

SRI DHARMASTHALA MANJUNATHESHWARA COLLEGE, UJIRE-574240

(Autonomous)

(Re-Accredited by NAAC at 'A' Grade with CGPA 3.61 out of 4)



DEPARTMENT OF HOME SCIENCE

Syllabus of
**Bachelor's Degree in
Home Science**

**(CREDIT BASED SEMESTER SCHEME)
2016 - 2017onwards.**

**Approved by the : BOS meeting held on 19th July 2016
Approved by the Academic Council meeting, held on 5th October 2016**



HOME SCIENCE AS A DISCIPLINE

Home Science is a multidisciplinary field of study which comes under the faculty of Science, It is the combination of Science and Art altogether. In Home Science is studied in an artistic way and at the same time art is developed scientifically in the form of skills. Many times Home Science Education being the basis for education of family ecosystem is referred to as the “Education for Better Living”. It deals with the natural as well as man – made environments in a family and inter as well as intra family relationships.

Home Science as the name itself suggests is the science that deals all the things that includes an individual, his / her home and family including family members and the resources available to them. Home Science education encourages better living and it mostly revolves around the sphere of the family and its ecosystem. It deals with the relations of the family amongst themselves and with other people. The primary aim of Home Science is to enable people to get them more and more satisfied with the family and gives the scientifically specific knowledge about making the home beautiful and a better place to live happily.

The main aim of Home Science is to gain maximum satisfaction from and for a person and the family to which the person belongs. It provides a person all the scientific knowledge of the processes for making a beautiful home.

The term Home Science is comprised of two terms i.e. Home and Science. The home is the place where family resides and science can be referred as the knowledge of facts, laws and various principles. Thus the combination of home and science altogether as a subject can be determined as the study which applies scientific knowledge in systematic way of improving the quality of family life and the home in which it lives. It is the subject related with all our daily aspects which include food, clothing, shelter, resource, health and services and thus draws various principles of art and Science. These principles when applied further develop healthier and happy life.



Course Objectives

- Improving the quality of higher education.
- To lead to social and economic empowerment by having competency based course.
- For empowering the individual, the family and the community
- To Prepare young students for studies, research and extension work.
- To Strengthen skills and potentials of students through scientific principles, knowledge and experience acquired for optimum living.
- To foster development of students towards innovative research to augment the quality of life to family, community and industry in the challenging life scenario.
- To instill appreciation for rural life, its problems and channel relevant mechanisms for progress.
- To create an environment and out look which will encourage, motivate and enable the common man to live a richer and move purposeful family life.



PAPER DESCRIPTION

Semester	Paper	Title
I Semester	HS I	Introductory Textiles
II Semester	HS II	Applied Textiles & Fashion Design
III Semester	HS III	Principles of Food and Nutrition
IV Semester	HS IV	Nutrition Through Life Cycle and Dietetics
V Semester	HS V	Life Span Development
	HS VI	Interior Decoration & Etiquette
VI Semester	HS VII	Human Development and Family Relations
	HS VIII	Family Resource Management

SCHEME OF EXAMINATION

Semester	Paper	Credits	Marks			
			IA		Sem End	Total
			Theory	Practical		
I Semester	I	3	20	10	120	150
II Semester	II	3	20	10	120	150
III Semester	III	3	20	10	120	150
IV Semester	IV	3	20	10	120	150
V Semester	V	3	20	10	120	150
	VI	3	20	10	120	150
VI Semester	VII	3	20	10	120	150
	VIII	3	20	10	120	150
Total		24	240		960	1200



I SEMESTER - Paper I
INTRODUCTORY TEXTILES
Teaching Hours : 3hrs per week

Rationale /Learning Objectives:

- To gain knowledge about textile fibers, their properties and identification.
- To acquire knowledge in various methods of Yarn Construction, Fabric Construction.
- To learn the types of weaves, weaving apparatus and non-woven textiles.

