



પરિપત્ર:

ભક્તકવિ નરસિંહ મહેતા યુનિવર્સિટીની લાઈફ સાયન્સ વિદ્યાશાખાનાં અભ્યાસક્રમ ચલાવતી તમામ સંલગ્ન કોલેજોનાં આચાર્યશ્રીઓને સવિનય જણાવવાનું કે લાઈફ સાયન્સ વિદ્યાશાખા હેઠળનો NEP-૨૦૨૦ અંતર્ગત માઇક્રોબાયોલોજી વિષય સેમેસ્ટર-૫નો અભ્યાસક્રમ આ સાથે સામેલ છે.

માનનીય કુલપતિશ્રીની મંજૂરી અનુસાર સદર અભ્યાસક્રમ શૈક્ષણિક વર્ષ જુન, ૨૦૨૫ થી અમલવારી કરવાની રહે છે. લાઈફ સાયન્સ વિદ્યાશાખાનાં અભ્યાસક્રમ ચલાવતી તમામ સંલગ્ન કોલેજો ધ્વારા તેની અમલવારી કરવા જણાવવામાં આવે છે.



[Signature]
9/6/2025
ખાસ ફરજ પરના અધિકારી
(એકેડેમિક)

ક્રમાંક/બીકેએનએમયુ/ એકેડેમિક/૨૪૨/૨૦૨૫

ભક્તકવિ નરસિંહ મહેતા યુનિવર્સિટી,

સરકારી પોલીટેકનિક કેમ્પસ,

ભક્તકવિ નરસિંહ મહેતા યુનિવર્સિટી રોડ,

ખડીયા, જૂનાગઢ-૩૬૨૨૬૩

તા.૦૯.૦૬.૨૦૨૫

પ્રતિ,

- ભક્તકવિ નરસિંહ મહેતા યુનિવર્સિટી સંલગ્ન લાઈફ સાયન્સ વિદ્યાશાખાનાં અભ્યાસક્રમો ચલાવતી તમામ કોલેજોના આચાર્યશ્રીઓ તરફ....

નકલ સાદર રવાના:-

- માન.કુલપતિશ્રી/ કુલસચિવશ્રીનાં અંગત સચિવશ્રી.
- પરીક્ષા નિયામકશ્રી, ભક્તકવિ નરસિંહ મહેતા યુનિવર્સિટી, જૂનાગઢ

નકલ રવાના જાણ તથા યોગ્ય કાર્યવાહી અર્થે:

- સીસ્ટમ મેનેજરશ્રી, આઇ.ટી.સેલ વિભાગ (વેબસાઇટ ઉપર પ્રસિદ્ધ થવા અર્થે.)



BHAKTA KAVI NARSINH MEHTA UNIVERSITY
JUNAGADH



BOARD OF STUDIES

FACULTY OF LIFE SCIENCES

SYLLABUS FOR MICROBIOLOGY (HONOURS)

PROGRAMME (SEMESTER- V)

EFFECTIVE FROM JUNE, 2025

BHAKTA KAVI NARSINH MEHTA UNIVERSITY**Major/Minor****Syllabus of B.Sc. (Honors) as per NEP-2020****Faculty of Life Sciences****Effective from June 2025****Subject: Microbiology****SEMESTER- V****SUMMARY OF THE SYLLABUS**

Sem No.	Sr. No.	Category of Course	Course Title	Course Level	Credit	Teaching Hrs.	SEE Marks	CCE Marks	Total Marks	Exam Duration
Sem-5	1	Major-11	Clinical Diagnostic Microbiology	5.5	4	60	50	50	100	02:00 Hrs.
	2	Major-12	Microbial Practice in the Ancient Indian System	5.5	4	60	50	50	100	02:00 Hrs.
	3	Major-13	Combine Practical	5.5	4	120	50	50	100	04:00 Hrs.
	4	Minor-4	Microbes in Sustainable Agriculture	5.5	4 (3T + 1P)	75 (45T + 30P)	50	50	100	04:00 Hrs.
	5	Minor-5	Environmental Microbiology	5.5	4 (3T + 1P)	75 (45T + 30P)	50	50	100	04:00 Hrs.
				Total	20					

Course Level	5.5	Internal Marks	50
Programme	B.Sc. Microbiology	External Marks	50
Semester	V	Practical Internal	-
Category of Course	MAJOR-11	Practical External	-
Course Credit	04	Prac. External Exam Duration	-
Teaching Hours	60	Total	100
Course Code	MAJMBT501	Exam Duration	2 hrs.
Course Title	Clinical Diagnostic Microbiology (Theory)		

Course Objectives:

- The main objective of this course is to explain the various clinical diagnosis reactions as hematological, serological etc.
- This course also focuses on the various microorganisms related to infections.

