KHALSA COLLEGE AMRITSAR

MODEL TEST PAPER FOR ENTRANCE TEST OF

B.Sc. (AGRICULTURE AND FOOD SCIENCE & TECHNOLOGY) 2017

General Instructions for Students

1. Every candidate should carry his/her valid Roll No. cum Admit Card to the Entrance Test. No candidate without the valid Roll No. cum Admit Card will be allowed to enter the examination centre.
2. The question paper will be of Two Hours duration and will comprise of **Hundred** Multiple Choice Questions of **One** mark each.
3. There will be four sections, *viz; Physics, Chemistry, Biology* OR *Mathematics* and *General Awareness* of the Subject.
4. The candidates with 10 + 2 (Medical) will opt the section of Biology while the candidates with 10+2 (Non-Medical) will opt the Mathematics Section.
5. The candidate has to mark the right option against the question number in the OMR sheet **with black pen.** The circles marked with pencil or blue pen will not be marked.
6. **There will be no negative marking.**
7. The OMR must be handed over to the Room Supervisor even if candidate has not filled any option.
8. No candidate will be allowed to leave the examination hall before two hours.
9. Don't write/make any identification marks(s)/religions/symbols/slogan(s) on the answer books.
10. The candidate must ensure that his OMR has been duly **stamped**.
11. Please ensure that you have signed the **attendance** sheet.
12. Mobile Phones and other electronic gadgets such as Bluetooth etc. are strictly prohibited in the Examination Centre.

(Multiple Choice Type)

Time Allowed : 2 hours **Max Marks : 100**

PHYSICS

1. Three different capacitors are connected in series. Then :
   A) they will have equal charges B) they will have same potential
   C) both 1 & 2 D) none of these
2. A wire has a resistance of 10Ω. It is stretched by one-tenth of its original length. Then its resistance will be
   A) 9Ω B) 10Ω C) 11Ω D) 12.1Ω
3. Time taken by a 836W water to heat one litre of water from 0°C to 40°C is
   A) 50s B) 100s C) 150s D) 200s
4. If the electric current in a lamp decreases by 5% then power output decreases by
   A) 25% B) 10% C) 5% D) 20%
5. The unit of permittivity of free space ε_0 is
   A) Coulomb^2/Newton-metre^2 B) Coulomb^2/(Newton-metre)^2
   C) Coulomb/Newton-metre D) Newton-metre^2/ Coulomb^2
6. A charged spherical shell does not produce an electric field at any
   A) interior point B) outer point
   C) beyond 2 metres D) beyond 10 metres
7. Work done in moving a unit positive charge through a distance of x metre on an equipotential surface is
   A) x joule B) 1/x joule C) zero D) x^2 joule
8. In bringing an electron towards another electron, the electrostatic potential energy of the system
   A) remains same B) becomes zero C) increases D) decreases
9. An electron is moving along the positive X-axis. You want to apply a magnetic field for a short time so that the electron may reverse its direction and move parallel to the negative X-axis. This can be done by applying the magnetic field along
   A) X-axis only B) Y-axis only C) Z-axis only D) Both Y and Z axis
10. The current sensitivity of a moving coil galvanometer increases by 35%. When its resistance is increased by a factor 3, the voltage sensitivity of galvanometer changes by a factor
    A) 35% B) 45% C) 55% D) None of the above
11. When a charged particle enters a uniform magnetic field, its kinetic energy
    A) remains constant B) increases C) decreases D) becomes zero
12. Above Curie's temperature
    A) a paramagnetic substance becomes ferromagnetic
    B) a ferromagnetic substance becomes paramagnetic
    C) a paramagnetic substance becomes diamagnetic
    D) a diamagnetic substance becomes paramagnetic

13. What is the minimum value of induction that can be obtained with the help of three inductances of 2H, 3H and 6H?
A) 1/6 H B) 1/3H C) 1H D) 11H

14. The reading of AC voltmeter is 220 V. What is the peak voltage?
A) 200V B) 220 V C) 240 V D) None of the these

15. If the power factor changes from ½ to ¼ then what is the increase in impedance in AC?
A) 29% B) 50% C) 25% D) 100%

16. Which of the following electromagnetic radiation has the smallest wavelength?
A) Microwaves B) Ultraviolet C) X-rays D) Gamma ray

17. Two coherent sources have wavelengths λ_A and λ_B. Then
A) $\lambda_A = \lambda_B$ B) $\lambda_A > \lambda_B$ C) $\lambda_A < \lambda_B$ D) None of these

