**BREEDER STOCK AND HATCHERY MANAGEMENT**

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Important Concepts-

Addled: An egg with its contents disintegrating

As hatched: An explanation of a batch of unsorted chicks.

Biddy: A colloquial expression for a laying hen older than one year

Bloom:The protective layer, also known as the cuticle, that is moist and partially seals the pores of a freshly deposited eggshell to keep bacteria out.

Blowout: when a big egg (also known as a prolapse) is laid, usually resulting in vent injury.

Brood: A brood is a collection of chicks reared in the same batch at the same age.

Brooder: The apparatus is to give the chicks more warmth in the early part of their lives. Energy can be obtained from a variety of sources, including gas, oil, and electricity.

Brooding: the first few weeks of a chicken's existence, during which it needs to receive extremely close attention, including special foods and extra warmth.

Broody: the hormone-driven impulse in females that drives them to want to sit on eggs until they hatch and tend to the young chickens.

Clear eggs: During incubation, infertile eggs—those without embryos—are often taken out of the incubator.

Day-old chick: Within 24 hours of hatching, a chick is referred to as a "day-old chick.

Dead-in-shell: eggs that do not hatch into chicks.

Egg tooth: a little, hard protrusion on a freshly fledged chick's beak that it utilized to crack open its shell in order to hatch; also known as a chick tooth.

Hatch of Fertile (HOF): the quantity of marketable chickens produced from each egg designated as viable.

Hatchability: The percentage of all eggs that hatch into marketable chickens is typically stated.

Hen day average: Record of progressive egg production stated as a percentage and determined on a survivor basis.

Pecking order: a flock's social hierarchy among its members.

Straight-run (chicks): day-old chicks (also known as unsexed) who have not been sorted by sex.

|  |  |  |
| --- | --- | --- |
| Species | Egg Weight | Incubation Period |
| Ostrich | 1400 | 42 |
| Quail | 10 | 18 |
| Chicken | 55 | 21 |
| Turkey | 85 | 28 |
| Muscovy Duck | 70 | 35 |
| Duck | 72 | 28 |
| Pigeon | 15 | 18 |
| Emu | 600 | 54 |
| Guinea Fowl | 45 | 28 |

Incubator Parameters

|  |  |  |
| --- | --- | --- |
| Parameter | Setter | Hatcher |
| Temperature (F) | 99.5-100.5 | 98.5-99.3 |
| Humidity (%) | 60-70 | 75-80 |
| Time Period | 1-18 Day | 19-21 Day |
| Oxygen (%) | 21% | 21% |
| Carbon Dioxide (%) | 0.04 | 0.04 |

|  |  |  |
| --- | --- | --- |
| Fumigation | Concentration | Time |
| Incubator and Hatcher room | 3X | 30 |
| Hatching Eggs | 3X | 20 |
| Chicks in Hatcher | X | 3 |
| Eggs in Setter | 2X | 20 |

1X concentration includes 20gm Potassium Permanganate and 40ml Formalin

|  |  |
| --- | --- |
| Days | Developmental Stage |
| 1 | Resume the development of embryos |
| 2 | The heart begins to beat and blood flow begins. |
| 3 | The embryo is surrounded by amnion and turns to the left. |
| 4 | Growth of the limb buds |
| 5 | Knee and elbow appearance |
| 6 | Paw and beak movements |
| Organ Development | |
| 7 | Development of combs starts |
| 8 | emergence of the beak's top and lower mandibles and the onset of feathers |
| 9 | beginning of the bird's form and mouth opening |
| 10 | Nails emerge and fingers split apart. |
| 11 | Differences in comb appearance and feather appearance |
| 12 | elliptical-shaped eyes |
| 13 | Down begins to blanket the embryo. |
| 14 | The embryo is oriented |
| 15 | Intestine's appearance in the abdomen |
| 16 | Feathers covering the body |
| Maturation Phase | |
| 17 | cranium between the legs |
| 18 | Head beneath the right wing |
| 19 | The amniotic fluid vanishes |
| 20 | Whole yolk sac integrated into embryo; beak beginning to protrude |
| 21 | Cracks the eggshell; typical hatching |

