M. E. S. KALLADI COLLEGE
MANNARKKAD
(AUTONOMOUS)
Accredited by NAAC with A++ Grade: 4th Cycle, CGPA 3.51
Govt. Aided College & Affiliated to the University of Calicut

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# PG Entrance Examination Sample MCQ

Time 2.00Hrs Marks 100

- All question carry 1 mark each
- No electronic devices are permitted

1. The following list contains some of the events that lead 'heart attack'.
   (a) Blood clot breaks loose and passes along blood vessel
   (b) Region of heart muscle suffers myocardial infarction
   (c) Narrow branch of coronary artery becomes blocked thrombus
   (d) Thrombus forms on inner surface of coronary artery

   The correct sequence of these events is:-
   (a) 1, 4, 2, 3 (b) 1, 4, 3, 2
   (c) 4, 1, 2, 3 (d) 4, 1, 3, 2

2. What forms the fetal portion of the placenta?
   (a) The epiblast (b) The trophoblast and some mesoderm
   (c) The allantois and yolk sac (d) The endometrium

3. In the mechanism of hormone action that relies on signal transduction pathways and second messengers
   (a) A tropic hormone signals an endocrine gland to release a hormone
   (b) Another molecule relays the message from the membrane bound hormone to the cytoplasmic enzymes
   (c) negative feedback turns off the production of the hormone
   (d) genes are turned on and new proteins are synthesized

4. It is INCORRECT to say that a synapse is :
   (a) A cytoplasmic connection between two types of nerve cell in a neural circuit.
   (b) Located between an axon ending of one neuron and a dendrite of another
   (c) Only able to allow the transmission of nerve impulses in one direction
   (d) A region of functional contact that can be bridged chemically by a neurotransmitter.

5. Breathing rate will increase when _____ $CO_2$ in your blood causes a _____ in pH.
   (a) Increase / rise (b) Increase / drop (c) Decrease / rise (d) Decrease / drop

6. Which of the following local regulators amplifies the sensation of pain?
   (a) Prostaglandins (b) Histamines (c) Growth factors (d) Interleukins

7. What is the best description of the mechanism of action of steroid hormones?
   (a) It is transported by neuro-secretory cells directly to target tissues
   (b) Form a hormone-receptor complex inside the cell that regulates gene expression
   (c) Amplified response using second messengers
   (d) Bind to membrane-bound receptors and initiate a signal transduction pathway

8. Myotonia is
   (a) A congenital birth defect
   (b) The hormone responsible for breast development
   (c) Muscle tension
   (d) The filling of a tissue with blood

9. ADH and the RAAS both increase water reabsorption, but they respond to different osmoregulatory problems. Which two of the following statements are true?
   1. ADH will be released in response to high alcohol consumption
   2. ADH is released when osmoregulatory cells in the hypothalamus sense an increase in blood osmolarity
   3. The RAAS will increase the osmolarity of urine due to the cooperative action of renin, aldosterone and ANP.
   4. The RAAS is a response to a rise in blood pressure or volume.
   5. The RAAS is most likely to response after an accident or severe case of diarrhoea.

   (a) 1 and 4 (b) 1 and 5 (c) 2 and 3 (d) 2 and 5

10. The ideal solvent system for Chromatography of blood sample is:
   a) Chloroform : Ethanol (40:60)
   b) Methanol : Water (70:30)
   c) Methanol : Acetic Acid : Water (90: 3: 7)
   d) Ethanol : Acetic Acid : Water ( 92:1:7)

11. After the depolarization of an action potential, repolarization occurs due to the
   (a) Closing of sodium activation and inactivation gates.
   (b) Opening of sodium activation gates.
   (c) Refractory period in which the membrane is hyperpolarized.
   (d) Delay in the action of the sodium-potassium pump.

