DHAKA COACHING CENTRE

GUESS / MODEL PAPER (CLASS XII - Science)

FOR THE YEAR 2020 - 21

As Per Condensed Syllabus

Ph :36826381, 36826389, 36826480

PHYSICS

SECTION A (MULTIPLE CHOICE QUESTIONS)

Time Allowed: 40 min. **Max. Marks: 42**

NOTE: i)This section consist of 42 part questions and all are to be answered each question carries one mark.
ii)Do not copy the part questions in your answer book. Write only the answer in full against the proper number of the question and its part.
iii) The code of your question paper is to be written in bold letters in the beginning of the answer script.
iv) The use of scientific calculator is allowed. All notations are used in their usual meanings.

Q1. Select the most appropriate answer for each from the given options:

1. Which of the following statements does not represent ohm's law?
* V = I R * I = $\frac{V}{R}$ *** R = $\frac{I}{V}$** * R = $\frac{V}{I}$

2. EMF is generated always in a direction where it opposes the change of flux. This statement is called:
* Faraday's law of electromagnetic induction * Biot & Savarat law
*** Lenz's law** * Gauss's law

3. Three resistors 2 ohm , 4 ohm and 10 ohm are connected so that the equivalent resistance is 1.18 ohm . The resistors are connected:
* all in series *** all in parallel**
* 2 Ohm and 4 Ohm in parallel and the combination in series with 10 Ohm
* 2 Ohm and 4 Ohm in series and the combination in parallel to 10 Ohm

4. Galvanometer has resistance,
* Greater than Voltmeter & lesser than Ammeter
* Equal to Voltmeter & Ammeter
*** Greater than Ammeter & lesser than Voltmeter**
* Lesser than Ammeter & Voltmeter

5. The working of all electrical instruments depends upon _____ effect of current.
* Magnetic * Chemical *** Electromagnetic** * no

6. For accurate measurement of current through a circuit the resistance of ammeter should be:
* Large compared to the circuit resistance *** Very small compared to the resistance**
* Neither too small nor too large * None of these

7. Amplitude Modulation in a signal means:
* Decrease in the time period of signal *** The increase in the vertical width of a signal**
* The increase in horizontal width of signal * All of them

8. Transistor is a device which has _____ terminals.
* One * Two *** Three** * Four

9. Geiger counter is a device to detect:
* Mass * Momentum * Charge ***Radiation**

10. A Wilson cloud chamber uses:
* Superheated liquid * Superheated vapours
*** Supersaturated vapour** *Saturated vapour

11. At constant temperature, the graph between V and 1/P is:
* Hyperbola * Parabola *** Straight line** * Ellipse

12. A set of coordinate axes with respect to which measurements are made is called:
*** frame of reference** * inertial frame of reference
* non-inertial frame of reference * none of these

13. The photoelectrons emitted from a metal surface _____, when incident radiations having energy equal to work function.
*** are all at rest** * have the same kinetic energy
* have the same momentum * have speeds varying from zero up to a certain maximum value

14. When we try to stop a very high photon it loses its wave identity and disintegration into an electron and a positron. This is called:
*** Pair production** * Annihilation * X-rays production * Compton effect

15. The force acting on a charged particle projected into a magnetic field of induction 'B' is maximum when the angle between B and the velocity of the particle is:
* 0^o *** 90^o** * 60^o * 45^o

16. What is the capacity of a capacitor when a charge of one Coulomb raises its potential by one volt?
*** 1 Farad** * 2 Farad * – 2 Farad * None of them

17. In order to increase the number of electrons in photo electric effect, _____ should be increased
*** Intensity of source of light** * Threshold frequency
* Velocity * K. E

18. Isobaric process is the process which takes place at constant:
*** Pressure** * Volume * Heat * Area

19. Capacitors of capacitance upto10μ F are usually made of alternate layers of aluminum foil and:
* Tin *** Paper** * Waxed paper * Carbon

20. A current of 1.6 Amperes is drawn from a battery for 10 minutes. How much charge flows through the circuit in this time?
* 96 C *** 960 C** * 69 C * 690 C

21. According to Lenz law, the emf opposes the change that induces e.m.f. and it is therefore known as:
* Forward emf *** Back emf** * conventional emf * None of these

22. Transistor can never be used as a/an:
* rectifier *** Amplifier** * Switcher * None

23. _____ transfers energy to and from its surroundings by the process of heating (or cooling) and the process of mechanical work
* closed system * Open system *** Both a & b** * None

24. When the temperature of source and sink of a heat engine become equal, the efficiency will be:
*** Zero** * Maximum * Minimum * Negative

25. The temperature at which the gases if they remain in gaseous state exert zero pressure and have zero volume is called:
* 1°C * 1°F * 1K *** Absolute Zero**

26. Gas in a closed container at temperature of 27 C has pressure P. what will be the pressure if temperature is raised to 127 C?
* 4 P / 3 * 27 / 127 P * 3 P / 4 *** 127 P / 27**

27. The average energy release per fission of U 235 is about:
*** 200 M eV** * 2 M eV * 2 K eV * 2 eV

28. The amount of energy required to break the nucleus into its constituent particles is called
* Mass defect *** binding energy**
* ionization energy * ionization potential

29. The main source of energy on Sun is:
*** Nuclear Fusion** * Nuclear Fission
* Nuclear Chain reaction * all of them

30. According to Bohr's theory of the hydrogen atom, the total energy of the hydrogen atom with its electron revolving in the nth stationary orbit is:
* proportional to n * proportional to n^2
* inversely proportional to n *** inversely proportional to n^2**

31. X-rays are a part of electromagnetic spectrum and are characterized by frequencies higher than those of:
* visible radiation * infrared radiation *** ultra violet radiations** * none of these

32. Number of electrons in 1Coulomb charge are:
* $1.097x10^7$ *** $6.25x10^{18}$** * $9x10^9$ * $1.6x10^{-19}$

33. The SI unit of electromotive force is:
* Newton * Joule.Sec * Joule/Sec *** Volts**

34. An electron is moving along the axis of the solenoid carrying a current.
* The force acts radially inwards * The force acts radially outwards
* The force acts in the direction of motion *** No force acts**.

35. The picture on a TV screen become distorted when a magnet is brought near the screen, because :
* The beam of electron will not be deflected due to the magnetic field
*** The beam of electron will be deflected due to the magnetic field**
* The beam of electron will stop in electron gun
* Magnetic field will destroy the coating of screen

36. The path along which a unit positive charge moves in an electric field is called:
* Direction of charge * path of charge
*** An electric line of force** * Magnetic line of force

37. The magnitude of drift velocity is of the order of:
* 0.1 m/s *** 0.01 m/s** * 0.001 m/s * 0.001 m/s

38. The charge moving perpendicular to the magnetic field 'B' with a certain velocity 'v' experiences:
* No force *** Maximum force** * Minimum Force *None of these

39. The direction of magnetic lines of force is given by the:
* head to tail rule *** right hand rule** * left hand rule * none of these

40. According to Bohr's theory of hydrogen atom, an electron can revolve around a proton indefinitely if its path is:
* a perfect circle of any radius * a circle of constantly decreasing radius
*** a circle of an allowed radius** * an ellipse

41. According to Bohr's theory of the hydrogen atom, the total energy of the hydrogen atom with its electron revolving in the nth stationary orbit is:
* proportional to n * proportional to n^2
* inversely proportional to n *** inversely proportional to n^2**

42. Gieger Muller counter contains
*** Argon and Alcohol** * Alcohol Only
* ions * super cooled water vapour

43. Average kinetic energy of the molecules of an object is:
*** Temperature** * Heat * sound * Fossil energy

44. Absolute zero temperature means:
*** 0 K** * 0^o C * 0^o F * 0 J

45. The temperature at which ^oC and ^oF gives the same value is:
* 40 * 160 *** - 40** * - 160

46. Amount of heat energy required to raise the temperature of an object by 1K is called:
* molar specific heat * specific heat capacity
* latent heat *** heat capacity**

48. The S.I unit for coefficient of linear thermal expansion is:
* J / K * J / KgK *** 1 / K** * J / molK

49. If value of coefficient of linear thermal expansion is $1.1X\ 10^{-5}$, the value of coefficient of volume expansion is:
* $1.1X\ 10^{-5}$ * $2.2\ X\ 10^{-5}$ *** $3.3X10^{-5}$** * $4.4X\ 10^{-5}$

50. The S.I unit of charge is:
* Ampere *** Coulomb** * Ohm * volt

51. The S.I unit of coulomb's constant is:
*** Nm^2 / C^2** * NC^2/ m^2 * m^2C^2 /N * C^2 / Nm^2

52. The value of coulomb's constant is:
* $1.6X10^{-19}$ * $9.11X10^{-31}$ * $6.02X10^{23}$ *** $9X10^9$**

53. Force of repulsion between two like charges each of 1C separated by 1m is:
* 1N * 100N *** $9X10^9$ N** * $1.6X10^{-19}$

54. Number of electric lines of forces passes through per unit area of surface perpendicularly is:
*** Electric flux** * Electric flux density
* Electric field * Equipotential surface

55. Total outward flux through an hypothetical surface is equal to $1/\varepsilon_o$ times charge enclosed by the surface, this statement is called:
*** Gauss's law** * Biot and savarat law
* Ampere's law * Ohm's law

56. Joule / Coulomb is called:
* Ampere * Watt *** Volt** * Ohm

57. Electric field intensity and electric potential difference are:
* inversely proportional * same quantities
* equal *** directly proportional**

58. Thermal velocity of free electron in the absence of electric field across the conductor at normal temperature is of the order of:
* a hundred metre / sec * a thousand metre / sec
*** a million metre / sec** * a billion metre / sec

59. Coulomb / second is:
*** Ampere** * Ohm * Volt * Joule

60. Electric current flowing in a conductor is directly proportional to potential difference provided constant:
* Length of conductor * Area of crossection of conductor
* Free electrons in conductor *** Resistance of conductor**

61. Volt.second / Coulomb is:
* Ampere *** Ohm** * Joule * Farad

62. Resistance of unit area per unit length is known as:
* Conductance * Conductivity *** Resistivity** * Permittivity

63. Change in resistance of a given conductor is directly proportional to:
* current and voltage *** initial resistance and temperature**
* length and area * Resistivity and volume

64. Change in resistance per unit resistance per kelvin change in temperature is called:
*** Temperature coefficient of resistance**
* Coefficient of linear expansion
* Coefficient of volume expansion
* Coefficient of resistivity

65. The S.I unit of resistivity is:
*** Ohm metre** * Ohm / metre * metre /Ohm * Ohm / metre^2

66. If four resistances each of 2 Ω are connected in series the net resistance of combination is:
* 2 Ω * 8 Ω * 0.5 Ω *** 16 Ω**

67. Around a current carrying conductor there is:
* an electric field *** a magnetic field**
* both electric and magnetic field * no field

68. Around a neutron there is:
* an electric field * an magnetic field
* both electric and magnetic field *** no field**

69. The unit of magnetic field of induction is :
* weber * weber / m^2 *** Tesla** * Henry

70. Newton / (ampere x metre) is called:
*** Tesla** * Weber * Henry * weber/m^2

71. Magnetic field of induction is directly proportional to twice of current and inversely proportional to distance from the conductor, this statement is called:
* Ampere's law * Gauss's law
* Ohm's law *** Biot and Savarat law**

72. The sum of the products of magnetic field of induction and length of the component of closed curve is $\mu_o$times current enclosed by the curve is called:
*** Ampere's law** * Gauss's law
* Ohm's law * Biot and Savarat law

73. The product of number of turns of the coil and magnetic flux through it is called:
* flux density * self-inductance
* mutual inductance *** flux linkage**

74. The rate of change of flux linked with the coil with respect to time is called:
* potential difference *** induced EMF**
* self-inductance * mutual inductance

75. Induced current always flows in such a direction in which it opposes the change of flux, this statement is called:
* Ampere's law * Gauss's law
*** Lenz's law** * Biot and Savarat law

76. To detect electric current in a circuit a device is used called:
*** Galvanometer** * Ammeter * Voltmeter * Ohmmeter

77. Which of the following device has least resistance?
* Galvanometer *** Ammeter** * Voltmeter * Ohmmeter

78. The deflection of galvanometer needle is directly proportional to:
* Resistance of coil * applied potential difference
*** current through the coil** * weight of needle

