



KARNATAK UNIVERSITY, DHARWAD
ACADEMIC (S&T) SECTION

ಕರ್ನಾಟಕ ವಿಶ್ವವಿದ್ಯಾಲಯ, ಧಾರವಾಡ
ವಿದ್ಯಾಮಂಡಳ (ಎಸ್&ಟಿ) ವಿಭಾಗ



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NAAC Accredited
'A' Grade 2014

website: kud.ac.in

No. KU/Aca(S&T)/JS/MGJ(Gen)/2023-24/59

Date: 04/09/2023

ಅಧಿಸೂಚನೆ

ವಿಷಯ: 2023-24ನೇ ಶೈಕ್ಷಣಿಕ ಸಾಲಿನಿಂದ ಎಲ್ಲ ಸ್ನಾತಕ ಪದವಿಗಳಿಗೆ 5 ಮತ್ತು 6ನೇ ಸೆಮಿಸ್ಟರ್
NEP-2020 ಪಠ್ಯಕ್ರಮವನ್ನು ಅಳವಡಿಸಿರುವ ಕುರಿತು.

- ಉಲ್ಲೇಖ: 1. ಸರ್ಕಾರದ ಅಧೀನ ಕಾರ್ಯದರ್ಶಿಗಳು(ವಿಶ್ವವಿದ್ಯಾಲಯ 1) ಉನ್ನತ ಶಿಕ್ಷಣ ಇಲಾಖೆ ಇವರ
ಆದೇಶ ಸಂಖ್ಯೆ: ಇಡಿ 104 ಯುಎನ್‌ಇ 2023, ದಿ: 20.07.2023.
2. ವಿದ್ಯಾವಿಷಯಕ ಪರಿಷತ್ ಸಭೆಯ ನಿರ್ಣಯ ಸಂಖ್ಯೆ: 2 ರಿಂದ 7, ದಿ: 31.08.2023.
3. ಮಾನ್ಯ ಕುಲಪತಿಗಳ ಆದೇಶ ದಿನಾಂಕ: 04/09/2023

ಮೇಲ್ಕಾಣಿಸಿದ ವಿಷಯ ಹಾಗೂ ಉಲ್ಲೇಖಗಳನ್ವಯ ಮಾನ್ಯ ಕುಲಪತಿಗಳ ಆದೇಶದ ಮೇರೆಗೆ, 2023-24ನೇ
ಶೈಕ್ಷಣಿಕ ಸಾಲಿನಿಂದ ಅನ್ವಯವಾಗುವಂತೆ, ಎಲ್ಲ B.A./ BPA (Music) /BVA / BTTM / BSW/ B.Sc./B.Sc. Pulp &
Paper Science/ B.Sc. (H.M)/ BCA/ B.A.S.L.P./ B.Com/ B.Com (CS) / BBA & BA ILRD ಸ್ನಾತಕ ಪದವಿಗಳ 5
ಮತ್ತು 6ನೇ ಸೆಮಿಸ್ಟರ್‌ಗಳಿಗೆ NEP-2020ರ ಮುಂದುವರಿದ ಭಾಗವಾಗಿ ವಿದ್ಯಾವಿಷಯಕ ಪರಿಷತ್ ಸಭೆಯ ಅನುಮೋದಿತ
ಕೋರ್ಸಿನ ಪಠ್ಯಕ್ರಮಗಳನ್ನು ಕ.ವಿ.ವಿ. ಅಂತರ್ಜಾಲ www.kud.ac.in ದಲ್ಲಿ ಭಿತ್ತರಿಸಲಾಗಿದೆ. ಸದರ ಪಠ್ಯಕ್ರಮಗಳನ್ನು ಕ.ವಿ.ವಿ.
ಅಂತರ್ಜಾಲದಿಂದ ಡೌನ್‌ಲೋಡ್ ಮಾಡಿಕೊಳ್ಳಲು ಸೂಚಿಸುತ್ತ ವಿದ್ಯಾರ್ಥಿಗಳ ಹಾಗೂ ಸಂಬಂಧಿಸಿದ ಎಲ್ಲ ಬೋಧಕರ ಗಮನಕ್ಕೆ
ತಂದು ಅದರಂತೆ ಕಾರ್ಯಪ್ರವೃತ್ತರಾಗಲು ಕವಿವಿ ಅಧೀನದ/ಸಂಲಗ್ನ ಮಹಾವಿದ್ಯಾಲಯಗಳ ಪ್ರಾಚಾರ್ಯರುಗಳಿಗೆ
ಸೂಚಿಸಲಾಗಿದೆ.

ಅಡಕ: ಮೇಲಿನಂತೆ


ಕುಲಸಚಿವರು.

ಗೆ,

ಕರ್ನಾಟಕ ವಿಶ್ವವಿದ್ಯಾಲಯದ ವ್ಯಾಪ್ತಿಯಲ್ಲಿ ಬರುವ ಎಲ್ಲ ಅಧೀನ ಹಾಗೂ ಸಂಲಗ್ನ ಮಹಾವಿದ್ಯಾಲಯಗಳ
ಪ್ರಾಚಾರ್ಯರುಗಳಿಗೆ. (ಕ.ವಿ.ವಿ. ಅಂತರ್ಜಾಲ ಹಾಗೂ ಮಿಂಚಂಚೆ ಮೂಲಕ ಬಿತ್ತರಿಸಲಾಗುವುದು)

ಪ್ರತಿ:

1. ಕುಲಪತಿಗಳ ಆಪ್ತ ಕಾರ್ಯದರ್ಶಿಗಳು, ಕ.ವಿ.ವಿ. ಧಾರವಾಡ.
2. ಕುಲಸಚಿವರ ಆಪ್ತ ಕಾರ್ಯದರ್ಶಿಗಳು, ಕ.ವಿ.ವಿ. ಧಾರವಾಡ.
3. ಕುಲಸಚಿವರು (ಮೌಲ್ಯಮಾಪನ) ಆಪ್ತ ಕಾರ್ಯದರ್ಶಿಗಳು, ಕ.ವಿ.ವಿ. ಧಾರವಾಡ.
4. ಅಧೀಕ್ಷಕರು, ಪ್ರಶ್ನೆ ಪತ್ರಿಕೆ / ಗೌಪ್ಯ / ಜಿ.ಎ.ಡಿ. / ವಿದ್ಯಾಂಡಳ (ಪಿ.ಜಿ.ಪಿ.ಎಚ್.ಡಿ) ವಿಭಾಗ, ಸಂಬಂಧಿಸಿದ
ಕೋರ್ಸುಗಳ ವಿಭಾಗಗಳು ಪರೀಕ್ಷಾ ವಿಭಾಗ, ಕ.ವಿ.ವಿ. ಧಾರವಾಡ.
5. ನಿರ್ದೇಶಕರು, ಕಾಲೇಜು ಅಭಿವೃದ್ಧಿ / ವಿದ್ಯಾರ್ಥಿ ಕಲ್ಯಾಣ ವಿಭಾಗ, ಕ.ವಿ.ವಿ. ಧಾರವಾಡ.



