C.P.A TEST PAPER (XI MOVING)
(Medical Entrance)

ICAD
Creating & Nurturing Talent

Time Allowed : **3 hrs**
Maximum Marks : **360**

Date of Test :
Name : _____ Roll No. _____

NOTE:
1. There are 3 part (1) **Physics - 30 Q.** (2) **Chemistry - 30 Q.** (3) **Biology - 30 Q.**
2. There are four options for each question; however only one is correct answer.
3. There is negative marking scheme **(4R-1W).** Which means that for correct answer 4 mark will be awarded & for wrong answer 1 mark will be deducted. No mark will be deducted for unanswered question.
4. Use **Black Ball** point **pen** only.
5. Darken only one bubble completely, corresponding to the correct option.
6. Do not cancel the filled bubble or darken more than one bubble. It will be treated as wrong answer.
7. You may do rough work on the given space.

PHYSICS

CHOOSE THE CORRECT OPTION :

01. A concave mirror is made by cutting a portion of a hollow glass sphere of radius 24 cm. Find the focal length of the mirror.
(a) 24 cm **(b)** 12 cm **(c)** 6 cm **(d)** 18 cm

02. A mirror forms a virtual image of a real object.
(a) It must be a convex mirror
(b) It must be a concave mirror
(c) It must be a plane mirror
(d) It may be any of the mirrors mentioned above

03. An object is placed at the centre of curvature of a concave mirror. The distance between its image and the pole is
(a) equal to f **(b)** between f and 2f
(c) equal to 2f **(d)** greater than 2f

04. Find the refractive index of glass with respect to water. The refractive indices of these with respect to air are 3/2 and 4/3 respectively.
(a) 2 : 1 **(b)** 1 : 2 **(c)** 9 : 8 **(d)** 8 : 9

05. An observer moves towards a stationary plane mirror at a speed of $4\ m\,s^{-1}$. With what speed will his image move towards him?
(a) $2\ m\,s^{-1}$ **(b)** $4\ m\,s^{-1}$ **(c)** $8\ m\,s^{-1}$
(d) the image will stay at rest

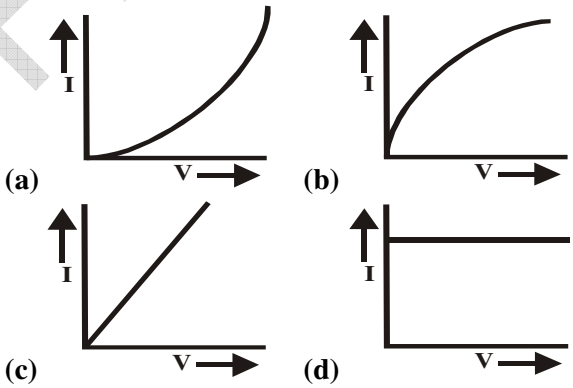
06. An object of height 4 cm is placed at a distance of 15 cm in front of a concave lens of power, -10 dioptres. Find the size of the image.
(a) 1.6 cm **(b)** 1.2 cm **(c)** 1.4 cm **(d)** 0.8 cm

07. An object 1 cm tall is placed 4 cm in front of a mirror. In order to produce an upright image of 3 cm height, one needs a
(a) convex mirror of radius of curvature 12 cm
(b) concave mirror of radius of curvature 12 cm
(c) concave mirror of radius of curvature 4 cm
(d) plane mirror of height 12 cm

08. In a metallic conductor, electric current is thought to be due to movement of:
(a) ions **(b)** amperes
(c) electrons **(d)** protons

09. Assuming that the charge of an electron is 1.6×10^{-19} coulomb, the number of electrons passing through a section of wire per sec, when the wire carries a current of one ampere is:
(a) 0.625×10^{19} (b) 1.6×10^{-19}
(c) 1.6×10^{19} (d) 0.627×10^{-17}

10. The V – I characteristics of four circuit elements are shown below. Which among the following is an ohmic conductor?

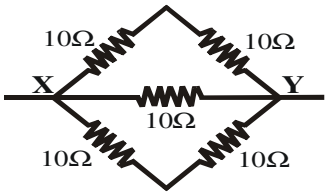


11. The resistance of a wire of uniform diameter D and length L is R. The resistance of another wire of the same material but diameter 2 D and length 4 L will be:
(a) 2 R **(b)** R **(c)** R/2 **(d)** R/4

