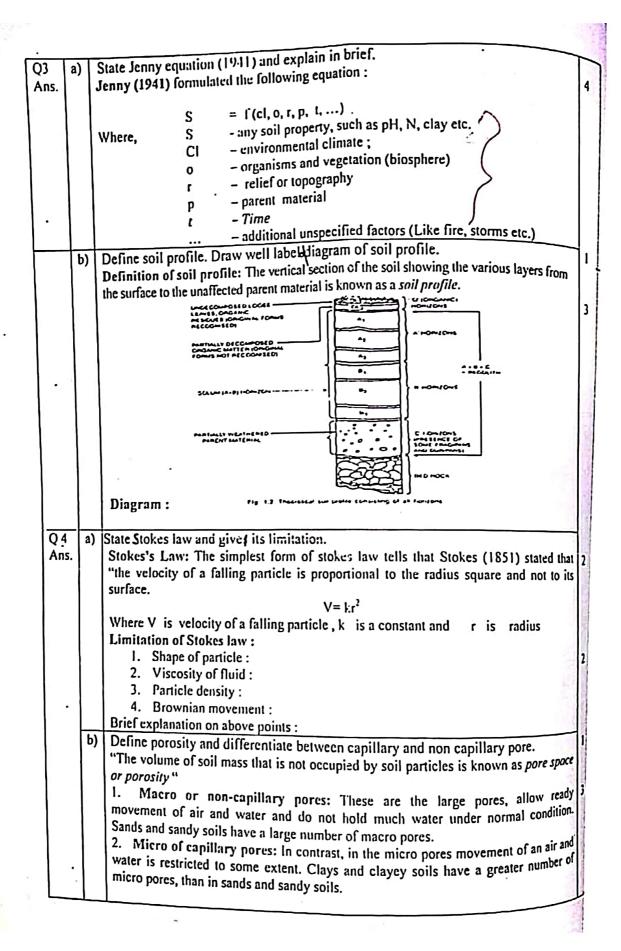
MAHARASHTRA AGRICULTURAL UNIVERSITIES EXAMINATION BOARD, PUNE

SEMESTER END EXAMINATION
B.Sc. (Hons.) Agri.

Course No SSAC-111 Title : Fundamentals to Soil Survey Total Mark : 80 Time Total Mark : 80	Ser	Semester : 1 st New Academic						GRISTU	
Credit	Co	urse i	No	- 1 14CW	Academi	c year	2018-2019	19	-
Day and Date Time Fundamentals to Soil Science Total Mark : 80 Model Answer SECTION "A" Marks	Cre	dit		· 3/2+1)				AGRI. NOTES	計
Time Total Mark : 80 Model Answer SECTION "A" Marks	Day	y and	Date	. 3(2+1)	_	: Fund	amentals to Soil	Seience	121
QI. Ans. a Define pedology. How soil is dynamic natural body? "It deals with the study of soil origin, its classification, and its description" Soil is a natural body developed by natural forces acting up on natural materials. It is usually differentiated into horizons from mineral and organic materials. It is usually differentiated into horizons from mineral and organic morphology, physical properties and constituents, chemical properties and composition and biological characteristics. It also differs from place to place under similar climate and landform. b Give the classification of rocks as per mode of formation with suitable examples. Classification on the basis of mode of formation a) Igneous rocks; Intrusive eg. – granite Extrusive eg. – basalt b)Sedimentary rocks: Arenaceous rocks: eg. mud stone Calcareous rocks: eg. – line stone Calcareous rocks: eg. – line stone Carbonaceous rocks: eg. – peat, coal Silicous rocks eg. – diatonaceous earth Precipitated rocks: eg. – rocks salt c)Metamorphic rocks: :Ilydro-metamorphic rocks: eg. – marble Dynamo-metamorphic rocks: eg. – marble Dynamo-metamorphic rocks: eg. – sandste Q2 Ans. Give the physical properties of mineralyand explain any two of them. 1) Colour 2) Lustre 3) Light transmission 4) Hardness 5) Streak 6) Specific gravity 7) Form and structure 8) Cleavage 9) Fracture 10) Tenacity 11) Chemical nature Explanation: any two of them Enlist the weathering processes. Explain in brief chemical weathering. 1. Physical weathering 2. Chemical weathering 3. Biological weathering Chemical Weathering: Explanation with reactions a. Solution 5, b. Hydration c. Hydrolysis d. Oxidation e. Reduction		Time Total Mark: 80					////- -		
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f. Carbonation	'	- 1	C.	. Reduction					
		$-\bot$	f.	Carbonation			14.00	•	1