Hatchery Troubleshooting

|  |  |  |
| --- | --- | --- |
| **Over 3% dead in first 3 Days of Incubation** | | |
| Problem | Causes | Remedies |
| Fertile, pre ovipositional  death. | Inbred strains. | Utilize young males and refrain from overly inbreeding. |
| Parthenogenesis in  turkeys. | Breeders should not utilize genetic stocks with a high parthenogenesis incidence. |
| Fertile, no development  (FND) | Eggs stored at a temperature that is too low. | Hold hatching eggs between 55°F and 68°F (12.80°C and 20.0°C). |
| Positive development (PD). | Inadequate collection schedule in both hot and cold climates. | Gather eggs four or more times a day when the temperature in the house or nest box is higher than 800F (26.60C). |
| Blastoderm without  embryo (BWE). | Improper storage temperature. | Hold hatching eggs between 55°F and 68°F (12.80°C and 20.0°C). |
| **Over 0.5% dead from day 4 to transfer** | | |
| Many dead embryos. | Improper incubator temperature. | Verify the thermometer's accuracy and adjust the setting to between 99.50 and 100 F (37.50 and 37.cc). |
|  | Power failure. | Open the machine till the power is restored if the power goes off. |
|  | Improper turning. | Three or more times a day, flip the eggs. |
| **Over 8% dead after transfer** | | |
| Malposition. | Eggs set small end up. | Place eggs in trays according to their size (horizontal or big end). |
| Embryos die before pipping. | Low-temperature incubating conditions; relative humidity too  high. | In a fan-ventilated setting, maintain a temperature of 99.50F (37.5 0C) for the dry bulb and 8ffF (30.0 C) for the wet bulb. |
|  | Infected eggs | Don't use cold water to wash eggs. Use 110–120 F (43.30–48.90 C) wash water; only nest-clean eggs should be laid. |
|  | Poor nutrition of breeder flock. | Almost all recognized vitamins and minerals, if lacking or insufficient, can result in late mortality on a heck breeder diet and low Quality of chicks. |
|  | Presence of lethal genes in stock. | Use hardy strains and steer clear of inbreeding. |
| Embryos weak and fail to pip or pip weakly. | Vitamin E deficiency. | Utilize fresh feed or add 48 IU of vitamin E per gallon of water as a supplement. |
| Chicks hatch too early,  are thin and noisy. | Temperature too high during  incubation period. | Examine your thermometer; any deviation of 1 F (0.60C) from 99.50F (37.50C) will result in hatching about 24 hours earlier. |
|  |  |  |

Important Points –

For a space of 100 square feet, fumigate at its standard strength concentration is adequate.

A drop in the ambient air's carbon dioxide content rather than a decrease in its oxygen content could be the cause of the incubation time increase with altitude.

Above 1015 meters, hatchability decreases by roughly 5% for every 300 meters.

A lack of biotin results in webbing between the third and fourth toes.

Lower humidity causes Down to stick to the shell.

Pre-incubation developments explain why eggs produced in the warmer months take less time to incubate than those laid in the cooler ones.

Eggs that have been artificially incubated should be held with the big end up.

A higher oxygen concentration of 23 to 23.5% in incubators will boost the hatchability of eggs at high elevations.

It is not advisable to spin eggs in a circle all the time in Incubator.

The most common kind of sexing is vent sexing.

Ostrich eggs must be incubated at 97.6 degrees Fahrenheit and 25% relative humidity.

Use 200 parts per million chlorine disinfectant when cleaning soiled eggs.

By the sixteenth day of incubation, the albumen supply is depleted, and the yolk becomes the embryo's source of nutrition.

The newly hatched chick's temperature is 103.5 F.

Fumigants are neutralized by the application of ammonium hydroxide.