Course Learning Outcomes: After completion of the course:

- Students improved their understanding of hematological and serological diagnosis.
- Have developed an understanding of different types of advanced diagnosis techniques.
- Students have acquired a piece of detailed knowledge about the microorganisms associated with various infectious diseases.

Course Contents

Sem	Unit No.	Syllabi	Teaching Hours
5	1	Hematology - Hematopoiesis - Discovery of human blood group system, ABO and Rh system - Hemostasis - Introduction to blood banking - Cross matching - Principle, significance and procedure of blood transfusion - Separation and storage of blood components.	15
	2	Serology In vitro antigen: antibody reaction, Precipitin test (in fluid and gel), Agglutination test (Hemagglutination, Bacterial	15

		Agglutination, Passive Agglutination and agglutination inhibition), Complement fixation test • Special Serological test; Fluorescent antibody technique Nuefeld Quellung reaction, Detection of heterophile antibody, Virus neutralizing antibody. • Evaluation of Virulence; Antifibrinolysin, Antistreptolysin • Overview of Intracutaneous diagnostic test	
	3	Conventional and Advanced Diagnostic Techniques • Conventional techniques; Methods of specimen collection, Identification of microbes from specimen; Microscopy, Rapid methods of identification, Molecular methods. • Advanced techniques; Immuno-electrophoresis, Immunofluorescence, Radioimmunoassay, ELISA, Western Blot, Detection of pathogen by PCR, Immunohistochemistry, Immunotherapy.	15
	4	Processing • Epidemiology of infectious disease: Markers, concepts and tools. • Microbial agents of disease: Bacteria – Pathogenicity, diagnosis, treatment and prevention; Gram negative Bacteria – <i>Treponema</i>, <i>Salmonella</i>, <i>Shigella</i>, <i>Neisseria</i>, <i>Vibrio</i> • Gram positive Bacteria – <i>Clostridium</i>, <i>Mycobacterium</i>, <i>Streptococci</i>, <i>Corynebacterium</i> • Fungi - Pathogenicity, diagnosis, treatment and prevention; Superficial mycoses – <i>Piedra</i> and <i>Malassezia furfur</i>, Cutaneous mycoses – <i>Tinea pedis</i>, Subcutaneous mycoses – <i>Sporothrix schenckii</i>, Systemic mycoses- <i>Cryptococcus neoformans</i> and <i>Histoplasma capsulatum</i>, Opportunistic fungi– <i>Candida albicans</i>, <i>Aspergillus fumigatus</i>, and <i>Cladosporium</i>.	15

Suggested Reading:

1. Microbiology – Pelczar – McGraw Hill
2. Immunology – 5th edition – J.Kuby, R. A. Goldsby , J.Kindt , B.A. Osborne – W.H. Freeman and Company , New York
3. Principles of Microbiology- 2nd edition – R.M.Atlas – Wm.C.Brown Publishers
4. Microbiology – 5th edition – Prescott , Harley , Klein – McGraw-Hill Publishers
5. Instant Notes in Microbiology – P.M. Lyolyard , A. Whelan, M.W. Fanger
6. Medical Bacteriology including Medical Mycology and AIDS – N C Dey, T K Dey and D Sinha – New Central Book Agency Calcutta
7. Textbook of Microbiology – A Panikar

Course Level	5.5	Internal Marks	50
Programme	B.Sc. Microbiology	External Marks	50
Semester	V	Practical Internal	-
Category of Course	MAJOR-12	Practical External	-
Course Credit	04	Prac. External Exam Duration	-
Teaching Hours	60	Total	100
Course Code	MAJMBT502	Exam Duration	2 hrs.
Course Title	Microbial Practice in the Ancient Indian System (Theory)		

Course Objectives:

- To explore and understand the scientific basis of ancient Indian biological knowledge
- To understand the value of ancient medicinal practices of Charaka, Sushruta and Ayurveda
- To study ancient Indian agricultural and environmental microbiology.
- To examine traditional Indian microbiological practices in healthcare and medicine

