

S R R & C V R GOVT. DEGREE COLLEGE

(Autonomous)

VIJAYAWADA-520004, KRISHNA DISTRICT



Minutes of the Meeting of the Up gradation of Syllabus
Department of Mathematics

Dated: 20-02-2019



SRR & CVR GOVT. DEGREE COLLEGE

(Autonomous)

NAAC accredited with 'B' Grade

Machavaram, Vijayawada - 520 004, Krishna District.

Cell: 94922 34488 Ph: 0866-2430060 Fax: 0866-2441092 www.srrcvt.org srrandcvt@gmail.com



Dr. Velaga Joshi, Principal
M.A. (PHI), M.A. (HIS), M.A. (M.C.), B.L., M.Phil., Ph.D.

MINUTES OF THE MEETING OF THE UPGRADATION OF SYLLABUS IN THE SUBJECT OF MATHEMATICS

A meeting on up gradation of syllabus of Department of Mathematics held on 20-02-2019 in the Department of Mathematics for 5th semester of III B.Sc Syllabus under the chairmanship of K.V.Naga Lakshmi, Head of the Mathematics Department . The following members are present

1. University Nominee
Prof. Bhavanari Satyanarayana,
Head of the Department of Mathematics,
Acharya Nagarjuna University,
Nagarjuna Nagar, Guntur

:

Bh. Satyanarayana
20/2/2019

2. Subject expert
Dr.S. Eswaraiah Setty,
Reader & HOD of Mathematics,
Principal, S.G.S College, Jaggaiahpet,
Krishna Dist.

:

S. Eswaraiah Setty
20/2/2019.

3. Subject expert
Sri. G.V. Bhaskar,
HOD of Mathematics, GDC for Women,
Guntur.

:

G.V. Bhaskar
20/2/19

4. Chairman
Smt.K.V. Naga Lakshmi,
Lecturer in Mathematics,
SRR & CVR Govt. Degree College,
Autonomous, Vijayawada.

:

K.V. Naga Lakshmi
20/2/2019

5. Alumni
B. Ratna Kumari,
SRR & CVR Govt. Degree College,
Vijayawada.

:

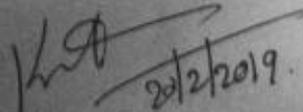
B. Ratna Kumari
20/2/19

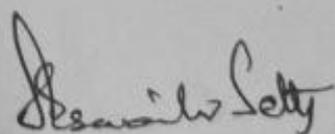
Agenda:

- To approve Mathematics Syllabus for 5th and 6th semesters of III B.Sc for the academic year 2019-2020.
- To divide the syllabus into 5 units.
- To approve Model papers, Blue print.
- To divide 100 marks into two components.
- a) i) External 60 Marks, ii) Internal 40 Marks.
- b) External 60 Marks further divided into two sections. Section-A consisting 20 Marks, Section-B consisting – 40 Marks is approved.
- To evaluate Internal Assessment as follows :-

(a) Internal exams (two)	- 10
(b) Assignments (two)	- 10
(c) Project	- 10
(d) Attendance	- 05
(e) Seminar	- 05
Total	= 40
- To divide the syllabus into FIVE units.
- In the Question paper Section-A consisting Questions of weightage 4 marks each. Five questions to be answered i.e. $5 \times 4 = 20$ marks and Section-B consisting of questions of weightage 8 marks each, Five questions to be answered $5 \times 8 = 40$ Marks is approved.
- To pass the exam, student must get 40% of 60 (external) and 40% of 40 (internal) and overall 40% combining both internal and external.
- To approve the model paper for III B.Sc
- To approve paper setters.
- To approve other Academic activities of the Department.
- To give permission to the Chairman for any small changes.

B. Ratna Kumar
20/2/19


K. V. Bhojappa
20/2/19


Sh. Subhanarayana
20/2/2019

Resolutions:

In BOS meeting the committee has unanimously resolved and approved the following items:-

- The syllabus for the Mathematics of 5th semester for III B.Sc Mathematics for 2019-2020 is approved.
- To divide 100 marks into two components.
 - a) i) External 60 Marks,
 - ii) Internal 40 Marks.
 - b) External 60 marks further divided into two sections. Section-A consisting 20 marks, Section-B consisting – 40 marks is approved.
- Internal exams(two) - 10
 Assignments (two) - 10
 Project - 10
 Attendance - 05
 Seminar - 05
 Total = 40 is approved.
- In the Model paper Section-A consisting Questions of weightage 4 marks each. Five questions to be answered i.e. $5 \times 4 = 20$ marks and Section-B consisting of questions of weightage 8 marks each, Five questions to be answered $5 \times 8 = 40$ Marks is approved.
- To pass the exam student must get 40% of 60 and overall 40% combining both internal and external.
- Workload for this paper is 6 hours.
- The chairman is given empowerment to do any small changes.
- The panel of paper setter is approved.
- The controller of examinations is given empowerment for any changes in selecting paper setter in case if non-availability if examiners as are listed.

B. Ratnakumar
20/2/19

Bh. Chandraoyana
20/2/2019

K. S. S.
20/2/2019

J. S. S. S.
20/2/19

[5]

1. Prof. Bhavanari Satyanarayana

:

Bh. Satyanarayana
20/2/2019

2. Dr. S. Eswaraiah Setty

:

S. Eswaraiah Setty

3. Sri. G.V. Bhaskar

:

G.V. Bhaskar
20/2/19

4. Smt. B. Ratna Kumari

:

B. Ratna Kumari
20/2/19

5. Smt. K.V. Naga Lakshmi

:

K.V. Naga Lakshmi
20/2/2019

6. Sri.M. Lakshmana Das

:

7. MD. Masthan

:

8. Kumari.G.Lalitha

:

9.Smt. S.Renuka

:

S R R & C V R GOVT DEGREE COLLEGE

(AUTONOMOUS) NAAC B⁺

Department of Mathematics

III B.Sc MATHEMATICS SYLLABUS

SEMESTER-5, PAPER-5

RING THEORY & VECTOR CALCULUS

60 Hrs

UNIT - 1 (12 hrs) RINGS-I :-

Definition of Ring and basic properties, Boolean Rings, divisors of zero and cancellation laws Rings, Integral Domains, Division Ring and Fields, The characteristic of a ring - The characteristic of an Integral Domain, The characteristic of a Field. Sub Rings, Ideals

UNIT - 2 (12 hrs) RINGS-II :-

Definition of Homomorphism - Homomorphic Image - Elementary Properties of Homomorphism - Kernel of a Homomorphism - Fundamental theorem of Homomorphism - Maximal Ideals - Prime Ideals.

UNIT - 3 (12 hrs) VECTOR DIFFERENTIATION :-

Vector Differentiation, Ordinary derivatives of vectors, Differentiability, Gradient, Divergence, Curl operators, Formulae Involving these operators.

UNIT - 4 (12 hrs) VECTOR INTEGRATION :-

Line Integral, Surface Integral, Volume integral with examples.

UNIT - 5 (12 hrs) VECTOR INTEGRATION APPLICATIONS :-

Theorems of Gauss and Stokes, Green's theorem in plane and applications of these theorems.

Reference Books :-

1. Abstract Algebra by J. Fraleigh, Published by Narosa Publishing house.
2. Vector Calculus by Santhi Narayana, Published by S. Chand & Company Pvt. Ltd., New Delhi.
3. A text Book of B.Sc., Mathematics by B.V.S.S.Sarma and others, published by S. Chand & Company Pvt. Ltd., New Delhi.
4. Vector Calculus by R. Gupta, Published by Laxmi Publications.
5. Vector Calculus by P.C. Matthews, Published by Springer Verlag publications.
6. Rings and Linear Algebra by Pundir & Pundir, Published by Pragathi Prakashan.

Suggested Activities:

Seminar/ Quiz/ Assignments/ Project on Ring theory and its applications

(by Bhavanari Satyanarayana,
T.V. Pradeep Kumar, D. Srinivasulu), Studera Prets,
New Delhi, 2016.

Bh. Satyanarayana
20/2/2019
B. Patra Kumar
20/2/19

K. S.
20/2/2019.

Dr. S. S. S. S.
20/2/19.

S R R & C V R GOVT DEGREE COLLEGE

(AUTONOMOUS) NAAC B⁺

Department of Mathematics

III B.Sc MATHEMATICS

SEMESTER-5, PAPER-5

RING THEORY & VECTOR CALCULUS

BLUE PRINT

DURATION : 3 HRSTotal Marks:60

SECTION-A

Answer anyFive questions. Each question carries 4 Marks.

5×4 = 20M

Question	Topics	No.of Questions	Weight age
1	UNIT-1	1	4
2	UNIT-1	1	4
3	UNIT-2	1	4
4	UNIT-2	1	4
5	UNIT-3	1	4
6	UNIT-3	1	4
7	UNIT-4	1	4
8	UNIT-4	1	4
9	UNIT-5	1	4
10	UNIT-5	1	4

SECTION-B

Answer ALL Questions.Each question carries 8 MARKS.

5×8 = 40M

QUESTION	Topic	No. of questions	Marks
11.(a) or (b)	UNIT-1	2	8
12.(a) or (b)	UNIT-2	2	8
13.(a) or (b)	UNIT-3	2	8
14.(a) or (b)	UNIT-4	2	8
15.(a) or (b)	UNIT-5	2	8

B. Patra kumar
20/2/19Bh. Subhakaroyan
20/2/2019K. S. S.
20/2/2019.

S. S. S. S.

S. S. S. S.
20/2/19

S.R.R & C.V.R GOVT DEGREE COLLEGE

(Autonomous) NAACB+

Department of Mathematics

Semester – V, Paper – 5

RING THEORY AND VECTOR CALCULUS

Time: 3 Hrs

Model Question paper

maximum : 60 Marks

SECTION A – (5 X 4 = 20 Mark)

Answer any FIVE questions.