79. When a low resistance is connected in parallel to galvanometer it is converted to:
* Galvanometer *** Ammeter** * Voltmeter * Ohmmeter

80. If length ratio(L_r / L_x) is 2 and known resistance is 5 Ω the resistance of given wire will be:
* 10Ω *** 2.5Ω** * 3Ω * 7Ω

81. Which one of the following is an application of wheatstone bridge?
* Ohmmeter * AVO meter * Multimeter *** P.O box**

82. If potential difference across 150 cm of potentiometer wire is 12V then potential difference across 75 cm wire will be:
*** 6 V** * 12 V * 24 V * 36 V

83. In P.O box the set of resistances are:
* 2 *** 3** * 4 * 5

84. A changing electric field causes an induced magnetic field, this statement was suggested by:
* Planck *** Faraday** * Maxwell * J.J Thomson

85. The angle between electric and magnetic fields in an electromagnetic wave is:
* 0^o * 45^o *** 90^o** * 180^o

86. Forbidden gap is least in case of:
*** conductors** * semiconductors * insulators * resistors

87. Pure semi conducting materials possess very low values of:
* resistivity *** conductivity** * densities * permeability

88. Extrinsic semi conducting materials possess higher values of:
* resistivity *** conductivity** * densities * permeability

89. The process of adding impurity in a semi conducting material is called:
* biasing * rectification * amplification *** doping**

90. In p-type semi-conductors impurity is added from elements of group:
* 3 * 4 * 5 * 6

91. The process of giving off light by applying an electrical source of energy is called:
* lightening *** electroluminescence**
* current gain * amplification

92. The coordinates of a particle in two frame of references moving relative to one another can be transformed into one another, this transformation is called:
* Maxwell's transitions * Lorentz transformations
*** Galilean transformations** * Paschen series

93. Time dilation, length contraction, mass variation, and mass energy relation are the consequences of:
* Accelerated frame of reference * Inertial frame of reference
*** Special theory of relativity** * Theory of relativity

94. Greater the intensity of radiations falling on metallic plate greater will be:
* kinetic energy of photoelectrons *** photoelectric current**
*work function * threshold frequency

95. which physical quantity will increase if higher frequency radiations falls on metal:
* work function * threshold frequency
* photoelectric current *** kinetic energy of photoelectron**

96. If a radiation of 10 ev falls on a gold sheet having work function 4.8 ev, then kinetic energy of photoelectron will be:
* 14.8 ev *** 5.2 ev** * 2.01 ev * same

97. If electrons from higher energy level jump to ground state then spectral line lies in the series called:
*** Lyman** * Balmer * Paschen * Bracket

98. The value of Rydberg constant is :
* $4\pi \times 10^7\ m^{-1}$ * $9 \times 10^9\ m^{-1}$ *** $1.097 \times 10^7\ m^{-1}$** * $3 \times 10^8\ m^{-1}$

99. The energy of hydrogen atom at ground state is:
*** -13.6 eV** * -3.4 eV * -1.51 eV * -0.85 eV

100. Energy required to remove an electron from an atom from ground state is called:
* excitation potential *** ionization potential**
* work function * accelerating potential

101. How many neutrons are in the nucleus of $_{17}Cl^{35}$?
* 17 * 35 * 52 *** 18**

102. Time interval in which number of radioactive nuclide become half is called:
* decay constant *** half-life** * wavelength * activity

103. If decay constant is 0.693, half-life will become:
* 0.693 sec *** 1 sec** * 0.693 hour * 1 hour

104. Amount of energy released during a hydrogen cycle is:
* 17.5 MeV * 19.6 MeV * 22 MeV *** 25MeV**

105. Amount of energy released during a carbon cycle is:
* 17.7 MeV * 19.7 MeV * 22.7 MeV *** 26.7 MeV**

106. The main source of energy on Sun is:
*** Nuclear fusion** * Nuclear fission
* α- induced reaction * β- induced reaction

107. The ionising power of a proton as compared to α – particle is:
* same * half *** quarter** * 1/5

108. A device which makes the path of ionising particles visible is:
* Telescope * Microscope
* Geiger counter *** Wilson cloud chamber**

109. A liquid having low boiling point is easily evaporated, this liquid is called:
* Flammable * anti flammable *** volatile** * anti volatile

110. A localized cancerous tumour requires a narrow beam of γ – rays from:
* Iodine – 131 *** cobalt – 60** * calcium – 40 * uranium – 238

111. The treatment of cancer or thyroid gland by the technique of internal therapy requires:
*** Iodine – 131** * cobalt – 60 * calcium – 40 * uranium – 238

112. A radiation of a very high penetrating power is falling on the Earth from outer space, this radiation is called:
* Alpha radiations * Gamma radiations
* Cosmic rays *** Ultra violet radiations**

SECTION B
SHORT-ANSWER QUESTION (25MARKS)

NOTE: Attempt any **five** part questions from this section. All questions carry equal marks. The use of scientific calculator is allowed. All notations are used in their usual meanings. Draw diagram where necessary.

Q.2: i) A pair of adjacent coil has a mutual inductance of 1.5 Henry. If current in the primary changes from zero to 20A in 0.050 sec, What is the average induced emf in the secondary? If secondary coil has 800 turns, what is the change of flux in it?

(ii) A galvanometer of resistance 50 Ω gives full scale deflection with a current of 5 mA resistance of 0.1 μΩ is connected in parallel. Which measuring instrument is formed & what will be its range?

(iii) An air storage tank whose volume is 112 liters contains 3Kg of air at a pressure of 18 atmospheres. How much air would have to be forced into the tank to increase the pressure to 21 atmospheres assuming no change in temperature?

(iv) Why there is only magnetic field exist around current carrying conductor?

(v) Determine the longest and shortest wavelength for Ballmer's series ($R_H = 10967800\ m^{-1}$)

(vi) What will be the relativistic speed and momentum of the particle if relativistic mass of the particle will be doubled than the rest mass?

(vii) A resistor is made by winding on a spool a 40m length of Constantan wire of diameter 0.8 mm. Calculate the resistance of wire at a) 0°C b) 50°C
($\rho = 49 \times 10^{-8}\Omega m$, $\alpha = 0\text{-}00001^{o*1}$ at 0°C)

(viii) A capacitor of 100pF is charged to a potential difference of 50V. Its plates are then connected in parallel to another capacitor & it is found that the potential difference between its plates fails to 35 volts. What is the capacitance of the second capacitor?

(ix) Find out the decay Constant of $_{84}Po^{210}$, if its half life is 138.38 days. If initial number of atoms is $5x10^{30}$ then what atoms will remain after 365days?

SECTION C
(DETAILED ANSWER QUESTIONS) (18 Marks)

NOTE: Attempt any One question from this section. Draw diagrams, where necessary. The use of scientific calculator is allowed. All notations are used in their usual meanings.

Q3: a) State the basic postulates of Bohar's atomic theory. Derive an expression for the nth radius of hydrogen atom. (06)

OR

State the basic postulates of Bohar's atomic theory. Derive an expression for the energy of nth orbit of hydrogen atom. (06)

b) State & explain Gauss's law. Derive relevant expression for magnetic flux through irregular shaped Gaussian surface.

OR

State and explain Ampere's law, Derive an expression for magnetic field of induction at the axis of a solenoid. (06)

c) Derive an expression for the force on a current carrying conductor in a uniform magnetic field.

OR

State Kelvin and clausius statements for 2nd law of thermodynamics, and prove that both statements are identical. (06)

Q4:a) Describe Carnot's cycle. Establish the relation for its efficiency. (06)

OR

Define coefficients of linear and volume thermal expansion and prove that $\beta = 3\alpha$. (06)

b) Why classical wave theory of light is unable to explain the phenomena of photoelectric effect? Also describe three important features of photoelectric effect. (06)

OR

What is Compton's effect? Derive a relevant expression. (06)

c) Describe working principle of a transformer & derive an expression for efficiency of transformer.

OR

Describe construction and working of Geiger counter. (06)

CHEMISTRY

Section "A" (M.C.Q'S) (43-marks)

Q.1. Choose the correct answer for each of the following from the given options:

1. The number of valence electrons in the elements of IIA group is:
   a) 1 b) 2 c) 3 d) 5
2. All noble gases fulfill the octet rule except:
   a) Ne b) Ar **c) He** d) Xe
3. The number of elements in each lanthanide and actinide series is:
   a) 2 **b) 14** c)18 d) 32
4. The metal ion having the highest number of unpaired electrons is:
   a) Mn^{+2} b) Fe^{+2} c) Co^{+2} d) Ni^{+2}
5. The electronic configuration of the outer shell of an element is $4s^2$, $3d^{10}$, $4p^1$. It belongs to:
   a) IA group and 3rd period b) IIA group and 4th period
   c) IIIA group and 3rd period **d) IIA group and 4th period**
6. Coinage metals are elements of 1B group and these include:
   a) Cu, Ag, Au b) Zn, Cd, Hg c) Fe, Co, Ni d) Cu, Zn, Ni
7. The number of elements in the 6th period of the periodic table is:
   a) 18 b) 24 **c) 32** d) 36
8. The electronic configuration of noble gases is:
   a) ns^3 b) ns^2 c) ns^2, np^3 **d) ns^2, np^6**
9. Hydrogen shows the oxidation state(s):
   a) Zero only b) -1 only c) +1 only **d) All of these**
10. Hydride ion and Helium atom have the same:
    a) Number of protons **b) Number of electrons**
    c) Number of neutrons d) Valency
11. An example of electron deficient hydrides is:
    a) BH_3 b) $NaBH_4$ c) NaH d) CH_4
12. Hydrides of group IV A are:
    a) Acidic b) Basic **c) Neutral** d) Amphoteric
13. Metallic hydrides are also known as:
    a) Interstitial hydrides b) Borderline hydrides
    c) Ionic hydrides d) Covalent hydrides
14. BeH_2 and MgH_2 are:
    a) Covalent hydrides b) Ionic hydrides
    c) Polymeric hydrides d) Metallic hydrides
15. Sodium reacts with water more vigorously than lithium because it:
    a) Has higher atomic weight b) Is more electronegative
    c) Is more electropositive d) Is a metal
16. This metal forms super oxide:
    a) Li b) Be **c) K** d) Mg
17. Brine is a concentrated aqueous solution of:
    a) Sodium carbonate b) Sodium sulphate
    c) Alum **d) Sodium chloride**
18. This has the minimum by hydration energy:
    a) Na^+ b) K^+ c) Rb^+ **d) Cs^+**
19. On burning in excess of Oxygen, Sodium forms its:
    a) Superoxide **b) Peroxide** c) Monoxide d) Dioxide

20. The formula of Dolomite is:
a) $KCl.MgCl_2$ b) $MgSO_4.7H_2O$ **c) $MgCO_3.CaCO_3$** d) $MgCO_3$

21. Sodium amalgam is an alloy of:
a) Sodium and Lead **b) Sodium and Mercury**
c) Sodium and Iron d) Sodium and Silver

22. Ammonal is a mixture of:
a) Aluminium powder and aluminium nitrate b) Aluminium powder and aluminium sulphate
c) Aluminium powder and sodium nitrate d) Aluminium powder and potassium sulphate

23. The chemical name of laughing gas is:
a) Nitric acid **b) Nitrous oxide** c) Nitrogen trioxide d) Nitrogen pentaoxide

24. The chemical formula $Al_2O_3.3H_2O$ stands for:
a) Diaspore b) Corundum c) Bauxite d) Gibbisite

25. Royal water is a mixture in the ratio of 1:3 by volume of:
a) HCl, H_2SO_4 **b) HNO_3, HCl** c) H_2SO_4, HNO_3 d) HCl, HF

26. This renders Aluminium passive:
a) NaOH **b) HNO_3** c) HCl d) H_2SO_4

27. The compounds l – butene and 2 – butene are:
a) Position isomers b) Chain isomers
c) Functional group isomers d) Metamers

28. Dimethyl ether and Ethyl alcohol are:
a) Metamers **b) Functional group isomers** c) Position isomers d) Cis-rans isomers

