UNIVERSITY OF THE PUNJAB

Part-I A/2018
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. Attempt TWO questions from Section-I and Attempt THREE questions from Section-II, All questions carry equal marks.

	SECTION-I : Database Management Information System (DBMS)	
Q. 1	Define the term DBMS Architecture? Discuss its various levels in DBMS Architecture?	**3+12=15**
Q. 2	**Write a note on the Following:** i. Specialization ii. Normalization iii. Generalization	**3x5=15**
Q. 3	i. Define DBMS. Write a note on its Components? ii. Define the term cardinality? Discuss its types in context of DB?	**8+7=15**
Q. 4	i. Define Specialization. Discuss its Features? ii. Define the term "Entities" with daily life examples. How Entity type is different from the Entity set?	**7+8=15**
	SECTION-II : Remote Sensing and Geographical Information System (RS/GIS)	
Q. 5	**Write a note on the Following:** i. Landsat ii. SPOT iii. NOAA (Meteorological Satellite)	**3x5=15**
Q. 6	What is EM? Write Characteristics of Electromagnetic radiation with the help of diagram?	**3+12=15**
Q. 7	Define Scanner. Describe functions of "Optical mechanical scanner" and "Optical electronic scanner" used in remote sensing satellites.	**3+12=15**
Q. 8	Describe in detail the fundamental energy interactions in the atmosphere with the help of diagram?	**2+13=15**
Q. 9	What is Stereoscopy? Which techniques are used in the Stereoscopy?	**3+5+7=15**

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Part-I A/2018
Examination:- M.A./M.Sc.

Roll No. .....

Subject: Mountain Conservation and Watershed Management **TIME ALLOWED: 3 hrs.**
PAPER: II (Forestry and Ecology) **MAX. MARKS: 100**

NOTE: This questin paper has two sections Forestry and Ecology. Every section has FOUR questions. Attempt any FIVE question at least TWO questions should be attempted from each section. All the parts of a question must be answered together. All question carry equal marks.

Section I: Forestry

(1) Narrate how urban forestry accounts for the ecological, economic, social and cultural values of forests. Give your opinion. **(20)**

(2) a. Explain the direct and indirect benefits of forestry sector. **(10+10)**
b. Pakistani forests are found to be rich in different kinds of non-timber forest products (NTFPs). List at least 10 NTFPs and their role in sustainable development.

(3) a. Explain the role of GIS (Geographic Information System) in forest management. **(10+10)**

b. Briefly describe the national forest policies of Pakistan.

(4) Explain the forests of Pakistan and discuss their importance. **(20)**

Section II: Ecology

(5) 'Himalayas' are rich source of biodiversity'. Discuss the values and significance of biodiversity. **(20)**

(6) Discuss about the different kinds of food chains in different habitats and ecosystem. **(20)**

(7) a. Write a note on symbiosis. **(10+10)**
b. What impact biotic and abiotic factors have on biodiversity?

(8) a. What are various threats to biodiversity? Explain each briefly. **(10+10)**
b. List and distinguish among the various forms that competition can take.

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Examination:- M.A./M.Sc.

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Subject: Mountain Conservation and Watershed Management **TIME ALLOWED: 3 hrs.**
PAPER: III (Integrated Watershed Management) **MAX. MARKS: 100**

NOTE: Attempt only FOUR questions. Attempt at least TWO from each section of subjective. Write to the point with the clear concept.

Section-1: Hydrology of Upland

Q.1 a) Differentiate between following terms: (6)
i. Upland Hydrology and Lowland Hydrology
ii. Hydrograph and Hyetograph
iii. Bank Storage and Valley Storage

b) Discuss critically the statement "Thorough knowledge of hydrology is a must for any watershed conservation and management"? (11)

c) At a certain point in an unconfined aquifer of 3 Km^2 area, the water table was at an elevation of 102.0 m. due to natural recharge in a wet season, its level rose to 103.2 m. A volume of 1.5 Mm^3 of water was then pumped out of aquifer causing the water table to reach a level of 101.2 m. Assuming the water table in the entire aquifer to respond in a similar way, estimate (a) the specific yield of the aquifer and (b) the volume of recharge during the wet season. (8)

