Total Marks: 800 | **ETEA 2014** | Total Question: 200

1. Any DNA molecule having foreign DNA is called:

   (a) Mutant   (b) Recombinant

   (c) Crossing over   (d) All of the above

2. A study of communities in relation to environment is called:

   (a) Social Ecology   (b) Syn-Ecology

   (c) Auto-Ecology   (d) Hetro-Ecology

3. Human arm is homologous with:
   (a) Sea-flipper   (b) Octopus Tentacle
   (c) Bird Wing   (d) Both A & C

4. The theory of new creation was composed by:
   (a) George Cuvier   (b) James Hutton
   (c) Louis Agassiz   (d) Wallace

5. A specific nucleotide sequence on DNA molecule to which RNA polymerase attached to initiate transcription of mRNA from a gene is called:
   (a) Polygene's   (b) Genome
   (c) Promoter   (d) Pletoropy

6. Replication of DNa occurs during:
   (a) Interphase   (b) Prophase
   (c) Metaphase   (d) Anaphase

7. The theory of uniformitarism was proposed by:
   (a) Hutton & Lyell   (b) Lamarck
   (c) George Cuvier   (d) Darwin

8. If two interozygous tall plants are crossed together the proportion of phenotypically tall plants will be:
   (a) 50%   (b) 25%
   (c) 75%   (d) 100%

9. Both DNA & RNA are synthesize by the process of:

(a) Transcription   (b) Replication

(c) Polymerization   (d) PCR

10. In Eurokaryots, DNA replication proceeds at the rate of:

(a) 50 Base pairs/ seconds   (b) 40 Base pairs/ seconds

(c) 20 Base pairs/ seconds   (d) 30 Base pairs/ seconds

11. The particular array of chromosomes that an individual possess is called its:

(a) Genotype   (b) Phenotype

(c) Karyotype   (d) Genome

12. If the coding sequence on DNA is AATIGCT, the sequence in the mRNA will be:

(a) AAUOCGT   (b) UUAACGA

(c) TTAACGA   (d) UUTTCGT

13. Gene and chromosome show parallel behaviour except in:

(a) Number   (b) Inheritance

(c) Hereditary   (d) Composition

14. Hypothalamus is part of:

(a) Diencephalon   (b) Myelencephalon

(c) Metencephalon   (d) Telencephalon

15. Deficiency of which of the following causes Diuresis?

(a) LH   (b) ACTH

(c) FSH   (d) ADH

16. A complex form of learning that requires the manipulation of mental concepts to arrive at adaptive behaviour is:

(a) Imprinting   (b) Insight Learning

(c) Latent Learning   (d) Trial & Error Learning

17. Which of the following play role in Biorhythm?

(a) MSH   (b) I.H

(c) ADH   (d) Melatonin

18. The enlarged lining epithelium cells connected with groups of developing spermatozoa in testis is:

(a) Somatic Cells   (b) Sertoll Cells

(c) Stem Cells   (d) Totipotent Cells

19. The temperature required for verbalization is approximately:

(a) 2c   (b) 3°C

(c) 4°C   (d) 10°C

20. The response of a plant related to length of the day and night is called:

(a) Photo-Receptor   (b) Photo-Taxis

(c) Photo-tropism   (d) Photo-periodism

21. The cross between two dissimilar individuals is called:

(a) Test-Cross   (b) Interbreeding

(c) Epitasis   (d) Hyderdization

22. In octopus, the foot is modified into:
(a) Disc   (b) Arm
(c) Foot   (d) Siphon

23. Which of the following animal is included in protosom?
(a) Sea Horse   (b) Sea Mouse
(c) Sea-Cucumber   (d) Sea Lion

24. How many wailing legs are present in arachnids?
(a) 4   (b) 6
(c) 8   (d) 10

25. Bile is released from gall bladder by the action of:
(a) Gastrin   (b) Chlecyslokinin
(c) Secretin   (d) Renin

26. In which of the following pharynx open directly into intestine?
(a) Planaria   (b) Earth Worm
(c) Cockroach   (d) Snail

27. To decrease the salt potentially the guard cells absorb:
   (a) Sodium Ions
   (b) Magnesium Ions
   (c) Potassium Ions
   (d) Calcium Ions

