# Sixth Semester (Reg.) B.Sc. (Hons.) Agri. End Examination: 2017

## AGRICULTURAL UNIVERSITIES OF GUJARAT

**ANAND/NAVSARI/JUNAGADH/SARDARKRUSHINAGAR**

Course No. & Title- Pl.Path.6.4: Introductory Nematology (1+1)

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<td>13/06/2017</td>
<td>10.15 to 12.00 hrs.</td>
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Note: Support your answer with suitable examples and diagram wherever necessary.

## Q.I Explain following questions in detail (ANY TWO)

1. Discuss the life cycle of *Meloidogyne* sp. with suitable diagram.
2. What is symptomatology? Explain the different types of symptoms produced by plant parasitic nematodes with examples.
3. Explain the female reproductive system of plant parasitic nematode with labeled diagram.

## Q.II Do as directed (ANY FIVE)

1. Explain nematodes – viruses interaction.
2. Discuss the different types of stylets.
3. Write the general characteristics of plant parasitic nematode.
4. Explain the nematode management through bioagents fungi.
5. Write the excretory system of plant parasitic nematodes.
6. Give the classification of nematodes on the basis of feeding habit with examples.

## Q.III A. Give the scientific name of the following (ANY TEN)

1. Stunt nematode
2. Needle nematode
3. Potato cyst nematode
4. Burrowing nematode
5. Seed gall nematode
6. Citrus nematode
7. Red ring nematode
8. Sting nematode
9. Pin nematode
10. Lance nematode
11. Spiral nematode
12. Rice root nematode

## Q.III B. Write the contribution of following scientists (ANY TEN)

1. Dr. Berkeley
2. Dr. Ritzema Boss
3. Dr. J. G. deMan
4. Dr. D. J. Raski
5. Dr. Hirshmann
6. Dr. E. J. Butler
7. Dr. F. G. W. Jones
8. Dr. A. C. Triantophyllu
9. Dr. Oostenbrinck
10. Dr. Barber
11. Dr. Atkinson
12. Dr. N.A.Cobb

## Q.IV Differentiate the following (ANY FIVE)

1. Dirty root symptoms AND Pearly root symptoms
2. *Anguina* sp. AND *Meloidogyne* sp.
3. Root nodules AND Root knots
4. Secernentea AND Adenophorea
5. Soil solarization AND Rabbing
6. Antagonistic crops AND Trap crops

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Agricultural Universities of Gujarat
Anand/Navsari/Junagadh/Sardarkrushinagar
Sixth Semester (Reg.) B.Sc. (Hons.) Agri. End Examination: 2017
Course No. & Title: PI.Path.6.4: Introductory Nematology (1+1)

Date: 13/06/2017
Day: Tuesday
Time: 9.30 to 10.15 hrs.
Marks: 40

Note: 1. All the questions carry equal marks.
2. Write the correct answers (A, B, C or D) of the questions in given separate sheet.
3. Overwriting or corrections are not permitted.

Part-A (Objective type)

Q.1 The book "Laboratory Methods for work with Plant and Soil Nematodes" published by:
A G. Thorne   B J. F. Southy
C N. G. Ravichandra D S. Bhatti & R. K. Wallia

Q.2 Molya disease of wheat caused by:
A Rotylenchulus reniformis
B Meloidogyne javanica
C Heterodera avenae
D Meloidogyne incognita

Q.3 Who reported the Aphelenchoides fragari?
A Dr. Kuhn
B Dr. J. G. deMan
C Dr. Berkeley
D Dr. Ritzema boss

Q.4 Who observed root knot nematode on black Pepper in Kerala?
A Butler
B Kuhn
C Berkeley
D Khan

Q.5 Method for extraction of nematodes from soil was given by:
A Dr. Barber
B Dr. Ritzema boss
C Dr. D. J. Raski
D Dr. N. A. Cobb

Q.6 Who gave the nematodes measurement formula?
A Dr. Kuhn
B Dr. deMan
C Dr. Berkeley
D Dr. Schmidt

Q.7 Who reported burrowing nematodes on banana crop in Kerala?
A Atkinson
B T. Goodey
C M. R. Nair
D E. J. Bulter

Q.8 Who reported the rice root nematode?
A Dr. Ritzema boss
B Dr. Kuhn
C Dr. Hirshmann
D Dr. D. J. Raski

Q.9 Total average crop yield loss caused by nematodes:
A 22.8%
B 15.0%
C 10.0%
D 12.3%

Q.10 In Europe, nematodes are known as:
A Nema
B Eelworm
C Nematode
D Round worm

(1 of 6)
Q.11 Out of total nematode, marine nematodes are:
A 15%  B 25%
C 50%  D 10%

Q.12 Nematodes are also known as:
A Eelworm  B Thread worms
C Roundworm  D All of them

Q.13 In plant parasitic nematodes oral opening surrounded with:
A 16 lips  B 12 lips
C 8 lips  D 6 lips

Q.14 *Anguina tritici* having _______ type sexual dimorphism.
A Sub spherical  B Round
C Obese  D None of them

Q.15 Narrow portion of Oesophagus is known as:
A Rectum  B Isthmus
C Intestine  D Tail

Q.16 Odonto stylet is present in:
A Dagger nematode  B Reniform nematode
C Root-knot nematode  D Lesion nematode

Q.17 In plant parasitic nematodes the male body always:
A Rectangular  B Round
C Vermiform  D Spiral

Q.18 Stomato stylet is present in:
A Lesion nematode  B Reniform nematode
C Root-knot nematode  D All of them

Q.19 Two ovaries present and both anteriorly directed to vulva is known as:
A Didelphic Prodelphic  B Amphidelphic
C Monodelphic Prodelphic  D Opisthodidelphic

Q.20 The body of plant parasitic nematode is:
A Triploblastic type  B Tripartite type
C Six layer  D Two layer

Q.21 Two ovaries are present, one is anterior side and other one is posterior side is called:
A Amphidelphic  B Opisthodidelphic
C Prodelphic  D Promonodelphic

Q.22 In plant parasitic nematodes, the nerve ring is encircles with:
A Intestine  B Basal bulb
C Isthmus  D Stylet

Q.23 Gelatinous matrix is secreted by:
A Rectal gland  B Esophageal gland
C Ventral gland  D Stylet knob

Q.24 Stomodium comprises:
A Rectum and Anus  B Cardiac and Rectum
C Amphid and Phasmid  D Stoma and Esophageous
Write the correct answer (A, B, C or D) of the multiple choice questions in given answer sheet.

1. Following attribute is harmful in solving objectives.
   A. SWOT  B. Opportunity  C. Strength  D. Threats

2. The full form of PERT is
   A. Programme Evaluation and Research Technique  
   B. Programme Evaluation and Recognition Technique  
   C. Programme Evaluation and Review Technique  
   D. Programme Evaluation and Recognition Technique

3. The project report is useful to attract the
   A. Innovators  B. Lenders  C. Finance manager  D. All of the above

4. Success or failure of any enterprise depends on
   A. Capital  B. Labours  C. Managerial ability  D. Market

5. Need assessment can be developed through
   A. Education  B. Teaching  C. Training  D. Learning

6. The most of any enterprise fall sick due to
   A. Lack of Finance  B. Management  C. Scarcity of labour  D. Lack of marketing

7. It is used for pre crisis planning and preventive crisis management
   A. Interpreting  B. Reporting  C. SWOT  D. Planning

8. It is essential for midterm correction
   A. Programme  B. Evaluation  C. Planning  D. Monitoring

9. It is more influential in general market than competitive market
   A. Monopoly of the labour  B. Monopoly of the product  C. Monopoly of the seller  D. Monopoly of the consumer

10. An objective without plan is
    A. Evaluation  B. Dream  C. Success  D. Programme

11. Product life cycle has been divided in
    A. Five stages  B. Four stages  C. Three stages  D. Two stages

12. 'Theory of Economic Development' is given by
    A. Knight  B. Jean-Baptiste  C. Joseph A. Schumpeter  D. Richard Cantillon

13. Promotion of any entrepreneurship is possible by
    A. Social mobility  B. Margin ability  C. Market  D. Legitimacy

14. The traditional concept of marketing was
    A. Need oriented  B. Consumer oriented  C. Producer and consumer oriented  D. Product oriented

15. It will help the entrepreneur in deciding the course of action
    A. Training  B. Teaching  C. Evaluation  D. Planning

16. A risk which cannot be insured and incalculable is
    A. Invention  B. Uncertainty  C. Planning  D. Monopoly
17. Which of the following is NOT an attribute of project?
   A. Course of action    B. Define time perspective    C. Specific objective    D. Finance

18. Mineral development industries is an example of
   A. Quantifiable    B. Non-quantifiable    C. Both    D. None of these

19. The process involved in selecting a project out of some project is also known as
   A. Selection of project    B. Identification of project    C. Zeroing of process    D. Idea generation

20. Electricity connection is example of
   A. Fixed cost    B. Variable cost    C. Establishment cost    D. Social cost

21. Graphically a straight line parallel to X-axis gets in
   A. Fixed cost    B. Total fixed cost    C. Variable cost    D. Total variable cost

22. Loans are due for the repayment within a period of two to five years
   A. Current liabilities    B. Intermediate liabilities    C. Current assets    D. Intermediate assets

23. Which of the following is NOT part of the variables of marking mix?
   A. People    B. Price    C. Production    D. Place

24. When the distribution of product is directed from producer to consumers is called as
   A. Zero level Channel    B. One level Channel    C. Two level channel    D. Distribution through retailers

25. Grouping of buyers is known as
   A. Marketing mix    B. Market assimilation    C. Market segmentation    D. Market intelligence

26. He is known as ‘Management Guru’.
   A. Bill Gates    B. David Evans    C. Peter Drucker    D. R. A. Fisher

27. The person who first introduced the term ‘entrepreneur’
   A. Knight    B. Jean-Baptiste    C. Joseph A. Schumpeter    D. Richard Cantillon

28. Who utilizes inventions and discoveries in order to make new combinations.
   A. Inventor    B. Innovator    C. Entrepreneur    D. Businessman

29. A person who tries to create something new, organizes production and undertakes risks and handles economic uncertainty involved in enterprise
   A. Inventor    B. Innovator    C. Entrepreneur    D. Businessman

30. Entrepreneurial Development Programme (EDP) was started in

31. First phase of EDPs is
   A. Initiation    B. Development    C. Support    D. None of above

32. Who is a person who foments a rebellion and attempts to establish a new society
   A. Retreatist    B. Reformist    C. Ritualistic    D. Innovator

33. For the success of business plan the goals should be
   A. Limitless    B. Specific    C. Generalized    D. Imaginary

34. Entrepreneurship Development Institute of India is situated at
   A. Gandhinagar    B. New Delhi    C. Ahmedabad    D. Surat

35. Entrepreneur must be good
   A. Writer    B. Receiver    C. Learner    D. Listener

36. The term entrepreneurship derived from the word
   A. Entreprendre    B. Entrepreneur    C. Micro enterprise    D. Macro enterprise

37. Which is the following is not a characteristic of an entrepreneur
   A. Decision maker    B. Traditional    C. Organizer    D. Innovator

38. Following factor has negative relationship with the rate of entrepreneurship development.
   A. Lack of capital    B. Lack of social insurgency    C. Lack of political turmoil    D. Both b & c

39. Entrepreneur have ______ level of achievement motivation
   A. High    B. Low    C. Medium    D. None of these
40. Technology recommended for an entrepreneurship must be
   A. Appropriate       B. Traditional       C. Innovative       D. Costly

41. The difference between current assets and current liability
   A. Gross working capital  B. Venture capital  C. Net working capital  D. Working capital

42. 4 Ps are important for
   A. Marketing mix       B. Market segmentation  C. Market assimilation  D. Market intelligence

43. Allocation of fund for different sectors of programmers
   A. Controlling       B. Financing     C. Budgeting       D. Centralization

44. Innovating entrepreneur is one who
   A. Adopts successful innovations readily     B. Introduces new goods
   C. Refuses to adopt new things       D. None of these

45. Azim permji is an example of
   A. Empire builder       B. Mobile entrepreneur
   C. Innovative entrepreneur  D. Managerial entrepreneur

46. How many steps are there in establishing an enterprise?
   A. 5        B. 7        C. 6        D. 8

47. Any organized efforts to gather information about the market or consumers is called
   A. Market analysis       B. Market survey  C. Market research  D. Market strategy

48. Women entrepreneurship development programme was started in

49. W T strategy aims to minimize which of the following
   A. Internal weakness       B. Both a & e  C. External weakness  D. Wireless threats

50. Which of the following is NOT an example of collecting primary data?
   A. Internet       B. Interview     C. Focus       D. Group Observation

51. It is commonly used to measure the short-term solvency of the venture.
   A. Debt to equity ratio       B. Profitability ratio  C. Current ratio  D. Activity ratio

52. In which of the following situation the company is considered to be on breakeven point?
   A. No Profit no loses       B. None of the given options
   C. Profits are higher than expenses  D. Expenses are higher than profits

53. The first Entrepreneurial Development Programme (EDP) was started by
   A. State Bank of India       B. Govt. of India
   C. ICICI       D. Bank of India

54. SWOT is an acronym for:
   C. Strategy, Work, Openness, Toughness       D. Strategy, Weakness, Opinions, Tactics

55. How many phases consist in EDPs?
   A. Three       B. Five     C. Six     D. Seven

56. Which of the following is not a characteristic of an entrepreneur?
   A. Decision maker       B. Traditional  C. Organizer  D. Innovator

57. Which of the following factor is most important in forming a new business?
   A. Finance       B. Marketing  C. Government support  D. Family support

58. The term entrepreneur came from
   A. Latin       B. English  C. French  D. None of the given option

59. For the success of business plan the goals should be
   A. Limitless       B. Generalised  C. Specific  D. Imaginary
60. Liquidity ratio is also known as
   A. Acid test ratio   B. Average collection period   C. Inventory turnover   D. Debt to equity ratio

61. The first EDP was started by
   A. BOB   B. SBI   C. IDBI   D. Government

62. Production is the servant of
   A. Consumers   B. Market   C. Producer   D. Product

63. Which phase of EDP creates awareness about entrepreneurial?
   A. Development   B. Support   C. Initial   D. None

64. It gives the information of transaction about one nature at one time.
   A. Journal   B. Ledger   C. Report   D. Balance sheet

65. When the cost of input and input services are expressed at constant price is
   A. Real cost   B. Economic cost   C. Deflated cost   D. Social cost

66. Example of fixed cost is
   A. Electricity bill   B. Land   C. Land rent   D. Raw material cost

67. When the net capital ratio is more than one, it indicates that
   A. Funds are safe   B. Liquidity position of business   C. Business in loss   D. Consistency falling dawn

68. The book “Entrepreneurship Development and Communication Skill” is written by
   A. R. R. Chole & P. M. Khan   B. R. R. Chole, P.S. Kapse & P. R. Deshmukh
   C. S. V. Supe & P. S. Kapse   D. P. M. Khan & S. V. Supe

69. Production is meaningless without
   A. Dealers   B. Consumers   C. Market   D. Finance

70. “Marketing Mix” was introduced by
   A. Neil M. Borden   B. Knight   C. Jean-Baptiste   D. Richard Cantillon

71. The origin of SWOT analysis techniques is credited by
   A. Edward hariman   B. Albert Humphrey   C. Schumpeter   D. Eli Whitney etc

72. Recording and writing of all business transactions in a book is known as
   A. Journal   B. Ledger   C. Report   D. Balance sheet

73. Which will be the next Tax system is going to implement in our country?
   A. GSOT   B. MST   C. GST   D. GMT

74. Account is an art of recording, classifying and summarising.
   A. Money   B. Transaction   C. Events   D. All of these.

75. Who is Agricultural Minister (Cabinet) of Gujarat?
   A. Babubhai Bhokhiriya   B. Purushottambhai Solanki
   C. Chimanbhai Sapariya   D. Govindbhai Patel

76. If the assets exceed liabilities, the business is financially
   A. Healthy   B. Weak   C. Medium   D. None of these

77. National institute for micro, small and medium enterprise (NI-MSME) is located at
   A. Hyderabad   B. New Delhi   C. Guwahati   D. Gujarat

78. Obligation which can be payable within a period of one week
   A. Variable cost   B. Current liabilities   C. Marginal cost   D. Working capital

79. It is an action and review of an enterprise from time to time.
   A. Evaluation   B. Planning   C. Monitoring   D. Decision making

80. Technology recommended for an entrepreneurship must be
   A. Appropriate   B. Traditional   C. Innovative   D. Costly

---x---x---
Q. 1 Define / Explain the following terms (Any ten) 10.00
(i) Project report (ii) Social mobility
(iii) SWOT analysis (iv) Agri-preneurship
(v) Balance sheet (vi) Market demand
(vii) Project appraisal (viii) Retreatist
(ix) Marketing (x) Accounting
(xi) Break-Even point (xii) Assets

Q. 2. A. Explain the guideline provided by a Planning Commission of India to format a project report. 5.00
B. Explain any ten characteristics of an entrepreneur. 5.00

Q. 3 Answer as directed. (Any Four) 10.00
(i) Explain accounting process.
(ii) Describe the common errors occurs in project formulation.
(iii) Write down the need of entrepreneurship development.
(iv) Discuss the different distribution channels with diagram.
(v) Enlist the points for formulation of project report and discuss any three in detail.
(vi) Explain the factors affecting entrepreneur behaviour.

Q. 4 Do as directed. (Any five) 10.00
(i) State the role demand of entrepreneur.
(ii) Describe the phases of entrepreneurship development.
(iii) Explain the economic factors affecting the entrepreneurship growth.
(iv) Enlist the method of project appraisal and discuss any three in detail.
(v) What are the uses of SWOT analysis?
(vi) Write down the problems of marketing in India.
(vii) Explain the market assessment.
PART: I

14.06.2017
Wednesday

09:30 to 10:15 hrs.
Marks: 40.00

Obtained Marks:

Write the correct option A/B/C/D in CAPITAL LETTERS ONLY against the question number.

*Note: Over writing and scratching is not allowed.