Q.2 a) Give short answers with clear concept: (6)
i. Enlists the types and use of Flood Routing?
ii. Enumerate the methods of measurement of water flow?
iii. What are sources of Ground water recharge/ replenishment?

b) What is meant by "runoff" and how does it produce? Also Discus the various factors, which affect the runoff from a basin? (11)

c) Using arithmetic average method and thiessen polygon method, find mean annual rainfall for the Hunza River Basin (a sub-basin of Indus Basin). The data is as follow: (8)

Rain Gauge Station:	Ziarat	Naltaer	Deosai	Daniyor	Khunjerab
Polygon Area (km^2):	5337	6516	2561	679	585
Annual Precipitation (mm):	260	690	370	110	175

Q.3 a) Give short answers with clear concept: (6)
i. What is the role of snow and glacier in hydrology and water resources?
ii. Draw a single-peaked hydrograph and indicate its various parts and components?
iii. What volume is represented by 3.5 cm of run off from a basin of 650 Square Kilometers? Give answer in cubic meters and Hectare-meter

b) Describe the process of glacier ice formation from snow. (11)

c) The average snowline is at 2000 m elevation and temperature index located at 2500 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 3mm/degree-day. Compute the snowmelt runoff for that day. An area 800 Km^2 is between freezing point and snowline from the elevation curve for the basin. (8)

Q.4 a) Define the following terms: (6)
Specific Yield; Ablation; Infiltration; Aquifer; Water Yield; Hydrograph

b) What are different steps required to develop a watershed model? (11)

PTO

c) At the beginning of a certain week, the depth of water in an evaporation pan, 1.2 m diameter, was 7.75 cm. during the week, the rainfall was 3.8 cm, and 2.5 cm of water was removed from the pan to keep the depth of water in it within a fixed range. At the end of the week, the gauge indicated depth of 8.32 cm of water in the pan. Using a suitable evaporation coefficient, estimate the volume of water lost due to evaporation during the week from the surface of reservoir having the 5000 hectare area under similar atmospheric condition. (8)

Section II: Integrated Watershed Management

Q.5 a) Define the following terms: (5)
Integrated Watershed Management; Watershed Development; Watershed Planning; Watershed Rehabilitation; Watershed Conservation

b) Describes the integrated and participatory watershed management approach for enhancement of resources use productivity and poverty alleviation. (12)

c) A catchment has a perimeter of 1020 Km, length of 300 Km and an area of 38520 km^2. Calculate the (i) compactness coefficient, (ii) form factor, (iii) elongation ratio, and (iv) circularity ratio. (8)

Q.6 a) Give short answers with clear concept: (6)
i. Write down the purpose of water harvesting?
ii. Write the problems associated with watersheds?
iii. State the watershed field survey and planning teams

b) What are the different causes of watershed degradation and describe its main negative impacts on watershed deterioration? (11)

c) Design a rainwater harvesting system for meeting water requirement of 50m^2 garden and five-member family living in a building with a rooftop area of 100 m^2. The average annual rainfall in the region is 600 mm. Daily drinking water requirement per person (drinking and cooking) is 10 liters. The irrigation system for the garden provides the equivalent of 6 litres/m^2 per use, and has an irrigated area of 50 m^2. The water is irrigated three times per week. (8)

Q.7 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 goals of watershed modeling?

b) How you can manage all three components (land, water and biomass) of the watershed? (11)

c) Compute the mean bifurcation ratio, stream density, drainage density and Drainage Intensity from following data of Gilgit River Basin which was derived from the 90×90 m DEM through GIS: Area of basin = 12700 Km^2

Stream Order	1	2	3	4
Stream Number	31	15	6	9
Stream Length (km)	356	191	109	116

(8)

Q.8 a) Differentiate between the following: (6)
i. Model calibration and model validation
ii. Micro catchment and Macro catchment rainwater harvesting
iii. Catchment area and Command area

b) Describe the framework of Watershed Management for Source Water Protection of water supply. (10)

c) Describes the role/responsibility of different departments/organizations for management of mountainous watershed in Pakistan. (9)

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Part-I A/2018
Examination:- M.A./M.Sc.