12. A piece of resistance wire has resistance of 4Ω. Its diameter is doubled. Now its resistance will be:
(a) 8Ω **(b)** 2Ω **(c)** 4Ω **(d)** 1Ω

13. If a wire of resistance R is stretched to double of its length, then new resistance will be:
(a) R/2 **(b)** 2 R **(c)** 4 R **(d)** 16 R

14. When the value of each resistor is 10Ω, the equivalent resistance between the terminals X and Y of the circuit is:



(a) 1Ω **(b)** 3Ω **(c)** 5Ω **(d)** 8Ω

15. Siemen is the S.I. unit for:
(a) conductance **(b)** resistivity
(c) conductivity **(d)** resistance

16. When a charged particle moves through a magnetic field it suffers a change in its:
(a) Energy **(b)** Mass
(c) Speed **(d)** Direction of motion

17. In an electrical motor, the energy transformation is from:
(a) electrical to light
(b) electrical to mechanical
(c) light to electrical
(d) mechanical to mechanical

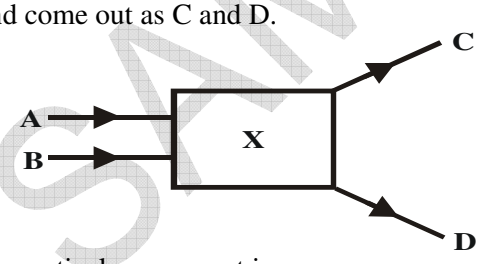
18. Energy in a current - carrying coil is stored in the form of:
(a) electric field **(b)** magnetic field
(c) dielectric strength **(d)** heat

19. In a pressure cooker the cooking is fast because
(a) the boiling point of water is raised by the increased pressure inside the cooker
(b) the boiling point of water is lowered by pressure
(c) more steam is available to cook the food at 100ºC
(d) more pressure is available to cook the food at 100ºC

20. In a chain reaction uranium atom gets fissioned forming two different materials. Then total weight of these put together is:
(a) more than the weight of the parent uranium atom
(b) less than the weight of the parent uranium atom
(c) may be more or less depending upon experimental conditions
(d) neither more nor less

21. A magnet is placed vertically on a paper. Then the number of neutral points obtained on the paper is__
(a) zero **(b)** one **(c)** Two **(d)** Three

22. Light rays A and B fall on an optical component x and come out as C and D.



The optical component is a _____
(a) concave lens **(b)** convex lens
(c) convex mirror **(d)** prism

23. A small magnet is placed perpendicular to a uniform magnetic field. The forces acting on the magnet will result in
(a) Rotational motion
(b) Translatory motion
(c) No motion at all
(d) translational and rotational motion both

24. A copper disc has a circular hole at its centre. When the copper disc is heated to raise its temperature, the diameter of the hole will ___
(a) decrease **(b)** not be affected
(c) increase **(d)** none of these

25. The radius of curvature of a plane mirror is____
(a) zero **(b)** infinite **(c)** negative **(d)** finite

26. Electric charge given to the hollow conductors resides
(a) on the outer surface **(b)** At the centre
(c) on the inner surface
(d) uniformly on the outer as well as on the inner surface

27. The sky is blue because ____
(a) there is more blue light in the sunlight
(b) of scattering of sunlight by air molecules in the atmosphere
(c) of scattering of sunlight by dust particles in the atmosphere
(d) other colours are absorbed by heavily bodies

28. In the following ____ is not a primary colour.
(a) Yellow **(b)** Red **(c)** Green **(d)** Blue

29. A 120 m long train is moving towards west at a speed of a 10 m/sec. A small bird flying towards east with a speed of 5 m/sec crosses the train. The time taken by the bird to cross the train would be _____.
(a) 24 sec **(b)** 16 sec **(c)** 12 sec **(d)** 8 sec