1. Prove that characteristic of a Boolean ring is '2'.
బూలియన్ వలయమునకు లాక్షణికము '2' అని చూపండి.
2. If F is a field then show that $\{0\}$ and F are the only ideals of F .
క్షేత్రము F కు $\{0\}$, F లు మాత్రమే ఆదర్శములు అగునని చూపుము.
3. If f is a homomorphism from a ring R into a ring S then prove that $\ker f$ is an ideal of R .
వలయము R నుండి వలయము S కు f ఒక సమరూపత అయితే కెర్నల్ f అనేది R లో ఆదర్శము అవుతుంది అని చూపండి.
4. An ideal A of a commutative ring R with unity is prime ideal iff R/A is an integral domain.
వినిమయ వలయము R కి ఐడియల్ A , అభాజ్య ఐడియల్ అగుటకు ఆవశ్యక పర్యాప్త నియము R/A ఒక పూర్ణాంక ప్రదేశము అని చూపండి.
5. If $\vec{r} = a \cos t \vec{i} + a \sin t \vec{j} + at \tan \theta \vec{k}$ then find
(a) $\left(\frac{dr}{dt} \times \frac{d^2r}{dt^2}\right)$ at $t = 0$.
 $\vec{r} = a \cos t \vec{i} + a \sin t \vec{j} + at \tan \theta \vec{k}$ అయినపుడు $t = 0$ వద్ద
(a) $\left(\frac{dr}{dt} \times \frac{d^2r}{dt^2}\right)$ వద్ద $t = 0$ ను కనుగొనుము.
6. If $A = t\vec{i} - t^2\vec{j} + (t-1)\vec{k}$, $B = 2t^2\vec{i} + 6t\vec{k}$, find
(a) $\int_0^2 (A \cdot B) dt$
 $A = t\vec{i} - t^2\vec{j} + (t-1)\vec{k}$, $B = 2t^2\vec{i} + 6t\vec{k}$ అయితే
(a) $\int_0^2 (A \cdot B) dt$ ను కనుగొనుము.

B. Ratnakumari
20/2/2019

K. S. S. S.
20/2/2019

B. Ratnakumari
20/2/19

7. If $\phi = x^3 - y^3 + x^2z$ then find grade ϕ at $(1, 1, -2)$.
(1, 1, -2) వద్ద $\phi = x^3 - y^3 + x^2z$ అయితే grade ϕ ను కనుగొనుము.
8. Evaluate $\oint_C \vec{F} \cdot d\vec{r}$ where C is the circle $x^2 + y^2 = 1, z = 0$ and $\vec{F} = y\vec{i} + z\vec{j} + x\vec{k}$
 $\vec{F} = y\vec{i} + z\vec{j} + x\vec{k}$ అయితే $x^2 + y^2 = 1, z = 0$ అను వక్రము C పై \vec{F} యొక్క రేఖా సమాకలని రాబట్టండి.
9. Evaluate by Green's theorem $\oint_C (y - \sin x)dx + \cos x dy$ where C is the triangle enclosed by the lines $x = 0, x = \frac{\pi}{2}, \pi y = 2x$.
గ్రీన్ సిద్ధాంతము నుపయోగించి $x = 0, x = \frac{\pi}{2}, \pi y = 2x$ రేఖలచే పరిబద్ధమైన త్రిభుజము C లో $\oint_C (y - \sin x)dx + \cos x dy$ విలువను రాబట్టండి.
10. Apply Gauss's theorem to prove that $\int_V rNdS = 3v$.
గౌస్ సిద్ధాంతమునుపయోగించి $\int_V rNdS = 3v$ ను నిరూపించుము.

SECTION B - (5 X 8 = 40 Marks)
Answer the following questions.

UNIT I

11. If $Z(i) = \{a + ib/a, b \in \mathbb{Z}, i^2 = -1\}$ then show that $z(i)$ is an integral domain w.r.t. addition and multiplication of complex numbers.
 $Z(i) = \{a + ib/a, b \in \mathbb{Z}, i^2 = -1\}$ అయితే $z(i)$ అనునది సంకలనము మరియు గుణకారం దృష్ట్యా పూర్ణాంక ప్రదేశము అవుతుందని చూపండి.

Or

12. Show that Z is a principal ideal ring.
 Z అనునది ప్రధాన ఆదర్శ వలయమవుతుందని చూపండి.

UNIT II

13. In the ring of integers, determine the maximal ideals.
పూర్ణాంక వలయములో అధికతను ఆదర్శాలను నిర్ణయింపుము.

Or

14. State and prove fundamental theorem of homomorphism of rings.
వలయ సమరూపతా ప్రాథమిక సిద్ధాంతమును ప్రవచించి నిరూపించుము.

UNIT III

15. (a) Find the directional derivative of $\phi = x^2yz + 4xz^2$ at the point $(1, -2, -1)$ in the direction of $2\vec{i} - \vec{j} - 2\vec{k}$.
(1, -2, -1) వద్ద $2\vec{i} - \vec{j} - 2\vec{k}$ వక్రానికి స్పర్శరేఖ దిశలో $\phi = x^2yz + 4xz^2$ ప్రమేయానికి దైశిక వ్యుత్పన్నము కనుగొనుము.
(b) Find $\text{div } \vec{F}$ and $\text{curl } \vec{F}$ where $\vec{F} = xy^2\vec{i} + 2x^2yz\vec{j} - 3yz^2\vec{k}$ at $(1, -1, 1)$.
 $\vec{F} = xy^2\vec{i} + 2x^2yz\vec{j} - 3yz^2\vec{k}$ అయితే $(1, -1, 1)$ వద్ద $\text{div } \vec{F}$ మరియు $\text{curl } \vec{F}$ కనుక్కోండి.

14. 10 If A, B are two differentiable vector point functions then show that
 $\text{grad}(A \cdot B) = (B \cdot \nabla)A + (A \cdot \nabla)B + B \times (\text{curl } A) + A \times (\text{curl } B)$.

A, B లు రెండు అదిశాబిందు ప్రమేయాలయితే

$\text{grad}(A \cdot B) = (B \cdot \nabla)A + (A \cdot \nabla)B + B \times (\text{curl } A) + A \times (\text{curl } B)$ అని చూపండి.

UNIT IV

15. 17 If $F = (x + y^2)\bar{i} - 2x\bar{j} + 2yz\bar{k}$, evaluate $\int_S F \cdot N dS$ where S is the surface of plane $2x + y + 2z = 6$ in the first octant.

$F = (x + y^2)\bar{i} - 2x\bar{j} + 2yz\bar{k}$, అయి ప్రథమాష్టమంలో $2x + y + 2z = 6$

తలభాగం S అయితే $\int_S F \cdot N dS$ రాబట్టుండి.

16. 18 If $\phi = 45x^2y$, evaluate $\iiint_V \phi dV$ where V is the closed region bounded by the plane $4x + 2y + z = 8$, $x = y = z = 0$.

$\phi = 45x^2y$, అయి $4x + 2y + z = 8$, $x = y = z = 0$ తలాలచే పరిబద్ధమైన

సంవృతాంతరాళం V అయితే $\iiint_V \phi dV$ కనుక్కోండి.

UNIT V

17. 19 State and prove Gauss's divergence theorem.

గాస్ అవసరణ సిద్ధాంతమును ప్రవచించి నిరూపించుము.

Or

18. 20 Verify Stoke's theorem for $\int_C xy dx + xy^2 dy$ where C is the square in the xy-plane with vertices (1, 0) (-1, 0) (0, 1) (0, -1).

(1, 0) (-1, 0) (0, 1) (0, -1)లచే xy-తలంలో ఏర్పడు చతురస్రమునకు $\int_C xy dx + xy^2 dy$ నకు స్టోక్స్ సిద్ధాంతం సరిచూడండి.

B. Ratna kumar
20/2/19

K. S. R.
20/2/2019.

Devi S.

V. S. R.
20/2/19

A. S. R.
20/2/2019

S R R & C V R GOVT DEGREE COLLEGE

(AUTONOMOUS) NAAC B⁺

Department of Mathematics

III B.Sc MATHEMATICS SYLLABUS

SEMESTER-5, PAPER-6

LINEAR ALGEBRA

60 Hrs

UNIT - I (12 hrs) : Vector Spaces-I :

Vector Spaces, General properties of vector spaces, n-dimensional Vectors, addition and scalar multiplication of Vectors, internal and external composition, Null space, Vector subspaces, Algebra of subspaces, Linear Sum of two subspaces, linear combination of Vectors, Linear span Linear independence and Linear dependence of Vectors.

UNIT -II (12 hrs) : Vector Spaces-II :

Basis of Vector space, Finite dimensional Vector spaces, basis extension, co-ordinates, Dimension of a Vector space, Dimension of a subspace, Quotient space and Dimension of Quotientspace.

UNIT -III (12 hrs) : Linear Transformations :

Linear transformations, linear operators, Properties of L.T, sum and product of LTs, Algebra of Linear Operators, Range and null space of linear transformation, Rank and Nullity of linear transformations – Rank – Nullity Theorem.

UNIT -IV (12 hrs) : Matrix :

Matrices, Elementary Properties of Matrices, Inverse Matrices, Rank of Matrix, Linear Equations, Characteristic Roots, Characteristic Values & Vectors of square Matrix, Cayley – Hamilton Theorem.

UNIT -V (12 hrs) : Inner product space :

Inner product spaces, Euclidean and unitary spaces, Norm or length of a Vector, Schwartz inequality, Triangle in Inequality, Parallelogram law, Orthogonality, Orthonormal set, complete orthonormal set, Gram – Schmidt orthogonalisation process. Bessel's inequality and Parseval's Identity.

Reference Books :

1. Linear Algebra by J.N. Sharma and A.R. Vasista, published by Krishna Prakashan Mandir, Meerut-250002.
2. Matrices by Shanti Narayana, published by S.Chand Publications.
3. Linear Algebra by Kenneth Hoffman and Ray Kunze, published by Pearson Education (low priced edition), New Delhi.
4. Linear Algebra by Stephen H. Friedberg et al published by Prentice Hall of India Pvt. Ltd. 4th Edition 2007.

5. Linear Algebra & Vector Calculus (by Bhavanari Subhanarayana, T. V. Pradeepkumar, D. Srinivasulu) Studera Press, New Delhi, 2016

Suggested Activities: Seminar/ Quiz/ Assignments/ Project on "Applications of Linear algebra Through Computer Sciences"

B. Ratra kumar
20/2/19.

Bh. Subhanarayana
20/2/2019

KR
20/2/2019.