28. Incomplete double circulation is found in:
   (a) Aves
   (b) Fish
   (c) Amphibians
   (d) Mammals

29. The oxygen carrying capacity of haemoglobin in humans when the blood is 100% oxygenated is:
   (a) 19.4ml
   (b) 19.6ml
   (c) 20ml
   (d) 21ml

30. Which of the following ions play important role in transport of carbon dioxide?
   (a) Sodium
   (b) Potassium
   (c) Bi-carbonate
   (d) Chloride

31. Lungs are _____ in origin:
   (a) Ectodermal
   (b) Endodermal
   (c) Mesodermal
   (d) Pre-formed

32. Shade loving plants are called:
   (a) Hallophytes
   (b) Mesophytes
   (c) Sciophytes
   (d) Xerophytes

33. The bone dissolving cells are called:
   (a) Osteoclast
   (b) Octeoblasts
   (c) Osteocytes
   (d) Fibroblasts

34. The hormone released by posterior pituitary gland that stimulates the contraction of uterine and mammary gland muscles is called:
   (a) Pro-lactant
   (b) LH
   (c)FSH
   (d) Oxytocin

35. All of the following are dioecious except:
   (a) Ulva
   (b) Funaria
   (c) Marchantia
   (d) Polytricum

36. All of the following are gametophytes except:
   (a) Club mosses
   (b) Funaria
   (c) Liver-worts
   (d) Horn-worts

37. A spore of fern plant develops into
    (a) Zygote   (b) Sporophyte
    (c) Gametophyte   (D) Prothalus

38. n angiosperms the megaspore develops into:
    (a) Embryo-sac   (b) embryo
    (c) Seed   (d) Male gametophyte

39. All of the following plants possess hermaphrodite flowers except
    (a) Lathyrusodoratus   (b) Solanum-nigrum
    (c) zia-mays   (d) Avena-sativa

40. A spore of fern plant develops into
    (a) Zygote   (b) Sporophyte
    (c) Gametophyte   (d) Prothalus

41. Which of the following fish have 14 pairs of gill slits?
    (a) Dog Fish   (b) Lamprey
    (c) Cat Fish   (d) Ray Fish

42. Which of the following is included in Deuterestome?
    (a) Brittle star   (b) Scorpion
    (c) Chaelopterus   (d) Unio

43. Choose the correct statement
    (a) The most direct and accurate method for determining atomic masses uses mass spectroscopy
    b) The indirect but accurate method for determining molecular masses uses mass spectroscopy
    (c) Collision between the electrons and the atoms produces negative ions by absorption of electrons by atoms or molecules.
    (d) The first application of mass spectroscopy was the demonstration to detect various isotopes of Argon.

44. A special protein carrier in plasma membrane is
    (a) Catalase   (b) lipase
    (c) Permease   (d) Arginase

45. High molecular mass compound was hydrolysed and the product was analysed and found to be amino acid. The compound is:
    (a) Protein   (b) Carbohydrate
    (c) Lipid   (d) Vitamins

46. The enzymes functions are optimum at:
    (a) Specific temperature   (b) Specific PH
    (c) Specific co enzyme   (d) All of the above

47. The product of light dependent reactions are:
    (a) RUBP+ATP   (b) RUBP+PGAL
    (c) NADPH + ATP   (d) PGAL +ATP

48. Accessory pigments are:
    (a) Red- Yellow-Green   (b) Red-Orange-Blue
    (c) Orange-Blue-Green   (d) Red-Orange-Yellow

49. Light absorption pigments in photo system first is:
    (a) P 600   (b) P680
    (c) P700   (d) P760

50. "Photo-phosph-rylation is:
    (a) ATP synthesis by food energy   (b) ATP synthesis by solar energy
    (c) ATP synthesis by source of water   (d) ATP synthesis by source of $NADH_2$

51. The genome of the most animals and higher plants is:
    (a) DNA   (b) RNA
    (c) Both DNA & RNA   (d) Either DNA or RNA

52. Milk sugar is pasteurized by heating for 15 seconds at the temperature of:
    (a) 60^oC (b) 71^oC
    (c) 50^oC (d) 80^oC

53. Murein cell wall is composed of:
    (a) Sugar and amino acids   (b) Calcium pectate
    (c) Glycoprotein   (d) peptidoglycan

54. All the following belong to phylum protista except:
    (a) Protomycota   (b) Gymnomycota
    (c) Oomycota   (d) Deutromycota

