

Question Booklet No. :

FSPG/2022

Register  
Number

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**2022**  
**PAPER – I**  
**FISHERIES SCIENCE**  
**(P.G. Degree Standard)**

Duration : Three Hours]

[Total Marks : 300

Read the following instructions carefully before you begin to answer the questions.

**IMPORTANT INSTRUCTIONS**

1. You will be supplied with this question booklet 15 minutes prior to the commencement of the examination.
2. This question booklet contains 200 questions. Before answering the questions, you shall check whether all the questions are printed serially and ensure that there are no blank pages in the question booklet. **If any defect is noticed in the question booklet, it shall be reported to the invigilator within the first 10 minutes and get it replaced with a complete question booklet. If the defect is reported after the commencement of the examination, it will not be replaced.**
3. Answer all the questions. All the questions carry equal marks.
4. You must write your register number in the space provided on the top right side of this page. Do not write anything else on the question booklet.
5. An answer sheet will be supplied to you separately by the room invigilator to shade the answers. Instructions regarding filling of answers etc., which are to be followed mandatorily, are provided in the answer sheet and in the memorandum of admission (Hall Ticket).
6. You shall write and shade your question booklet number in the space provided on page one of the answer sheet with **BLACK INK BALL POINT PEN**. If you do not shade correctly or fail to shade the question booklet number, your answer sheet will be invalidated.
7. Each question comprises of five responses (answers) : i.e. (A), (B), (C), (D) and (E). You have to select **ONLY ONE** correct answer from (A) or (B) or (C) or (D) and shade the same in your answer sheet. If you feel that there are more than one correct answer, shade the one which you consider the best. **If you do not know the answer, you have to mandatorily shade (E).** In any case, choose **ONLY ONE** answer for each question. If you shade more than one answer for a question, it will be treated as a wrong answer even if one of the given answers happens to be correct.
8. You should not remove or tear off any sheet from this question booklet. You are not allowed to take this question booklet and the answer sheet out of the examination room during the time of the examination. After the examination, you must hand over your answer sheet to the invigilator. You are allowed to take the question booklet with you only after the examination is over.
9. **You should not make any marking in the question booklet except in the sheets before the last page of the question booklet, which can be used for rough work. This should be strictly adhered to.**
10. Failure to comply with any of the above instructions will render you liable for such action as the Commission may decide at their discretion.

SEAL

**SPACE FOR ROUGH WORK**



1. Chemical substances added to packaging materials for attaining better functional properties, but toxic to humans
- (i) Vinyl chloride
  - (ii) Acrylonitrile
  - (iii) Styrene
  - (iv) Nylons
- (A) (ii), (iii) and (iv)  
(B) (ii) and (iii)  
(C) (iii) and (iv)  
 (D) (i), (ii) and (iii)  
(E) Answer not known
2. The outer to inner layers of 3-ply retort pouch
- (A) Aluminium foil, Nylon, Polyester
  - (B) Polyester, Aluminium foil, Polyolefin
  - (C) Nylon, Polyolefin, Aluminium foil
  - (D) Aluminium foil, Nylon, Polyolefin
  - (E) Answer not known
3. A question in CCP decision tree that helps in the identification of CCPs of a process
- (A) Does control measure for the hazard exist at this step?
  - (B) Whether critical limit is set to control the hazard at this step?
  - (C) Does preventive measure identified to control the hazard at this step?
  - (D) Whether critical limit required to eliminate the risk of the hazard to consumers?
  - (E) Answer not known

4. Acid gels are formed using

- (A) Agar
- (B) Alginic acid
- (C) Carrageenan
- (D) Fucoidan
- (E) Answer not known

5. Match the correct processes for the extraction of fish protein concentrate

- |                        |                              |
|------------------------|------------------------------|
| (a) Viobin process     | 1. Use of hexane and ethanol |
| (b) Enzymatic process  | 2. Use of Isopropanol        |
| (c) Azeotropic process | 3. Use of ethylene chloride  |
| (d) Canadian process   | 4. Use of trysin             |

- |   | (a)              | (b) | (c) | (d) |
|---|------------------|-----|-----|-----|
| (A)                                     | 2                | 4   | 1   | 3   |
| <input checked="" type="checkbox"/> (B) | 3                | 4   | 1   | 2   |
| (C)                                     | 2                | 1   | 4   | 3   |
| (D)                                     | 3                | 1   | 2   | 4   |
| (E)                                     | Answer not known |     |     |     |

6. Which of the following products are correctly matched with their respective algal sources?

- |                     |                     |
|---------------------|---------------------|
| 1. Fucoidan         | – Red Macro algae   |
| 2. Spirulina        | – Blue Green algae  |
| 3. Floridean starch | – Brown Macro algae |
| 4. Ulvan            | – Green Macro algae |

- (A) 1 and 2 are correct
- (B) 2 and 4 are correct
- (C) 3 and 4 are correct
- (D) 2 and 3 are correct
- (E) Answer not known

7. Arrange the Agar manufacturing process in correct sequence

1. solubilization in hot water for hydrolysis
2. filtration for purification
3. freezing and thawing for concentration
4. sulphate alkaline hydrolysis for disulfation

(A) 3, 1, 4, 2

(B) 4, 1, 2, 3

(C) 1, 3, 2, 4

(D) 4, 2, 1, 3

(E) Answer not known

8. Match the following Batter ingredients with their functions :

- |                    |                                      |
|--------------------|--------------------------------------|
| (a) Starch         | 1. Flavouring agent                  |
| (b) Salt           | 2. Gelatinisation and Retrogradation |
| (c) Egg            | 3. Control CO <sub>2</sub> Release   |
| (d) Leavening salt | 4. Binding both Batter and Breeding  |

(a) (b) (c) (d)

(A) 2 1 4 3

(B) 3 1 2 4

(C) 4 3 1 2

(D) 4 3 2 1

(E) Answer not known

9. Which is the best method of exhausting?

- |   |                           |
|---|---------------------------|
| <input checked="" type="checkbox"/> (A) Heat exhausting | (B) Mechanical exhausting |
| (C) Steam injection                                     | (D) Vacuum exhausting     |
| (E) Answer not known                                    |                           |

10. A major disadvantage of RSW used for chilling fish onboard the vessel.

- |   |                                  |
|---|----------------------------------|
| <input checked="" type="checkbox"/> (A) Not suitable for fatty fish | (B) Not suitable for lean fish   |
| (C) Slow chilling of fish   | (D) More physical damage to fish |
| (E) Answer not known  |                                  |

11. The requirements of life-jacket are given in which of the following schedule of Marine Shipping Act (LSA) rules 1978?
- (A) Schedule I (B) Schedule IV  
 (C) Schedule V (D) Schedule II  
(E) Answer not known
12. In Navigation, Distress code "IN" indicates
- (A) I have no diver  
(B) A diver will be sent as soon as possible  
 (C) I require a diver  
(D) Engaged in submarine survey work  
(E) Answer not known
13. According to Merchant Shipping Act, mechanised fishing vessels comes under class
- (A) Class XIV (B) Class XII  
 (C) Class XIII (D) Class XV  
(E) Answer not known
14. Which one of the following indicates the signals of purse seiners when hampered by fishing gear?
- (A) Two white lights in vertical line  
(B) One white light over one red light in a vertical line  
(C) Two red lights in a vertical line  
 (D) Two yellow lights in vertical line  
(E) Answer not known
15. Which of the following colour used for special marks by International Association of Light house Authorities (IALA)?
- (A) Red (B) Blue  
(C) Green  (D) Yellow  
(E) Answer not known

16. The term Chocolate mouse is related to

- (A) Heavy metal pollution
- (B) Oil pollution
- (C) Pesticide pollution
- (D) Sewage pollution
- (E) Answer not known

17. Choose the correct statement :

- (i) The presence of chelators and zinc in water reduces toxicity of cadmium to fish
- (ii) Maximum toxicity of cadmium is associated with high pH
- (iii) Hard waters are affected heavily by cadmium toxicity
- (iv) Cadmium causes Itai-Itai disease

- (A) (i) and (ii) are correct
- (B) (ii) and (iii) are correct
- (C) (i) and (iv) are correct
- (D) (iii) and (iv) are correct
- (E) Answer not known

18. Which one of the following is an organo chlorine pesticide?

- (A) Chloropyrifos
- (B) Endosulfan
- (C) Malathion
- (D) Parathion
- (E) Answer not known