Pradeep Kumar

Pradeep Kumar
20/2/19

S R R & C V R GOVT DEGREE COLLEGE

(AUTONOMOUS) NAAC B⁺

Department of Mathematics

III B.Sc MATHEMATICS

SEMESTER-5, PAPER-6

LINEAR ALGEBRA

BLUE PRINT

DURATION : 3 HRSTotal Marks:60

SECTION-A

Answer any Five questions. Each question carries 4 Marks.

5×4 = 20M

Question	Topics	No.of Questions	Weight age
1	UNIT-1	1	4
2	UNIT-1	1	4
3	UNIT-2	1	4
4	UNIT-2	1	4
5	UNIT-3	1	4
6	UNIT-3	1	4
7	UNIT-4	1	4
8	UNIT-4	1	4
9	UNIT-5	1	4
10	UNIT-5	1	4

SECTION-B

Answer ALL Questions. Each question carries 8 MARKS.

5×8 = 40M

QUESTION	Topic	No. of questions	Marks
11.(a) or (b)	UNIT-1	2	8
12.(a) or (b)	UNIT-2	2	8
13.(a) or (b)	UNIT-3	2	8
14.(a) or (b)	UNIT-4	2	8
15.(a) or (b)	UNIT-5	2	8

B. Ratna kumar
20/2/19A. S. Narayana
20/2/2019V. B. Lakshmi
20/2/2019

S. S. S. S.

V. B. Lakshmi
20/2/19

S.R.R & C.V.R GOVT DEGREE COLLEGE

(Autonomous) NAACB+
Department of Mathematics
Semester – V, Paper – 6
Linear Algebra

Time: 3 Hrs

Model Question paper

maximum : 60 Marks

SECTION A – (5 X 4 = 20 Mark)

Answer any FIVE questions.

1. Let p, q, r be the fixed elements of a field F . Show that the set W of all triads (x, y, z) of elements of F , such that $px + qy + rz = 0$ is a vector space of $V_3(F)$.
క్షేత్రము F లో p, q, r లు స్థిరమూలకాలు అయితే, సదిశాంతరాళము $V_3(F)$ కి $w = \{(x, y, z) / px + qy + rz = 0\}$ ఉపాంతరాళమని చూపుము.
2. If S is a subset of a vector space $V(F)$ then prove that
(a) S is a subspace of $V \Leftrightarrow L(S) = S$
 $V(F)$ సదిశాంతరాళానికి S ఒక ఉప పరిమితి అయితే
(a) V కి S ఉపాంతరాళము $\Leftrightarrow L(S) = S$ అని నిరూపించండి.
3. If α, β, γ are linearly independent vectors of a vector space $V(F)$, show that $\alpha + \beta, \beta + \gamma, \gamma + \alpha$ are also linearly independent.
 α, β, γ అను సదిశలు సదిశాంతరాళము $V(F)$ లో ఋజు స్వాతంత్ర్య సదిశలు అయితే $\alpha + \beta, \beta + \gamma, \gamma + \alpha$ కూడా ఋజు స్వాతంత్ర్య సదిశలు అని చూపండి.
4. Show that the set $\{(1, 0, 0), (1, 1, 0), (1, 1, 1)\}$ is a basis of $C^3(C)$
సదిశాంతరాళము $C^3(C)$ కి సమితి $\{(1, 0, 0), (1, 1, 0), (1, 1, 1)\}$ ఒక ఆధారమగునని చూపించుము.
5. If the mapping $T : V_3(R) \rightarrow V_2(R)$ is defined by $T(x, y, z) = (x - y, x + z)$ then show that T is a linear transformation.
 $T : V_3(R) \rightarrow V_2(R)$ ని $T(x, y, z) = (x - y, x + z)$ అని నిర్వచించిన T ఋజు పరివర్తన అని చూపండి.
6. If T is a linear Transformation from a vector space $U(F)$ into a vector space $V(F)$ then prove that $R(T)$, the range of T is a subspace of V .
సదిశాంతరాళము $U(F)$ నుండి సదిశాంతరాళము $V(F)$ కు T అనునది ఋజు పరివర్తనము అయితే V కు $R(T)$ ఉపాంతరాళము అని చూపండి.

B. Patra kumar
20/2/19

A. Subhanouy
20/2/2019

V. Blesker
20/2/19

K. S. B.
20/2/2019.

S. S. S.

7. Prove that the characteristic vectors corresponding to distinct characteristic roots of a matrix are linearly independent.
మాత్రికలోని లాక్షణిక సదిశలు కలిగి వున్న లాక్షణిక మూలములు ఋజు స్వతంత్ర్యములు అని నిరూపించుము.

8. Find the characteristic roots and the corresponding of the matrix

$$A = \begin{bmatrix} 2 & 1 & 0 \\ 0 & 2 & 1 \\ 0 & 0 & 2 \end{bmatrix}$$

$$A = \begin{bmatrix} 2 & 1 & 0 \\ 0 & 2 & 1 \\ 0 & 0 & 2 \end{bmatrix} \text{ కి లాక్షణిక మూలములు కనుగొనుము.}$$

9. Find the unit vector orthogonal to $(4, 2, 3)$ in R^3 .
 R^3 లో సదిశ $(4, 2, 3)$ కు అభిలంబ యూనిట్ సదిశను కనుగొనుము.

10. State and prove Triangle inequality.

త్రిభుజ అసమానతను ప్రవచించి నిరూపించుము.

SECTION - B - (5 X 8 = 40 Marks)

Answer the following questions.

UNIT I

11. Show that the necessary and sufficient condition for a non empty subset W of a vector space $V(F)$ to be a subspace of V is that $a, b \in F, \alpha, \beta \in W \Rightarrow \alpha a + \beta b \in W$.
 W అనునది $V(F)$ అను సదిశాంతరాళము యొక్క శూన్యేతర ఉపసమితి, W అనునది $V(F)$ కు ఉపాంతరాళము అగుటకు ఆవశ్యక పర్యాప్త నియమము
 $a, b \in F, \alpha, \beta \in W \Rightarrow \alpha a + \beta b \in W$

Or

12. If W_1 and W_2 are subspaces of a vector space $V(F)$ then show that $W_1 + W_2$ is a subspace of $V(F)$ and $L(w_1 \cup w_2) = w_1 + w_2$.
 W_1 మరియు W_2 లు ఒక సదిశాంతరాళము $V(F)$ యొక్క రెండు ఉపాంతరాళములు.
అప్పుడు $W_1 + W_2$ అనేది $V(F)$ కు ఉపాంతరాళము మరియు $L(w_1 \cup w_2) = w_1 + w_2$ అని చూపండి.

UNIT II

13. If w_1 and w_2 are two subspaces of a finite dimensional vector space $V(F)$ then prove that $\dim(w_1 + w_2) = \dim w_1 + \dim w_2 - \dim(w_1 \cap w_2)$
సదిశాంతరాళము $V(F)$ కు w_1 మరియు w_2 లు రెండు ఉపసదిశాంతరాళములు అయితే $\dim(w_1 + w_2) = \dim w_1 + \dim w_2 - \dim(w_1 \cap w_2)$ అని నిరూపించండి.

Or

14. Let $V(F)$ be a finite dimension vector space and $S = \{\alpha_1, \alpha_2, \dots, \alpha_n\}$ is L.I. subset of V . Then either S itself a basis of V or S can be extended to form a basis of V .
 $V(F)$ అనేది ఒక పరిమిత పరిమాణ సదిశాంతరాళము మరియు $S = \{\alpha_1, \alpha_2, \dots, \alpha_n\}$ అనేది V కు ఒక స్వతంత్ర సదిశల ఉపసమితి. అయితే అనేది V కు ఆధారము అవుతుంది లేదా S ను V కు ఆధారమయ్యే విధముగా విస్తరించవచ్చును.

UNIT - III

13. 15 State and prove Rank - Nullity theorem.
కోటిశూన్యతా సిద్ధాంతమును ప్రవచించి, నిరూపించుము.

Or

14. 16 Find the null space, range, rank and nullity of the transformation $T: R^2 \rightarrow R^3$ defined by $T(x, y) = (x + y, x - y, y)$.
 $T(x, y) = (x + y, x - y, y)$. గా నిర్వచించబడిన $T: R^2 \rightarrow R^3$ యొక్క శూన్య అంతరాళము, వ్యాప్తి, కోటి మరియు శూన్యత్వములను కనుక్కోండి.

UNIT - IV

15. 17 State and prove Cayley - Hamilton theorem.
కేలే - హేమిల్టన్ సిద్ధాంతమును ప్రవచించి నిరూపించుము.

Or

16. 18 Solve $x + y + z = 6$, $x - y + z = 2$, $2x - y + 3z = 9$ by matrix inversion method.
 $x + y + z = 6$, $x - y + z = 2$, $2x - y + 3z = 9$ ను మాత్రిక విలోమ పద్ధతి ద్వారా సాధించండి.

UNIT - V

17. 19 State and prove Cauchy - Schwarz's inequality.
కోషి స్క్వార్జ్ అసమానతను ప్రవచించి, నిరూపించుము.

Or

18. 20 Applying Gram - Schmidt orthogonalisation process obtain an orthonormal basis of R^3 from the basis $\{(1,0,1), (1,0,-1), (0,3,4)\}$
అంతర్లబ్ధాంతరాళము R^3 కి ఆధారము $\{(1,0,1), (1,0,-1), (0,3,4)\}$ అయితే దీని నుండి గ్రామ్-స్మిత్ పద్ధతిని R^3 కు ఒక లంభాబిలంబ ఆధారాన్ని రాబట్టుము.