29. Cycloalkanes have the general formula:
a) C_nH_{2n+2} **b) C_nH_{2n}** c) C_nH_{2n+2} d) C_nH_{2n+4}

30. Propanal and Propanone are:
a) Chain isomers b) Positon isomers
c) Metamers **d) Functional group isomers**

31. The commercial name of Phenol Formaldehyde Polymer is:
a) Celluloid b) Teflon c) P.V.C **d) Bakelite**

32. The number of isomers of pentane is
a) 3 b) 5 c) 7 d) 9

33. The ethyl chloride reacts with alcoholic KOH to give:
a) Ethyl alcohol b) Ethane c) Butane **d) Ethene**

34. Markownikoff's rule will be applicable in the addition of HBr on:
a) $CH_2 = CH_2$ b) $CH \equiv CH$ **c) $CH_2 = CHBr$** d) None of them

35. This gas was used in the First World War:
a) Phosgene gas **b) Mustard gas** c) Coal gas d) Ammonia gas

36. Ethylene is used as/in:
a) Anaesthetic b) Ripening of fruits
c) Preparing Mustard gas d) All of these

37. The harmful and undesirable reaction of metals, when exposed to atmosphere or any chemical agent, is known as:
a) Allotropy **b) Corrosion** c) Electroplating d) Cracking

38. EDTA is :
a) Bidentate ligand b) Monodentate ligand c) Chelate **d) Multihexa ligand**

39. It's not a nucleophile:
a) OH^- b) NH_3 **c) BF_3** d) CN^-

40. The most stable carbonium ion is:
a) R_3C^{++} b) R_2CH^+ c) RCH_2^+ d) CH_3^+

41. The percentage by weight of Ethanol in rectified spirit is:
a) 92 – 95 b) 70 – 80 c) 85 – 90 d) 50 – 60

42. The sweetest sugar is:
a) Fructose b) Glucose c) Sucrose d) Lactose

43. This acid is used for etching of glass:
a) HF b) HCl c) HBr d) HI

44. The atomic number of an element belonging to group VA and 3rd period is:
a) 7 b) 13 **c) 15** d) 23

45. Elements of group IB are called:
a) Normal element b) Rare Earth metals **c) Coinage metals** d) Alkali metals

46. The first seven groups of the periodic table are divided su*groups 'A' and consisting of:
a) Transition elements **b) Representative elements**
c) Metallic elements d) Complex elements

47. Water gas is produced by passing steam over red hot coke at:
a) 800^0C b) 900^0C c) 600^0C **d) 1000^0C**

48. The number of neutrons in Protium is:
a) Zero b) 1 c) 2 d) 3

49. The ratio of electron, proton and neutron in protium is:
a) 1:1:0 b) 1:1:1 c) 1:2:1 d) 1:1:2

50. The element having the symbol 'Ga' belongs to this family:
a) Carbon b) Nitrogen **c) Boron** d) Beryllium

51. Tincal is a mineral of:
a) Al b) Si **c) B** d) C

52. Kipp's apparatus is used to prepare:
a) HCl b) Cl_2 **c) H_2S** d) SO_2

53. The formula of Hypochlorous acid is:
a) HOCl b) $HClO_2$ c) $HClO_3$ d) $HClO_4$

54. $Ca_2B_6O_{11}.5H_2O$ is the chemical formula of:
a) Cryolite **b) Colemanite** c) Bauxite d) Borax

55. The process of covering iron sheets by a layer of Zinc is known as:
a) Tempering b) Tin plating **c) Galvanizing** d) Annealing

56. Hypo is used as:
a) Fixer b) Developer c) Reducer d) Blinder

57. On jumping from e_g to t_{2g} orbital, an electron radiates energy in this region:
a) Ultraviolet b) Visible c) Infrared d) Far infrared

58. The nature of $Zn(OH)_2$ is:
a) Acidic b) Basic c) Neutral **d) Amphotric**

59. Co-ordination number of Pt in $[PtCl(NO_2)(NH_3)_4$ is:
a) 1 b) 2 c) 4 **d) 6**

60. This functional group is present in oil and fats:
a) Carboxylic b) Alcoholic group c) Aldehydic group **d) Ester groups**

61. Dimethyl ether and Ethyl alcohol are:
a) Metamers **b) Functional group isomers** c) Position isomers d) Cis-rans isomers

62. Cycloalkanes have the general formula:
a) C_nH_{2n+2} **b) C_nH_{2n}** c) C_nH_{2n+2} d) C_nH_{2n+4}

63. The formula of Caproic acid is:
a) $CH_3.(CH_2)_2.COOH$ b) $CH_3.(CH_2)_3.COOH$ c) $CH_3.CH_2.COOH$ **d) $CH_3.(CH_2)_4.COOH$**

64. The formula of Valeric acid is:
a) $CH_3.(CH_2)_2.COOH$ **b) $CH_3.(CH_2)_3.COOH$** c) $CH_3.(CH_2)_4.COOH$ d) $CH_3.(CH_2)_5.COOH$

65. The functional group in RSH is:
a) Alcohol b) Carboxylic acid c) Ether **d) Thioalcohol**

66. A carbon atom having a positive charge is called:
a) Hydrogen ion b) Halide ion **c) Carbonium ion** d) Carbon ion

67. Carbon atom of carbonyl group is hybridized as:
a) Sp **b) Sp^2** c) Sp^3 d) dsp^2

68. This gas is produced by treating ethene with sulphur monochloride:
a) Tear gas **b) Mustard gas** c) Laughing gas d) Marsh gas

69. This gas was used in the First World War:
a) Phosgene gas **b) Mustard gas** c) Coal gas d) Ammonia gas

70. Another name of methane is:
a) Mustard gas b) Oil gas c) Coal gas **d) Marsh gas**

71. It's not a nucleophile:
a) $\bar{O}H$ b) $\bar{N}H$ **c) $\bar{B}F_3$** d) CN

72. Molecular formula of Chloroform is:
a) CH_3Cl **b) $CHCl_3$** c) CH_2Cl d) CCl_4

73. General formula of Alkyl Halides is:
a) $C_nH_{2n}X$ b) $C_nH2_{n-2}X$ **c) $C_nH_{2n+1}X$** d) C_nH_nX

74. Grignard's reagent reacts with ketone to give:
a) 1^0 –alcohol b) 2^0 –alcohol **c) 3^0 –alcohol** d) Phenol

75. The first step is similar in these mechanism:
a) E_1 and E_2 b) SN^1 and E_2 c) E_1 and SN^2 **d) SN^1 and E1**

76. Ethyl acetate is present in:
a) Pineapple b) Orange c) Guava d) Lemon

77. Another name of Wood spirit is:
a) Methyl alcohol b) Propyl alcohol c) Ethyl alcohol d) Butyl alcohol

78. In Acetone, the numbers of bonds are:
a) Nine and one π b) Ten c) Eight and two π d) Nine π and one

79. The reagent converts acetic acid into Acetyl Chloride is:
a) NaCl b) $HCl/ZnCl_2$ **c) $SOCl_2$** d) HCl

80. Thw sweetest sugar is:
a) Fructose b) Glucose c) Sucrose d) Lactose

81. Milk sugar is also called:
a) Glucose b) Fructose **c) Lactose** d) Sucrose

82. Cholestrol cholic acid and progresterone are:
a) Amino acids b) Proteins **c) Steriods** d) Enzymes

83. Glycogen is a :
a) Monosaccharide b) Oligosaccharide **c) Polusaccharide** d) Disaccharide

84. Chemical name for Fruit sugar is:
a) Sucrose b) Glucose c) Lactose d) Fructose

85. This is animal starch:
c) Glycogen b) Amylose **c) Cellulose** d) Amino acid

86. The number of carbon atoms in Monosaccharide is:
a) 3 – 10 b) 2 – 8 c) 3 – 9 d) 4 – 9

87. This acid is used for etching of glass:
a) HF b) HCl c) HBr d) HI

88. This is not nitrogenous fertilizer:
a) Urea b) Ammonium sulphate **c) Triple phosphate** d) Ammonium nitrate

SECTION "B" (SHORT ANSWER SECTION) (25-marks)

Note: Attempt 5 questions from this section. 2 from inorganic and 2 from organic chemistry at least

INORGANIC CHEMISTRY

Q2.

i. Write the block group and period of the following elements:
17, 24, 29, 49, 38

OR

Explain how modern law removed the defects of Mendeleev's system of classification.

ii. Explain atomic hydrogen. How it is used for welding purpose? Differentiate between atomic and nascent hydrogen.

OR

What are binary compounds of hydrogen? How are they classified? Give preparation and properties of covalent hydrides

iii. Explain the position of hydrogen with group I-A and VII-A

OR

Refer to the list of following compounds:

Compound	A	B	C	D
Specific name	Blue vitriol	Alum	Phosgene gas	Alunite

- Write the formulae of A and D
- The equation for the preparation of C
- Give only one common use of B
- Give the equation A is heated up to 230°C

iv. (a) What is Aqua regia? How does it dissolves gold in it? Show by equations
(b) Explain auto oxidation and reduction reaction of chlorine

v. Describe the preparation of Chlorine gas by Castner-Kellner cell **OR** Nelson cell

vi. Write the I.U.P.A.C names of the following complexes

a. $[Co(en)_3](NO_3)_3$
b. $[Cu(NH_3)_4]^{+2}$
c. $[AuCl_4]^{-1}$
d. $Na_3[Fe(CN)_5NO]$

OR

Discuss any two of the following properties of transition metals

Magnetic properties Colour Formation of complexes

ORGANIC CHEMISTRY

vii. Define isomerism. Give its types with examples **OR** Write the classification of organic compounds with examples

viii. Define Polymerization. How many types of Polymerizations are there? Give the preparation of the following:

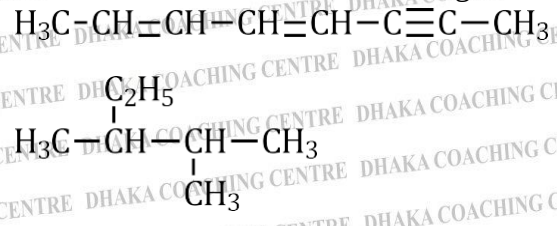
. PVC . Bakelite

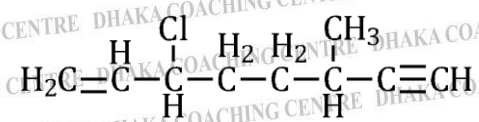
OR

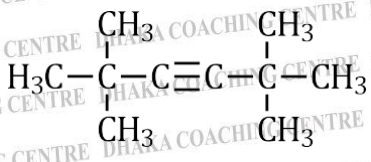
Give the mechanism of these electrophilic substitution reactions of benzene:

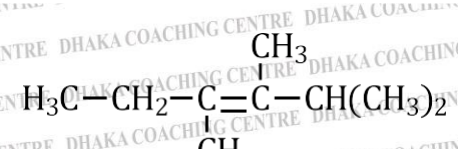
Friedel-Craft acylation Sulphonation

ix. Write down the IUPAC naming of the following:









x. . How will you obtain:

i) Ethane from iodomethane.
ii) Ethene from ethanol.
iii) Ethyne from calcium carbide
iv) 2-Bromo propane from 1-Bromo propane

xi. Draw and explain orbital structure of ethane **OR** ethane

xii. (a) Write equation for the preparation of the following:

- Oxime from formaldehyde
- Acetone from Acetic acid

(b) Complete and balance the following equations:

- $HCHO + NaOH \longrightarrow$
- $H - CHO + [Ag(NH_3)_2]OH \rightarrow$
- $C_2H_5OH + SOCl_2 \rightarrow$

SECTION "C" (DESCRIPTIVE QUESTIONS) (17-marks)

Note: Attempt 2 questions from this section. 1 from inorganic and 1 from organic chemistry

INORGANIC CHEMISTRY

Q3. Describe the extraction of sodium by Down's process

Q4. How nitric acid is manufacture by Ostwald's process? Draw diagram

OR

Give extraction of 99.99% pure aluminum from bauxite ore containing excess ferric oxide

ORGANIC CHEMISTRY

Q5. What is fermentation? How is Ethyl alcohol is manufactured by the fermentation of:

Starch Molasses

Also give preparation of methanol

OR

What are nucleophillic substitution reactions? Explain the reaction mechanism of SN_1 and SN_2 with example. Also explain why tertiary alkyl halides give SN_1 mechanism

OR

what reagents should be used to change methyl iodide into the following?