19. Which of the following statements are incorrect about anaerobic digestion of sewage treatment?
- (i) The end products are digested sludge, supernatant fluid and gases
  - (ii) The digested sludge is relatively unstable
  - (iii) The digested sludge volume is about  $1/3^{\text{rd}}$  of primary sludge
  - (iv) The operating temperature is  $> 55^{\circ}\text{C}$
- (A) (ii) and (iii)
  - (B) (iii) and (iv)
  - (C) (ii) and (iv)
  - (D) (i) and (iii)
  - (E) Answer not known
20. The organised sets of horizontal cork screw like water motion in surface layer ocean that caused by wind is termed as
- (A) Ekman spiral
  - (B) Upwelling
  - (C) Downwelling
  - (D) Langmuir circulation
  - (E) Answer not known
21. The rise and fall of the levels of the ocean due to sun, moon and the earth is called as
- (A) Winds
  - (B) Waves
  - (C) Tides
  - (D) Currents
  - (E) Answer not known



22. Which of the following is incorrectly paired?

- (i) IHO – International Hydrographic Organisation
- (ii) GODAS – Global Ocean Data Assimilation System
- (iii) IPCC – Intergovernmental Panel of Chemical Change
- (iv) CSIRO – Commonwealth Scientific and Industrial Research Organisation

Responses :

(A) (i) and (ii)

(B) (ii) and (iv)

(C) (iii) only

(D) (iv) only

(E) Answer not known

23. Which of the following algae is known as Calcareous green algae?

(A) Caulerpa

(B) Codium

(C) Ulva

(D) Halimeda

(E) Answer not known

24. Assertion [A] : In aquatic environment, sediment is the major sink for phosphorus

Reason [R] : Phosphorus bound to carbonates and oxides of Iron and Manganese as well as the organic matter in the sediment.

(A) [A] is true but [R] is false

(B) Both [A] and [R] are true ; and [R] is the correct explanation of [A]

(C) [A] is false, [R] is true

(D) Both [A] and [R] are true, but [R] is not the correct explanation of [A]

(E) Answer not known

25. Which is the largest biosphere reserve in India?

(A) Sunderbans

(B) Great Nicobar

(C) Gulf of Kutchh

(D) Gulf of Mannar

(E) Answer not known

26. Choose the correct answer among the following classification of lakes on the basis of average bound  $\text{CO}_2$  level.

- (i) In soft water lakes it does not exceed 15 and 22 CC per litre
- (ii) In medium class lakes, it falls between 15 and 22 CC per litre
- (iii) In hard water lakes, it exceeds more than 22 CC per litre

(A) (i) only

(B) (i) and (iii) only

(C) (iii) only

(D) (ii) and (iii) only

(E) Answer not known

27. Summer stratification with minimum temperature in upper part of hypolimnion layer instead of usual minimum at bottom is called

(A) Poikilothermy

(B) Mesothermy

(C) Dichothermy

(D) Thermocline

(E) Answer not known

28. A substance that enhances the immune system by interacting directly with cells of the system is
- (A) Antibiotics
  - (B) Probiotics
  - (C) Therapeutics
  - (D) Immunostimulants
  - (E) Answer not known
29. The process by which particulate materials and Microorganisms are ingested by cell is called
- (A) Blastogenesis
  - (B) Phagocytosis
  - (C) Pinocytosis
  - (D) Capping
  - (E) Answer not known
30. T cells are responsible for
- (A) Cell mediated immunity
  - (B) Phagocytosis
  - (C) Propo system
  - (D) Antibody Production
  - (E) Answer not known

31. White spot disease (Itch) in fish is caused by

- (A) Myxobolus sp
- (B) Ichthyophthirius sp
- (C) Trypanosoma sp
- (D) Saprolegnia sp
- (E) Answer not known

32. IHN disease affecting Salmonid fishes is caused by

- (A) Virus
- (B) Bacteria
- (C) Fungi
- (D) Parasite
- (E) Answer not known

33. Match the following :

- |  |                     |
|--|---------------------|
| (a) Effect of drugs on the living system | 1. Toxicology       |
| (b) Study of poisons                     | 2. Pharmacodynamics |
| (c) Action of drugs on the body          | 3. Pharmacology     |
| (d) What the body does to the drug       | 4. Pharmacokinetics |

- |                                      | (a)              | (b) | (c) | (d) |
|--------------------------------------|------------------|-----|-----|-----|
| (A)                                  | 2                | 1   | 3   | 4   |
| <input checked="" type="radio"/> (B) | 3                | 1   | 2   | 4   |
| (C)                                  | 3                | 1   | 4   | 2   |
| (D)                                  | 1                | 3   | 4   | 2   |
| (E)                                  | Answer not known |     |     |     |

34. What is the biological agent that remove toxic wastes and improve the environment?
- (A) Biofertilizer
  - (B) Bioleaching
  - (C) Bioremediator
  - (D) Bioreduction
  - (E) Answer not known
35. Which among the following antibiotics has a higher solubility in water at neutral pH?
- (A) Oxytetracycline
  - (B) Chlorotetracycline
  - (C) Tetracycline
  - (D) Doxycycline
  - (E) Answer not known
36. The most widely used Nucleic acid amplification strategy is
- (A) RAPD
  - (B) LAMP
  - (C) PCR
  - (D) ELISA
  - (E) Answer not known

37. What is the environmental stress mediated fish disease in fresh water bodies?

- (i) Gill necrosis
- (ii) Columnaris disease
- (iii) Myxosporean disease
- (iv) Lordosis

- (A) (iv) is correct
- (B) (ii) and (iii) are correct
- (C) (i) and (iv) are correct
- (D) (i) and (ii) are correct
- (E) Answer not known

38. Assertion [A] : In many instances, outbreaks on farm are a result of increased stress in the host animal or decreased water quality

Reason [R] : Shell fishes are a more likely route of infection to Human compared with fish

- (A) [A] is true but [R] is false
- (B) Both [A] and [R] are true and [R] is the correct explanation of [A]
- (C) [A] is false [R] is true
- (D) Both [A] and [R] are true, but [R] is not the correct explanation of [A]
- (E) Answer not known

39. In cages, which of the following structure normally supports and buoy the cage bag and helps to retain its shape?
- (A) Frame
  - (B) Freeboard
  - (C) Linkages and Groupings
  - (D) Collars
  - (E) Answer not known
40. A dry placed pump/submerged pump consists of
- (A) Impeller
  - (B) Impeller, transfer shaft and electric motor
  - (C) Transfer shaft and electric motor
  - (D) Impeller and electric motor
  - (E) Answer not known
41. Match the common name with its genus name for the following Shell fishes :
- |             |                    |
|-------------|--------------------|
| (a) Oyster  | 1. Mytilus spp     |
| (b) Mussels | 2. Haliotis spp    |
| (c) Clams   | 3. Crassostrea spp |
| (d) Abalone | 4. Anadora spp     |
- 
- |   | (a) | (b) | (c) | (d) |
|---|-----|-----|-----|-----|
| <input checked="" type="checkbox"/> (A) | 3   | 1   | 4   | 2   |
| (B)                                     | 4   | 3   | 1   | 2   |
| (C)                                     | 1   | 3   | 4   | 2   |
| (D)                                     | 2   | 1   | 3   | 4   |
- (E) Answer not known



42. The principal Neuro haemal organ involved in the storage and release of Neuro secretory materials in penaeid shrimps
- (A) X organ sinus gland
  - (B) Y organ
  - (C) Androgenic gland
  - (D) Pericardial organs
  - (E) Answer not known
43. The truly migration of Marine fish which travel long distance in the sea to spawn and return to feeding area
- (A) Oceanodromous
  - (B) Anadromous
  - (C) Catadromous
  - (D) Potamodromous
  - (E) Answer not known
44. 'Aflotoxin', the most important toxin contaminating the feedstuff is produced by
- (A) Protozoans
  - (B) Fungus
  - (C) Bacteria
  - (D) Insects
  - (E) Answer not known

45. In integrated fish farming, pokkuli refers to
- (A) A rice field in Gujarat
  - (B) Fish cultivated in rice fields of West Bengal
  - (C) A salinity resistant rice variety cultivated in Kerala
  - (D) A tribe which is involved in Rice-cum fish culture
  - (E) Answer not known
46. Assertion [A] : Rohu has a little sub-terminal mouth with thick fimbriated lips.
- Reason [R] : Rohu has filter feeding habit.
- (A) [A] is true but [R] is false
  - (B) [A] is false, [R] is true
  - (C) Both [A] and [R] are true ; and [R] is the correct explanation of [A]
  - (D) Both [A] and [R] are false
  - (E) Answer not known
47. Choose the incorrectly paired aquatic weeds.
- (i) Floating weed – Pistia
  - (ii) Emergent weed – Eichhornia
  - (iii) Submerged weed – Vallisneria
  - (iv) Marginal weed – Typha
- (A) (ii) only
  - (B) (i) and (ii) only
  - (C) (ii) and (iii) only
  - (D) (iii) and (iv) only
  - (E) Answer not known