18. Rainbow is formed due to combination of
A) refraction and absorption B) dispersion and focusing
C) refraction and scattering D) dispersion and total internal reflection

19. To get three images of a single object, one should have two plane mirrors at an angle of
A) 60° B) 90° C) 120° D) 30°

20. Two thin lenses of focal length f_1 and f_2 are in contact and coaxial. The power of the combination is
A) $\sqrt{(f_1+f_2)}$ B) $\sqrt{(f_2/f_1)}$ C) $(f_1+f_2)/2$ D) $(f_1+f_2)/(f_1 f_2)$

21. Inverse square law for the illumination is valid for
A) isotropic point source B) search light
C) cylindrical source D) all type of sources

22. How will an image produced by a lens change, if half the lens is wrapped in black paper ?
A) There will be no effect B) The size of image will be reduced to one half
C) The image will disappear D) The brightness of the image will be reduced

23. It is possible to understand nuclear fission on the basis of the
A) meson theory of nuclear forces
B) proton-proton cycle
C) independent particle model of the nucleus
D) liquid drop model of the nucleus

24. A radioactive substance decays to $\frac{1}{16}$th of its initial activity in 40 days. The half life of the radioactive substance expressed in days is
A) 20 B) 5
C) 10 D) 2.5

25. When n-p-n transistor is used as an amplifier
A) electrons move from base to collector B) holes move from emitter to base
C) holes move from collector to base D) holes move from base to emitter

38. The structure of IF_7 is

A) Pentagonal bipyramid B) Square pyramid

C) Trigonal bipyramid D) Octahedral

39. The basic building unit of all silicates is

A) SiO B) $(SiO_3)^{3-}$ C) SiO_2 D) $(SiO_4)^{4-}$

40. When an insulator is heated, an electric charge is developed on the face of the insulator crystal. This phenomenon is known as

A) feroelectric effect B) paramagnetic effect

C) pyroelectric effect D) piezoelectric effect

41. X-ray diffraction studies indicated that the edge length of unit cell of fcc lattice of KF is 537.5 pm. The distance between K^+ and F^- ions is

A) 385.3 pm B) 179.3 pm C) 268.3 pm D) 136.3 pm

42. Among the anions Cl^-, SO_4^{-2}, PO_4^{-3}, the coagulating power follows the order

A) $PO_4^{-3} > Cl^- > SO_4^{-2}$ B) $PO_4^{-3} > SO_4^{-2} > Cl^-$

C) $Cl^- > SO_4^{-2} > PO_4^{-3}$ D) $SO_4^{-2} > Cl^- > PO_4^{-3}$

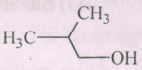
43. Which of the following statements is true of the critical micelle concentration?

A) The surfactant molecules decompose B) The surfactant molecules become completely soluble.

C) The surfactant molecules dissociate D) The surfactant molecules associate

44. Among the following the one that gives positive iodoform test upon reaction with I_2 and NaOH is

A) $CH_3CH_2CH(OH)CH_2CH_3$ B) $C_6H_5CH_2CH_2OH$

C)  D) $PhCHOHCH_3$

45. The reaction between benzaldehyde and formaldehyde in the presence of conc. NaOH gives

A) $C_6H_5COONa + CH_3OH$ B) $C_6H_5CH_2OH + HCOONa$

C) $C_6H_5CH_2OH + C_6H_5COONa$ D) $CH_3OH + HCOONa$

46. Which of the following reactions occur at anode when the electrolysis of $CuCl_2$ is done using platinum electrode?

A) $Cu \rightarrow Cu^{2+} + 2e$ B) $2Cl^- \rightarrow Cl_2(g) + 2e$

C) $2H_2O \rightarrow O_2 + 4H^+ + 4e$ D) $2\,Cu \rightarrow Cu_2^{2+} + 2e$

47. A solution of naphthalene in benzene has a mole fraction of naphthalene equal to 0.10. What is the molality of the solution?

A) 2.3 m B) 1.42 m C) 3.1 m D) 1.9 m

48. The coagulation of 10 ml of gold solution is just prevented by an addition of 1 ml of 10% NaCl in the presence of 0.025 g. of starch. The gold number of starch is :

A) 0.25 B) 0.025 C) 25 D) 250

49. For the preparation of *p*–nitroiodobenzene from *p*–nitroaniline, the best method is :

A) $NaNO_2$/HCl followed by KI B) $NaNO_2$/HCl followed by CuCN

C) $LiAlH_4$ followed by I_2 D) $NaBH_4$ followed by I_2.