- $H_3C - SH$
- $H_3C - O - C_2H_5$
- $H_3C - COO - CH_3$

Q6. Give kekule's structure of benzene. Write the objections against it. How were these objections removed

OR

What is orientation in benzene? Explain orientation in mono-substituted benzene. Give the names of ortho and meta directors. How will you convert benzene into:

- m-nitro toulene
- o,p nitro toluene

OR

Explain the structure of Benzene by molecular orbital treatment and discuss the stability of Benzene molecule.

BOTANY

SECTION 'A' (Multiple Choice Questions)

1. Mangrove plants are considered as:
a) Halophytes b) Hydrophytes c) Mesophytes d) Xerophytes
2. Guttation takes place through:
a) Stomata b) Plasmodesmata **c) Hydathode** d) Cuticle
3. Xerophytes grow in____condition.
a) Drought b) Dry c) Harsh **d) All of these**
4. Plants get rid of surplus water in vapours by process called:
a) Osmosis b) Guttation **c) Transpiration** d) Excretion
5. Thin walled cells of epiderm is cortex & pith called:
a) Collenchyma b) Sclerenchyma **c) Parenchyma** d) Stele
6. Secondary growth take place due to:
a) Cork cambium b) Vascularcambium **c) both of these** d) None of these
7. Age of tree can be estimated by:
a) Concentricrings b) Annual rings **c) Both of these** d) None of these
8. The inner hard part of annual ring called:
a) Hardwood b) Softwood c) Sap Wood **d) Heartwood**
9. Epinasty is due to_____hormone.
a) Gibberellin **b) Auxin** c) Cytokine d) All of these
10. Movement of plant organ in zigzag manner called:
a) Nastic **b) Nutation** c) Growth & Curvature d) All of these
11. Un equal distribution of auxin is due to:
a) Light b) Dark c) Both d) None of these
12. The independent time measuring system for the rhythmic movement of plants is called:
a) Ecological clock b) Physiological clock .
c) Biological clock d) Systemic clock
13. The biorhythms which occur with a frequency of 24 hours is called.
a) Circardian rhythms b) Biocardian rhythms
c) Geocardian rhythms d) none of these
14. Gibberella fujikuroi fungus causes foolish seedling disease in Rice, called:
a) Bakanae b) Bakori c) Bikarina d) Korina
15. The gas hormone which helps in rapid ripening of fruit is called:
a) Auxin b) Cytokinins **c) Ethene** d) Abscisic acid
16. In dolacetic acid(IAA) is the name of_____hormone:
a) Auxin b) Gibberellin c) Cytokinins d) Ethene
17. Plants having both staminate and carpellate flowers are called:
a) Monoeciouss b) Dioecious c) Female d) Male
18. Double fertilization is the characteristics of:
a) Bryophytes b) Gymnosperms **c) Angiosperms** d) Pteridophytes
19. Bryophyllum is propogated from_____.
a) Rhizome **b) Bud** c) Bulb d) Corm
20. Spores are_____:
a) Diploid b) Tetraploid c) Triploid **d) Haploid**
21. Potato is underground stem known as:
a) Tuber b) Bulb c) Rhizome d) None of these
22. Inangiospermsthefruitisdevelopedby:
a) Ovule **b) Ovary** c) Zygote d) Allofthese
23. The endospermic nucleus of angiosperm is_____in nature.
a) Haploid b) Diploid c) Tetraploid **d) Triploid**

24. The seed coat is developed from_____
a) Chalaza **b) Integument** c) Micropyle d) Embryosac
25. In monocot the protective sheath around radical is called_____
a) Plumule b) Coleoptile **c) Coleorhiza** d) Bothbandc
26. The inflorescence in which the main axis is stopped due to flower called:
a) Race mose **b) Cymose** c) Centrifugal d) All of these
27. Spadixin florescence is found in:
a) Banana b) Mulberry c) Strawberry d) GoldMohr
28. In family Phocaea the inflorescence is:
a) Spike **b) Spikelet** c) Raceme d) Spadix
29. Capitulumin florescence is present in:
a) Marigold b) Sunflower **c) Both A and B** d) Rose
30. Pollen tube acts as____for sperms.
a) Vehicle b) House c) Tube d) Pathway
31. Flower in ghormone is:
a) Phytochrome **b) Florigen** c) Auxin d) Gibberellins
32. Gasnerand Lysenko worked on the process called_____.
a) Vernalization b) Photoperiodism c) Dormancy d) Apomixis
33. Parthenocarpic fruits are_____.
a) Banana and pineapple b) Apple and Mango
c) Apple and Cherry d) Both a and b
34. The tissue in which division occurs in plant body are called _____.
a) Apisome **b) Meristem** c) Mesostem d) Laterostem
35. The cambium and phallogen tissue are considered as_____ meristems.
a) Lateral b) Apical c) Intercalary d) Interlateral
36. The growth due to lateral meristem is called_____.
a) Secondary growth b) Primary growth c) Pre primary growth d) None of them
37. The cambium present between phloem and xylem is called _____.
a) Intrafascicular cambium b) All of these
c) Fascicular cambium d) Inter fascicular cambium
38. _____ cause compensatory effect.
a) Apical bud **b) lateral bud** c) terminal bud d) All of these
38. Growth phase where cells are nucleated, densely packed and divide constantly called_____.
a) formative phase b) elongation phase c) growth phase d) apical phase
39. In grasses, intercalary meristem occurs _____.
a) at the base of internode c) below the node
c) at the tip of the shoot d) at the tip of the root
40. In Fern the number of chromosomes is _____
a) 100 b) 1200 c) 1400 **d) 1000**
41. In Leptotene stage, the chromosome is called
a) Chromonema b) Kinetochore c) Chromatids d) Centromere
42. The different chromatids of two different chromosomes are called _____.
a) sister chromatids **b) Non-sisters chromatids**
c) homologous Chromatids d) chromatids
43. The most abundant chromosomal proteins are _____.
a) Actin b) Histidine **c) Histones** d) Myosin
44. In chromosomes the percentage of proteins is _____.
a) 45% – 50% b) 50% – 65% **c) 60% – 65%** d) 30% – 40%
45. The chromosomal theory of Heredity was purposed by_____.
a) Mendel **b) Walter Sutton** c) Morgan d) Karl Correns
46. The two strands of DNA apart from each other by_____ A^0.
a) 15 b) 18 **c) 20** d) 25
47. Griffith performed the process of _____ in bacteria.
a) Transduction **b) Transformation** c) Conjugation d) Binary Fission

48. During RNA synthesis (transcription) adenine pairs with _____.
a) Thymine **b) uracil** c) Cytosine d) none of these
49. The semi conservation during replication of DNA was tested by _____.
a) Singer & Nicholson b) Hershy & Chase
c) Melson & Stahl d) Mathew & Mortan
50. The disease in which urine is turn into black on oxidation, called _____.
a) phenylketonuria **b) alkaptonuria** c) Hamophilia d) none of these
51. One complete turn of DNA duplex occurs after _____ A^0.
a) 3.4 **b) 34** c) 2 d) 20
52. A ladder like structure of DNA was purposed by _____.
a) Hershy & Chase **b) Watson & Crick** c) Mendel & Morgan d) Sutton & Crick
53. The duration of S-phase of interphase is about _____.
a) 10-20% b) 20-30% **c) 35-40%** d) 40-50%
54. Amitosis is usually occur in _____.
a) Bacteria b) old tissue c) Tumor of cancer cells **d) All of these**
55. Mitosis in plants is _____.
a) Astral **b) Anastral** c) Amphiastral d) None of these
56. Meiosis is _____ division.
a) complete **b) reduction** c) incomplete d) Long
57. Mongolism disease is known as _____.
a) Turner's Syndrome **b) Down's Syndrome** c) Kline Felter's Syndrome d) All of these
58. The person with turner's syndrome have _____.
a) XX **b) XO** c) XY d) XXY
59. In kline felter's syndrome the number of chromosomes are _____.
a) 45 b) 46 **c) 47** d) 44
60. Meiosis occurs in _____ cells at the time of gamete formation.
a) Somatic **b) Germ** c) vegetative d) None of these
61. Meiosis helps in restoring the definite number of _____ of the species..
a) Chromosomes b) Genes c) Nucleotide d) DNA
62. In _____ stage of interphase, cells are metabolically active but do not divide.
a) G1 b) G2 c) S **d) G0**
63. A type of orderly or programmed cell death is called _____
a) Necrosis b) Synapsis **c) Apoptosis** d) Mitosis
64. Chiasmata formation occur during _____ su*stage of Prophase I
a) zygotene b) pachytene **c) diplotene** d) leptotene
65. Down's syndrome is an example of:
a) Trisomic b) Monosomic c) Nullisomic d) None of them
66. Botanical name of garden pea is:
a) Triticum b) Datura **c) Pisumsativum** d) Zeamays
67. The phenotypicdihybrid ratio is:
a) 6 : 1 **b) 9 : 3 : 3 : 1** c) 9 : 1 d) 1 : 2 : 1
68. A cross between a heterozygous and a homozygous recessive individual is referred to as:
a) Test cross b) Back cross c) Reciprocal cross d) Criss cross
69. Genes with multiple phenotypic effects are known as:
a) Multiple genes b) Polygenes c) Heterotropic genes **d) Pleiotropic genes**
70. In RNAuracil replaces:
a) Adenine **b) Thymine** c) Guanine d) Cytosine
71. Which one of the following diseases is sex-linked?
a) Colour - blindness b) Night blindness c) Cancer d) Diabetes
72. A chromosome with the centromere at one end is:
a) Acentric b) Metacenttric **c) Telocentric** d) Submetacentric
73. The blood group of a universal donor will be:
a) A b) B c) A **d) O**
74. In birds, moths and some fishes ,the genetic constitution of male is:
a) ZZ b) ZW c) WW d) XX

75. Exchange of chromatids parts take place between paired chromosomes at_____
a) Chiasmata b) Centromere c) Centrosome d) Kinetochore

76. The term Ecology was first studied by:
a) Mendel b) Fleming **c) Ernest Hackle** d) Darwin

77. Type of environment in which a population lives, is called
a) Niche b) Ecology c) Biosphere **d) Habitat**

78. The study of different community in the ecology is called
a) Ecosystem b) Autecology **c) Synecology** d) Habitat approach

79. The ecosystem is composed of two components, called
a) Abiotic b) Biotic **c) Both A and B** d) Climatic

80. Plants growing under shade are known as:
a) Psamophytes **b) Sciophytes** c) Heliophytes d) Dicots

81. Fungi and bacteria are generally known as
a) Consumer b) Producer **c) Decomposer** d) None

82. _____ is an ectoparasite
a) Leeches b) Tape worm c) Hook worm d) Plasmodium

83. The scientific study of soil is called:
a) Hydrography b) Biography **c) Pedology** d) Physiology

84. Fire favors growth of some fungi mostly ascomycetes called:
a) Phyrophilus b) Tinea pedis c) Tinea corporis d) dermatophytes

85. Association of sea anemone and hermit crab is an example of:
a) Mutualism b) Symbiosis c) Interaction d) Parasitism

86. The term succession was first used in 1885 by:
a) Hult b) Lamarck c) Drawin d) Ernest

87. The aquatic habitat are:
a) Fresh water b) Marine c) Estuarine **d) All of these**

88. Terrestrial ecosystems are recognized as_____ are:
a) Biosphere **b) Biomes** c) Niche d) None

89. The estuarines are places where
a) Lake meet pond **b) River meets sea** c) Two seas meet d) Sea water reach to pond

90. The oxygen concentration on surface of a river is
a) 1% **b) 5%** c) 10% d) More than 10%

91. Phytoplankton are also called:
a) Phytoplankton b) Zooplankton **c) Microphytes** d) None of these

92. Saprophytic bacteria and Fungi are also called:
a) Macrophytes **b) Micro consumers** c) Microphytes d) None of these

93. Ocean covered earth surface about:
a) 60% b) 80% **c) 70** d) 90%

94. The quantity of salt in sea is:
a) 1.5% b) 2.5% c) 4.5% **d) 3.5%**

95. Water movement as deep to surface & surface to deep sea is:
a) Costal surface **b) Up welling** c) Movement d) None of these

96. The sea below 2000 meters is called:
a) Oceanic Zone b) Pelagic Zone c) Benthic Zone **d) Abyssal Zone**

97. Forest occupies the land surface roughly about:
a) 30-60% b) 40-80% c) 30-90% **d) 35-40%**

98. Wheat, Oat and barely of Grassland are called:
a) Flour basket b) Flower basket **c) Bread basket** d) None of these

99. The coldest desert Gobi is found in:
a) Pakistan b) India c) Bangladesh **d) Mangolia**

100. Cholistan and Thull are the famous deserts of:
a) Pakistan b) India c) Mangolia d) Bangladesh

101. The frozen soil surface of tundra is called:
a) Perma frost b) ice c) Cold d) None of these

102. Temperature of warmest months in Tundra do not exceed from:

a) 15^0C b) 17^0C **c) 10^0C** d) 20^0C

IMPORTANT QUESTIONS 2019-2020

CHAPTER 01: HOMEOSTASIS

Homeostasis and its aspects, Adaptations in xerophytic and halophytic plants, excretion in plants, adaptations of plants to low or hightemperature.