12. Pyrolysis gas chromatography conducted for paint examination is useful for characterizing:
   a. Vehicle
   b. Metal Ion
   c. Binder
   d. Pigment

13. Incomplete proteins are :
   (a) lacking in essential vitamins
   (b) a cause of undernourishment
   (c) found in meat, eggs, and cheese
   (d) lacking in one or more essential amino acids

14. Which of the following does not distinguish the nervous system from the endocrine system?
   (a) transmission of nervous impulses is more rapid
   (b) the nervous system uses chemical communication
   (c) nervous system messages are delivered directly to target cells or organs
   (d) the structural complexity of the nervous system allows for integration of more information and responses

15. What is the role of ATP in muscle contraction?
   (a) to form cross-bridges between thick and thin filaments
   (b) to break the cross-bridge when it binds to myosin and provide energy to myosin to forms its high-energy configuration
   (c) to remove the tropomyosin-troponin complex from blocking the binding sites on actin
   (d) to bend the cross-bridge and pull the thin filaments towards the center of the sarcomere

16. Cytoplasmic determinants
    (a) are unevenly distributed cytoplasmic components that influence the developmental fates of cells
    (b) are involved in the regulation of gene expression
    (c) usually include maternal mRNA
    (d) all of the above
17. Which of the following is added to hastening the hardening of plaster of Paris cast?
    a) Sodium sulphate b) Sodium chloride
    c) Sodium carbonate d) Aluminium sulphate

18. An inhibitory postsynaptic potential occurs when
    (a) sodium flows into the postsynaptic cell
    (b) enzymes do not break down the neurotransmitter in the synaptic cleft
    (c) binding of the neurotransmitter opens ion gates that result in the membrane becoming hyperpolarized
    (d) acetylcholine is the neurotransmitter

19. Loss of acetylcholine-producing cells in the limbic system followed by amnesia is symptomatic of
    (a) Alzheimer's disease (b) sickle-cell trait
    (c) Phenylketonuria (d) Schizophrenia

20. Which of the following is not a similarity between open and closed circulatory system?
    (a) some sort of pumping device helps to move blood through the body
    (b) some of the circulation of blood is a result of movements of the body
    (c) the blood and interstitial fluid are distinguishable from each other
    (d) all tissues come into close contact with the circulating body fluid so that the exchange of nutrients and wastes can take place
21. The myelin sheath that surrounds some axons in the peripheral nervous system is formed by
    (a) neurons (b) Schwann cells
    (c) bacteria that have invaded the nervous system (d) synapses

22. The adrenal medulla develops from nervous tissue and produces the hormone
    (a) epinephrine (b) adrenocorticotropin
    (c) aldosterone (d) cholesterol

23. The purpose of anti-diarrhoeal medicine would most likely be to:
    (a) speed up peristalsis in the small intestine
    (b) speed up peristalsis in the large intestine
    (c) kill *E. coli* in the intestine
    (d) increase water reabsorption in the large intestine

24. What are villi and what do they do?
    (a) folds in the stomach that aid in the mechanical breakdown of food
    (b) extensions of the lymphatic system that pick up digested fats for transport to the circulatory system and then to the liver
    (c) fingerlike projections of the small intestine lining that increase the surface area for absorption
    (d) microscopic extensions of epithelial cells lining the small intestine that provide more surface area for digestion

25. Blood flows more slowly in the arterioles than in the arteries because the arterioles
(a) have thoroughfare channels to venules that are often closed off
(b) collectively have a larger cross-sectional area than do the arteries
(c) must provide opportunity for exchange with the interstitial fluid
(d) have sphincters that restrict flow to capillary beds

26. Which of the following is important for the identification from hair?
(a) Cuticle (b) Medulla
(c) Cortex (d) All of the above

27. A gas is found to have density 1.80g/litre at 760mm pressure and $27^{o}$ C. The gas will be
(a) $O_2$ (b) $CO_2$ (c) $NH_3$ (d) $SO_2$

28. Ultraviolet rays can be checked by
(a) Flint glass (b) Crooke's glass (c) Soda glass (d) Pyrex glass

29. The bond angle between two hybrid orbitals is $105^{o}$. The percentage of S- character of hybrid orbital is between
(a) 50-55% (b) 9-12% (c) 11-12% (d) 22-33%