30. Sudden fall of a barometer reading indicates.
(a) Storm **(b)** Dry weather
(c) Fine weather **(d)** Cold weather

❒ ❒ ❒

CHEMISTRY

CHOOSE THE CORRECT OPTION :

31. A student is asked to measure 30.0 gm of methanol (density = 0.7914 gm/ml at 25ºC) but has only a graduated cylinder with which to measure it. What volume of methanol should the student use to obtain required 30.0 gm.
(a) 23.7 ml **(b)** 30.0 ml **(c)** 32.4 ml **(d)** 37.9 ml

32. How many neutrons are in 0.025 mole of the isotope $_{24}Cr^{54}$?
(a) 1.5×10^{22} **(b)** 3.6×10^{23}
(c) 4.5×10^{23} **(d)** 8.1×10^{23}

33. Enzymes convert glucose (Molar mass = 180.2) to ethanol (Molar mass = 46.1) according to equation

$$C_6H_{12}O_6 \longrightarrow 2C_2H_5OH + 2CO_2$$

What is the mass of ethanol that can be made from 15.5 kg of glucose
(a) 0.256 kg **(b)** 0.512 kg **(c)** 3.96 kg **(d)** 7.93 kg

34. Commercial vinegar is a 5% by mass aqueous solution of acetic acid. (CH_3COOH, Molar mass = 60.0) What is the molarity of acetic acid in vinegar (density of vinegar = 1.00 gm/ml)
(a) 0.833 M **(b)** 1.00 M **(c)** 1.20 M **(d)** 3.00 M

35. Which family of elements has solid, liquid and gaseous members at 25ºC and 1 atmosphere?
(a) alkali metals **(b)** pnicogens
(c) chalcogens **(d)** halogens

36. The electronic configuration of cobalt (Z = 27) is $1s^2 2s^2 2p^6 3s^2 3p^6 3d^7 4s^2$. How many unpaired electrons are in a gaseous Co^{+3} ion in its ground state?
(a) 0 **(b)** 2 **(c)** 4 **(d)** 6

37. Which molecule contains the strongest bond?
(a) H—Cl **(b)** H—F **(c)** Cl—Cl **(d)** F—F

38. When the compounds HF, H_2O, NH_3 and CH_4 are listed in order of increasing boiling point, which order is correct?
(a) $CH_4 < NH_3 < H_2O < HF$
(b) $NH_3 < CH_4 < H_2O < HF$
(c) $HF < CH_4 < H_2O < NH_3$
(d) $CH_4 < NH_3 < HF < H_2O$

39. The removal of an electron from which gaseous atom requires the greatest amount of energy?
(a) Na **(b)** Cl **(c)** K **(d)** Br

40. The classification of a fat as unsaturated or saturated is based on whether
(a) it can be metabolised by humans
(b) it contains carbon-carbon double bond
(c) it has twenty or more carbon atoms
(d) it is of animal origin

41. The mass of one atom of an element is 1.71×10^{-22}gm . What is the atomic mass of this element in gm/mol?
(a) 101 **(b)** 103 **(c)** 105 **(d)** 107

42. How many moles of water will be produced by complete combustion of 4.4 gm of C_3H_8?
(a) 0.10 **(b)** 0.25 **(c)** 0.40 **(d)** 0.80

43. A 10.0 gm sample of an oxide of copper forms metallic copper and 1.26 gm of water when heated in a stream of hydrogen. What is the mass percent of copper in this oxide?
(a) 11.2 % **(b)** 66.6% **(c)** 79.9% **(d)** 88.8%

44. How do the number of molecules, '*n*', in 1.0 litre of each of the following gases; CH_4,N_2 and CO_2 compare at 1 atm and 25ºC?
(a) $n(CH_4) < n(CO_2) < n(N_2)$
(b) $n(N_2) < n(CO_2) < n(CH_4)$
(c) $n(CO_2) < n(CH_4) < n(N_2)$
(d) $n(CH_4) = n(CO_2) = n(N_2)$

45. In which series are the species listed in order of increasing size?
(a) N, O, F **(b)** Na, Mg, K
(c) Cr, Cr^{+2}, Cr^{+3} **(d)** Cl,Cl^-,S^{-2}