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GUJARAT AGRICULTURAL UNIVERSITIES
Anand/Junagadh/Nasrrol/Sardarkrushinagar
Sixth Semester B. Sc. (Hons.) Agriculture (Regular) End Examination 2016-17
Envs 6.1: Environmental Science

PART: B

Date: 15-06-2017
Day: Thursday
Time: 10.15 to 12.00 hrs
Marks: 40

Q.1 A) Define or explain the following terms (ANY TEN). (5.0)
   a) Environmental science
   b) Habitat
   c) Pollutant
   d) Atmosphere
   e) Resources
   f) Endemic
   g) Fauna
   h) Afforestation
   i) Hazards
   j) Forest
   k) Information technology
   l) Ecology

   B) What is Biodiversity? Enlist the bio-geographical zones of India along with its importance. (5.0)

Q.2 A) Differentiate between the following (ANY FIVE). (5.0)
   i) Natural ecosystem and Artificial ecosystem
   ii) Sustainable development and Unsustainable development
   iii) Producer and Consumer
   iv) Soil pollution and Water pollution
   v) Autotroph and Heterotroph
   vi) Flood disaster and Cyclone disaster

   B) Write scope and importance of environmental science. (5.0)

Q.3 A) Write short notes (ANY THREE). (6.0)
   i) Organic farming
   ii) Structure of an ecosystem
   iii) Conservation methods for biodiversity
   iv) Acid rains

   B) Write full form for the following, (4.0)
   i) AIDS
   ii) PCB
   iii) TERI
   iv) NBPG
   v) CPCB
   vi) WWF
   vii) dB
   viii) GIS

Q.4 Do as directed (ANY FIVE). (10.0)
   a) Explain energy flow in an ecosystem.
   b) Enlist the importance of rain water harvesting.
   c) Discuss in brief the types of resources.
   d) Explain ecological pyramids.
   e) Enlist the different acts related to environment in India.
   f) Write sources and effects of air pollution.
Q.1 Select the most appropriate answer from given options (A/B/C/D). (40.0)

1. Recently "Maggie" is banned in majority of Indian states due to higher content of
   A) MSG & Lead
   B) Choromic acid & fulvic acid
   C) Lead acetate & Cadmium
   D) Gluten & Mercury

2. National Mission for Clean Ganga (NMCG) is related to
   A) Air pollution
   B) River pollution
   C) Soil pollution
   D) None of the above

3. At global level, total biodiversity hotspots are
   A) 12
   B) 14
   C) 16
   D) 18

4. Swachh Bharat Abhiyan was started in
   A) 2nd October 2013
   B) 2nd October 2014
   C) 2nd October 2015
   D) 2nd October 2016

5. Sardrasarovar dam is constructed on
   A) Ganga river
   B) Narmada river
   C) Purna river
   D) Godavari river

6. Depletion of ozone layer is due to
   A) H₂SO₄
   B) HCl
   C) CFCs
   D) H₂O

7. The unit of measurement of Ozone thickness is
   A) Decibel
   B) Centimetre
   C) Kilometre
   D) Dobson

8. The example of lotic ecosystem is
   A) Stream
   B) River
   C) Spring
   D) All of the above

9. Energy flow in an ecosystem is
   A) Unidirectional
   B) Bidirectional
   C) Multidirectional
   D) None of the above

10. The author of the textbook "Environmental studies" is
    A) B. D. Singh
    B) Pandey and Sinha
    C) Agrawal R. L.
    D) Earch Bharucha

11. The head quarter of Botanical Survey of India is located at
    A) Delhi
    B) Mumbai
    C) Kolkata
    D) Dehradun
12. Green house gases is /are
   A) CO₂  B) CH₄  C) Water vapour  D) All of the above
13. Which is a clean source of energy?
   A) Sun  B) Petrol  C) Wood  D) All of the above
14. A natural food web contains
   A) Only grazing food chain  B) Usually unstable
   C) Several trophic levels  D) All of the above
15. Which is known as primary producer in most ecosystems?
   A) Photosynthetic bacteria  B) Lower plants
   C) Shrubs, trees & grasses  D) All of the above
16. Biodiversity is virtually synonymous with
   A) Life on earth  B) Life of earth
   C) Life in earth  D) None of the above
17. In India, which crop has lost maximum genetic diversity in last few decades?
   A) Rice  B) Wheat
   C) Cotton  D) Sugarcane
18. Sundarban forest is located in
   A) Assam  B) Bihar
   C) Kerala  D) West Bengal
19. Ornithology is a study of
   A) Animals  B) Microbes
   C) Birds  D) None of the above
20. A group of organisms that are uncommon or scare are known as
   A) Vulnerable  B) Endemic
   C) Endangered  D) Rare
21. The example of In situ conservation is
   A) National park  B) Germplasm collection
   C) Introduction of species  D) None of the above
22. Ozone layer is present in
   A) Mesosphere  B) Ionosphere
   C) Thermosphere  D) Stratosphere
23. The concept of biodiversity hotspot is given by
   A) Odum F. P.  B) Norman Borlaug
   C) Norman Myers  D) Rachel Carson
24. Remediation of soil contamination using microorganisms is called as
   A) Bioremediation  B) Phytoremediation
   C) Biosorption  D) None of the above
25. Natural home of species is known as
   A) Environment  B) Biome
   C) Realm  D) Habitat
26. The largest ocean ecosystem is
   A) Indian
   B) Atlantic
   C) Pacific
   D) Arctic

27. National bird of India is
   A) Peacock
   B) Parrot
   C) Pigeon
   D) Eagle

28. HIV AIDS transmits through
   A) Blood transfusion
   B) Sex with HIV infected person
   C) Infected syringe
   D) All of the above

29. Which is outer mantle of the solid earth?
   A) Atmosphere
   B) Biosphere
   C) Hydrosphere
   D) Lithosphere

30. “Environment protection act” was passed in
   A) 1886
   B) 1968
   C) 1978
   D) 1986

31. Mixture of smoke and fog is
   A) Dust
   B) Droplet
   C) Mist
   D) Smog

32. The process of repeated eating and being eaten is called
   A) Food chain
   B) Food web
   C) Food hub
   D) Food plaza

33. Which of the following is primary consumer?
   A) Shark
   B) Lion
   C) Goat
   D) Dog

34. Which state in India has lowest sex ratio?
   A) Gujarat
   B) Kerala
   C) Haryana
   D) Maharashtra

35. Endemism is due to
   A) Poor adaptability
   B) Geographical barrier
   C) Failure of reproductive ability
   D) All of the above

36. Productivity of an ecosystem is high in case of
   A) Desert
   B) Temperate forest
   C) Tropical forest
   D) Coniferous forest

37. ................. trophic levels contains maximum number of organisms for biomass
   A) First
   B) Second
   C) Third
   D) Fourth

38. The major pollutant from e-waste is
   A) Aluminium
   B) Copper
   C) Zinc
   D) Polybrominated biphenyl (PBB)

39. ................. toxic gas was released in Bhopal gas tragedy
   A) Carbide
   B) CO
   C) Methyl isocyanide
   D) CFC
40. EC and ESP are measured for
   A) Air quality  B) Soil quality
   C) Water quality  D) None of the above

41. In aquatic ecosystems, the dominant producers are
   A) Phytoplankton  B) Macrophyte
   C) Zooplankton  D) All of the above

42. Decomposers are also known as
   A) Flora  B) Detrivor
   C) Fauna  D) None of the above

43. Variation of gene within the same species is
   A) Species diversity  B) Genetic diversity
   C) Biodiversity  D) Ecosystem

44. The protective blanket of gases surrounding the earth is known as
   A) Biosphere  B) Lithosphere
   C) Atmosphere  D) Hydrosphere

45. Pearls are obtained from
   A) Marine algae  B) Poly-metallic nodules
   C) Diatomite  D) Oyster

46. Phytoplanktons are free floating
   A) Producer  B) Animals
   C) Consumer  D) Bacteria

47. Methane is liberated from which of the following crop cultivation
   A) Sugarcane  B) Wheat
   C) Rice  D) Cotton

48. The natural disaster that generally do not occur in India is
   A) Earthquakes  B) Volcanoes
   C) Floods  D) Cyclones

49. Asiatic lion sanctuary is located in
   A) West Bengal  B) Orissa
   C) Rajasthan  D) Gujarat

50. The person associated with Chipko movement is
   A) Vandana Shiva  B) Sundarlal Bahuguna
   C) Madhv Sarin  D) Sagar Dhara

51. Best example of benefits of biodiversity are
   A) Food  B) Medicine
   C) Fibre  D) All of the above

52. Largest mangrove forest in India is
   A) Pitchvaram  B) Sundarban
   C) Thar  D) Gulf of Kutch

53. Decibel is the unit for
   A) Air  B) Water
   C) Noise  D) Weight
54. The historical monument which is affected by air pollution is
   A) Kutubminar  B) Red fort  C) Taj Mahal  D) Charminar
55. Mangroves are part of
   A) Desert ecosystem  B) Grassland ecosystem  C) Marine ecosystem  D) Tundra ecosystem
56. Which of the following states are covered by Western Ghats?
   A) Gujarat  B) Maharashtra  C) Karnataka  D) All of the above
57. Total plant species of an ecosystem is said to be
   A) Fauna  B) Flora  C) Both (A & B)  D) None of the above
58. Biological Oxygen Demand is an indicator of level of pollution in
   A) Air  B) Noise  C) Water  D) Soil
59. SPM stands for
   A) Superior Pollution Matter  B) Saline Pollution Matter  C) Save Pollution Matter  D) Suspended Particulate Matter
60. Which of the following is the largest biomass producer on earth?
   A) Grassland  B) Forest  C) Ocean  D) Desert
61. Water born disease is
   A) Typhoid fever  B) TB  C) Malaria  D) None of the above
62. NBPGGR is situated at
   A) New Delhi  B) Pune  C) Gandhinagar  D) Jaipur
63. Rann of Kutch, is known for breeding colony of
   A) Flamingo  B) Sparrow  C) Crow  D) Hawk
64. Kaziranga National park is located in
   A) Assam  B) Goa  C) Maharashtra  D) Gujarat
65. “Nal sarovar” wild life sanctuary is for
   A) Bird  B) Tiger  C) Chinkara  D) Elephant
66. Ozone is found in
   A) Lithosphere  B) Stratosphere  C) Hydrosphere  D) Troposphere
67. Nitrogen percent in atmosphere is
   A) 21  B) 89  C) 78  D) 20
68. World ozone day is
   A) September 16
   B) July 16
   C) June 21
   D) April 16

69. Ranthambore tiger reserve is located at
   A) Rajasthan
   B) Uttar Pradesh
   C) Gujrat
   D) Goa

70. “Y” shaped model of energy flow was proposed by
    A) King
    B) Odum
    C) Lindeman
    D) None of the above

71. Artificial ecosystems are
    A) Gardens
    B) Aquarium
    C) Cropland
    D) All of the above

72. India’s first National park is
    A) Gir
    B) Kaziranga
    C) Kanha
    D) Corbett

73. Which of the following is a Ramsar site in India?
    A) Ansupa lake
    B) Dal lake
    C) Sambar lake
    D) Dimna lake

74. Which have vegetarian diet in most ecosystems?
    A) Herbivores
    B) Carnivores
    C) Omnivores
    D) Hydrators

75. Which among the following is an endangered species?
    A) Deer
    B) Goat
    C) Asiatic lion
    D) Parakeet

76. In arid and semi arid areas of the world, the major problem is
    A) Acidity
    B) Water logging
    C) Salinity
    D) Al toxicity

77. Red book contains list of
    A) Endangered species
    B) Non endangered species
    C) Both (A & B)
    D) None of the above

78. The unit of energy is
    A) Decibel
    B) Kilogram
    C) Grams
    D) Calorie

79. The major consumption of water is in
    A) Industries
    B) Domestic household
    C) Power generation
    D) Agriculture

80. Status of highly endangered species is
    A) Vulnerable
    B) Threatened
    C) Rare
    D) None of the above
<table>
<thead>
<tr>
<th>No.</th>
<th>Question</th>
<th>(a)</th>
<th>(b)</th>
<th>(c)</th>
<th>(d)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>How many calories are needed to raise the temperature of 1 g of water by 1°C</td>
<td>1 cal</td>
<td>10 cal</td>
<td>100 cal</td>
<td>1000 cal</td>
</tr>
<tr>
<td>2</td>
<td>What for the greenhouse gases are responsible?</td>
<td>Agricultural warming</td>
<td>Global warming</td>
<td>Industrial warming</td>
<td>Global warming</td>
</tr>
<tr>
<td>3</td>
<td>Renewable energy is called “green power” because</td>
<td>It does not produce any harmful pollutants</td>
<td>It is green in colour</td>
<td>It is produced from green plants</td>
<td>It is produced from renewable energy sources</td>
</tr>
<tr>
<td>4</td>
<td>Plants utilizes water, carbon dioxide and light to produce their own food by</td>
<td>respiration</td>
<td>photosynthesis</td>
<td>circulation</td>
<td>transportation</td>
</tr>
<tr>
<td>5</td>
<td>What is the full form of LPG?</td>
<td>Liquefied petrol gas</td>
<td>Liquefied petroleum gas</td>
<td>Liquid petrol gas</td>
<td>Liquid petroleum gas</td>
</tr>
<tr>
<td>6</td>
<td>Water can be pumped using</td>
<td>Bio-energy</td>
<td>Solar energy</td>
<td>Wind energy</td>
<td>All of the Above</td>
</tr>
<tr>
<td>7</td>
<td>Which one is an example of Fossil Fuel?</td>
<td>Coal</td>
<td>Natural gas</td>
<td>Oil</td>
<td>All of the Above</td>
</tr>
<tr>
<td>8</td>
<td>The inexhaustible resources, that are replenished by nature, are known as</td>
<td>Conventional resources</td>
<td>Non-renewable resources</td>
<td>Non-natural resources</td>
<td>Renewable resources</td>
</tr>
<tr>
<td>9</td>
<td>What is the full form of CNG?</td>
<td>Compact natural gas</td>
<td>Complete natural gas</td>
<td>Compressed natural gas</td>
<td>Critical natural gas</td>
</tr>
<tr>
<td>10</td>
<td>Main constituent of gasifier gas is</td>
<td>Butane</td>
<td>Carbon monoxide</td>
<td>Methane</td>
<td>Propane</td>
</tr>
<tr>
<td>11</td>
<td>Which is the most common fuel for generating electricity in India?</td>
<td>Coal</td>
<td>Diesel</td>
<td>Petrol</td>
<td>Wood</td>
</tr>
<tr>
<td>12</td>
<td>What is the prime source of water on earth?</td>
<td>Rainfall</td>
<td>River</td>
<td>Ocean</td>
<td>Snowfall</td>
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<tr>
<td>Question</td>
<td>Options</td>
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<tr>
<td>13 Nuclear fuel is:</td>
<td>(a) Non-renewable (b) Renewable (c) Burnt (d) Environmentally friendly</td>
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<tr>
<td>14 What is soil?</td>
<td>(a) The lowermost layer of earth (b) The middle layer of earth (c) The uppermost layer of earth (d) All layers of earth</td>
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<td>15 The major constituent element of Earth atmosphere is</td>
<td>(a) Carbon dioxide (b) Nitrogen (c) Oxygen (d) Ozone</td>
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<tr>
<td>16 The major constituent element of Sun atmosphere is</td>
<td>(a) Carbon dioxide (b) Helium (c) Hydrogen (d) Oxygen</td>
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<td>17 The C:N ratio of cattle dung is approximately</td>
<td>(a) 30:1 (b) 40:1 (c) 50:1 (d) 60:1</td>
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<tr>
<td>18 What should be the PH value of slurry for better gas production in biogas plant?</td>
<td>(a) 3-4 (b) 5-6 (c) 7-8 (d) 9-10</td>
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<tr>
<td>19 What is typical composition of methane in the biogas?</td>
<td>(a) 50% (b) 60% (c) 70% (d) 80%</td>
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<tr>
<td>20 What is the calorific value of biogas in kcal per m³?</td>
<td>(a) 4800 (b) 8600 (c) 10300 (d) 11100</td>
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<td></td>
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<tr>
<td>21 Ratio of lignin and carbohydrates in biomass is:</td>
<td>(a) 25% and 75% (b) 50% and 50% (c) 75% and 25% (d) 100% and Zero</td>
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<tr>
<td>22 Which of the following is not a raw material for biogas generation?</td>
<td>(a) Algae (b) Coal (c) Grasses (d) Water hyacinth</td>
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<tr>
<td>23 The waste material of living or non-living things is called</td>
<td>(a) Biofuel (b) Biogas (c) Biomass (d) Biotechnology</td>
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<tr>
<td>24 Which of the following is the local name of biogas in rural areas?</td>
<td>(a) Gobar gas (b) Marsh gas (c) Water gas (d) Wood gas</td>
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</tr>
<tr>
<td>25 What is the type of KVIC biogas plant?</td>
<td>(a) Fixed dome type (b) Floating drum type (c) Open air type (d) Floating dome type</td>
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<tr>
<td>26 The dome of Janata biogas plant is made of</td>
<td>(a) Concrete (b) Iron (c) PVC (d) Wood</td>
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<tr>
<td>27 In biogas plants the gas yield is maximum in the thermophilic region and the period of digestion</td>
<td>(a) gets enhanced (b) gets reduced (c) remains unchanged (d) remains comparable</td>
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<tr>
<td>28 Biogas can be used for</td>
<td>(a) Cooking (b) Lighting (c) Transportation (d) All of the above</td>
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</tr>
<tr>
<td>29 Which of the following is not biomass?</td>
<td>(a) Cattle dung (b) Plants and trees (c) Water (d) Wood</td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>
30. Which one is the major constituent gas in biogas?
   (a) Carbon-dioxide  (b) Carbon-monoxide
   (c) Methane         (d) Oxygen

31. Which of the following is biodegradable waste?
   (a) Detergent      (b) Rubber
   (c) Silver foil    (d) Vegetable and fruit peels

32. The process of gas production by the biological breakdown of organic matter in absence of oxygen is known as
   (a) Aerobic digestion (b) Anaerobic Digestion
   (c) Overnight fermentation (d) Day time fermentation

33. What is the heat value of gas produced in gasifier?
   (a) 950-1200 kcal/m³  (b) 1200-1450 kcal/m³
   (c) 1450-1700 kcal/m³ (d) 1700-1950 kcal/m³

34. Biomass gasifiers produce a combustible mixture of different gases called as
   (a) Combustion gas  (b) Internal gas
   (c) Mixed gas       (d) producer gas

