



UNIVERSITY OF THE PUNJAB

Part-I A/2016
Examination:- M.A./M.Sc.

Roll No.

Subject: Mountain Conservation and Watershed Management
PAPER: I (Database Management Information System & Applications
of Remote Sensing and Geographical Information System)

TIME ALLOWED: 3 hrs.
MAX. MARKS: 75

NOTE: Attempt only FIVE questions. Q.1 (Objective) is Compulsory.
Attempt at least TWO questions from each section. All question carry equal marks.

<u>Objective</u>		(8+ 7=15 Marks)
Q.1	a) Fill in the blanks with appropriate answer.	(08 Marks)
1	For sorting row in a relation, the keyword _____ is used.	01
2	A database management system (DBMS) is a _____ package designed to define, manipulate, retrieve and manage data in a database.	01
3	The weak entity cannot exist without a _____ entity.	01
4	The intersection of a row and a column is called _____.	01
5	The distance between two successive wave crests or troughs is called _____.	01
6	In Non-selective scattering, since all the wavelengths are scattered equally so cloud appears _____.	01
7	If R.F. is 1:2500 then statement of scale is _____.	01
8	The most efficient absorbers of solar radiation in the atmosphere are CO ₂ , O ₃ and _____.	01
	b) Mark "✓" against the correct statement and "×" against the wrong statement.	07 Marks
9	'IN' command is use to arrange the data.	01
10	A key that consists the data that is only present in primary key is known as candidate keys.	01
11	The weak entity is dependent on the strong entity.	01
12	Eight bit multispectral image has 128 colour levels.	01
13	A map designed to convey information about a single topic or theme is called thematic map.	01
14	Run length encoding is the data compression technique of raster data.	01
15	The beam of light outward from the sun travels at the speed of 186,000 km per second.	01

P.T.O.

SECTION-I : Database Management Information System(DBMS)																										
Q.2	Define the following terms: i. DDL ii. Alternate Key iii. SQL iv. Relation v. Strong Entity	5*3=15 Marks																								
Q.3	Differentiate the following: i. Simple and composite primary Key ii. 1:M and M:M relationship iii. Drop and Truncate	3*5=15 Marks																								
Q.4	Write a note on the following: i. Cascade Update and Delete ii. Constraints with some examples iii. Group By command	3*5= 15 Marks																								
Q.5	i. Selects all continents with name having letter 'a' and letter 'e' ii. Calculate population /area of each continent and display answer in a column named "Average Area". iii. <table border="1" style="margin-left: 20px;"> <thead> <tr> <th>name</th> <th>continent</th> <th>area</th> <th>population</th> </tr> </thead> <tbody> <tr> <td>Afghanistan</td> <td>Asia</td> <td>652230</td> <td>25500100</td> </tr> <tr> <td>Albania</td> <td>Europe</td> <td>28748</td> <td>2831741</td> </tr> <tr> <td>Algeria</td> <td>Africa</td> <td>2381741</td> <td>37100000</td> </tr> <tr> <td>Andorra</td> <td>Europe</td> <td>468</td> <td>78115</td> </tr> <tr> <td>Angola</td> <td>Africa</td> <td>1246700</td> <td>20609294</td> </tr> </tbody> </table>	name	continent	area	population	Afghanistan	Asia	652230	25500100	Albania	Europe	28748	2831741	Algeria	Africa	2381741	37100000	Andorra	Europe	468	78115	Angola	Africa	1246700	20609294	7+8=15 Marks
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SECTION-II: Remote Sensing and Geographical Information System (RS/GIS)																										
Q.6	Define the following Terms: i. Scale ii. Spatial data iii. Microwave region iv. GPS v. Map Projection	5*3=15 Marks																								
Q.7	Differentiate the following: i. Whiskbroom & Push broom scanner ii. Types of Vector data model iii. Radiometric and spectral resolution	3*5=15 Marks																								
Q.8	Write a note on the following: i. Landsat ii. TIN data model iii. Components of GIS	3*5=15 Marks																								
Q.9	Define atmospheric scattering. What kinds of scattering take place in the atmosphere?	3+12=15 Marks																								

UNIVERSITY OF THE PUNJAB



Part-I A/2016
Examination:- M.A./M.Sc.

Roll No.