UNIT I: FIBERS

1. Identification of fibers
 - a. Physical Method
 - b. Chemical Method
 - c. Microscopic Method
2. Kinds of fibers
 - a. Natural
 - Vegetable fiber(Cellulose fibers)
 - Animal Fiber
 - Mineral Fiber
 - b. Man Made Fivers
 - Thermoplastic
 - Non-Thermoplastic
 - c. General Properties of Fibers
 - d. Manufacturing processes, properties and uses of Cotton, Silk and Nylon

UNIT II: YARN

1. Methods of Yarn Construction
 - a. Conventional Ring Spinning
 - b. Blending, opening and cleaning
 - c. Carding
 - d. Combing



- e. Roving
 - f. Doubling
 - g. Drawing
 - h. Spinning
2. Types of Yarn
- a. Simple Yarn
 - b. Double Yarn
 - c. Staple Yarn
 - d. Filament Yarn
 - e. Novelty Yarns – Slub yarn, Flake yarn, Spiral yarn, Loop yarn, Knot yarn
3. Twists – Types of twists, amount of twists
4. Yarn Count

UNIT III – FABRIC

1. Construction of fabric
- Shedding, picking, battening, taking up and letting off
2. Loom – Types of looms – Parts and functions
3. Thread count, Balance of cloth, Count of cloth
4. Types of weaving
- a. Basic weaves
 - Plain weave
 - Twill weave
 - Satin and sateen weave
5. Identification of right side of the weave
6. Identifying woven fabric defects
7. Novelty weaves – Pile, Jacquard, dobby, Leno
8. Non-woven textiles – Knitting, Braiding, Netting, Felting

PRACTICALS - 3hrs / week

1. Identification of fibers
- a. Microscopic appearance
 - b. Breaking test



- c. Chemical test
 - d. Burning test of cotton, wool, silk and synthetic fibers
- 2. Weaving
- 3. Basic construction stitches
- 4. Decorative stitches
- 5. Sewing equipment- parts, use and care
- 6. Construction processes
 - a. Fastenings
 - b. Plackets
 - c. Fullness
 - d. Seams
 - e. Edge finishes

Student Activities : Extension Activity, Seminar, Quiz, Debate, Student lecture series, Group Discussion.

Books for Reference

1. Ziffer – clothing construction practicals – Prasaraanga Mysore University
2. Hess “Textile’ fibres and their use: 6th edition, New Delhi, Bombay, Calcutta Oxford & IBH publishing Co. Pvt. Ltd.
3. Mary B. Cowan Martha E. Jungerman introduction to textiles, D. B. Taraporvala Sons & Company Pvt. Ltd.
4. Durga Daulkar “Household Textiles & Laundry Work”
5. Erwin Mabul “Clothing for Moderns N Y Macmillan Publication
6. Wingate “Textile fabrics and their selection” Prentice Hall Eaglewood Cliffs N J
7. Potter and Corbmon “Fibre to Fabric” N.Y. Gregg division and Macran Hill Book Co.
8. Bernard P Corbman, Textiles – Fiber to Fabric VI Edition McGraw Hill International Editions Home Economics Series 1983.



II SEMESTER - PAPER II
APPLIED TEXTILES & FASHION DESIGN
Teaching Hours : 6 per week

Rationale /Learning Objectives:

- To develop an understanding of the application of art elements and principles of design in clothing
- To acquire knowledge about the care of clothing, finishes, removal of stains, design for different figures
- To learn about ready made garments, traditional embroidery and textiles

UNIT I: FINISHES

1. Objectives of application of finishes
2. Types of finishes
 - f. Mechanical finishes – Calendaring, Tentering
 - g. Chemical finishes – Bleaching Mercerizing, Weighting, Sizing, Shrinkling
3. Dyeing
 - a. Classification of dyes
 - Pigment dyes
 - Natural dyes
 - Artificial dyes

Techniques of dyeing – Raw stock, Yarn dyeing, Slub dyeing, Piece dyeing .

UNIT II: LAUNDERING

1. Laundry equipments
2. Care of clothing
3. Washing of cotton, silk
4. Soaps – types of soap,
5. Detergents
6. Stain removal – methods – dip method, steam method, drop method, sponge method
7. Clothing in relation to season, occasion, size, figure



UNIT III: DESIGN PROCESS

1. Elements of design – Line, Texture, Colour
2. Principles of design – Proportion – Scale
3. Printed and dyed textiles – Techniques of Printing – Block Printing, Discharge Printing, Roller Printing, Screen Printing, Tie and Dye & Batik.
4. Readymade Cloths – Advantages, Disadvantages, Guides for Wise Shopping(advertisement,Brand,labels)
5. Traditional Embroideries
 - Kashida of Kashmir
 - Kantha of Bengal
 - Phulkaries of Punjab
 - Kasuthi of Karnataka
6. Traditional Indian Textiles
 - Dacca Muslin
 - Baluchar Buttedar
 - Chanderi Saries
 - Himrus and Amrus