46. Which molecule contains shortest carbon-carbon bonds
(a) C_2H_2 **(b)** C_2H_4
(c) C_3H_8 **(d)** C_6H_{12}

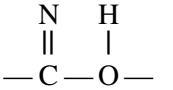
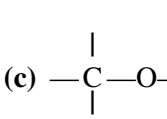
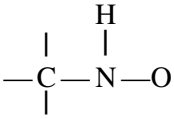
47. The formula $CH_3CO_2CH_3$ represents an
(a) aldehyde **(b)** ketone
(c) ester **(d)** ether

48. Which functional group is not commonly found in protein?
(a) alcohol **(b)** aldehyde
(c) amide **(d)** amine

49. How many moles of ions are present in 250 ml of a 4.4 M solution of sodium sulphate?
(a) 1.1 **(b)** 2.2 **(c)** 3.3 **(d)** 13

50. Which of the following statement is true about a substance that is subjected to a lower external pressure at a constant temperature?
(a) A liquid will boil at a lower temperature
(b) A liquid will exhibit a lower vapour pressure
(c) A gas in an insulated container will change into a liquid.
(d) A gas in a nonrigid container will change into a smaller volume.

51. Which occurs at the anode of any voltaic cell
(I) A metal electrode dissolves
(II) A substance undergoes oxidation
(III) Positive ions are deposited from the solution.
(a) I only **(b)** II only
(c) I and II only **(d)** I and III only

52. Which structure represents a peptide bond.
(a) 
(b) 
(c) 
(d) 

53. How many pi bonds are present in a molecule of but-1-yne?
(a) one **(b)** two **(c)** three **(d)** four

54. Which is the molecular formula of a saturated compound named 2,2,4-trimethyl pentane?
(a) C_7H_{14} **(b)** C_8H_{14} **(c)** C_8H_{16} **(d)** C_8H_{18}

55. Which pair of symbols identifies two elements that are metalloids?
(a) B and Ge **(b)** Mg and Si
(c) P and As **(d)** Ti and V

56. All of these are charactristics of most of the ionic compounds in the solid phase Except
(a) High electrical conductivity
(b) High melting point
(c) Solubility in water
(d) insolubility in organic solvents

57. Which family of compounds is used most frequently as flavouring agents?
(a) acids **(b)** alkenes **(c)** esters **(d)** ethers

58. In addition to carbon, hydrogen and oxygen, which elements is found in all amino acids?
(a) Chlorine **(b)** Nitrogen
(c) Phosphorus **(d)** sulphur

59. When egg white is coagulated, the protein is said to be _____.
(a) condensed **(b)** denatured
(c) hydrolysed **(d)** polymerised

60. When the atoms Li, Be, B, Na are arranged in order of increasing atomic radius? Which is the correct order?
(a) Li < Be < B < Na **(b)** Li < Na < B < Be
(c) Na < Li < Be < B **(d)** B < Be < Li < Na

❐ ❐ ❐

BIOLOGY

CHOOSE THE CORRECT OPTION :

61. The coded information for synthesising a protein is carried from the nucleus to the ribosome in the form of
(a) DNA **(b)** mRNA **(c)** rRNA **(d)** tRNA

62. Accumulation of nitrogen and phosphorus in a water body leads to heavy growth of algae and other aquatic plants. Subsequently the fish population declines because
(a) the fish do not consume plants
(b) oxygen depletion situation develops
(c) availability of light is reduced
(d) no nutrients are available

63. A plant cell has the potential to develope into an entire plant. This property of the plants cells is known as
(a) gene cloning **(b)** totipotency
(c) tissue culture **(d)** pleuripotency

64. Platyhelminthes can be distinguished from codenterata because
(a) they have flat body **(b)** they live in air
(c) they have long body **(d)** they live in water

65. Which of the following is a voluntary muscle?
(a) Smooth **(b)** Cardiac **(c)** Leg **(d)** Striated

66. People living in coastal areas do not suffer from goitre mainly because
(a) they eat a lot of fish
(b) they are biologically safe
(c) they eat a lot of sea weeds
(d) of nearness of sea water