K.V. B. Lakshmi
20/2/19

B. Patna Kumari
20/2/19

K. V. B. Lakshmi
20/2/2019.

B. Patna Kumari
20/2/2019

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DEPARTMENT OF MATHEMATICS

BOS MEETING APPROVED THE FOLLOWING LIST OF PAPER SETTERS FOR
AUTONOMOUS

<u>S.NO</u>	<u>NAME OF THE LECTURER</u>	<u>DESIGNATION</u>	<u>COLLEGE</u>
1	Dr.A. Ananta Lakshmi	<u>Lecturer in Mathematics</u>	P.R. Govt. College, Kakinada
2	Dr.P. Subhashini	<u>Lecturer in Mathematics</u>	P.R. Govt. College, Kakinada
3	S. Padmaja	<u>Lecturer in Mathematics</u>	G.D.C, Pitapuram
4	Dr.B. Chitti Babu	<u>Lecturer in Mathematics</u>	GDC, Pentapadu, JP.Gudem,W.G Dt.
5	Dr.Ch. Srinivasa Rao	<u>Lecturer in Mathematics</u>	GDC,Mandapet
6	Ch.S. Haranadh	<u>Lecturer in Mathematics</u>	GDC, Adkiveedu,W.G.Dt.
7	P. Hari Krishna	<u>Lecturer in Mathematics</u>	GDC, Eluru
8	G.V. Bhaskar	<u>Lecturer in Mathematics</u>	GDC for Women, Guntur
9	M. Maha Lakshmi Naidu	<u>Lecturer in Mathematics</u>	GDC(A), Tuni
10	A. Surya Narayana	<u>Lecturer in Mathematics</u>	GDC(A), Rajahmundry
11	BVN. Srirama Murthy	<u>Lecturer in Mathematics</u>	GDC(A), Rajahmundry
12	I. Lakshmi Gayatri	<u>Lecturer in Mathematics</u>	GDC(A), Rajahmundry
13	S. Jaganmohan Rao	<u>Lecturer in Mathematics</u>	GDC, Jaggampea, E.G.Dt.
14	V. Chitti Babu	<u>Lecturer in Mathematics</u>	GDC, Ramachandrapuram.

K. S. S. S.
20/2/2019.

A. S. S. S.
20/2/2019

B. Ratna Kumari
20/2/19

J. V. B. S. S.
20/2/19

S. S. S. S.



SRR & CVR GOVT. DEGREE COLLEGE

(Autonomous)

NAAC accredited with 'B' Grade

Machavaram, Vijayawada – 520 004, Krishna District.



Cell: 94922 34488 Ph: 0866-2430060 Fax: 0866-2441092 www.srrcvr.org srrandcvr@gmail.com

Dr. Velaga Joshi, Principal

M.A., Ph.D., M.A., Ph.D., M.A., M.C.U., B.L., M.Phil., Ph.D.

MINUTES OF THE MEETING OF DEPARTMENT OF MATHEMATICS(BOS)

A meeting of Board of studies of Department of Mathematics held on 28-08-2019 in the Department of Mathematics and Statistics for VIth Semester of III. B.Sc Course syllabus under the chairmanship of Smt. K. V. Naga Lakshmi, Head Of The Department Of Mathematics. The following members are present

1) University Nominee

Prof. Bhavanari Satyanarayana,
Head of the Department of Mathematics,
Acharya Nagarjuna University,
Nagarjuna Nagar , Guntur.

Prof. Satyanarayana
28/8/19

2) Subject Expert

Dr. S. Eswaraiah Setty,
Reader &HOD of Mathematics,
Principal, S. G. College, Jaggaiahpet,
Krishna Dist.

S. Eswaraiah Setty
28/8/19

3) Subject Expert

Sri G.V. Bhaskar,
HOD of Mathematics, G.D.C for Women,
Guntur

G.V. Bhaskar
28/8/19

4) Chairman

Smt. K. V. Naga Lakshmi,
HOD of Mathematics,
SRR & CVR Govt. Degree College (Autonomous),
Vijayawada.

K. V. Naga Lakshmi
28/8/2019

5) Alumni

B. Ratna Kumari,
SRR & CVR Govt. Degree College,
Vijayawada.

: B. Ratna Kumari

Agenda :-

1. To approve Mathematics Syllabus for VIth Semester of III B.Sc. for the academic year 2019-2020.
2. To approve Syllabus, Model Papers and Blue Print.
3. To divide 100 marks into two components
 - a) i) External 60Marks, ii) Internal 40Marks.
 - b) External 60marks further divided into Section-A consisting 20Marks and Section-B consisting 40Marks is approved.
4. To evaluate Internal Assessment as follows :-

(a) Internal exams (two)	- 10
(b) Assignments (two)	- 10
(c) Project	- 10
(d) Attendance	- 05
(e) Seminar	- 05
Total	= 40
5. To divide the Syllabus into 5 Units.
6. In the Question Paper Section-A consisting Questions of weightage of 4 Marks each. FIVE questions to be answered i.e. $5 \times 4 = 20$ Marks and Section-B consisting of question of weightage 8 marks each. FIVE questions to be answered $5 \times 8 = 40$ Marks is approved.
7. To Pass the exam, student must get 40% of 60Marks(External) and 40% of 40Marks (Internal) and overall 40% combining both internal and external.
8. To approve Model Papers of Semester-VI of III B.Sc.
9. To approve Paper setters and Project work external examiners.
10. To approve other Academic activities of the Department
11. To give permission to the Chairman for any small changes

M. S. S. S. S.
28/8/19

B. Ratna Kumari
28/8/19

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28/8/19

B. Ratna Kumari 28/8/19

Resolutions:-

In BOS meeting the committee has unanimously resolved and approved the following items:-

1. The syllabus for Mathematics of VIth Semester to III B.Sc for 2019-20 is approved.
2. To divide 100 marks into two components
 - a) i) External 60Marks,
 - ii) Internal 40Marks.
 - b) External 60marks further divided into Section-A consisting 20Marks and Section-B consisting -40Marks, is approved.
3. Internal exams (two) - 10
 Assignments (two) - 10
 Project - 10
 Attendance -05
 Seminar -05
 Total = 40 is approved.
4. In the Model paper Section – A consisting Questions of Weightage 4 marks Each. Five questions to be answered i.e $5 \times 4 = 20$ marks and Section – B Consisting Questions of Weightage 8 marks each. Five Questions to be answered $5 \times 8 = 40$ Marks is approved.
5. To pass the Exam student must get 40 % of 60 and overall 40% Combining both internal and external.
7. Work load for this paper is 5 hours.
8. The chairman is given empowerment to do any small changes.
9. The Panel of Paper Setters for theory and Project is approved.
10. The Controller of examinations is given empowerment for any changes in selecting paper setter & Project work external examiner in case of non availability of examiners as are listed.

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B. Ratna Kumari
28/8/19

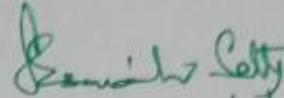
1. Prof. Bhavanari Satyanarayana

:


28/8/2019

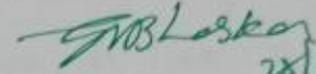
2. Dr. S. Eswaraiah Setty

:


28/8/19

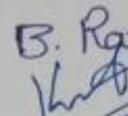
3. Sri G. V. Bhaskar

:


28/8/19

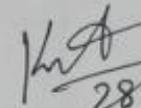
4. Smt B. Ratna Kumari

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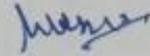
5. Smt K. V. Naga Lakshmi

:


28/8/2019

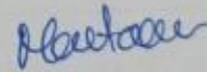
6. Sri. M. Lakshmandasu

:



7. Md. Masthan

:



8. Kum. G. Lalitha

:



9. Smt S. Renuka

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S.R.R&C.V.R GOVT. DEGREE COLLEGE (AUTONOMOUS). NAAC B⁺-
VIJAYAWADA.

Department of Mathematics
III Year B.Sc MATHEMATICS SYLLABUS
SEMESTER-VI, ELECTIVES&CLUSTERS

Year	Semester	Paper	Subject	Hours	IA	EA	Total		
III	VI	VII	Elective(any one)*	5	40	60	100		
			A. Numerical Analysis						
		B. Number Theory							
		VIII	Cluster Electives:**						
			VIII A.						
			1. Integral transforms	5	40	60	100		
2. Advanced Numerical Analysis.	5		40	60	100				
3. Project	5	40	60	100					
VIII B.									
1. Graph Theory	5	40	60	100					
2. Applied Graph Theory	5	40	60	100					
3. Project	5	40	60	100					

* Candidate has to choose only one paper from VII(A) or VII(B).

** Candidates are choose one Cluster Among Cluster A or Cluster-B irrespective of what they have chosen in paper VII.

*** Project work Done by the Students From Cluster Subject only.

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28/8/19

B. Radhakumari
28/8/19

S.R.R&C.V.R GOVT. DEGREE COLLEGE (AUTONOMOUS). NAAC B⁺-
VIJAYAWADA.

Department of Mathematics
III Year B.Sc MATHEMATICS SYLLABUS
SEMESTER-VI, PAPER-VII(B)

ELECTIVE-B: NUMERICAL ANALYSIS

60Marks

UNIT-I: (10hours)

Errors in numerical computations: Errors and their accuracy, Mathematical preliminaries, Errors and their analysis, Absolute, Relative and percentage errors, A general error formula, Error in the approximation of a function.

UNIT-II: (12hours)

Solution of algebraic and transcendental equations: The bisection method, The iteration, The method of false position, Newton Raphson method, Ramanujan's method.

UNIT-III: (12hours) Interpolation-I

Interpolation: Errors in a polynomial interpolation, Finite differences, Forward differences, Backward differences, Central differences, Symbolic relations, Detection of errors by differences tables, Differences of a polynomial.

UNIT-IV: (12hours) Interpolation-II

Newton's formulae for interpolation, Central difference interpolation formulae, Gauss's forward central difference formulae, Gauss's backward central difference formulae, Stirling's central difference formula, Bessel's formula.

UNIT-V: (14hours)) Interpolation-III

Interpolation with unevenly spaced points, Lagrange's formula, Divided differences and their properties, Relation between divided differences and forward differences, Relation between divided differences and backward differences, Relation between divided differences and central differences, Newton's divided difference interpolation formula.

Reference books:

1. Numerical analysis by S.S.Sastry, Published by Prentice Hall of India pvt.Ltd.,New Delhi (Latest Edition).
2. Numerical analysis by G.Sankar Rao Published by New Age International Publishers,Hyderabad.
3. Finite differences and Numerical analysis by H.C.Saxena Published by S.Chand and company,pvt.Ltd., New Delhi.
4. Numerical methods for scientific and engineering computation by M.K.Jain, S.R.K.Iyengar, R.K.Jain.

Suggested activities: Seminar/Quiz/Assignments.