PRACTICALS

1. Dying – Tie and Dye & Batik
2. Darning, Patch work
3. Construction of Saree Peticoat /Apron
 - a. Drafting
 - b. Tracing
 - c. Construction

Student Activities:

Books for Reference:

1. Kathryn Mckelvery and Janine Munslow, Fashion Design Process, Innovation and Practice
2. Ziffzer – clothing construction practicals – Prasaranga Mysore University



3. Hess "Textile" fibres and their use: 6th Edition New Delhi, Bombay, Calcutta, Oxford & IBH Publishing Co. Pvt. Ltd.,
4. Mary B. Cowan Martha E. Jungerman "Introduction to Textiles, D.B. Taraporvala Sons & Company Pvt. Ltd.
5. Durga Daular "Household Textiles & Laundry Work"
6. Erwin, Mabul "Clothing for Moderns N. Y. MacMillon Publication
7. Wingate "Textile Fabrics and their Selection" Prentice Hall Eaglewood Cliffs N.J.
8. Potter and Corbmon "Fibre to Fabric" N.Y. Gregg division and Macran Hill Book Co.



III SEMESTER - PAPER III
PRINCIPLES OF FOOD AND NUTRITION
Teaching Hours : 6 per week

Rationale /Learning Objectives:

To enable the students to

- Understand the vital link between Nutrition and Health
- Gain knowledge on functions, requirements and effects of deficiency of various nutrients
- To gain knowledge and practical skills in planning and preparing basic recipes

UNIT I

1. Terminology – Nutrition, Health, Food, Nutrient, Malnutrition, RDA
2. The relation of good nutrition to normal physical development and sound health
3. Classifications of nutrients
4. Classification of food
5. Improving nutritional quality of food – Germination, Fermentation Fortification
6. Food Preparation
 - a. Basic Terminology – Blanch, beat, blend, broil, caramelize, cream
 - b. Methods – Boiling, steam Cooking, Stewing, Frying, Baking, Pressure Cooking

UNIT II

1. Energy
 - Definition
 - Gross and Physiological energy value of food using bomb calorie meter.
 - Basal metabolic rate – definition, factors affecting BMR
2. Carbohydrates – Classification, function sources
3. Protein – Classification, functions, sources, requirements, effects of deficiency
4. Lipids – Classification, functions, sources



UNIT III

1. Macro minerals – Functions, sources, requirements and effects of deficiency of calcium, potassium
2. Micro minerals – Functions, sources, requirements and effects of deficiency of iron, iodine
3. Vitamins – Classification – Water soluble ‘B’ and ‘C’, Fat Soluble – A, D, E, K – Functions, sources, requirements, effects of deficiency.

PRACTICALS

1. Standardization of weights and measures
2. Plan and prepare recipes rich in (a) Protein (b) (c) Iron (d) Vitamin ‘A’ (e) Thiamine (f) Vitamin ‘C’

Students Activities:

Books for Reference:

1. Robinson C H Lawler M R., Chenoweth W L and Garwick A E (1986) Normal and Therapeutic Nutrition, 17th Edn., Macmillan Publishing Co.
2. Swaminathan M S (1985) Essentials of food and nutrition fundamentals aspects VII: Applied Aspects
3. Hugher C Bennion M (1970): Introductory Foods, 5th Edn., Macmillan Company
4. Williamns S R (1989): Nutrition and Diet Theory, 4th Edn., Modly Co., Srilakshmi ‘Dietetics’
5. Krause M V and Mohan L K (1986) ‘Food’ Nutrition and Diet Therapy
6. M. Raheena Begum, Sterling Publications Pvt. Ltd., (1989) a Text Book of Food Nutrition & Dietetics



IV SEMESTER - PAPER IV
NUTRITION THROUGH LIFE CYCLE AND DIETETICS
Teaching Hours : 6 per week

Rationale /Learning Objectives:

- To understand the concepts of an adequate diet and the importance of meal planning
- To know the factors affecting the nutrient needs during the life cycle and RDA for various age groups.
- To acquire skill in planning. Preparing diets in health and disease
- To understand the Physiology of Pregnancy and Lactation and how these influence nutritional requirements.