KARNATAK UNIVERSITY, DHARWAD

B.A./B.Sc. in Geography

SYLLABUS

With Effect from 2023-24

**DISCIPLINE SPECIFIC CORE COURSE (DSCC) FOR SEM V & VI,
SKILL ENHANCEMENT COURSE (SEC) FOR SEM V SEM**

AS PER N E P - 2020

Karnatak University, Dharwad

B.Sc. in Geography

Effective from 2023-24

Sem.	Type of Course	Theory/ Practical	Course Code	CourseTitle	Instructi onhour/ week	Total hours / sem	Duration of Exam	Marks			Credits
								Formati ve	Summa tive	Total	
V	DSCC-9	Theory	035 GEO 011	Population Resources and Dynamics	04hrs	56	02 hrs	40	60	100	04
	DSCC-10	Practical	035 GEO 012	Techniques in Population Geography	04 hrs	56	03 hrs	25	25	50	02
	DSCC-11	Theory	035 GEO 013	Fundamentals of Remote Sensing	04hrs	56	02 hrs	40	60	100	04
	DSCC-12	Practical	035 GEO 014	Interpretation of Aerial Photos and Satellite Images	04 hrs	56	03 hrs	25	25	50	02
	SEC-3	Practical	035 GEO 061	Fundamentals of Cartography	04hrs	56	03 hrs	25	25	50	02
	Total										26
VI	DSCC-13	Theory	036 GEO 011	Environmental Geography	04hrs	56	02 hrs	40	60	100	04
	DSCC-4	Practical	036 GEO 012	Methods in Environmental Geography	04 hrs	56	03 hrs	25	25	50	02
	DSCC-15	Theory	036 GEO 013	Fundamentals of Geographic Information Systems	04hrs	56	02 hrs	40	60	100	04
	DSCC-16	Practical	036 GEO 014	GIS for Map-Making	04 hrs	56	03 hrs	25	25	50	02
	Internship-1		036 GEO 091	Internship/ Mini Project/ Field Based Report				50	0	50	02
	Total										26

Karnatak University, Dharwad
B.A. in Geography
 Effective from 2023-24

Sem.	Type of Course	Theory/ Practical	Course Code	Course Title	Instructor hour/ week	Total hours / sem	Duration of Exam	Marks			Credits
								Formative	Summative	Total	
V	DSCC-9	Theory	015 GEO 011	Population Resources and Dynamics	04hrs	56	02 hrs	40	60	100	04
	DSCC-10	Practical	015 GEO 012	Techniques in Population Geography	04 hrs	56	03 hrs	25	25	50	02
	DSCC-11	Theory	015 GEO 013	Fundamentals of Remote Sensing	04hrs	56	02 hrs	40	60	100	04
	DSCC-12	Practical	015 GEO 014	Interpretation of Aerial Photos and Satellite Images	04 hrs	56	03 hrs	25	25	50	02
	SEC-3	Practical	015 GEO 061	Fundamentals of Cartography	04hrs	56	03 hrs	25	25	50	02
	Total										26
VI	DSCC-13	Theory	016 GEO 011	Environmental Geography	04hrs	56	02 hrs	40	60	100	04
	DSCC-4	Practical	016 GEO 012	Methods in Environmental Geography	04 hrs	56	03 hrs	25	25	50	02
	DSCC-15	Theory	016 GEO 013	Fundamentals of Geographic Information Systems	04hrs	56	02 hrs	40	60	100	04
	DSCC-16	Practical	016 GEO 014	GIS for Map-Making	04 hrs	56	03 hrs	25	25	50	02
	Internship-1		016 GEO 091	Internship/ Mini Project/ Field Based Report				50	0	50	02
	Total										26

B.A/B.Sc. Semester – V
Discipline Specific Course (DSC)-9

Course Title: Population Resources and Dynamics

Course Code: 035 Geog 011(B.Sc)

015 Geog 011 (B.A)

Type of Course	Theory / Practical	Credits	Instruction hour per week	Total No. of Lectures/Hours / Semester	Duration of Exam	Formative Assessment Marks	Summative assessment Marks	Total Marks
DSCC-9	Theory	04	04	56 hrs.	2hrs.	40	60	100

Course Outcomes (COs):At the end of the course students will be able to:

CO1: Apply critical analysis skills on the demographic composition of a country.

CO2: Classify and evaluate migrations and their types.

CO3: Understanding the population resources.

CO4: Analyse population growth issues and challenges.

CO5: Investigate how migration takes place

Unit	Title:	56.hrs/ Sem
Unit I	Introduction: Nature and Scope of Population Geography, Population Geography and Demography, Sources of Population Data. Density of Population. World Population: Measures, patterns, and determinants. Growth, distribution, and problems.	14
Unit II	Population Change: Concept of over, under & optimum population; Growth of Population in the World and India, Components of Population Change. Fertility and Mortality Analysis: Indices, determinants, and world patterns. Demographic Attributes and Demographic Transition. Theories of Population Growth: Malthus, Sadler, and Ricardo. Assignment: Students are to be prepared a report regarding population change in their own area and submit a report.	14
Unit III	Migration: Meaning, types, causes, consequences, and models. Theories of Migration Ravenstein & Lee. Population composition and characteristics. Age, Sex, rural-urban, occupational structure, and educational level. Field Activity: Students need to visit a nearby village and get to know how and why migration takes place and submit a report.	14
Unit IV	Population as Resource: Population Resource Regions. Population Policy of India. Policy issues; Social well-being and quality of life; population as social capital. Contemporary Issues – Ageing of Population; Declining Sex Ratio; HIV/AIDS. Population policies in developed and developing countries. Human Development Index (HDI).	14