Roll No. .....

Subject: Mountain Conservation and Watershed Management **TIME ALLOWED: 3 hrs.**
PAPER: IV (Mountain Environment) **MAX. MARKS: 100**

NOTE: Attempt any FIVE questions taking FOUR questions from Sectiona-A and only ONE question from Section-B. All questions carry equal marks.

Sr.No of Question	Questions Section-A	No. of Marks
1	Define Climatology and explain how climatic conditions effects on the economy of the mountainous regions.	20
2	Write a note on the Temperate Cyclones and associated weather conditions.	20
3	"Climatic Change is a global concern" Discuss this with reference to mountain environment in Pakistan.	20
4	Describe the global distribution of surface pressure system and associated permanent winds.	20
5	Enlist the various forms of precipitation and explain any Rainfall in detail.	20
6	Discuss in detail different factors responsible for the variations in horizontal temperature distribution on Earth.	20
7	Give a comprehensive review of the Koppen classification of the world's climate.	20
	Section-B	
8	Enumerate the elements and factors which affect the environment of the mountainous region of Pakistan.	20
9	Write note on the socio-economic benefits of mountains to the local population living in Gilgit-Baltistan.	20

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Part-I A/2018
Examination:- M.A./M.Sc.

Roll No. .....

Subject: Mountain Conservation and Watershed Management **TIME ALLOWED: 3 hrs.**
PAPER: VI (Mountain Hazards & Disaster Management) **MAX. MARKS: 100**

Note: Attempt any FOUR questions by selecting at least TWO questions from each section.

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

Q.1 a) **Give short answers with clear concept:** (6)
i. Main causes of landslides
ii. Community Based Disaster Risk Management (CBDRM) approach
iii. Basic equation to estimate the disaster risk

b) Briefly explain different strategies and measures to mitigate the risk of droughts in Pakistan. (12)

c) In calculating the volume of materials moved during the landslides, the average width of 8m, average length of 548.8m and average height of 16.32m were determined using measuring tapes and visual estimation of inaccessible area of the catchment. Calculate the total materials moved from the 41 landslides. (7)

Q.2 a) **Differentiate between following terms:** (6)
i. Loose Snow Avalanches and Wet Snow Avalanches
ii. Physical and Socio-economic vulnerability
iii. Conceptual Drought and Operational Drought

b) Describes the different issues and activities in Glacier Lake Outburst Flood (GLOF) risk management? (12)

c) Estimate the state (severity) of hydrological drought of the Kunhar River basin using the Percent Norm, Percent Deviation and Streamflow Drought Index (indices based on streamflow) from the following data. The mean annual streamflow from 30 year data period is 100 cumec while the standard deviation is 20 cumec. (7)

Year	2006	2007	2008	2009	2010
Streamflow (cumec)	100	89	88	122	115

Q.3 a) Give short answers with clear concept: (6)
i. Hazards based on geology, water, climate and environment.
ii. Different limits of floods
iii. Major types of landslides found in Pakistan

b) Describe the structure for Disaster Risk Management in Pakistan? (12)

c) Determine the runoff from a watershed of 60 ha to adopt the different flood mitigation measures? The following data are available: depth of rainfall = 100 mm, Antecedent rainfall condition = AMC II, Row crop, good condition in 40 ha (CN, 82), woodland good condition in 20 ha (CN, 55). (7)

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Q.4	**a)**	**Define the following terms:** Snow Avalanches; Glacier Lake outburst Flood (GLOF); Landslide; Earthquake; Drought	**(5)**
	b)	Discuss the Disaster Management Cycle with suitable examples?	**(10)**
	c)	Describes the different steps to formulate comprehensive risk assessment plan.	**(10)**