UNIT 1

Nutrition during changed Physiological conditions

1. Food guide pyramid
 - a. Pregnancy RDA, RFA – Weight gain, dietary guideline supplementation. Pica during pregnancy. Common problems of pregnancy and their management – nausea, vomiting, food aversion, Toxaemia, Obesity, Diabetes
 - b. Lactation – physiological changes, milk output ,factors influencing milk output,Nutritional requirements, Dietary managements, Food Supplements

UNIT II

1. Nutrition during infancy
 - a. Breast feeding – duration, advantages, reasons for not giving breast milk
 - b. Bottle feeding – advantages and disadvantages, care and sterilization of bottles
 - c. Weaning and introducing supplementary foods.
2. Nutrition during Pre School Age
3. Nutrition during adolescence



4. Nutrition during old age – Physiological and Psychological changes dietary requirements

UNIT III: DIET THERAPY

1. Principles of diet therapy
2. Routine hospital diets – clear fluid, full fluid, soft and general
3. Causes, symptoms, dietary management of the following diseases
 - a. Peptic Ulcer
 - b. Constipation
 - c. Diarrhoea
 - d. Obesity
 - e. Diabetes Mellitus – Types, Causes, Symptoms, Identification and Treatment.

PRACTICALS

1. Preparation of weaning food
2. Plan and prepare diet for a preschooler, adolescent girl and pregnant woman

Students Activities:

Books for References:

1. Robinson C H Lawler M R., Chenoweth W L and Garwick A. E. (1986) Normal and Therapeutic Nutrition, 17th Edn., Macmillan Publishing Co.
2. Swaminathan M S (1985) Essentials of food and nutrition fundamentals Aspects VII: Applied Aspects
3. Hugher C., Bennion M. (1970): Introductory Foods, 5th Edn., Macmillan Company
4. Williams S. R. (1989) : Nutrition and Diet Theory, 4th Edn., Mosly Co., Srilakshmi 'Dietetics'
5. Krause M.V. and Mohan L.K.(1986) 'Food' Nutrition and Diet Therapy
6. M. Raheena Begum, Sterling Publications Pvt. Ltd., (1989) A Text Book of Food Nutrition and Dietetics
7. Wincent – Hegary, Houston, Texas (1988) Decision in Nutrition



V SEMESTER - Paper V
LIFE SPAN DEVELOPMENT
Teaching Hours : 6hrs per week

Rationale /Learning Objectives:

To enable the students to:

- Develop an understanding of the concepts of growth and development of a child
- Achieve knowledge of the organization of a good nursery school
- To introduce the student to the field of Human Development, concepts, scope, dimensions and interrelations
- To understand and prepare teaching aids

UNIT I

1. Introduction and objectives
2. Principles of growth and development
3. Methods of child study
4. Needs of children
5. Learning process
6. Heredity and environment

UNIT II

1. Pregnancy – Discomfort and Complications
Care and Hygiene during pregnancy
Both process, Types of Birth
2. Prenatal Development
Stages of prenatal development
Factors affecting prenatal development
3. Neonate
 - a. Appearance
 - b. Size and Proportion
 - c. Physiological functions
 - d. Behavioral pattern



- e. Care of the neonate
- 4. Infancy (two week to two years)
 - a. Physical development and motor skills
 - b. Emotional development
 - c. Habit formation
 - d. Social development

UNIT III

- 1. Early childhood (2 – 6 years)
 - a. Physical growth and Motor skills
 - b. Social behavior
 - c. Intellectual Development
 - d. Pre-School child’s vocabulary
 - e. Discipline and guidance of Pre-School child
- 2. Nursery School
 - a. Essentials of a nursery school – buildings, equipments and personnel
 - b. Programmes in he nursery school
 - c. Play – Types and Values
 - Teaching children to play safely
 - d. Teaching aids
- 3. Adolescence
 - a. Physical changes
 - b. Interests – Personal, recreational, social, religious, educational, money, independence, vocational, sexual
 - c. Problems and adjustments
 - d. Counseling of adolescents

PRACTICALS

- 1. Observation of different developments
 - a. Physical development
 - b. Motor development
 - c. Emotional development
 - d. Language development