References	
1	Chandna R.C. (2009), Geography of Population, Kalyani Publicishers, Aneari Road, Daryaganj, New Delhi.
2	Majid Hussain (1999), Human Geography, Rawat publications, Jaipur.
3	Trewartha GT. (1959) A Geography of Population, world Patterns, John Wiley and Sons Inc. New York.
4	Ghosh BN. (1987) Fundamentals of population Geography s, sterling publishing company, New Delhi
5	Jingam ML. B.K. Bhat, JN Deasi (2003) Demography, Urinda Publishers Pvt. Ltd. Delhi.
6	R.K. Tripathi ((2000) Population geography, commonwealth publishers, New Delhi.
7	Kayastha SL. (1998) Geography of Population, Rawat publications, jaipur.
8	Clerk I (1984) Geography of populations, approaches and applications, pergamon press, Oxford, UK.
9	Ritu Malik (2013), Changes in population Dynamics, Sanjay Prakashan
10	Prthvish Nag, G.C.Debnath (2021), Population Geography, Bharti Prakashan, Varanasi
11	Nanjannavar.S.S (2017) : Janasankhya Bhugola Shastra, Prabhu Publications, Dharwad.
Resource Websites:	
1	https://censusindia.gov.in/census.website/
2	https://mea.gov.in/icm.htm
3	https://population.un.org/wpp/
4	https://www.popcouncil.org/research/india
5	https://www.cdc.gov/csels/dsepd/ss1978/lesson3/section3.html

Formative Assessment for Theory	
Assessment Occasion/ type	Marks
Internal Assessment Test 1	10
Internal Assessment Test 2	10
Quiz/ Assignment/ Small Project	10
Seminar	10
Total	40 Marks
<i>Formative Assessment as per guidelines.</i>	

B.A/B.Sc. Semester – V
Discipline Specific Course (DSC)-10

Course Title: Techniques in Population Geography

Course Code: 035 Geog 012 (B. Sc)
015 Geog 012 (B.A)

Type of Course	Theory / Practical	Credits	Instruction hour per week	Total No. of Lectures/Hours / Semester	Duration of Exam	Formative Assessment Marks	Summative assessment Marks	Total Marks
DSCC-10	Practical	02	04	56 hrs.	3hrs.	25	25	50

Course Outcomes (COs) :At the end of the course, students will be able to:

CO1: Learn various methods of representative of demographic data.

CO2: Apply various technologies in representation of demographic data.

CO3: Analyse the trend and pattern of demographic data.

CO4: Construct different diagrams using the data.

CO5: Formulate the future trend of the data.

Excer No.	Title	56.hrs/ sem
1	Sources of population data: Census of India, United Nations Population Division, Birth And Death Registry, Vital statistics survey, National Sample Survey, National Family and Health Survey.	04
2	Thematic maps for population Distribution-patterns (dot map, Choropleth maps).	06
3	Calculation of Population Growth rate in different decades.	06
4	Calculation of population projection, arithmetic method.	04
5	Calculation of population Density, arithmetic density, and agriculture density.	06
6	Calculation of Crude birth rate, General fertility rate and Total fertility rate.	06
7	Calculation of Crude death rate / mortality rate and Infant mortality rate.	06
8	Calculation of Age-specific mortality rate and Sex-specific mortality rate	06
9	Construction of population pyramids for Age, Sex, Rural and Urban.	06
10	Prepare a population map of district/ Karnataka/India.	06

References	
1	Chandna R.C. (2009), Geography of Population, Kalyani Publicishers, Aneari Road, Daryaganj, New Delhi.
2	Majid Hussain (1999), Human Geography, Rawat publications, Jaipur.
3	Trewartha GT. (1959) A Geography of Population, world Patterns, John Wiley and Sons Inc. New York.
4	Ghosh BN. (1987) Fundamentals of population Geography s, sterling publishing company, New Delhi
5	Jingam ML. B.K. Bhat, JN Deasi (2003) Demography, Urinda Publishers Pvt. Ltd. Delhi.
6	R.K. Tripathi ((2000) Population geography, commonwealth publishers, New Delhi.
7	Kayastha SL. (1998) Geography of Population, Rawat publications, jaipur.
8	Clerk I (1984) Geography of populations, approaches and applications, pergamon press, Oxford, UK.
9	Ritu Malik (2013), Changes in population Dynamics, Sanjay Prakashan
10	Prthvish Nag, G.C.Debnath (2021), Population Geography, Bharti Prakashan, Varanasi
11	Nanjanavar.S.S (2017) : Janasankhya Bhugola Shastra, Prabhu Publications, Dharwad.
	Resource Websites:
1	https://censusindia.gov.in/census.website/
2	https://mea.gov.in/icm.htm
3	https://population.un.org/wpp/
4	https://www.popcouncil.org/research/india
5	https://www.cdc.gov/csels/dsepd/ss1978/lesson3/section3.html

Formative Assessment for Practical	
Assessment	Distribution of Marks
Assessment Occasion/ type	Marks
Internal Assessment Test	10
Case study /Assignment / Field-activity / Project work etc	10
Journal/Record	03
Viva	02
Total	25 Marks
<i>Formative Assessment as per guidelines.</i>	

The same shall be used for semester end Examination

B.A/ B.Sc. Semester – V

Discipline Specific Course (DSC)-11

Course Title: Fundamentals of Remote Sensing

Course Code: 035 Geog 013 (B. Sc)

015 Geog 013 (B.A)

Type of Course	Theory / Practical	Credits	Instruction hour per week	Total No. of Lectures/Hours / Semester	Duration of Exam	Formative Assessment Marks	Summative assessment Marks	Total Marks
DSCC-11	Theory	04	04	56 hrs.	2hrs.	40	60	100

Course Outcomes (COs): At the end of the course, students will be able to:

CO1: Define and describe the components of remote sensing and explain the history of remote sensing.

CO2: Differentiate between the types of remote sensors and platforms and analyze.

CO3: Interpret aerial photographs and identify and compare digital and analog data.

CO4: Evaluate the applications of remote sensing, including the new satellite programs of India.

CO5: Analyze ground truth verification using Google Earth and evaluate its usefulness.