48. Which of the following is considered relatively as the fastest growing carp?
- (A) Rohu (B) Mrigal  
(C) Grass carp  (D) Catla  
(E) Answer not known
49. Which of the following fish is not an exotic carp?
- (A) Catla catla (B) Cyprinus carpio  
(C) Tinca tinca (D) Carassius vulgaris  
(E) Answer not known
50. Name the entrepreneurs who go on creating a chain of new ventures one after another without losing ownership control of them.
- (A) Mobile entrepreneur (B) Managerial entrepreneur  
 (C) Empire builder (D) Innovative entrepreneur  
(E) Answer not known
51. Which among the following is/are true about social entrepreneurs?
- (i) Work for both – Profit and mission.  
(ii) Attempt to draw upon business techniques to find solutions to social problems.  
(iii) Focus on maximizing profit gains rather than maximizing gains for social well-being.
- (A) (i) only  
(B) (ii) only  
(C) (i) and (iii) only  
 (D) (i) and (ii) only  
(E) Answer not known

52. Which of the following statements are true about SHG?

- (i) Voluntary organisation
  - (ii) 10-20 members
  - (iii) Members should have common interest
  - (iv) Group should have political or religious affiliation
- (A) (i), (ii) and (iii) only                      (B) (i), (ii) and (iv) only  
(C) (i) and (iv) only                                      (D) (i) and (ii) only  
(E) Answer not known

53. Among the following which is not an objective of SHG linked – Micro credit Financing Programme

- (A) To reach the women of the society  
(B) To Increase credit mobilization  
(C) To cultivate saving habits  
(D) To improve loan recovery  
(E) Answer not known

54. Identify the New initiatives in fisheries extension :

- (i) Expert system
  - (ii) Aqua Tech Centres / Aqua Labs
  - (iii) FLD/OFT
  - (iv) Mobile App
- (A) (i) and (iv)  
(B) (ii) and (iii)  
(C) (iii) Alone  
(D) (ii) Alone  
(E) Answer not known

55. Among the following, choose the perceived attribute of innovation that is indirectly proportional to adoption of an innovation
- (A) Relative advantage
  - (B) Compatibility
  - (C) Observability
  - (D) Complexity
  - (E) Answer not known
56. Choose the correctly paired among the following :
- |                                      |   |             |
|--------------------------------------|---|-------------|
| (i) Non-projected visual aid         | – | Specimen    |
| (ii) Projected visual aid            | – | Flash card  |
| (iii) Non-projected Audio-visual aid | – | Puppet show |
| (iv) Projected Audio-visual aid      | – | Drama       |
- (A) (i) only
  - (B) (iv) only
  - (C) (ii) and (iii) only
  - (D) (i) and (iii) only
  - (E) Answer not known
57. Which of the following PRA technique helps to indicate the position of households in a village and their socio-economic characteristics?
- (A) Social Map
  - (B) Resource Map
  - (C) Transect Walk
  - (D) Wealth Ranking
  - (E) Answer not known

58. As per Annexure I of the EU notification, which among the following fish species are exempted from catch certification?
- (A) Ornamental fishes
  - (B) Freshwater fishery products
  - (C) Oysters (live)
  - (D) Prepared and preserved molluscs
  - (E) Answer not known
59. Choose the right matches among Trade related abbreviations in export marketing
- |            |   |  |
|------------|---|--|
| (i) PUD    | — | Peeled and Deveined shrimp                         |
| (ii) PRIME | — | Price indicator of Marine product exports (weekly) |
| (iii) FOB  | — | Freight on board price                             |
| (iv) IQF   | — | Individual Quick Frozen product                    |
- (A) (i) and (iii) are correct
  - (B) (ii) and (iii) are correct
  - (C) (i) and (iv) are correct
  - (D) (ii) and (iv) are correct
  - (E) Answer not known
60. The aquaculture production system where fishes are held in floating net pens are called
- (A) Cage culture
  - (B) Pond culture
  - (C) Recirculating aquaculture system
  - (D) Longline
  - (E) Answer not known

61. Deck fitting with two horns used for securing the lines in boats are called as
- (A) Stern ramp (B) Side thrusters  
 (C) Cleat (D) Out rigger  
(E) Answer not known
62. Assertion (A) : Winches are driven electrically in large fishing vessels from the main engine.  
Reason (R) : Electrical winch offers good flexibility of operation and control.
- (A) (A) is true but (R) is false  
(B) Both (A) and (R) are true, but (R) is not the correct explanation of (A)  
 (C) Both (A) and (R) are true; and (R) is the correct explanation of (A)  
(D) (A) is false, (R) is true  
(E) Answer not known
63. Deck fittings which are used in hitching up of heavy otter boards as well as for passing of towing warps is called as
- (A) Gantries (B) Blocks  
 (C) Gallows (D) Rollers  
(E) Answer not known
64. Type of Sonar used to measure thickness of sea ice, roughness and concentration is
- (A) Upward Looking Sonar (ULS)  
(B) Limpet Mine Imaging Sonar (LIMIS)  
(C) Lensing Underwater Imaging System (LUIS)  
(D) Integrated Navigation Sonar System (INSS)  
(E) Answer not known

65. Direction of netting at right angles to the general course of netting yarn in net mending is called as
- (A) T direction
  - (B) Bar cut
  - (C) N cut
  - (D) N direction
  - (E) Answer not known
66. Which one of the following includes light mass of the ship?
- (i) Cargo mass
  - (ii) Mass of machinery
  - (iii) Fuel mass
  - (iv) Mass of outfit and fittings
- (A) (i) and (ii) only
  - (B) (ii) and (iv) only
  - (C) (iii) and (iv) only
  - (D) (i) and (iii) only
  - (E) Answer not known
67. Drag of mid-water trawl is primarily determined by
- (A) Mesh size
  - (B) Twine surface area of the netting
  - (C) Length of net
  - (D) Length of sinker
  - (E) Answer not known



68. Why synthetic fibres are used as Netting materials?
- (i) Have less towing resistance
  - (ii) More weather resistance
  - (iii) Prone to quicker rotting
  - (iv) Good resistance to acids
- (A) (i) and (iv) are correct
- (B) (i) and (iii) are correct
- (C) (ii) and (iv) are correct
- (D) (ii) and (iii) are correct
- (E) Answer not known
- 
69. The buoys which are set when locations of good fish concentration are found is called as
- (A) Light Buoy
  - (B) Dahn Buoy
  - (C) Radio Buoy
  - (D) Danish Buoy
  - (E) Answer not known
- 
70. The traps which consist of cone shaped bags and wings are known as
- (A) Mechanical traps
  - (B) Tubular traps
  - (C) Basket traps
  - (D) Trap nets
  - (E) Answer not known

71. Ethyl-M-Aminobenzoate is used as a/an

- (A) Hormone
- (B) Anaesthetizer
- (C) Disinfectant
- (D) Fertilizer
- (E) Answer not known

72. Which of the following are correctly paired in maintenance and selection of Giant freshwater prawn, Macrobrachium rosenbergii?

