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SEMESTER END THEORY EXAMINATION

B.Sc. (Hons.) Agriculture

Semester	: **III (New)**	**Term**	: **I**	**Academic Year**	: **2020-21**
Course No.	: AGRO 235	**Title**	:	**Rainfed Agriculture and Watershed Management**	
Credit	: (1+1)				
Day & Date	:	**Time**	:	**Total Marks**	: **40**

Model Answer Set

Note :
1. Solve **ANY FOUR** questions from **SECTION -A**
2. Solve **ANY SIX** questions from **SECTION -B**
3. All questions from **SECTION -C are compulsory**

SECTION "A"

Q.1 What is rainfed agriculture?. What are the problems of rainfed agriculture in India?

ANS:-Rainfed agriculture refer as rain dependent agriculture, where the management of soil and growing of crops under natural precipitation or rainfall, without any irrigation. (1 marks)

Problems of rainfed agriculture in India (any six) (3marks)

1. Rainfall variation (intensity & distribution)
2. Late onset of monsoon
3. Early withdrawal of monsoon
4. Prolong dry spells.
5. Low fertility due to low organic matter , Low N & P availability.
6. Poor crop growth unreliable moisture stress.
7. Lack of suitable genotype giving high and stable yield
8. Land degradation due to soil erosion.

Q.2 What are the different techniques of water harvesting under semi-arid region?

(4 Marks)

ANS:-

Semiarid Regions

Dug Wells : Hand dug wells have been used to collect and store underground water and this water is lifted for irrigation. The quality of water is generally poor due to dissolved salts.

Tanks : The runoff water from catchment area is collected and stored in storage tank on the plains with the help of bund.

Percolation tanks : Water from the ponds percolates in to the soil and raises the water table of the region. The improved water level in the wells lower down the percolation tanks are used for supplemental irrigation.

Farm ponds : These are small storage structure for collection and storage of runoff water. There are three types of excavated farm ponds – Square, rectangular and circular. Circular ponds have high water storage capacity.

Inter-row water harvesting : In areas of high rainfall. Growing of maize on bed and rice in furrows helps in increasing the yield of both the crops. The excess water is collected on beds is stored in furrows which is beneficial for rice.

Broad bed furrows (BBF): Crops are sown on the broad beds and excess water is drained through number of small furrows which may be farm ponds where the water can be stored for subsequent use.

Q.3 State the classification of drought on the basis of source of water availability and describe Agriculture drought.

ANS:-

Drought can be classified based on relevance to the users (water availability) are…….

1) Hydrological drought 2) Meteorological drought 3) Atmospheric drought 4) Agriculture drought

Agricultural drought : It is the result of soil moisture stress due to imbalance between available soil moisture and evapotranspiration of a crop. This situation arises as a consequence of scanty precipitation or its uneven distribution both in space and time. It causes yield loss depends on the crop growth stage and the degree of stress, when the plant roots are not able to obtain the soil moisture rapidly enough to replace evapotranspiration losses

Q.4 Enlist agronomic measures for soil and water conservation and describe conservational tillage

ANS:-

Agronomic measures: (3 marks)

1. Contour cultivation
2. Tillage
3. Dense growing crops
4. Strip cropping
5. Mulching
6. Mix cropping
7. Crop rotation
8. Cropping systems

Conservation tillage: (1 mark)

Conservation tillage disturbs the soil to the minimum extent necessary and leaves crop residue on the soil. Tillage system (minimum and zero tillage) can reduce the soil loss by 50% over conventional tillage.

Q.5 Enlist any five principles of watershed management.

ANS:- Principles of watershed management are..

1. Utilizing the land according to its capability.
2. Protecting top fertile soil.
3. Conserving as much rain water as possible at the place where it falls.
4. Minimizing the silting of tanks, reservoirs and lower fertile land.
5. Protecting vegetative cover throughout the year.
6. Draining out excess water and diverting it to storage pond and store it for future use.
7. Avoiding gully formation and putting checks at suitable interval to control soil erosion and recharge ground water.
8. Increasing cropping intensity through intercropping and sequence cropping.
9. maximizing productivity for unit time per unit water.
10. Safe utilization of marginal land through alternate land use system.

11. Maximizing farm income through agricultural activities such as dairy, poultry, sheep and goat farming.
12. Setting up of small scale agro-industries.
13. Improving socio-economic status of farmers

Q.6 Define following terms

a) Alternate land use system may be defined as a pattern of land use that is different from existing or conventional.

b) Intercropping is the cropping system in which two or more crops are grown simultaneously on same piece of land with definite row pattern.

c) Watershed is a drainage area on and surface from which runoff from precipitation reach a particular point called common outlet. Or watershed us a geohydrological unit with a common drainage outlet.

d) Tillage defined as the mechanical manipulation of soil with certain implements or tools to provide suitable environment for seed germination, root growth, weed control, soil erosion control and moisture conservation. Or Tillage is the practice of modifying the state of soil in order to provide conditions favorable for plant growth.

e) Plants complete their life cycle before water stress is called Ephemerals..

f) Drought is defined as prolonged period without rainfall. OR Drought is a situation when the actual seasonal rainfall is deficient by more than twice the mean deviation. OR drought as a situation occurring in any area where the annual rainfall is less than 75% of normal rainfall.

g) Cropping pattern defined as the proportion of area under various crops at point of time in a unit area.

SECTION -C

(Choose the correct option. Each question carry 1 marks)

Q.7 1) Management option suitable for late onset of monsoon condition is…..

a Transplanting through community nursery b Choosing alternate crop
c Choosing alternate variety d **All of these**

2) Watershed is also called as……

a Catchment area b Drainage basin
c **Both a & b** d None of these

3) Bench terracing is possible up to ---------- % of slop

a 6 b 10
c 16 d **33**

4) Which is stomatal closing type of antitranspirant

a **Atrazine** b Mobi-leaf
c Silicon d All of these

5) Any material arrest the evaporation is called…..

a **Mulch** b Anti transparent
c Chemicals d None of these

6) Which of the following is not kind of drought

a Invisible b **Climatic**
c Seasonal d Permanent

7) Broad bed and furrow is evolved by

a **ICRISAT** b CRIDA
c IARI d IRRI

8) Under rainfed farming, which of the following mulches are mostly used?

a Straw mulch b Dust mulch
c Stubble mulch d **All of these**

9) Conserving water mechanism for water stress avoidance are..

a Stomatal Mechanisms, Lipid deposition on leaves
b Increased photosynthesis efficiency
c Reduction in leaf area,
d **All of these**

10) NWDPRA stands for

a **National watershed Development programme for rainfed area.**
b Nationwide Development programme for rainfed agriculture
c New watershed Development programme for rainfed agriculture.
d None of these

11) The sustainable cropping system under rainfed cropping system is……..

a **Intercropping**
b Mix cropping
c Relay cropping
d None of these

12) The characteristics of rainfed farming are …..

a Rainfall more than 1150 m, enough moisture.
b Growing season more than 200 days, intercropping or double cropping.
c Water erosion & excesses water removal are constraints
d **All of these**

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