Unit	Title:	56.hrs/sem
Unit I	<p>Introduction to Remote Sensing: Definition and Components, History of Remote Sensing, Electromagnetic Magnetic Spectrum, Interaction of EMR with the atmosphere and with the surface feature, Atmospheric window, spectral reflectance of land covers (minerals, rocks, water, vegetation, and urban area)</p>	14
Unit II	<p>Sensors & Platforms: Types of orbits-sun-synchronous and geosynchronous, Sources of energy, Classification of remote sensors - Active, Passive, Electro-mechanical, and optical sensors. Resolution concept - Spectral, Radiometric, and temporal resolution. Platform types and characteristics Launch of space vehicles. Angular characteristics-FOV and IFOV, pushbroom and whiskbroom cameras, Panchromatic, multispectral, hyper spectral scanners, and geometric characteristics of the imageries. Assignment: Students need to prepare a report on how satellite images are captured, processed, and distributed to the end users by citing Bhuvan, ISRO, ISAC, NRSC, and SGC Websites.</p>	14
Unit III	<p>Aerial Photography: Elements, Types and interpretation of Aerial photography, Principles, Classification of Aerial photographs based on Height and Tilt, Scales, Components of camera, film, Aerial platforms. Elements of Aerial photo interpretation, Digital and Analog data, Image formats, Stereo pairs, Applications of Aerial Photography.</p>	14
Unit IV	<p>Applications of Remote Sensing: Indian remote sensing Centers and their activities, new satellite programs of India. Different Satellites and their Application in Land Resources, Meteorology, and Hydrology. Ground truth verification using Google Earth. Field Activity: Students need to visit a nearby village and get to know how remote sensing images and real world looks and submit a report.</p>	14

References	
	Books
1	Lillesand T. Mand Kiefer R.W (2021), Remote Sensing and Image interpretation, 7 th Edition, John Wiley & Sons, Canada.
2	Jensen J. R, (2012), Remote Sensing of Environment: An Earth Resources Perspective, 2 nd Edition, Pearson Education, Upper Saddle River, Prentice Hall, New Jersey.
3	Elachi Candvan Zyl J .J, (2006), Introduction to the Physics and Techniques of Remote Sensing, John Wiley & Sons, Canada.
4	Joseph G, (2005), Fundamentals of Remote Sensing, 2 nd Edition, Universities Press (India) Pvt Ltd, Hyderabad.
5	Narayan LRA, (1999), Remote Sensing and its Applications, Universities Press (India) Pvt Ltd, Hyderabad.
6	Rampal K. K, (1999), Handbook of Aerial Photography and Interpretation, Concept Publishing Co, New Delhi.
7	Avery T. E and Berlin G.L, (1992), Fundamentals of Remote Sensing and Air Photo Interpretation, 5 th Edition, Prentice Hall, New Jersey.
8	Sabins, F.F. Jr, (1987), Remote Sensing; Principles and Interpretation, 2 nd Edition, W.H. Freeman and Co, New York.
9	Jensen, John R., (2005), Introductory Digital Image Processing, 3 rd Ed., Upper Saddle River, NJ: Prentice Hall, 526 pages.
	MOOC
1	Remote Sensing: https://nptel.ac.in/courses/105/108/105108077/
2	Introduction to Remote Sensing: https://nptel.ac.in/courses/121/107/121107009/
3	Digital Image Processing of Remote Sensing Data: https://nptel.ac.in/courses/105/107/105107160/
4	Remote Sensing and GIS: https://nptel.ac.in/courses/105/103/105103193/
5	Remote Sensing Essentials: https://nptel.ac.in/courses/105/107/105107201/
6	Remote Sensing: Principles and Applications: https://nptel.ac.in/courses/105/101/105101206/
7	Basics of Remote sensing, GIS & GNSS technology and their applications:
8	https://onlinecourses.swayam2.ac.in/aic20_ge05/preview
9	http://rst.gsfc.nasa.gov/Front/tofc.html .
	Web Resources
1	Projections: https://map-projections.net/imglist.php
2	Textbook of Canadian Remote Sensing: https://www.nrcan.gc.ca/sites/www.nrcan.gc.ca/files/earthsciences/pdf/resource/tutor/fundam/pdf/fundamentals_e.pdf
3	ITC Netherlands, Principles of Remote Sensing https://webapps.itc.utwente.nl/librarywww/papers_2009/general/principlesremotesensing .
4	Pdf http://earthobservatory.nasa.gov/Library/RemoteSensing
5	https://earthexplorer.usgs.gov/
6	https://bhuvan.nrsc.gov.in/home/index.php
7	https://map-projections.net/imglist.php

Formative Assessment for Theory	
Assessment Occasion/ type	Marks
Internal Assessment Test 1	10
Internal Assessment Test 2	10
Quiz/ Assignment/ Small Project	10
Seminar	10
Total	40 Marks
<i>Formative Assessment as per guidelines.</i>	

B.A/ B.Sc. Semester – V

Discipline Specific Course (DSC)-12

Course Title: Interpretation of Aerial Photos and Satellite Images

Course Code: 035 Geog 014 (BSC)

015 Geog 014 (B.A)

Type of Course	Theory / Practical	Credits	Instruction hour per week	Total No. of Lectures/Hours / Semester	Duration of Exam	Formative Assessment Marks	Summative assessment Marks	Total Marks
DSCC-12	Practical	02	04	56 hrs.	3hrs.	25	25	50

Course Outcomes (COs): At the end of the course, students will be able to:

CO1: Learn remote sensing techniques.

CO2: Apply modern technology in various geographical areas.

CO3: Interpret remotely sensed data.

CO4: Analyze digital imageries.

CO5: Analyze ground truth verification using Google Earth and evaluate its usefulness.

Expt. No,	Title:	56.hrs/ Sem
1	Basic information of the image (projection histogram, layers, pixel)	04
2	Visual interpretation: colour, texture, association, pattern, tone, shape.	06
3	Satellite Products and Band Characteristics, band combination	06
4	Satellite image downloading portals, Bhuvan, USGS explorer.	04
5	Image Enhancement: Radiometric, spatial enhancement	06
6	Layers Stacking	06
7	Pre-Processing: Geometric and Radiometric Correction	06
8	Spectral enhancement: Spectral Indices, NDVI	06
9	Image Classification: Supervised and Unsupervised	06
10	Change Detection	06