CHAPTER 02:SUPPORT AND MOVEMENT

Note on parenchyma and sclerenchyma, significance of secondary growth. Heart wood and sap wood.

CHAPTER 03: CO-ORDINATION AND CONTROL

Role of different types of hormones. Define biological clock, circadian rhythmand biorhythm, List of Responses to environmental stresses in plants.

CHAPTER 04: REPRODUCTION

Tissue culture and its advantages and disadvantages, salient features in the life cycle of Gymnosperm, spikelet inflorescence, germination and its types, seed dormancy, pollination and its types, photoperiodism and its kinds, invitro-fertilization in plants and its importance, role of pollen tube, P660 and P730.

CHAPTER 05: GROWTH AND DEVELOPMENT

Phases of growth, meristem and its types, Growth correlation.

CHAP 06: CHROMOSOMES AND DNA.

Chromosomes number in different organisms, Chemical composition of Chromosomes, Karyotype, Autosomes and sex chromosome, homologous chromosomes, Chromosomal aberration, Phenylketonuria, Alkaptonuria, RNA and its types.

CHAPTER 07: CELL CYCLE

Interphase,Necrosis & Apoptosis, significance of mitosis and meiosis, Meiotic errors (Klinefelter's and Turner's syndrome), Note on Cancer.

CHAPTER 08: VARIATION AND GENETICS

Test cross, incomplete and co-dominance, Multiple alleles, Pleiotropy and polygenic inheritance.
Define Linkage and Crossing over,Note on Diabites Mellitus.

Chapter 11: ECOSYSTEM

Define ecosystem and levels of organization, topographic and epdaphic factors, Mutualism and Commensalism with example, Autecology / Synecology, Primary and Secondary Successions

CHAPTER 12 : SOME MAJOR ECOSYSTEM

Life in fresh water(Pond Ecosystem), Note on Neritic Or Oceanic region, Tropical rain forest, Coniferous forest of Pakistan,Desert ecosystem.

Detailed Answer Questions

- Describe Pararonic Movement in plants. OR Describe Mendel's 2nd law of independent assortment of genes with punette square method.
- Describe the process of Mitosis OR Meiosis Prophase-I in detail With diagram.
- Describe Ultra structure of chromosomes with the help of diagram.OR Evidence that DNA is a hereditary material.
- Describe Gene expression with reference to Protein synthesis in eukaryotic cell.
- Sex determination in Drosophila and Man (Haemophilia and color blindness).OR Classification of Angiospermic plants on the basis of Osmoregulation.
- Explain climatic factors of ecosystem. OR Ecological Successions (Hydrosere Or Xerosere).

REASONING QUESTIONS

- Write down the effect of Isotonic and Hypertonic solution on the cell turgidity.
- Name different aspects of Homeostasis.
- How the Cymose inflorescence is different from Recemose inflorescence.
- What internal factors are responsible for the growth of plant?
- How does plant defend themselves against pathogen?
- Define Mertistem. Mention the name of different meristems found in plant?
- Mention the number of chromosomes for any two of the following species.
    - a) Penicillium b) Fern c) Drosophila d) Sugar cane
- Which nitrogenous base is present in RNA but not in DNA?
- Name the scientists known for the following discoveries.
- Ladder type organization of DNA.
- Identification of genetic material of bacteria.
- Why does chromosome consider a colour body?
- What is Nucleosome?
- Define Supercoiling of DNA.
- How the Histone and Non- Histone proteins are similar and dissimilar from each other?
- Write down the chemical formulas of Ribose sugar and Phosphoric acid.
- Define Karyotype.
- Write only the name of different kinds of gametes form in sexual reproduction.
- Define monoecious and dioecious.
- In which process the fruit formation take place without pollination and fertilization.
- What hormone is involve for treating the unpollinated flower?
- Define photoperiodism. Give only the name of plants on the basis of light and dark period they required.
- What is Floregin?
- Give the name of scientists for the following discoveries.
- Vernalization b) One- gene one- enzyme hypothesis.
- State the Chargaff's rule.
- How many base triplets are more than enought for 20 aminoacids? Mention the Start and Stop codons also.
- Define Gene mutation. * Define biological clock and circadian rythum.
- Why the cancer cell is considered as an uncontrollable cell division?
- How the Urine turn to become black in Alkaptonourian?
- How the Phenylketonuria is harmful to infants?
- How the red blood cells change into sickle shaped in sickle cell anemia?
- Define Parthenocarpy.Or Apomixes. * Define linkage OR Synapsis.
- Give the name of cross with example that use for determining the hetrozygosity and homozygosity.
- If the colorblind woman is married to a normal man then how many children of this couple are likely to be colorblind in F_2 generation?
- Define Permafrost OR Ecological niche.
- Give the name of an Ecosystem known as Bread basket of the world and why?
- Why does the Lichens consider as Pioneer community of any ecosystem?
- Classify only the Abiotic factors of an ecosystem.
- Define Pedology OR Weathering.
- Define Sciophytes and Heliophytes.
- Give only the names of different Ecological approaches also differentiate between Autecology and Syncology.
- Write a note on Edaphic factors OR Topographic factors.
- Give the name of any two of the scientists who used the following terms first.
- Ecosystem b) Succsession c) Sex- linked inheritance
- Define Pleiotropy OR Gene pool.
- Give only the name of different stages of Xerosere community.
- Define Multiple Alleles.

ZOOLOGY

SECTION 'A' (Multiple Choice Questions)

1. The animals are active during day time is known as _____.
a) Diurnal b) nocturnal c) activator d) both a and b

2. _____ is the largest part of brain .
a) Telecephalon b) Amygdala c) pons d) diencephalon

3. In man sperms are stored in _____.
a) Urethra **b) epididymus**
c) seminiferous tubules d) Vasa deferens

4. _____ resembles a Mulberry fruit or a compact ball like mass.
a) blastula b) Gastrula **c) Morula** d) cleavage

5. The concentration of urea in urine is _____.
a) 2.00 /100cm^3 b) 3.00/100 cm^3 c) 4.00 /100 cm^3 d) 1.00/100cm^3

6. Over production of cortisol result in _____ syndrome .
a) Cushing syndrome b) Down syndrome
c) klienfilter syndrome d) edema

7. Gaba and Dopamine are the example of _____.
a) nerve b) messege **c) Neurotransmitter** d) hormone

8. The number of Cranial Nerves in man is _____ pairs.
a) 12 b) 15 c) 21 d) 31

9. Vasodilation occur in _____ .
a) summer b) winter c) Autumn d) spring

10. _____ is kidney stones.
a) calculi b) carbonates c) sulphates d) phosphate

11. _____ is the excretory organ of cockroach.
a) flame cells **b) malphigian tubules** c) nephridia d) metanephridia

12. Muscles connected with bones by _____.
a) octeoclast cells b) chondrocytes cells **c) Tendons** d) ligaments

13. The autosomal recessive allele disease is _____.
a) Cystic Fibrosis b) down syndrome c) cushing syndrome d) SCID

14. The animals are active at Dusk or Dawn is known as _____.
a) Nocturnal b) diurnal **c) crepuscular** d) All of these

15. Mammals lacking sweat gland promote heat loss through _____.
a) Panting b) secreting c) hibernation d) aestivation

16. Ovulation is initiated by _____ hormone.
a) LH b) ACTH c) ADH d) FSH

17. The cells of bones are called _____.
a) Osteocytes b) chondrocytes c) osteoclast d) chondroclast

18. Leishminia is transmitted by _____.
a) sand fly b) house fly c) honey bee d) Mosquito

19. _____ is used to construct rDNA as vector.
a) Ligase b) Restriction enzyme **c) Plasmid** d) Bacteriophage

20. The approximate number of Human gene on 23 pairs of chromosomes are _____.
a) 30,000 to 35,000 b) 40,000 to 45000 c) 5000 to 50,000 d) 20,000 to 25000

21. Testes produces _____ hormone.
a) Testosterone b) Progestron c) Oestrogen d) All of these

22. The emergency hormone or the metabolic rate is raised for a short period by the secretion of Hormone or An Emergency treatment is Cardiac arrest is _____.
a) Epinephrin b) Anesthesia c) non adrenalin d) non epinephrine

23. The cells of cartilage is known as _____.
a) chondrocytes b) osteocytes c) osteoblast d) none of these
24. Hypothyroidism in adult cause _____.
a) Myxedema b) exopthelmia c) diabetes d) cretinism
25. The joints of Elbow and Knee are _____ .
a) ball and socket joint **b) hinge joint**
c) girdles d) pivot joint
26. Abductor Muscles are antagonistic to _____ Muscle.
a) Adductor muscles b) bicep c) triceps d) rotatory muscles
27. Microcephaly is caused due to _____ disorder.
a) genetic disorder b) nutritional deficiency
c) viral disease d) bacterial
28. Tooth decay is caused due to deficiency of _____.
a) Chlorine **b) Fluorine** c) Bromine d) iron
29. The Human Brain consist of the Functional clusters of the cells called _____.
a) diecephalon b) neuroglial **c) neurons** d) interferons
30. Hypothalamus is set at a particular point known as _____.
a) exact point b) suitable point **c) Set point** d) limit point
31. Electrochemical message is called _____.
a) nerve impulse b) neurotransmitter c) receptors d) neurochemical
32. Long-term Memory is stored in _____.
a) pons **b) reticular formation** c) Hippocampus d) cerebrum
33. Cold Blooded animals are also called _____.
a) heterotherms b) poikilotherms c) homeotherms d) endotherms
34. The concentration of water in urine is _____.
a) 95 % b) 90 % c) 97 % d) 87
35. True coelom is formed by _____.
a) endoderm b) ectoderm **c) Mesoderm** d) none of these
36. The Locomotory organ of Snail is _____.
a) foot b) flagella c) cilia d) Pseudopodia
37. The Non coding region of DNA molecule is called _____.
a) axon b) dendrite **c) Interon** d) Exon
38. _____ Nervous system found in Hydra.
a) continuous b) congested **c) Diffused** d) central
39. Carpal bones are present in _____.
a) Hands b) feet c) shoulder d) toe
40. Treponema pallidum causes _____.
a) Syphilis b) Gonorrhea c) AIDS d) Genital herpes
41. Rabies is caused by _____.
a) virus b) bacteria c) Fungi d) Protozoan
42. The Unit of measurement of noise level is _____.
a) Decible b) meter c) milli meter d) Hertz
43. Athletes foot disease is caused by _____.
a) Fungi b) virus c) Bacteria d) all of these
44. Germinal Continuty Theory was proposed by _____.
a) Darwin **b) Weismann** c) Lemarks d) Hardy- Weinberg
45. Urea is 10,000 times more toxic than _____.
a) Chlorine **b) Ammonia** c) uric acid d) nitrogen
46. The deficiency of Insuline may lead to a disease called _____.
a) diabetes b) cough c) flu d) hypoglycemia
47. Skull is the part of _____.
a) Axial Skeleton b) girdles
c) appendicular skeleton d) Exoskeleton
48. The egg of Hen is Laid at the stage of _____.
a) gastrula **b) Blastula** c) morula d) Cleavage

