1. Land-grant colleges came into existence as a part of the
   (A) Smith-Lever Act
   (B) Morrill Acts
   (C) Hatch Act
   (D) Extension Act

2. The degree to which individual involved in communication differs in certain characteristics is
   (A) homophily
   (B) credibility
   (C) empathy
   (D) heterophily

3. The decision to make full use of an innovation is known as
   (A) interest
   (B) desire
   (C) adoption
   (D) satisfaction

4. The SMCR model of communication is given by
   (A) Berlo
   (B) Lasswell
   (C) Roger
   (D) Leagan

5. The process by which the effectiveness of extension is assessed is
   (A) plan of work
   (B) evaluation
   (C) programme execution
   (D) written programme statement

6. The principles of cooperation imply that a cooperative society must maintain non-alignment to any political body and observe neutrality. This is a fundamental aspect under the principle of
   (A) economic independence
   (B) political neutrality
   (C) cultural neutrality
   (D) cultural dependence

7. The mathematical model of communication was given by
   (A) the Osgood-Schramm model
   (B) the Shannon and Weaver model
   (C) the Lasswell's model of communication
   (D) the Westley and MacLean model

8. Krishi Vigyan Kendra concept was given by the
   (A) Abhijit Sen Committee
   (B) Shanta Kumar Committee
   (C) Mohan Singh Mehta Committee
   (D) National Advisory Committee on Agriculture

9. A research study aims to explore the outcomes of various factors influencing the organization of effective mid-day meal interventions. Which research method would be the most appropriate?
   (A) Experimental method
   (B) Historical method
   (C) Descriptive survey method
   (D) Ex-post facto method

10. The fractions of proximate analysis of feed include

(A) dry matter, crude protein, ash, ether extract and crude fibre

(B) moisture, ash, crude protein, ether extract, crude fibre and nitrogen-free extracts

(C) dry matter, crude protein, crude fibre, ash and moisture

(D) None of the above

11. Which one among the following is **not** a desirable property of good quality silage?

(A) pH range of 3·5–4·2

(B) Higher Flieg index

(C) >75% lactic acid in silage

(D) >40% butyric acid in silage

12. On a roughage-based diet, the concentrations of volatile fatty acids produced in the cow's rumen follow in which of the following orders?

(A) Propionic acid > Acetic acid > Butyric acid

(B) Acetic acid > Butyric acid > Propionic acid

(C) Propionic acid > Butyric acid > Acetic acid

(D) Acetic acid > Propionic acid > Butyric acid

13. How much concentrate feed is typically needed for producing 1 kg of milk in cows above their maintenance requirement?

(A) 1 kg

(B) 0·5 kg

(C) 1·5 kg

(D) 2 kg

14. Methylene blue is most commonly used in the treatment of ____ poisoning in animals.

(A) oxalic acid

(B) nitrate

(C) mimosine

(D) gossypol

15. ____ is the essential amino acid required for wool production in sheep.

(A) Threonine

(B) Methionine

(C) Tryptophan

(D) Sulfur

16. 'African tall' is a variety of ____ fodder.

(A) maize

(B) sorghum

(C) hybrid Napier

(D) Napier

17. According to BIS (2007), what is the maximum permissible level of aflatoxin B1 in poultry feed?

(A) 10 ppb

(B) 10 ppm

(C) 20 ppb

(D) 20 ppm

18. The good characteristics of probiotics include which of the following?

(A) It should be Gram-positive

(B) It should be acid- and bile-resistant

(C) It should be non-pathogenic

(D) All of the above

19. The minimum recommended level of calcium in layer feed is

(A) 1%

(B) 2%

(C) 3%

(D) 0·4%

20. Assume that you are the implementing officer of a government scheme to distribute 10-layer hens and cage each to selected rural beneficiaries. The minimum cage floor space allowance for 10-layer hens is calculated as

(A) $450\ cm^2 \times 10$

(B) $900\ cm^2 \times 10$

(C) $1800\ cm^2 \times 10$

(D) $3600\ cm^2 \times 10$

21. A farmer purchased ducks from a supplier who identified them as 'emperor ducks'. This meat-type duck has creamy white plumage, orange bills and legs, yellow flesh and a long broad body. Identify the breed of duck.