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28/8/19

B-Rachha Kumari 28/8/19

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SRR&CVR GOVT.DEGREE COLLEGE (AUTONOMOUS) NAAC B⁺
VIJAYAWADA-520004

Department of Mathematics

III B.Sc MATHEMATICS SYLLABUS
SEMESTER-VI, PAPER-VII

ELECTIVE-B: NUMERICAL ANALYSIS (w.e.f 2019-2020)

BLUE PRINT

DURATION : 3 HOURS

TOTAL MARKS : 60

SECTION – A

Answer any FIVE questions. Each question carries 4 Marks

5x4 = 20M

Question	Topics	No. of Questions	Weightage
1	UNIT- I	1	4
2	UNIT-I	1	4
3	UNIT-II	1	4
4	UNIT-II	1	4
5	UNIT-III	1	4
6	UNIT-III	1	4
7	UNIT-IV	1	4
8	UNIT-IV	1	4
9	UNIT-V	1	4
10	UNIT-V	1	4

SECTION – B

Answer any ALL questions. Each question carries 8 marks

5x8 = 40M

Question	Topic	No.of questions	Marks
11(a) or (b)	UNIT-I	2	8
12(a) or (b)	UNIT-II	2	8
13(a) or (b)	UNIT-III	2	8
14a) or (b)	UNIT-IV	2	8
15(a) or (b)	UNIT-V	2	8

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B. Rastna kumar
28/8/19

S.R.R & C.V.R. GOVT. DEGREE COLLEGE (Autonomus)
Department of Mathematics Semester VI, Paper 7A
NUMERICAL ANALYSIS
Model Question Paper

Time : 2 ½ hours

Maximum : 60 Marks

SECTION A – (5 X 4 = 20 Marks)

Answer any FIVE of the following questions.

1. If $u = 3x^7 - 6x$, find the percentage error in u at $x = 1$, if the error in x is 0.05.
 $u = 3x^7 - 6x$, అయితే u లతో దోషశాతంను కనుక్కోండి. ఇచ్చట $x = 1, \Delta x = 0.05$.
2. Find the r due of $\sqrt{102} - \sqrt{101}$ విలువను కనుగొనుము.
3. Find a real root of the equation $x^3 + x^2 - 1 = 0$ by iteration method.
 $x^3 + x^2 - 1 = 0$ సమీకరణమునకు పునరుక్త పద్ధతిన ఒక వ్యాస్తవమూలంను కనుగొనుము.
4. Using Newton – Raphson method, establish the interative formula
 $x_{n+1} = \frac{1}{2} \left[x_n + \frac{N}{x_n} \right]$ to calculate the square root of N .
 N యొక్క వర్గమూలంను గణనం చేయడానికి, న్యూటన్ పద్ధతినుపయోగించి
 $x_{n+1} = \frac{1}{2} \left[x_n + \frac{N}{x_n} \right]$ అనే పునరుక్త సూత్రమును నిరూపించండి.
5. Construct a forward difference table.
 క్రింది దత్తాంశానికి పురోగమన ఖేద పట్టికను నిర్మించుము.

$x :$	1	2	3	4	5
$y :$	2	5	10	20	30
6. Evaluate :
 గణించండి.
 (a) $\Delta^2 (3e^x)$.
 (b) $\Delta^2 (ab^{cx})$
7. From the following table find the value of y at $x = 21$.
 క్రింది పట్టిక నుండి $x = 21$ అయినప్పుడు y విలువను కనుగొనుము.

$x :$	20	23	26	29
$y :$	0.34202	0.3907	0.4384	0.4848
8. Show that $\Delta \nabla = \Delta - \nabla = \delta^2$.
 $\Delta \nabla = \Delta - \nabla = \delta^2$ అని చూపుము.
9. Derive Newton's divided difference formula.
 న్యూటన్ విభజిత ఖేద సూత్రమును రాబట్టండి.
10. Using Lagrange's formula, find $f(2)$ from the following data :
 క్రింది దత్తాంశము నుండి లెగ్రాంజ్ సూత్రము ద్వారా $f(2)$ ను కనుగొనుము.

$x :$	0	1	3	4
$f(x) :$	5	6	50	105

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28/8/19

Answer ALL questions each Question carries 8 marks. (5 X 8 = 40 Marks)

UNIT - 1

11(a) If $R = \frac{4x^2y^3}{3^4}$ and errors in x, y, z be 0.001 show that the maximum relative error at $x = y = z = 1$ is 0.009.

$$R = \frac{4x^2y^3}{3^4} \Delta x = \Delta y = \Delta z = 0.001 \text{ అయితే } x = y = z = 1 \text{ అయినప్పుడు}$$

R లో సాపేక్ష గరిష్ట దోషము 0.009 అని చూపుము.

Or

(b) Define absolute, relative, percentage error and derive general error formula.

మారు, సాపేక్ష, శాత దోషములను రాబట్టండి. మరియు సాధారణ దోష సూత్రము రాబట్టండి

UNIT II

12 (a) Find the real root of the equation $x \log_{10} x = 1.2$ by Newton - Raphson method.

న్యూటన్-రాఫ్సన్ పద్ధతిలో $x \log_{10} x = 1.2$ సమీకరణం యొక్క వాస్తవ మూలాలను కనుక్కోండి.

Or

(b) Find the real root of the equation $x^3 - 6x - 4 = 0$ by bisection method.

ద్విధాకర పద్ధతిని $x^3 - 6x - 4 = 0$ సమీకరణానికి ఒక వాస్తవ మూలమును కనుగొనుము.

UNIT III

13 (a) Find the missing term in the following data :

$$x : 0 \quad 1 \quad 2 \quad 3 \quad 4$$

$$y : 1 \quad 3 \quad 9 \quad ? \quad 81$$

పైన తెలిపిన దత్తాంశము నందు లోపించిన పదమును కనుగొనుము.

Or

(b) Prove that

$$(a) u_3 = u_2 + \Delta u_1 + \Delta^2 u_0 + \Delta^3 u_0.$$

$$(b) u_4 = u_3 + \Delta u_1 + \Delta^2 u_1 + \Delta^3 u_1.$$

అని నిరూపించండి.

UNIT IV

14 (a) State and prove Gauss forward interpolation formula.

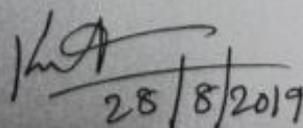
గాస్ పురోగమన సూత్రాన్ని నిర్వచించి నిరూపించండి.

Or

(b) Apply Bessel's formula to obtain y_{25} given that $y_{20} = 2854, y_{24} = 3162, y_{28} = 3544, y_{32} = 3992$.

$y_{20} = 2854, y_{24} = 3162, y_{28} = 3544, y_{32} = 3992$ లకు బెస్సెల్ సూత్రంను

అనువర్తించి y_{25} ను రాబట్టండి.


28/8/2019

B. Rathakumari
28/8/19

UNIT V

- 15 (a) By means of Newton's divided difference formula, find the value of $f(8)$ and $f(15)$ from the following table :

$x :$	4	5	7	10	11	13
$y :$	48	100	294	900	1210	2028

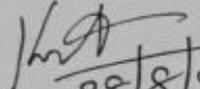
పైన తెలిపిన పట్టిక ద్వారా న్యూటన్ విభాగిత భేద సూత్రం ఉపయోగించి $f(8)$, $f(15)$ లను కనుగొనుము.

Or

- (b) Calculate y at $x = 155$ by using Lagrange's interpolation.

$x :$	150	152	154	156
$y :$	12.247	12.329	12.410	12.490

పైన తెలిపిన దత్తాంశమునకు లెంగ్రాజి అంతర్వేశనం వుపయోగించి $x = 155$ వద్ద y విలువను కనుక్కోండి.


28/8/2019.

B. Racha Kumar:
28/8/19

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S.R.R&C.V.R GOVT. DEGREE COLLEGE (AUTONOMOUS). NAAC B⁺-
VIJAYAWADA.

Department of Mathematics
III Year B.Sc MATHEMATICS SYLLABUS
SEMESTER-VI, PAPER-VII(C)

ELECTIVE-C: NUMBER THEORY

60 Hrs

UNIT-(12 hours)

Divisibility-Greatest Common Divisor-Euclidean Algorithm-The Fundamental Theorem of Arithmetic.

UNIT-(12 hours)

Congruences-Special Divisibility Tests-Chinese Remainder theorem-Fermat's Little theorem-Wilsons Theorem-Residue Classes and Reduced Residue Classes-Solutions of Congruences.

UNIT-(12 hours)

Number Theory for an Algebraic View Point-Multiplicative Groups, Rings and Fields.

UNIT-(12 hours)

Quadratic Residues-Quadratic Reciprocity-The Jacobi Symbol.

UNIT-(12 hours)

Greatest Integer Function-Arithmetic Functions-The Moebies Inversion Formula.

Reference books:

- 1."Introduction to theory of numbers" by Niven,Zuckerman & Mantgomery(John Wiley&Sons).
- 2."Elementary number theory" by David, M.Burton.
3. "Elementary number theory" by David, M.Burton Published by Second Edition(UBS Publishers)
- 4."Introduction to theory of numbers", by DavenportH., Higher arithmetic published fifth edition (John Wiley&Sons) Niven,Zuckerman & Mantgomery.,Camb,Univ,Press.
- 5.Number Theory by Hardy and Wright Published by Oxford Univ,Press.
- 6.Elements of the theory of numbers by Dence J.B& Dence T.P Published by academic Press.

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B. Radhakumari
28/8/19

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SRR&CVR GOVT.DEGREE COLLEGE (AUTONOMOUS) NAAC B⁺
VIJAYAWADA-520004

Department of Mathematics

III B.Sc MATHEMATICS SYLLABUS

SEMESTER-VI, PAPER-VII

ELECTIVE-VII(C):NUMBER THEORY (w.e.f 2019-2020)

BLUE PRINT

DURATION : 3 HOURS

TOTAL MARKS : 60

SECTION – A

Answer any FIVE questions. Each question carries 4 Marks

5x4 = 20M

Question	Topics	No.of Questions	Weightage
1	UNIT- I	1	4
2	UNIT-I	1	4
3	UNIT-II	1	4
4	UNIT-II	1	4
5	UNIT-III	1	4
6	UNIT-III	1	4
7	UNIT-IV	1	4
8	UNIT-IV	1	4
9	UNIT-V	1	4
10	UNIT-V	1	4

SECTION – B

Answer any ALL questions. Each question carries 8 marks

5x8 = 40M

Question	Topic	No.of questions	Marks
11(a) or (b)	UNIT-I	2	8
12(a) or (b)	UNIT-II	2	8
13(a) or (b)	UNIT-III	2	8
14a) or (b)	UNIT-IV	2	8
15(a) or (b)	UNIT-V	2	8

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28/8/19

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**S.R.R&C.V.R GOVT. DEGREE COLLEGE (AUTONOMOUS). NAAC B⁺-
VIJAYAWADA.**

Department of Mathematics
· III Year B.Sc MATHEMATICS SYLLABUS
SEMESTER-VI, CLUSTER-A, PAPER-VIII-A-1

CLUSTER ELECTIVE-VIII-A-1; INTEGRAL TRANSFORMS

60Hrs

UNIT-I: (12hours) Laplace transforms-I:

Definition of Integral Transform-Laplace transform, Linearity Property, Laplace transform of some Elementary Functions-First Shifting Theorem, Second Shifting Theorem, Change of Scale property- Laplace transform of Derivative of a Function.