Subject: Mountain Conservation and Watershed Management
PAPER: II (Forestry and Ecology)

TIME ALLOWED: 3 hrs.
MAX. MARKS: 100

NOTE: Attempt any FIVE questions in all. Q.1 (Objective) is Compulsory. Attempt at least TWO questions from each section of Subjective. Write to the point with the clear concept. All question carry equal marks.

OBJECTIVE SECTION

Q.1A) Fill in the blanks with suitable words: (5)

- i. Streams with no tributaries are 1st _____ streams.
- ii. _____ begins in a place that already has soil.
- iii. Only that part of the sun's radiation which reaches the earth is called _____
- iv. Solar energy is trapped by the _____
- v. Forest is derived from a Latin word _____

Q.1B) Mark as True / False (5)

- i. Aphotic zone is deep water zone. T/F
- ii. Plants growing on saline soils are called xerophytes. T/F
- iii. Exponential Growth Indicated by a S-shaped growth curve. T/F
- iv. The number of individuals of a species per unit area is population density. T/F
- v. Each biome is made up of many individual ecosystems. T/F

Q.1C) Choose the correct answer (10)

- i. Following are main characteristics of population:
A- size C- Both (A) & (B)
B- Age structure D- None of these
- ii. Which of the following means autoecology:
A. Study of individual species C. Both (A) & (B)
B. Study of different species D. None of these
- iii. Edaphic factor is due to:
A. Man C. Soil
B. Temperature D. None of these
- iv. The forest with trees differ in age from each other is called:
A. Full forest C. Uneven aged forest
B. Even aged forest D. None of these
- v. Pond is an example of:
A. Artificial ecosystem C. Natural ecosystem
B. Forest ecosystem D. Grassland ecosystem
- vi. Each level of a food chain is called a:
A. Chain level C. Both (A) & (B)
B. Trophic level D. None of these

vii. The word ecosystem was coined by:

- A. Daubenmire/R. Misra/Koestle
- B. Tansley

- C. Weaver and Clements
- D. Odum/Kormondy

viii. Total percentage of forest resources in Pakistan is:

- A. 8.3%
- B. 3.8%

- C. 4.8%
- D. 10%

ix. The earth is an open ecosystem for:

- A. Carbon dioxide
- B. Nitrogen

- C. Water
- D. Energy

x. 'Mensura' is Latin word meaning:

- A. Measure
- B. Monitor

- C. Both (A) & (B)
- D. None of the above

SUBJECTIVE SECTION

Section I (Ecology and Biodiversity)

- Q.2 A) Who first proposed the term Ecosystem? Consider a small puddle and discuss its zones and energy flow in that puddle. (10)
B) Differentiate between primary and secondary succession. Discuss briefly ecological succession's role in maintain equilibrium? Trace the succession of plants on a dry rock? (10)
- Q.3 A) What are ecological pyramids? Explain different types of food pyramids with diagrams and their significance? (10)
B) Define the acronym HIPPO Dilemma. Humans are dependent on biodiversity for their sustenance, health, well-being and enjoyment of life. Discuss? (10)
- Q.4 A) Briefly describe the types of lake and thermal stratification of a lake? (10)
B) How are the nutrients recycled in the ecosystem? Where are the reservoirs? State the function of reservoirs. Write a cyclic account of carbon movement in nature? (10)
- Q.5 A) Differentiate between population ecology and population density. Briefly explain the main characteristics of population? (10)
B) Discuss the initiatives taken by Pakistan to promote and conserve biological diversity? (10)

Section II (Forestry)

- Q.6 A) Briefly write the mountain forest structure and composition? (10)
B) Define the term silviculture? Explain briefly different silvicultural methods? (10)
- Q.7 A) Forests in Pakistan can be classified according to different ecological zones. Discuss? (10)
B) Although trees come in different shapes and size but most have the same basic parts and stem anatomy. Discuss? (10)
- Q.8 A) Forest may provide a diversity of ecosystem services. Explain? (10)
B) Climate change alters the distribution, extent and frequency of any disturbances in forests. Discuss? (10)
- Q.9 A) What are the barriers to sustainable forest management in Pakistan? (10)
B) Define irrigated plantation. How can we manage such plantations? Explain? (10)

UNIVERSITY OF THE PUNJAB



Part-I A/2016
Examination:- M.A./M.Sc.

Roll No.