- e. Intellectual development
2. Teaching Rhyme with teaching aids and actions
3. Story telling – using different techniques – Sand tray, puppets, flash cards, theatre, table top and chart
4. Review of literature
5. Basic activities
 - a. Tearing, cutting and pasting – Tearing with all fingers, tearing with thumb and two fingers as used in holding pencil, tearing on straight line, curved line
 - b. Button – button and unbutton
 - c. Beading the thread, personal hygiene
 - d. Tearing circular rings starting from one corner of the page till centre of page making designs
 - e. Cutting a design, pasting pieces of papers, cloth, sticks, leaves
 - f. Tracing and cutting designs, creating designs

Books for Reference:

1. Gorden I J (1975): Human Development, New York: Harper and Row, Unit I PP- 2-21
2. Harries A.C. (1986): Child Development St. Paul: West Pub. Unit I, PP 5-17
3. Lerner, R M & Hultsch F (1983) Human Development: A Life Span perspective, New York: Harper and Row, Unit I PP. 75-91, PP 117-140, Unit II OPP. Unit IV PP
4. Lerner & Jultsch (1982): Human Development: A life span perspective (PP 247 – 253) New York: Mccraw Hill Book Co.
5. Saraswathi T S & Kaur, B(1993): Human Development and Family Studies in India, New Delhi: Sage Publications, Unit VIII



V SEMESTER - PAPER VI
INTERIOR DECORATION & ETIQUETTE
Teaching Hours : 6hrs per week

Rationale /Learning Objectives:

- To provide an insight into the foundation of art and design
- To inculcate an environment for aesthetic appreciation in interiors and exteriors
- Acquaint students with the basic knowledge on the art of entertainment and Etiquette

UNIT I

1. Objectives of interior decoration & types of design – structural and decorative design – types of motifs used in decorative design
2. Elements of Art – (Line, form, color, texture, pattern, light and space) and Principles of design – Balance, Proportion, Rhythm, Harmony and Emphasis – their application.

UNIT II

1. Color – Qualities of color, systems and standard color combination, Prang, Munsell
2. Flower arrangement – Materials used, styles, Preparation and Care of flowers

UNIT III

Etiquette

Planning & Organizing Parties

- a. Selection of table wares
- b. Table setting
- c. Introduction of guests & art of conversation
- d. Table manners
- e. Role of Hostess



PRACTICALS

1. Illustrating and explaining structural and decorative design; Elements and Principles of design
2. Painting color wheel, value scale neutrals, tints and shades and shades and standard color schemes (fabric sample,pictures,painting)
3. Flower arrangement – styles and arrangements suited to different areas
4. Making invitations – Acceptance and rejection letters, Note paper, place card, greeting and thank you card, get –well card and book mark
5. Table setting – Formal and informal, Napkin folding
6. Visit to interiors.

Books for Reference:

1. Anna Hong Rutt (1961), Home Furnishing, John Wiley Eastern Pvt. Ltd., New Commerce
2. Goldstein and Goldstein ('Art in everyday life', the Maemillan Co.,)
3. Dorothy Sara; The colier quick and easy guide to Etiquette, New York Collier Books
4. Sarah, Faulkner (1979), Planning a House, Rinehart and Winsten



VI SEMESTER - Paper VII
HUMAN DEVELOPMENT AND FAMILY RELATIONS
Teaching Hours : 6hr per week

Rationale /Learning Objectives:

- To study family relationship during different stages in the family life cycle
- To sensitize the students to intervention in the field of Human Development
- To understand the significance of various creative activities and to develop skills

UNIT I: MARRIAGE

1. Definition
2. Purpose of marriage
3. Factors – Religious and economic
4. Adjustmental problems – Environmental, Relational, Personal Areas of adjustments – Husband-Wife, In-Laws and others, Religious, Financial and Cultural
5. Types of marriage
6. Personality characteristics associated with marital failure
7. The need for marriage counseling

UNIT II: THE FAMILY

1. Definition
2. Characteristics of the family
3. The family as a basic institution
4. Types of family
5. Functions of the family
6. Role of different members in the family

UNIT III

1. Family Planning
 - a. Definition
 - b. Population Education
 - c. Temporary and permanent methods of family planning ‘



- d. Importance of small family in India
- 2. Family in the later years
 - a. Characteristics of old ageProblems – Health Problem, Relationship Problem Decreased Income, Leisure Time Activities
- 3. Crisis in the family
 - a. Death
 - b. Infidelity
 - c. Separation
 - d. Alcoholism
 - e. Divorce