55. The cell wall of fungus like protista is composed of:
    (a) Chitin   (b) Cellulose
    (c) Murein   (d) Lignin

56. An Ascus develops:
    (a) 2 Ascospores   (b) 4 Ascospores
    (c) 6 Ascospores   (d) 8 Ascospores

57. Sea fungi is related to:

(a) Zygomycota

(b) Ascomycota

(c) Basidiomycota

(d) Deutromycota

58. Black bread mold is:

(a) Rhizopus

(b) Penicillium

(c) Mucor

(d) Yeast

59. Cell wall of gram positive bacteria is composed of:

(a) Glycolipids

(b) Glycoproteins

(c) Lipoproteins

(d) Peptidoglycan

60. Blue green algae, besides chlorophyll also posesses another pigment known as;

(a) Phycocyanin

(b) phycoerythrin

(c) phycobillirubin

(d) phycobilliprotein

61. A tertiary carbon is bonded directly to:

(a) 2 Hydrogen's

(b) 2 Carbons

(c) 3 Carbons

(d) 4 Carbons

62. Which of the following compounds undergoes nitration more readily?

(a) Benzene

(b) Toluene

(c) Benzoic acid

(d) Nitrobenzene

63. Which of the following is a Lewis acid?

(a) CH_3OH

(b) $AlCl_3$

(c) BH_3

(d) CH_3OCH_3

64. Which of the following substituents is an Ortho and Pera director and ring deactivating?

(a) -OH

(b) $-NH_2$

(c) –CL

(d) $-OCH_3$

65. Which of the following compounds will react with methyl magnesium iodide followed by acid hydrolysis to give ethyl alcohol?

(a) Ethylene

(b) Acetone

(c) Acetaldehyde

(d) Formaldehyde

66. Which of the following compounds does not give iodoform test on reaction with I_2 and NaOH?

(a) Propanone

(b) Ethanol

(c) Butanone

(d) 2- Propanol

67. Reduction of acetaldehyde with H_2/Ni gives:
    (a) Ethanol   (b) Ethanoic acid
    (c) Ethane   (d) Ethylene

68. Fatty acids are:
    (a) Linsaturated dicarboxylic acid   (b) Long chain alkanoic acid
    (c) Aromatic carboxylic acid   (d) Aromatic dicarboxylic acid

69. 95. Saponification of a fat:
    (a) Always results in the formation of soaps
    (b) Results in the formation of esters
    (c) Results in the formation of waxes
    (d) Results in the formation of glycerol and soap

70. Carbylamines test is given by:
    (a) Primary amines   (b) secondary amines
    (c) Tertiary amines   (d) all of these

71. The characteristic reaction of carboxylic acid is;
    (a) Electrophilic substitution   (b) nucleophilic substitution

    (c) Electrophilic addition   (d) Nucleophilic addition

72. Acetic acid reacts with methyl alcohol in the presence of acid catalyst to give;
    (a) Ethyl formate   (b) Ethyl acetate
    (c) Methyl formate   (d) Methyl acetate

73. High molecular mass compound was hydrolysed the product was analysed and found to be amino acid. The compound is;
    (a) Proteins   (b) Carbohydrates
    (c) Lipid   (d) Vitamins

74. Which of the following polymers contain nitrogen?
    (a) PVC   (b) Terylene
    (c) Nylon   (d) Teflon

75. Polyhydroxy aldehydes or ketones are known as;
    (a) Carbohydrates   (b) Proteins
    (c) Lipids   (d) Vitamins

76. Sucrose id considered as;
    (a) Monosaccharides   (b) Disaccharides
    (c) Polysaccharides   (d) none of these

77. The major sources responsible for the presence of NO, NO_2, N_2O in the atmosphere is/are;
    (a) Fertilizers   (b) Biological decay of deadly organism
    (c) Fossil fuel combination   (d) All of them

78. An acid is a substance which accepts:
    (a) An electron pair   (b) Proton
    (c) An Electron   (d) Pair of proton

79. Change in concentration of a reactant is plotted against time and the slope $\frac{dx}{dt}$ determined. The value of $\frac{dx}{dt}$ are plotted against $(a-x)^2$ a straight line is obtained. It may be concluded that the reaction is:
    (a) First order   (b) Second order
    (c) Third order   (d) Zero order

80. The addition of a catalyst to a chemical reaction changes:
    (a) The enthalpy   (b) The entropy
    (c) The activation energy   (d) the free energy