Course Learning Outcomes: After completion of the course:

- Students will gain insights into Ayurveda, Siddha, and unani and their relevance to modern microbiology.
- The course will evaluate ayurvedic formulations, fermentation techniques, and surgical innovations in light of contemporary biomedical sciences.
- This course will allow students to explore sustainable farming methods, organic fertilizers, bio-pesticides, and seed preservation techniques used in historical Indian agriculture.
- The study will give knowledge of traditional fermentation, probiotic food preparation, and ancient water purification methods for their microbiological basis.
- This subject will integrate traditional Indian biological knowledge with modern research for sustainable solutions in healthcare, agriculture, and environmental microbiology.

Course Contents

Sem	Unit No.	Syllabi	Teaching Hours
5	1	Ancient Indian Medicine • The concept of Ayurveda, its introduction, and the microbiology practice behind it. • Investigating the historical understanding and use of substances with antimicrobial properties in traditional Indian	15

		medicine systems (Ayurveda, Siddha, Unani) from a modern microbiological perspective. Traditional drug formulations: Asava, Arishta, Churna, Bhasma, Kadha	
	2	Traditional Indian Fermentation Microbiology - Ancient fermentation techniques: Preparation of curd, idli, kanji, dhokla, pickles, and alcoholic beverages - Microbial applications in food preservation and water purification. - Ancient knowledge on Probiotics and gut health in Ayurveda	15
	3	Ancient Agriculture and Environmental Microbiology - Traditional organic farming techniques: Panchagavya, Jeevamrut, and biofertilizers in sustainable agriculture - Plant-based pest control methods, developing microbial biopesticides, and plant disease management practices using natural predators, herbal pesticides, and Agnihotra in ancient India - Sustainable ancient Indian practices for organic and chemical-free livestock farming.	15
	4	Traditional Environmental Microbiology - Soil fertility improvement using green manure, vermiculture, animal dung, crop residues - Indigenous method of rainwater harvesting: stepwells, nadi system, kanats - Use of charcoal, sand filters, moringa seeds, and copper vessels for natural water purification.	15

Suggested Reading:

1. Ayurveda: The Science of Self-Healing – Dr. Vasant Lad
2. The Charaka Samhita – Translated by P.V. Sharma
3. Siddha Medicine: Fundamentals and Practice – Dr. K. Sivaraman
4. Vrikshayurveda: The Science of Plant Life – Surapala (Translated by Nalini Sadhale)
5. Indian Farming: Traditional Techniques and Practices" by R. K. P. Prakash Ayurvedic Medicinal plants by Vasant Lad

Course Level	5.5	Internal Marks	-
Programme	B.Sc. Microbiology	External Marks	-
Semester	V	Practical Internal	50
Category of Course	MAJOR-13	Practical External	50
Course Credit	04	Prac. External Exam Duration	4 hrs.
Teaching Hours	120	Total	100
Course Code	MAJMBP503	Exam Duration	4 hrs
Course Title	Combine practical (Practical)		

Course Objectives:

- To study and improve the hands-on practical skills in clinical and diagnostic microbiology and some ancient Indian practices.

Course Learning Outcomes: After completion of the course:

- Students gain knowledge on microorganisms associated with various infectious diseases.
- The diagnosis and treatment strategies followed for the infectious diseases.
- Explain basic concept of ancient Indian practices.
- Students learned the ancient Indian fermentation process and techniques

Course Contents

Sem	No.	Syllabi	Teaching Hours
5	1	Antibiotic susceptibility of the pathogens isolated from the clinical specimen	120
	2	Study of Agglutination by a Blood grouping b Serodiagnosis of enteric fever by Widal test c Serodiagnosis of syphilis by RPR Test	
	3	Haemoglobin estimation by Drabkin's method	
	4	Bleeding time by filter paper technique and clotting time by capillary method	

5	Blood sugar estimation by GOD / POD method
6	Determination of Serum Bilirubin
7	Determination of Serum Cholesterol
8	Physical, chemical and microscopic analysis of urine
9	Screening of Thalassemia by NESTROFT
10	Total count of platelets
11	Fermentation of bioproduct using crude and synthetic media
12	Isolation of probiotic microbes
13	Prepare curd in a laboratory and study its parameters
14	Preparation of panchgavya and its microbial activities
15	Preparation of Jeevamrut and its microbial activities
16	Improvement of soil fertility using microbes
17	Preparation and development of biopesticides
18	Water purification using the moringa seed/biocharcoal
19	Preparation and application of biofertilizer