PRACTICALS

- 1. Visits to rural nursery schools and primary health centre
- 2. Participation with visual aids
 - a. Nature experience
 - b. Science experience through experiment
 - c. Dramatization – Using simple costumes and make ups
- 3. Creative Activities
 - a. Painting and Graphics
 - b. Painting with brush, drawing with crayon, chalk, finger painting, collage work, spray painting, stencil painting, easel painting, sand mosaic, paper mosaic

Books for Reference:

- 1. Gorden I.J. (1975): Human Development, New York: Harper and Row, Unit I PP 2-21
- 2. Harries, A.C. (1986): Child Development st. Paul: West Pub. Unit I, PP 5-17
- 3. Lemer, R.M. & Hultsch F (1983) Human Development: A Life span perspective, New York: Harper AND Row, Unit I PP. 75-91, PP 117-140, Unit II OPP. Unit IV PP



4. Lemer & Jultsech (1982): Human Development: A life span perspective (PP 247-253) New York: Mccraw Hill Book Co.
5. Saraswathi, T.S. & Kaur, B (1993): Human Development and family studies in India, New Delhi: Sage Publications, Unit VIII
6. Craig G. (1999): Human Development N.J. Prentice Hall
7. Rice F. P. (1965) Human Development - A Life span approach, N.J. Prentice Hall
8. A text book on child development
Rajammal P Devdas and Dr. Jaya N,1984,Published by S.G. Wasami for Macmillan India Limited
9. Social and Preventive Medicine – Park and Park



VI SEMESTER - Paper VIII
FAMILY RESOURCE MANAGEMENT
Teaching Hours : 6hrs per week

Rationale /Learning Objectives:

- Develop an understanding of the principles of home management
- Help students develop experience and technique in the field of household equipment and purchase

Unit I

Family resource management:

Meaning & processes of family resource management,

Decision making – steps in decision making,

Resources – classification, characteristics & factors affecting use of resources

Unit II

Time as a resource:

Its importance, tools in time management,

Energy – Fatigue and types of fatigue

Work simplification – definition, importance, techniques and Mundell's classes of change

Unit III

Money

- a. Income – Types and ways of supplementing family income
- b. Family budget – Definition, limitation, advantages and steps in making a budget, maintenance of accounts
- c. Savings – need, saving institutions
- d. Consumer economics

PRACTICALS

1. Preparation of time and activity chart
2. Drawing and evaluating kitchen plans – four (standard)



3. Use and care of house hold equipments – mixer, oven, refrigerator, washing machine and iron
4. Analysis of household budgets and accounts, budget plan for 3 income groups
5. Illustrating, selecting and evaluating consumer aids.
6. Project work

Books for Reference:

1. Deshpande R.S. (1980), Modern Ideal Homes for India, Education Deshpande Publications, India
2. Nickel and Dorsey (1986) Management in family living 3rd edition, New York, John Wiley & Sons Inc.
3. Gross, Crandall & Kroll (1980) Management for Modern Families Prentier Hall, New Jersey
4. Varghese, Ogale and Srinivasan “Home Management” New Delhi, Wiley eastern Ltd.,



**Question Paper Pattern
Credit Based I Semester Examination
B.A. Home Science**

Time: 3 Hrs

Max. Marks: 80

Paper I Introductory Textiles

Note:

1. Write the question number clearly
2. Use diagrams wherever necessary

PART A

1. Answer any TEN of the following:

10x 2 = 20

- (a)
- (b)
- (c)
- (d)
- (e)
- (f)
- (g)
- (i)
- (j)
- (k)
- (l)
- (m)

PART B

Answer any **three** of the following questions choosing one from each unit. 3x20=60

- | | | |
|----|-----|---|
| 2. | (a) | 6 |
| | (b) | 4 |
| | (c) | 5 |
| | (d) | 5 |

OR



3. (a) 6
(b) 4
(c) 5
(d) 5

OR

4. (a) 6
(b) 4
(c) 5
(d) 5

OR

5. (a) 6
(b) 4
(c) 5
(d) 5

OR

6. (a) 6
(b) 4
(c) 5
(d) 5

OR

7. (a) 6
(b) 4
(c) 5
(d) 5