81. Which is not used in calculating the lattice energy of crystalline solids?
    (a) Haber Process   (b) Born Haber Cycle
    (c) Hess's Law   (d) Enthalpy changes

82. Providing heat to the following reaction causes it shift to the right $CO_2(_2)$ + $2H_2O$ (^{g}). The reaction can therefore be described as:
    (a) Spontaneous   (b) Adiabatic
    (c) Endothermic   (d) Exothermic

83. Which one of the following is most iconic?
    (a) NaCI   (b) $MgCl_2$
    (c) KCL   (d) $AICl_3$

84. Milk of magnesia is used for treatment of acidity in stomach, its formula is:
    (a) $Mg(OH)_2$ (b) $MgSO_4$
    (c) $Ca(OH)_2$ (d) $CaSO_4$

85. The compound used in Borax bead test for the detection of basic radicals to form coloured bead is:
    (a) H_2BO_2 (b) $(C_2H_5)_3BO_3$
    (c) $Ca_2B_6O_{11}5H_2O$ (d) $Na_2B_4O_710H_2O$

86. Which one of the following does not exists?
    (a) HBO_2 (b) HFO_2
    (c) H_3PO_3 (d) $HBrO_2$

87. Ethanol ($CH_3 CH_2 OH$) and dim ethyl ether (CH_3OCH) are best considered as:
    (a) Structural Isomers
    (b) Stereo Isomers
    (c) Enantiomers
    (d) Diasteromers

88. Which of the following compound is assigned the octane number of 100?
    (a) n-heptane
    (b) n-octane
    (c) 2, 3, 3-tri methyl pentane
    (d) 2, 2, 4- tri methyl pentane

89. Diethyl ether and Methyl propyl ether are:
    (a) Conformational isomers
    (b) Metamers
    (c) Geometrical isomers
    (d) Enantiomers

90. Choose the correct statement:
    (a) The most direct and accurate method for determining atomic masses uses mass spectroscopy.
    (b) The indirect but accurate method for determining molecular masses uses mass spectroscopy
    (c) Collision between the electrons and the atoms produce s negative ions by absorption of electrons by atoms or molecules
    (d) The first application

91. Choose the correct relation about the percent yield. It is equal to:
    (a) $\frac{Actual\ Yield}{Theoratical\ Yield} \times 100$
    (b) $\frac{Theoratical\ Yield}{Actual\ Yield} \times 100$
    (c) $\frac{Actual\ Yield}{Theoratical\ Yield} \times 10^6$
    (d) $\frac{Actual\ Yield}{Theoratical\ Yield} \times 10^3$

92. Which is incorrect about ionization energy?
    (a) Ionization energy depends upon the magnitude of nuclear charge
    (b) Ionization energy depends upon the atomic radius
    (c) Ionization energy depends upon the shielding effect
    (d) Ionization energy does not depend upon the penetration effect of the inner orbital

93. Select the incorrect statement:
    (a) Molecule may gain electron to form molecular ions
    (b) Molecule may lose electron to form molecular ions
    (c) Molecular actions are less abundant than molecular ions
    (d) These molecular ions can be formed by passing high energy electron beam through a gas

94. Ruther Ford's experiment scattering experiment demonstrate:
    (a) The existence of X-rays
    (b) The existence of α particles.
    (c) The mass to charge ratio of electron
    (d) The nuclear model of the atom

95. Which is the correct statement:
   (a) The ionic bonds are non-directional in character
   (b) The crystals of covalent compounds are made up of molecules
   (c) The covalent bonds are rigid and non-directional
   (d) Ionic compounds have high melting point and boiling point.

96. In which compound the bond angle is maximum?
   (a) Methane   (b) Beryllium Chloride
   (c) Ammonia   (d) Boron Tri fluoride

97. Equal volume of different gases under same condition of temperature and pressure contain the same no. of particles. The above statement is of
   (a) Avogadro's law   (b) Graham's law
   (c) Dalton's law   (d) hund's rule

98. The van der waals equation of state for no-ideal gases differs from the ideal gas law in that it accounts for
   (I) The mass of each molecule of the gas
   (II) The volume of each molecule of gas
   (III) The attractive forces between molecules of the gas.
   (a) I, II and III   (b) I and II only
   (c) I and III only   (d) II and III only