35. The gas produced by the down-draft gasifier is called as
   (a) Biogas          (b) Gobargas
   (c) Natural gas     (d) Producer gas

36. Down draft gasifier is also known as
   (a) Co-axial Gasifier (b) Co-current Gasifier
   (c) Counter-current Gasifier (d) Counter-axial Gasifier

37. The process in which waste material is reduced to ashes is called
   (a) Biodegradation (b) Composting
   (c) Incineration   (d) Recycling

38. Thermo-chemical conversion of biomass or waste is known as
   (a) Combustion     (b) Gasification
   (c) Pyrolysis      (d) Burning

39. Briquetting is done for densification of
   (a) air-mass       (b) solid-mass
   (c) liquid-mass    (d) bio-mass

40. The screw pressed briquettes are far superior to the ram pressed because of their:
   (a) management and combustibility  (b) transportation and management
   (c) storability and transportation (d) storability and combustibility

41. The proportion of wet cow during and water in slurry feed to the digester is
   (a) 1:1  (b) 1:2
   (c) 1:3  (d) 1:4

42. The solar box cooker typically reaches a maximum temperature of
   (a) 80-100 °C  (b) 100-120 °C
   (c) 120-140 °C (d) 140-160 °C

43. Solar Energy is the electromagnetic energy emitted by the sun in the form of
   (a) Conduction    (b) Convection
   (c) Radiation     (d) Radio-active waves

44. Solar ponds are used for collection and storage of
   (a) Geothermal energy  (b) Hydropower energy
   (c) Bio-energy       (d) Solar energy

45. Solar energy can be used to cook food in a
   (a) Gas oven       (b) Solar cooker
   (c) Traditional oven (d) Wood stove

46. Passive domestic water heating system is also known as
   (a) Artificial system (b) Forced feed system
   (c) Thermosyphon system (d) Reverse osmosis system
<table>
<thead>
<tr>
<th>Question</th>
<th>Answer Options</th>
<th>Correct Answer</th>
</tr>
</thead>
<tbody>
<tr>
<td>47</td>
<td>The transfer of solar energy from the sun to the earth is governed by</td>
<td>(a) Conduction</td>
</tr>
<tr>
<td>48</td>
<td>The solar cooker normally used in houses is</td>
<td>(a) Box-type</td>
</tr>
<tr>
<td>49</td>
<td>Photovoltaic system is the technology of solar cells for converting solar energy directly into</td>
<td>(a) electricity</td>
</tr>
<tr>
<td>50</td>
<td>Solar energy can be converted directly into electrical energy with the help of</td>
<td>(a) Battery</td>
</tr>
<tr>
<td>51</td>
<td>Thermal capacitance refers to the ability of materials to store</td>
<td>(a) Electricity</td>
</tr>
<tr>
<td>52</td>
<td>The way heat moves through the air from warmer objects to cooler ones is known as</td>
<td>(a) Circulation</td>
</tr>
<tr>
<td>53</td>
<td>The way heat circulates through liquids and gases is known as</td>
<td>(a) Circulation</td>
</tr>
<tr>
<td>54</td>
<td>Active domestic water heating system is also known as</td>
<td>(a) Forced circulation system</td>
</tr>
<tr>
<td>55</td>
<td>Which process creates the radiant power of the sun?</td>
<td>(a) Nuclear fission</td>
</tr>
<tr>
<td>56</td>
<td>Solar energy can be used to produce</td>
<td>(a) Electrical energy</td>
</tr>
<tr>
<td>57</td>
<td>Which instrument is used to measure direct solar radiation?</td>
<td>(a) Anemometer</td>
</tr>
<tr>
<td>58</td>
<td>In solar water heater, hot water is available for use at what time?</td>
<td>(a) Evening time</td>
</tr>
<tr>
<td>59</td>
<td>Solar cell is used to convert solar energy into which type of energy?</td>
<td>(a) Chemical</td>
</tr>
<tr>
<td>60</td>
<td>Solar cells are made of</td>
<td>(a) Germanium</td>
</tr>
<tr>
<td>61</td>
<td>Which of the following is used to cover the box in a box type solar cooker?</td>
<td>(a) Double glass layer</td>
</tr>
<tr>
<td>62</td>
<td>Which type of reflector is used in box type solar cooker?</td>
<td>(a) Aluminium foil</td>
</tr>
<tr>
<td>63</td>
<td>Solar thermal collector converts radiant solar energy into which type of energy?</td>
<td>(a) Electrical energy</td>
</tr>
<tr>
<td>Question</td>
<td>Options</td>
<td>Correct Answer</td>
</tr>
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</tr>
<tr>
<td>64</td>
<td>Solar energy can be used in the form of</td>
<td>(a) Electrical energy (b) Mechanical energy (c) Thermal energy (d) All of the above</td>
</tr>
<tr>
<td>65</td>
<td>With increase in height, wind speed</td>
<td>(a) Decreases (b) Increases (c) Does not change (d) Changes inversely</td>
</tr>
<tr>
<td>66</td>
<td>The instrument used to measure the wind speed is known as</td>
<td>(a) Ammeter (b) Voltmeter (c) Dynamometer (d) Anemometer</td>
</tr>
<tr>
<td>67</td>
<td>Wind turbine is a rotating machine which converts the kinetic energy of wind into</td>
<td>(a) Bio-energy (b) Mechanical energy (c) Thermal energy (d) Geo-thermal energy</td>
</tr>
<tr>
<td>68</td>
<td>For what purpose wind energy can be used?</td>
<td>(a) To draw underground water (b) To generate electricity (c) To operate flour mills (d) All of the above</td>
</tr>
<tr>
<td>69</td>
<td>Wind is a form of solar energy and caused by</td>
<td>(a) Abrupt heating of the atmosphere (b) Uneven heating of the atmosphere (c) Uniform heating of the atmosphere (d) Controlled heating of the atmosphere</td>
</tr>
<tr>
<td>70</td>
<td>Wind energy converted into a useful form of energy is called as</td>
<td>(a) Wind direction (b) Wind intensity (c) Wind power (d) Wind velocity</td>
</tr>
<tr>
<td>71</td>
<td>What is wind?</td>
<td>(a) Air blowing very fast (b) Air circulating at a point (c) Still air (d) Polluted air</td>
</tr>
<tr>
<td>72</td>
<td>Which of the following is the high wind energy region of India?</td>
<td>(a) Andhra Pradesh (b) Assam (c) Gujarat (d) West Bengal</td>
</tr>
<tr>
<td>73</td>
<td>What is a byproduct of producing biodiesel?</td>
<td>(a) methanol (b) salt (c) glycerin (d) polymer</td>
</tr>
<tr>
<td>74</td>
<td>Oil content in jatropha seed is</td>
<td>(a) 30-40% (b) 40-50% (c) 50-60% (d) 60-70%</td>
</tr>
<tr>
<td>75</td>
<td>Pure biodiesel is referred to as</td>
<td>(a) B 0 (b) B 100 (c) B 1000 (d) B 10000</td>
</tr>
<tr>
<td>76</td>
<td>Bio-diesel is produced from oils or fats using the process known as</td>
<td>(a) transaction (b) transportation (c) transformation (d) transesterification</td>
</tr>
<tr>
<td>77</td>
<td>Ethanol is produced by the process of</td>
<td>(a) Biochemical conversion (b) Biological conversion (c) Chemical conversion (d) Thermo chemical conversion</td>
</tr>
<tr>
<td>78</td>
<td>A place where many wind turbines are installed together to produce electricity is called:</td>
<td>(a) Wind farm (b) Propeller collection (c) Wind station (d) Wind turbine station</td>
</tr>
<tr>
<td>79</td>
<td>Constant pressure type bio gas is known as:</td>
<td>(a) Janta type (b) Fixed dome type (c) KVIC type (d) Deen bandhu type</td>
</tr>
<tr>
<td>80</td>
<td>Gasification is a process where the fuel is partially</td>
<td>(a) Hydrolyzed (b) Neutralized (c) Carbonized (d) Oxidized</td>
</tr>
</tbody>
</table>
Q.1. Answer the following (Any Four): (10.0)
A. Differentiate between HAWT and VAWT.
B. Write function of solar dryer, mention its types and explain how it works with process taking place in each component.
C. Write down the advantages and disadvantages of biomass.
D. Explain solar water pumping system, mention its application.
E. Write main advantages and limitations of power generation from wind energy.

Q.2. Answer the following (Any Four): (10.0)
A. Explain different ways to harness biomass energy.
B. Mention base pre-requisites of biogas plant installation.
C. Illustrate active domestic water heating system with neat sketch.
D. Write down the constructional details of KVIC types of biogas plants.
E. Explain biomass briquetting technology and practices.

Q.3. Answer the following (Any Four): (10.0)
A. What are various renewable energy sources? Classify them with their applications.
B. Discuss the process of biogas production and its stages.
C. Draw the flowchart of bio-diesel production process from Jatropha seed.
D. Write short note on solar pond.
E. Write short note on solar cooker.

Q.4.1. Answer the following (Any Two): (5.0)
A. Explain major factors affecting biogas production.
B. What is solar thermal collector, Describe its main components.
C. Write down the processes (technologies) for biomass pyrolysis.

Q.4.2. Answer the following (Any Two): (5.0)
A. Explain solar fencing with neat sketch.
B. Describe the Up draft gasifier with neat sketch.
C. Describe the bio-ethanol process.

OR

Solve the following problem:
Design an appropriate size of biogas plant for a family of 8 members owing two bullocks, two buffaloes, two cow and two calves. The gas is required for cooking food and lighting four lamps of 100 candle power for two hours daily. Assume necessary standard data.

****
PART - A : OBJECTIVE

1. The quantity of nutrients available to plants and animals can be increased within the system by activating the __________ resulting in increased weathering of parent material.
   (A) Edaphon (B) Earphon (C) Headphon (D) None of these

2. __________ in organic matter is the main source of energy for microbes.
   (A) Hydrogen (B) Carbon (C) Oxygen (D) Nitrogen

3. __________ farming favours synergistic concept among plant, animal and soil.
   (A) Mixed (B) Irrigated (C) Commercial (D) Specialized

4. Ecological balance is less considered in __________ farming.
   (A) Natural (B) Organic (C) Conventional (D) Eco

5. A product obtained by the controlled decomposition of organic wastes is called __________.
   (A) Decompost (B) FYM (C) Compost (D) Biogas slurry

6. Development of nutrient imbalance/deficiencies are due to adoption of __________.
   (A) Organic farming (B) Natural farming (C) Mixed farming (D) GRT

7. A Hand Book of Organic Farming is written by __________.
   (A) A.K. Singh (B) N. Lampkin (C) A.K. Sharma (D) O.P. Dahama

8. IFOAM stand for International __________ of Organic Agriculture Movement.
   (A) Foundation (B) Forum (C) Family (D) Federation

9. The excreta and dead remains of bird is called __________.
   (A) Meat meal (B) Blood meal (C) Horne meal (D) Bird guano

10. Animal urine is normally rich in __________ and low in phosphorus.
    (A) Carbon (B) Potash (C) Nitrogen (D) Calcium

11. VAM stand for Vesicular Arbuscular __________.
    (A) Microorganism (B) Mycoherbicide (C) Mycorrhizae (D) Mycoplasma

12. __________ is used to prevent volatilization losses of N from FYM.
    (A) Boron (B) Thiram (C) Potassium (D) Gypsum

13. Population of __________ is high in acidic soils.
    (A) Rhizobium (B) Azolla (C) BGA (D) Beijerinckia

14. Organic production of __________ recorded higher profitability in Haryana.
    (A) Wheat (B) Cotton (C) Coconut (D) Banana

15. _Azolla_ biofertilizer is mostly used in __________ crop.
    (A) Maize (B) Groundnut (C) Flooded rice (D) Sorghum

16. _Frateuria aurantia_ is __________ solubilizing bacteria.
    (A) Potash (B) Phosphorus (C) Nitrogen (D) Calcium
17. _______ contains 5.5% N, 4% P₂O₅ and 2% K₂O.
   (A) FYM  (B) Compost  (C) Night soil  (D) Biogas slurry
18. _______ of night soil produces poudrette.
   (A) Fermentation  (B) Reduction  (C) Hydrolysis  (D) Dehydration
19. *Bacillus polymixa* increases availability of _______.
   (A) Nitrogen  (B) Phosphorus  (C) Potassium  (D) Zinc
20. Organic matter supplies _______ nutrients.
   (A) Primary  (B) Secondary  (C) Micro  (D) All these
21. Decomposition of manures and plant residues liberates carbon dioxide and _______ which helps in neutralizing alkaline soil.
   (A) Organic acid  (B) Oxygen  (C) Ammonia  (D) Nitrogen
22. Non-edible oil cakes take about 7 to 10 days for _______ process.
   (A) Fermentation  (B) Reduction  (C) Hydrolysis  (D) Dehydration
23. Waste decomposition by earthworms _______ times faster than in conventional composting.
   (A) 2 to 5  (B) 10 to 20  (C) 20 to 30  (D) 30 to 50
24. Castor cake contains _______ % nitrogen.
   (A) 7.9  (B) 6.5  (C) 5.2  (D) 4.3
25. On an average green manuring adds _______ kg N/ha.
   (A) 30-50  (B) 60-80  (C) 90-110  (D) 120-140
26. Blood meal contains _______ % N.
   (A) 1-5  (B) 6-12  (C) 13-20  (D) 21-28
27. _______ of the following manures has highest P₂O₅%.
   (A) Raw bone meal  (B) Bird guano  (C) Fish guano  (D) Castor cake
28. Nitrogen fixation in lucerne by Rhizobium ranges from _______ kg N/ha.
   (A) 60-80  (B) 80-100  (C) 100-300  (D) 300-500
29. Sheep and goats are allowed to stay overnight in the field and urine and faecal matter is added to soil is called _______.
   (A) Sheep penning  (B) Sheep rearing  (C) Sheep guano  (D) Sheep meal
30. _______ acts as nitrification inhibitor.
   (A) Cotton cake  (B) Groundnut cake  (C) Neem cake  (D) Mustard cake
31. _______ cake can be used as feed for livestock.
   (A) Cotton seed  (B) Cotton seed (un-decorticated)  (C) Castor seed (decorticated)  (D) Neem seed
32. Rearing and breeding of earthworms in controlled condition is termed as _______.
   (A) Vermicast  (B) Vermiwash  (C) Vermiculture  (D) Vermicide
33. *Eisenia foetida* is _______ type of earthworm.
   (A) Endogeic  (B) Anecic  (C) Epigeic  (D) Endo-anecic
34. There are about _______ species of earth worms reported in the world.
   (A) 1000  (B) 2000  (C) 3000  (D) 4000
35. *Lampito mauritii* is a type of _______.
   (A) Bacteria  (B) Fungi  (C) Earthworm  (D) Azolla
36. _______ is a popular green leaf manure crop/plant.
   (A) Glyricidia  (B) Sunnhemp  (C) Dhaincha  (D) Cowpea
37. Vermicompost should be applied @ _______ t/ha for general use in agriculture.
   (A) 20  (B) 15  (C) 10  (D) 5
38. All organic food is produced and handled according to strict rules called _______.
   (A) Organic standards  (B) Organic produce  (C) Organic process  (D) None of these
39. ______ sp. posses ability to bring insoluble phosphates into soluble form.
   (A) Frateuria  (B) Acetobacter  (C) Penicilium  (D) Azotobacter
40. ______ of the followings is a concentrated organic manure.
   (A) FYM  (B) Biogas slurry  (C) Fish meal  (D) Poultry manure
41. ______ is renewable nutrient source.
   (A) Urea  (B) CAN  (C) Crop residue  (D) DAP
42. Stable humus has a break down rate of ______ a year.
   (A) 2-5%  (B) 20-25%  (C) 30-40%  (D) 50-80%
43. Mycorrhiza is an association between fungus and _______ of plant.
   (A) Stem  (B) Root  (C) Leaf  (D) Branch
44. The predator Chrysoperla is used for the control of _______.
   (A) White grub  (B) Helicoverpa  (C) Aphids  (D) Pod borer
45. ______ is used as trap crop in groundnut and cotton for Spodoptera pest.
   (A) Rose  (B) Sunflower  (C) Sunnhemp  (D) Cowpea
46. Azadiractin from neem oil extract acts as ______ to manage insect.
   (A) Contact poison  (B) Sterilent  (C) Repellent  (D) Fumigant
47. ______ is used to control powdery mildew.
   (A) Sulphur  (B) Nitrogen  (C) Boron  (D) Zinc
48. Trichograma chilonis is _______.
   (A) Predator  (B) Parasitoid  (C) Trap crop  (D) Virus
49. _______ extracted from citrus fruit peel used for controlling pests of animals.
   (A) Pyrethrin  (B) Lemonene  (C) Nicotine  (D) Azadiractin
50. _______ bio-control agent is used for control of Lepidopterous pests.
   (A) Bacillus  (B) Trichoderma  (C) Pseudomonas  (D) Verticillium lecanii
51. Kadiri variety of _______ is resistant against leaf spot.
   (A) Groundnut  (B) Pigeonpea  (C) Cotton  (D) Castor
52. _______ variety of red gram is resistant against pod borer.
   (A) L-603  (B) ICGS-10  (C) ICPL-332  (D) JI-144
53. NPV culture is useful for the control of _______.
   (A) Aphids  (B) Hoppers  (C) Whitefly  (D) Spodoptera
54. Yellow sticky traps are used to monitor _______.
   (A) Boll worms  (B) Borers  (C) Aphids  (D) Termite
55. Azadiractin is _______ pesticide.
   (A) Fungal  (B) Bacterial  (C) Viral  (D) Botanical
56. Sorghum crop sown before end of June usually escapes attack by _______.
   (A) Stem borer  (B) Moulds  (C) Shootfly  (D) Smut
57. Marigold is grown as trap crop for the control of _______ in cotton and pigeonpea.
   (A) Red hairy catter  (B) Whitefly  (C) Hoppers  (D) Helicoverpa pillar
58. Uprooting of infected plants is practiced to minimize _______.
   (A) Viral diseases  (B) Bacterial diseases  (C) Fungal diseases  (D) Nematodes
59. _______ bio-agent is used to control Prickly pear cactus.
   (A) C. cactorum  (B) F. oxysporum  (C) Siphamaidis  (D) N. bruchi
60. _______ mycoherbicide is prepared from Phytophthora palmivora fungus.
   (A) Collego  (B) Velgo  (C) DeVine  (D) Biomal
61. Wheat, oats and peas suppress the growth of _______ due to allelopathic effect.
   (A) Chenopodium  (B) Parthenium  (C) Cyperus  (D) Opuntia
62. **mycoherbicide** is used for control of milk weed vine.
   (A) Collego  (B) Velgo  (C) DeVine  (D) Biomal