Subject: Mountain Conservation and Watershed Management
PAPER: III (Integrated Watershed Management)

TIME ALLOWED: 3 hrs.
MAX. MARKS: 100

NOTE: Attempt only FIVE questions. Q.1 (Objective) is Compulsory. Attempt at least TWO from each section of subjective. Write to the point with the clear concept.

OBJECTIVE SECTION

Q.1: (a) Each question has four options. Encircle the correct answer: [10]

- i. A watershed having the geographical area more 50,000 Hectare is called:
a) Milli-watershed
b) Macro-watershed
c) Sub-watershed
d) Micro-watershed
- ii. The percentage of total quantity of water in the world that is saline is about:
a) 71%
b) 67%
c) 33%
d) 97%
- iii. Measurement of discharge of water is depicted by:
a) $Q = AV$
b) $A =$ Cross Sectional Area
c) $V =$ Velocity of Water
d) All of the these
- iv. A graph showing the variation of discharge with time at a particular point of a stream is known as:
a) Inflow curve
b) Hyetograph
c) Outflow curve
d) Hydrograph
- v. Watershed which includes watershed name, location, boundaries, size, elevation, the presence of streams, etc. is known as:
a) General data
b) Specified data
c) Physical data
d) Geomorphological data
- vi. The three natural watershed management zones are:
a) Lake, river, and stream
b) Headwater, confluence, and outlet
c) Waterbody, riparian, and upland
d) None of the above
- vii. The circulation of water from the earth's surface to atmosphere and vice versa is called
a) Hydrologic cycle
b) Runoff cycle
c) Precipitation cycle
d) All of above
- viii. Hills and mountains do help in bringing precipitation of the type:
a) Orographic
b) Cyclonic
c) Convective
d) None of the above
- ix. Routing of a wave through a river reach can be done by using:
a) Gumbel's method
b) Penman's method
c) Muskingum method
d) None of these
- x. Watershed survey and planning is taken upto levels:
a) One
b) Two
c) Four
d) Six

Q.1: (b) Write whether the statement is true or false: [05]

- i. The Tarbela dam is located on Jhelum River. **True/False**
- ii. Watershed plans should therefore be updated in time for changes to be incorporated into official plans on a five-year basis. **True/False**
- iii. Precipitation is heavy on the leeward side. **True/False**
- iv. Direct runoff is the sum of overland flow and interflow. **True/False**
- v. Integrated watershed management allows us to address single issues and objectives. **True/False**

Q.1: (c) Fill in the blanks:

[05]

- i. One cusec day is equal to -----acre-feet.
- ii. The boundary line along a topographic ridge, separating two adjacent drainage basins is called the -----
- iii. The watershed is often used as a-----
- iv. -----of a drainage basin is expressed as the number of streams per square kilometer.
- v. The evaporation from plants and from the surrounding soils together is known as -----

SUBJECTIVE SECTION

Section-1: Hydrology of Upland

- Q.2 a) Differentiate between following terms: (6)
- i. Upland Hydrology and Lowland Hydrology
 - ii. Zone of Accumulation and Zone of Ablation
 - iii. Confined Aquifer and Unconfined Aquifer
- b) Justify the statement: "without flow measurements, proper water management is not possible". (8)
- c) Using arithmetic average method and Thiessen polygon method, find mean annual rainfall for the Kunhar catchment (a sub-catchment of Mangla Watershed). The data is as follow: (6)
- | | | | |
|----------------------------------|-------|---------|--------------|
| Rain Gauge Station: | Naran | Balakot | Muzaffarabad |
| Polygon Area (km ²): | 1737 | 621 | 271 |
| Annual Precipitation (mm): | 1778 | 1544 | 1564 |
- Q.3 a) Give short answers with clear concept: (6)
- i. Write the water mass equation
 - ii. Explain degree day w.r.t snowmelt process with any example?
 - iii. What is the application of ground water hydrology?
- b) What is meant by "runoff" and how does it produce from a basin? (8)
- c) The average snowline is at 1500 m elevation and temperature index located at 1800 m elevation indicated a mean daily temperature of 7°C on certain day. Assuming a temperature decrease of 1°C per 200 m increase in elevation and degree day factor of 5mm/degree-day. Compute the snowmelt runoff for that day. An area 780Km² is between freezing point and snowline from the elevation curve for the basin. (6)
- Q.4 a) Give short answers with clear concept: (6)
- i. Enumerate the different forms and types of precipitation?
 - ii. List out major glaciers in Northern Area of Pakistan?
 - iii. Write the different forms of units while water is measuring at rest and in motion?
- b) Describes the measures to reduce the lake evaporation? (8)
- c) Assume that Mangla Reservoir has surface area of 39 sq. km in the beginning of a certain month and the water depth is 76.20 m for this whole surface of the lake. Further assume that sides of reservoir are nearly vertical. Now in that month the reservoir received an average inflow of 226.50 cumec as a direct runoff, and direct precipitation of 125 mm. The outflow from the reservoir was 170 cumec and evaporation and seepage losses were estimated to be 113 mm during that month. Find out depth of reservoir at the end of that month and total increase or decrease in the storage. (6)