49. The Element necessary for muscles contraction is _____.
a) Ca^+ b) H_2O c) Cl^- d) O_2

50. An animal which possesses both the function of Testis and Ovaries is called _____.
a) Hermaphrodite b) Hetrophrodite c) seperate sexes d) Unisexual

51. Follicle Stimulating Hormone is produced by _____.
a) adrenal glad **b) master gland** c) thyroid gland d) Parathyroid gland

52. The Longest and Strongest Bone of Human body is _____.
a) Femur b) Tibio fibula c) Humerus d) Radioulna

53. In Archeopteryx the Number of Vertebrae is_____.
a) 30 **b) 20** c) 40 d) 50

54. _____ disease is Controlled by gene therapy.
a) Cystic Fibrosis b) Infertility c) sydromes d) Klinefelter's

55. The animal are active at dusk or down is known as _____.
a) Diurnal b) nocturnal **c) Crepuscular** d) All of these

56. In star fish locomotion is take place by _____.
a) water vascular system b) arms
c) jet propulsion d) Arm

57. This percentage of the water of the world is retained as glaciers and polar ice is ____.
a) 2 b) 4 c) 6 d) 8

58. The Immune system Influenced by _____.
a) Thymosine b) thyroxin c) renin d) Calcitonin

59. Cranial, vagas, and spinal nerve are a part of _____.
a) Parasympathetic Nervous System b) autonomic nervous system
c) sympathetic nervous system d) All of these

60. The connection between mother and fetus is through _____.
a) placenta b) uterus c) endometrium wall d) None of these

61. In man there are _____ pairs of Spinal Nerves.
a) 31 pairs b) 25 pairs c) 20 pairs d) 12 pairs

62. During Embryonic stage Two layered stage is called _____.
a) blastula **b) gastrula** c) morula d) All of these

63. Emergency Hormone Epinephrin is secreted from _____.
a) Adrenal medulla b) adrenal cortex c) thymosine d) Thyroid

64. Turner syndrome is _____ sexual disease.
a) Male **b) Female** c) animal d) None of these

65. Excretory organ of Planaria is called _____.
a) Flame cells b) nephridia c) metanephridia d) Malpighian tubule

66. _____ Joint is found in vertebrae.
a) Gliding joint b) hinge joint c) fixed joint d) Ball & socket

67. By the activity of chlorine ozone is converted into
a) Water b) Hydrogen **c) Oxygen** d) Sulphur

68. Bat and humming bird are _____.
a) poikilotherms b) homeotherms c) warm blooded **d) Heterotherms**

69. The period starting from conception upto the birth of a baby is called _____.
a) Gestation b) pregnancy c) menstruation d) lactation

70. Hypothalamus, Amygdalaand Hippocampus are the part of _____.
a) limbic system b) axial skeleton c) endoskeleton d) Thalamus

71. Sickle cell Anemia is caused by _____.
a) WBCs b) abnormal hemoglobin
c) platelets **d) RBCs**

72. In Human Brain , plasma like fluid is called _____.
a) brain fluid b) protoplasm **c) Cerebrospinal fluid** d) Spinal fluid

73. Renal Artery enters and renal vein leave the kidney at a side of _____.
a) hillus b) pelvis c) pyramid d) Urethra

74. The spongy Vascular internal Lining of the Uterus is called _____.
a) myomatrium **b) Endomertrium** c) mesoderm d) All of these

75. Physical Trauma in the Human Vertebrae is called _____.
a) Disc slip b) spondolysis c) arthritis d) Sciatica

76. The most abundant component of urine is _____.
a) urea **b) water** c) cretinine d) Salts

77. The capillary network around the loop of Henle is called _____.
a) Vasa Recta b) descending limb c) ascending limb d) Glomeruli

78. Parthenogenesis is found in phylum _____.
a) Cnidaria b) Protozoa **c) Artropoda** d) Annelida

79. Vassodilation occur in _____.
a) excessive heat b) mild heat c) winter d) cold

80. _____ is the Female disease cause due to the aging.
a) Osteoarthritis **b) Osteoporosis** c) menopause d) Anaemia

81. The fifth early stage of an animal Embryonic life is called _____.
a) gastrulation b) blastulation **c) Organogenesis** d) Neurulation

82. The complete development of chick takes _____ days.
a) 21 days b) 30 days c) 25 days d) 32 days

83. Orninthine requires Ammonia and CO2 to produce _____.
a) Urea b) Citruline c) Arginine d) Uric acid

84. The concentration of calcium ions in blood is controlled by _____.
a) Parathormone Hormone b) ADH
c) ACTH. **d) Calcitonin**

85. Lemarks presented _____ theory.
a) natural selection b) mutation theory
c) Inheritance of acquired charater d) All of these

86. Solar energy is _____ energy .
a) Non renewable energy **b) Renewable Energy**
c) Fuel d) All of these

87. The gap between Axon terminal one Neuron and Dendrite of another neuron is known as_____.
a) synapse **b) cleft** c) dendrite d) Post Synaptic region

88. The number of muscles present in Human Body is about _____.
a) 600 b) 700 c) 650 d) 450

89. Myelin sheath is formed by _____.
a) flame cells **b) Neuroglia** c) germ cells d) neural cell

90. The end of fertility in women is known as _____.
a) Menstruation **b) Menopause** c) puberty d) None of these

91. The deficiency of iodine cause _____.
a) Goiter b) BP c) Myxedema d) Cretinism

92. Theory of Acquired inheritance is proposed by _____.
a) Weismann **b) Lamarks** c) Darwin d) All of these

93. ADH and Oxytosin is produced by _____.
a) Hypothalamus **b) posterior pituitary gland**
c) adrenal gland d) Anterior Pituitary gland

94. The safest and cheapest source of Energy is _____.
a) Hydroelectric Energy b) nuclear energy
c) atomic energy d) Thermal energy

95. The normal human body temperature is _____ °C.
a) 98.6 °C **b) 37 °C** c) 32°C d) 35°C

96. Solving Problem without trial and error is _____.
a) Insight Learning b) latent learning c) habituation d) imprinting

97. AIDS is caused by _____.
a) tuberculosis **b) HIV**
c) Neisseria Gonorrhea d) Gonorrhea

98. The deficiency of Iron lead to a disease _____.
a) Diabetes **b) anemia** c) malnutrition d) Myxedema

99. The locomotory organ of paramecium is _____.
a) cilia b) flagella c) flame cells d) Pseudopodia

100. _____ enzyme used to seal the DNA.
a) Ligase enzyme b) restriction enzyme c) polymerase d) Transferees

SECTION 'B' (Short- Answer Questions)

Reasoning Questions:

i. **How does muscles spasticity becomes reduce in Neurological condition? Or**
ii. **Why testes descends down in Human male Foetus before birth?**
iii. **How does SCID different from AIDS? Or Why Monozygotic have same sex? Or why we cannot use non renewable energy resources again?**
iv. **monozygotic twins have same sex?**
v. **Why we cannot use non renewable energy resources again?**
vi. **Why humidity and overcrowding favors the spread of air borne diseases?**
vii. **How chlorine convert Ozone into Oxygen?**
viii. **How the rains become acidic? Reason?**
ix. **Calculate through Hardy Weinberg equilibrium. Allele A = P has frequency of 0.9 and Allele a=q has 0.1 frequency.**
x. **Why restriction enzyme is called Scissor?**
xi. **Why another enzyme also use for binding of DNA fragments although DNA has already sticky ends. Name the enzyme also? Why testes descend down in Human male Foetus before birth?**
xii. **If a new born baby suffers from blindness, which sexually transmitted infection may have been involved?**
xiii. **Why is Synapse termed as Motor end Plate?**
xiv. **What is genetic monotomy ? In which type of Reproduction it is found?**
xv. **How does counter current multiplier system create a counter current multiplier system create a concentration gradient in medulla?**
xvi. **How the waste products from the blood removal from the body in case of renal failure?**
xvii. **Why the degree of concentration of urine varies in human being?**
xviii. **Excreting ammonia by animals is advantageous reason?**
xix. **Why crystallization occur in uric acid?**
xx. **Why the lower two pairs of ribs is called floating ribs?**
xxi. **By decreasing the level of Estrogen which disease is caused?**
xxii. **What is the function of jet propulsion is jelly fish and octopus?**
xxiii. **Why high temperature more harmful than low temperature?**
xxiv. **Which bone carry sound waves?**
xxv. **Why deposition of fats helps in thermoregulation?**
xxvi. **Why lower parts of the body especially hands and feet remains cool more than other parts of the body?**
xxvii. **Which substance gives strength and elasticity to the cartilage?**
xxviii. **Which agent prevents the bone from grinding together and act as a shock absorber?**
xxix. **How can a muscle can contract to a greater or lesser degree?**
xxx. **Which compound serve as high reserve energy for muscles?**
xxxi. **Why a tiring condition produced in muscles after exercise?**
xxxii. **Why synovial joint is known as gleno-humeral articulation?**
xxxiii. **Why Ball and socket joint of the shoulder allows more movement than any other joint of the human body?**
xxxiv. **A shiny tract is left by a moving snail. Why?**
xxxv. **Which substance is required to transfer the impulse from Presynaptic to Postsynaptic neuron?**
xxxvi. **Why action potential is a temporary localized reversal of the polarity of the neurolemma?**

xxxvii. Why some areas like lips, Palms, Fingers, soles etc are hairs less?
xxxviii. Why testis lie between the thighs?
xxxix. Why the muscles of uterus begin to contract and relax at the time of birth?

Non Reasoning Questions:

- **What is DNA finger printing? Give its advantages?**
- **Discuss the Mutation theory in view of evolution. Or Define cleavage. Why is cleavage in birds discoidal? What is the function of pelvic girdle? Name its three important bones.**
- **Describe the function of encapsulated receptors of the skin.OR Write a note on Haemodialysis.**
- **Write a note on significance of sexual reproduction?**
- **Define joint. Draw a labelled diagram of Ball and socket joint.**
- **Explain osmoregulation in fresh water fish or Marine water fish.**
- **Differentiate between theory of special creation and theory of organic evolution.**
- **What is meant by sticky ends of DNA?**
- **Define receptor. Write down its types on the basis of sensation and working of sensory receptors. Or what is the importance of plasmids in recombinant DNA technology?**
- **What is cell differentiation and embryonic induction and role of cytoplasm and nucleus. OR Describe all STD and write their causes, symptoms, treatment and precaution.**
- **Write a note on:**
  Effect of Drugs on Co ordination, Aging, Abnormal development, Regeneration, Identical and fraternal twins, Oestrous cycle, Birth, Lactation, placenta, extra embryonic coats, umblical cord, Amnion, Twins, Test tube babies, Centralized nervous system, diffused nervous system.
- **How the hormones control the reproductive cycle? OR Write down different types of neurons ?**
- **Write a note on abnormal muscular contraction? OR Write down the factors of abnormal development with examples.**
- **Write a note on peripheral nervous system.**
- **Write four differences of the following: Nervous coordination and chemical coordination**
- **Write about Disc slip OR Thymus Gland**

SECTION 'C' (DETAILED ANSWER QUESTIONS)

- **Explain the mechanism of development and transmission of nerve impulse with diagram showing chemical transmission at the Synapse and Nerve Impulse.**
- **How homiotherms maintain their body temperature in hot and cold season in mammals.**
- **Describe the structure and mechanism of contraction of skeletal muscles.**
  OR describe the control of muscle contraction.
- **Define chemical coordination. What is the role of hypothalamus as the master gland? Give the names of hormones secreted by it and state their functions.**
- **What is menstrual cycle ? Discus its various phases and the events taking place in each phase.OR What is Gastrula ? Explain the formation of three germinal layers in gastrula of chick along with label diagram.**
- **Lamark's theory ORDarwin's theory of natural selection and the objections raised against it. Explain all the examples also.**

MATHEMATICS

IMPORTANT MCQ'S XII MATHEMATICS

1.Scalar Triple product [I , j , k] = _____.
a) 3 **b) 1** c) -1 d) 0

2. [a, ∞) is used for the set.
a) **{ x ∈ ℝ |x > a }** (b) { x ∈ ℝ |x ≥ a} (c) { x ∈ ℝ | x < a } (d) { x ∈ ℝ | x ≤ a}