Incubators with still air hatch duck eggs more successfully than those with pushed air.

The temperature of chick holding room is 75°F and 70% relative humidity.

1)Zinc and copper level in feed of breeder chickens are respectively.

A) 60 ppm, 30 ppm

B) 5 ppm, 65 ppm

C) 75 ppm, 10 ppm

D) 40 ppm, 75 ppm

2)To achieve Uniform Flock Weight which of the following method is most suitable

A) Qualitative feed restriction

B) Quantitative Feed restriction

C) Providing Salt Deficient Diets

D) Methionine restriction

3)**Assertion** - Concave growth curve is desirable in breeder birds over the convex growth curve.

**Reason -** Concave growth curves give rapid early growth which causes reduction in fertility percentage by increase in weight.

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) Both A and R are false.

4)Following are the nutrient requirement for broiler breeder match the correct Energy and Protein levels from the options

|  |  |  |
| --- | --- | --- |
| Feeding Standard | Energy Level | Protein Level |
| 1)ICAR 2013 | P. 450 Kcal ME/hen/day | X. 19.5% |
| 2)BIS 2007 | Q. 2700 Kcal ME | Y. 16% |
| 3)NRC 1994 | R. 2800 Kcal ME | Z. 16% |

A) 1-P-Z;2-Q-X;3-R-Y

B) 1-Q-Y;2-R-Z;3-P-X

C) 1-R-X;2-P-Y;3-Q-Z

D) none of the above

5) **Statement A -** It is recommended to add more methionine to the diets of prebreeders.

**Statement B -** The size of eggs can be effectively controlled by adjusting the protein content in the diet, particularly the concentration of methionine.

A) Statement A is Correct and Statement B is wrong

B) Statement A is Wrong and Statement B is Correct

C) Both the statements are correct and statement B is Correct explanation of statement A

D) Both the statements are correct and statement B is Not the Correct explanation of statement A

6) **Statement A** - During the growing season, never reduce the length or intensity of the light.

**Statement B -** During the laying time, never extend or intensify the light.

A) Statement A is Correct and Statement B is wrong

B) Statement A is Wrong and Statement B is Correct

C) Both the Statements are correct

D) Both the Statements are Wrong

7) Which Receptors are responsible for growth in chickens

A) Retinal photoreceptors

B) Extra retinal Photoreceptors

C) Surface receptors

D) Species Specific Chemoreceptors

8)Duration of light during brooding and laying period of breeder stock is \_\_\_\_\_\_\_\_\_\_\_ and \_\_\_\_\_\_\_\_\_\_\_\_ Respectively

A)24,16

B)12,14

C)8,20

D)12,12

9)Match the Pairs

|  |  |  |  |
| --- | --- | --- | --- |
| Sr No. | Light Colour |  | Effect on Birds |
| 1 | Red | A | Improves reproductive performance |
| 2 | White | B | Reduces cannibalism |
| 3 | Blue and Green | C | Better feed Intake |
| 4 | Orange | D | Lowers age at sexual maturity |

A)1B,2D,3A,4C

B)1B,2C,3D,4A

C)1B,2C,3A,4D

D)1D,2B,3C,4A

10) Which hormone injections inhibit the production of Gonadotropin hormones which is also responsible for broodiness?

A) Prolactin

B) FSH

C) LH

D) TRH

11)\_\_\_\_\_\_\_\_\_\_\_\_\_\_ area is examined for general body fat deposition in breeder birds

A) Neck

B) Shank

C) Wing Web

D) Vent

12)Choose Correct Statements from given Statements

1)Critical and saturation day lengths are about 10 h and 14 h re­spectively for domesticated poultry.

2)The turkey's critical and saturation day lengths are fixed.

3)A saturation day length is reached when there is no further increase in plasma LH with longer day lengths.

4)The pineal gland is considered an extra retinal receptor in Poultry, but not in mammals.

5) The term "switching off" of egg production by a bird's decreased ability to react to stimulatory day lengths is known as photorefractoriness.