- Q.5 a) Define the following terms: (6)
Hydrograph; Bank Storage; Aquifer; Flood Routing; Snowline; Consumptive use
- b) Describe the process of glacier ice formation from snow. (8)
- c) The rainfall during a particular day was 10 mm. Class - A Pan is installed in this area. If water added to Pan on that particular day was 12 mm, find the evaporation. Take the Pan coefficient as 0.60. Lake having surface area of 500 Hectares, find the volume of water lost due to evaporation. (6)

Section II: Integrated Watershed Management

- Q.6 a) Define the following terms: (6)
Integrated Watershed Management; Watershed Development; Watershed Planning; Water scarcity; Rainwater Harvesting; Watershed degradation
- b) What are the different causes of watershed degradation and briefly describe its main negative impacts on watershed deterioration? (8)
- c) A basin has an area of 26560 km², perimeter 965 km and length of the thalweg 230 km. Determine: (i) form factor, (ii) elongation ratio, and (iii) circularity ratio. (6)
- Q.7 a) Give short answers with clear concept: (6)
- i. Write down the different components of watershed?
 - ii. State the main objectives of watershed
 - iii. Write down the problems associated with watersheds?
- b) Describe the participatory approach for watershed management? (8)
- c) Design a rainwater harvesting system for meeting drinking water requirement of a five-member family living in a building with a rooftop area of 100 sq. m. The average annual rainfall in the region is 600. Daily drinking water requirement per person (drinking and cooking) is 10 liters. (6)
- Q.8 a) Give short answer with clear concept: (6)
- i. Write down the stages of a watershed project cycle?
 - ii. Write main principles of sustainable watershed management?
 - iii. What are the main constraints facing watershed projects?
- b) Describes the role of gender (women) for watershed management? (7)
- c) How you can manage all three components (land, water and biomass) of the watershed? (7)
- Q.9 a) Differentiate between the following: (6)
- i. Passive rainwater harvesting and Active rainwater harvesting
 - ii. Improvement and Watershed Rehabilitation
 - iii. Catchment area and Command area
- b) Discuss briefly the various steps that are involved in planning watershed projects? (7)
- c) Describes the role/responsibility of different departments/organizations for management of watershed in Pakistan? (7)

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Part-I A/2016
Examination:- M.A./M.Sc.

Roll No.

Subject: Mountain Conservation and Watershed Management
PAPER: IV (Mountain Environment)

TIME ALLOWED: 3 hrs.
MAX. MARKS: 100

NOTE: Attempt any FIVE questions. Q.1 (Objective) is compulsory. Attempt at least TWO questions from each section of Subjective. Write to the point with the clear concept.

OBJECTIVE SECTION

Q.1: (a) Each question has four options. Encircle the correct answer: [10]

i. Climate has deep an impact on the:

- a) Food of people c) Dress of people
b) Living of people d) All of above

ii. The important elements of climate are:

- a) Temperature & pressure c) Winds and rains fall
b) Humidity of air d) All of above

iii. Pakistan has:

- a) Three seasons c) Two seasons
b) All the year same d) Four seasons

iv. Earth's spherical surface outside the atmosphere receives solar radiation throughout the year is:

- a) 235 Watts/m² c) 724 Watts/m²
b) 432 Watts/m² d) 342 Watts/m²

v. . Oxygen contains in the Earth's dry atmosphere by volume mixing ratio is:

- a) 0.93% c) 78.1%
b) 20.9% d) None of these

vi. Landforms made by the vertical endogenetic movement:

- a) Plains c) Plateaus
b) Mountains d) a & b both

vii. These mountains are formed due to the convergent movement of plate tectonics;

- a) Fold c) Residual
b) Block d) Volcanic

viii. Compressional forces produce shallow to deep focus quake along reverse faults at;