3. The symbol "∀" stands for _____.
a) for each (b) for every **(c) for all** (d) for everybody

4. The implication symbol "=>" is read as.
a) tends to **(b) implies that** (c) approaches to (d) None of these

5. An____ is a set of all the points or real numbers between two points.
a) bound **(b) interval** (c) limit (d) Function

6. The elements of R are usually represented as points on the _____.
a) curved line **(b) real line** (c) imaginary line (d) straight line

7. The open interval (a, b) is represented by line segment from a to b consisting of all the points of ℝ.
a) between a and b including a, b (b) between a and b excluding a, b
c) with a and b (d) without a and b

8. (-∞, a) is represented by a ray consisting of all points of ℝ on the,
a) left of a **(b) right of a** (c) upward (d) downward

9. (a, ∞) is represented by a ray consisting of all points of ℝ on the,
a) left of a **(b) right of a** (c) upward (d) downward

10. (5,6) are called _____ coordinates.
a) Polar b) Triangular c) Spherical **d) Cartesian**

11. $(8, \pi/3)$ are called the_____ coordinates.
a) Polar b) Triangular c) Spherical d) Cartesian

12. The distance between any two points on the axis of x is the absolute value of the difference of their _____.
a) Zeros b) Ordinates **c) Abscissa** d) None of these

13. The distance between any two points on the axis of y is the absolute value of the difference of their _____.
a) Ordinates b) Abscissa c) Zeros d) None of these

14. The distance of a point p (x,y) from the origin is _____.
a) $\sqrt{x^2}$ b) $\sqrt{y^2}$ **c) $\sqrt{x^2+y^2}$** d) $\sqrt{x^2-y^2}$

15. The distance between two points P (x_1, y_1) and Q (x_2, y_2) is _____.
a) $\sqrt{|y_2-y_1|+|x_2-x_1|}$ b) $\sqrt{|x_2-x_1|^2+|y_2-y_1|^2}$
c) $\sqrt{(x_2-x_1)^2+(y_2-y_1)^2}$ d) $\sqrt{|y_2-y_1|-|x_2-x_1|}$

16. The distance between two points P (r_1 , θ_1) and Q (r_2, θ_2) is _____.
a) $\sqrt{r_1^2-r_1^2-2r_1r_2Cos(\theta_2-\theta_1)}$
b) $\sqrt{r_1^2-r_1^2+2r_1r_2Cos(\theta_2-\theta_1)}$
c) $\sqrt{r_1^2+r_1^2-2r_1r_2Cos(\theta_2+\theta_1)}$
d) $\sqrt{r_1^2+r_1^2-2r_1r_2Cos(\theta_2-\theta_1)}$

17. The length of the line segment joining the points (a,0) and (0,b) is _____ units.
a) $\sqrt{a^2+b^2}$
b) $\sqrt{a^2-b^2}$
c) $\sqrt{a^2b^2}$
d) $\sqrt{b^2-a^2}$

18. The distance between the points (x,y) and (x + $\mu Cos\theta$, y + $\mu Sin\theta$) is _____ units.
a) x b) y **c) μ** d) 1

19. The distance between the points (-1, 4) and (3, -2) is _____ units.
a) 26 b) $\sqrt{26}$ **c) $2\sqrt{13}$** d) $\sqrt{13}$

20. The mi*point of the join of (5,7) and (-17,-7) is _____.
a) (6,0) b) (-6,0) c) (0,6) **d) (0,-6)**

21. If the lines $a_1x + b_1y + c_1 = 0$ and $a_2x + b_2y + c_2 = 0$ are perpendicular then _____.
a) $a_2b_1 - a_1b_2 = 0$ b) $a_2b_1 + a_1b_2 = 0$ c) $a_1a_2 - b_1b_2 = 0$ **d) $a_1a_2 + b_1b_2 = 0$**

22. If the equations of the lines are 3x + 4y – 5 = 0 and 3x + 4y + 81 = 0, then they are _____.
a) Perpendicular **b) parallel** c) neither a or b d) None of these

23. The measure of the angle between the lines $x + \sqrt{3}y = 4$ and $\sqrt{3}x - y + 2 = 0$ is
a) 45° b) 60° c) 30° **d) 90°**

24. If P (x_1, y_1) is a point above the line ax + by + c = 0 with b > 0 then,
a) $ax_1 + by_1 + c < 0$ **b) $ax_1 + by_1 + c > 0$** c) $ax_1 + by_1 + c = 0$ d) $a_1x + by_1 + c \geq 0$

25. If P (x_1, y_1) is a point below the line ax + by + c = 0 with a > 0 then,
a) **$ax_1 + by_1 + c < 0$** b) $ax_1 + by_1 + c > 0$ c) $ax_1 + by_1 + c = 0$ d) $a_1x + by_1 + c \geq 0$

26. The area of the triangle whose vertices are (11, -12), (6, 2) are (-5, 10) is _____ sq. units.
a) 55 b) 56 **c) 57** d) 75

27. The area of a quadrilateral whose consecutive vertices are (3, -3), (7, 5), (1, 2) and (-3, 4) is _____ sq. units.
a) **26** b) 62 c) 22 d) 66

28. The area of a triangle with vertices (-a, b + c), (a, b – c) and (a, -c) is _____ sq. units.
a) a b) b **c) ab** d) a/b

29. The distance between the parallel lines x + y – 2 = 0 and 2x + 2y -1 = 0 is _____ units.
a) ¾ b) 3/2 **c) $3\sqrt{2}/4$** d) $3\sqrt{2}/2$

30. The distance between the two parallel lines 5x – 12y + 10 = 0 and 5x – 12y – 16 =0 is _____ units.
a) 1 b) 3 c) 5 **d) 2**

31. The distance between 5x + 12y – 16 = 0 and (3, -1) is _____ units.
a) -1 **b) 1** c) -2 d) 2

32. The equation of the straight line that passes through the point (4, $\sqrt{3}$) and makes an angle of $\pi/6$ radians with axis of x will be _____.
a) $x + \sqrt{3}y + 1 = 0$ b) $x - \sqrt{3}y + 1 = 0$ c) $x + \sqrt{3}y - 1 = 0$ **d) $x - \sqrt{3}y - 1 = 0$**

33. A linear equation ax + by + c = 0 then equation of line is parallel to _____.
a) **Two** b) Three c) Four d) Five

34. ax + by + c = 0 if a = 0 then equation of line is parallel to _____.
a) y-axis **b) x-axis** c) z-axis d) None of these

35. ax + by + c = 0 if b = 0 then equation of line is parallel to _____.
a) **y-axis** b) x-axis c) z-axis d) None of these

36. ax + by +c = 0, if a ≠ 0, b ≠ 0, c = 0 then line passes through _____.
a) x-axis **b) origin** c) y-axis d) None of these

37. Which one represent the general equation of straight line _____.
a) $ax^2 + by^2 + c = 0$ **b) ax + by + c = 0** c) $ax + by^2 + c = 0$ d) $ax^2 + by + c = 0$

38. If two linear equations have the same x and y coefficient then the lines represented by them are _____.
a) **Parallel** b) Perpendicular c) Neither parallel nor perpendicular d) None of these

39. The length of perpendicular from origin to ax + by + c = 0 _____.
a) $\frac{c}{\sqrt{a^2+b^2}}$ b) $\frac{-c}{\sqrt{a^2+b^2}}$ c) $\sqrt{a^2+b^2}$ d) c

40. Language used _____ for derivative of y with respect to x.

a) f (x) **b) f' (x)** c) Df (x) d) $\frac{dy}{dx}$

41. Cauchy used _____ for derivative of y with respect to x.

a) f (x) b) f' (x) **c) Df (x)** d) $\frac{dy}{dx}$

42. $\frac{d}{dx}$(c) = _____ where "C" being a constant.

a) 0 b) 1 c) -1 d) ∞

43. $\frac{d}{dx}$ is called _____.

a) Functional b) Derivative

b) **c) Differential Operator** d) None of these

44. $\frac{d}{dx}$(Sinx) = _____.

a) **Cosx** b) –Cosx c) Secx d) – Sinx

45. $\frac{d}{dx}$(Cosx) = _____.

a) Cosx b) –Cosx c) Secx d) **–Sinx**

46. $\frac{d}{dx}(e^x)$ = _____.

a) e **b) e^x** c) e^{2x} d) e^{x+1}

47. If f(x) = $e^{\frac{\pi}{2}}$ then f ''' (0) = _____.

a) 1 b) ¼ c) 8 **d) 1/8**

48. Find the domain of f(x) = $\frac{x-1}{x+1}$

a) **D (f) = R – {-1}** b) D (f) = R – {1} c) D (f) = R – {0} d) D (f) = R

59. Find the domain of f(x) = $\frac{x^2-1}{x^2+1}$

a) D (f) = R – {-1} b) D (f) = R – {1} c) D (f) = R – {0} **d) D (f) = R**

50. $(1+x^2)\frac{d}{dx}(\tan^{-1}x+\text{Cot}^{-1}x)$ x = _____.

a) -1 **b) 0** c) 1 d) 2

51. The function e lny = Sin^{-1} y is called _____ turn on.

a) Exponential b) Logarithm **c) Implicit** d) Explicit

52. If y is easily expressed in terms of the independent variable x, then y is called an _____ function of x.

a) Logarithmic b) Exponential c) Implicit **d) Explicit**

53. If x and y are so mixed up and y cannot be expressed in terms of the independent variable x and y is called an _____ function of x.

a) Logarithmic b) Exponential **c) Implicit** d) Explicit

54. $\int lnx\, dx$ = _____.

a) $xlnx$ b) $xlnx + x + c$ **c) $xlnx - x + c$** d) $xlnx + x^2 + c$

55. The solution of the differential equation $\frac{dy}{dx}$ = y^2 Sinx is _____.

a) $y = \text{Cos}^2x + c$ b) y = Cos x + c **c) 1/y = Cos x – c** d) 1/y = Sin x + c

56. An antiderivative of a function is called _____.

a) Summation **b) Integral** c) Derivative d) None of these

57. An equation involving derivatives of a function is called _____ equation.

a) Differential b) Radical c) Functional d) None of these

58. Antiderivative of Zero is _____.

a) Zero **b) Constant** c) x d) None of these

59. ∫ Cosecx Cot x dx = _____.

a) –Cos x + c **b) –Cosec x + c** c) Sex x + c d) – Cot x + c

60. ∫ Sec^2x . tan x dx = _____.

a) –Sec x + c b) 2 Sec x + c **c) ½ Sec^2x + c** d) $\tan^2x + c$

61. ∫ 0 dx = _____.

a) ∞ b) x **c) constant** d) x^2

62. ∫ a f(x) dx = _____.

a) $\int f(x)\,dx + a$ b) $a\,f(x) + c$ c) $\int f(x) + a$ **d) $a \int f(x)\,dx$**

63. $\int \frac{dx}{xlnx}$ = _____.

a) $\frac{lnx}{x}$ **b) ln (lnx) + c** c) x/lnx d) None of these

64. The solution of differential equation $\frac{dy}{dx} = Cos^2y$ is _____.

a) **tan y = x + c** b) y = tan x + c c) $Sin^3 y = 3 (x + c)$ d) None of these

65. $\int Cotx\,dx$ = _____.

a) tan x + c **b) ln Sin x + c** c) Sin x + c d) $Cosec^2x + c$

66. $\int_1^2 2xdx$ = _____.

a) 1 b) 2 **c) 3** d) 4

67. $\int \frac{1}{x}\,dx$ = _____.

a) c b) x + c **c) lnx + c** d) None of these

68. $\int Sec\,x \tan x\,dx$ = _____.

a) Sec x + c b) Sec x c) tan x + c d) –Sec x + c

69. The general solution of the differential equation $\frac{dy}{dx} = 1$ is.

a) Y = cx b) y = lnx **c) y = x + c** d) y = - x + c

70. $\int \tan x\,dx$ = _____.

a) Sec^2x b) Sec x tan x **c) lnSec x** d) Sec x

71. $\int Cos\,x \left(\frac{ln\,Sinx}{Sinx}\right)dx$ = _____.

a) ln $(Sinx^2)$ + c b) ½ ln $(Sin\,x)^2$ + c c) $(ln\,Sin\,x)^2$ + c **d) ½ $(ln\,Sinx)^2$ + c**

72. $\int Cos\,x\,dx$ = _____.