UNIT-II: (12hours) Inverse Laplace transform:

Definition of Inverse Laplace transform, Linearity Property, First Shifting Theorem, Second Shifting Theorem, Change of Scale property, Use of Partial fractions, Examples.

UNIT-III: (12 hours) Applications of Laplace transform Solutions of differential Equations:

Solutions of Ordinary Differential Equations,
Solutions of Differential Equations with Constant Coefficients.

UNIT-IV: (12hours) Applications of Laplace transform :

Definition of Fourier Transform- Fourier Sine Transform- Fourier Cosine Transform, Linear Property of Fourier Transform- Change of Scale property for Fourier Transform.

UNIT-V: (12hours) Finite Fourier Transform:

Finite Fourier Sine Transform-Finite Fourier Cosine Transform-Inversion formula for Sine and Cosine Transforms only statements and related problems.

Reference books:

1. Integral Transforms by A.R.Vasistha and Dr.R.K.Guptha Published by Krishna.
2. A Course of Mathematical Analysis by Santhi Narayana and P.K.Mittal, Published by S.Chand & Company Pvt.Ltd. New Delhi.
3. Fourier Series and Integral Transforms by Dr.S.Sreenadh, Published by S.Chand & Company Pvt.Ltd New Delhi.
4. Laplace and Fourier Transforms by Dr.J.K.Goyal and G.P.Guptha by Pragati Prakasan, Meerut.
5. Integral Pvt.Ltd. New Delhi. Transforms by M.V.Raisinghanian- H.C.Saxena and H.K.Dass, Published by S.Chand & Company Pvt. Ltd. New Delhi.

Suggested activities: Seminar/Quiz/Assignments.

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//12//

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VIJAYAWADA-520004

Department of Mathematics

III B.Sc MATHEMATICS SYLLABUS
SEMESTER-VI(Cluster), PAPER-VIII(A)-1

CLUSTER ELECTIVE-VIII(A)-1.INTEGRAL TRANSFORMS (w.e.f 2019-2020)

BLUE PRINT

DURATION : 3 HOURS

TOTAL MARKS : 60

SECTION – A

Answer any FIVE questions. Each question carries 4 Marks

5x4 = 20M

Question	Topics	No.of Questions	Weightage
1	UNIT- I	1	4
2	UNIT-I	1	4
3	UNIT-II	1	4
4	UNIT-II	1	4
5	UNIT-III	1	4
6	UNIT-III	1	4
7	UNIT-IV	1	4
8	UNIT-IV	1	4
9	UNIT-V	1	4
10	UNIT-V	1	4

SECTION – B

Answer any ALL questions. Each question carries 8 marks

5x8 = 40M

Question	Topic	No.of questions	Marks
11(a) or (b)	UNIT-I	2	8
12(a) or (b)	UNIT-II	2	8
13(a) or (b)	UNIT-III	2	8
14a) or (b)	UNIT-IV	2	8

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S.R.R & C.V.R. GOVT. DEGREE COLLEGE (Autonomus)
 Department of Mathematics Semester VI, Paper 8A1
INTEGRAL TRANSFORMS
MODEL QUESTION PAPER

Time : 2 ½ hours

Maximum : 60 Marks

PART A – (5 X 4 = 20 Marks)

Answer any FIVE of the following questions.

1. Evaluate $L(t \sin 3t \cos 2t)$ ను సాధించుము.
2. Find $L(e^{-2t} \sin 3t)$ ను కనుగొనుము.
3. Define integral transforms, Laplace transforms of a function.
సమాకలన, లెప్లాస్ పరివర్తన ప్రమేయమును నిర్వచించుము.
4. Find the inverse Laplace transform of $L^{-1} \left\{ \frac{p^2}{(p+2)^3} \right\}$.
విలోమ లెప్లాస్ పరివర్తనను కనుగొనుము.
5. If $L[F(t)] = f(p)$ then prove that $L^{-1}[f(a)] = \frac{1}{a} F \left[\frac{t}{a} \right]$
 $L[F(t)] = f(p)$, అయితే $L^{-1}[f(a)] = \frac{1}{a} F \left[\frac{t}{a} \right]$ ను నిరూపించుము.
6. Solve $(D^2 + 4D + 3)y = e^{-t}$ given $y = 1, \frac{dy}{dt} = 1$ at $t = 0$.
 $t = 0$ వద్ద, ఇచ్చిన ప్రకారం $\frac{dy}{dt} = 1, y = 1$ అయితే
 $(D^2 + 4D + 3)y = e^{-t}$ ను సాధించుము.
7. Solve $ty'' + y' + 4ty = 0$ if $y(0) = 3, y'(0) = 0$.
 $y(0) = 3, y'(0) = 0$ అయితే $ty'' + y' + 4ty = 0$ ను సాధించుము.
8. Define the Fourier sine transform and Fourier cosine transform of a function.
ఫోరియర్ సైన్ మరియు కాసైన్ పరివర్తన ప్రమేయమును నిర్వచించుము.
9. Find the Fourier sine and Fourier cosine transforms of $f(x) = x$.
 $f(x) = x$ కు సైన్ మరియు కాసైన్ పరివర్తనను కనుగొనుము.
10. Find fourier sine transform of $f(x) = \frac{1}{x}$
 $f(x) = \frac{1}{x}$ యొక్క ఫోరియర్ సైన్ పరివర్తనను కనుగొనుము.

SECTION – B (5 X 8 = 40 Marks)

Answer ALL questions each question carry 8 marks.

- 11(a). State and prove first shifting theorem for Laplace transformation.
లెప్లాస్ పరివర్తన మొదటి సిద్ధాంతమును ప్రవచించి నిరూపించుము.

Or

- (b) Find $L \left\{ \frac{1 - \cos t}{t^2} \right\}$.
 $L \left\{ \frac{1 - \cos t}{t^2} \right\}$ ను కనుగొనుము.

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28/8/2019.

- 12(a). State and prove change of scale property of inverse Laplace transformations.
 లప్లాస్ పరివర్తనలో స్కేల్ మార్పు ధర్మాన్ని ప్రవచించి నిరూపణ చేయండి.

Or

- (b) Find the inverse Laplace transforms of $\left[\frac{4P+5}{(P-1)^2(P+2)}\right]$.
 $\left[\frac{4P+5}{(P-1)^2(P+2)}\right]$ యొక్క విలోమ లప్లాస్ పరివర్తనను కనుగొనుము.

- 13(a). Solve $(D^2 - D - 2)y = 20 \sin 2t$, $y = -1, Dy = 2$ when $t = 0$.
 $t = 0$ వద్ద $y = -1, Dy = 2$, అయితే $(D^2 - D - 2)y = 20 \sin 2t$ ను సాధించుము.

Or

- (b). Solve $(D^2 + 1)y = \sin t \sin 2t$, $t > 0$ if $y = 1, Dy = 0$ when $t = 0$.
 $t = 0$ వద్ద $y = -1, Dy = 2$, $(D^2 - D - 2)y = 20 \sin 2t$ ను సాధించుము.

- 14(a). Find the Fourier transform of $f(x)$ defined by
 $f(x)$ నిర్వచించబడిన ఫోరియర్ పరివర్తనను కనుగొనుము.

$$f(x) = \begin{cases} 1, & |x| < a \\ 0, & |x| > a \end{cases} \text{ and hence evaluate మరియు}$$

(a) $\int_{-\infty}^{\infty} \frac{\sin pa \cos px}{p} dp$ మరియు

(b) $\int_0^{\infty} \frac{\sin p}{p} dp$. ను సాధించుము.

Or

- (b). Find Fourier sine transforms of $\frac{e^{-ax}}{x}$ and deduce
 that $\int_0^{\infty} \frac{e^{-ax} - e^{-bx}}{x} \sin pxdx = \tan^{-1} \frac{p}{a} - \tan^{-1} \frac{p}{b}$.

$\frac{e^{-ax}}{x}$ కు ఫోరియర్ సైన్ పరివర్తనను కనుగొనుము మరియు

$$\int_0^{\infty} \frac{e^{-ax} - e^{-bx}}{x} \sin pxdx = \tan^{-1} \frac{p}{a} - \tan^{-1} \frac{p}{b} \text{ ను రాబట్టుము.}$$

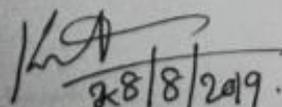
- 15(a). Find the finite Fourier sine and Fourier cosin transform of $f(x)$ if

$$f(x) = \begin{cases} 1 & 0 < x < \pi/2 \\ -1 & \pi/2 < x < \pi \end{cases}$$

$f(x) = \begin{cases} 1 & 0 < x < \pi/2 \\ -1 & \pi/2 < x < \pi \end{cases}$ అయితే పరిమిత ఫోరియర్ సైన్ మరియు కోసైన్ పరివర్తనను కనుగొనుము.

Or

- (b) Find the finite sine transform of $f(x)$, if $f(x) = \cos kx$.
 $f(x) = \cos kx$ అయితే $f(x)$ యొక్క పరిమిత సైన్ పరివర్తనను కనుగొనుము.


 28/8/2019.

B-Rooha kumari
 28/8/19

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S.R.R&C.V.R GOVT. DEGREE COLLEGE (AUTONOMOUS). NAAC B⁺-
VIJAYAWADA.