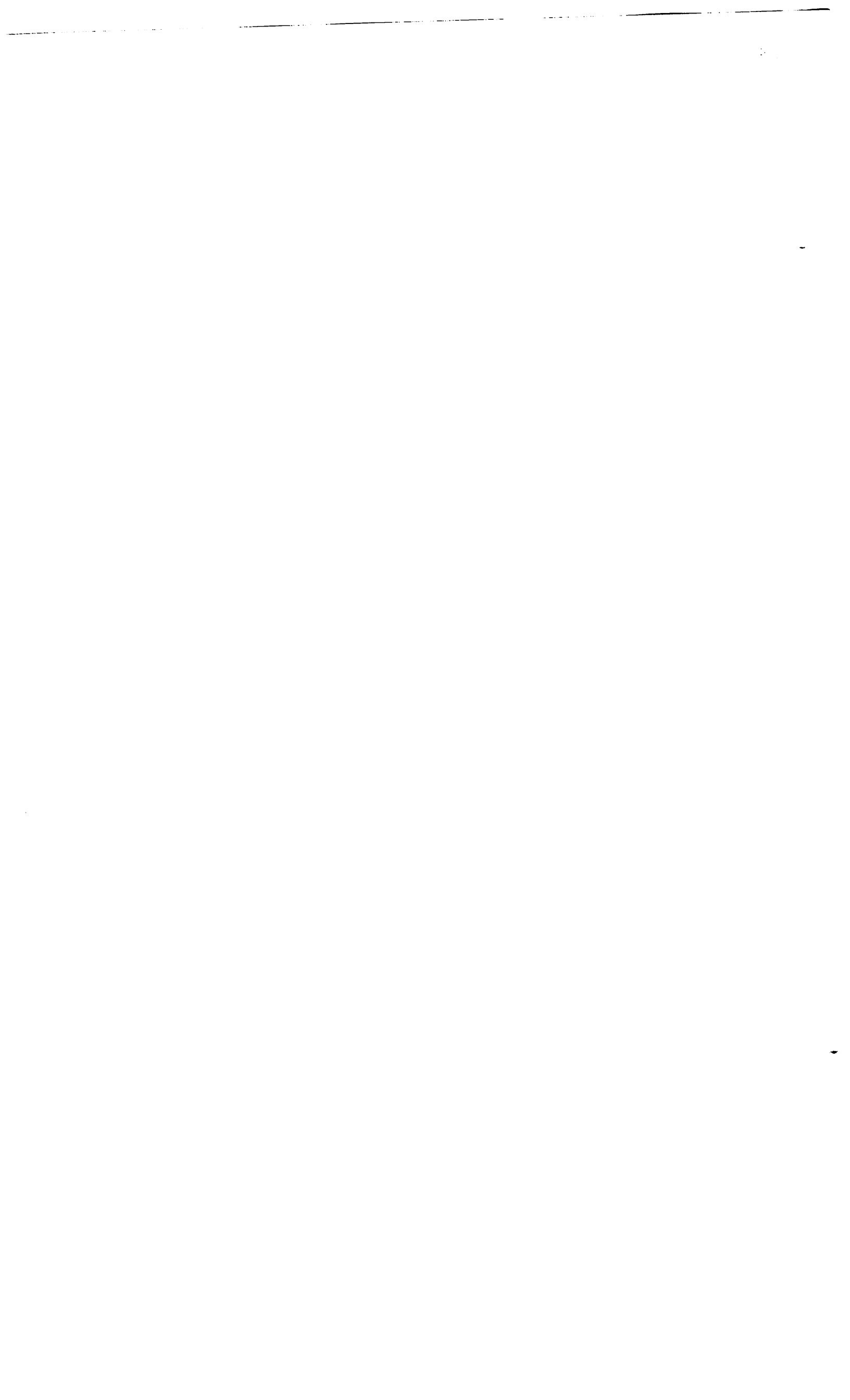
- a) Convergent boundaries c) Divergent boundaries
b) Transform boundaries d) None of these

ix. The downward movement of material under the influence of gravity is known as:

- a) Earthquake c) Mass wasting
b) Flood d) Market

x. The possible threats to biodiversity in the HKH include:

- a) Loss of genetic resources c) Increase in ecosystem
 and species services
b) Loss of habitats d) All of above



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Part-I A/2016
Examination:- M.A./M.Sc.