67. Which of the following does not help of plant to restrict transpiration?
(a) sunken stomata **(b)** a thick cuticle
(c) hairy leaves **(d)** flattened stems

68. Among the following plant nutrients, which is a macro-nutrient?
(a) Manganese **(b)** Calcium
(c) Chlorine **(d)** Copper

69. Which of the following is true about producers in food chain?
(a) producers do not produce food for higher trophic levels
(b) producers are at the second traphic level
(c) producers convert inorganic substances to organic ones
(d) producers have the least population

70. Abscisic acid controls
(a) Cell division
(b) Short elongation
(c) Leaf fall and dormancy
(d) Cell elongation and wall formation

71. If the thyroid a new born child is removed, it will cause.
(a) gigantism **(b)** cretinism
(c) diabetes mellitus **(d)** virulism

72. Which one of the following groups of organisms does not possesses exoskeleton?
(a) Arthropoda **(b)** Mollusca
(c) Coelenterates **(d)** Fishes

73. Which one of the following constitutes the two best reasons for distinguishing the living from the non-living?
(a) Respiration and excretion
(b) Growth and locomotion
(c) Reproduction and locomotion
(d) Irritability and metabolism

74. Four important mineral nutrients required in large quantities by humans are
(a) Calcium, sulphur, molybdenum and zinc
(b) Nitrogen, potassium, manganese and cobalt
(c) Phosphours, copper, manganese and calcium
(d) Phosphours, calcium, sodium and magnesium

75. Which of the following organism is made of one type of tissue?
(a) Volvax **(b)** Spirogyra
(c) Ulothrix **(d)** All of these

76. Which of the following parts are present in both the animal and plant cells?
(a) Nucleus, nuclear sap and cell membrane
(b) Centrosome and Golgi apparatus
(c) Cellulose and plastids
(d) All of these

77. The chromosome which has dissimilar pair is responsible for characters like.
(a) colour of eyes **(b)** colour of hair
(c) sex **(d)** size of the body

78. Contractile Vacuole in Amoeba is analogous to the
(a) gastrovascular cavity of hydra
(b) sweat glands of mammals
(c) uriniferous tubules of frog
(d) typosole of earthworm

79. The tepeworm has no digestive system because
(a) it does not require food
(b) it lives in the small intestine
(c) it is a sporophyte
(d) it absorbs digested food trough the general body surface

80. The excertory organs of earthworms are
(a) flame cells **(b)** nephridia
(c) green cells **(d)** kidneys

81. Bacteriophage is the name given to
(a) a virus which infects a bacterium
(b) a bacterium which infects an animal cell
(c) an organelle of the bacterium
(d) None of these

82. The unique feature of bryophytes as compared to other plant groups is that
(a) they produce spores
(b) they lack vascular tissue
(c) they lack roots
(d) their sporphyte is attached to the gametophyte

83. pteridophytes differ from bryophytes in having
(a) motile male gametes
(b) antheridia
(c) alternation of generations
(d) vascular tissue

84. Auxins are
(a) building blocks of cell production
(b) growth regulators
(c) growth inhibitors
(d) raw material for a plant to grow normally

85. The region of growth of an elongation in the root is
(a) at the tip
(b) its entire extent
(c) in the middle
(d) a little distance away from the tip

86. Man cannot digest cellulose whereas cows can do so because
(a) their gut contains certain bacteria capable of digesting cellulose
(b) they have a many-chambered stomach
(c) they have efficient for molars grinding
(d) they produce an enzyme which can digest cellulose

87. A man becomes fat if
(a) his food intake is more than his body requirement
(b) he is diabetic
(c) he takes more water
(d) he swallow air while eating

88. Haemophilia is a hereditary disease carried by
(a) Females and expressed by females
(b) Females and expressed by males
(c) Males and expressed by females
(d) Males and expressed by males

89. Foot and mouth disease is common in
(a) Birds **(b)** Cattle
(c) human beings **(d)** Monkeys

90. Glucose is stored in the liver in the form of
(a) Starch **(b)** Glycogen
(c) Cellulose **(d)** Sucrose

❐ ❐ ❐