Suggested Reading:

1. Patel. R.J., Patel. K.R., Experimental Microbiology, Vol-I, Aditya Publications, Ahmedabad, India.
2. Patel. R.J., Patel. K.R., Experimental Microbiology, Vol-II, Aditya Publications, Ahmedabad, India.
3. Dubey. R.C., Maheshwari. D.K., Practical Microbiology, S.Chand & Company Ltd., New Delhi
4. Konika Sharma., manual of Microbiology – Tools & Techniques, Ane Books, Delhi.

Course Level	5.5	Internal Marks	25
Programme	B.Sc. Microbiology	External Marks	50
Semester	V	Practical Internal	25
Category of Course	MINOR-4	Practical External	-
Course Credit	04 (03T+01P)	Prac. External Exam Duration	2 Hrs.
Teaching Hours	75 (45T+30P)	Total	100
Course Code	MINMBT501	Exam Duration	2 Hrs.
Course Title	Microbes in Sustainable Agriculture (Theory)		

Course Objectives:

- To explore the sustainable practices in the field of agricultural microbiology and biotechnology
- Study the possible bioenergy sources and their current status in agricultural biotechnology.

Course Learning Outcomes: After completion of the course:

- Has acquired a fairly good understanding of microbes in the soil.
- Has developed a fairly good understanding of the use of microbes in sustainable agriculture, namely role in nitrogen fixing, organic matter degradation, use as bio fertilizers, as bio pesticides, and production of biofuels.
- Has developed skills for growing microorganisms in the laboratory to produce different enzymes by different microorganisms.

Course Contents

Sem	Unit No.	Syllabi	Teaching Hours
5	1	Soil Microbiology • Soil as Microbial Habitat, Soil profile and properties, Soil formation, Diversity and distribution of microorganisms in soil. • Microbial Activity in Soil and Green House Gases- Carbon dioxide, methane, hydrogen, nitrous oxide, nitric oxide – production and control.	12

	2	Microbial Biocontrol - Mineralization of Organic & Inorganic Matter in Soil: Mineralization of cellulose, hemicelluloses, lignocelluloses, lignin and humus, phosphate, nitrate, silica, potassium - Microbial Control of Soil Borne Plant Pathogens: Biocontrol mechanisms and ways, - Microorganisms used as biocontrol agents against Microbial plant pathogens, Insects, Weeds.	12
	3	Microbial Biofertilizer - Biofertilization, Phytostimulation, Bioinsecticides: Plant growth promoting bacteria, biofertilizers–symbiotic (<i>Bradyrhizobium</i>, <i>Rhizobium</i>, <i>Frankia</i>), - Non-Symbiotic (<i>Azospirillum</i>, <i>Azotobacter</i>, Mycorrhizae, MHBs, Phosphate solubilizers, algae), - Novel combination of microbes as biofertilizers, PGPRs	11
	4	Agriculture Biotechnology - Agriculture Biotechnology: Biotech feed, Silage, Biomanure, biogas, biofuels– advantages and processing parameters. - GM crops: Advantages, social and environmental aspects, Bt crops, golden rice, transgenic animals.	10

Suggested Reading:

- Eldor A.Paul. Soil Microbiology. Ecology and Biochemistry. VI Edition: Academic Press, (2007).
- Eugene L. Madsen. Environmental Microbiology: From Genomes to Biogeochemistry I Edition, Wiley-Blackwell Publishing. (2008).
- Agrios, G. N. Plant pathology. Harcourt Asia Pvt. Ltd. (2000).
- Buchanan.B.B., Gruissem, W. and Jones, R. L Biochemistry and Molecular Biology of Plants. I. K. International Pvt. Ltd. (2000)
- Mehrotra R S and Ashok Agrawal. Plant Pathology. Tata Mc Graw Hill ,6th reprint (2006)
- K. S. Bilgrami, H. C. Dube. A textbook of modern pathology. 6th Edition, Vani Educational Books a division of Vikas, (1984).
- K. R. Aneja. Experiments in Microbiology, Plant Pathology and Biotechnology. New Age Publications. 2017