Roll No.

Subject: Mountain Conservation and Watershed Management
PAPER: V (Soil and Water Conservation)

TIME ALLOWED: 3 hrs.
MAX. MARKS: 100

NOTE: Attempt only FIVE questions. Q.1 (Objective) is Compulsory. Attempt at least TWO questions from each section. All question carry equal marks.

Objective

- Q.1** (Read each question carefully before you answer. Click on the letter of the best answer.) (20)
- MCQ's**
1. **A watershed is generally means** 1
a. a building that stores water
b. all the land area that drains to a given point in a water body
c. all the water area that drains to a given point in a landform
d. a moment in time when you cross into a new area
e. a new way of organizing environmental agencies
 2. **A soil horizon characterized by the accumulation of Organic matter is** 1
a. A b. B
c. E d. O
 3. **Recent deposits have ----- soil development** 1
a deep b little
c good d none of above
 4. **Soil Pollution: What is the most common cause of soil pollution?** 1
a) Irrigation with industrial waste water
b) surface water runoff from yards, city streets, and farm fields
c) irrigation from canals
d) Use of organic manure
 5. **Macro nutrients are** 1
a. NPK b. Cu, Fe, Mn, Zn
c. Pb, N, Fe d. none of these
 6. **The largest reservoir of fresh water that is readily available for human use is** 1
a. Rivers b groundwater
c lakes d oceans
 7. **Saline soils having EC dSm-1** 1
a. 2.0 b. 0.8
c. more than 4.0 d. 3.5

8. **What are the recharge sources of a river?**
 a. Through stream rainfall and stream b. Through rainfall c. Through
9. **Strongly alkaline soils pH**
 a. 6.5-6.9 b. 8.2-8.4
 c. 8.5-9.0 d. 5.4-5.8
10. **Sediments brought into the Indus basins each year are about-----**

 a. 26 million tons b. 30 million tons
 c. 40 million tons d. 10 million tons

True/ False

11. Human activities have created "water crisis"? T/F 1
12. Playas soils are mainly saline sodic and water logged T/F 1
13. Soils forms from shale will be silty T/F 1
14. Acidic soils are more likely to develop under coniferous trees than under elm T/F 1
15. Exploratory survey scale is 1:40,000 T/F 1

Fill in the blanks

16. ESP stands for ----- 1
17. Decalcification refers to the removal of ----- from one or more soil horizons 1
18. Name three soil properties that can be seen ----- 1
19. Acidic soils forms in ----- climate/areas due to intense weathering and leaching of cations 1
20. Conversion of productive land to unproductive land is called----- 1

Section-1: Soil & Water Conservation

- Q.2 a) Explain soil forming factors in detail (10)
- b) Describe factors of soil degradation? How these factors contribute towards the degradation of soil? (10)
- Q.3 a) Define the following:- (12)
- i. Homogenization
 - ii. Infiltration & Percolation
 - iii. Illuviation and Eluviations
 - iv. weathering
- b) Explain in detail the about soil conservation? (8)

- Q.4 a) Explain the concept salinity/sodicity and write consequences of salinity/sodicity. (10)
- b) Explain in detail the Soil Profile and master horizons (10)
- Q.5 a) Explain Soil problems related to Agriculture of Pakistan (10)
- b) Explain in detail Soil parent material in Pakistan (10)

Section- 2: Water Resources of Pakistan

- Q.6 a) Explain about Jhelum river and Dam constructed on this river? (10)
- b) Discuss about integrated water resources management. (10)
- Q.7 a) Explain about Indus river and its tributaries. (8)
- b) Give short definitions (12)
- I Water pollution
- II Parameters of water fit for irrigation
- III Salient features of irrigation system of Pakistan
- IV Name 5 dams of Pakistan. Name rivers on which these dams are
- Q.8 a) Explain about water conservation. (10)
- b) Indus Water Treaty where and when signed it. Give your comments regarding treaty. (10)
- Q.9 a) Write note on affect of accumulation of sediments in reservoirs. (10)
- b) Describe the factors of water pollution, its effects and management (10)



UNIVERSITY OF THE PUNJAB

Part-I A/2016
Examination:- M.A./M.Sc.

Roll No.