63. Use of weed seed free crop seed is _______ method of weed control
   (A) Mechanical  (B) Cultural  (C) Biological  (D) Preventive

64. _______ plastic film is used to trap the heat in soil solarization.
   (A) Black  (B) Blue  (C) Green  (D) Clear

65. _______ is effective method to control parasitic weeds.
   (A) Interculturing  (B) Rabbing  (C) Crop rotation  (D) Solarization

66. _______ is not mechanical method of weed control.
   (A) Hand weeding  (B) Hoeing  (C) Digging  (D) Crop rotation

67. Soil, water and food quality tests are done by _______.
   (A) Certification  (B) Producer  (C) Operator  (D) Processor

68. _______ is used as processing aid for drying/dehydration.
   (A) Sugar  (B) Jagerry  (C) Salt  (D) Ascorbic acid

69. Dry fruit products have a water content of _______ % during storage.
   (A) 2 to 5  (B) 8 to 12  (C) 15 to 20  (D) 25 to 30

70. _______ is a government agency for organic certification in Gujarat.
   (A) GOPCA  (B) GOCA  (C) GSSCA  (D) GSOCA

71. NPOP is administered by _______.
   (A) IFOAM  (B) APEDA  (C) INDOCERT  (D) DASP

72. _______ ensures genuineness of organically grown farm products.
   (A) Certification  (B) Processing  (C) Packaging  (D) Marketing

73. INDOCERT is located at _______.
   (A) Bangalore  (B) Chennai  (C) Cochin  (D) New Delhi

74. In India, standards for organic agriculture were announced in _______.
   (A) 1981  (B) 1991  (C) 2001  (D) 2011

75. _______ is not the certification body for organic farming.
   (A) INDOCERT  (B) NPOP  (C) ECOCERT  (D) SKAL

76. Buckwheat is a type of _______.
   (A) Tea  (B) Coffee  (C) Spices  (D) Honey

77. _______ tea is fully fermented tea.
   (A) Oolong  (B) Green  (C) Instant  (D) Black

78. Salts are dissolved in water and leached down in the deeper layer of soil is known as _______.
   (A) Percolation  (B) Inundation  (C) Absorption  (D) Infiltration

79. Addition of organic matter in clay soil promotes _______.
   (A) Bulk density  (B) Aggregation  (C) Compactness  (D) Texture

80. Robusta variety share _______ % of world total coffee production.
   (A) 30  (B) 50  (C) 70  (D) 90

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AGRICULTURAL UNIVERSITIES OF GUJARAT
1. Anand Agricultural University, Anand
2. Junagadh Agricultural University, Junagadh
3. Navsari Agricultural University, Navsari
4. S.D. Agril. University, Sardarkrushinagar

Sixth Semester B.Sc. (Hons.) Agri. (Regular) End Examination June-2017
Agron.6.8 : Organic Farming (1+1)

Date : 17-06-2017
Day : Saturday
Time : 10:15 to 12:00 hrs
Marks : 40.00

PART - B : SUBJECTIVE

Q.1 (A) Define/explain the following (Any four) (4.0)
(1) Mycoherbicide
(2) Biofertilizers
(3) Biological Intensive Nutrient Management
(4) Certified organic
(5) Parasitoids

(B) Write short note on the following (6.0)
(1) Advantages of biological control
(2) Constraints of organic farming in India
(3) Functions of accreditation agencies

Q.2 (A) Differentiate the following (6.0)
(1) Conventional farming V/s Organic farming
(2) Microbial insecticides V/s Bio-pesticides
(3) Arabica variety V/s Robusta variety of coffee

(B) Describe the methods of recycling of organic residues. (4.0)

Q.3 (A) Justify the followings by giving scientific reason/s. (5.0)
(1) Leguminous crops are used as green manure crops.
(2) Sulphur should not be sprayed where recently oil compounds have been sprayed on plant.
(3) Sewage is given fermentation and oxidation treatments before used for agricultural purpose.
(4) Green manure crop should be buried into the soil at flowering stage.
(5) Freezing is applied to vegetable crops.

(B) Explain the cultural methods to manage pests and diseases in organic farming. (5.0)

Q.4 (A) Answer as directed (Any six) (6.0)
(1) Give the full form : GRT, NPOP, AMF, PGPR, WTO
(2) Enlist techniques adopted for processing.
(3) Write names of accrediting agencies appointed by Government of India.
(4) Write about labelling of organic food products.
(5) Enlist the mineral amendments used for soil improvement.
(6) Give details about choice of crops and variety for conversion to organic system.
(7) Give basic characteristics of earthworm species suitable for vermicomposting.

(B) Discuss the principles of organic farming. (4.0)

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AGRICULTURAL UNIVERSITIES OF GUJARAT
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2. Junagadh Agricultural University, Junagadh  
3. Navsari Agricultural University, Navsari  
4. S.D. Agril. University, Sardarkrushinagar

Sixth Sem. B.Sc. (Hons.) Agri. (Regular) End Examination June-2017
Agron.6.9 : Farming Systems and Sustainable Agriculture (1+1)

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PART - B : SUBJECTIVE

Q.1 (A) Define or explain the following terms. (Any Five)  
(1) Specific heat  
(2) Organic farming  
(3) Heat injury  
(4) Soil conservation  
(5) Intercropping  
(6) Gully

(B) Discuss in detail the mechanical measures of soil conservation.  

Q.2 (A) Differentiate the following.(Any three).  
1. Shelter belt Vs Wind break  
2. Contour bunding Vs Compartmental bunding  
3. Chilling injury Vs Freezing injury  
4. Organic farming Vs Natural farming

(B) Explain basic elements of sustainable agriculture.  

Q.3 Write short notes (Any four).  
1. Components of organic farming  
2. Basic features of farming system  
3. High External Input Agriculture (HEIA)  
5. Reclamation of salt affected soil.

Q.4 Do as directed. (Any five).  
1. Mention the criteria for selection of crops for mix cropping.  
2. Enlist the role of soil moisture in crop growth.  
3. Give the advantages of organic farming  
4. Enlist components of farming system  
5. Which are the constraints in adoption of organic farming?  

---X---
Select the most appropriate answer from the options and write it in the separate sheet

1. _____ of rainfall is more important than total amount of rainfall.
   (A) Time  (B) Quality  (C) Distribution  (D) Good start

2. When RH is more than _____%, there is high chance for infestation of diseases and pests.
   (A) 60  (B) 70  (C) 90  (D) 80

3. More than _____% solar radiation absorbed by plants is converted in to heat.
   (A) 60  (B) 70  (C) 80  (D) 90

4. _Striga_ is a parasitic weed of _______ crop.
   (A) Sugar beet  (B) Sugarcane  (C) Wheat  (D) Greengram

5. Atmospheric nitrogen is fixed in the soil by ______.
   (A) Lightening  (B) Rainfall  (C) All of these  (D) Microbes

6. Region where temperature remains low throughout the year is classified as ______.
   (A) Megatherm  (B) Microtherm  (C) Hekistotherm  (D) Mesotherm

7. ______ pollination is necessary in oil palm.
   (A) Thrips  (B) Wasp  (C) Beetle  (D) Bee

8. Soils with low pH are injurious to plants due high toxicity of ______.
   (A) Cu  (B) Fe  (C) Mn  (D) Zn

9. The practice of growing crops across the slope is known as ______.
   (A) Contour  (B) Strip cropping  (C) Intercropping  (D) Mix cropping farming

10. For controlling erosion and large deposition of sediments, the plantation beneficial is ______.
    (A) Live hedges  (B) Scattered bushes  (C) Shrubs  (D) Grasses

11. _____ of rainfall is more important than total amount of rainfall.
    (A) Quality  (B) Time  (C) A good start  (D) Distribution

12. Organic farming technology is ________.
    (A) Area specific  (B) Time specific  (C) Location specific  (D) None

13. The rate of chemical reaction may be doubled or even more for every 10 °C increase in temperature is known as ______.
    (A) Cardinal  (B) Quotient\textsuperscript{10}  (C) CR10  (D) Fast reaction

14. Culturable waste lands are ______ lands instead of wastelands.
    (A) Problematic  (B) Fertile  (C) Desert  (D) Wastelands

15. Low level of oxygen and high level of CO\textsubscript{2} is found in ______ soils.
    (A) Arid  (B) Saline  (C) Alkaline  (D) Waterlogged
16. The other name of shifting cultivation is ________.
   (A) Khadar (B) Diara (C) Bhangar (D) Jhuming

17. ________ lands are permanently or periodically inundated by water.
   (A) Marshy lands (B) Dry lands (C) Raverine lands (D) Ravine lands

18. An excessive tillage may destruct soil ________.
   (A) Texture (B) Structure (C) Moisture (D) Depth

19. The soils suitable for bunding are ________.
   (A) Medium black (B) Sandy (C) Loamy sand (D) Deep black

20. The cheapest mechanical measure for soil conservation is ________.
   (A) Contour bunding (B) Bench terracing (C) Compartmental bunding (D) BBF bunding

21. ________ is an important tree suitable for coastal belts.
   (A) Neem (B) Casuarina (C) Khejri (D) Sapota

22. ________ is highly salt tolerance tree.
   (A) Bottle palm (B) Date palm (C) Neem (D) Oil palm

23. Common name of Panicum maximum is ________.
   (A) Khus (B) Guinea grass (C) Munj (D) Napier grass

24. ________ is found promising grass in arid regions.
   (A) Dhaman (B) Munj (C) Khus (D) Guinea grass

25. Synthetically compounded fertilizers and pesticides generally suppress ________ activity in the soil.
   (A) Chemical (B) Biological (C) Physical (D) Biochemical

26. ________ can lead to more stable farm income.
   (A) Beautification (B) Modification (C) Communication (D) Diversification

27. Raverine lands in north India are called as ________.
   (A) Khadar (B) Diara (C) Char (D) Cho

28. Sustainable agriculture insists on maximization of ________.
   (A) On farm (B) Purchased inputs (C) Non-renewable resources (D) Cheap output resources

29. ________ is a mechanical approach of weed management.
   (A) Crop Rotation (B) Smother crops (C) Allelopathic plants (D) Mowing

30. Early maturity and resistance to lodging are the characters governed by ________ factors.
    (A) Edaphic (B) Climatic (C) External (D) Internal

31. CO₂ content in atmosphere is ________ %.
    (A) 0.03 (B) 0.3 (C) 0.003 (D) 3.0

32. Most of the plants grow best at ________ °C.
    (A) 0-10 (B) 15-30 (C) 45-55 (D) > 55

33. When legume and cereals are grown together, mutual benefit results in higher yield, the effect is known as ________ effect.
   (A) Antagonistic (B) Synergistic (C) Reverse (D) Mutual

34. RGR and NAR increase with increase in ________.
   (A) Moisture (B) Wind speed (C) RH (D) Temperature

35. Moisture range between field capacity (FC) and wilting point (WP) is known as ________ water.
    (A) Gravitational (B) Hygroscopic (C) Unavailable (D) Available

36. ________ is accumulated in poorly aerated soil which is detrimental to roots.
    (A) NO₂ (B) CO₂ (C) NO₃ (D) O₂
37. Soil organic matter is less in _____ soils.
   (A) Arid    (B) Humid forest    (C) Semi-arid    (D) Sub-Humid forest

38. _____ is the source of food for micro organisms.
   (A) Soil air    (B) Soil moisture    (C) Mineral matter    (D) Organic matter

39. Blue green algae fix atmospheric nitrogen in _____ fields.
   (A) Rice    (B) Wheat    (C) Potato    (D) Mungbean

40. At low pH (acidic condition), _____ gets fixed in soil.
   (A) Nitrogen    (B) Phosphorus    (C) Hydrogen    (D) Potassium

41. _____ helps in aeration and drainage of the soil.
   (A) Earthworm    (B) Weeds    (C) Fungi    (D) Nematode

42. _____ includes all forms of water falling from atmosphere.
   (A) Evaporation    (B) Transpiration    (C) Precipitation    (D) Vapour

43. Condensation of water vapour present in the air in cool night is called _____.
   (A) Dew    (B) Snow    (C) Hail    (D) Fog

44. The example of culturable waste land is _____.
   (A) Degraded forest    (B) Sheet rock area    (C) Desert    (D) Snow glacial

45. The practice of shifting cultivation consists of _____.
   (A) Land clearing    (B) Cultivation    (C) Burning    (D) All

46. The most important green manure crop for alkali soil is _____.
   (A) Clusterbean    (B) Sunnhemp    (C) Dhaincha    (D) Greengram

47. Chemical formula of Gypsum is _____.
   (A) CaPO4-2H2O    (B) CaSO4-2H2O    (C) CaCO3-2H2O    (D) CaSO4-H2O

48. _____ gas is important for respiration.
   (A) Oxygen    (B) Nitrogen    (C) CO2    (D) CO

49. Temperate crops prefer _____ temperature at maturity.
   (A) Low    (B) High    (C) Medium    (D) Average

50. Evapotranspiration increases with temperature, but decreases with high _____.
   (A) IR    (B) CU    (C) WR    (D) RH

51. Light regulates the opening and closing of _____.
   (A) Stomata    (B) Buds    (C) Root cells    (D) Flowers

52. The length of day has greater influence than _____.
   (A) Temperature    (B) Light intensity    (C) RH    (D) Moisture

53. Minimum, optimum and maximum temperature of individual plant is called _____ temperature.
   (A) Cardinal    (B) Mean    (C) Daily    (D) Suitable

54. Evapotranspiration increase with increase in _____.
   (A) RH    (B) Wind speed    (C) Dew    (D) Rainfall

55. _____ helps in pollination of flowers.
   (A) RH    (B) Temperature    (C) Wind    (D) Light intensity

56. _____ light is favourable for plant growth.
   (A) Blue    (B) Red    (C) Green    (D) Ultra violet

57. The velocity in the channel should not exceed _____ m/sec for sandy soils.
   (A) 0.35    (B) 0.50    (C) 0.75    (D) 0.60

58. _____ depends heavily on external and chemical inputs.
   (A) HEIA    (B) LEISA    (C) INM    (D) IPM

59. The fruit tree suitable for salt affected soils is _____.
   (A) Mango    (B) Sapota    (C) Lemon    (D) Almond
60. The prerequisite to reclaim waterlogged and marshy lands is _______.
   (A) Moisture       (B) Amendments  (C) Drainage    (D) Soil conservation

61. Very deep and wide gullies with steep sides are known as _______.
   (A) Ravine        (B) Raverine   (C) Cracks      (D) Marshy

62. The process of harnessing solar energy in the form of economic plant and animal products
    is _______.
   (A) Farming       (B) IFS        (C) Cropping system (D) Farming system

63. Crop + Fish + Goat is _______ ecosystem.
   (A) Garden land  (B) Wet land    (C) Rainfed      (D) Dry land

64. Crop + Dairy + Biogas + Sericulture is _______ ecosystem.
   (A) Garden land  (B) Wet land    (C) Rainfed      (D) Dry land

65. Crop + Goat + Agroforestry + Horticulture is _______ ecosystem.
   (A) Garden land  (B) Wet land    (C) Dry land     (D) Rainfed

66. Crop like _______ is grown in wet land IFS.
   (A) Sugarcane    (B) Sorghum     (C) Pearl millet (D) Wheat

67. Casuarina plantations can be maintained up to _______ meters width along the sea coast.
   (A) 8            (B) 10          (C) 14          (D) 12

68. Prosopis spp. is highly adopted for _______ areas.
   (A) Waterlogged  (B) Sloppy      (C) Sand dune    (D) Saline coastal

69. Farming in relation to biological diversity is called _______ farming.
   (A) Eco          (B) Biodiversity (C) Biological   (D) Biodynamic

70. _______ is an example of day neutral crop.
   (A) Wheat        (B) Rice        (C) Pearl millet (D) Tomato

71. Agriculture in relation to macro-fauna is called _______ agriculture.
   (A) Macrobiotic  (B) Profitable  (C) Sensible      (D) Ecofarming

72. _______ of crops lead to more secure income.
   (A) Classification (B) Diversification (C) Improvement (D) Enhancement

73. Relative humidity of _______% is suitable for most of the crops.
   (A) 20-40        (B) 40-60       (C) <20        (D) 60-80

74. Water present in the atmosphere in the form of invisible water vapour is known as _______.
   (A) Relative     (B) Fog         (C) Humidity    (D) Dew

75. Injury to plants caused by lifting upward of the plants along with soil from its normal
    position in temperate region is known as _______.
   (A) Suffocation   (B) Chilling    (C) Heat injury  (D) Heaving

76. Attraction of two similar kinds of molecules is known as _______.
   (A) Cohesion      (B) Adhesion    (C) Adsorption  (D) Absorption

77. The plants requires less than 10 hours of illumination are known as _______ plants.
   (A) Short day    (B) Long day    (C) Medium day  (D) Day neutral

78. Loss of water from plant leaves is known as _______.
   (A) Transpiration (B) Respiration (C) ET         (D) Evaporation

79. The response of plants to the relative length of day and night is called _______.
   (A) Thermoperiodism (B) Photoperiodism (C) Light intensity (D) Day length

80. Green plants contain _______% water which maintains turgidity of plant cell.
   (A) 85           (B) 90         (C) 95          (D) 100
PART B : SUBJECTIVE PAPER

Q.1 (A) Classify the phosphatic fertilizers with suitable examples and give the (4.00) characteristics of water soluble phosphatic fertilizers.

(B) Define the following terms (Any Six) (6.00)
1. Mixed Fertilizers
2. FYM
3. Pesticide
4. Filler
5. Chelate
6. Manures
7. Soil amendments

Q.2 (A) Give the scientific reasons of the following (Any five) (5.00)
1. SSP is not packed in gunny bags.
2. Green manuring is not advisable in low rainfall region.
3. Urea is most popular fertilizer among the farmers.
4. Sulphur is now become necessary to apply in soil.
5. Phosphorus fertilizers are generally applied as basal dose.
6. Superphosphate is being widely used as manure preservative.