30. A cylinder filled with a movable piston contains liquid water in equilibrium with water vapour at $25^{o}$ C. Which one of the following operations results in a decrease in the equilibrium vapour pressure?
(a) Moving the piston downward a distance
(b) Removing a small amount of vapour
(c) Removing a small amount of the liquid water
(d) Dissolving salt in water

31. Which reagent would serve as the basis for a simple chemical test to distinguish between hexanoic acid and hexanamide?
(a) Cold dil. NaOH (b) Cold conc.$H_2SO_4$
(c) Carbontetrachloride and $Br_2$ (d) More than one of these

32. Most likely the lanthanoid elements will occur with
(a) Phosphate minerals (b) Chloride minerals
(c) Sulphide minerals (d) Free metals

33. Raffinose is
(a) Monosaccharide (b) Disaccharide (c) Trisaccharide (d) Polysaccharide

34. Lithium diorgano cuprates are
(a) Wurtz reagent (b) Grignard reagent (c) Gilman reagent (d) Molisch reagent

35. Tropylium ion is an
(a) Aromatic cation (b) Aromatic anion (c) Zwitter ion (d) Neutral molecule

36. Crotonic and Cinnamic acids can be prepared by
(a) Claisen condensation (b) Knoevenagel condensation
(c) Darzens condensation (d) Aldol condensation

37. Which of the following is not a part of the mechanical system of a compound microscope?
a) Coarse adjustment b) Objective lens
c) Body tube d) Stage

38. The anomeric carbon in fructose is
(a) C-1 (b) C-2 (c) C-3 (d) C-5

39. The black body emits
(a) Line spectrum (b) Band spectrum (c) Mixed spectrum (d) Continuous spectrum

40. The actual shape of $XeF_6$ is
(a) Square pyramid (b) Octahedral (c) Pentagonal bipyramid (d) Distortedoctahedral

41. Hydrogen will not reduce
(a) Heated aluminium oxide (b) Heated cupric oxide
(c) Heated stannic oxide (d) Heated ferric oxide

42. A solution of sodium sulphate in water is eletrolysed using inert electrodes. The product at the cathode and anode are respectively
(a) $H_2$, $O_2$ (b) $O_2$, $H_2$ (c) $O_2$, Na (d) $O_2$ and $SO_2$

43. The most prevalent plant fiber is
(a) Wool (b) Hemp (c) Cotton (d) Mohair

44. Positron rot Which of the following is the most potent form of cannabis preparation?
(a) Bhang (b) Ganja (c) Hashish (d) Marijuana

45. Which oxide of nitrogen is obtained on heating ammonium nitrate at $250^oC$?
(a) Nitric oxide (b) Nitrogen dioxide (c) Dinitrogen tetroxide (d) Nitrous oxide

46. When a mixture of solid NaCl, Solid Potassium dichromate and conc. Sulphuric acid, the gas produced is
(a) Chromous chloride (b) Chromyl chloride (c) Chromic chloride (d) Hydrogen chloride

47. Diphenyl amine reagent gives a blue color with
(a) Oxidising agents (b) Reducing agents (c) Acids (d) Bases

48. Reaction of acetaldehyde with HCN followed by hydrolyses gives a compound which shows
(a) Geometrical isomerism (b) Optical isomerism
(c) Metamerism (d) Tautomerism

49. Which of the following will not give iodoform test?
(a) Ethanol (b) Ethanal
(c) Isopropyl alcohol (d) benzyl alcohol

50. The carboxylic acid which shows reducing property is
(a) Acetic acid (b) Oxalic acid (c) Benzoic acid (d) Formic acid

51. Raman effect is the optical analogue of
(a) Compton effect (b) Stark effect (c) Zeeman effect (d) Photoelectric effect

52. If 75% of a radioactive material is disintegrated is 30 minutes, it's halflife is
(a) 15 minutes (b) 40 minutes (c) 50 minutes (d) 60 minutes

53. Stationery charge can produce
(a) Magnetic field (b) Electric field
(c) Both magnetic and electric field (d) None of these

54. Time period of a simple pendulum in a space craft orbiting the earth
(a) Infinity (b) 1 second (c) 2 second (d) 0 second