(A) Khaki Campbell

(B) Indian Runner

(C) Pekin

(D) Muscovy

22. Assume that you are the farm manager of a semen station. A breeding bull was found positive for brucellosis. Some points of action are provided below :

1. Proper therapeutic management before the next semen collection
2. Castrate immediately
3. Cull/remove the bull within 48 hours
4. Discard the frozen semen doses since the last negative test

Which of the above actions suit(s) the best for semen station?

(A) Point 1 only

(B) Point 2 only

(C) Points 1 and 4

(D) Points 2, 3 and 4

23. Which of the following is ***not*** an National Bureau of Animal Genetic Resources (NBAGR)-registered breed belonging to Assam?

(A) Miri

(B) Siri

(C) Daothigir

(D) Doom

24. Assume that you are the certifying veterinary authority to issue a transit certificate under the Rule 96 of Transportation of Animal Rules, 2001. Which of the following conditions ***does not*** comply with the requirements for on-road cattle transportation by vehicle?

(A) All animals are apparently healthy and free from infectious diseases

(B) Animals that have given birth within the preceding 24 hours or are likely to deliver during the transit are kept in the vehicle for transportation

(C) None of the animals is injured, blind, emaciated, lame or fatigued

(D) A clearly visible 'Animal Carrier' board is installed on the front and back sides of the vehicle

25. Swine farmers reported heavy neonatal mortality due to the crushing by large white Yorkshire dams. They require your advice regarding the installation of guard rails along the walls of the farrowing pen. Suggest the recommended height of guard rails.

(A) 10 cm above floor level

(B) 25 cm above floor level

(C) 50 cm above floor level

(D) 100 cm above floor level

26. A goat farmer recently had triplets born on his farm. However, the mother goat developed mastitis, significantly reducing her milk production during the first week after giving birth. The farmer approached you for a suitable substitute for milk. Which of the following feeding management strategies would you recommend to ensure the optimal growth of the kids?

(A) Milk replacer

(B) Creep feeding

(C) Steaming up

(D) Flushing

27. The dental formula (permanent teeth) of a livestock species is given below :

3/3, 1/1, 4/4, 3/3

Identify the livestock species.

(A) *Bos taurus*

(B) *Capra hircus*

(C) *Ovis aries*

(D) *Sus scrofa*

28. If all the individuals are regarded homozygous for one allele, then the particular locus is said to be

(A) polymorphic

(B) dimorphic

(C) monomorphic

(D) None of the above

29. The transfer of small segment of DNA from donor to recipient via bacteriophage is known as

(A) transfection

(B) transformation

(C) transduction

(D) conjugation

30. To check whether a population is in Hardy-Weinberg equilibrium, which of the following statistical tests is used?

(A) Student *t*-test

(B) *F*-test

(C) Chi-square test

(D) ANOVA

31. Statement A :

The degree of correspondence between phenotypic value and breeding value is measured by heritability.

Statement B :

The ratio of phenotypic variance to additive genetic variance is heritability.

Which of the following is correct?

(A) Statement A is correct, but Statement B is incorrect

(B) Both Statement A and Statement B are correct

(C) Statement B is correct, but Statement A is incorrect

(D) Both Statement A and Statement B are incorrect

32. Correlated traits can be selected by

(A) progeny testing

(B) sib selection

(C) indirect selection

(D) BLUP

33. Holding of carcasses or meat at refrigeration temperatures for extended periods following initial chilling is called

(A) aging

(B) conditioning

(C) Both (A) and (B)

(D) None of the above

34. If meat is frozen prior to rigor onset and subsequently thawed, it will shorten dramatically and be extremely tough. This phenomenon is known as

(A) thaw shortening

(B) rigor mortis

(C) blooming

(D) double muscling

35. Which of the following conditions restricts effective blood removal during exsanguination of animals?

(A) Subjecting to preslaughter stress

(B) Extended time between stunning and exsanguination

(C) Improper suspension of carcass during exsanguination

(D) All of the above

36. _____ refers to the degree Celsius (or Fahrenheit) by which the temperature must be raised in order to obtain a 10-fold (one $\log_{10}$) increase in the death rate of bacterial cells in meat.