(B) Differentiate the following (Any Two) (5.00)
1. Manure V/S Fertilizer
2. Heap method V/S Peat method of decomposition
3. Nitrification V/S Denitrification

Q.3 (A) What is green manuring? Give its advantages and disadvantages. (4.00)

(B) Answer the following in brief (Any Six) (6.00)
1. Enlist the properties of perfect insecticide.
2. Give the precautions while using the oil cakes.
3. What is the importance of biofertilizers?
4. Give the Characteristics of complex fertilizers.
5. What are the advantages of Vermicomposting?
6. Give the general properties of plant hormones.
7. Enlist the factors affecting the nutritional build up of FYM.

Q.4 (A) Write short note on the following (Any Two) (5.00)
1. Micronutrients
2. Balanced fertilization
3. Role of organic matter in agriculture

(B) Prepare 1 ton of a 15:10:10 grade of fertilizer mixture using Ammonium sulphate (20% N), DAP (18% N and 46% P2O5) and MOP (60% K2O). Dolomite can be used as filler.

XXXXXXXXXXXXX
Que.1 Write most appropriate answer from options (A, B, C, D) in the given answer-sheet.

1. Which of the following micronutrient requirement is very little by plant, as it present in seed and soils.
   (A) Mn (B) Mo (C) Cu (D) Fe

2. Earthworm species Eisenia fetida, is most commonly known as:
   (A) Belgian nightcrawler (B) Red wiggler (C) Blue worm (D) European nightcrawler

3. Castor cake contains which of following toxic alkaloids?
   (A) Saponin (B) Ricin (C) Iodine (D) Nimbidin

4. What is the common mineral source of soil phosphorus?
   (A) Kaolinite (B) Apatite (C) Calcite (D) Mica

5. Application of 20 tonnes of farmyard manure to soil, will add how many kilogram of nitrogen in soil?
   (A) 100 (B) 200 (C) 300 (D) 400

6. Practice of green leaf manures is usually followed in which part of the India?
   (A) Eastern (B) Central (C) Western (D) Southern

7. Which of the following is/are not an example of leguminous green manuring crop(s)?
   (A) Sunflower (B) Sorghum (C) Dhaincha (D) Options ‘A’ and ‘B’

8. Ammonium sulphate fertiliser is:
   (A) The highest concentration nitrogenous fertiliser. (B) The best fertiliser for paddy.
   (C) A neutral fertiliser. (D) A basic fertilizer.

9. What type following of microbe may utilize NH₄⁺ ion during nitrification process?
   (A) Auto-trophic (B) Mesophilic (C) Heterotropic (D) Thermophilic

10. The capacity of soil to resist the sudden changes in pH is called as:
    (A) Soil fertility (B) Buffering capacity (C) Hydraulic conductivity (D) Acidity

11. Which of the following acid is released during decomposing of organic matter?
    (A) Sulphuric acid (B) Lactic acid (C) Organic acids (D) Hydrochloric acid

12. Which of following meals/manures contains the highest percentage of N?
    (A) Blood meal (B) Meat meal (C) Fish meal (D) Horn and hoof meal

13. Most of the commercial NH₃ is obtained from _gas(es) for the manufacturing of N-fertilizers.
    (A) Coal (B) Naphtha (C) Natural gas (D) All of these

14. Which fertilizer is used for improving qualities of crop produces?
    (A) Nitrogenous (B) Phosphatic (C) Potassic (D) Sulphate

15. Single superphosphate is produced by reaction of rock phosphate with _
    (A) Nitric acid (B) Perchloric acid (C) Hydrochloric acid (D) Sulphuric acid

16. Which of the following is an example of citric acid soluble phosphatic fertilizers?
    (A) Superphosphate (B) Dicalcium phosphate (C) Rock phosphate (D) DAP

17. Which of following cake contains relatively higher nitrogen?
    (A) Neem cake (B) Groundnut cake (C) Cotton seed cake (D) Castor cake
18. Reaction of anhydrous liquid ammonia with orthophosphoric acid produces:
(A) Ammonium phosphate (B) Triple superphosphate (C) Superphosphate (D) Ammonium nitrate

19. _______ is the non-symbiotic organism which fixes atmospheric nitrogen into the soil.
(A) Azotobacter (B) Rhizobium (C) Nitrosomonas (D) Nitrobacter

20. Which of the following fertilisers contains the least percentage of nitrogen?
(A) Urea (B) Liquid ammonia (C) Ammonium phosphate (D) Ammonium sulphate

21. Calcium ammonium nitrate (CAN) is:
(A) High analysis fertilizer (B) Mixed fertilizer (C) Complex fertilizer (D) Straight fertilizer

22. Biuret formation in urea is kept at minimum (<1.5%), because it is:
(A) Helpful in decomposition of urea. (B) Explosive in nature. (C) Toxic and harmful to some crops. (D) Corrosive in nature.

23. Addition of _______ nitrogeus fertilizer produces alkalinity in soils.
(A) NH₄NO₃ (B) NH₄Cl (C) (NH₄)₂SO₄ (D) NaNO₃

24. Which of the following is the potential inhibitor of nitrification process?
(A) CONH₂ (B) TBDO (C) CDU (D) AM

25. Requirement of phosphorus by crops is maximum at which of the following plant stage?
(A) Maturity (B) Grand growth (C) Harvest (D) Early

26. _______ is the chief compound for manufacturing of Nitrogenous fertilizers?
(A) NH₃ (B) NO₂ (C) NO₃ (D) NH₄

27. What is the typical range of soil pH for maximum availability of all essential plant nutrients in soils?
(A) <5.5 (B) 6.0 – 7.5 (C) 7.5 – 8.5 (D) >8.5

28. Catalyst used in Haber’s process for ammonia production is:
(A) Nickel (B) Reduced iron oxide (C) Silica gel (D) Vanadium pentoxide

29. Fertilizer producing company GNFC is situated in which city of the Gujarat State?
(A) Vadodara (B) Bharuch (C) Hazira (D) Jamnagar

30. Fertilizer containing chloride ion are not suitable for _______ crop.
(A) Sugarcane (B) Potato (C) Wheat (D) Castor

31. _______ cake has the highest nitrification rate.
(A) Castor (B) Mahua (C) Neem seed (D) Groundnut

32. Which of the following does not come under the category of ‘secondary nutrient’ for plant growth?
(A) Calcium (B) Oxygen (C) Sulphur (D) Magnesium

33. To prevent N-losses during manure decomposition, which of following chemical preservative is most preferred over gypsum in Indian condition?
(A) Calcite (B) SSP (C) Calcium hydroxide (D) Calcium oxide

34. The blood from the slaughter house is normally treated with _______ to prepare blood meal.
(A) K₂SO₄ (B) FeSO₄ (C) CuSO₄ (D) CaSO₄

35. Which of the following group of insecticide has low environmental persistence?
(A) Chlorinated hydrocarbon (B) Carbamates (C) Organophosphates (D) Synthetic Pyrethroid

36. Sulphur content in ammonium sulphate fertilizer is _______ percent.
(A) 24 (B) 20 (C) 16 (D) 46

37. Agrochemical used to kill mites is termed as:
(A) Nematicide (B) Ovicide (C) Rodenticide (D) Acaricide

38. Which of the following is commonly known as muriate of potash?
(A) Potassium chloride (B) Potassium sulphate (C) Potassium silicate (D) Potassium nitrate
39. Which is the best fertiliser for paddy?
(A) Nitro-phosphate  (B) Superphosphate  (C) Ammonium phosphate  (D) Potassium nitrate

40. ______ plant hormone is being effectively used to produce parthenocarpy in tomato.
(A) GA  (B) NAA  (C) Cytokinins  (D) 2, 4 - D

41. Which of the following micronutrient is usually found deficient in calcareous soils?
(A) Manganese  (B) Molybdenum  (C) Boron  (D) Cu

42. Fruit ripening is controlled principally by the production of ______.
(A) Cytokinin  (B) GA  (C) Ethylene  (D) Auxin

43. Microbes are instrumental in which of the following pathways in the N cycle?
(A) Nitrification  (B) Denitrification  (C) Biological N-fixation  (D) All of given options

44. The micronutrients iron, manganese, and zinc are all ______.
(A) Anion in soil solution  (B) Available at low pH  (C) Cation in soil solution  (D) Options ‘B’ and ‘C’

45. Pyrethroid is a natural insecticide made from the flowers of ______ plant.
(A) Neem  (B) Chrysanthemum  (C) Tulsi  (D) Tobacco

46. Application of ______ may change the female flowers to male flowers and vice-a-versa.
(A) NAA  (B) Ethylene  (C) Gibberlin  (D) Cytokinin

47. Which of the following forms of phosphate is/are available to the plants?
(A) H₃PO₄  (B) PO₄²⁻  (C) P₂O₅  (D) H₂PO₄⁻

48. Auxin favours female flowers production in which of the following crop?
(A) Cucumber  (B) Brinjal  (C) Cauliflower  (D) Tomato

49. Fertilizers containing all major plant nutrients are called as:
(A) Complete fertilizers  (B) Incomplete fertilizers  (C) Straight fertilizers  (D) Mixed fertilizers

50. The first fertilizer manufacturing company in India was established at ______ city of India.
(A) Ranipet  (B) Ranchi  (C) Faizabad  (D) Vadodara

51. In alkaline soils, most inorganic-P is react with compounds containing ______, and form insoluble-P.
(A) Fe  (B) Al  (C) Ca  (D) Both Fe and Al

52. What multiplication factor is used to convert K to K₂O?
(A) 1.20  (B) 2.20  (C) 2.29  (D) 2.24

53. The discovery of the insecticidal use of the ______ was awarded the Nobel Prize of year 1937.
(A) 2,4 – D  (B) DDT  (C) Pyrethrin  (D) Glyphosate

54. ______ is normally used as anti-transparent.
(A) Auxin  (B) Abscisic acid  (C) Gibberlin  (D) Ethylene

55. The harmful effect of chloride in plant is neutralized by which of the following element?
(A) Nitrogen  (B) Phosphorus  (C) Potash  (D) Sulphur

56. Which of the following an example of carbamate group of insecticide?
(A) Methomyl  (B) Lindane  (C) Parathion  (D) Malathion

57. How much kilogram of CaCO₃ required to compensate the losses of Ca from soils (i.e., equivalent acidity) per 100 kg of urea application to soil?
(A) 110  (B) 60  (C) 80  (D) 93

58. Which of the following is not a specification for fertilizers manufacturing?
(A) Clay percentage  (B) Nutrient percentage  (C) Moisture percentage  (D) filler percentage

59. Which anionic plant micronutrient becomes more available at low pH?
(A) Iron  (B) Chlorine  (C) Boron  (D) Molybdenum

60. Which of following nitrogenous fertilizer produces acidic residual effect in soil?
(A) NH₄NO₃  (B) CaCN₂  (C) Ca(NO₃)₂  (D) NaNO₃
61. **nutrient** is present in soil solution as anion.
   (A) Fe  (B) Mn  (C) Zn  (D) Mo

62. The high analysis fertilizer are contain plant nutrient more than ____ kg/100 kg of fertilizer.
   (A) 40  (B) 20  (C) 30  (D) 10

63. Rotenone is derived from ______ of over 68 plant species.
   (A) Buds  (B) Leaves  (C) Roots  (D) Fruits

64. Conversion of Nitrite to nitrate is mediated by which of following bacteria?
   (A) Nitrosomonas  (B) Nitrobacter  (C) Nitrococcus  (D) Pseudomonas

65. The content of P and K in phosphatic and potassic fertilizer are normally expressed in what form?
   (A) Oxide  (B) Hydroxide  (C) Elemental  (D) Carbonate

66. The region receiving how much rainfall is not suitable for green manuring?
   (A) <25 inches  (B) 35 inches  (C) 45 inches  (D) 50 inches

67. Diammonium phosphate contains ______ %P (not P₂O₅).
   (A) 46  (B) 20  (C) 18  (D) 16

68. Which of the following is an example of synthetic organic fertilizer?
   (A) DAP  (B) Urea  (C) SSP  (D) CAN

69. The most suitable green manuring for problematic soil is ______.
   (A) Cluster bean  (B) Dhaingha  (C) Sunnhemp  (D) Cowpea

70. What form of nitrogen is being normally taken up by sub-merged crops?
   (A) NH₄⁺  (B) NO₃⁻  (C) Elemental N  (D) NO₂⁻

71. Which of the following is not an example of complex fertilizer?
   (A) APS  (B) DAP  (C) AS  (D) KNO₃

72. Which of the following element in excess amount causes deficiencies of Fe and Zn in crops?
   (A) Nitrogen  (B) Phosphorus  (C) Potassium  (D) Calcium

73. %P × ______ = %P₂O₅
   (A) 2.29  (B) 1.19  (C) 2.24  (D) 2.50

74. Which of the following pair is correctly matched?
   (A) Neutral reaction - CAN  (B) Basic reaction - AS  (C) Basic reaction - Urea  (D) Acidic reaction - NaNO₃

75. What is the name used for a manure prepared from the night-soil that is dried and mixed with charcoal, gypsum, etc.
   (A) Sewage sludge  (B) Compost  (C) Poudrette  (D) Activated sludge

76. Which fertilizer nutrient increases protein content in crops?
   (A) Nitrogen  (B) Phosphorus  (C) Potassium  (D) Calcium

77. Fertilizers which come from living things like animal dung, compost, fish and bone meals are called as:
   (A) Organic fertilizers  (B) Complex fertilizers  (C) Inorganic fertilizers  (D) Synthetic fertilizers

78. Plant absorbs sulphur in ______ form.
   (A) elemental S  (B) SO₂⁻  (C) SO₃⁻  (D) SO₄²⁻

79. The following reaction illustrates the final step of which process?
   2NO₃⁻ + O₂ → Nitrobacter bacteria → 2NO₂⁻ + 18 KCal
   (A) Denitrification  (B) Immobilization  (C) Ammonification  (D) Nitrification

80. If nitrogen fertilizer is incorporated instead of left on the soil surface, the loss of nitrogen by which of the following processes can be expected to be reduced?
   (A) Leaching  (B) Immobilization by clay minerals  (C) Volatilization of nitrate via denitrification  (D) Volatilization of ammonia
1. The sigatoka disease of banana increase with _______ plant spacing.
   A. More
   B. Closer
   C. Wider
   D. None of the above

2. _______ disease of grape is also known as Bird’s eye spot.
   A. Anthracnose
   B. Powdery mildew
   C. Downy mildew
   D. Bacterial blight

3. Discovery of Bordeaux mixture is associated with _______ disease.
   A. Downy mildew of grape
   B. Early blight of potato
   C. Late blight of potato
   D. Powdery mildew of grape

4. The primary source of inoculum of Phytophthora sp. is _______.
   A. Zygospore
   B. Oospore
   C. Ascospore
   D. Sclerotia

5. Vein flecking in young leaves and stem pitting are characteristic symptoms of _______.
   A. Citrus gummosis
   B. Citrus tristeza
   C. Citrus greening
   D. Citrus canker

6. 100 ppm = _______ gm/lit water.
   A. 0.1 gm
   B. 0.01 gm
   C. 1 gm
   D. 10 gm

7. Damping off diseases is favoured by _______ soil moisture.
   A. Low
   B. Medium
   C. Dry
   D. High

8. Chrysanthemum stunt disease is caused by _______.
   A. Nematode
   B. Bacteria
   C. Viriod
   D. Virus

9. The pathogen of apple scab disease overwinters in leaves by forming _______.
   A. Pseudothecia
   B. Cleistothecia
   C. Perithecia
   D. Apothecia

10. _______ pest helps in transmission of purple blotch disease of onion.
    A. Aphid
    B. Jassid
    C. Thrips
    D. White fly
11. Symptoms of leafy outgrowths on the under surface of tomato leaves due to infection of leaf curl virus is known as ___________.
   A. Abscission  B. Enations  C. Sarcody  D. Flecking

12. Each ascus normally contains ________ number of ascospores.
   A. Two  B. Four  C. Eight  D. Six

13. Red scale onions are resistant to ________ disease.
   A. Purple blotch  B. Smut  C. Downy mildew  D. Smudge

14. The mycelium of *Leveillula taurica* is ________.
   A. Paraphylic  B. Endophytic  C. Ectophytic

15. Coffee rust is caused by ________.
   A. *Uromyces hobsoni*  B. *Hemileia vastatrix*  C. *Cronartium ribicola*

16. Ridomil-MZ is a fungicide consists of ________.
   A. Metalaxyl  B. Mancozeb  C. Metalaxyl and Mancozeb

17. The term ‘Phytophthora’ means ________.
   A. Root rot  B. Plant destroyer  C. Phytonlike

18. The red rust disease of tea is caused by ________.
   A. Fungi  B. Bacteria  C. Algae

19. Bunchy top of banana was introduced in India from ________ country.
   A. Fiji  B. Cuba  C. Sri Lanka  D. Brazil

20. Pathogen causing bean anthracnose perpetuates in infected seed and debris by forming ________.
   A. Acervuli  B. Pycnidia  C. Perithecia

21. ________ variety of banana is most susceptible for panama disease.
   A. Basrai  B. Poovan  C. Gros Michel  D. Gaint cavendish

22. The species name of apple scab causing pathogen *Venturia inequalis* is given due to ________.
   A. Unequal size of 2-celled ascospores  B. Even size of 2-celled ascospores  C. Two different shape of spots on leaves  D. Two different type symptoms

23. The phytoplasmal diseases are mainly transmitted by hoppers due to ________.
   A. Phytoplasma resides in phloem tissue & hoppers are phloem feeder  B. Phytoplasma resides in xylem tissue & hoppers are phloem feeder  C. Phytoplasma resides in phloem tissue & hoppers are xylem feeder  D. Phytoplasma resides in xylem tissue & hoppers are xylem feeder

24. Select the wrong pair:
   A. Hypertrophy: abnormal increase in size of organ  B. Atrophy: inhibition of growth or dwarfing
   C. Hypotrophy: abnormal increase in number of cells of the organ  D. Hyperplasia: abnormal increase in number of cells of the organ
   A. Potash  B. Nitrogen  C. Sulphur  D. Phosphorous

26. Which of the following apple disease is having characteristic symptoms like olive green to grey coloured velvety spots on sepalas and young leaves, later turning to metallic black?
   A. Fire blight  B. Twig blight  C. Powdery mildew  D. Scab