Subject: Mountain Conservation and Watershed Management
PAPER: VI (Mountain Hazards & Disaster Management)

TIME ALLOWED: 3 hrs.
MAX. MARKS: 100

Instructions: Attempt only FIVE questions. Q.1 (Objective) is Compulsory. Attempt at least TWO questions from each section of Subjective. Write to the point with the clear concept. All question carry equal marks.

OBJECTIVE SECTION

Q.1: (a) Each question has four options. Encircle the correct answer: [10]

- i. Over the last 80 years, Pakistan has witnessed major disaster at least:
 - a) 119
 - b) 139
 - c) 149
 - d) 179
- ii. Pakistan is the most earthquake prone country in the world:
 - a) 3rd
 - b) 5th
 - c) 7th
 - d) 12th
- iii. The National Disaster Management Authority (NDMA), is founded in:
 - a) August 17, 2005
 - b) August 17, 2006
 - c) August 17, 2007
 - d) August 17, 2008
- iv. Severe drought occurs when Deficit of rainfall more than normal rainfall:
 - a) 25%
 - b) 40%
 - c) 50%
 - d) 60%
- v. The World Glacier Monitoring Service (WGMS), Switzerland is monitoring glaciers round the world upto.
 - a) 50, 000
 - b) 100, 000
 - c) 150, 000
 - d) 200, 000
- vi. Karamber Lake ranks in Pakistan
 - a) 2nd highest
 - b) 4th highest
 - c) 3rd highest
 - d) 5th highest
- vii. The crop which needs a huge amount of water for its harvest is
 - a) Tobacco
 - b) Cotton
 - c) Rice
 - d) Wheat
- viii. Pakistan is the world's 4th largest producer of
 - a) Oranges
 - b) Grapes
 - c) Bananas
 - d) Mangoes
- ix. High and narrow continuation of hills is called
 - a) Mountain chain
 - b) Mountain system
 - c) Ridge
 - d) Cordillera
- x. Economy of Pakistan largely depends on
 - a) Industry
 - b) Mineral
 - c) Agriculture
 - d) Fishing

Q.1: (b) Write whether the statement is true or false: [05]

- i. The bigger the vulnerability, the smaller the disaster risks. **True/False**
- ii. Slope stability is increased when retaining structures are placed at the toe of the landslide. **True/False**
- iii. The Siachen Glacier is located in the eastern Karakoram Range in the Hindukush Mountains. **True/False**
- iv. Alpine Mountains are the oldest mountains formed in Cambrian and Precambrian times. **True/False**
- v. A sharp-edged ridge of rock formed between adjacent cirque glaciers is called Arete. **True/False**

Q.1: (c) Fill in the blanks: [05]

- i. NDMA stands for-----
- ii. Initiatives taken after disasters are called as -----
- iii. An earthquake of magnitude -----is the smallest normally felt by humans.
- iv. The elevation above which snow can form and remain all year is termed as -----
- v. In Pakistan, the world's famous Tobacco called Virginia Tobacco is grown in Peshawar, Swabi and -----

PTO

SUBJECTIVE SECTION

Section-I: Mountain Hazards & Disaster Management (MHDM)

- Q.2** a) Differentiate between following terms: (6)
 i. Physical and Socio-economic vulnerability
 ii. Hazard and Disaster
 iii. Hydrological Drought and Meteorological Drought
- b) Briefly describe and discuss structural and non-structural measures of flood control? (8)
- c) Estimate the state (severity) of hydrological drought of the Poonch River basin using the Standardized Precipitation Index (indices based on precipitation) from the following data. The mean annual precipitation from 30 year data period is 960 mm respectively. (6)