- (i) Brood stock pond – Impervious clayey soil
  - (ii) Algal bloom in brood stock pond – Fungicides
  - (iii) Broodstock transport – More than one at a time
  - (iv) Active berried brooders – Orange (or) dark colour eggs
- (A) (i) and (ii)
  - (B) (ii) and (iii)
  - (C) (i) and (iv)
  - (D) (iii) and (iv)
  - (E) Answer not known

73. Which of the following characteristics of carp eggs are correctly paired?

- (i) Catla – Pale brownish
  - (ii) Rohu – Pale reddish
  - (iii) Mrigal – Reddish tinge
  - (iv) Calbasu – Pale bluish
- (A) (i) and (iii) are correct
  - (B) (ii) and (iv) are correct
  - (C) (iii) and (iv) are correct
  - (D) (i) and (ii) are correct
  - (E) Answer not known

74. Match correctly the Indian major carps first sexual maturity year

(a) C. Mrigal

(b) C. Catla

(c) L. Rohita

(d) L. Calbasu

1. Second Year

2. Third year

3. About one year

4. One year

(a) (b) (c) (d)

(A) 3 1 4 2

(B) 1 3 2 4

(C) 2 4 3 1

(D) 4 3 2 1

(E) Answer not known

75. Which fish Eggs possess Cortial Alyeoli, at the periphery in two to three rows

(A) Gold Fish

(B) Cat Fish

(C) Cum Salmon

(D) Murrel

(E) Answer not known

76. Buccal incubation (Mouth Breeding) is found in which fish?

(A) Mrigal

(B) Common Carp

(C) Tilapia

(D) Grass Carp

(E) Answer not known

77. Which of the following statements are true about spawning of fish?
- (i) Rabbit fishes spawn in conjunction with a particular phase of the moon
  - (ii) Spawning in American lobster (Homarus americanus) is controlled by photo period in nature
  - (iii) Sudden change in photo period will induce gametogenesis in turbot
  - (iv) Photo period modification will not induce spawning of milk fish
- (A) (i) and (iv)                                ~~(B)~~ (i) and (iii)  
(C) (iii) and (ii)                              (D) (ii) and (iv)  
(E) Answer not known
78. The concept of induced breeding by administration of pituitary extract was first successfully attempted in
- (A) Thailand in 1934                             ~~(B)~~ Brazil in 1934  
(C) France in 1934                              (D) China in 1934  
(E) Answer not known
79. The Pituitary glands of fish are stored in
- ~~(A)~~ Alcohol                                        (B) Chlorine  
(C) Copper sulphate                             (D) Common salt  
(E) Answer not known
80. What is the induced breeding agent with all the following advantages?
- (i) less latency period
  - (ii) reduced spawning period
  - (iii) single dose of administration
  - (iv) long shelf life
- (A) Carp pituitary extract                      ~~(B)~~ GnRH  
(C) Dopamine                                     (D) (A) and (B)  
(E) Answer not known

81. The improvement of domesticated broodstock may be initiated through which of the following specific genetic improvement programs?

(i) GET, EXCEL

(ii) GIFT, GST

(iii) GTH, GnRH

(iv) LHRH, FSH

(A) (i) and (ii) are correct

(B) (ii) and (iii) are correct

(C) (iii) and (iv) are correct

(D) (i) and (iv) are correct

(E) Answer not known

82. Match correctly with the sex differentiating characters in fin and shell fishes

(a) Flounders

(b) Florida lobster

(c) Female blue crab

(d) Female shrimp

1. Thelycum

2. Large females

3. Carry their eggs externally

4. Triangular abdomen

(a) (b) (c) (d)

(A) 3 4 1 2

(B) 2 4 1 3

(C) 2 3 4 1

(D) 2 1 4 3

(E) Answer not known

83. Why the following statements are true about fishing mortality?
- (i) It is inversely proportional to fishing effort
  - (ii) It is directly proportional to fishing effort
  - (iii) It is expressed as  $q_f = F$
  - (iv) It is expressed as  $Y/R$
- (A) (iv) only
- (B) (ii) and (iii) only
- (C) (i) and (iv) only
- (D) (i) only
- (E) Answer not known
84. Under wild life protection act, the marine finfish Epinephelus lanceolatus is included in which of the following?
- (A) Schedule I
- (B) Schedule II
- (C) Schedule III
- (D) Schedule IV
- (E) Answer not known
85. Which is the spawning or breeding phase in the life history of freshwater eel, Anguilla?
- (A) Glass eel
- (B) Yellow eel
- (C) Silver eel
- (D) Elver
- (E) Answer not known

86. 'Labyrinthiform organ' is an accessory respiratory organ found in

- (A) Murrel  
(B)  Climbing Perch  
(C) Catfish  
(D) Eel  
(E) Answer not known

87. Which among the following is used to calculate the index of preponderance?

- (A)   $I_i = (V_i O_i / \sum V_i O_i) \times 100$   
(B)  $I_i = (\%N_i + \%V_i) \% O_i$   
(C)  $A_1 = \%F + \%N + \%W$   
(D)  $W_i = \frac{W_i}{\sum_{i1} W_i}$   
(E) Answer not known

88. Swim bladder produces sound in

- (A) Mammals  
(B) Deep sea fishes  
(C) Polypterus  
(D)  Anguilla  
(E) Answer not known

89. Which of the following are not true about flat fishes?

- (i) Pectalfins absent  
(ii) Adults are bilaterally symmetrical  
(iii) Swim bladder present  
(iv) Bottom living fishes  
(A) (i) and (ii) only  
(B)  (ii) and (iii) only  
(C) (i) and (iii) only  
(D) (i) and (iv)  
(E) Answer not known

90. Match the following :

- (a) Ribbon fish
- (b) Thread fin bream
- (c) Croakers
- (d) Mackerel

- 1. Rastrelliger Kanagurta
- 2. Johnius sp
- 3. Nemipterus japonicus
- 4. Trichiurus sp

- |   | (a)              | (b) | (c) | (d) |
|---|------------------|-----|-----|-----|
| (A)                                     | 4                | 2   | 3   | 1   |
| (B)                                     | 4                | 3   | 1   | 2   |
| (C)                                     | 3                | 4   | 2   | 1   |
| <input checked="" type="checkbox"/> (D) | 4                | 3   | 2   | 1   |
| (E)                                     | Answer not known |     |     |     |

91. Which of the following are incorrectly paired?

- (i) Metapenaeus dobsoni – Kaal shrimp
- (ii) Metapenaeus brevicornis – Speckled shrimp
- (iii) Metapenaeus monocerus – Yellow shrimp
- (iv) Metapenaeus affinis – Jinga shrimp

- (A) (i) and (ii) only
- (B) (ii) and (iii) only
- (C) (iii) and (iv) only
- (D) (ii) and (iv) only
- (E) Answer not known

92. Presence of 'Double Blowhole' is the characteristic feature of

- (A) Sperm whale
- (B) Porpoise
- (C) Dolphin
- (D) Baleen whale
- (E) Answer not known



93. In low-acid canned foods, the primary goal is to inactivate
- (A) Listeria monocytogenes                      (B) Clostridium sporogenes  
(C) Staphylococcus aureus                       (D) Clostridium botulinum  
(E) Answer not known
94. Which of the following is a aliphatic diamine?
- (A) Agmatine     (B) Putrescine  
(C) Spermine    (D) Spermidine  
(E) Answer not known
95. Arrange the correct series of infectious process of listeria monocytogenes
- (i) Residence in phagosomes  
(ii) Replication in cytosol and formation of protrusions  
(iii) Escape from phagosomes by action of listeriolysin  
(iv) Adhesion and internalization
- (A) (ii), (iv), (i), (iii)  
(B) (i), (iv), (iii), (ii)  
 (C) (iv), (i), (iii), (ii)  
(D) (iv), (ii), (i), (iii)  
(E) Answer not known
96. Which is not a characteristics of Campylobacter jejuni?
- (A) It is a thermotolerant bacteria with optimum growth temperature at 41 – 43°C  
(B) It produces a toxin that cause cell distension  
 (C) It lacks flagella but has Fimbriae  
(D) It is resistant to antibiotics such as tetra cycline and chloramphenicol  
(E) Answer not known

97. The type of bacteria responsible for the spoilage of shell fishes, (crustaceans) is
- (i) Pseudomonas and Vibrio
  - (ii) Vibrio
  - (iii) Salmonella (Gram Positive)
  - (iv) Pseudomonas (Gram Negative)
- (A) (ii)                      ✓ ~~(B)~~ (iv) alone  
(C) (iii) and (ii)                      (D) (i) and (iii)  
(E) Answer not known
98. Bifidobacteria is an indicator of recent fecal contamination in tropical freshwater system because of
- (A) Specific association with other bacteria
  - (B) Anaerobic nature
  - ✓ ~~(C)~~ Faster death than coliforms
  - (D) Growth in fecal matter
  - (E) Answer not known
99. Oxidative deamination means
- (i) Removal of free ammonia from tissues to yield glutamine by glutamine synthetase
  - (ii) Removal of amino group from glutamate by L-Glutamate Dehydrogenase
  - (iii) Transfer of Amino group from glutamine to pyruvate by Aminotransferase
- (A) (i) only  
✓ ~~(B)~~ (ii) only  
(C) (i) and (iii) only  
(D) (ii) and (iii) only  
(E) Answer not known

100. The protein fraction that do not play any role in fish processing is

- (A) Actin
- (B) Myosine
- (C) Sarcoplasmic
- (D) Tropomyosine
- (E) Answer not known