References	
	Books
1	Lillesand T. Mand Kiefer R.W (2021), Remote Sensing and Image interpretation, 7 th Edition, John Wiley & Sons, Canada.
2	Jensen J. R, (2012), Remote Sensing of Environment: An Earth Resources Perspective, 2 nd Edition, Pearson Education, Upper Saddle River, Prentice Hall, New Jersey.
3	Elachi Candvan Zyl J .J, (2006), Introduction to the Physics and Techniques of Remote Sensing, John Wiley & Sons, Canada.
4	Joseph G, (2005), Fundamentals of Remote Sensing, 2 nd Edition, Universities Press (India) Pvt Ltd, Hyderabad.
5	Narayan LRA, (1999), Remote Sensing and its Applications, Universities Press (India) Pvt Ltd, Hyderabad.
6	Rampal K. K, (1999), Handbook of Aerial Photography and Interpretation, Concept Publishing Co, New Delhi.
7	Avery T. E and Berlin G.L, (1992), Fundamentals of Remote Sensing and Air Photo Interpretation, 5 th Edition, Prentice Hall, New Jersey.
8	Sabins, F.F. Jr, (1987), Remote Sensing; Principles and Interpretation, 2 nd Edition, W.H. Freeman and Co, New York.
9	Jensen, John R., (2005), Introductory Digital Image Processing, 3 rd Ed., Upper Saddle River, NJ: Prentice Hall, 526 pages.
	MOOC
1	Remote Sensing: https://nptel.ac.in/courses/105/108/105108077/
2	Introduction to Remote Sensing: https://nptel.ac.in/courses/121/107/121107009/
3	Digital Image Processing of Remote Sensing Data: https://nptel.ac.in/courses/105/107/105107160/
4	Remote Sensing and GIS: https://nptel.ac.in/courses/105/103/105103193/
5	Remote Sensing Essentials: https://nptel.ac.in/courses/105/107/105107201/
6	Remote Sensing: Principles and Applications: https://nptel.ac.in/courses/105/101/105101206/
7	Basics of Remote sensing, GIS & GNSS technology and their applications:
8	https://onlinecourses.swayam2.ac.in/aic20_ge05/preview
9	http://rst.gsfc.nasa.gov/Front/tofc.html .
	Web Resources
1	Projections: https://map-projections.net/imglist.php
2	Textbook of Canadian Remote Sensing: https://www.nrcan.gc.ca/sites/www.nrcan.gc.ca/files/earthsciences/pdf/resource/tutor/fundam/pdf/fundamentals_e.pdf
3	ITC Netherlands, Principles of Remote Sensing https://webapps.itc.utwente.nl/librarywww/papers_2009/general/principlesremotesensing .
4	Pdf http://earthobservatory.nasa.gov/Library/RemoteSensing
5	https://earthexplorer.usgs.gov/
6	https://bhuvan.nrsc.gov.in/home/index.php
7	https://map-projections.net/imglist.php

Formative Assessment for Practical	
Assessment	Distribution of Marks
Internal Assessment Test	10
Case study /Assignment / Field-activity / Project work etc	10
Journal/Record	03
Viva	02
Total	25 Marks
<i>Formative Assessment as per guidelines.</i>	

The same shall be used for semester end Examination

BA/ B.Sc. Semester – V

Skill Enhancement Course: SEC-3

Course Title: Fundamentals of Cartography

Course Code: 035 Geog 06 (B.Sc)

015 Geog 06 (B.A)

Type of Course	Theory / Practical	Credits	Instruction hour/ week	Total No. of Lectures/Hours / Semester	Duration of Exam	Formative Assessment Marks	Summative assessment Marks	Total Marks
SEC-3	Practical	02	04	56 hrs.	3hrs.	25	25	50

Course Outcomes (COs): At the end of the course students will be able to:

CO1: Construct of different Profiles.

CO2: Draw the block Diagrams and analyze.

CO3: Constriction of the Projections.

CO4: Understand the 2d and 3d Views.

CO5: Construct the map based on the cartographic principles.

Expt. No	Title:	56.hrs/ Sem
1	Construction of Simple Profile.	04
2	Construction of Super Imposed Profile.	06
3	Construction of Projected Profile.	06
4	Construction of Composite Profile.	04
5	Construction of One Point Perspective Block Diagram.	06
6	Construction of Two Point Perspective Block Diagram.	06
7	Constriction of Simple Cylindrical Projection.	06
8	Constriction of Conical Projection.	06
9	Constriction of Bone's Projection.	06
10	Constriction of Mercator's Projection.	06

References	
1	
1	Nanjannavar. S.S (2022): Practical Geography, Prabhu Publications, Dharwad.
2	Negi.B.S (1995): Practical Geography, Kedarnath Ramnath, Meerat.
3	Pijushkanti Saha & Partha Basu (2010) Advanced Practical Geography, Arunbha Sen Books & Allied Publishers, Kolkata.
4	R.P. Mishra & A. Ramesh (2002): Fundamental of Cartography, Concept Publishing Company, New Delhi.
5	Singh R.L. (1992) : Elements of Practical Geography, Kalyani Publishers New Delhi.

Formative Assessment for Practical	
Assessment	Distribution of Marks
Internal Assessment Test -1	10
Case study /Assignment / Field-activity / Project work etc	05
Practical Record Maintenance	10
Total	25 Marks
<i>Formative Assessment as per guidelines.</i>	

The same shall be used for semester end Examination

B.A./ B.Sc. in Geography

VI Semester

W. e. f.: 2023-24

B.A/ B.Sc. Semester – VI

Discipline Specific Course (DSC)-13

Course Title: Environmental Geography

Course Code: 036 Geog 011 (B. Sc)
016 Geog 011 (B.A)

Type of Course	Theory / Practical	Credits	Instruction hour per week	Total No. of Lectures/Hours / Semester	Duration of Exam	Formative Assessment Marks	Summative assessment Marks	Total Marks
DSCC-13	Theory	04	04	56 hrs.	2hrs.	40	60	100

Course Outcomes (COs): At the end of the course students will be able to:

- CO1:** Understand the interdisciplinary nature and the relationship between man and the environment.
CO2: Know functioning of ecosystems, including the impact of human activity and global ecological changes.
CO3: Evaluate man-made changes like pollution, environmental hazards, and the depletion of natural resources.
CO4: Examine environmental policy, impact assessment, and conservation measures.
CO5: Apply knowledge of environmental geography to real-world situations.