Years	2006	2007	2008	2009	2010
Precipitation (mm)	981	750	634	440	745

- Q.3** a) Give short answers with clear concept: (6)
 i. Enumerate major classes of earthquake?
 ii. State the major causes of snow avalanches?
 iii. State the different indices used to estimate the drought
- b) Describe the structure for Disaster Risk Management in Pakistan? (8)
- c) A watershed consist of 30% (24 acres) rooftops area, 10% (8 acres) street and driveways area, 20% (16 acres) average lawns @ 5% slope on sandy soil and 40% (32 acres) with woodland. The time of concentration for all flow regimes (sheet flow, shallow concentrated flow and channel flow) is 40 minutes. The 2yr/24hr rainfall was 5 inches. The runoff coefficient (C) for rooftops, street and driveways area, average lawns and woodland are 0.9, 0.9, 0.15 and 0.1 respectively. Compute the peak storm water run-off for this watershed to adopt the different flood mitigation measures? (6)
- Q.4** a) Give short answers with clear concept: (6)
 i. What are the committees within the Emergency Operation Center (EOC)
 ii. What is disaster risk management cycle?
 iii. Enumerate the hazards based on geology, water, climate and biological.
- b) Identify major type of landslides and suggest risk reduction measures for landslide mitigation. (8)
- c) Describes the community risk reduction measures for drought, flood, earthquake and landslide? (6)
- Q.5** a) Define the following terms: (6)
 Snow Avalanches; Glacier Lake outburst Flood (GLOF); Disaster; Glacier; Earthquake; Cyclone;
- b) Briefly describes the role and responsibility of different departments/organizations for disaster risk management in mountain region of Pakistan? (8)
- c) What are major effects and remedies measures of earthquakes? (6)

Section-II: Geomorphology of Pakistan

- Q.6** a) Define the following terms: (6)
 Continents; Map; Climatic; Region; Tectonic plates; Mountain; Alluvium
- b) How did the Eratosthenes calculate the circumference of the Earth? (6)
- c) Describe in detail the internal structure of the earth. (8)
- Q.7** a) Give short answers with clear concept: (6)
 i. What do you mean by Geological Time?
 ii. What types of soil movements occur during the process of wind erosion?
 iii. What kind of morains is formed due to glacial deposition?
- b) How the crust of Pakistan is evaluated on the earth? (6)
- c) Define "Agriculture". What are the two cropping seasons of Pakistan and which crops are grown in these seasons? (8)
- Q.8** a) Differentiate between following terms: (6)
 i. Latitude and Longitude
 ii. Convergent & Divergent movements of tectonic plates
 iii. Sedimentary & Igneous rocks
- b) Write a note on Indus delta. (6)
- c) What do you mean by Natural resources? Describe briefly the renewable and non-renewable resources of Pakistan. (8)
- Q.9** a) What kinds of agents cause erosion on the earth surface? Give example from Pakistan. (6)
- b) Define Mineral. Which mineral resources are found in Pakistan? (6)
- c) Write a detailed note on Pothwar Plateau and Salt range? (8)

- Q.5 a)** Give short answers with clear concept: (6)
- i. Enlists the climate change adaptation types and forms
 - ii. Convert 20 °C into Fahrenheit?
 - iii. Write the different objective functions which are used to evaluate the SDSM (statistical downscaling model) for generation of climate change scenario?
- b)** What are the types of precipitation based on the lifting mechanisms that produce it? (7)
- c)** How climate change impacts on the Millennium Development Goals, explain it? (7)

Section-II: Mountain Environment

- Q.6 a)** Give short answers with clear concept: (8)
- i. Differentiate between exogenetic and endogenetic forces of the earth.
 - ii. What is the difference between mountain and plateau?
 - iii. Give any two characteristics of North and Western Mountains in Pakistan.
 - iv. What are the different types of mass movement?
- b)** Mass wasting is a natural disaster that shapes the mountain environment. Describe its different classes and the precautionary measures that can reduce the impacts of mass wasting. (12)
- Q.7 a)** Give short answers with clear concept: (8)
- i. What is the difference between Weathering & Erosion?
 - ii. What is the difference between focus and epicenter?
 - iii. Differentiate between mud flow and debris flow.
 - iv. What is the difference between earthquake and tsunami?
- b)** Mountains possess diverse environment and diverse sources of livelihood. Explain how does the mountain environment shape the life of communities living there? (12)
- Q.8 a)** Give short answers with clear concept: (8)
- i. What is meant by escape route in the mountain?
 - ii. Enlist the three geological eras of mountain building.
 - iii. What is Orographic Rainfall?
 - iv. What is the importance of HKH with reference to mountain biodiversity?
- b)** Discuss in detail the relationship of mountain biodiversity and the climate change. Also describe the adaptation strategies of the communities. (12)
- Q.9 a)** Give short answers with clear concept: (8)
- i. Write in short about the significance of biodiversity conservation in the mountains.
 - ii. Define slump with reference to mass movement.
 - iii. What are PSL waves?
 - iv. Differentiate between flow and fall movement.
- b)** Discuss in detail the environment of North-western and western mountains of Pakistan with reference to the diversity of physiography, climate, soil and biodiversity. (12)