Section-II: Geomorphology of Pakistan

Q.5	**a)**	**Differentiate between following terms:** **i.** Highest Mountain and Tallest Mountain **ii.** Point bar and Lateral bar **iii.** Renewable resources and Non-renewable resources	**(6)**
	b)	How are mountains formed? Explain it.	**(9)**
	c)	Explain the different types of streams/channels	**(10)**
Q.6	**a)**	**Give short answers with clear concept:** **i.** What is fluvial geomorphology? **ii.** State the mountain ranges in the Pakistan **iii.** Enlist the major causes of the desertification	**(6)**
	b)	Describe the processes of fluvial landforms?	**(9)**
	c)	With reference to relief and drainage, explain how the Pothwar Plateau is different from Baluchistan Plateau.	**(10)**
Q.7	**a)**	**Give short answers with clear concept:** **i.** List out the major desert of the Pakistan **ii.** State the Projected percentage of different fuel shares for the year 2030 for Pakistan. **iii.** Enlists the different types of rivers on the basis of topography of river basin, stage, shape in plain, flood hydrograph and on location.	**(6)**
	b)	Describes the different types of glaciers on the basis of morphology, dynamics and thermally.	**(9)**
	c)	Explain both the mountain renewable and non-renewable resources.	**(10)**
Q.8	**a)**	**Define the following terms:** Landform, Bar, Fluvial geomorphology, Desertification, Alluvial fans	**(5)**
	b)	Describes the different types of Mountains.	**(10)**
	c)	What are different fluvial landforms? Briefly explain.	**(10)**

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Roll No. .....

Subject: Mountain Conservation and Watershed Management **TIME ALLOWED: 3 hrs.**
PAPER: V (Soil and Water Conservation) **MAX. MARKS: 100**

NOTE: Attempt only FIVE questions taking THREE questions from Section-I and TWO questions from Section-2. All questions carry equal marks.

Section-1: Soil & Water Conservation

Q.1	a)	Define soil and describe briefly its major types	(10)
	b)	Explain soil profile and its horizons	(10)
Q.2	a)	What is water erosion and explain its various types?	(10)
	b)	Write down the processes of water erosion in mountain regions	(10)
Q.3	a)	What are the barriers to create a sustainable agriculture system to feed the world growing population?	(14)
	b)	What are the measures against pollutants from agriculture?	(06)
Q.4		Discuss in detail soil erosion and its various types?	(20)
Q.5	a)	What is tragedy of the common carrying capacity and describe Top down, Bottom-Up concept?	(12)
	b)	Explain the human activities which increase the rate of soil erosion?	(08)

Section-2: Water Resources of Pakistan

Q.6	a)	What is rooftop rainwater harvesting? Describe its benefits.	(10)
	b)	Write a note on Water Logging and Salinity.	(10)
Q.7	a)	Elaborate the water saving strategies at domestic and industrial sectors.	(12)
	b)	Highlight the objectives of soil and water policy of Pakistan	(08)
Q.8	a)	Write a note on the following: i) Barrages on Indus River ii) Hydrological cycle iii) Irrigation and Drainage	(4x3=12)
	b)	Write a concise note on Tarbela Dam.	(08)
Q.9	a)	Describe salient features of irrigation system in Pakistan.	(12)
	b)	Write in detail Water Resources of Pakistan	(08)

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Roll No. .....

Subject: Mass Communication (English Medium Candidates) **TIME ALLOWED: 3 hrs.**
PAPER: II (News Techniques and Traditions) **MAX. MARKS: 100**

NOTE: Attempt any FOUR questions. All questions carry equal marks.

(1)Why an editorial is important in print media and what message it conveys to readers?

(2)Why human interest news is important and what are basic ingredients for writing good human interest news? Elaborate with examples.

(3)What are the different types of news and its values with special focus on important of source in news?

(4)What are the parameters for conducting interview and why it is important in electronic and print media? Discuss in details.

(5)Do you feel any difference between responsibilities of a sub-editor and a reporter? Discuss in details

(6)What do you understand "beats" and why these are allocated in electronic and print media?

(7)Why the "code of ethics" is not practiced in true letter and spirit in electronic and print media in worldwide? Discuss reasons and motives behind this non-compliance.