A)3,4,5

B)1,2,3,5

C)1,4,5

D)1,2,3,4,5

13)Choose Correct Statements from given Statements

1) Broodiness is determined by complementary genes, and it has a sex-lined inheritance.

2) Placing artificial eggs into nests does not stimulates broodiness

3) warm weather has inhibitory effect on broodiness

4) hens stop laying when they become broody

A)1,2,3

B)2,3,4

C)3,4

D)1,4

14) During Debeaking the cut surfaces of the beak can then be held on the hot blade for \_\_\_\_\_\_\_\_\_ seconds to cauterize and prevent bleeding.

A)4-5

B)2-3

C)5-6

D)10

15)Which of the following Operations are performed in Breeder stock Management

A) Dubbing

B) Toe Clipping

C) Debeaking

D) All of the above

16)Choose the Correct Statements related to factors affecting Fertility in birds

1)Less fertility common in heavy breeds compared to light breeds

2)Cross breeding improves fertility

3)Fertility is usually higher in younger birds than older ones

4)The cocks kept under darkness for longer period exhibit higher fertility as compared to cocks of lighting conditions

A)1,2,4

B)2,3,4

C)1,2,3

D)1,2,3,4

17)Correlation between body weight and fertility is \_\_\_\_\_\_\_\_

A) -0.3

B) +0.3

C) -0.7

D) -0.5

18) Parthenogenesis, or the spontaneous development of unfertilized eggs is

a very commonly seen in\_\_\_\_\_\_\_\_\_\_\_\_

A) Ducks

B) Turkey

C) Chicken

D) Quail

19)Presence of which bacteria in cecum of breeder chickens promotes to high egg laying percentage and better fertility

A) Firmicutes

B) Spirochaetes

C) Sphaerochaeta

D) Bacillus

20) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ ml of undiluted semen needs to be inseminated into a turkey hen to give around 100 million sperm.

A) 0.25

B)0.03

C)0.01

D)0.50

21) osmotic pressure of ideal semen diluent should be \_\_\_\_\_\_\_\_\_\_\_\_\_\_

A)210 m osmol/kg

B)360 m osmol/kg

C)470 m osmol/kg

D)500 m osmol/kg

22)

Assertion - There are no fructose, citrate inositol, phosphoryl choline, or glyceryl phosphoryl choline—compounds typically present in mammalian semen—in the seminal fluid of avian sperm.

Reason - There are no prostate glands or seminal vesicles in poultry, and there is very little seminal fluid in the animal.

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) Both A and R are false.

23)Sperm Storage Tubules are present in \_\_\_\_\_\_\_\_\_\_\_\_\_\_ part of oviduct

A) Uterus

B) Isthmus

C) Infundibulum

D) Utero-Vaginal Junction

24)Statement 1 – Insemination in chickens is done in afternoon time after 2 PM

Statement 2 – Light Intensity is more which affect Insemination dose.

A) Statement A is Correct and Statement B is wrong

B) Statement A is Wrong and Statement B is Correct

C) Both the statements are correct and statement B is Correct explanation of statement A

D) Both the statements are correct and statement B is Not the Correct explanation of statement A

25)Match the Pairs

|  |  |  |  |
| --- | --- | --- | --- |
| Sr No | Species | Sr No | Sperm concentration (million per ml) |
| 1 | Chicken | A | 4000 |
| 2 | Gander | B | 3800 |
| 3 | Tom | C | 2500 |
| 4 | Drake | D | 9000 |

A)1C,2D,3B,4A

B)1A,2C,3D,4B

C)1B,2D,3A,4C

D)1B,2C,3D,4A

26)Courtship Dance by Male Turkey is known as

A) Stumping

B) Stunning

C) Strutting

D) Shutting

27)Statement A- Phosvitin and lipovitellin are two protein components of developing yolk

Statement B- Yolk protein synthesis occurs in Ovary.