50. The composition of brown ring obtained during the qualitative detection of nitrates with ferrous sulphate and sulphuric acid corresponds to :

A) $[Fe(H_2O)_5NO]^{3+}$ B) $[Fe(H_2O)_5NO]^{2+}$

C) $[Fe(H_2O)_5NO]^{+}$ D) $[Fe(H_2O)_5NO]$

BIOLOGY

51. Pollen culture is used to produce

A) Hybrids B) Disease resistant plant

C) Haploid plant D) None of these

52. In grafting contact is made between

A) Phloem B) Cambium C) Xylem D) Flower

53. 'Montreal Protocol' is an international treaty to control the emission of

A) CO_2 B) Ozone depleting substances

C) CO D) Nuclear radiation

54. Bulb helps the vegetative reproduction in

A) Tomato B) Rye C) Potato D) Onion

55. The first cell of female gametophyte is

A) Anther lobe B) Megaspore mother cell

C) Pollen before germination D) Microspore mother cell

56. The grassland in Asia are known as

A) Prairies B) Veldt C) Pamps D) Savannah

57. Stratification can be observed in

A) Tundra B) Temperate forest C) Tropical forest D) Desert

58. India became a party to "Convention of Biological diversity' in the year

A) 1994 B) 1992 C) 1993 D) 1998

59. The acid rain destroys vegetation because it contains

A) Nitrates B) H_2SO_4 C) O_3 D) CO

60. The basic component of the smog may be

A) PAN B) PBN C) Ozone D) All the above

61. Chalazogamy is found in

A) Casurina B) Pisum C) Pistia D) Cucurbits

62. In gobar gas, the maximum amount is that of

A) Butane B) Propane C) Methane D) Carbon dioxide

63. A virus that can reproduce without killing the host is called :

A) Lytic virus B) Retroactive virus C) Virion D) Temperate virus

64. A deadly disease caused by a virus on the heart muscles,

A) Myocarditis B) Bronchitis C) Angina D) Hypertension

65. Disinfectants are used to destroy bacteria. It is not always advisable to destroy them due to certain reasons. The need to destroy them is because,
    A) They decompose garbage
    B) They may be pathogenic
    C) They are involved in recycling of materials
    D) They are helpful in increasing fertility of soil
66. *Mycobacterium leprae* causes leprosy, *Corynebacterium diphtheria* causes diphtheria and *Vibrio comma* causes
    A) Tetanus B) Influenza C) Cholera D) Typhoid
67. Mutation is
    A) a factor responsible for plant growth
    B) a change which affects the offspring of F_2 generation only
    C) a change that is inherited
    D) a change which affects the parents
68. In the absence of fertilization
    A) Corpus luteum is formed B) Corpus luteum degenerates
    C) Disintegration of myometrium occur D) Both B & C
69. Cleavage in insect is :
    A) Holoblastic equal B) Meroblastic discoidal
    C) Holoblastic unequal D) Meroblastic superticial
70. A partial blockage of fallopian tubes prevents ovulated eggs from reaching the uterus. This would result in
    A) fertilization not taking place
    B) fertilization occurring but zygote developing in womb
    C) fertilization occurring but zygote developing ectopically
    D) None of these
71. Which of the following birth control measures can be considered as the safest?
    A) The use of physical barrier B) The rhythm method
    C) Termination of unwanted pregnancy D) Sterilization techniques
72. IUT is
    A) Intrauterine transplantation B) Intrauterine technique
    C) Intrauterine tract D) Intrauterine transfer
73. Yolk sac is non functional in human beings . Some authors are of opinion that it is site of early blood cells formation. It consists of
    A) Mesoderm inside and endoderm outside B) Mesoderm inside and ectoderm outside
    C) Endoderm inside and mesoderm outside D) Mesoderm on both side
74. Extraembryonic membranes of the mammalian embryo are derived from
    A) Inner cell mass B) Trophoblast C) Formative cells D) Follicle cells

75. If different alleles are present in the same genotype then it is called

A) homozygous B) hetreozygous C) diallelic D) polyallelic

OR

MATHEMATICS

51. $A=\left[a_{ij}\right]_{m\times n}$ is a square matrix, if

A) $m < n$ B) $m > n$ C) $m = n$ D) None of these

52. If $\begin{vmatrix} x & 2 \\ 18 & x \end{vmatrix} = \begin{vmatrix} 6 & 2 \\ 18 & 6 \end{vmatrix}$, then x is equal to

A) 6 B) ± 6 C) -6 D) 0

53. Which of the following is correct :

A) Determinant is a square matrix.

