CENTRE FOR DISTANCE EDUCATION

(RECOGNISED BY THE DISTANCE EDUCATION BUREAU, UGC, NEW DELHI)

OSMANIA UNIVERSITY

(A University with Potential for Excellence and Re-Accredited by NAAC with "A" + Grade)

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 Advanced Diploma in Mathematics Semester II has to write and submit **Assignment** for each paper compulsorily. Each assignment 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.**

Candidates are required to submit the Exam fee receipt along with the assignment answers scripts at the concerned counter on or before **25-04-2025** 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 will be accepted and valued.

Students are advised not use Black Pen.

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. SEMESTER (I, II, III & IV) :
5. TITLE OF THE PAPER :
6. 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 **25-04-2025** at the concerned counter at PGRRCDE, OU on any working day and obtain receipt.

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INTERNAL ASSIGNMENT QUESTION PAPER

COURSE: Advanced Diploma in Mathematics - Semester - II

Paper: I Subject: **Basics of Discrete Mathematics**

Total Marks: 30

Section - A

Answer the following short questions

(Each question carries two marks) 5 x 2 = 10

1. Construct the truth table for the compound proposition $p \to \neg q$

2. Using truth table, show that the following conditional statement $p \to (p \vee q)$ is a tautology.

3. In a Boolean algebra, show that $a + (a * b) = a$.

4. Draw the Boolean switching circuit which represents $A \wedge (B \vee C)$.

5. Stae and prove cancellation law for addition in $\mathbb{Z}$.

Section - B

Answer the following Questions (Each question carries ten marks) 2 x10 = 20

1. Show that $(p \to r) \wedge (q \to r)$ *and* $(p \vee q) \to r$ are logically equivalent.

2. If $(1586)_{10} = (x)_2 = (y)_5 = (z)_7$, then find x, y, z.

Name of the Faculty: Prof. V. Kiran

Dept. of Mathematics

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INTERNAL ASSIGNMENT QUESTION PAPER

COURSE : Advanced Diploma in Mathematics - Semester – II

Paper : II Subject : Rings, Vectors & Operators Re

Total Marks: 30

Section – A

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

1 Show that every field is an integral domain.

2 Show that the intersection of two subspaces of a vector space is again a subspace

3 Show that the set $\{(1,i,0),(2i,1,1),(0,1+i,1-i)\}$ is a basis for V_3

4 Solve the graphically the LPP : Max $Z = 10x + 15y$

5 Explain i) Standard form of LPP
(ii) Slack & Surplus variables

STC
$3x+3y \leq 36$
$5x+2y \leq 50$
$2x+6y \leq 60$
$x, y \geq 0$

Section – B

UNIT – II : Answer the following Questions (each question carries ten marks) 2x10=20

1 Determine the Eigen values / Eigen vectors of $A = \begin{bmatrix} 8 & -6 & 2 \\ -6 & 7 & -4 \\ 2 & -4 & 3 \end{bmatrix}$

2. Solve the LPP by Simplex Method

Max $Z = 4x_1 + 10x_2$

STC $2x_1 + x_2 \leq 50$
$2x_1 + 5x_2 \leq 100$
$2x_1 + 3x_2 \leq 90$
$x_1, x_2 \geq 0$

Name of the Faculty : Dr. G. G. Shyam Sunder

Dept. Mathematics.

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INTERNAL ASSIGNMENT QUESTION PAPER

COURSE: Advanced Diploma in Mathematics - Semester - II

Paper: **III** Subject: **Differential Equations**

Total Marks: 30

Section - A

Answer the following short questions (each question carries two marks) 5 x 2 = 10

1. Form a differential equation by eliminating a and b from $y = a + be^x$.

2. Solve $\frac{dy}{dx} - y = e^x$.

3. Solve $(xy - 2xy^2)\,dx + (3x^2y - x^3)\,dy = 0$.

4. Find the orthogonal trajectories of the family $ay^2 = x^3$.

5. Solve $y'' - y' - 6y = e^{-x}$ by the method of variation of parameters.

Section - B

Answer the following Questions (each question carries ten marks) 2 x10 = 20

1. Solve (a) $x^2p + y^2q = z^2$ and (b) $zpq = p + q$.

2. Find the Fourier series expansion of $f(x) = x^2$, $-\pi \le x \le \pi$. Hence, deduce that

$$1+\frac{1}{2^2}+\frac{1}{3^2}+\ldots=\frac{\pi^2}{6}.$$

Name of the Faculty: Prof. V. Naga Raju

Dept. of Mathematics

PROF. G. RAM REDDY CENTRE FOR DISTANCE EDUCATION
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INTERNAL ASSIGNMENT QUESTION PAPER

COURSE : Advanced Diploma in Mathematics - Semester – II

DT 16/3/25

Paper : IV Subject : STATISTICS

Total Marks: 30

Section – A

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

1 Calculate the Variance and S.D of the following Raw data : 16, 4, 7, 9, 5, 10, 20, 6, ...

2 If the Population is 3, 6, 9, 15, 27 then Find 1) the mean of each of the S.D & mean

3 2) Find the S.D of Sampling distributions of

4

5

Section – B

UNIT – II : Answer the following Questions (each question carries ten marks) 2x10=20

1 Calculate the Variance of the following F.D

Marks Group	0-10	10-20	20-30	30-40	40-50	50-60	60-70	70 ...
No. of Students	5	6	9	15	18	7	2	1

80-90	1
90-100	1

Name of the Faculty : DVK Ramesh

Dept. Mathematics

2. Explain briefly student 't' distribution

Section - A

3) The mean and the S.D of a population are 11.795 and 1.4054 respectively. If $n = 50$ find 95% confidence interval for the mean.

4) Explain briefly the following

a) Type I error ✓ b) Type II error ✓

c) Critical Region

5) Define Chi-square (χ^2) distribution

16/9/25