101. The protein value of osyter ranges between

- (A) 5 – 12%
- (B) 5 – 10%
- (C) 5 – 14%
- (D) 6 – 18%
- (E) Answer not known

102. Which of the statement is/are true about Sea turtles?

- (i) Turtles are warm blooded creatures
  - (ii) Turtles breathe air and visit surface at regular interval to fill their lungs
  - (iii) Temperature of the beaches determine whether eggs develop into male or female hatchlings
- (A) (i) and (iii) only
  - (B) (ii) and (iii) only
  - (C) (i) and (ii) only
  - (D) (iii) only
  - (E) Answer not known

103. Match the following products with their packaging materials :

- |                         |  |
|-------------------------|--|
| (a) Frozen fish         | 1. Polyester laminated with LDPE                           |
| (b) Fish pickles        | 2. Polyester/Aluminium foil/Polypropylene Laminate         |
| (c) Leed fish           | 3. Waxed duplex cartons with LDPE inner wrap               |
| (d) Retorted fish curry | 4. Polypropylene boxes with foamed polyurethane inner slab |

- |   | (a)              | (b) | (c) | (d) |
|---|------------------|-----|-----|-----|
| (A)                                     | 1                | 4   | 2   | 3   |
| (B)                                     | 2                | 3   | 1   | 4   |
| (C)                                     | 3                | 2   | 4   | 1   |
| <input checked="" type="checkbox"/> (D) | 3                | 1   | 4   | 2   |
| (E)                                     | Answer not known |     |     |     |

104. Assertion [A] : Polyethylene/Polypropylene packaging films used for retail packing of dried fish have limited shelf life.

Reason [R] : PE/PP packages have high water vapour and gas transmission rates.

- (A) [A] is true ; but [R] is false
- (B) [A] is false; but [R] is true
- (C) Both [A] and [R] are true ; but [R] is the correct reason for [A]
- (D) Both [A] and [R] are true ; but [R] is not the correct reason for [A]
- (E) Answer not known

105. Properties of packaging materials suitable for fresh fish

- (i) keep the fish moist and prevent dehydration
- (ii) prevent permeation of external odours
- (iii) prevent fat oxidation
- |  |                    |
|--|--------------------|
| (A) (i) only   | (B) (iii) only     |
| <input checked="" type="checkbox"/> (C) (i) and (ii) | (D) (ii) and (iii) |
| (E) Answer not known                                 |                    |

106. Critical control points in the processing of Dried fishery products for controlling growth of pathogenic bacteria
- (i) Raw material receiving
  - (ii) Drying
  - (iii) Labelling
  - (iv) Storage
- (A) (i) and (ii) are correct
- (B) (ii) is correct
- (C) (ii) and (iii) are correct
- (D) (ii) and (iv) are correct
- (E) Answer not known
- 
107. Insect infestation in dry fish can be destroyed by a Radiation dose upto
- (A) 1 kGy                      (B) 3 kGy
- (C) 5 kGy                        (D) 10 kGy
- (E) Answer not known
- 
108. What are the critical limits monitored by a fresh Tuna processor who receives fish on ice directly from harvest fishing vessels?
- (i) Harvest vessel records on placement of fish on ice
  - (ii) Amount of decomposition in a lot
  - (iii) Internal temperature of the fish at the time of off-loading from vessel
  - (iv) Histamine content in Raw Tuna
- (A) (i) and (iii) are correct
- (B) (iv) is correct
- (C) (i), (iii) and (iv) are correct
- (D) (i), (ii) and (iii) are correct
- (E) Answer not known

109. A Retort used for thermal processing of non-rigid containers like flexible pouches

- (A) Pressure overhead retort
- (B) Batch retort
- (C) Agitating type retort
- (D) Hydrostatic retort
- (E) Answer not known

110. Leavening agents used in battered and breaded fish products

- (i) Sodium carbonate
  - (ii) Tartaric acid
  - (iii) Mono sodium Glutamate
  - (iv) Sodium meta bisulphate
- (A) (ii) and (iv)
  - (B) (iii) and (iv)
  - (C) (i) and (ii)
  - (D) (i) and (iv)
  - (E) Answer not known

111. Alginates derived from Brown sea weeds have the following applications

- (i) as coating in welding rods
  - (ii) as medical dressings
  - (iii) as immobilized Bio-catalyst
  - (iv) as smooth laxative
- (A) (i) only
  - (B) (ii) and (iii) only
  - (C) (i), (ii) and (iii) only
  - (D) (i), (ii), (iii) and (iv)
  - (E) Answer not known

112. Assertion [A] : Fish with high moisture content rapidly deteriorate in quality  
Reason [R] : During freezing, the water in the fish is separated out from other components and frozen
- (A) [A] is true but [R] is false  
(B) Both [A] and [R] are true and [R] is the correct explanation of [A]  
(C) [A] is false and [R] is true  
 (D) Both [A] and [R] are correct but [R] is not the correct explanation of [A]  
(E) Answer not known
113. Automatic size grading of fish is \_\_\_\_\_ times more efficient than manual grading.
- (A) 1 – 3 (B) 2 – 5  
 (C) 6 – 10 (D) 10 – 16  
(E) Answer not known
114. The water content required to prevent mould growth in dry fish is below \_\_\_\_\_%.
- (A) 45 (B) 35  
 (C) 25 (D) 15  
(E) Answer not known
115. The minimum period required for complete destruction of E. Coli during frozen storage at  $-23^{\circ}\text{C}$  is
- (A) About 15 days (B) About 30 days  
 (C) About 3 months (D) About 6 months  
(E) Answer not known





120. The type of radiation that emitted white conversion of Plutonium 239 to Uranium 235 is

- (i)  $\alpha$  radiation
- (ii)  $\beta$  radiation
- (iii)  $\gamma$  radiation
- (iv) x-rays

- (A) (i) and (ii) only
- (B) (i) and (iv) only
- (C) (i) only
- (D) (ii) only
- (E) Answer not known

121. Paralytic shell fish poisoning is caused by which of the following dinoflagellates?

- (i) Gambierdiscus sp
- (ii) Gonyaulax sp
- (iii) Pyrodinium sp
- (iv) Gymnodinium sp

- (A) (i) and (ii)
- (B) (ii) and (iii)
- (C) (iii) and (iv)
- (D) (i) and (iv)
- (E) Answer not known

122. Match the following terms with respective items :

- |                          |                         |
|--------------------------|-------------------------|
| (a) T-S diagram          | 1. Dissolved salts      |
| (b) EL-Nino              | 2. Water masses         |
| (c) Residence time       | 3. Southern oscillation |
| (d) Density of sea water | 4. Elements             |

- |   | (a)              | (b) | (c) | (d) |
|---|------------------|-----|-----|-----|
| (A)                                     | 1                | 3   | 4   | 2   |
| <input checked="" type="checkbox"/> (B) | 2                | 3   | 4   | 1   |
| (C)                                     | 2                | 4   | 3   | 1   |
| (D)                                     | 1                | 2   | 4   | 3   |
| (E)                                     | Answer not known |     |     |     |

123. The solubility of a gas in sea water increases with

- (A) Increase of temperature, pressure and salinity
- (B) Increase of temperature and salinity and decrease of pressure
- (C) Increase of temperature and decrease of pressure and salinity
- (D) Decrease of temperature and salinity and increase of pressure
- (E) Answer not known

124. Flat-topped seamounts common in pacific ocean are called as

- (A) Guyots
- (B) Trenches
- (C) Plateaus
- (D) Canyons
- (E) Answer not known

125. Choose the correct statement about the type of Pyramid :

- (1) Pyramid of number is the total number of organisms in each trophic level
- (2) Pyramid of biomass is the dry weight of standing crop
- (3) Pyramid of biomass is upright in pond ecosystem
- (4) Pyramid of number is inverted in aquatic ecosystem

(A) (1) and (2) are correct

(B) (1) and (3) are correct

(C) (2) and (3) are correct

(D) (3) and (4) are correct

(E) Answer not known

126. The assemblage of organisms that grow upon surface of any objects submerged in water is referred as

(A) Pleuston

(B) Borers

(C) Burrowers

(D) Periphyton

(E) Answer not known

127. Which of the statements are correct about coral reef?

- (i) They do not occur at temperature less than  $10^{\circ}\text{C}$
- (ii) They do not develop at the depth more than 70 m
- (iii) They feed on Zooplankton
- (iv) All the corals are reef builders