B) Determinant is a number associated to a matrix.

C) Determinant is a number associated to a square matrix.

D) None of these.

54. The function 'f' : $\mathbb{N} \to \mathbb{N}$ given by $f(x) = 3x$ is

A) one-one but not onto B) onto

C) one-one and onto D) None of these

55. Range of the function $f(x) = \dfrac{|x-3|}{x-3}$ is

A) $\{-1,2\}$ B) $\{1,2\}$ C) $\{-2,2\}$ D) $\{-1,1\}$

56. Value of $\tan^{-1}\left(\dfrac{3}{4}\right) + \tan^{-1}\left(\dfrac{4}{3}\right)$ is

A) $\dfrac{\pi}{4}$ B) $\dfrac{\pi}{3}$ C) $\dfrac{\pi}{6}$ D) $\dfrac{\pi}{2}$

57. Value of k for which $f(x) = \begin{cases} \dfrac{x^2-25}{x-5} & \text{if } x \neq 5 \\ k & \text{if } x = 5 \end{cases}$ is continuous at $x = 5$ is :

A) 10 B) 15 C) 30 D) 25

58. If $y = \sin^{-1}(e^x)$, then $\dfrac{dy}{dx}$ is

A) $\dfrac{e^x}{\sqrt{1-e^x}}$ B) $\dfrac{-e^x}{\sqrt{1-e^{2x}}}$ C) $\dfrac{e^x}{\sqrt{1-e^{2x}}}$ D) $\dfrac{-e^x}{\sqrt{1-e^x}}$

59. Slope of tangent to the curve $y = 2 - x^2$ at $x = 1$ is

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

60. If $f(x) = 7x - 3 \ \forall x \in \mathbb{R}$, then

A) f is strictly increasing function on $\mathbb{R}$ B) f is strictly decreasing function on $\mathbb{R}$.

C) f is neither increasing nor descreasing on $\mathbb{R}$ D) None of these

61. $\int \frac{1}{ax+b}\,dx$ is equal to

A) $\frac{(ax+b)^{-2}}{-2} + c$ B) $\log|ax+b| + c$

C) $\frac{1}{(ax+b)^2}$ D) None of these

62. $\int e^{ax} \sin bx\, dx$ is equal to

A) $\frac{1}{a^2+b^2} e^{ax}(a\sin bx - b\cos bx) + c$ B) $\frac{1}{a^2} e^2(a\sin bx) + c$

C) $\frac{1}{b^2} e^{ax} \sin bx + c$ D) $\frac{1}{a^2+b^2} e^{bx}(a\sin bx) + c$

63. Value of $\int_1^{\sqrt{3}} \frac{dx}{1+x^2}$ is

A) $\frac{\pi}{3}$ B) $\frac{2\pi}{3}$ C) $\frac{\pi}{6}$ D) $\frac{\pi}{12}$

64. Area of the region bounded by $y^2 = 9x$, $x = 2$, $x = 4$ & the x-axis in Ist quadrant is

A) $16 - 2\sqrt{2}$ B) $16 - 4\sqrt{2}$ C) $16 - \sqrt{2}$ D) $8 - 2\sqrt{2}$

65. Number of arbitrary constants in particular solution of a differential equation of 3rd order as :

A) 3 B) 2 C) 1 D) 0

66. General solution of which of the following is $y = c_1 e^x + c_2 e^{-x}$

A) $\frac{d^2y}{dx^2} + y = 0$ B) $\frac{d^2y}{dx^2} - y = 0$ C) $\frac{d^2y}{dx^2} - 1 = 0$ D) $\frac{d^2y}{dx^2} + 1 = 0$

67. If l, m, n are direction cosines of vector $\vec{r}$, then

A) $l^2 + m^2 + n^2 = 2$ B) $l^2 + m^2 + n^2 = 1$

C) $l^2 + m^2 + n^2 = -1$ D) $l^2 + m^2 + n^2 = 4$

68. If $|\vec{a}| = 1$, $|\vec{b}| = 2$, $|\vec{a} \times \vec{b}| = \sqrt{3}$, then angle between $\vec{a}$ & $\vec{b}$ is

A) 90° B) 30° C) 60° (d) 45°

69. Direction cosines of line $\frac{4-x}{2} = \frac{y+3}{3} = \frac{z+2}{6}$ is

A) (–2, 3, 6) B) (2, 3, 6) C) $\left(\frac{-2}{7}, \frac{3}{7}, \frac{6}{7}\right)$ D) (2, –3, 6)