A) Statement A is Correct and Statement B is wrong

B) Statement A is Wrong and Statement B is Correct

C) Both the Statements are correct

D) Both the Statements are Wrong

28)Which of the following are correct statements

1)Interval between two successive ovulation is around 25 hrs in chicken.

2)Rupture of follicle occurs during specific period of day called as Open Period.

3)Tubular glands present in magnum of oviduct produces avidin.

4)One sperm storage tubule can store upto 1000 sperms.

A)1,2,3

B)1,3

C)2,3,4

D)1,2

29)

**Assertion** - On the follicle Stigma is the weakest part.

**Reason -** Collagen fibres are arranged parallel to each other on surface of follicle where stigma is present

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) Both A and R are false.

30)Male chicken mates around \_\_\_\_\_\_\_\_\_\_\_ times in a day

A)5-10

B)10-20

C)25-40

D)80-90

31)Strain Used for vaccination against Mareks Disease in Breeder Chickens is

A) HVT

B) SAT  
C) MAT  
D) Lasota

32)Which is the Marker Vaccine Used to differentiate infected from vaccinated animals

A) Lasota

B) DIVA

C) MD

D) HVT

33)In OVO vaccination is performed at 18th day of incubation through

A) Amniotic

B) Embryonic route

C) Allantois

D) Both a and b

34)Match the pairs

|  |  |  |  |
| --- | --- | --- | --- |
| Sr No | Vaccine | Sr No | Duration |
| 1 | MD | a | 14th day |
| 2 | RD | b | 45th day |
| 3 | IBD | c | 1st day |
| 4 | Fowl Pox | d | 7th day |

A)1c,2d,3b,4a

B)1c,2d,3a,4b

C)1c,2a,3b,4d

D)1d,2b,3c,4a

35) In Commercial Broiler stock minimum inter flock interval is of

A)10 Days

B)30 Days

C)15 Days

D)7 Days

36) Choose Correct Statement

A-Parent Stock for commercial broiler is present at Hatcheries

B-Grand Parent Stock of is Present at Poultry Ventures and Breeders

A) Statement A is Correct and Statement B is wrong

B) Statement A is Wrong and Statement B is Correct

C) Both the Statements are correct

D) Both the Statements are Wrong

37)

**Assertion** - Hatcheries that use parent-line breeding sex their chicks.

**Reason -** Male and female breeders come from distinct parent lines..

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) Both A and R are false.

38)Critical Day length for chicken is \_\_\_\_\_\_\_\_\_\_\_hrs

A) 10.5 to 15.25 hrs

B)8.5 to 13.2hrs

C)14 to 16 hrs

D)8 to 10.5 hrs

39)Arrange the following traits according to their heritability values in increasing order

1)Humeral strength (HSTR)

2)Tibial strength (TSTR)

3)Keel radiographic density (KRD)

A)1,3,2

B)3,2,1

C)2,3,1

D)1,2,3

40) Which of the following are **vertically transmitted diseases** in breeder chickens

1.Mareks Diseases

2.Salmonelosis

3.CIA

4.Ranikhet Disease

5.CRD

6.Infectious Bronchitis

7.leachy Disease

A)1,2,3,6,7

B)2,3,5,7

C)1,2,4,5,7

D)1,2,3,4,5,6,7

41) Development stops when the embryo is kept below what is known as physiological zero, which is at

A)20°C. to 21°C

B)17°C to 18°C

C)28°C to 30°C

D)37°C to 38°C

42) **Assertion** - Prewarming of eggs is done for 6 to 8 hours before setting

**Reason -** Egg sweating occurs when we move eggs from cold room to warm room

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) Both A and R are false.