Ans. a) Enlist the different type of soil survey. Detailed 1. Reconnaissance 2. Detailed-reconnaissance [a combination of (1) and (2) above] 3. Semi-detailed 4. Reconnaissance Explain in brief reconnaissance soil survey • Prepare research inventory for large area Viz, district .sta • Map used SOI topo sheet 1: 100,000 and 1: 250,000 • Small scale are used for soil mapping	te level planning 2
b) Enlist the different soils of India. Red soils, Laterite, Black Soil, Alluvial soils, Desert salkaline soils. Peaty and marshy soils, Tarai soils, Mountain Brown hill soils and Sub-montane soils: Give the characteristics of black soil. Black colour of soil due to titan ferrous oxide and organication.	Meadow Soils, 2
 High amount of clay and CEC High water holding capacity Soils under Vertisols, Inceptisols, Entisols 	matter . 2
Also called as Regur soil. Ans. Differentiate between saturated and unsaturated flow of water. Saturated flow: Movement of water under saturated condition Percolation.: percolation is the downward movement of water saturated or nearly saturated soil in response to the force of gra Interflow, Seepage, Permeability etc under saturated flow. Measure through hydraulic conductivity (cm/hr). Unsaturated flow: In unsaturated soil moisture movement, also movement is often termed as capillary conductivity. Measure through infiltration rate measure through double ring (cm/hr.) The unsaturated flow is a function of soil moisture content as wasize and continuity of soil pores.	called capillary
b) Enlist and explain factor affecting soil temperature. 1. Soil texture: 1. Soil structure 2. Soil composition:. 3. Soil colour:. 4. Soil moisture. 5. Slope of the land 6. Climate:. 7. Season: 8. Vegetative cover:	. 4

		Explain in brief significance of soil reaction in plant nutrition.
Q7	a)	ixplain in brief significance of son reaction.
Ans.		19
		Influence on availability of plant nutrients; Description and Chart are given on page 337 of Daji (1996), Tambane 182-183
		n 'I - Noids
	b)	Give the general properties of soil colloids.
		1. Size:
		2. Surface area:
		3. Isomorphous substitution:
,		4. Broken bonds
		5. Adsorption of cations:
		6. Adsorption of water:
		7. Cohesion
		8. Adhesion:
1		9. Swelling and shrinkage:
		10. Dispersion and flocculation: 11. Brownian movement:.
		12. Non permeability
		12. Non permeability
Q8	a)	Give the composition of plant residues.
Ans.		1. Water 75%
		2. Dry matter 25 %
		A) Carbohydrates 60%, Protein 10%, Lignin 25% Fat and Wax 5% B) Carbon 44%, Oxygen 40% Ash 8% and Hydrogen 8%
	b)	Explain in brief the heavy metal pollution by pesticide.
		The pesticides are applied to plant foliage to the soil surface as an
1.		I morporated into the Soll, a high proportion of the chamicals make the
		1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
		1 ''' '''' ''''' Yaponze into the atmosphere without showing shows
		I will may move downward through the soil in liquid or solution!
	1	I will do lost from the soil by leaching
		I mey may undergo chemical reactions within an an the surface of
		me bott.
		5) They may be broken down by soil microorganisms. 6) They may be absorbed by the soil microorganisms.
		6) They may be absorbed by plants.
		-7 Piulio.
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3 g 3 g	Q Ar		Give the composition of soil air. Explain in brief the factog affecting soil air. Soil air: Nitrogen 79.2 % Oxygen 20.6 % Carbon dioxide 0.30 % Factors Affecting the Composition of Soil Air.: Explanation Nature and condition of soil:. Type of crop. Microbial activity: Seasonal variation:.	3
		b)	Enlist and explain the fundamental soil forming processes 1. Humification 2. Eluviation). 3. Illuviation	2
			4. Horizonation Explanation:	2
es (An)	Q 10 na)is	a)	Phyllosilicates: are comprised of two kinds of horizontal sheets, one dominated by silicon and other by aluminum and/or magnesium. The basic structure of silica tretrahedron and aluminum octahedran is explained below. 1. Silica Tretrahedron 2. Alumina-Magnesia Octahedron with diagram	2
		ь)	C:N Ratio: The ratio of the weight of organic carbon (C) to the weight of total nitrogen (N) in a soil (or organic material), is known as C: N ratio The content of carbohydrates is high. This results in wide carbon nitrogen ratio which may be 40 to 1. Upon decomposition the organic matter of soils changes to humus and has an approximate C: N ratio of 10:1. The ratio of carbon to nitrogen in the arable (cultivated) soils (organic matter) commonly ranges from 8:1 to 15:1. The carbon nitrogen ratio in plant material is variable, ranging from 20:1 to 30:1 in legumes and farm yard manure, to 100:1 in certain strawy residues. It is as high as 400:1 in saw dust. The C:N ratio of the body of moicroorganisms ordinarily ranges between 4:1 and 9:1.	
		С	Humic substances: It comprise about 60 to 80% of the soil organic matter. They comprised of huge molecules with variable, rather than specific, structures and composition. Humic substances are characterised by aromatic, ring-type structures that include polyphenols and comparable polyquinones, which are even more complex. Fulvic acid- 2. Humic acid- 3. Humin-	2 .
			Acid rain: Acid precipitation is called as acid rain, which is due to oxidation of N and S present in exhaust gasses and smokes of industries Oxide of N and S dissolve in rain water to form nitric acid sulphuric acid which precipitate in soil.	١.
	5			
	Ka Taka Ma			-14