Unit	Title:	56.hrs/ Sem
Unit I	Introduction to Environment Geography: Nature and Interdisciplinary Aspect of Environmental Geography. Ecological Approaches. Definition and meaning of environment. Habitat. Ecological Niche. Biosphere and Biodiversity; bio-diversity and sustainable development. Biomes – major Biomes of the world. Man and Environmental Relationships.	14
Unit II	Ecosystem: Structure and Functioning of Ecosystem, Pond as an Ecosystem, ecosystem management, and conservation. Principle of ecology; human ecological adaptation; the influence of man on ecology and environment. Global and regional ecological change & imbalance. Food Chains, Food Webs, Food Pyramid.	14
Unit III	Man-Induced Changes in Environment: Environmental Pollution, i.e., Air, Water, Noise; Solid Waste with special reference to India. Environmental Hazards, i.e., earth as Warehouses, Flood, Famines; Land Slides, Avalanches, Forest Fires; Impact of Green Revolution and Extinction of Species. Man-Made Ecosystem - Urban, Ecotourism, National Parks and Sanctuaries. Depletion of Ozone, Green House Effect, and Acid Rain.	14
Unit IV	Principles of Environmental Management: Environmental Policy of India, (post-2000 AD). Environment Impact Assessment (EIA). Global Summits & Agencies of Environment Conservation. Environmental degradation, management and conservation. Problems of Deforestation and conservation measures. Environmental policy; environmental hazards and remedial measures. Environmental Education and Legislation.	14

References	
1	Strahler A.N. (1968) The Earth Sciences, Harper International Education, New York.
2	Richard H.B. (2004) Physical Geography, Heinmann Simple Services, Rupa & Company, New Delhi
3	Robinson H. (1982) Bio Geography, ELBS, New York.
4	Healey I.N. and Moore P.D. (1973) Biogeography, Backwell Oxford, U.K.
5	Strahler A.N. and Strahler A.H. (1973) Environmental Geo Science, Hamilton, California, USA.
6	Savindra Singh (2004) Environmental Geography, Prayog Pustak Bhawan, Allahabad, India.
7	Paul Selman (2000) Environmental Planning, Sage Publications, New Delhi
8	Cheryl Simon Silve& Ruth S. De Fries (1991) One Earth One Future-Our chaining Global Environment, National Academy of Sciences, Affiliated to East-West Press Pvt. Ltd. New Delhi.
9	Strahler A.N. and Strahler A.H. (1977) Geography and Man's Environment, John Wiley & Sons, New York
10	Goldsmith Edward et al. (1988) The Earth Report – The Essential Guide to Global Issues, Price Stern Solan Inc. California, USA
11	Y.K. Sharma (2020), Narain's Environmental Geography (Resource and Development), Lakshmi Narain Agarwal
12	H.M. Saxena (2021), Environmental Geography, Rawat Publications
13	Strahler A.N. (1968) The Earth Sciences, Harper International Education, New York.
14	Richard H.B. (2004) Physical Geography, Heinmann Simple Services, Rupa & Company, New Delhi
15	Robinson H. (1982) Bio Geography, ELBS, New York.
16	Healey I.N. and Moore P.D. (1973) Bio-Geography, Backwell Oxford, U.K.
17	Strahler A.N. and Strahler A.H. (1973) Environmental Geo Science, Hamilton, California, USA.
18	Savindra Singh (2004) Environmental Geography, Prayog Pustak Bhawan, Allahabad, India.
19	Paul Selman (2000) Environmental Planning, Sage Publications, New Delhi
20	Cheryl Simon Silve& Ruth S. De Fries (1991) One Earth One Future-Our chaining Global Environment, National Academy of Sciences, Affiliated to East-West Press Pvt. Ltd. New Delhi.
21	Strahler A.N. and Strahler A.H. (1977) Geography and Man's Environment, John Wiley & Sons, New York
22	Goldsmith Edward et al. (1988) The Earth Report – The Essential Guide to Global Issues, Price Stern Solan Inc. California, USA
23	Nanjannavar.S.S (2017): Parisara Bhugolshastra, Prabhu Publications, Dharwad.
	Websites:
1	https://moef.gov.in/en/
2	http://environmentclearance.nic.in/
3	https://ndma.gov.in/
4	https://bhuvan.nrsc.gov.in/home/index.php
5	http://www.indiaenvironmentportal.org.in/

Formative Assessment for Theory	
Assessment Occasion/ type	Marks
Internal Assessment Test -1	10
Internal Assessment Test -2	10
Quiz/ Assignment/ Small Project	10
Seminar	10
Total	40 Marks
<i>Formative Assessment as per guidelines.</i>	

B.A/ B.Sc. Semester – VI

Discipline Specific Course (DSC)-14

Course Title: Methods in Environmental Geography

Course Code: 036 Geog 012 (B. Sc)
016 Geog 012 (B.A)

Type of Course	Theory / Practical	Credits	Instruction hour per week	Total No. of Lectures/Hours / Semester	Duration of Exam	Formative Assessment Marks	Summative assessment Marks	Total Marks
DSCC-14	Practical	02	04	56 hrs.	3hrs.	25	25	50

Course Outcomes (COs): At the end of the course, students will be able to:

CO 1: Biotic and Abiotic elements exist in the environment.

CO 2: Identify micro-Biomes in the local region.

CO 3: Identify the water bodies and polluting points in the local region.

CO 4: Identify the waste disposal sites

CO 5: Handle GPS in field.

Expt. No,	Title:	56.hrs/ Sem
1	List out Biotic and Abiotic elements in the local region.	04
2	Identify and map micro-Biomes in the local region and study the biodiversity of the place.	06
3	List some ecosystem management and conservation methods in the local region for water bodies,	06
4	Mapping of water bodies and bore wells.	04
5	Map the polluting points in the local area and their influence of man on the local environment.	06
6	Mapping of Waste disposal sites	06
7	Suitability of the site for waste disposal (with reference to height, location, land use, land value, slope,	06
8	Mapping of parks and open spaces in the neighborhood.	06
9	Mapping of areas in the neighborhood where crowding is prevalent and type of land use around such places.	06
10	Materials required for the practical survey: Use a Boundary map of the neighborhood area and GPS (field mapping) or Google Earth can also be used for mapping neighborhood area.	06