43)First cleavage of germ cell occurs when egg enter in

A) Isthmus

B) Infundibulum

C) Magnum

D) Uterus

44)Heart Beat starts at which day of incubation

A)2nd

B)4th

C)5th

D)8th

45)Statement A - Blastodisc is present in fertile egg

Statement B - Blastoderm is present in infertile egg

A) Statement A is Correct and Statement B is wrong

B) Statement A is Wrong and Statement B is Correct

C) Both the Statements are correct

D) Both the Statements are Wrong

46)Type of cleavage in fertile egg is

A) Meroblastic

B) Hypoblastic

C) Epiclastic

D) Homoblastic

47) A narrow cleft called blastocoels appears between the

A) Area Pellucida and Area Opaca

B) Area Opaca and Epiblast

C) Area Pellucida and Epiblast

D) Epiblast and hypoblast.

48) thickened area at the posterior region of area pellucida in the mid dorsal line

A) Epiblast

B) Primitive streak

C) Primitive Groove

D) Mesoblast

49)Breathing starts inside the air sac at \_\_\_\_\_\_\_\_\_\_\_ of Incubation

A)2nd Day

B)11th Day

C)20th Day

D)8th Day

50)Match the Pairs

|  |  |  |  |
| --- | --- | --- | --- |
| Sr No | Species | Sr  No | Incubation Period |
| 1 | Turkey | a | 21 |
| 2 | Muscovy Duck | b | 28 |
| 3 | Quail | c | 35 |
| 4 | Chicken | d | 54 |
| 5 | Emu | e | 17 |

A)1d,2e,3a,4b,5c

B)1b,2d,3c,4a,5e

C)1b,2e,3c,4a,5d

D)1b,2c,3e,4a,5d

51) Match the Pairs

|  |  |  |  |
| --- | --- | --- | --- |
| Sr No | Species | Sr No | Egg Weight |
| 1 | Goose | a | 10 |
| 2 | Duck | b | 285 |
| 3 | Quail | c | 85 |
| 4 | Turkey | d | 72 |

A)1d,2c,3a,4b

B)1b,2d,3a,4c

C)1b,2b,3c,4a

D)1b,2c,3d,4a

52)Hatcheries must be located at least \_\_\_\_\_\_\_\_\_ m away from other poultry farm

A)460

B)600

C)1500

D)100

53)Ideal temperature and relative humidity for prewarming is

A) 65°C & 45%

B)73°C & 45%  
C) 55°C & 55%  
D) 85°C & 55%

54)**Statement A-** No back tracking of staff and eggs is allowed in hatcheries

**Statement B –** Eggs from the breeder farm are directly stored in Egg Storage Room

A) Statement A is Correct and Statement B is wrong

B) Statement A is Wrong and Statement B is Correct

C) Both the Statements are correct

D) Both the Statements are Wrong

55) The temperature of the dry bulb thermometer is recorded by the

A) incubator  
B) Water  
C) Room temperature  
D) Ambient air

56)Incubation temperature during first 18 days is \_\_\_\_\_\_\_\_\_\_\_ and temperature during last three days is \_\_\_\_\_\_\_\_\_\_\_\_\_\_

A)98.5 – 100.25 and 98 - 99  
B)95 – 96.5 and 98 – 101.5  
C)97.5 -98 and 98 – 99.5  
D)99.5 – 100 and 102 – 102.5

57)Statement A – Temperature increases from setter to hatcher and relative humidity decreases from setter to hatcher

Statement A – Temperature decreases from setter to hatcher and relative humidity increases from setter to hatcher.

A) Statement A is Correct and Statement B is wrong

B) Statement A is Wrong and Statement B is Correct

C) Both the Statements are correct

D) Both the Statements are Wrong

58)Position of egg in hatcher should be

A) Broad end up  
B) Narrow end up  
C) Horizontal  
D) Narrow end up

59)\_\_\_\_\_\_\_\_\_\_\_\_\_ valve is used to control flow of water in incubator

A) Flow Diversion Valve  
B) Solenoid Valve  
C) Pressure Valve  
D) One way valve

60) Concentration of potassium permanganate and formalin is used for fumigation is in the ratio