Regolith: It is disintegrated mass of weathered rocks and soil material overlying a solid rock on the earth surface. 3 Soil Colloids: The clay fraction of the soil contains particles less than 0.002 mm in soil colloids. The clay fraction of the soil contains particles less than 0.002 mm in soil colloids. 4 Humus: Humus is a complex and rather resistat mixture of brown or dark brown and synthesis and lass chemical and physical properties of great significant to soils and synthesis and lass chemical and physical properties of great significant to soils and plants. 5 Fortification: It is the process of enrichment of surface water bodies with nutriens. 6 Cation exchange capacity: It is Sum of total exchangeable cation that soil as adsorb OR. It is the capacity of a soil for ion exchange of cations between the soil and the soil solution. 7 Soil survey: Soil survey is a study and mapping of soils in their natural environment. It is the systematic examination, description, classification and mapping of soils of an area. 8 Particle density: The weight per unit volume of the solid portion of soil is alled particle density. Particle density is also termed as true density. Q12 I Greather than 65 % composition of SiO ₂ in acid rocks 2 Andisols the soil is known as volcanic soil: 3 As the water content of soil increases, soil moisture tension decreases Normally soil air contain about 8 times more carbon dioxide than the atmospher air 5 The value of Munsell notation 16YR 3/6 is 3 6 Average particle density of mineral soil is 2.66Mg/m ³ 7 Natural soil aggregates are termed as peds	,			
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Soli survey : Soil survey is a study and mapping of soils in their natural of soils of an area. Particle density : The weight per unit volume of the solid portion of soil is called particle density. Particle density is also termed as true density. Q12 Greather than 65 % composition of SiO ₂ in acid rocks Andisols the soil is known as volcanic soil. 3 As the water content of soil increases, soil moisture tension decreases 4 Normally soil air contain about 8 times more carbon dioxide than the atmosphere 5 The value of Munsell notation 10 YR 3/6 is 3 6 Average particle density of mineral soil is 2.66Mg/m ³ 7 Natural soil aggregates are termed as peds			4	amorphous and colloidal organic substance that results from microbial decomposition and synthesis and has chemical and physical properties of great significant to soile and plants.
Cation exchange capacity: It is Sum of total exchangeable cation that soil can adsorb OR It is the capacity of a soil for ion exchange of cations between the soil and the soil solution. 7 Soil survey: Soil survey is a study and mapping of soils in their natural environment. It is the systematic examination, description, classification and mapping of soils of an area. 8 Particle density: The weight per unit volume of the solid portion of soil is called particle density. Particle density is also termed as true density. Q12 1 Greather than 65 % composition of SiO ₂ in acid rocks 2 Andisols the soil is known as volcanic soil: 3 As the water content of soil increases, soil moisture tension decreases 4 Normally soil air contain about 8 times more carbon dioxide than the atmosphere air 5 The value of Munsell notation 10YR 3/6 is 3 6 Average particle density of mineral soil is 2.66Mg/m ³ 7 Natural soil aggregates are termed as peds			5	Fortification: It is the process of enrichment of surface water bodies with nutrient
of soils of an area. 8 Particle density: The weight per unit volume of the solid portion of soil is called particle density. Particle density is also termed as true density. Q12 1 Greather than 65 % composition of SiO ₂ in acid rocks 2 Andisols be soil is known as volcanic soil. 3 As the water content of soil increases, soil moisture tension decreases Normally soil air contain about 8 times more carbon dioxide than the atmosphere air 5 The value of Munsell notation 10YR 3/6 is 3 A verage particle density of mineral soil is 2.66Mg/m ³ 7 Natural soil aggregates are termed as peds		•	6	Cation exchange capacity: It is Sum of total exchangeable cation that soil can adsorb OR It is the capacity of a soil for ion exchange of cations between the soil and the soil solution.
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7 Natural soil aggregates are termed as peds			6	Average particle density of mineral soil is 2.66Mg/m ³
8 StreThe C: N ratio of saw dust \(\frac{400:1}{\text{K}}\)			- 7	Natural soil aggregates are termed as peds
				The C: N ratio of saw dust \(\frac{400:1}{15}

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