(A) (i) and (ii) only

(B) (i) and (iii) only

(C) (i), (ii) and (iii) only

(D) (i), (ii) and (iv) only

(E) Answer not known

128. The term Plankton was first proposed by which Oceanographer?

(A) Welch

(B) Bhowmick

(C) Victor Hensen

(D) Vivekanandan

(E) Answer not known

129. Which of the following statement(s) is/are incorrect about solubility of gas in water?

- (i) rising temperature reduces the solubility of gas
- (ii) decreasing concentration of dissolved salts diminishes solubility
- (iii) rate of solution depends upon the degree of unsaturation of water
- (iv) rate of solution is increased by wave action

- (A) (ii) only
- (B) (iii) only
- (C) (ii) and (iii) only
- (D) (i) and (iii) only
- (E) Answer not known

130. One of the most important limiting nutrients in the development of Phytoplankton is

- (A) Silicate
- (B) Iron
- (C) Nitrogen
- (D) Phosphorous
- (E) Answer not known

131. The ratio of C : N : P in Plankton is

- (A) 106 : 16 : 1
- (B) 200 : 15 : 1
- (C) 256 : 16 : 1
- (D) 106 : 1 : 16
- (E) Answer not known

132. Choose the correct answer

One of the following statement is/are true about killed vaccine :

- (i) Pathogen is rendered incapable of replicating
- (ii) Killed bacterial vaccines are also called bacterins
- (iii) Killed vaccines must be given in smaller doses than live attenuated vaccine

(A) (i) only

(B) (i) and (ii) only

(C) (i), (ii) and (iii) only

(D) (i) and (iii) only

(E) Answer not known

133. Which of the following is the primary responsible agent for the epizootic ulcerative syndrome?

(A) Pseudomonas Septicaemia

(B) Yersinia ruckeri

(C) Aphanomyces invadens

(D) Renibacterium salmoninarum

(E) Answer not known

134. Largest class of synthetic antifungal agents is

(A) Antimetabolites

(B) Azoles

(C) Allyamines

(D) Antifungal antibiotics

(E) Answer not known

135. Which of the following is incorrectly matched?

- (A) Skin ulcers – Aliivibrio logei  
(B) Gill rot – Flavobacterium branchiophilum  
(C) Bacterial kidney diseases – Renibacterium Salmoninarum  
 (D) Red spot – Aeromonas sobria  
(E) Answer not known

136. Match the following :

- |                 |                                  |
|-----------------|----------------------------------|
| (a) Calcite     | 1. $\text{Ca Mg}(\text{CO}_3)_2$ |
| (b) Dolomite    | 2. $\text{Ca}(\text{OH})_2$      |
| (c) Quick lime  | 3. $\text{Ca CO}_3$              |
| (d) Slaked lime | 4. $\text{CaO}$                  |

- |   | (a)              | (b) | (c) | (d) |
|---|------------------|-----|-----|-----|
| (A)                                     | 4                | 3   | 2   | 1   |
| (B)                                     | 4                | 3   | 1   | 2   |
| <input checked="" type="checkbox"/> (C) | 3                | 1   | 4   | 2   |
| (D)                                     | 3                | 1   | 2   | 4   |
| (E)                                     | Answer not known |     |     |     |

137. The aggregates of Algae, Bacteria, Protozoans and other kind of particulate organic matter such as pieces and uneaten feed in fish ponds which improves fish growth is

- (A) Biofertiliser  
 (B) Biofloc  
(C) Detritus  
(D) Fish protein concentrate  
(E) Answer not known

138. Match the following :

- |                       |  |
|-----------------------|--|
| (a) Biomagnification  | 1. Biochemical modification of chemical compound           |
| (b) Bioaccumulation   | 2. Increase in concentration in tissues of living organism |
| (c) Bioconcentration  | 3. Increase in concentration of pollutant/chemical         |
| (d) Biotransformation | 4. Concentration of chemical in the organism               |

- |   | (a)              | (b) | (c) | (d) |
|---|------------------|-----|-----|-----|
| (A)                                     | 4                | 3   | 1   | 2   |
| (B)                                     | 1                | 4   | 3   | 2   |
| <input checked="" type="checkbox"/> (C) | 3                | 2   | 4   | 1   |
| (D)                                     | 3                | 4   | 1   | 2   |
| (E)                                     | Answer not known |     |     |     |

139. Consider the following statement :

Acute environmental hypoxia can be treated by

- (a) Monitoring ammonia and nitrite daily for one week to be sure that biological filtration is functioning properly
  - (b) Restoring oxygen levels immediately
- (A) Statement (a) is correct and (b) is wrong  
(B) Statement (a) is wrong and (b) is correct  
 (C) Both Statement (a) and (b) are correct  
(D) Both Statement (a) and (b) are wrong  
(E) Answer not known



140. Genome Annotation is the process of

- (A) Marking the genes and other biological features of DNA
- (B) Mutations in the gene (DNA) sequences
- (C) Sequences of small DNA fragments
- (D) Mapping and analysing of DNA
- (E) Answer not known

141. The practice of selecting only the best specimens for propagation is

- (A) Heterosis
- (B) Cross breeding
- (C) Genotypic selection
- (D) Mass selection
- (E) Answer not known

142. Which of the following statements are true about Mussel farming?

- (i) Technology developed by CMFRI
  - (ii) Technology is complex
  - (iii) No supplementary feed is required
  - (iv) Green Mussel is extensively farmed along the South-west coast
- (A) (i), (ii) and (iii) only
  - (B) (i), (ii) and (iv) only
  - (C) (ii), (iii) and (iv) only
  - (D) (i), (iii) and (iv) only
  - (E) Answer not known

143. Normally, shrimp fed continuously due to presence of

- (A) Longer intestine
- (B) Shorter intestine
- (C) Medium storage of gut
- (D) Long and Medium gut
- (E) Answer not known

144. In India, the viable culture technology has been developed for which of the following?

- (i) Mud crab fattening
  - (ii) Lobster fattening
  - (iii) Seabass farming
  - (iv) Sea cucumber culture
- (A) (i) only
  - (B) (i), (ii) and (iii)
  - (C) (iv) only
  - (D) (ii) only
  - (E) Answer not known

145. Which of the following is not a nest-builder?

- (A) Dwarf gourami
- (B) Siamese fighting fish
- (C) Indian rosy barb
- (D) Honey gourami
- (E) Answer not known

146. Which of the following is/are not true about Biogas Slurry-fish integrated system?

- (i) Direct use of bio-slurry in liquid form mixes quickly in pond water to produce required fish food organisms
- (ii) Bio gas-slurry is a byproduct from aquatic plants
- (iii) Slurry application for fry and fingerling rearing is advantageous
- (iv) In this system, pond environment is kept clean

(A) (iv) only

(B) (ii) only

(C) (i) and (iv) only

(D) (iii) and (iv) only

(E) Answer not known

147. The important Morphometric factor which is related to productivity in shallow reservoir is

(A) Area

(B) Depth

(C) Volume

(D) Area and Volume

(E) Answer not known

148. In sewage treatment, sewage passes through the bed of rocks, bacteria and fungi which uses the dissolved and suspended matter present in water. This system is known as

(A) Grit removal

(B) Activated sludge

(C) Trickling filters

(D) Sedimentation

(E) Answer not known

149. The ark clam known as blood cockle with Red Haemoglobin

- (A) Arca Inaequalvis
- (B) Acra Granosa
- (C) Anadara Granosa
- (D) Barbatia Tensera
- (E) Answer not known

150. Choose the right matches among the types :

1. Predatory fishes are Wallago attu and clarias batrachus
2. Predatory fishes are Notopterus chitara and notopterus notopterus
3. Predatory fishes are Wallago attu and catla catla
4. Predatory fishes are Notopterus and mystius species

- (A) 1 and 3 are correct
- (B) 1 and 2 are correct
- (C) 2 and 3 are correct
- (D) 3 and 4 are correct
- (E) Answer not known

151. Which of the following is correctly paired with its scientific name?

- (i) Climbing perch – Anabas testeodineus
- (ii) Singhi – Clarias batrachus
- (iii) Magur – Heteropneustes fossilis
- (iv) Murrel – Channa Striatus

- (A) (i) and (ii) only
- (B) (i) and (iv) only
- (C) (ii) and (iii) only
- (D) (ii) and (iv) only
- (E) Answer not known

152. Which among the following statements are true about Microfinance Organisations (MFOs)?

- (i) The poor have great access to institutional credit.
  - (ii) Substitution of group collateral for physical collateral
  - (iii) Establishment of "Grameen Bank" in Bangladesh
  - (iv) Group based social development model does not give emphasis on women
- (A) (i) and (ii) only  
 (B) (ii) and (iii) only  
(C) (iii) and (iv) only  
(D) (i) and (iv) only  
(E) Answer not known

153. Which of the following is incorrectly paired towards its headquarters?

- (A) CIFA – Barrackpore  
(B) CIBA – Chennai  
(C) CIFE – Mumbai  
(D) NBFGR – Lucknow  
(E) Answer not known

154. "A demonstration on value-added fish products shall not be conducted in a village where fishes are not eaten". This statement relates to which of the following principles of extension education?