A) 1:2  
B) 2:1  
C) 3:1  
D) 1:3

61) Neutralizer used for fumigation in Incubator room is

A) Calcium hydroxide  
B) Ammonium hydroxide  
C) Sodium Sulphate  
D) Zinc Sulphate

62)Chicks in Hatcher are fumigated for \_\_\_\_\_\_\_\_ min

A)1  
B)12  
C)3  
D)9

63)Fumigation concentration used to disinfect Trucks is

A)2X  
B)3X  
C)4X  
D)5X

64)Candling is term used for egg inspection process with bright light because

A) Candle wax was used to shine the surface of egg  
B) Candles were source of light   
C) Candle wax was used as preservative  
D) None

65)Commercially at big hatcheries candling is done at \_\_\_\_\_\_\_\_

A)1st day  
B)18th day  
C)21st day  
D)3rd day

66)Size of air cell in B grade is \_\_\_\_\_\_\_\_\_

A)1/16  
B)8/16  
C)3/16  
D)3/8

67) **Assertion** – The incubation period is shorter for eggs produced during the warmer months.

**Reason –** Warm temperature causes pre incubation development in embryo

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) Both A and R are false.

68)Rate of Air Turnover for 1000 chicks is \_\_\_\_\_\_\_\_

A)50 m3/hr  
B) 35 m3/hr  
C) 45 m3/hr  
D) 20 m3/hr

69)Storage area per 100 chicks in chick storage room is \_\_\_\_\_\_\_

A)1.1 m2  
B)2 m2  
C)2.5 m2  
D)3 m2

70)Incubation hours for single stage setting of eggs are \_\_\_\_\_

A)496  
B)510  
C)450  
D)503

71)For each 2.5gm over 55 gm will add \_\_\_\_\_\_ extra minutes to incubation

A)10  
B)20   
C)30   
D)40

72)Choose Correct statement

1. when the weight loss is optimum, about one third of the shell will be removed after piping.

2. When the humidity is too high, the shell will be piped nearer to blunt end

3. When the humidity is too low, the shell will be piped nearer to narrow end

A) 1,2  
B) 2,3  
C) 1,2,3  
D) None

73)Choose correct statements

1. Turning is done to prevent sticking of embryonic membranes to shell

2. Optimum utilization of all nutrients

3. For Utilization of albumen by the embryo

4. To provide air ventilation to all surface of egg

A)1,2,4  
B)2,4  
C)2,3,4  
D)1,2,3,4

74)Birds which can walk swim or drive soon after hatching are called as \_\_\_\_\_\_\_\_\_

A) Precocial   
B) Altrical  
C)Hytrecial  
D) None of above

75) R value of Walls and ceiling of egg holding room should be \_\_\_\_\_\_\_

A)10 - 12  
B)12 - 16  
C)20 - 25  
D) 32 - 34

76) The cause of the webbing between the third and fourth toes is a lack of

A)Biotin  
B)Riboflavin  
C)Thiamine  
D)Vit E

77)Time period between the hatching of first chick and last chick in one particular hatcher

A) Holding time  
B) Batch period  
C) Hatching Window  
D) None

78) The percentage of hatches and the percentage of fertile eggs differ by this:

A) Leaker   
B) Spread

C) Shrinkage

D) Hatch Loss

79) Percentage of all sets of eggs that hatch, fertile or not (anywhere from 80% to 90% is considered a typical hatch).

A) Hatch of total

B) Percent hatch

C) Hatch

D) All the Above

80) Vitamin deficiencies are the cause of the high death rate and head-between-legs condition between days 14 and 18 of incubation.

A) Vitamin M  
B) Vitamin H  
C) Vitamin B1  
D) Vitamin B12

81) What is the optimal site for delivery of MD vaccines by in ovo injection?

A) Air cell

B) Allantoic sac

C) Amnion

D) Embryo body

82) Which of the following vaccines has been shown to be effective when delivered into the amnion or body of the embryo by in ovo injection?