70. The planes $2x - y + 4z = 5$ & $5x - 2.5y + 10z = 6$ are

A) Perpendicular
B) Parallel
C) Intersect y-axis
D) Pass through (0,0,0)

71. Distance of the plane $2x - 3y + 4z = 6$ from origin is

A) $\frac{6}{\sqrt{29}}$ B) $\frac{4}{\sqrt{29}}$ C) $\frac{1}{\sqrt{29}}$ (d) $\sqrt{29}$

72. For two events E & F of a random experiment, $P(E / F)$ is equal to

A) $\frac{P(E \cap F)}{P(E)}$ B) $\frac{P(E \cap F)}{P(F)}$ C) $P(E \cap F)$ D) $P(E \cup F)$

73. For a random variable X, var (x) is equal to

A) $E(x^2)$ B) $[E(x)]^2 - E(x^2)$ C) $E(x^2) - [E(x)]^2$ D) None of these

74. If A & B are independent events, $P(A) = \frac{3}{5}$, $P(B) = \frac{1}{5}$, then $P(A \cap B)$ is

A) $\frac{3}{5}$ B) $\frac{3}{25}$ C) $\frac{1}{25}$ D) $\frac{2}{25}$

75. If $\sin^{-1} x = y$, then

A) $0 \le y \le \pi$ B) $\frac{-\pi}{2} \le y \le \frac{\pi}{2}$ C) $0 < y < \pi$ D) $\frac{-\pi}{2} < y < \frac{\pi}{2}$

GENERAL AWARENESS OF THE SUBJECT

76. Which one is the main Rabi/Harri crop in Punjab

A) Maize B) Gram C) Rice D) Wheat

77. What is the main reason of depleting underground water?

A) Rice crop
B) Wheat crop
C) Underground water lifting
D) Overcultivation

78. Major source of irrigation water in Punjab is

A) Canal B) Rain water C) Pond D) Tubewell

79. Turi is made from

A) Rice B) Sugarcane C) Toria D) Wheat

80. One Acre/Killa is composed of _____Kanals.

A) 10 B) 8 C) 4 D) 6

81. Which variety of basmati is grown in large areas of Punjab?

A) Pakistani B) 1121 C) 1509 D) 386

82. Punjab area is suitable for _____ fruit tree.

A) Banana B) Papaya C) Grapes D) Kinnow

83. Which crop takes longer time to mature?

A) Rice B) Wheat C) Cotton D) Sugarcane

84. Type of farming in Punjab is

A) Tenant B) Contract C) Ownership D) None of these

85. Pear is fruit plant and is predominantly grown in

A) Ludhiana B) Bathinda C) Ferozepur D) Amritsar

86. Average number of irrigations required for rice are

A) 4 B) 14 C) 34 D) 24

87. Gullidanda/Lallu is major weed of

A) Rice B) Wheat C) Barseem D) Maize

88. The red color of tomatoes is due to

A) Lycopene B) Carotenoids C) Anthocyanin D) None of the above

89. In glucose fermentation gas produced is :

A) Oxygen B) Hydrogen gas C) Carbon monoxide D) Carbon dioxide

90. Rapid freezing causes the formation of .....crystals.

A) Large B) Medium C) Small D) None of the above

91. Pasteurization causes destruction of .....organisms.

A) All B) Pathogenic C) Commercial D) Desirable

92. The color of papaya is due to presence of :

A) Carotene B) Anthocyanin C) Lycopene D) Betalin

93. Biotin is also known as :

A) Vitamin H B) Vitamin K C) Antioxidant D) Thiamine

94. Blanching of food helps to inactivate

A) Dust B) Enzymes C) Microorganisms D) All of the above

95. The deficiency of iodine results lead to :

A) Thyroid B) Scurvy C) Severe Fever D) All of the above

96. The frequency of waves in a household microwave oven is :

A) 1540 Hz B) 2450 Hz C) 3360 Hz D) 4450 Hz

97. Lactose is :

A) Monosaccharide B) Polysaccharide C) Oligosaccharide D) Disaccharide

98. Table sugar is :

A) Lactose B) Sucrose C) Maltose D) Fructose

99. Carrots are rich in which of the following vitamin :

A) Vitamin C B) Vitamin A C) Vitamin E D) All of the above

100. Price of wheat in Rupees/Qt. fixed by Central Government during 2015-16 is

A) 1450 B) 1475 C) 1500 D) 1525