Practical Course (Minor-4)

Sem	No.	Syllabi	Teaching Hours
5	1	Isolation and purification of cyanobacteria, actinomycetes, fungi	30
	2	Methods of isolation and identification of fungi by traditional methods Study of soil fungi	
	3	Staining and observation of plant pathogenic fungi.	
	4	Isolation of amylase producing microorganisms from soil	
	5	Isolation of protease producing microorganisms from soil	
	6	Isolation and Rhizobium and Azotobacter Nitrogen bacteria from soil.	
	7	Laboratory scale production of biofertilizers.	
	8	Isolation and characterization of plant growth promoting bacteria.	
	9	Splash liberation of fungal spores from diseased tissue.	

Suggested Reading:

1. Patel. R.J., Patel. K.R., Experimental Microbiology, Vol-I, Aditya Publications, Ahmedabad, India.
2. Patel. R.J., Patel. K.R., Experimental Microbiology, Vol-II, Aditya Publications, Ahmedabad, India.
3. Dubey. R.C., Maheshwari. D.K., Practical Microbiology, S. Chand & Company Ltd., New Delhi
4. Konika Sharma., manual of Microbiology – Tools & Techniques, Ane Books, Delhi.
5. International student edition: Microbiology- A laboratory Manual 4th edition. by James G. Chappuccino & Natalie Sherman.

Course Level	5.5	Internal Marks	25
Programme	B.Sc. Microbiology	External Marks	50
Semester	V	Practical Internal	25
Category of Course	MINOR-5	Practical External	-
Course Credit	04 (03T+01P)	Prac. External Exam Duration	2 Hrs.
Teaching Hours	75 (45T+30P)	Total	100
Course Code	MINMBT502	Exam Duration	2 Hrs.
Course Title	Environmental Microbiology (Theory)		

Course Objectives:

- The objective of the course is to enhance the understanding of environmental microbiology and to know the microbial habitats and their role in the ecology and biogeochemical cycle.
- Study the possible waste management and microbial treatment to improve the environmental understanding.

Course Learning Outcomes: After completion of the course:

- Students have acquired a fairly good understanding of microbes in the various habitats.
- Understand how microbes interact among themselves and with higher plants and animals with the help of various examples.
- Gain in-depth knowledge of the biological aspects of water pollution, its bacteriological analysis and management.

Course Contents

Sem	Unit No.	Syllabi	Teaching Hours
5	1	Microorganisms and their Habitats - Structure and function of ecosystems-Terrestrial Environment: Soil profile and soil microflora - Aquatic Environment: Microflora of fresh water and marine habitats Atmosphere: Aeromicroflora and dispersal of microbes - Animal Environment: Microbes in/on human body (Microbiomics) & animal (ruminants) body.	12

		• Extreme Habitats: Extremophiles: Microbes thriving at high & low temperatures, pH, high hydrostatic & osmotic pressures, salinity, & low nutrient levels.	
	2	Microbial Interactions • Microbe interactions: Mutualism, synergism, commensalism, competition, amensalism, parasitism, predation • Microbe-Plant interaction: Symbiotic and non-symbiotic interactions • Microbe-animal interaction: Microbes in ruminants, nematophagus fungi and symbiotic luminescent bacteria.	11
	3	Biogeochemical Cycles • Carbon cycle: Microbial degradation of cellulose, hemicelluloses, lignin and chitin • Nitrogen cycle: Nitrogen fixation, ammonification, nitrification, denitrification and nitratereduction • Phosphorus cycle: Phosphate immobilization and solubilisation. • Sulphur cycle: Microbes involved in sulphur cycle.	10
	4	Waste management and degradation • Solid Waste management: Sources and types of solid waste, Methods of solid waste disposal (composting and sanitary landfill). • Liquid waste management: Composition and strength of sewage (BOD and COD), Primary, secondary (oxidation ponds, trickling filter, activated sludge process and septic tank) and tertiary sewage treatment. • Principles and degradation of common pesticides, organic (hydrocarbons, oil spills) and inorganic • (metals) matter, biosurfactants.	12

Suggested Reading:

1. Atlas RM and Bartha R. (2000). Microbial Ecology: Fundamentals & Applications. 4th edition. Benjamin/Cummings Science Publishing, USA
2. Madigan MT, Martinko JM and Parker J. (2014). Brock Biology of Microorganisms. 14th edition. Pearson/ Benjamin Cummings
3. Maier RM, Pepper IL and Gerba CP. (2009). Environmental Microbiology. 2nd edition, Academic Press
4. Okafor, N (2011). Environmental Microbiology of Aquatic & Waste systems. 1st edition, Springer, New York

5. Singh A, Kuhad, RC & Ward OP (2009). Advances in Applied Bioremediation. Volume 17, Springer-Verlag, Berlin Hedeilberg
6. Barton LL & Northup DE (2011). Microbial Ecology. 1st edition, Wiley Blackwell, USA Campbell RE. (1983). Microbial Ecology. Blackwell Scientific Publication, Oxford, England.
7. Coyne MS. (2001). Soil Microbiology: An Exploratory Approach. Delmar Thomson Learning.
8. Subba Rao NS. (1999). Soil Microbiology. 4th edition. Oxford & IBH Publishing Co., New Delhi.
9. Willey JM, Sherwood LM, and Woolverton CJ. (2013). Prescott's Microbiology. 9th edition. McGraw Hill Higher Education.

Practical Course (Minor-5)

Sem	No.	Syllabi	Teaching Hours
5	1	Isolation of microbes (bacteria & fungi) from soil.	30
	2	Isolation of microbes from rhizosphere and phyllosphere.	
	3	Assessment of microbiological quality of water.	
	4	Determination of BOD of waste water sample.	
	5	Study of amylase production by soil bacteria at extreme conditions	
	6	Study the phosphorus solubilization by soil bacteria	
	7	Study the air microflora	

Suggested Reading:

1. Patel. R.J., Patel. K.R., Experimental Microbiology, Vol-I, Aditya Publications, Ahmedabad, India.
2. Patel. R.J., Patel. K.R., Experimental Microbiology, Vol-II, Aditya Publications, Ahmedabad, India.
3. Dubey. R.C., Maheshwari. D.K., Practical Microbiology, S. Chand & Company Ltd., New Delhi
4. Konika Sharma., manual of Microbiology – Tools & Techniques, Ane Books, Delhi.
5. International student edition: Microbiology- A laboratory Manual 4th edition. by James G. Chappuccino & Natalie Sherman.

INTERNAL EVALUATION SCHEME (MAJOR)			
INTERNAL ASSESSMENT			
No.	Particulars	Marks	Weightage
1	Internal Test	50	25
2	Assignment		10
3	Field visit report/ class presentation		10
4	Attendance		05
	Total		50

INTERNAL EVALUATION SCHEME (MINOR)			
INTERNAL ASSESSMENT			
No.	Particulars	Marks	Weightage
1	Internal Practical	50	25
2	Internal Test		10
3	Field visit report/ class presentation		10
4	Attendance		05
	Total		50

INTERNAL EVALUATION SCHEME		
INTERNAL ASSESSMENT		
No.	Particulars	Weightage
1	Practical Performance	40
2	Viva	10
	Total	50

Paper Style:

INTERNAL EVALUATION SCHEME		
INTERNAL ASSESSMENT PRACTICAL		
No.	Particulars	Weightage
1	Perform any Four practical from the given list of exercises as per the instruction of the examiner.	40
2	Viva	10
Total		50

ASSESSMENT BY UNIVERSITY		
Que. No.	Particulars	Marks
EXTERNAL EXAMINER		
1	Perform any Three or Four practical from the given list of exercises as per the instruction of the examiner	40
2	Viva-voce	10
Total		50

Paper Style

EXTERNAL ASSESSMENT BY UNIVERSITY			
Que. No.	Particulars	Unit	Marks
Que. 1	(1)	Unit 1	05
	(2)		05
	OR		
	(1)		05
	(2)		05
Que. 2	(1)	Unit 2	05
	(2)		05
	OR		
	(1)		05
	(2)		05
Que. 3	(1)	Unit 3	05
	(2)		05
	OR		
	(1)		05
	(2)		05
Que. 4	(1)	Unit 4	05
	(2)		05
	OR		
	(1)		05
	(2)		05
Que. 5	(1)	Unit 1 & 2	05
	(2)		05
	OR		
	(1)	Unit 3 & 4	05
	(2)		05
Total			50