Department of Mathematics
III Year B.Sc MATHEMATICS SYLLABUS
SEMESTER-VI, CLUSTER-A, PAPER-VIII-A-1

CLUSTER ELECTIVE-VIII-A-2; ADVANCED NUMERICAL ANALYSIS

60Hrs

UNIT-I: (10hours)

Curve Fitting: Least Squares curve fitting procedures, fitting a straight line, Nonlinear curve fitting, curve fitting by a sum of exponentials.

UNIT-II: (12hours)

Numerical Differentiation: Derivatives using Newton's forward difference formula, Newton's Backward difference formula, Derivatives using central difference formula, Stirling's interpolation formula, Newton's divided difference formula. Newton's divided difference formula.

UNIT-III: (12 hours)

Numerical Integration: General quadrature formula on errors, Trapezoidal rule, Simpson's 1/3 rule, Simpson's 3/8 rule, Weddl's rule and Boole's rule.

UNIT-IV: (14hours)

Solutions of Simultaneous Linear Systems of Equations: Solution of linear systems- Direct methods; Matrix inversion method, Gaussian Elimination methods, Gauss-Jordan method, Method of factorization, Iterative methods; Jacobi's method, Gauss-Seidal methods.

UNIT-V: (12hours)

Numerical Solution of Ordinary Differential Equations: Introduction, Solution by Taylor's series, Picard's method of successive approximations, Euler's method, Modified Euler's method, Runge-Kutta methods.

Reference books:

1. Numerical analysis by S.S.Sastry, Published by Prentice Hall of India pvt.Ltd.,New Delhi (Latest Edition).
2. Numerical analysis by G.Sankar Rao Published by New Age International Publishers,Hyderabad.
3. Finite differences and Numerical analysis by H.C.Saxena Published by S.Chand and company.pvt.Ltd. New Delhi.
4. Numerical methods for scientific and engineering computation by M.K.Jain, S.R.K.Iyengar, R.K.Jain

Suggested activities: Seminar/Quiz/Assignments.

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B. Raha Kumari
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SRR&CVR GOVT.DEGREE COLLEGE (AUTONOMOUS) NAAC B⁺
VIJAYAWADA-520004

Department of Mathematics

III B.Sc MATHEMATICS SYLLABUS
SEMESTER-VI(Cluster), PAPER-VIII(A)-2

CLUSTER ELECTIVE-VIII(A)-2.ADVANCED NUMERICAL ANALYSIS (w.e.f 2019-2020)

BLUE PRINT

DURATION : 3 HOURS

TOTAL MARKS : 60

SECTION – A

Answer any FIVE questions. Each question carries 4 Marks

5x4 = 20M

Question	Topics	No.of Questions	Weightage
1	UNIT- I	1	4
2	UNIT-I	1	4
3	UNIT-II	1	4
4	UNIT-II	1	4
5	UNIT-III	1	4
6	UNIT-III	1	4
7	UNIT-IV	1	4
8	UNIT-IV	1	4
9	UNIT-V	1	4
10	UNIT-V	1	4

SECTION – B

Answer any ALL questions. Each question carries 8 marks

5x8 = 40M

Question	Topic	No.of questions	Marks
11(a) or (b)	UNIT-I	2	8
12(a) or (b)	UNIT-II	2	8
13(a) or (b)	UNIT-III	2	8
14a) or (b)	UNIT-IV	2	8
15(a) or (b)	UNIT-V	2	8

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Sanjay Lety
28/8/19

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28/8/19

B. Radhakumar
28/8/19

GOVT. DEGREE COLLEGE (Autonomus)
Department of Mathematics Semester VI, Paper 8A2
ADVANCED NUMERICAL ANALYSIS
Model Question Paper

Time : 2 ½ hours

Maximum : 60 Marks

SECTION A – (5 X 4 = 20 Marks)
Answer any FIVE of the following questions.

1. By the method of least squares, fit a straight line to the following data :

x :	1	2	3	4	5
y :	14	27	40	55	68

పై దత్తాంశానికి కనిష్ట వర్గాల పద్ధతిలో సరళ రేఖను సంధానించండి.

2. Fit a parabola to the data given below :

క్రింది దత్తాంశమునకు ఒక పరావలయంను సంధించండి :

x :	1	2	3	4	5
y :	10	12	8	10	14

3. Using the following table, compute $\frac{dy}{dx}$ at $x = 1$:

క్రింది పట్టికను పయోగించి $x = 1$ వద్ద $\frac{dy}{dx}$ ను కనుక్కోండి.

x :	1	2	3	4	5	6
y :	1	8	27	64	125	216

4. Find $f'(1.5)$ from the following table.

క్రింది ఇవ్వబడిన దత్తాంశము నుండి $f'(1.5)$ ను కనుగొనుము.

x :	1.5	2.0	2.5	3.0	3.5	4.0
y :	3.375	7.000	13.625	24.000	38.875	59.000

5. Evaluate $\int_0^1 x^3 dx$ with 5 sub-intervals by trapezoidal rule.

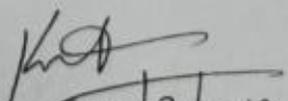
ట్రాపిజాయిడల్ సూత్రమును పయోగించి 5 అంతరాలతో $\int_0^1 x^3 dx$ విలువను కనుక్కోండి.

6. By Simpson's rule, evaluate $\int_1^2 \sqrt{1 - \frac{1}{x}} dx$ with 5 ordinates.

సింప్సన్ సూత్రము ద్వారా 5 సమాన దూరంలో గల బిందువులలో $\int_1^2 \sqrt{1 - \frac{1}{x}} dx$ విలువను కనుక్కోండి.

7. Solve the equations $x + y + z = 9, 2x + 5y + 7z = 52, 2x + y - z = 0$ by Cramer's rule.

$x + y + z = 9, 2x + 5y + 7z = 52, 2x + y - z = 0$ సమీకరణములను క్రామర్ సూత్రము ద్వారా సాధించండి.


28/8/2019

B-Radhakumari
28/8/19

8. Solve the system of equations $5x + 2y + z = 12$, $x + 4y + 2z = 15$, $x + 2y + 5z = 20$ by Gauss - Jordan Method.
 $5x + 2y + z = 12$, $x + 4y + 2z = 15$, $x + 2y + 5z = 20$ సమీకరణాలను గాస్-జార్జన్ పద్ధతినుపయోగించి సాధించండి.

9. Solve the differential equation $\frac{dy}{dx} = x + y$, with $y(0) = 1$, $x \in [0,1]$ by Taylor series expansion to obtain y for $x = 0.1$.
 $\frac{dy}{dx} = x + y$, $y(0) = 1$, $x \in [0,1]$ అను అవకలన సమీకరణమును టేలర్స్ సిరీస్ పద్ధతి ద్వారా సాధించి $x = 0.1$ దగ్గర y విలువను పొందండి.

10. Solve $\frac{dy}{dx} = y^2 - x^2$ with $y(0) = 1$ by using Euler's method.
 యూల్ర్ పద్ధతినుపయోగించి $y(0) = 1$ తో $\frac{dy}{dx} = y^2 - x^2$ ను సాధించుము.

SECTION - B (5 X 8 = 40 MARKS)

Answer ALL questions, each question carries 8 Marks.

- 11(a). Fit a curve of the form $y = ab^x$ to the following data :

క్రింది దత్తాంశమునకు $y = ab^x$ వక్రమును కనుగొనుము.

x :	1	2	3	4	5	6	7	8
y :	1.0	1.2	1.8	2.5	3.6	4.7	6.6	9.1

Or

- (b). Find a parabolic curve to the following data :

క్రింది దత్తాంశమునకు పరావలయ వక్రమును కనుక్కోండి.

x :	1	2	3	4	5
y :	1090	1220	1390	1625	1915

- 12(a). From the following table, find $\frac{dy}{dx}$ and $\frac{d^2y}{dx^2}$ at $x = 1.05$.

క్రింది పట్టిక నుండి $x = 1.05$ వద్ద $\frac{dy}{dx}$ మరియు $\frac{d^2y}{dx^2}$ విలువలను కనుక్కోండి.

x :	1.00	1.05	1.10	1.15	1.20	1.25	1.30
y :	1.00000	1.02470	1.04881	1.07238	1.09544	1.11803	1.14017

Or

- (b). From the following table, find the value of $\frac{dy}{dx}$ and $\frac{d^2y}{dx^2}$ at $x = 2.03$.

క్రింది పట్టిక నుండి $x = 2.03$ వద్ద $\frac{dy}{dx}$ మరియు $\frac{d^2y}{dx^2}$ విలువలను కనుక్కోండి.

x :	1.96	1.98	2.00	2.02	2.04
y :	0.7825	0.7739	0.7651	0.7563	0.7473

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28/8/2019.

B. Racha Kumari
28/8/19

- 13(a). Let $y = f(x)$ be a function which assumes the values $y_0, y_1, y_2, \dots, y_n$ corresponding to the values $x_0 = a, x_1 = a + h, \dots, x_n = a + nh = b$ so that $b - a = nh$ and n is a multiple of 6.

Then show that $\int_a^b y dx = \frac{3h}{10} [y_0 + 5y_1 + y_2 + 6y_3 + y_4 + 5y_5 + 2y_6 + 5y_7 + y_8 + \dots + y_n]$

$y = f(x)$ ఒక ప్రమేయము, $x_0 = a, x_1 = a + h, \dots, x_n = a + nh = b$

విలువలకు అనురూపంగా y విలువలు $y_0, y_1, y_2, \dots, y_n$ మరియు $b - a = nh, n$

అనేది 6 యొక్క గుణకము అయితే $\int_a^b y dx = \frac{3h}{10} [y_0 + 5y_1 + y_2 + 6y_3 + y_4 + 5y_5 + 2y_6 + 5y_7 + y_8 + \dots + y_n]$ అని చూపండి.

Or

- (b). Use Simpson's formula with $n=4$ to estimate $\int_0^1 \frac{1}{1+x^2} dx$ and hence find the approximate value of π .

సింప్సన్ సూత్రమును పయోగించి $n=4$ తో $\int_0^1 \frac{1}{1+x^2} dx$ ను అంచనా వేయండి మరియు π విలువను కనుక్కోండి.

- 14(a). Solve $x_1 - 2x_2 + 3x_3 = 2, 3x_1 - x_2 + 4x_3 = 4, 2x_1 + x_2 - 2x_3 = 5$ by matrix inversion method. $x_1 - 2x_2 + 3x_3 = 2, 3x_1 - x_2 + 4x_3 = 4, 2x_1 + x_2 - 2x_3 = 5$ సమీకరణములను మాత్రిక విలోమ పద్ధతిలో సాధించండి.