- (A) Principle of interests and needs  
 (B) Principle of cultural differences  
(C) Principle of co-operation and participation  
(D) Grassroots principle  
(E) Answer not known

155. Which among are the most important characteristics of NGOs?
- (i) Non-Membership development oriented organisations
  - (ii) NGOs-Provides services Directly to the Rural or Grass root membership organisations
  - (iii) Implementing many innovations
  - (iv) Re-Invention of sustainability
- (A) (i) and (iv) only  
(B) (ii) and (iii) only  
 (C) (i) and (ii) only  
(D) (i) and (iii) only  
(E) Answer not known
156. Which one of the Coastal Regulation Zone (CRZ) includes the Coastal Zone in Rural Areas?
- (A) CRZ I (B) CRZ II  
 (C) CRZ III (D) CRZ IV  
(E) Answer not known
157. The cone of experience by Edgar Dale explains the inter relationship of
- (i) Direct experience at base and abstraction at apex (AV aids and learning experience)
  - (ii) Teaching level and AV aids
  - (iii) AV Aids and its positions in learning process
  - (iv) Learning levels and AV aids
- (A) (i) only  (B) (i) and (iii) only  
(C) (i) and (ii) only (D) (ii) and (iii) only  
(E) Answer not known

158. Which among the following statements are true about the insignificant credit flow in fisheries sector?

- (i) Bankers are aware of fish technologies and its profitability
  - (ii) Project size is fixed
  - (iii) Commercial fisheries is a new activity
  - (iv) Difficulty in assessing available stock / standing crops
- (A) (i) and (ii) only                      (B) (ii) and (iii) only  
 (C) (iii) and (iv) only                      (D) (i) and (iii) only  
(E) Answer not known

159. Choose the right matches

- (i) Father of Economics                      – Adam Smith
  - (ii) Balance sheet                              – Profit and Loss account statement
  - (iii) Production Possibility curve                      – Iso-factor curve
  - (iv) Net Present worth                              – Relative measure
- (A) (i) and (ii) are correct                       (B) (i) and (iii) are correct  
(C) (ii) and (iii) are correct                      (D) (iii) and (iv) are correct  
(E) Answer not known

160. Identify the major aim of micro planning process for any project in fisheries.

- (A) To get fund / finance only
- (B) To set the Goal for benefit from resources
- (C) To make small group for utilising resources
- (D) To make profit for the group only
- (E) Answer not known

161. Which among the following organisations was established with the objective to facilitate the fishing industry in India?

- (A) National Federation of Fisherman's Cooperatives Ltd (FISHCOPFED)
- (B) National Centre for Agricultural Research and Policy (NCAP)
- (C) National Institute for Fisheries Post Harvest Technology and Training (NIFPHATT)
- (D) Central Institute of Brackish Water Aquaculture (CIBA)
- (E) Answer not known

162. Which of the following are correctly paired?

- (i) Pelagic High Value (PHV) – Seerfish
  - (ii) Pelagic Low Value (PLV) – Pomfret
  - (iii) Demersal High Value (DHV) – Snappers
  - (iv) Demersal Low Value (DLV) – Sharks
- (A) (i) and (iv)                       (B) (i) and (iii)
- (C) (ii) and (iv)                      (D) (iii) and (iv)
- (E) Answer not known

163. What are the principal factors that affects the value of shrimps in export market?

- (i) Size of shrimp
  - (ii) Quality of shrimp
  - (iii) Infrastructure facilities
  - (iv) Extension service
- (A) (i) and (ii) only                      (B) (ii) and (iii) only
- (C) (iii) and (iv) only                      (D) (i) and (iii) only
- (E) Answer not known



164. Assertion (A) : Large number blade propellers are used when the load is too heavy and to control variation problem
- Reason (R) : The area of the blade propeller depends on the loading in  $\text{kg/cm}^2$ , which affects the strength and thickness of blades.
- (A) Both (A) and (R) are true (R) is not the correct explanation of (A)
- (B) (A) is false, (R) is true
- (C) (A) is true (R) is false
- (D) Both (A) and (R) are true, and (R) is the correct explanation of (A)
- (E) Answer not known
165. In travel net, the portion of the webbing between the belly and cod end is known as
- (A) Square
- (B) Throat
- (C) Selvedge
- (D) Bosum
- (E) Answer not known
166. The tendency of a vessel to return to its original position after inclination due to its external forces is called as
- (A) Centre of buoyancy
- (B) Centre of gravity
- (C) Centre of floatation
- (D) Stability
- (E) Answer not known

167. Choose the correct factors with the following type of gear

- |                           |               |
|---------------------------|---------------|
| (i) Capture and retention | – Trammel net |
| (ii) Structure            | – Set net     |
| (iii) Method of operation | – Drift net   |
| (iv) Target species       | – Crab net    |

Responses

- (A) (i), (ii) and (iii) only  
 (B) (i), (iii) and (iv) only  
(C) (ii), (iii) and (iv) only  
(D) (i), (ii) and (iv) only  
(E) Answer not known

168. The basic material used in the fabrication of netting yarns is

- (i) Rope  
(ii) Fibre  
(iii) Coir  
(iv) Yarn  
(A) (i) and (ii)  
 (B) (ii) alone  
(C) (iii) and (iv)  
(D) (iv) alone  
(E) Answer not known

169. Aerial traps are used to catch which type of the fishes?

- (A) Sardines  
(B)  Mullet  
(C) Anchovies  
(D) Crab  
(E) Answer not known

170. The net has central bent with two lateral wings and foot rope to prevent the escape of fish is known as
- (A) Ring nets (B) Purse seines  
 (C) Lampara nets (D) Blanket nets  
(E) Answer not known
171. The destructive artisan fishing method employed on coral reefs in south east Asia is
- (A) Cyanide fishing (B)  Muroami  
(C) Blast fishing (D) Bottom trawling  
(E) Answer not known
172. Ropes or cables that connect the wing to the otter boards in fishing gears are called as
- (A) Warps (B)  Sweep lines  
(C) G-link (D) Backstrop  
(E) Answer not known
173. Choose the correct pairs among the following :
- (i) Sacfry – Young larvae after yolk sac is absorbed  
(ii) Hatchling – Stage immediately after hatching  
(iii) Spawn – developing fertilized ova
- (A) (ii) and (iii) only  
(B) (i) and (ii) only  
(C) (i) and (iii) only  
(D) (i) only  
(E) Answer not known

174. Arrange the following events in chronological order.

- (i) Induced breeding of carps through hypophysation
- (ii) Natural breeding of Indian Major Carps (IMC)
- (iii) Bundh breeding of major carps
- (iv) Induced breeding of IMC with fractionated pituitary extract

- (A) (iii), (ii), (i), (iv)
- (B) (ii), (iii), (iv), (i)
- (C) (i), (iv), (ii), (iii)
- (D) (iv), (i), (iii), (ii)
- (E) Answer not known

175. Which of the following statements are true about Good Management Practices (GMP) in shrimp hatchery to ensure quality seed production?

- (A) Horizontal transmission of viral pathogens from mother shrimps to larvae is one of the sources of viral pathogens in the hatchery
- (B) Wild collected broodstock after prophylactic treatment and acclimatization are induced to mature through eyestalk ablation
- (C) Induced and disinfected matured stock should be provided with feed on spawning tanks
- (D) Prophylactic use of antibiotics (or) other drugs in larval rearing / nursery rearing tanks is recommended
- (E) Answer not known

176. Package of practices for seed production is available for

- (A) Silonia silondia
- (B) Clarias batrachus
- (C) Rita rita
- (D) Clarias dussumieri
- (E) Answer not known

177. Feeding the ornamental fishes with live feed is done for the following benefits

- (i) For providing vibrant colour
- (ii) For excellent growth of fish
- (iii) For excellent disease resistance
- (iv) To decrease the rearing period

- (A) (ii) and (iii) are correct      (B) (i) and (iv) are correct  
 (C) (i) and (ii) are correct      (D) (iii) and (iv) are correct  
(E) Answer not known

178. Which of the following statements are true about transportation of Brood fish?

- (i) Oxygen requirement of fish ranges from 100-1100 mg/kg/hour
- (ii) Carps (Brood stock) are tranquilized with the use coldwater (5-10°C)
- (iii) Oxygen requirement of brood fish depends on fish spares, size and physiological condition
- (iv) Cold water (5-10°C) is not used as tranquilizer for tropical fishes like carps

- (A) (iii), (i) and (ii) are correct       (B) (iv), (i) and (iii) are correct  
(C) (ii), (iii) and (iv) are correct      (D) (i), (ii) and (iv) are correct  
(E) Answer not known

179. Which of the following statements are true about Artemia hatchery?

- (i) Commercially available Artemia cysts are used
- (ii) Artemia nauplii are fed to mysis and post-larval stages of shrimps
- (iii) Continuous aeration and subdued light is not recommended for hatching
- (iv) The hatched larvae are separated from cyst-walls using their negative phototactic behaviour

- (A) (i) and (ii) are correct      (B) (ii) and (iii) are correct  
(C) (iii) and (iv) are correct      (D) (ii) and (iv) are correct  
(E) Answer not known

180. As Gonadotropin (GtH) in the pituitary gland of carps is found abundantly during breeding phase, which of the following season is suitable for collection of glands to be more potent?