References	
1	Strahler A.N. (1968) The Earth Sciences, Harper International Education, New York.
2	Richard H.B. (2004) Physical Geography, Heinmann Simple Services, Rupa & Company, New Delhi
3	Robinson H. (1982) Bio Geography, ELBS, New York.
4	Healey I.N. and Moore P.D. (1973) Biogeography, Backwell Oxford, U.K.
5	Strahler A.N. and Strahler A.H. (1973) Environmental Geo Science, Hamilton, California, USA.
6	Savindra Singh (2004) Environmental Geography, Prayog Pustak Bhawan, Allahabad, India.
7	Paul Selman (2000) Environmental Planning, Sage Publications, New Delhi
8	Cheryl Simon Silve& Ruth S. De Fries (1991) One Earth One Future-Our chaining Global Environment, National Academy of Sciences, Affiliated to East-West Press Pvt. Ltd. New Delhi.
9	Strahler A.N. and Strahler A.H. (1977) Geography and Man's Environment, John Wiley & Sons, New York
10	Goldsmith Edward et al. (1988) The Earth Report – The Essential Guide to Global Issues, Price Stern Solan Inc. California, USA
11	Y.K. Sharma (2020), Narain's Environmental Geography (Resource and Development), Lakshmi Narain Agarwal
12	H.M. Saxena (2021), Environmental Geography, Rawat Publications
13	Strahler A.N. (1968) The Earth Sciences, Harper International Education, New York.
14	Richard H.B. (2004) Physical Geography, Heinmann Simple Services, Rupa & Company, New Delhi
15	Robinson H. (1982) Bio Geography, ELBS, New York.
16	Healey I.N. and Moore P.D. (1973) Bio-Geography, Backwell Oxford, U.K.
17	Strahler A.N. and Strahler A.H. (1973) Environmental Geo Science, Hamilton, California, USA.
18	Savindra Singh (2004) Environmental Geography, Prayog Pustak Bhawan, Allahabad, India.
19	Paul Selman (2000) Environmental Planning, Sage Publications, New Delhi
20	Cheryl Simon Silve& Ruth S. De Fries (1991) One Earth One Future-Our chaining Global Environment, National Academy of Sciences, Affiliated to East-West Press Pvt. Ltd. New Delhi.
21	Strahler A.N. and Strahler A.H. (1977) Geography and Man's Environment, John Wiley & Sons, New York
22	Goldsmith Edward et al. (1988) The Earth Report – The Essential Guide to Global Issues, Price Stern Solan Inc. California, USA
	Websites:
1	https://moef.gov.in/en/
2	http://environmentclearance.nic.in/
3	https://ndma.gov.in/
4	https://bhuvan.nrsc.gov.in/home/index.php
5	http://www.indiaenvironmentportal.org.in/

Formative Assessment for Practical	
Assessment	Distribution of Marks
Internal Assessment Test	10
Case study /Assignment / Field-activity / Project work etc	10
Journal/Record	03
Viva	02
Total	25 Marks
<i>Formative Assessment as per guidelines.</i>	

The same shall be used for semester end Examination

B.A/B.Sc. Semester – VI

Discipline Specific Course (DSC)-15

Course Title: Fundamentals of Geographic Information Systems

Course Code: 036 Geog 013 (B.Sc)
016 Geog 013 (B.A).

Type of Course	Theory / Practical	Credits	Instruction hour per week	Total No. of Lectures/Hours / Semester	Duration of Exam	Formative Assessment Marks	Summative assessment Marks	Total Marks
DSCC-15	Theory	04	04	56 hrs.	2hrs.	40	60	100

Course Outcomes (COs): At the end of the course, students will be able to:

CO1: Understand the definition, components, and interdisciplinary domains of GIS.

CO2: Apply geodesy and spatial mathematics for measuring distances and coordinates.

CO3: Analyze and evaluate spatial data structures, sources, errors, and scales for precision and accuracy.

CO4: Perform geo-processing and visualization techniques including spatial and non-spatial queries.

CO5: Collect and integrate spatial and non-spatial data for a case study using online resources.

Unit	Title:	56.hrs/ Sem
Unit I	Introduction: Definition, Scope of GIS in digital world; Components, functionalities, merits and demerits, global market. Interdisciplinary domains, and its integration with GIS.	14
Unit II	Geodesy and Spatial Mathematics: Meaning scope of geodesy, geographical coordinates, latitude, longitudes; Datum: WGS-84, V/S NAD-32. UTM; Aerial Distance measurement using Geographic and projected coordinates. Area, perimeter, length by coordinates and various international measures. Assignment: students need to prepare hand drawn maps with the help of graticules.	14
Unit III	Data and Scale: Spatial Data and its structures; Sources and Types of data. Collection, Data errors and relationships. Large Scale V/S small scale; Generalization precision and accuracy data.	14
Unit IV	Geo-processing and Visualization: Spatial and Non-Spatial Queries; Proximity analysis, Preparation of Terrain and Surface models. Hotspot and density mapping. Types of maps, thematic maps and its types, relief maps, flow maps and cartograms. Tabulations: Graphs and Pivot tables. Case Study: Students need to collect available spatial and non-spatial data of all the talukas of their districts from online resources.	14

References	
1	Ian Heywood (2011), An Introduction to Geographical Information Systems, Pearson
2	Aronoff, S. (1989), Geographic Information Systems: A Management Perspective, Geocarto International: Vol. 4, No. 4, pp. 58-58.
3	Elangovan, K. (2006), GIS - Fundamentals, Applications, and Implementations, Nipa
4	Chang, Kang – Tsung (2015), Introduction to Geographical Information Systems, McGraw-Hill Education
5	Bhatta, B. (2011), Remote Sensing and GIS, Oxford
6	Sharma, H.S. (2006), Mathematical Modelling in Geographical Information System, Global Positioning System and Digital Cartography – New Delhi, India
7	Spatial Analysis and Location-Allocation Models - Ghosh, A. and G. Rushton (1987)
8	Geographic Information Systems and Cartographic Modelling - Tomlin, C.D. (1990)
9	Geographic Information Systems and Science – Paul A. Longley, et.al. (2015)
10	Geographic Information Systems and Environmental Modelling - Clarke, C.,K. (2002)
11	An Introduction to Geographical Information Systems, 3rd Edition- Ian Heywood, Sarah Cornelius, Steve Carver (2009)
12	Concepts and Techniques of Geographic Information Systems- Chor Pang Lo, Albert K.W. Yeung (2016)
	Web resources:
1	IIRS MOOC programme: https://isat.iirs.gov.in/mooc.php
2	ITC Netherlands, Principles of GIS https://webapps.itc.utwente.nl/librarywww/papers_2009/general/principlesgis.pdf
3	Geographical Information Systems: Principles, Techniques, Management and Applications https://www.geos.ed.ac.uk/~gisteac/gis_book_abridged/
4	https://www.esri.com/en-us/home

Formative Assessment for Theory	
Assessment Occasion/ type	Marks
Internal Assessment Test 1	10
Internal Assessment Test 2	10
Quiz/ Assignment/ Small Project	10
Seminar	10
Total	40 Marks
<i>Formative Assessment as per guidelines.</i>	

B.A/B.Sc. Semester – VI

Discipline Specific Course (DSC)-16

Course Title: GIS for Map-Making

Course Code: 036 Geog 014 (B. Sc)

016 Geog 014 (B.A)

Type of Course	Theory / Practical	Credits	Instruction hour per week	Total No. of Lectures/Hours / Semester	Duration of Exam	Formative Assessment Marks	Summative assessment Marks	Total Marks
DSCC-16	Practical	02	04	56 hrs.	3hrs.	25	25	50

Course Outcomes (Cos):At the end of the course, students will be able to:

CO 1: Draw manually point, line, and polygon using a toposheet

CO 2: Draw vector and raster structures using features on the toposheet.