55. A car starts from rest with a constant acceleration of 5 $ms^{-2}$. The velocity of that car travelling for 1 km will be
(a) 10 m/s (b) 50 m/s (c) 5 m/s (d) 100 m/s

56. Materials with negative magnetic susceptibility are known as
(a) Paramagnetic (b) Diamagnetic (c) Ferro magnetic (d) Non magnetic

57. Which of the following is the principle on which the working of Polilight is based on?
(a) Alternate light source (b) U.V. light source
(c) I.R. radiation source (d) Near I.R. radiation source

58. An atomic nucleus X with half-life Tx decays to a nucleus Y, which has half life Ty. The condition (s) for secular equilibrium is (are)
(a) Tx >> Ty (b) Tx = Ty (c) Tx< Ty (d) Tx ≤ Ty

59. For a quantum particle confined a cubic box of side L, the ground state energy is given by $E_0$. The energy of the first excited state is
(a) 2 ε0 (b)3ε0 (c)6ε0 (d)4ε0

60. In the X-ray diffraction pattern recorded for a simple cubic solid (lattice pattern a= $1A^0$ ) using X-rays of wavelength 1 $A^0$ , the first order diffraction peak would appear for the
(a) 120 planes (b) 220 planes (c) 100 planes (d) 112 planes

61. Consider a classical particle subjected to an attractive inverse- square force field. The total energy of the particle is E and the eccentricity is$\varepsilon$ .The particle will follow a parabolic orbit if
(a) E = 0 and $\varepsilon = 1 (b) E = 1 \wedge \varepsilon = 0 (c) E = 0 \wedge \varepsilon = 0 (d) E = 1 \wedge \varepsilon = 1$

62. Which statistics will apply to deuterons and alpha particles
(a) Bose-Einstein (b) Fermi-Dirac (c) Maxwell- Distribution (d) None of these

63. In suspected cases of drowning, which of the following organs is most suitable for diatom test?
(a) Jejunum (b) Lungs
(c) Stomach (d) Sternum

64. The cyclotrone frequency is
(a) $2\frac{\pi m}{qB} (b) \frac{e\,h}{2\pi m} (c) \frac{qB}{m} (d)$

65. If the spin speed of the earth is increased then the weight of body at the equator will be
(a) Increase (b) Decrease (c) same (d) double

66. What is the size of electron as compared to proton and neutron
(a) 1/1836 (b) 1/4567 (c)1/1234 (d) 1/5687

67. The tidal waves on sea is mainly due to
(a) gravitional effect of moon on earth (b) Gravitational effect on sun on earth
(c) Gravitational effect of earth on moon (d) None of these

68. The famous law of kepler is related to
(a) Optics (b) planetary motion (c) speed (d) oscillation

69. Which of the following is the most reliable test for detection of semen in the absence of spermatozoa?
(a) Acid phosphatase (b) Prostate Specific Antigen
(c) Florence test (d) Esterase

70. The escape velocity of a particle depends upon its mass m, being proportional to
(a) $m^2$ (b) $m^{-2}$ (c) $m^{-1}$ (d) m

71. The efficiency of a carnot engine working between steam point and ice point
(a) 36% (b) 100 % (c) 27 % (d) 73 %

72. The light gathering power of the fiber depends on
(a) Acceptance angle (b) Diameter of the core
(c) Cross sectional area of both core and cladding (d) None of these

73. In DNA fingerprinting, which is the locus used for the determination of the gender of the individual?
(a) DYS 19 (b) DYS 393 (c) Y-Plex ladder (d) Amelogenin

74. The maximum number of intensity minima that can be observed in the Franhofer defraction pattern of a single slit (width 10 $\mu$m) illuminated by a lazer beam (wave length 0. 630$\mu$m) will be
(a) 4 (b) 12 (c) 7 (d) 15

75. If the motion of the particle is described by x= 5 cos ($8\pi$t) y = 5 sin ($8\pi t$), z = 5 t then the trajectory of the particle is
(a) Helical (b) Circular (c) Elliptical (d) Spiral