(A) Winter

(B) Summer

(C) Spring

(D) Autumn

(E) Answer not known

181. Which of the following statements are true about different inducing agents in carp breeding?

(i) Pituitary gland extract is easy to prepare and dosa calculation depends on the body weight of the donor and recipient

(ii) Disease spreading chance is less when pituitary extract is used

(iii) HCG is easily available and in ready to use form

(iv) Long term storage of HCG is not possible

(A) (i) and (ii) are correct

(B) (i) and (iv) are correct

(C) (i) and (iii) are correct

(D) (ii) and (iv) are correct

(E) Answer not known

182. Who developed the fish stock assessment tool, FISAT?
- (A) Gayanilo, Pauly and Nansen
  - (B) Sparre, Pauly and Nansen
  - (C) Pauly, Stromme and Sparre
  - (D) Gayanilo, Sparre and Pauly
  - (E) Answer not known
183. Who proposed 'Match-Mismatch theory'?
- (A) Hjort
  - (B) Harden-Jones
  - (C) Cushing
  - (D) Illes and Sinclair
  - (E) Answer not known
184. Which method is employed to estimate the total instantaneous mortality, Z from CPUE?
- (A) Heinchke's method
  - (B) Jackson's method
  - (C) Paloheimo's method
  - (D) Robson' and Chapman's method
  - (E) Answer not known
185. Which of the statement is incorrect about Baleen whale?
- (A) Breath air through lungs
  - (B) Give birth to young ones
  - (C) Insulating blubber layer present
  - (D) Respire through Baleen plates
  - (E) Answer not known

186. Which of the following denotes decrease in affinity of haemoglobin for oxygen in the event of decrease in pH level?

- (A) Bohr effect                      (B) Root effect  
(C) Chloride shift                      (D) Oxygen dissociation  
(E) Answer not known

187. The number of ova per gram body weight is known as

- (A) Fecundity                               (B) Relative Fecundity  
(C) Absolute Fecundity                      (D) Total Fecundity  
(E) Answer not known

188. Assertion [A] : Mature adults of several species of fish undertake migration.

Reason [R] : For Breeding or feeding purposes.

- (A) [A] is true but [R] is false  
 (B) Both [A] and [R] are true and [R] is the correct explanation of [A]  
(C) [A] is false but [R] is true  
(D) Both [A] and [R] are true but [R] is not the correct explanation of [A]  
(E) Answer not known

189. Which one refers to fishes in which migration from freshwater to sea or vice versa is not for spawning and occurs regularly at some definite stage of the life cycle?

- (A) Potamodromous fishes                      (B) Oceanodromous fishes  
(C) Diadromous fishes                               (D) Amphidromous fishes  
(E) Answer not known



190. Which of the following are the characteristics Clarias sp?

- (i) Air breathing arborescent organ present
- (ii) 2 Nos. of barbels present
- (iii) Adipose fin absent
- (iv) Forked caudal fin present
- (A) (i) and (ii) only
- (B) (i) and (iii) only
- (C) (i) and (iv) only
- (D) (ii) and (iii) only
- (E) Answer not known

191. Match the following :

- |                          |                 |
|--------------------------|-----------------|
| (a) <u>Pristis</u> sp    | 1. Sting ray    |
| (b) <u>Rhinobatus</u> sp | 2. Electric ray |
| (c) <u>Torpedo</u> sp    | 3. Saw fish     |
| (d) <u>Dasyatis</u> sp   | 4. Guitar fish  |

- |   | (a)              | (b) | (c) | (d) |
|---|------------------|-----|-----|-----|
| (A)                                     | 2                | 3   | 4   | 1   |
| (B)                                     | 3                | 4   | 1   | 2   |
| <input checked="" type="checkbox"/> (C) | 3                | 4   | 2   | 1   |
| (D)                                     | 1                | 4   | 2   | 3   |
| (E)                                     | Answer not known |     |     |     |

192. Which of the following is / are not the characteristics of Tuna?

- (i) They move in shoals
- (ii) They visit estuaries and rivers
- (iii) They contain high proportion of Red muscle
- (iv) They are intolerant to temperature below 10°C
- (A) (i) only
- (B) (ii) only
- (C) (i) and (iv) only
- (D) (i) and (ii) only
- (E) Answer not known

193. The stomatopods belong to the subclass

- (A) Branchiopoda
- (B) Malacostraca
- (C) Ostracode
- (D) Cirripedia
- (E) Answer not known

194. Assertion [A] : *Aeromonas Hydrophila* is an opportunistic pathogen in fish.

Reason [R] : *Aeromonas* is a pathogen in freshwater fish.

- (A) [A] is true but [R] is false
- (B) [A] is false but [R] is true
- (C) Both [A] and [R] are true; and [R] is the correct explanation of [A]
- (D) Both [A] and [R] are true; but [R] is not the correct explanation of [A]
- (E) Answer not known

195. Characteristics of paralytic shellfish toxin

- (i) Water soluble and heat stable
  - (ii) Associated with snappers, and Barracuda
  - (iii) Produced by Alexandrium, Gymnodinium and Pyrodinium
  - (iv) Affects central nervous system by blocking sodium channels
- (A) (i) and (ii) are correct
  - (B) (i) and (iii) are correct
  - (C) (i), (iii) and (iv) are correct
  - (D) (ii), (iii) and (iv) are correct
  - (E) Answer not known

196. Which among the following is the smallest Sea turtle?

- (A) Green turtle
- (B) Olive ridley turtle
- (C) Leatherback turtle
- (D) Loggerhead turtle
- (E) Answer not known

197. Arrange the correct sequence of cellular action of clostridium perfringens Type C toxin

- (i) Small complex formation
- (ii) Receptor binding
- (iii) Pore formation
- (iv) Large complex formation

- (A) (ii), (iii), (i), (iv)
- (B) (iii), (ii), (i), (iv)
- (C) (ii), (i), (iv), (iii)
- (D) (i), (iv), (ii), (iii)
- (E) Answer not known

198. Identify the correct sequence of melanin formation in shrimps

- (A) Tyrosine → DOPA → Dopaquinone → 5, 6 Dihydroxy indole → Melanin
- (B) Tyrosine → Dopaquinone → DOPA → 5, 6 Dihydroxy indole → Melanin
- (C) Tyrosine → 5, 6 Dihydroxy indole → DOPA → Dopaquinone → Melanin
- (D) Tyrosine → 5, 6 Dihydroxy indole, → Dopaquinone → DOPA → Melanin
- (E) Answer not known

199. How oxidation of fish lipid is accelerated during freezing?

- (i) Release of prooxidants from myoglobin
- (ii) Mixing of membrane phospholipids with prooxidants
- (iii) Pure ice formation leaves remaining liquid water for reaction
- (iv) Ice crystal destroys lipid membrane structure and release phospholipids

(A) (ii), (i), (iv), (iii)

(B) (iii), (iv), (i), (ii)

(C) (iii), (i), (ii), (iv)

(D) (ii), (iii), (iv), (i)

(E) Answer not known

200. Which of the following statements are correct in relation to myosin?

- (i) Myosin is associated with the hydrolysis of ATP
- (ii) Myosin are more stable than actin to heat processing
- (iii) Myosin is responsible for the textural quality of fish
- (iv) Myosin is not easily digested by trypsin and chymotrypsin

(A) (ii) and (iv)

(B) (iii) and (iv)

(C) (ii) and (iii)

(D) (i) and (iii)

(E) Answer not known

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