(A) D-value

(B) Z-value

(C) F-value

(D) 12-D concept

37. 'Giblets' consists of

(A) lungs, oesophagus, trachea and intestine

(B) pineal gland, lungs, adrenal gland and intestine

(C) neck, liver, heart and gizzard

(D) bile duct, trachea, intestine and gallbladder

38. Gonadotropin-releasing hormone secretion can be inhibited by the following hormones, ***except***

(A) testosterone

(B) progesterone

(C) estrogen

(D) adrenocorticotropic hormone

39. The 'P wave' of ECG represents which of the following electrical activities of the heart?

(A) Atrial depolarization

(B) Atrial repolarization

(C) Ventricular depolarization

(D) Ventricular repolarization

40. The circle of Willis supplies blood to which of the following organs?

(A) Heart

(B) Liver

(C) Lungs

(D) Brain

41. Which of the following hormones is primarily involved in development of lobulo-alveolar system in mammary gland?
(A) Estrogen
(B) Progesterone
(C) Thyroxine
(D) Cortisol

42. Which one of the following hormones promotes the tubular reabsorption of sodium ions in kidney?
(A) Antidiuretic hormone
(B) Secretin
(C) Aldosterone
(D) Oxytocin

43. In which of the following conditions a cow sits on sternum and the head rests on the flank?
(A) Bilateral hip dysplasia
(B) Milk fever
(C) Traumatic pericarditis
(D) Peritonitis

44. All of the following are constituents of Ringer's solution, ***except***
(A) water
(B) calcium chloride
(C) sodium lactate
(D) potassium chloride

45. Van den Bergh test is used for the diagnosis of dysfunction of
(A) kidney
(B) liver
(C) heart
(D) spleen

46. Pathognomonic post-mortem lesion 'button ulcer' is found in
(A) bovine viral diarrhoea
(B) foot-and-mouth disease in cattle
(C) porcine circovirus infection
(D) classical swine fever

47. The characteristic temperature reaction known as 'diphasic reaction' is observed in
(A) rabies in dog
(B) canine distemper
(C) canine parvoviral infection
(D) infectious canine hepatitis

48. The fundamental obstetrical manoeuvre to all intrauterine measures required to rectify defects of presentation, position and posture is
(A) extension
(B) traction
(C) retropulsion
(D) rotation

49. The sigmoid flexure is pre-scrotal in
(A) bull and ram
(B) ram and boar
(C) boar and camel
(D) camel and buck

50. The most common tumour in old dogs is
(A) Sertoli cell tumour
(B) Leydig cell tumour
(C) seminoma
(D) All of the above

51. Pyometra is defined as a progressive accumulation of purulent material within the uterus in the presence of

(A) small follicles

(B) large follicles

(C) active corpus luteum

(D) inactive corpus luteum

52. The protective value of the egg yolk is largely due to

(A) lecithin and lipoprotein

(B) arachidonic acid and lipoprotein

(C) lecithin and arachidonic acid

(D) None of the above

53. Diffuse, epitheliochorial-type placenta is found in

(A) cattle, mare and sheep

(B) mare, goat and sow

(C) sow, camel and mare

(D) camel, cattle and sheep

54. Pre-implantation stage of immunological pregnancy diagnosis in cattle, sheep and pigs can be done using _____ during pregnancy test.

(A) estrone sulfate

(B) early pregnancy factor

(C) equine chorionic gonadotropin

(D) progesterone

55. Viborg's triangle is the anatomical site for access to

(A) cornual nerve block

(B) guttural pouches

(C) rumenotomy

(D) mandibular nerve block

56. Which of the following structures passes through foramen orbito-rotundum?

(A) Maxillary nerve

(B) Optic nerve

(C) Hypoglossal nerve

(D) Internal carotid artery

57. The larvae of trichostrongyloids and strongyloids nematodes can survive severe dessication by entering into a state of

(A) metabiosis

(B) hypobiosis

(C) anhydrobiosis

(D) dehydrobiosis

58. The most common causative agent of 'winter coccidiosis' in calves is

(A) *Eimeria zuernii*

(B) *Eimeria alabamensis*

(C) *Eimeria ellipsoidalis*

(D) *Eimeria bovis*

59. Belfast, Brisbane and Manley strains are different strains associated with which of the following parasitic protozoa?