76. Match the following:

| List – I | List – II |
|---|---|
| A. Inquest | i. Cross examination |
| B. Conduct Money | ii. Police |
| C. Leading Question | iii. Body of evidence |
| D. Corpus delicti | iv. Witness |

| Codes: | A | B | C | D |
|---|---|---|---|---|
| (a) | ii | iv | i | iii |
| (b) | iii | ii | iv | i |
| (c) | iv | i | iii | ii |
| (d) | i | iii | ii | iv |

77. The scales of hair can be preserved with the help of
(a) Wax cast (b) Nail polish (c) Plaster of Paris cast (d) Plasticine

78. Seminal fluid choline originate from the
(a) Seminal vesicle (b) Sertoli's cell (c) Leydig cell (d) Prostate

79. One of the following tests is used to determine the species of origin from blood stain:
(a) Acid phosphate (b) Teichmann (c) Fluorescence (d) Immuno precipitation

80. The following typing is used to determine the both sex from a biological specimen:
(a) Mt. STR typing (b) Amelogenin typing (c) PCR typing (d) Y-STR typing

81. Radioactivity of a substance can be measured by
(a) TCD detector (b) MCT detector (c) EC detector (d) Geiger Muller counter

82. Following test is a confirmatory test for phenol
(a) Ware's Nitrite Test (b) Cobalt Thiocyanate Test
(c) Vitali's Test (d) Marqui's Test

83. It is not used as a primer in cartridge:
(a) Hg fulminate (b) Ammonium nitrate (c) Lead azide (d) Lead styphnate

84. Which of the following witness can be asked a leading question during examination-in-chief?
(a) Common witness (b) Expert witness
(c) Hostile witness (d) None of the above

85. 'Expert' is defined in the following section:
(a) 145 of Indian Evidence Act (b) 45 of Indian Evidence Act
(c) 145 of Criminal Procedure Code (d) 45 of Indian Penal Code

86. Which of the following is the most important component for the individualization of hair?
(a) Follicular tag (b) Cuticle (c) Medulla (d) Cortex

87. Which of the following is used as a detector in HPLC?
(a) Electrochemical Detector (b) Photomultiplier Tubes
(c) Photovoltiac Cells **(d)** Phototubes

88. Which of the following is a pigment found in faecal matter?
(a) Titanium oxide (b) Urobilinogen
(c) Creatinine (d) Keratin

89. Vaginal secretions can be characterized on the basis of the following:
(a) Glycogenated epithelial cells (b) Papillary cells
(c) Squamous cells (d) Elongated cells

90. The working of Polilight is based on _____.
(a) Alternate light source (b) U.V. light source
(c) I.R. radiation source (d) Near I.R. radiation source

91. ACE-V in fingerprints terminology stands for _____.
(a) Association, comparison, evaluation, verification
(b) Analysis, comparison, expertise, verification
(c) Analysis, correlation evaluation, verification
(d) Analysis, comparison, evaluation, verification

92. The book entitled "An Introduction to Criminalistics" was written by
(a) Hans Gross (b) Soderman
(c) Paul Kirk (d) Osterburg & O'Hara

93. The amplified effects from the combination of drugs is called
(a) Tolerance (b) Dependence (c) Synergism (d) Reverse tolerance

94. One of the options mentioned is not a step involved in PCR technique:
(a) Annealing (b) Denaturation
(c) Extension of nucleotides (d) Southern blotting

95. Screening tests are performed for
(a) Tentative identification (b) Definite identification
(c) Quantitative analysis (d) Semi-quantitative analysis

96. 'Stass-Otto' process is used for:
(a) Extraction of poisons (b) Extraction of DNA
(c) Extraction of antigens (d) Isolation of compliments

97. Burning, blackening and tattooing are useful for determination of
(a) Time of fire (b) Distance of fire
(c) Ricocheting of bullet (d) None of the above

98. Walker Test of GSR is done for the identification of presence of
(a) Metallic residue (b) Nitrate (c) Sulphur (d) Nitrite

99. Fecal matter as evidence is encountered in cases like
(a) Rape (b) Murder (c) Bestiality (d) Hanging

100. The following bones are useful for the determination of stature:
(a) Fibula and Pisiform (b) Radius and Talus
(c) Femur and Ulna (d) Humerus and Hyoid