27. Brown ring in potato tuber is characteristic symptoms of _________ disease.
   A. Common scab  B. Bacterial wilt  C. Black scurf  D. PhosPhorous

28. Consider the following processes on host plant occurring during pathogenesis.
   (1) Landing of Inoculum  (2) Penetration  (3) Germination  (4) Recognition  (5) Establishment and sporulation
   A. 1,2,3,4,5  B. 1,3,2,4,5  C. 2,3,1,5,4  D. 4,1,2,3,5

29. Which disease has taken historical citation due to famine in Ireland during 1845?
   A. Early blight of potato  B. Late blight of tomato  C. Early blight of tomato  D. None of the above

30. Paecilomyces lilacinus, a bio-agent is used for the management of _______.
   A. Fungi  B. Bacteria  C. Nematodes  D. Algae

31. Stem canker of Guava is caused by _________.
   A. Colletotricum psidii  B. Puccinia psidii  C. Fusarium oxysporum  D. Physalospora psidii

32. Which of following bioagent is used for management of wilt of cumin?
   A. Metarrhizium anisopliae  B. Trichoderma harzianum  C. Beauveria bassiana  D. Verticillium lecani

33. Which chemical is recommended for the management of mango malformation?
   A. IAA  B. Cytokinin  C. NAA  D. IBA

34. Spraying of urea on fallen leaves is effective for management of _______ disease.
   A. Powdery mildew of Apple  B. Fire blight of Apple  C. Apple scab  D. None of the above

35. Bunchy top disease of banana is transmitted by _________.
   A. Aphis gossypit  B. Pentalonia nigronervosa  C. Myzus persicae  D. Aphis medicaginis

36. Primary source of inoculum for ber powdery mildew is _________.
   A. Bud wood  B. Fruits  C. Leaves  D. Root

37. Deep reddish brown ooze exuding through cracks formed in coconut trunk is characteristic symptoms of _______ disease.
   A. Bud rot  B. Wilt  C. Stem bleeding  D. Root rot

38. Partial phanerogamic stem parasite of mango is _________.
   A. Orobanche sp.  B. Cuscutta sp.  C. Striga sp.  D. Dendrophthoe sp.
39. Which type of asexual fructification is observed on fruit rot of Brinjal?
   A. Pycnidia  B. Sclerotia  C. Acervuli  D. Stroma

40. Which vector is responsible for transmission of little leaf of brinjal?
   A. Myzus persicae  B. Hishimonas phycitis  C. Aceria cajani  D. Bemisia tabaci

41. Which of the following pathogen is responsible for causing powdery mildew disease of grape?
   A. Plasmopara viticola  B. Erysiphe polygoni  C. Uncinula necator  D. Sphaerotheca pannosa

42. Total destruction of citrus orchards was done in Florida state of USA for the eradication of ________ disease.
   A. Citrus Gummosis  B. Citrus tristeza  C. Citrus Canker  D. None of the above

43. Fire blight of apple pathogen is transmitted by ________.
   A. Weeds  B. Fungi  C. Insects  D. Nematodes

44. Slightly raised oily brown spots on pomegranate leaf and fruit are produced by ________.
   A. Cercospora punicae  B. Xanthomonas punicae  C. Alternaria alternate  D. Colletotrichum gloesporioides

45. Which pathogen of grapes caused heavy losses to wine industry in France due to its epidemics in 1875?
   A. Phytophthora infestans  B. Plasmopara viticola  C. Helminthosporium oryzae  D. Uncinula necator

46. Which of the following fungicidal group is having anti-bacterial properties?
   A. Copper  B. Sulphur  C. Triazole  D. Acylalanine

47. In leaf curl of papaya, cupping of leaves occurs in ________.
   A. Upward direction  B. Downward direction  C. In both direction  D. None of the above

48. Dusting with sulphur powder of ________ mesh size is effective against powdery mildew disease.
   A. 100 mesh size  B. 200 mesh size  C. 300 mesh size  D. 400 mesh size

49. Oomycetes fungi can be managed by application of ________.
   A. Triazoles  B. Imazalil  C. Oxathins  D. Metalaxyl MZ

50. Which stage of Meloidogyne incognita cause infection to solanaceous host?
   A. 1st stage larvae (J₁)  B. 2nd stage larvae (J₂)  C. 3rd stage larvae (J₃)  D. Mature larvae (J₄)

51. For soil solarization, ________ μm thick LLDPE (Low linear density) polyethylene is used.
   A. 1 μm  B. 20-25 μm  C. 100 μm  D. 200-250 μm

52. Yellow networking of veins in green lamina is the characteristic symptoms of ________ disease.
   A. Leaf curl of chilli  B. Leaf blight of tomato  C. Little leaf of brinjal  D. Bhendi yellow vein mosaic
53. Which type of soil is most favourable for root-knot nematode?
A. Heavy black soil  B. Sandy soil
C. Clay soil  D. Calcareous soil

54. White spots appear on upper surface of the leaf and turn ashy gray in later stage is a characteristic symptoms of disease.
A. Powdery mildew  B. White rust
C. Downy mildew  D. Blister blight

55. *Diplodia rosarum* causes disease in rose.
A. Rust  B. Powdery mildew
C. Wilt  D. Die back

56. Most of the banana diseases are disseminated in new areas through_______.
A. Soil  B. Suckers
C. Air  D. Fruits

57. The powdery mildew disease of clusterbean is caused by_______.
A. *Podosphaera leucotricha*  B. *Plasmopara viticola*
C. *Leveillula taurica*  D. *Uncinula necator*

58. Garlic mosaic disease is transmitted by_______.
A. *Myzus persicae*  B. *Aphis gossypii*
C. Both A & B  D. *Bemisia tabaci*

59. Common scab of potato is caused by_______.
A. *Streptomuces griseus*  B. *Streptomuces flaveolus*
C. *Streptomuces aureofaciens*  D. *Streptomuces scabies*

60. *Oidium mangiferæ* survives during off-season as_______.
A. Cleistothecia in malformed panicles  B. Dormant mycelium in malformed panicles
C. Both A & B  D. None of the above

61. Management through cross protection technique is effective against_______ disease.
A. Citrus Gummosis  B. Citrus tristeza
C. Citrus Canker  D. None of the above

62. The restricted movement of planting materials of banana from Gujarat and Maharashtra state to other parts of the country is due to________ disease.
A. Banana bunchy top disease  B. Panama wilt of banana
C. Moko wilt of banana  D. Banana mosaic disease

63. *Phytophthora palmivora* is a causal organism of_______ disease.
A. Coconut bud rot  B. Coconut wilt
C. Coconut stem bleeding  D. Cadang cadang of coconut

64. The disintegration of internal tissue and honey comb appearance and toppling down of plant is a characteristic symptoms of_______ disease.
A. Banana sigatoka  B. Moko disease of banana
C. Stem rot of papaya  D. Anthracnose of mango

65. The trade name of Tilt is_______.
A. Difenconazole  B. Propiconazole
C. Hexaconazole  D. Penconazole

66. Symptoms of cracking of berries skin are common in_______ disease of grape.
A. Powdery mildew  B. Downy mildew
C. Anthracnose  D. Grey mold
67. Perfect stage of phomopsis blight of brinjal is _______.
   A. Diporthe vexans  
   B. Phomopsis vexans  
   C. Exobasidium vexans  
   D. Magnaporthe grisea  

68. Root-knot nematode infection is causing complex with _______ pathogen.
   A. Alternaria sp.  
   B. Cercospora sp.  
   C. Fusarium sp.  

69. Select the wrong pair from the following:
   A. Sapota leaf spot: Phavophloeospora indica  
   B. Coffee Rust: Hemelia vastatris  
   C. Damping off of fennel: Rhizoctonia solani  
   D. Blister blight of tea: Uncinula nector  

70. Alternaria blight of cumin was first time reported by _______ in Kheda district.
   A. M. K. Patel  
   B. B. N. Uppal  
   C. E. J. Butler  
   D. M. V. Desai  

71. Bacterial blight of cluster bean can be managed by hot water treatment of seeds at _______.
   A. 40 °C for 10 min  
   B. 60 °C for 20 min  
   C. 70 °C for 10 min  
   D. 56 °C for 10 min  

72. Which is the cheapest method of disease management?
   A. Cultural practices  
   B. Timely fungicidal spray  
   C. Resistant variety  
   D. Disease free seed  

73. Which month is most suitable for soil solarization for the management of soil borne diseases?
   A. April-May  
   B. July-August  
   C. September-October  
   D. January-February  

74. Moko disease of banana is caused by _______.
   A. Cercospora musae  
   B. Fusarium oxysporum  
   C. Burkholderia solanacearum  
   D. Alternaria cubensis  

75. Seed plot technique is adopted to produce disease free seeds of potato for _______.
   A. Early blight  
   B. Late blight  
   C. Brown rot  
   D. Viral diseases  

76. Citrus Tristeza virus is transmitted through _______.
   A. Toxoptera citricida  
   B. Cuscuta reflexa  
   C. Tools & implements  
   D. All of the above  

77. Common scab disease of potato favours _______ conditions.
   A. High Soil pH & Low soil temperature  
   B. Less Soil pH & Low soil temperature  
   C. Less Soil pH & High soil temperature  
   D. High Soil pH & High soil temperature  

78. Stem gall of coriander is caused by _______.
   A. Protomyces macrosporus  
   B. Venturia inequalis  
   C. Exobasidium vexans  
   D. Macrophomina phaseolina  

79. Fire blight of apple for the first time reported by _______.
   A. E. J. Butler  
   B. E. F. Smith  
   C. T. J. Burrill  
   D. Beinrinck  

80. Papaya ring spot virus is transmitted by _______.
   A. Bemisia tabaci  
   B. Empoasca devastans  
   C. Aceria cajani  
   D. None of the above
Q.1 Mention causal organism and describe characteristic symptoms of the following diseases (ANY FIVE).
1. Sigatoka disease of banana
2. Foot rot of papaya
3. Purple blotch of onion
4. Little leaf of brinjal
5. Powdery mildew of rose
6. Yellow vein mosaic of okra
7. Mango malformation.

Q.2 Write causal organism, favourable conditions and disease cycle of the following diseases (ANY FIVE).
1. Late blight of potato
2. Downy mildew of cucurbits
3. Cumin wilt
4. Bacterial blight of pomegranate
5. Powdery mildew of ber
6. Citrus gummosis
7. Anthracnose of beans.

Q.3 Write the causal organism and suggest suitable management strategies of the following diseases (ANY FIVE).
1. Apple scab
2. Cumin blight
3. Wilt of guava
4. Alternaria leaf blight of marigold
5. Leaf curl of chilli
6. Powdery mildew of fennel
7. Citrus canker.

Q.4 (A) Write the perfect stage of the following pathogens.
1. Oidium
2. Phomopsis
3. Cercospora

(B) Give scientific reason of the following.
1. Urea @ 5% is recommended for the management of apple scab disease.
2. Sulphur dust is not recommended for management of cucumber powdery mildew.
3. Soil application of gypsum is recommended for the management of potato common scab disease.
4. Systemic insecticides are recommended for the management of viral diseases.

(C) Differentiate the following (ANY THREE).
1. Late blight v/s Early blight of potato
2. Moko disease v/s Panama disease of banana
3. Powdery mildew v/s Downy mildew of grapevine
**AGRICULTURAL UNIVERSITIES OF GUJARAT**

1. Anand Agricultural University, Anand  
2. Junagadh Agricultural University, Junagadh  
3. Navsari Agricultural University, Navsari  
4. S. D. Agricultural University, Sardarkrushinagar

**Sixth Semester End Examination of B. Sc. (Hons.) Agriculture (Regular): 2016-17**

**Ag. Ento. 6.4: Pests of Horticultural Crops and their Management (1+1)**

**Date:** 24-06-2017  
**Time:** 09.30-12.00 hrs.  
**Day:** Saturday  
**Total Marks:** 80.00

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**Part A: Objective**

<table>
<thead>
<tr>
<th>Note: Write the correct option A /B /C /D in CAPITAL LETTERS ONLY in provided answer sheet</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. “Shot hole” like symptom in radish is due to_________</td>
</tr>
<tr>
<td>A. Red pumpkin beetle</td>
</tr>
<tr>
<td>C. Flea beetle</td>
</tr>
<tr>
<td>2. <em>Nephopteryx eugraphella</em> is a pest of_________</td>
</tr>
<tr>
<td>A. Guava</td>
</tr>
<tr>
<td>C. Citrus</td>
</tr>
<tr>
<td>3. Adult abdomen remains upward position at the time of resting.</td>
</tr>
<tr>
<td>A. Psylla</td>
</tr>
<tr>
<td>C. Aphid</td>
</tr>
<tr>
<td>4. Which one of the following pair is CORRECT in terms of pupation site?</td>
</tr>
<tr>
<td>A. Ber fruit fly - Inside stem</td>
</tr>
<tr>
<td>C. Lemon butterfly - Inside soil</td>
</tr>
<tr>
<td>5. The insect feeds on leaves, shoots, buds and mainly on fruits of custard apple by sucking the cell sap is_________.</td>
</tr>
<tr>
<td>A. Fruit borer</td>
</tr>
<tr>
<td>C. Fruit fly</td>
</tr>
<tr>
<td>6. Weevils are small, bluish black in colour with reddish brown prothorax having pointed snout and resemble to ants.</td>
</tr>
<tr>
<td>A. Banana pseudostem weevil</td>
</tr>
<tr>
<td>C. Sweet potato weevil</td>
</tr>
<tr>
<td>7. The caterpillar infesting fruit by feeding inside and riddling the ripening seeds of pomegranate is_________.</td>
</tr>
<tr>
<td>A. Anar butterfly</td>
</tr>
<tr>
<td>C. Fruit sucking moth</td>
</tr>
<tr>
<td>8. Which one of the following pair is INCORRECT in terms of host plant?</td>
</tr>
<tr>
<td>A. <em>Helicoverpa</em> - Tomato</td>
</tr>
<tr>
<td>C. <em>Bactrocera dorsalis</em> - Guava</td>
</tr>
<tr>
<td>9. Prompt cutting of drooped shoots in brinjal is advisable for the management of_________.</td>
</tr>
<tr>
<td>A. <em>Leucinodes orbonalis</em></td>
</tr>
<tr>
<td>C. <em>E. vitella</em></td>
</tr>
<tr>
<td>10. Scientific name of eriophyid mite is_________.</td>
</tr>
<tr>
<td>A. <em>Rhynehophorus ferrugineus</em></td>
</tr>
<tr>
<td>C. <em>Opisina arenosella</em></td>
</tr>
</tbody>
</table>
11. Red coloured adults and nymphs found on lower surface of okra leaves, sucking the cell sap and cause webbing are ________.
   | A. Red spider mites | B. Broad mites |
   | C. Eriophyid mites | D. False spider mites |

12. Formation of gall like structure on aonla twig is due to ________.
   | A. Apical twig gall maker | B. Leaf roller |
   | C. Bark eating caterpillar | D. None of these |

13. “Dead heart” in turmeric is caused by ________.
   | A. Shoot borer | B. Leaf roller |
   | C. Leaf beetle | D. None of these |

14. Trapping of adult with splits of banana stem during nights is advisable to manage ________.
   | A. *Spodoptera litura* | B. Psuedostem weevil |
   | C. Thrips | D. Aphid |

15. Larva feeds on the leaflets reducing them into papery structures
   | A. Drumstick hairy caterpillar | B. Drumstick pod fly |
   | C. Drumstick leaf eating caterpillar | D. Drumstick bud worm |

16. Larval parasitoid, *Goniozus nepanthidis* is the most effective in controlling the ________.
   | A. Rhinoceros beetle | B. Red palm weevil |
   | C. Bark weevil | D. Black headed caterpillar |

17. First instar larvae of ________ is look like a bird dropping.
   | A. Citrus psylla | B. Whitefly |
   | C. Lemon butterfly | D. Fruit sucking moth |

18. The family of coconut red palm weevil is ________.
   | A. Curculionidae | B. Pyralidae |
   | C. Chrysomelidae | D. Coccinellidae |

19. Citrus leaf miner encourages the development of ________.
   | A. Greening disease | B. Tristeza disease |
   | C. Canker disease | D. None of these |

20. Application of *Metarhizium anisopliae* fungus to FYM pit kills the grub of ________.
   | A. Red palm weevil | B. Rhinoceros beetle |
   | C. Black headed caterpillar | D. Bark weevil |

21. Larvae are pinkish in colour with three dorso-lateral brown stripes on thorax and generally make hole on the basal portion of sapota buds ________.
   | A. Chiku bud borer | B. Chiku margin folder |
   | C. Chiku seed borer | D. Chiku moth |

22. Brown colour patches, longitudinal fissures and splits on outer surface of the coconut husk is due to ________.
   | A. Red palm weevil | B. Black headed caterpillar |
   | C. Eriophyid mite | D. Rhinoceros beetle |

23. Which of the following non insect pest is damaging to the coconut?
   | A. Eriophyid mite | B. Squirrel |
   | C. Rat | D. All of these |
24. Adult is large with very long antennae and short thick spine like projection on either side of the thorax whereas full grown grub measure about 10 cm in length, fleshy and stout with well-defined segmentation.

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<table>
<thead>
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<tbody>
<tr>
<td>A</td>
<td>Mango nut weevil</td>
</tr>
<tr>
<td>B</td>
<td>Mango stem borer</td>
</tr>
<tr>
<td>C</td>
<td>Mango shoot borer</td>
</tr>
<tr>
<td>D</td>
<td>Mango fruit borer</td>
</tr>
</tbody>
</table>

25. Application of persistent insecticides on the mango trunk during off season is advised for the management of

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<tbody>
<tr>
<td>A</td>
<td>Mango hopper</td>
</tr>
<tr>
<td>B</td>
<td>Stem borer</td>
</tr>
<tr>
<td>C</td>
<td>Mealy bug</td>
</tr>
<tr>
<td>D</td>
<td>Fruit fly</td>
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</tbody>
</table>

26. Caterpillars bore into the guava trunk/branches make zig-zag galleries and presence of gallery made out of silk and frass is the key symptom of

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<tbody>
<tr>
<td>A</td>
<td>Stem borer</td>
</tr>
<tr>
<td>B</td>
<td>Bark eating caterpillar</td>
</tr>
<tr>
<td>C</td>
<td>Stone weevil</td>
</tr>
<tr>
<td>D</td>
<td>All of these</td>
</tr>
</tbody>
</table>

27. causes irritation during harvest and is a nuisance in orchard crops.