(A) *Trypanosoma evansi*

(B) *Tritrichomonas foetus*

(C) *Sarcocystis bovihominis*

(D) *Neospora caninum*

60. Ringworm lesion in abomasum of calves is due to infection with

(A) *Trichostrongylus axei*

(B) *Ostertagia ostertagi*

(C) *Haemonchus placei*

(D) *Nematodirus battus*

61. 'Wet feather' condition among ducks is caused by

(A) *Menopon phaeostomum*

(B) *Trinoton anserinum*

(C) *Holomenopon leucoxanthum*

(D) *Heterodoxus longitarsus*

62. Transformed muscle cells parasitized by *Trichinella spiralis* are known as

(A) mother cells

(B) feeder cells

(C) parent cells

(D) nurse cells

63. Adenoma is

(A) benign tumour of squamous epithelium

(B) benign tumour of glandular epithelium

(C) malignant tumour of squamous epithelium

(D) malignant tumour of glandular epithelium

64. The macrophage in the central nervous system is

(A) microglia

(B) Schwann cells

(C) oligodendroglia

(D) astrocytes

65. Icterus, anaemia, haemoglobinuria, abortion, petechiae on mucous membrane and demonstration of organism by Levaditi's strain are diagnostic points for

(A) anaplasmosis

(B) IBRT

(C) listeriosis

(D) leptospirosis

66. Tuberculosis is the best example for

(A) coagulative necrosis

(B) caseation necrosis

(C) liquefactive necrosis

(D) fat necrosis

67. Heart failure cells are found in

(A) heart

(B) lungs

(C) spleen

(D) pulmonary artery

68. Drugs mentioned below are all adrenergic drugs, **except**

(A) epinephrine

(B) dopamine

(C) carbachol

(D) norepinephrine

69. The reduction in response to the drug after repeated administration is called

(A) drug resistance

(B) tachyphylaxis

(C) desensitization

(D) tolerance

70. Abnormal immunological reaction initiated by previous exposure to the drug against the drug-generated antigen is known as

(A) down-regulation

(B) anaphylaxis

(C) cumulative action

(D) cross-tolerance

71. Basophilic stippling of RBC is observed in

(A) nitrate poisoning

(B) mercury poisoning

(C) lead poisoning

(D) cyanide poisoning

72. Alkali disease is caused by toxicity due to

(A) arsenic

(B) zinc

(C) copper

(D) selenium

73. Point-of-care test used for rapid diagnosis of African swine fever is

(A) enzyme-linked immunosorbent assay

(B) immunochromatographic lateral flow assay

(C) real-time polymerase chain reaction

(D) haemagglutination inhibition assay

74. Lumpy skin disease in cattle is caused by lumpy skin disease virus (LSDV) of which family?

(A) Coronaviridae

(B) Asfarviridae

(C) Poxviridae

(D) Paramyxoviridae

75. Which of the following are true about Kyasanur Forest Disease (KFD)?

1. KFD is a viral disease.
2. KFD has also been reported from Northern India.
3. *Haemaphysalis spinigera* (ticks) are responsible for transmission of this virus to humans.

Choose the correct option from the answers given below.

(A) Only 1 and 2 are correct
(B) Only 2 and 3 are correct
(C) Only 1 and 3 are correct
(D) All of the above are correct

76. Which of the following are true for pasteurization of milk?

1. The term 'pasteurization' means the process of heating every particle of milk to at least 63 °C for 30 minutes.
2. The term 'pasteurization' means the process of heating every particle of milk to at least 72 °C for 15 seconds.
3. Any other temperature-time combination, sufficient to give a microbicidal effect equivalent to the above defined temperature-time combination.

Choose the correct option from the answers given below.

(A) Only 1 and 2 are correct
(B) Only 2 and 3 are correct
(C) Only 1 and 3 are correct
(D) All of the above are correct

77. In which type of sampling method, the choice of the sample is left to the investigator?

(A) Probability sampling
(B) Simple random sampling
(C) Stratified random sampling
(D) Non-probability sampling

78. An N95 respirator is a respiratory device designed to achieve a very close facial fit and very efficient filtration of airborne particles. What does 'N' denote in N95 masks?

(A) The 'N' stands for 'normal' and indicates that the mask is suitable for everyday use.
(B) The 'N' stands for 'nasal' and indicates that the mask is specifically designed for nasal protection.
(C) The 'N' stands for 'neutral' and implies that the mask offers balanced protection against all types of particulates.
(D) The 'N' stands for 'non-oil' or 'not resistant to oil' and indicates that the mask is not resistant to oil-based particulates.