(a) –Sinx + c **b) Sin x + c** c) – Cos x + c d) tan x + c

73. Equation of circle with centre at origin and radius r is _____.

a) $x^2 – y^2 = r^2$ **b) $x^2 + y^2 = r^2$** c) x + y = r d) x - y = r

74. $x^2 + y^2 = r^2$ is the equation of the circle with centre _____.

a) (1,1) b) (0,1) **c) (0,0)** d) (1,0)

75. Two circles are said to be concentric circle if they have _____.

a) same radius **b) same centre** c) different diameters d) same diameters

76. General equation of the circle is

a) $x^2 + 2y^2 + 2gx + 2fy + c = 0$ b) $2x^2 + y^2 + 2gx + 2fy + c = 0$

c) $x^2 + y^2 + 2gx + 2fy + c = 0$ d) $x^2 - y^2 + 2gx + 2fy + c = 0$

77. The radius of the circle $x^2 + y^2 + 2gx + 2fy + c = 0$ is

a) $\sqrt{g^2 + f^2 + c}$ b) $\sqrt{g^2 - f^2 + c}$ **c) $\sqrt{g^2 + f^2 - c}$** d) g + f – c

78. The centre of the circle $x^2 + y^2 + 2gx + 2fy + c = 0$ is

a) (g,f) b) (f,g) c) (-f, -g) **d) (-g, -f)**

79. Circle $x^2 + y^2 + 2gx + 2fy + c = 0$ passes through the origin if

a) c = 0 b) $c \neq 0$ c) c =1 d) c = -1

80. If the circle $x^2 + y^2 + x + 2y + c = 0$ passes through (-1, 0) then _____.

a) c = -1 b) c = 0 c) c = 1 d) c = 2

81. Radius of the circle $x^2 + y^2 + 12x – 10y = 0$ is

a) $\sqrt{61}$ b) 61 c) 62 d) 64

82. Equation of tangent to the circle $x^2 + y^2 + 2gx + 2fy + c = 0$ at (x_1 , y_1) is

a) $x_1^2 + y_1^2 + 2gx_1 + 2fy_1 + c = 0$ b) $xx_1 + yy_1 + g\,(x + x_1) + f\,(y + y_1) + c = 0$

c) $xx_1 + yy_1 + 2g\,(x + x_1) + 2f\,(y + y_1) + c = 0$ d) $x_1^2 + y_1^2 + gx_1 + fy_1 + c = 0$

83. If the intersecting plane is parallel to a generator of the cone but intersects its one nappe only, then the curve of their intersecting is _____.

a) a circle **b) a parabola** c) a hyperbola d) an ellipse

84. If the intersecting plane which is parallel to a generator of the cone, intersects its both nappes but does not pass through it's vertex, then the curve of their intersection is called _____.

a) a circle b) a parabola c) a hyperbola **d) an ellipse**

85. The greek mathematicians Appollonius (260 – 200 B.C)? And pappus (early fourth century) discovered many intersecting properties of the _____ section.
a) plane b) point c) geometry **d) conic**

86. Appollonius and pappus used the methods of _____ geometry to study conics.
a) Euclidean b) plane **c) Analytical** d) none of these

87. The theory of _____ plays an important role in modern space mechanics, occeangraphy and many other branches of science and technology.
a) lines b) planes c) pascal **d) conics**

88. The set of all points in a plane which are equidistant from a fixed point and a fixed line is called ____.
a) circle b) parabola c) ellipse d) hyperbola

89. The point midway between the focus and the directrix on the parabola is called the _____ of the parabola.
a) vertex b) centre c) latus-rectum d) focus

90. The line through the focus and perpendicular to the directrix is called _____ of the parabola.
a) vertex b) axis **c) latus-rectum** d)focus

91. A line joining two distance points on a parabola is called _____ of the parabola.
a) vertex b) axis c) latus-rectum **d)chord**

92. Any chord passing through the focus of the parabola is called _____ of the parabola.
a) vertex b) axis **c) focal chord** d) latus-rectum

93. Focal chord perpendicular to the axis of the parabola is called the _____ of the parabola.
a) vertex b) axis **c) latus-rectum** d)focal chord

94. The point on the parabola which is closest to the focus is _____.
a) vertex b) directrix c) focus d) origin

95. The point where the axis meets the parabola is called _____.
a) focus b) directrix c) centre **d) vertex**

96. The unit vector along z – axis is _____.
a) $\hat{\imath}$ b) $\hat{\jmath}$ **c) $\hat{k}$** d) none of these

97. If $\vec{a}=\hat{\imath}$, $\vec{b}=\hat{\jmath}$ and $\vec{c}=\hat{k}$ and $\vec{a}\ .\ \vec{b}\times\vec{c}=$ _____.
a) 1 **b) 0** c) 2 d) 3

98. The Coordinates of a point on x-axis in three axes are _____.
a) (x, 0, 0) b) (o, y, 0) c) (0, 0, z) d) (0, 0, 0)

99. The coordinates of a point on y-axis in three axes are _____.
a) (x, 0, 0) **b) (o, y, 0)** c) (0, 0, z) d) (0, 0, 0)

100. The coordinates of a point on z-axis in three axes are _____.
a) (x, 0, 0) b) (o, y, 0) **c) (0, 0, z)** d) (0, 0, 0)

101. The position vector of the point p (x, y, z) is _____.
a) $\vec{P}$ b) $|\overrightarrow{OP}|$ c) $\overrightarrow{|P|}$ **d) $\boldsymbol{\overrightarrow{OP}}$**

102. If two vectors $\vec{A}$ and $\vec{B}$ are such that $\vec{A}.\vec{B}=0$ then the vectors are _____.
a) Parallel **b) Perpendicular** c) Tangent d) None of these

103. If $\vec{a}$ is any vector the vector with 3 times the length of $\vec{a}$ & opposite to the direction of $\vec{a}$ is _____.
a) $-3\overrightarrow{|a|}$ b)$-3\hat{a}$ c) $-3\vec{a}$ d) -3

104. If $\vec{U}=\hat{\imath}+\hat{\jmath}+\hat{k}$ and $\vec{V}=2\hat{\imath}-\hat{\jmath}+2k$ then $\vec{U}.V=$ _____.
a) 4 **b) 3** c) 5 d) -2

105. If $\vec{a}.\vec{b}=0$ then the angle between the vectors $\vec{a}$ and $\vec{b}$ is _____.
a) 0 **b) $\frac{\pi}{2}$** c) $\frac{\pi}{3}$ d) π

106. The unit vector in the direction of a vector $\vec{a}$ = (3, -2, 7) .
a) $\frac{3i-2j+7k}{\sqrt{62}}$ b) $\frac{3i-2j+2k}{\sqrt{54}}$ c) $\frac{3i-2j+2k}{62}$ d) 1

Section 'B'

Short Answer Question

Analytical Geometry and vector Algebra

Q2i) **Find the points of trisection of the segment joining by the ports (3,4) and (7,7).**

OR

Find the equation of the lines which is perpendicular to 2x + 3y + 4 = 0 and passes through (2,-1).

OR

Find the coordinates of the foot of the perpendicular from (-2, 5) to 3x + y + 11 = 0.

Q2ii) **By using slopes, find the fourth vector of a parallelogram if (1,-2) (1,0) and (2,1) are its three consecutive vertices.** **OR**

Find the equation of the line which passes through the point (-2, -4) and has sum of its intercepts equal to 3. **OR**

Find the slope of the line through the mi*point of the segment from a (-4, 4) to B (2,2) and the point which is three fifth the way from C (5,3) to D (-3, -2).

Q2iii) **For what value of k will the three lines 2x – 3y – 7 = 0 , 4x – 3y – 11 = 0 and 2x + ky + 1 = 0 be concurrent?**

OR

For what value of k for which the two lines kx + (2k+3) y + k+6=9; (2k+1) x + (k-1) y + k2 = 0 intersects in a point lying on the axis of y.

Q2iv) **Prove that $[\vec{a}+\vec{b}\quad \vec{b}+\vec{c}\quad \vec{c}+\vec{a}] = 2\,[\vec{a}\vec{b}\vec{c}]$** **OR**

Find the angle between the positive y-axis and the vector $\vec{a} = -\hat{\imath} - 1\ \ 3\hat{\jmath} + 2\hat{k}$

OR

Resolve the vector $\vec{a}$= (6,8,-6) in the direction of vectors $\vec{p}1$= (1,-1,2), $\vec{p}2$ = (2,2,-1) and $\vec{p}3$ = (3,7,-7).

CONIC SECTION

Q3i) **Find the equation of the circle of radius a which passes through the two points on the x-axis which are a distance b from the origin.**

OR

Find the equation of the circle concentric with the circle $x^2 + y^2 + 6x – 10y + 33 = 0$ and to aching the lines

y = 0

Q3ii) **Find the equation of the circle containing the points (-1, -1) and (3,1) and with the centre on the line x – y + 10 = 0**

OR

Show the line x + 5 and y = 7 both touch the circle $x^2 + y^2 – 4x – 8y + 11 = 0$

Q3iii) **Find the equation of parabola with focus (3,4) and directrix x + y -1 = 0.**

OR

Find the equation of the parabola whose vector is (3,2) and the ends of focal chord are (5,6) and (5,-2)

Q3iv) **the length of the major axis of m ellipse 25 and its foci are the points (±6, 0). Find the equation of the ellipse.**

OR

Find the equation of the rectangular hyperbola with centre at (0,0) and vertices (0, ±3).

CALCULAS

Q4i) Evaluate:

$\lim_{x\to 0}\frac{1-Cosx}{x^2}$, $\lim_{x\to 0}\frac{e^{mx}-e^{nx}}{x}$, $\lim_{x\to\infty}\frac{x^2-5x+2}{5x^2+6x-4}$, $\lim_{x\to 0}\frac{tanx-sinx}{5m^2x}$

Q4ii) Find the directive using first principle

f(x) = sin2x , f(x) = secx

f(x) = $x^{2/3}$

Q4iii) Find $\frac{dy}{dx}$

$\sqrt{x^2+y^2}$=ln (x^2-y^2)

e^xlny – $\sin^{-1}$ g

$\sqrt{a^2+r^2}$ +ln $\sqrt{1+x^2}$

$x^4 . y^4 = 10$

$x = \ln^e t + \sin^{-1}t$, $y = e^t + cost$

$y = \ln\left(\frac{1-x^2}{1+x^2}\right)$

Section 'C' (Detailed Answer Question)

Q5. Evaluate:

$\int(x^3+1)^{7/3}x^5\,dx$, $\int_{-9}^{-3}\frac{\sqrt{x^2-9}}{x}$, $\int tan^{-1}x dx$, $\int_0^2\frac{y^3dy}{\sqrt{16-y^2}}$, $\int_0^{x/2}cos^4x\,dx$

Q6i) The area of triangle is 8 square unit, two of its vertices are the points A ((1,-2) and B(2,3) and the third vertex C lies on the line 2x+y-2=0. Find the coordinates of vertex C.

OR

The coordinates of two points A and B are (3,4) and (5,-2) respectively find the coordinates of point P. If $|\overline{PA}| = |\overline{PB}|$ and the area of triangle PAB=10 square units.

Q6ii) Find K if the line $2\sqrt{x} - 3y = k$ touches the hyperbola $16x^2 – 36y^2 = 675$.

OR

Show that the line touches the ellipse $\frac{x^2}{a^2}+\frac{y^2}{b^2}=1$, if $\frac{x^2}{\alpha^2}+\frac{b^2}{\beta^2}=1$

Q7i) Find the relative maximum and relative minimum values of the function.

f(x) = ex sinx OR $f(x) = x^2 – 9x^2 + 15x + 3$ OR $f(x) = \frac{lnx}{x}$

Q7ii) Evaluate: $\int\frac{tanx}{\ln(cosx)}dx$, $\int\frac{secx\,tanx}{\text{cotb}\,cosx}dx$, $\int\frac{x^2tan^{-1}x}{\ln(cosx)}dx$, $\int\frac{2x-1}{x(x-1)(x-3)}dx$