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<table>
<thead>
<tr>
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<tbody>
<tr>
<td>A</td>
<td>Leaf webber</td>
</tr>
<tr>
<td>B</td>
<td>Leaf twisting weevil</td>
</tr>
<tr>
<td>C</td>
<td>Termite</td>
</tr>
<tr>
<td>D</td>
<td>Red tree ant</td>
</tr>
</tbody>
</table>

28. Which one of the following pair is CORRECT?

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
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<tbody>
<tr>
<td>A</td>
<td>Pomegranate: <em>Aphis punicæ</em></td>
</tr>
<tr>
<td>B</td>
<td>Citrus: <em>Pentalonia nigronervosa</em></td>
</tr>
<tr>
<td>C</td>
<td>Tomato: <em>Aphis craccivora</em></td>
</tr>
<tr>
<td>D</td>
<td>Okra: <em>Toxoptera Spp.</em></td>
</tr>
</tbody>
</table>

29. Release of larval parasitoid, *Cotesia plutella* is to reduce the damage of

<p>| | |</p>
<table>
<thead>
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<tbody>
<tr>
<td>A</td>
<td>Leaf webber</td>
</tr>
<tr>
<td>B</td>
<td>Diamond back moth</td>
</tr>
<tr>
<td>C</td>
<td>Semilooper</td>
</tr>
<tr>
<td>D</td>
<td>None of these</td>
</tr>
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</table>

30. A larva damages to the coconut leaves. It has greenish brown to dark brown head and prothorax with reddish mesothorax and brown stripes

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<tbody>
<tr>
<td>A</td>
<td>Red palm weevil</td>
</tr>
<tr>
<td>B</td>
<td>Rhinoceros beetle</td>
</tr>
<tr>
<td>C</td>
<td>Eriophyid mite</td>
</tr>
<tr>
<td>D</td>
<td>Black headed caterpillar</td>
</tr>
</tbody>
</table>

31. Banana bunchy top is transmitted by

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<thead>
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<tbody>
<tr>
<td>A</td>
<td><em>Brevicoryne brassicae</em></td>
</tr>
<tr>
<td>B</td>
<td><em>Pentalonia nigronervosa</em></td>
</tr>
<tr>
<td>C</td>
<td><em>Aphis gossypii</em></td>
</tr>
<tr>
<td>D</td>
<td><em>Rhopalosiphum maidis</em></td>
</tr>
</tbody>
</table>

32. Mango gall midge belongs to order

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<table>
<thead>
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</thead>
<tbody>
<tr>
<td>A</td>
<td>Diptera</td>
</tr>
<tr>
<td>B</td>
<td>Lepidoptera</td>
</tr>
<tr>
<td>C</td>
<td>Coleoptera</td>
</tr>
<tr>
<td>D</td>
<td>Hemiptera</td>
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</tbody>
</table>

33. The presence of small holes in collar region, gummosis and extrusion of chewed up fibers with excreta in cashewnut is symptoms of

<p>| | |</p>
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<tbody>
<tr>
<td>A</td>
<td>Tea mosquito bug</td>
</tr>
<tr>
<td>B</td>
<td>Stem and root borer</td>
</tr>
<tr>
<td>C</td>
<td>Fruit and nut borer</td>
</tr>
<tr>
<td>D</td>
<td>None of these</td>
</tr>
</tbody>
</table>

34. Forewing of the adult moth is pale with a wedge shaped green band in the middle

<p>| | |</p>
<table>
<thead>
<tr>
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<tbody>
<tr>
<td>A</td>
<td>Okra shoot and fruit borer</td>
</tr>
<tr>
<td>B</td>
<td>Brinjal shoot and fruit borer</td>
</tr>
<tr>
<td>C</td>
<td>Fruit borer</td>
</tr>
<tr>
<td>D</td>
<td>Leaf folder</td>
</tr>
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</table>

35. Spider mite can be managed by

<p>| | |</p>
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<thead>
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<tbody>
<tr>
<td>A</td>
<td>Propargite 57 EC</td>
</tr>
<tr>
<td>B</td>
<td>Quinalphos 25 EC</td>
</tr>
<tr>
<td>C</td>
<td>Spiromesifen 22.9 SC</td>
</tr>
<tr>
<td>D</td>
<td>Both A and C</td>
</tr>
</tbody>
</table>

36. Rusty reddish discoloration on the banana fingers with rusty growth over fruits and yellowing of leaves due to damage caused by

<p>| | |</p>
<table>
<thead>
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</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td><em>Spodoptera litura</em></td>
</tr>
<tr>
<td>B</td>
<td>Thrips</td>
</tr>
<tr>
<td>C</td>
<td>Aphid</td>
</tr>
<tr>
<td>D</td>
<td>Banana rhizome weevil</td>
</tr>
</tbody>
</table>
37. Adult butterfly is medium sized, glossy bluish violet (male) to brownish violet (female) in colour with an orange patch on forewing.

<table>
<thead>
<tr>
<th>A. Anar butterfly</th>
<th>B. Fruit sucking moth</th>
</tr>
</thead>
<tbody>
<tr>
<td>C. Sapota semilooper</td>
<td>D. Chiku moth</td>
</tr>
</tbody>
</table>

38. Which one of the following pair is CORRECT in terms of hibernating stage?

<table>
<thead>
<tr>
<th>A. Mango mealy bug - Adult</th>
<th>B. White grub – Adult</th>
</tr>
</thead>
<tbody>
<tr>
<td>C. Fruit fly - Maggot</td>
<td>D. DBM - Adult</td>
</tr>
</tbody>
</table>

39. Which pest is the vector of citrus greening disease?

<table>
<thead>
<tr>
<th>A. Citrus leaf miner</th>
<th>B. Citrus psylla</th>
</tr>
</thead>
<tbody>
<tr>
<td>C. Citrus whitefly</td>
<td>D. Citrus aphid</td>
</tr>
</tbody>
</table>

40. Fallen fruits in mango, sapota and guava orchard serve as breeding site for

<table>
<thead>
<tr>
<th>A. Bark eating caterpillar</th>
<th>B. Frugivorous birds</th>
</tr>
</thead>
<tbody>
<tr>
<td>C. Fruit fly</td>
<td>D. Mealy bug</td>
</tr>
</tbody>
</table>

41. Aggregation pheromone trap is used to attract the adults of

<table>
<thead>
<tr>
<th>A. Coconut rhinoceros beetle</th>
<th>B. Chiku moth</th>
</tr>
</thead>
<tbody>
<tr>
<td>C. Fruit fly</td>
<td>D. Fruit sucking moth</td>
</tr>
</tbody>
</table>

42. is the vector of okra yellow vein mosaic virus

<table>
<thead>
<tr>
<th>A. Aphid</th>
<th>B. Thrips</th>
</tr>
</thead>
<tbody>
<tr>
<td>C. Jassid</td>
<td>D. Whitefly</td>
</tr>
</tbody>
</table>

43. Which one of the following pair is INCORRECT in terms of damaging stage?

<table>
<thead>
<tr>
<th>A. Epilachna beetle – Grub &amp; Adult</th>
<th>B. Spodoptera - Adult</th>
</tr>
</thead>
<tbody>
<tr>
<td>C. Red spider mite – Nymph &amp; Adult</td>
<td>D. Onion maggot - maggot</td>
</tr>
</tbody>
</table>

44. Females are apterus, long and slender covered with white waxy secretion, pair of waxy filaments and males are wingless.

<table>
<thead>
<tr>
<th>A. Jassids</th>
<th>B. Aphids</th>
</tr>
</thead>
<tbody>
<tr>
<td>C. Mealy bug</td>
<td>D. Psylla</td>
</tr>
</tbody>
</table>

45. Maggots bore inside the leaf tissues and feed within, resulting in formation of small raised wart like structure on the leaves.

<table>
<thead>
<tr>
<th>A. Mango leaf gall midge</th>
<th>B. Mango leaf weevil</th>
</tr>
</thead>
<tbody>
<tr>
<td>C. Mango leaf miner</td>
<td>D. Mango shoot borer</td>
</tr>
</tbody>
</table>

46. adult is found damaging to the tomato fruits.

<table>
<thead>
<tr>
<th>A. White grub</th>
<th>B. Til sphinx moth</th>
</tr>
</thead>
<tbody>
<tr>
<td>C. Fruit sucking moth</td>
<td>D. Chiku moth</td>
</tr>
</tbody>
</table>

47. Deformity of bitter guard fruits with gummy secretion at the site of oviposition injury and gives the indication of the infestation due to

<table>
<thead>
<tr>
<th>A. Melon fruit fly</th>
<th>B. Pea stem fly</th>
</tr>
</thead>
<tbody>
<tr>
<td>C. Mustard sawfly</td>
<td>D. Orchard fruit fly</td>
</tr>
</tbody>
</table>

48. Forewings are mottled with grey brown while hindwings are orange or yellowish with marginal dark band mixed with white spots and a prominent black spot on the middle are the key marks of identification of

<table>
<thead>
<tr>
<th>A. Otheris fullonica</th>
<th>B. Diaphorina citri</th>
</tr>
</thead>
<tbody>
<tr>
<td>C. Otheris materna</td>
<td>D. Dialeurodes citri</td>
</tr>
</tbody>
</table>

49. Coleopteran beetles are spherical, pale brown and mottled black spots while grubs are yellowish in colour and having stout hairs.

<table>
<thead>
<tr>
<th>A. Flower beetle</th>
<th>B. Epilachna beetle</th>
</tr>
</thead>
<tbody>
<tr>
<td>C. Rhinoceros beetle</td>
<td>D. Pumpkin beetle</td>
</tr>
</tbody>
</table>

50. Downward curling of chilli leaves look like inverted boat shape is a characteristic symptom of

<table>
<thead>
<tr>
<th>A. Jassid</th>
<th>B. Aphid</th>
</tr>
</thead>
<tbody>
<tr>
<td>C. Broad mite</td>
<td>D. Thrips</td>
</tr>
</tbody>
</table>

Page 4 of 6
<table>
<thead>
<tr>
<th>Question</th>
<th>Options</th>
</tr>
</thead>
<tbody>
<tr>
<td>51. Tomato spotted wilt virus is transmitted by</td>
<td>A. Thrips</td>
</tr>
<tr>
<td>52. <em>Philocnisiis citrella</em> belong to order</td>
<td>A. Diptera</td>
</tr>
<tr>
<td>53. Tristeza virus disease in citrus is transmitted by</td>
<td>A. <em>Dialeurodes citri</em></td>
</tr>
<tr>
<td>54. Geometrical cutting on coconut fronds is due to</td>
<td>A. Rhinoceros beetle</td>
</tr>
<tr>
<td>55. Which one of the following pair is INCORRECT?</td>
<td>A. Epilachna beetle - Coccinellidae</td>
</tr>
<tr>
<td>56. Which one is the trap crop for tomato fruit borer, <em>H. armigera</em>?</td>
<td>A. Brinjal</td>
</tr>
<tr>
<td>57. Cosmolure is used for the management of</td>
<td>A. Banana pseudostem weevil</td>
</tr>
<tr>
<td>58. Drying of mango inflorescence and shedding of flowers occurs due to</td>
<td>A. Mango hopper</td>
</tr>
<tr>
<td>59. Which one of the following pair is INCORRECT in terms of egg laying?</td>
<td>A. <em>Spodoptera litura</em> - On leaves</td>
</tr>
<tr>
<td>60. Root feeding technique is effective against</td>
<td>A. Eriophyid mite</td>
</tr>
<tr>
<td>61. Fallen citrus fruit with feeding punctures is a damage symptom of</td>
<td>A. Mealy bug</td>
</tr>
<tr>
<td>62. Little leaf disease in brinjal is transmitted by</td>
<td>A. Aphids</td>
</tr>
<tr>
<td>63. Which one of the following pair is CORRECT in terms of egg laying site?</td>
<td>A. Guava fruit fly - Inside fruit</td>
</tr>
<tr>
<td>64. <em>Tuta absoluta</em> belongs to order</td>
<td>A. Lepidoptera</td>
</tr>
<tr>
<td>65. Which one of the following pair is CORRECT in terms of host plant?</td>
<td>A. Banana: <em>Drosicha mangiferae</em></td>
</tr>
<tr>
<td>66. Pomegranate butterfly laid eggs on/underside</td>
<td>A. Calyx</td>
</tr>
</tbody>
</table>
67. "Feigning death" behavior of larva is observed in case of

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<thead>
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</thead>
<tbody>
<tr>
<td>A. Fruit fly</td>
<td>B. Lemon butterfly</td>
</tr>
<tr>
<td>C. Sawfly</td>
<td>D. Diamond back moth</td>
</tr>
</tbody>
</table>

68. The larva of ___ cuts the stem nearly to the soil region and feeds on tender leaves of potato during night.

<p>| | |</p>
<table>
<thead>
<tr>
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</tr>
</thead>
<tbody>
<tr>
<td>A. Sweet potato weevil</td>
<td>B. Spodoptera litura</td>
</tr>
<tr>
<td>C. Potato tuber moth</td>
<td>D. Potato cut worm</td>
</tr>
</tbody>
</table>

69. Bronze colour appearance of okra leaves with downward curling is the damaging symptoms of ___

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<table>
<thead>
<tr>
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</thead>
<tbody>
<tr>
<td>A. Jassids</td>
<td>B. Aphids</td>
</tr>
<tr>
<td>C. Thrips</td>
<td>D. Mites</td>
</tr>
</tbody>
</table>

70. Moth is greyish brown with three white triangular spots on inner margin of forewings and appears like a diamond pattern in resting position.

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<table>
<thead>
<tr>
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</thead>
<tbody>
<tr>
<td>A. Earias vittella</td>
<td>B. Spodoptera litura</td>
</tr>
<tr>
<td>C. Plutella xylostella</td>
<td>D. Helicoverpa armigera</td>
</tr>
</tbody>
</table>

71. Cotton and okra are hosts of ___ pest.

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<table>
<thead>
<tr>
<th></th>
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</thead>
<tbody>
<tr>
<td>A. Plutella xylostella</td>
<td>B. Earias vittella</td>
</tr>
<tr>
<td>C. Bactrocera dorsalis</td>
<td>D. Leucinodes orbonalis</td>
</tr>
</tbody>
</table>

72. Noorda moringae is the pest of ___

<p>| | |</p>
<table>
<thead>
<tr>
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</thead>
<tbody>
<tr>
<td>A. Mango</td>
<td>B. Drum stick</td>
</tr>
<tr>
<td>C. Sapota</td>
<td>D. Pomegranate</td>
</tr>
</tbody>
</table>

73. Incidence of ___ is severe in sandy and sandy-loam soils.

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<table>
<thead>
<tr>
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</thead>
<tbody>
<tr>
<td>A. Whitefly</td>
<td>B. Mealy bug</td>
</tr>
<tr>
<td>C. Termite</td>
<td>D. Aphid</td>
</tr>
</tbody>
</table>

74. Which one of the following pair is CORRECT?

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<table>
<thead>
<tr>
<th></th>
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</thead>
<tbody>
<tr>
<td>A. Mustard aphid - Aphis craccivora</td>
<td>B. Semilooper – Helulsa undalis</td>
</tr>
<tr>
<td>C. Cabbage butterfly - Pieris brassicae</td>
<td>D. Head borer – Trichoplusia ni</td>
</tr>
</tbody>
</table>

75. Black larva with red white spots feeds on spider lily leaves and its adult is brown with yellow and red markings.

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<table>
<thead>
<tr>
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</thead>
<tbody>
<tr>
<td>A. Cut worm</td>
<td>B. Lily leaf caterpillar</td>
</tr>
<tr>
<td>C. Leaf miner</td>
<td>D. None of these</td>
</tr>
</tbody>
</table>

76. Which pest of potato attacks the tuber both in field and storage?

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<thead>
<tr>
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</thead>
<tbody>
<tr>
<td>A. Potato aphid</td>
<td>B. Cut worm</td>
</tr>
<tr>
<td>C. Potato tuber moth</td>
<td>D. Mealy bug</td>
</tr>
</tbody>
</table>

77. The recommended trap crop for IPM of diamondback moth in cabbage is ___

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<thead>
<tr>
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</thead>
<tbody>
<tr>
<td>A. Radish</td>
<td>B. Onion</td>
</tr>
<tr>
<td>C. Mustard</td>
<td>D. Carrot</td>
</tr>
</tbody>
</table>

78. The infestation of ___ leads to rotting of bulb at the time of storage.

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<table>
<thead>
<tr>
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</tr>
</thead>
<tbody>
<tr>
<td>A. Onion thrips</td>
<td>B. Onion maggot</td>
</tr>
<tr>
<td>C. Earwig</td>
<td>D. None of these</td>
</tr>
</tbody>
</table>

79. The red and black pumpkin beetle belong to family

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<table>
<thead>
<tr>
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</tr>
</thead>
<tbody>
<tr>
<td>A. Coccidae</td>
<td>B. Chrysomelidae</td>
</tr>
<tr>
<td>C. Dermestidae</td>
<td>D. Curculionidae</td>
</tr>
</tbody>
</table>

80. Damaging stage of coconut rhinoceros beetle is

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<table>
<thead>
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<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Egg</td>
<td>B. Nymph</td>
</tr>
<tr>
<td>C. Adult</td>
<td>D. Grub</td>
</tr>
</tbody>
</table>
Problems: Q.1: Explain the nature of damage caused by the following pests. (Any Ten) (10.00)

1. Chiku moth
2. Amarantus weevil
3. Virachola isocrates
4. Aonla gall forming caterpillar
5. Ber fruit borer
6. Coconut eriophyid mite
7. Bananausty thrips
8. Cashewnut tea mosquito bug
9. Onion thrips
10. Cabbage flea beetle
11. Tetranychus urticae in brinjal
12. Spinach aphid

Q.2: Discuss the IPM strategies of the following pests. (Any Five) (10.00)

1. Guava bark eating caterpillar
2. Potato greasy cutworm
3. Citrus fruit sucking moth
4. Coconut rhinoceros beetle
5. Sucking pest complex of ornamental crops
6. Banana rhizome weevil

Q.3[A]: Enlist the insect pests of mango along with damaging stage(s). Describe the host crop, marks of identification, nature of damage and integrated management strategies of fruit fly. (5.00)

Enlist the insect pests of okra along with damaging stage(s). Describe the host crop, marks of identification, nature of damage and integrated management strategies of shoot and fruit borer.