79. Causality (causation) deals with the relationship between cause and effect and is addressed in both science and philosophy. Alfred Evans (1976) produced a set of 10 rules that are consistent with the modern concepts of disease causality. Below are four such rules out of the 10 rules. Identify the ***incorrect*** one.

(A) The proportion of individuals with the disease should be significantly higher in those exposed to the supposed cause than in those who are not.

(B) Exposure to the supposed cause should be present more commonly in those with than those without the disease, when all other risk factors are held constant.

(C) The number of new cases of disease should be significantly higher in those exposed to the supposed cause than in those not so exposed, as shown in prospective studies.

(D) Temporally, the exposure to the supposed cause should follow the disease with a distribution of incubation periods on a bell-shaped curve.

80. A zoonosis is any disease or infection that is naturally transmissible from vertebrate animals to humans. Infection with which of the following viruses is considered non-zoonotic?

(A) Monkeypox

(B) Buffalopox

(C) Chickenpox

(D) Orf virus

81. Which of the following bones forms the foramen magnum in the cranium?

(A) Temporal

(B) Occipital

(C) Zygomatic

(D) Pterygoid

82. During embryogenesis, the Rathke's pouch gives rise to which of the following structures?

(A) Pituitary

(B) Tongue

(C) Tooth

(D) Pharynx

83. Laminae are characteristics of the interior surface of which of the following chambers of complex stomach?

(A) Rumen

(B) Reticulum

(C) Omasum

(D) Abomasum

84. Which of the following is unpaired skeletal muscle present in the animal body?

(A) Diaphragm

(B) Biceps brachii

(C) Popliteus

(D) Quadriceps femoris

85. In which part of the cloaca in birds, the bursa of fabricius opens?

(A) Urodeum

(B) Proctodeum

(C) Coprodeum

(D) Vent

86. Which of the following is the space between right and left pleural cavities?

(A) Omentum

(B) Mediastinum

(C) Serous sac

(D) Pleural sac

87. Which one of the following veins is called as milk vein in cow?

(A) External jugular vein

(B) Subcutaneous abdominal vein

(C) Umbilical vein

(D) None of the above

88. The foramen ovale in the fetal heart is located in the

(A) right atrium

(B) left atrium

(C) interventricular septum

(D) interatrial septum

89. Which of the following is a ventricle of hindbrain?

(A) Third ventricle

(B) Fourth ventricle

(C) Lateral ventricle

(D) None of the above

90. Visceral skeleton present in pigs is

(A) os penis

(B) os phrenic

(C) os cordis

(D) os rostri

91. Which of the following species presents single occipital condyle in skull?

(A) Cattle

(B) Horse

(C) Dog

(D) Poultry

92. Which of the following is ***not*** a feature of humerus bone of dog?

(A) Deltoid tuberosity

(B) Olecranon fossa

(C) Musculospiral groove

(D) Trochlear notch

93. Which of the following is a complex carbohydrate?

(A) Glucose

(B) Lactose

(C) Cellulose

(D) Galactose

94. Which of the following nitrogenous bases is ***not*** present in DNA?

(A) Adenine

(B) Guanine

(C) Cytosine

(D) Uracil

95. Which of the following fatty acids is the precursor in the biosynthesis of prostaglandins?

(A) Arachidonic acid

(B) Palmitic acid

(C) Oleic acid

(D) Stearic acid

96. Net gain of ATPs from one molecule of glucose during glycolysis is

(A) 2

(B) 4

(C) 18

(D) 36

97. Which of the following is a sulfur-containing amino acid?

(A) Serine

(B) Lysine

(C) Methionine

(D) Histidine

98. The non-translated DNA segments in genes are called

(A) exons

(B) introns

(C) transposons

(D) None of the above

99. The location of urea cycle in the body is

(A) kidney

(B) liver

(C) lungs

(D) intestine

100. Which of the following enzymes is the first enzyme to appear in the blood after myocardial infarction and is of diagnostic value?

(A) Pyruvate kinase

(B) Aldolase

(C) Creatine kinase

(D) Glutamate oxaloacetate transaminase