CO 3: Understand the different image formats and file management.

CO 4: Do geo-referencing and digitalization.

CO 5: Prepare Map layout, map composition, and map designing.

Expt. No,	Title:.	56.hrs/ Sem
1	Draw manually point, line, and polygon using a toposheet	04
2	Draw vector structures from the toposheet with reference to settlements, roads,	06
3	Create raster structures of a portion of the toposheet using a graph sheet.	06
4	Downloading images from the internet portal (Bhuvan);	04
5	Different image formats	06
6	File Management	06
7	Geo-referencing of toposheet.	06
8	Digitize the Point line polygon, creating layers.	06
9	Buffer analysis, and proximity analysis,	06
10	Map layout, map composition, and map designing.	06

References	
1	Ian Heywood (2011), An Introduction to Geographical Information Systems, Pearson
2	Aronoff, S. (1989), Geographic Information Systems: A Management Perspective, Geocarto International: Vol. 4, No. 4, pp. 58-58.
3	Elangovan, K. (2006), GIS - Fundamentals, Applications, and Implementations, Nipa
4	Chang, Kang – Tsung (2015), Introduction to Geographical Information Systems, McGraw-Hill Education
5	Bhatta, B. (2011), Remote Sensing and GIS, Oxford
6	Sharma, H.S. (2006), Mathematical Modelling in Geographical Information System, Global Positioning System and Digital Cartography – New Delhi, India
7	Spatial Analysis and Location-Allocation Models - Ghosh, A. and G. Rushton (1987)
8	Geographic Information Systems and Cartographic Modelling - Tomlin, C.D. (1990)
9	Geographic Information Systems and Science – Paul A. Longley, et.al. (2015)
10	Geographic Information Systems and Environmental Modelling - Clarke, C.,K. (2002)
11	An Introduction to Geographical Information Systems, 3rd Edition- Ian Heywood, Sarah Cornelius, Steve Carver (2009)
12	Concepts and Techniques of Geographic Information Systems- Chor Pang Lo, Albert K.W. Yeung (2016)
	Web resources:
1	IIRS MOOC programme: https://isat.iirs.gov.in/mooc.php
2	ITC Netherlands, Principles of GIS https://webapps.itc.utwente.nl/librarywww/papers_2009/general/principlesgis.pdf
3	Geographical Information Systems: Principles, Techniques, Management and Applications https://www.geos.ed.ac.uk/~gisteac/gis_book_abridged/
4	https://www.esri.com/en-us/home

Formative Assessment for Practical	
Assessment	Distribution of Marks
Internal Assessment Test	10
Case study /Assignment / Field-activity / Project work etc	10
Journal/Record	03
Viva	02
Total	25 Marks
<i>Formative Assessment as per guidelines.</i>	

The same shall be used for semester end Examination

B.A/ B.Sc. Semester – VI

INTERNSHIP

Course Title: INTERNSHIP/ MINI PROJECT/ FIELD BASED REPORT.

Course Code: 036 Geog 091 (B. Sc)
016 Geog 091 (B.A)

Type of Course	Theory / Practical	Credits	Instruction hour/ week	Total No. of Lectures/Hours / Semester	Duration of Exam	Formative Assessment Marks	Summative assessment Marks	Total Marks
INTERNSHIP	Internship	02	04	56 hrs.	3hrs.	50	0	50

Course Outcomes (COs): At the end of the course students will be able to:

- CO 1:** Conduct the field visit based on the objectives of the internship.
- CO 2:** Participate in a professional activity and gain the practical work experience.
- CO 3:** Learn the behavioral approach and fascinate in communication.
- CO 4:** Interact with the different personalities with local agencies.
- CO 5:** Prepare the report with sound techniques/ technology.

Formative Assessment for Practical	
Assessment	Distribution of Marks
Internal Assessment Test 1	10
Internal Assessment Test 2	10
Case study /Assignment / Field-activity.etc	10
Journal / Record	10
Viva-Voce	10
Total	50Marks
<i>Formative Assessment as per guidelines.</i>	

Internship:

A course requiring students to participate in a professional activity or work experience, or cooperative education activity with an entity external to the education institution, normally under the supervision of an expert of the given external entity.

A key aspect of the internship is induction into actual work situations for **2 credits**. Internships involve working with local industry, local governments (such as panchayats, municipalities) or private organizations, business organizations, artists, crafts persons, and similar entities to provide opportunities for students to actively engage in on-site experiential learning.

Note;

1. 1 credit internship is equal to 30hrs on field experience.
2. Internship shall be Discipline Specific of 45-60 hours (2 credits) with duration 1-2 weeks.
3. Internship may be full-time/part-time (full-time during last 1-2 weeks before closure of the semester or weekly 4 hrs in the academic session for 13-14 weeks). College shall decide the suitable method for programme wise but not subject wise.
4. Internship mentor/supervisor shall avail work allotment during 6th semester for a maximum of 20 hours.
5. The student should submit the final internship report (45-60 hours of Internship) to the mentor for completion of the internship.
6. Method of evaluation: Presentations/Report submission/Activity etc.

UG Programme: 2023-24

GENERAL PATTERN OF THEORY QUESTION COURSE FOR DSCC/ OEC

(60 marks for semester end Examination with 2 hrs duration)

Part-A

1. Question number 1-06 carries 2 marks each. Answer any 05 questions : 10 marks

Part-B

2. Question number 07- 11 carries 05Marks each. Answer any 04 questions : 20 marks

Part-C

3. Question number 12-15 carries 10 Marks each. Answer any 03 questions : 30 marks
(Minimum 1 question from each unit and 10 marks question may have sub questions for 7+3 or 6+4 or 5+5 if necessary)

Total: 60 Marks

**Note: Proportionate weight age shall be given to each unit based on number of hours
Prescribed**