[B]: Give the scientific reason(s) of the followings. (5.00)

1. Systematic destruction of wild creepers is advised in citrus orchard.
2. Shoot tip plucking in the brinjal field is advisable.
3. It is advisable to avoid manure pits near the coconut orchards.
4. Banding the mango tree trunk with 400 gauge polythene sheet during the month of November-December is advisable.
5. Racking of soil in ber orchard is advocated.

Q.4[A]: Describe the life cycle of the following pests. (Any four) (4.00)

1. Mango hopper
2. Chilli thrips
3. Custard apple mealy bug
4. Diamond back moth
5. Brinjal epilachna beetle
6. Sweet potato weevil

[B]: Write the answer in brief. (6.00)

1. Differentiate between Earias viella and E. insulana on the basis of morphological characteristics.
2. How will you differentiate the damage caused by Liriomyza trifolii and Tuta absoluta in tomato crop?
3. Describe the procedure for preparation of black Tulsi trap for the management of chiku bud borer.
4. Enlist the different types of traps with target insect used for the management of vegetable pests.
5. Enlist the various important pests of turmeric, ginger and colocasia.
6. Give two examples of larvicides and acaricides along with their formulation for the management of horticultural crop pests.

****
**PART-B (Subjective)**

**Q-1**
(a) Compare the three basic production relationships with neat diagrams.  
(b) Write a brief note on farm management decisions.

**Q-2**
(a) Enlist all the principles of production economics related to farm management and explain any one in detail.  
(b) **Write short note on the following:**
   (i) Measures to manage farm risks  
   (ii) Returns to scale  
   (iii) Three zones of production function

**Q-3**
(a) **Differentiate between the following: (ANY THREE)**  
   (i) Law of increasing returns Vs Law of decreasing returns  
   (ii) Agricultural production economics Vs Farm management  
   (iii) Cost of production Vs Cost of cultivation  
   (iv) Specialized farming Vs Diversified farming  
(b) **Define the following: (ANY FOUR)**  
   (i) Choice indicators  
   (ii) Production function  
   (iii) Flow resources  
   (iv) Discounting principle  
   (v) MRTS  
   (vi) Point of inflection  
   (vii) Capitalistic farming

**Q-4**
(a) **Do as directed: (ANY SIX)**  
   (i) Enlist the basic steps of farm planning.  
   (ii) List out the properties of an iso-cost line.  
   (iii) Why the long run production function can also be called as the law of returns to scale? Validate your answer.  
   (iv) List out the objectives of agricultural production economics.  
   (v) Why Zone – II is referred to as rational zone in classical production function?  
   (vi) Prove that \( Ep = MP / AP \).  
   (vii) Why the law of diminishing returns is applicable to agriculture?

(b) **Draw the diagram:**  
   (i) Profit maximization of outputs  
   (ii) Iso-quant map  
   (iii) Joint products  
   (iv) Law of constant returns

xxxxxxxxxxxxxxxxxxxxxxxxxx
### AGRICULTURAL UNIVERSITIES OF GUJARAT

1. Anand Agricultural University, Anand  
2. Junagadh Agricultural University, Junagadh  
3. Navsari Agricultural University, Navsari  
4. S. D. Agricultural University S. K. Nagar

Sixth Semester End Examination of B. Sc. (Hons.) Agri. (Regular) 2017-18

**PART A: (Objective)**

<table>
<thead>
<tr>
<th>Question</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Elasticity of production in the first stage of production function is-&lt;br&gt; A Greater than unity</td>
</tr>
<tr>
<td></td>
<td>B Zero</td>
</tr>
<tr>
<td>2</td>
<td>L–shaped iso-quants refer to&lt;br&gt; A Perfect complements</td>
</tr>
<tr>
<td></td>
<td>B Perfect competition</td>
</tr>
<tr>
<td>3</td>
<td>The shape of the law of increasing returns curve is&lt;br&gt; A Convex</td>
</tr>
<tr>
<td></td>
<td>B Concave</td>
</tr>
<tr>
<td>4</td>
<td>The slope of an iso-quant is&lt;br&gt; A MRTS</td>
</tr>
<tr>
<td></td>
<td>B MPP</td>
</tr>
<tr>
<td>5</td>
<td>Which one of the following can be an example for both stock and flow resources?&lt;br&gt; A Hired labour</td>
</tr>
<tr>
<td></td>
<td>B Tractor</td>
</tr>
<tr>
<td>6</td>
<td>Production function explains how the output can be&lt;br&gt; A Maximized</td>
</tr>
<tr>
<td></td>
<td>B Minimized</td>
</tr>
<tr>
<td>7</td>
<td>The reward for land is&lt;br&gt; A Profit</td>
</tr>
<tr>
<td></td>
<td>B Rent</td>
</tr>
</tbody>
</table>

Note: Write the correct option (A / B / C / D) again each question in CAPITAL LETTERS in the answer sheet given separately.
<table>
<thead>
<tr>
<th></th>
<th>Rainfed farming refers to the crop cultivation in the regions with <strong>mm</strong> of rainfall.</th>
</tr>
</thead>
<tbody>
<tr>
<td>8</td>
<td>A &gt; 1150</td>
</tr>
<tr>
<td></td>
<td>B &lt; 750</td>
</tr>
<tr>
<td></td>
<td>C 650 – 750</td>
</tr>
<tr>
<td></td>
<td>D 750 – 1150</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Farmers coming together and working together on voluntary basis to achieve a common objective refer to system of farming.</th>
</tr>
</thead>
<tbody>
<tr>
<td>9</td>
<td>A Capitalistic</td>
</tr>
<tr>
<td></td>
<td>B Socialistic</td>
</tr>
<tr>
<td></td>
<td>C Need based</td>
</tr>
<tr>
<td></td>
<td>D Cooperative</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Product-Product relationship deals with</th>
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</thead>
<tbody>
<tr>
<td>10</td>
<td>A Resource allocation</td>
</tr>
<tr>
<td></td>
<td>B Resource formulation</td>
</tr>
<tr>
<td></td>
<td>C Resource substitution</td>
</tr>
<tr>
<td></td>
<td>D All of these</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Negative MRTS can be found among</th>
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<tbody>
<tr>
<td>11</td>
<td>A Substitutes</td>
</tr>
<tr>
<td></td>
<td>B Complements</td>
</tr>
<tr>
<td></td>
<td>C Both (a) and (b)</td>
</tr>
<tr>
<td></td>
<td>D Perfect complements</td>
</tr>
</tbody>
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<table>
<thead>
<tr>
<th></th>
<th>Factors of production refer to the</th>
</tr>
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<tbody>
<tr>
<td>12</td>
<td>A Inputs in the production process</td>
</tr>
<tr>
<td></td>
<td>B Relationships among inputs</td>
</tr>
<tr>
<td></td>
<td>C Weather elements influencing farming</td>
</tr>
<tr>
<td></td>
<td>D Marketing forces governing prices</td>
</tr>
</tbody>
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<table>
<thead>
<tr>
<th></th>
<th>Expenditure incurred in producing output in a unit area of landholding is</th>
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<tbody>
<tr>
<td>13</td>
<td>A Cost of production</td>
</tr>
<tr>
<td></td>
<td>B Cost of cultivation</td>
</tr>
<tr>
<td></td>
<td>C Both (a) and (b)</td>
</tr>
<tr>
<td></td>
<td>D Cost of management</td>
</tr>
</tbody>
</table>

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<thead>
<tr>
<th></th>
<th>MPP cuts APP at its</th>
</tr>
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<tbody>
<tr>
<td>14</td>
<td>A Maximum</td>
</tr>
<tr>
<td></td>
<td>B Minimum</td>
</tr>
<tr>
<td></td>
<td>C Both (a) and (b)</td>
</tr>
<tr>
<td></td>
<td>D None of these</td>
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</tbody>
</table>

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<thead>
<tr>
<th></th>
<th>The process of finding out the future value of the present is referred to as</th>
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<tbody>
<tr>
<td>15</td>
<td>A Compounding</td>
</tr>
<tr>
<td></td>
<td>B Discounting</td>
</tr>
<tr>
<td></td>
<td>C Forwarding</td>
</tr>
<tr>
<td></td>
<td>D Ratio analysis</td>
</tr>
</tbody>
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<thead>
<tr>
<th></th>
<th>When should a farmer need to stop his production process temporarily?</th>
</tr>
</thead>
<tbody>
<tr>
<td>16</td>
<td>A Loss &gt; FC</td>
</tr>
<tr>
<td></td>
<td>B Price &lt; ATC</td>
</tr>
<tr>
<td></td>
<td>C Loss = FC</td>
</tr>
<tr>
<td></td>
<td>D Both (a) and (c)</td>
</tr>
</tbody>
</table>

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<thead>
<tr>
<th></th>
<th>Point of inflection is where MPP is</th>
</tr>
</thead>
<tbody>
<tr>
<td>17</td>
<td>A Maximum</td>
</tr>
<tr>
<td></td>
<td>B Minimum</td>
</tr>
<tr>
<td></td>
<td>C Zero</td>
</tr>
<tr>
<td></td>
<td>D All of these</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>A convenient unit of production for which cost and returns are computed</th>
</tr>
</thead>
<tbody>
<tr>
<td>18</td>
<td>A Farm-firm</td>
</tr>
<tr>
<td></td>
<td>B Plant</td>
</tr>
<tr>
<td></td>
<td>C Technical unit</td>
</tr>
<tr>
<td></td>
<td>D Economic unit</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>When increase or decrease of cotton production does not affect or influence groundnut production, then both are enterprises?</th>
</tr>
</thead>
<tbody>
<tr>
<td>19</td>
<td>A Complementary</td>
</tr>
<tr>
<td></td>
<td>B Effective</td>
</tr>
<tr>
<td></td>
<td>C Competitive</td>
</tr>
<tr>
<td></td>
<td>D Supplementary</td>
</tr>
</tbody>
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<thead>
<tr>
<th></th>
<th>decision requires heavy investment from the part of the farmer.</th>
</tr>
</thead>
<tbody>
<tr>
<td>20</td>
<td>A Marketing</td>
</tr>
<tr>
<td></td>
<td>B Strategic</td>
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<tr>
<td></td>
<td>C Operational</td>
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<tr>
<td></td>
<td>D Administrative</td>
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<td>No.</td>
<td>Question</td>
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<tr>
<td>21</td>
<td>Short run is a time period in which</td>
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<tr>
<td>22</td>
<td>Iso-quant is also known as</td>
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<tr>
<td>23</td>
<td>When MP = AP, then Ep becomes</td>
</tr>
<tr>
<td>24</td>
<td>The management decision of how to produce is related with</td>
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<tr>
<td>25</td>
<td>Profit rule for law of diminishing returns is</td>
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<tr>
<td>26</td>
<td>Which is the recently launched crop insurance scheme by Shri. Narendra Modi, the Hon’ble PM of India?</td>
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<td>27</td>
<td>Resources which cannot be stored and have to used up as and when available are</td>
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<tr>
<td>28</td>
<td>The economic law determining the allocation behaviour of farmers with limited resources is</td>
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<td>29</td>
<td>The slope of a curve is given by</td>
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<tr>
<td>30</td>
<td>Least cost combination can be obtained using the specification</td>
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<tr>
<td>31</td>
<td>An efficient farm plan</td>
</tr>
<tr>
<td>32</td>
<td>If all the resources used in the production process are increased by 50 % and output also increases by 50 %, then there is the possibility of</td>
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<tr>
<td>33</td>
<td>Costs that change with the level of production are</td>
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<td>34</td>
<td>When total physical product (TPP) curve is falling, the</td>
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<td>35</td>
<td>Though all the categories of farmers are interested in high returns from their enterprises, what they actually try to maximize?</td>
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<tr>
<td>Question Number</td>
<td>Description</td>
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<tr>
<td>36</td>
<td>Production refers to ____________ of utilities.</td>
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<td>37</td>
<td>Preparing farm budget in advance is known as ____________.</td>
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<td>38</td>
<td>Ineffective supervision is the major disadvantage of ____________ farming.</td>
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<td>39</td>
<td>In which of the following relationship inputs are kept constant whereas the products are varied?</td>
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<td>40</td>
<td>Agricultural Production Economics comes under the domain of ____________.</td>
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<td>41</td>
<td>Change in income due to the farmer purchasing new farm implements instead of renting them like that of the previous year can be captured using ____________.</td>
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<tr>
<td>42</td>
<td>____________ costs are not relevant for decision making purpose.</td>
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<td>43</td>
<td>The term operational holding refers to ____________.</td>
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<td>44</td>
<td>MRTS is indicated by ____________.</td>
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<td>45</td>
<td>Various combinations of two inputs that can be purchased with the same amount of money is ____________.</td>
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<td>46</td>
<td>The classical production function comprises ____________ number of irrational zones.</td>
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<td>47</td>
<td>After inflection point, TPP curve changes its curvature ____________.</td>
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<td>48</td>
<td>The future value of Rs. 1500 invested for 6 years earning 10% interest rate will be ____________.</td>
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<td>49</td>
<td>Cost of cultivation can be expressed in terms of ____________.</td>
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<td>50</td>
<td>When the price of both the products increases, iso-revenue line moves ____________.</td>
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</tbody>
</table>
51. Construction of farm building is an example for ____ type of management decision.
   - A: Strategic
   - B: Administrative
   - C: Operational
   - D: All of these

52. A farmer with less than 1 ha of land in India can be classified as ____ farmer category.
   - A: Small
   - B: Medium
   - C: Marginal
   - D: Semi-medium

53. Enterprise budgeting deals with input-output relationship of ____.
   - A: A set of different enterprises
   - B: A single enterprise on the farm
   - C: Both A and B
   - D: None of these

54. When two products are substituting, the optimum level of enterprises is determined by ____.
   - A: Iso-quant and Price-line
   - B: PPC and Price-line
   - C: Iso-quant and Iso-revenue line
   - D: None of these

55. What is the slope of budget line?
   - A: Downward from left to right
   - B: Vertical straight line
   - C: Upward from left to right
   - D: Horizontal straight line

56. MRPS is the slope of ____.
   - A: Production possibility curve
   - B: Iso-quant curve
   - C: Iso-cline curve
   - D: All of these

57. Which one of the following is TRUE?
   - A: Farm risks are not measurable
   - B: Discounting measures the present value of future money
   - C: Partial budgeting is done for the whole farm
   - D: Enterprise contributing < 50% farm income can be referred as specialized

58. Total product is same as ____.
   - A: Total resources used
   - B: Total revenue
   - C: Total utility
   - D: Total output

59. Among all other states in India, the crop in which Gujarat has comparative advantage is ____.
   - A: Cotton
   - B: Sugarcane
   - C: Pulses
   - D: Rice

60. Cultivation of groundnut crop in kharif and wheat crop in rabi is an example for ____ relationship.
   - A: Complementary
   - B: Supplementary
   - C: Competitive
   - D: Antagonistic

61. Grazing of livestock in open pastures is called as ____.
   - A: Ranching
   - B: Mixed farming
   - C: Specialized farming
   - D: All of these

62. The expression of a farm plan in monetary terms is ____.
   - A: Farm valuation
   - B: Farm budgeting
   - C: Farm cost concepts
   - D: Farm income measures

63. Elasticity of production (Ep) is given by the formula ____.
   - A: AP/MP
   - B: MP = AP
   - C: MP/AP
   - D: MP/TP

64. Which among the following options can reduce production risk?
   - A: Crop insurance
   - B: Crop rotation
   - C: Suitable varieties
   - D: All of these

65. Which one of the following is a double-loss zone?
   - A: Zone I
   - B: Zone II
   - C: Zone III
   - D: None of these
<table>
<thead>
<tr>
<th>Number</th>
<th>Question</th>
<th>Options</th>
<th>Correct Answer</th>
</tr>
</thead>
</table>
| 66     | Neerav finds that the total cost in running his farm business is Rs. 6,000 per month. If the total variable cost is found to be Rs. 5,500, then what is the total fixed cost? | A Rs. 5000  
B Rs. 1500  
C Rs. 1000  
D Rs. 500 | C Rs. 1000 |
| 67     | Which one of the following refers to the classical production function?    | A Factor-Factor relationship  
B Factor - Product relationship  
C Product-product relationship  
D All of these | B Factor - Product relationship |
| 68     | Law of variable proportions is also called as production function.        | A Short-run  
B Long-run  
C Both (a) and (b)  
D None of these | C Both (a) and (b) |
| 69     | The production possibility curve is                                      | A Convex  
B Concave  
C Linear  
D Circular | D Circular |
| 70     | Expression of technical efficiency in terms of monetary value is referred to as | A Productive efficiency  
B Social efficiency  
C Technical efficiency  
D Allocative efficiency | C Technical efficiency |
| 71     | In production analysis, delta (Δ) is used to denote in any variable.     | A Profit  
B Income  
C Efficiency  
D Change | C Efficiency |
| 72     | A variable whose value relies on the other variable is referred to as    | A Dependent  
B Mutual  
C Independent  
D Capital | B Mutual |
| 73     | Farm management is an form of study.                                     | A Intra  
B Inter  
C Both (a) and (b)  
D None of these | C Both (a) and (b) |
| 74     | Operationalization of MSP may reduce risk.                              | A Production  
B Price  
C Marketing  
D Financial | C Marketing |
| 75     | Which one of the following is the rational zone of production?           | A I- Zone  
B II- Zone  
C III- Zone  
D I & III Zone | C III- Zone |
| 76     | Crop loss is the major drawback of farming.                             | A Specialized  
B Diversified  
C Cooperative  
D Organic | C Cooperative |
| 77     | The cost of producing one more unit of an output is                      | A Marginal cost  
B Opportunity cost  
C Average cost  
D Fixed cost | A Marginal cost |
| 78     | Optimum input level is obtained by using the formula                    | A MC = MR  
B MVP = MIC  
C MPP = APP  
D MPP = 0 | B MVP = MIC |
| 79     | Anything that aids in production is called                              | A Resource  
B Input  
C Factor  
D All of these | D All of these |
| 80     | Among the given factors of production, which one has got highest mobility? | A Land  
B Management  
C Labour  
D Capital | D Capital |