A) Marek’s disease vaccine

B) Avian influenza vaccine

C) Mycoplasma gallisepticum vaccine

D) All of the above

83) Which of the following stimulants was found to be more potent and to decrease embryo body weight and moisture content when injected by in ovo injection at 16 d of incubation?

A) Caffeine

B) Theophylline

C) L-carnitine

D) Creatine

84) Which of the following probiotic bacteria was found to reduce hatchability of fertile eggs when injected by in ovo injection at 18 d of incubation?

A) Bacillus subtilis

B) Lactobacillus acidophilus

C) Bifidobacterium animalis

D) None of the above

85) What is the moisture range of hatchery waste?

A) 33–61%

B) 43–71%

C) 53–81%

D) 63–91%

86) How can you separate the membrane from the shell of an egg?

A) Egg shells can be ground into a powder in a meat processor; combine the powder with water.

B) Use a blender to blend the egg shells and then strain the mixture

C) Use a hammer to crush the egg shells and then wash them with water

D) Use a knife to cut the egg shells into small pie

87) What does the egg shell membrane contain about 10% of

A) Protein

B) Fat

C) Collagen

D) Carbohydrates

88) What is one potential use of the extruder for integrated operations?

A) Processing breeder diets to control pathogens

B) Rendering hatchery waste into animal feeding meals

C) Incinerating hatchery waste to reduce disposal costs

D) Ensiling hatchery waste with molasses to preserve it

89) What is the name of the extruded product made from hatchery waste and corn?

A) LK-99

B) Chips

C) Brady

D) Hamm

90) What are the two types of inactivated AI vaccines used by the traditional hatcheries for vaccinating DOCs?

A) H5N1 and H5N2

B) H5N1 and H7N9

C) H7N9 and H9N2

D) H9N2 and H5N2

91) What is the name of the material used to construct most of the traditional hatcheries?

A) Red brick

B) Gypsum

C) Mud brick

D) Wood

92) What hormone is secreted by the embryonic testis and causes the regression of the Mullerian ducts?

A) Testosterone

B) Estrogen

C) AMH

D) FSH

93) What gene is responsible for the development of testes in male birds?

A) AMH

B) DMRT1

C) SRY

D) SOX9

94) What is the rate of yolk deposition for the last four days of follicle development?

A) 2.5 cm3 or greater per day

B) 2.5 mg or greater per day

C) 2.5 g or greater per day

D) 2.5 ml or greater per day

95) What proteins are produced in the yolk when the oocyte cleaves vitellogenin?

A) Light and heavy chain lipovitellin, phosvitin

B) phosphatidylcholine, heavy and light-chain lip

C) Heavy- and light-chain lipase, phosphorus,

D) Heavy and light-chain lipids, phosphate, and yolk

96) What is the process for obtaining and manipulating primordial germ cells in chicken?

A) From chick embryo blood and cultured

B) From blastoderm of fertilized eggs and injected into embryos

C) From yolk sac of hatched chicks and transfected with plasmids

D) From feather follicles of adult chickens and edited with CRISPR

97) What is the advantage of using oviduct specific promoters for producing pharmaceutical proteins in transgenic hens?

A) They increase the expression level of the proteins

B) They target the proteins to the egg white

C) They prevent the proteins from being degraded

D) They reduce the immunogenicity of the proteins

98)What is the role of progesterone in the ovary?

A) It stimulates production of yolk precursors by the liver

B) A certain protein found in egg whites, called avidin, is stimulated by it.

C) The granulosa cells are stimulated to produce more estrogens.

D) It stimulates production of androgens by the Leydig cells

99) Mention the pair of hormones which are gonadotropin releasing in the birds?

A) cGnRH-I and cGnRH-II

B) cGnRH-II and cGnRH-III

C) cGnRH-I and cGnRH-IV

D) cGnRH-III and cGnRH-IV

100) What are the two factors that are commercially increased to bring pullets into lay?

A) Photoperiod and light intensity

B) Photoperiod and temperature

C) Light intensity and temperature

D) Light intensity and humidity