Or

- (b). Solve the equations $2x_1 + x_2 + x_3 = 2, x_1 + 3x_2 + 2x_3 = 2, 3x_1 + x_2 + 2x_3 = 2$ by LU decomposition method. $2x_1 + x_2 + x_3 = 2, x_1 + 3x_2 + 2x_3 = 2, 3x_1 + x_2 + 2x_3 = 2$ సమీకరణములను పద్ధతి ద్వారా సాధించండి.

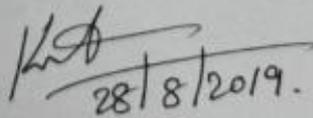
- 15(a). Find an approximate value of y for $x = 0.1$ if $\frac{dy}{dx} = x + y$ and $y = 1$ at $x = 0$ using Picard's method.

$\frac{dy}{dx} = x + y$ మరియు $x = 0$ వద్ద $y = 1$ అయినప్పుడు, ఫికార్డు పద్ధతిన $x = 0.1$ వద్ద y యొక్క ఉజ్జాయింపు విలువను కనుక్కోండి.

Or

- (b). Given the differential equation $\frac{dy}{dx} = \frac{x^2}{y^2+1}$ with the initial condition $y=0$ when $x=0$, use Picard's to obtain y for $x = 0.25, 0.5$ and 1.0 correct to three decimal places.

అవకలన సమీకరణము $\frac{dy}{dx} = \frac{x^2}{y^2+1}$ మరియు $x = 0, y = 0$ ప్రాథమిక నిబంధనతో $x = 0.25, 0.5$ మరియు 1.0 ల వద్ద ఫికార్డు పద్ధతిలో y విలువలను కనుక్కోండి. 3 దశాంశ స్థానములకు సవరించండి.


28/8/2019.

B. Radhakumari
28/8/19

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SRR&CVR GOVT.DEGREE COLLEGE (AUTONOMOUS) NAAC B⁺
VIJAYAWADA-520004

Department of Mathematics

III B.Sc MATHEMATICS SYLLABUS

SEMESTER-VI, PAPER-VIII-A-3

CLUSTER ELECTIVE-VIII(A)-3.PROJECT (w.e.f 2019-2020)

BLUE PRINT

DURATION : 3 HOURS

TOTAL MARKS : 60

Project Work done by the Students From cluster subjects only

Evaluation of project work

Total Marks -100

Internal Marks-40

1. Internal exams (two)	- 10
2. Assignments (two)	- 10
3. Project	- 10
4. Seminar	- 05
5. Attendance	- 05

External Marks-60

1. Project report	- 20M
2. Seminar	- 20M
3. Examination	- 20M

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B. Radhakumar
28/8/19

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**S.R.R&C.V.R GOVT. DEGREE COLLEGE (AUTONOMOUS). NAAC B⁺-
VIJAYAWADA.**

Department of Mathematics
III Year B.Sc MATHEMATICS SYLLABUS
SEMESTER-VI, CLUSTER-C, PAPER-VIII-C-1

CLUSTER ELECTIVE-VIII-C-1; GRAPH THEORY

60 Hrs

UNIT-I: (12hours) Graphs and Sub Graphs:

Graphs, Simple Graph, Graph Isomorphism, The Incidence and adjacency Matrices, Sub Graphs, Vertex, Degree, Hand Shaking Theorem, Paths and connection, Cycles.

UNIT-II: (12hours)

Applications, The Shortest Path Problem, Sperner's Lemma.

Trees:

Trees, Cut Edges and Bonds, Cut Vertices, Cayley's Formula.

UNIT-III: (12hours)

Applications of Trees-The Connector Problem.

Connectivity:

Connectivity, Blocks and Applications, Construction of Reliable Communication Networks.

UNIT-IV: (12hours)

Euler tours Hamilton cycles:

Eulers tours, Euler Trial, Hamilton Path, Hamilton cycles, Dodecahedron Graph, Petersen Graphs, Hamilton Graph, Closure of a Graphs.

UNIT-V: (12hours)

Applications of Eulerian Graphs, The Chinese Postman Problem, Fleury's Algorithm-the Travelling Salesman Problem.

Reference Books:

1. Graph Theory with Applications by J.A. Bondy and U.S.R Murthy Published by Mac.Millan Press.
2. Introduction to Graph Theory by S. Arumugham and S. Ramachandran Published by Scitech Publications, Chennai-17
3. A Text Book of Discrete Mathematics by Dr Swapan Kumar Sankar . Published by S Chand & Co. Publishers, New Delhi.
4. Graph Theory and Combinations by H.S. Govinda Rao Published by Galgotia Publications.

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B. Ratna Kumari 28/8/19

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VIJAYAWADA-520004

Department of Mathematics

III B.Sc MATHEMATICS SYLLABUS
SEMESTER-VI(Cluster), PAPER-VIII(C)-1

CLUSTER ELECTIVE-VIII(C)-1.GRAPH THEORY (w.e.f 2019-2020)

BLUE PRINT

DURATION : 3 HOURS

TOTAL MARKS : 60

SECTION – A

Answer any FIVE questions. Each question carries 4 Marks

5x4 = 20M

Question	Topics	No.of Questions	Weightage
1	UNIT- I	1	4
2	UNIT-I	1	4
3	UNIT-II	1	4
4	UNIT-II	1	4
5	UNIT-III	1	4
6	UNIT-III	1	4
7	UNIT-IV	1	4
8	UNIT-IV	1	4
9	UNIT-V	1	4
10	UNIT-V	1	4

SECTION – B

Answer any ALL questions. Each question carries 8 marks

5x8 = 40M

Question	Topic	No.of questions	Marks
11(a) or (b)	UNIT-I	2	8
12(a) or (b)	UNIT-II	2	8
13(a) or (b)	UNIT-III	2	8
14a) or (b)	UNIT-IV	2	8
15(a) or (b)	UNIT-V	2	8

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B. Ratna Kumari
28/8/19

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**S.R.R&C.V.R GOVT. DEGREE COLLEGE (AUTONOMOUS). NAAC B⁺-
VIJAYAWADA.**

Department of Mathematics
III Year B.Sc MATHEMATICS SYLLABUS
SEMESTER-VI, CLUSTER-C, PAPER-VIII-C-1

CLUSTER ELECTIVE-VIII-C-2; APPLIED GRAPH THEORY

60 Hrs

UNIT – I (12 hours):

Matchings: Matchings – Alternating Path, Matchings and coverings in Bipartite graphs, Marriage Theorem, Minimum Coverings.

UNIT- II (12 hours):

Perfect Matchings, Tutte's Theorem, Applications, The Personal Assignment Problem – The optional Assignment Problem, Kuhn-Munkres Theorem.

UNIT-III (12 hours):

Edge colorings: Edge Chromatic Number, Edge Coloring in Bipartite Graphs - -Vizing's Theorem.

UNIT – IV (12 hours):

Applications of Matchings, The timetabling problem. Independent sets and Cliques. Independent sets, Covering Number, Edge Independence Number, Edge Covering Number – Ramsey's Theorem.

UNIT - V (12 hours):

Determination of Ramsey's Numbers – Erdos Theorem, Turan's Theorem and Applications. Sehur's Theorem, A Geometry problem.

Reference Books:

1. Graph Theory with Applications by J.A.Bondy and U.S.R.Murthy published by Mac. Millan Press.
2. Introduction to Graph Theory by S. Arumugham and S. Ramchandhran published by scitech Publications, Chennai- 17.
3. A Text Book of Discrete Mathematics by Dr. Swapan Kumar Sanker, published by S. Chand & Co. Publishers, New Delhi.
4. Graph theory and combinations by H.S.Govinda Rao published by Galgotia Publications.

S.
SBL
28/8/19

Swapan Sanker
28/8/19

P. Sankar
K. Sankar
28/8/19

B. Ratna kumari
28/8/19

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VIJAYAWADA-520004

Department of Mathematics

III B.Sc MATHEMATICS SYLLABUS

SEMESTER-VI(Cluster), PAPER-VIII(C)-1

CLUSTER ELECTIVE-VIII(C)-1.GRAPH THEORY (w.e.f 2019-2020)

BLUE PRINT

DURATION : 3 HOURS

TOTAL MARKS : 60

SECTION – A

Answer any FIVE questions. Each question carries 4 Marks

5x4 = 20M

Question	Topics	No.of Questions	Weightage
1	UNIT-I	1	4
2	UNIT-I	1	4
3	UNIT-II	1	4
4	UNIT-II	1	4
5	UNIT-III	1	4
6	UNIT-III	1	4
7	UNIT-IV	1	4
8	UNIT-IV	1	4
9	UNIT-V	1	4
10	UNIT-V	1	4

SECTION – B

Answer any ALL questions. Each question carries 8 marks

5x8 = 40M

Question	Topic	No.of questions	Marks
11(a) or (b)	UNIT-I	2	8
12(a) or (b)	UNIT-II	2	8
13(a) or (b)	UNIT-III	2	8
14a) or (b)	UNIT-IV	2	8
15(a) or (b)	UNIT-V	2	8

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Jemal Selty
28/8/19

P.Sw

V.A
28/8/19.

B. Ratha Kumari
28/8/19

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VIJAYAWADA-520004

Department of Mathematics

III B.Sc MATHEMATICS SYLLABUS

SEMESTER-VI, PAPER-VIII-C-3

CLUSTER ELECTIVE-VIII(C)-3.PROJECT (w.e.f 2019-2020)

BLUE PRINT

DURATION : 3 HOURS

TOTAL MARKS : 60

Project Work done by the Students From cluster subjects only

Evaluation of project work

Total Marks -100

Internal Marks-40

- | | |
|-------------------------|------|
| 1. Internal exams (two) | - 10 |
| 2. Assignments (two) | - 10 |
| 3. Project | - 10 |
| 4. Seminar | - 05 |
| 5. Attendance | - 05 |

External Marks-60

- | | |
|-------------------|-------|
| 1. Project report | - 20M |
| 2. Seminar | - 20M |
| 3. Examination | - 20M |

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B. Ratna Kumari
28/8/19