99. Both $NaNO_3$ and $CaCO_3$ both crystallize in rhombohedra forms therefore they are
   (a) Allotropes   (b) Polymorphous
   (c) Isomorphs   (d) None of these

100. Pure water freezes at 0^oC and boils at 100^oC at standard conditions. Calcium chloride was added to pure water. What do you expect about its freezing point and boiling point?
   (a) No change in freezing and boiling points
   (b) Freezing point increases and boiling point decreases
   (c) Freezing point increases and boiling point increases
   (d) Freezing point decreases and boiling point increases

101. Hydrogen bonding does not exist in the molecule of:
   (a) Hydrogen   (b) Proteins
   (c) Carbohydrates   (d) Ammonia

102. Vapour pressure of a liquid can be measured by the Barometric method and Manometric:
   (a) Barometric method is more accurate than Manometric method
   (b) Manometric method is more accurate than Barometric method
   (c) Both are equally accurate and applicable
   (d) Both methods are in use but are not reliable

103. Liquid crystalline substances are used to locate tumours' in the body because:
    (a) These parts of the body are warmer than the surroundings
    (b) These parts of the body are cooler than the surroundings
    (c) These parts of the body are constantly increasing and decreasing with the temperature.
    (d) None of the above

104. Sodium chloride crystal structure is:
    (a) Hexagonal   (b) Both Centred cubic
    (c) Face centred cubic   (d) Tetragonal

105. Choose the compound in which hydrogen bonding is not possible:
    (a) H_2O (b) HCL
    (c) CH_3COOH (d) Ch_3OCH_3

106. A certain radionuclide decays by emitting a α-particle. What is the difference between the atomic numbers of the parent and the daughter nuclides?

    (a) 1   (b) 2

    (c) 4   (d) 6

107. Of the following one particle belongs to lepton group:

    (a) Neutrinos   (b) Protons

    (c) Neutrons   (d) Mesons

108. In liquid metal fast breeder reactor the moderator used is:

    (a) Graphite   (b) Heavy Water

    (c) Boron Rods   (d) Not required

109. The half-life of 22Na is 2.6 years. If X grams of this sodium isotope are initially present how much is left after 13 years.

    (a)X/32   (b) X/13   (c) X/8   (d) X/5

110. Which specie has no net charge?

    (a) An α particle   (b) An electron

    (c) A proton   (d) A neutrino

111. The first artificial radioactive substance was made by bombarding aluminium $_{15}A1^{27}$, with α particle. This produces an unstable isotope of phosphorus $_{15}P^{30}$, what was the by-product of this reaction?

    (a) An α particle   (b) A β particle

    (c) A y ray   (d) A neutron

112. Carbon- 14 is used in carbon dating. Which of the following species has both same sumbers of neutrons and same number of electrons as in atom of c-14?

(a) $\frac{14}{7}N^+$

(b) $\frac{16}{8}N^2$

(c) $\frac{17}{9}P^+$

(d) $\frac{18}{14}SI$

113. Which statement correctly describes a nucleon?

(a) Any atomic nucleus

(b) A radioactive atomic nucleus

(c) A neutron or a proton

(d) A neutron proton or an electron

114. Choose the correct statement:

(a) $_2Li^7 + _2He^4 - _5B^{10} + _1n^0$

(b) $_2Li^7 + _2He^4 - _5B^9 + 1/0P$

(c) $_4Be^9 + _2He^4 - _6C^{12} + _0N^1$

(d) $_4Be^9 + _2He^4 - _6C^{12} + _1P^1$

115. Which derived unit below is equivalent to the SI unit for magnetic field strength, the Tesla T?

(a) Nm/A

(b) NA/m

(c) N/Am

(d) Am/N

116. Which experimental technique reduces the systematic error of the quantity being investigated?

(a) Adjusting an ammeter to remove its zero error before measuring a current

(b) Measuring several intermodal distance on a standing wave to find the mean intermodal distance

(c) Measuring the diameter 6f of a wire repeatedly and calculating the average

(d) Timing a large number of oscillations to find a period

117. A step up transformer is one that:

(a) Increase the power

(b) Increase the current

(c) Increase the voltage

(d) Increase the energy

118. Which of the following is not ferromagnetic substance:

(a) Iron

(b) Cobalt

(c) Nickel

(d) Barium

119. Sodium Chloride crystal structure is:

(a) Hexagonal

(b) Body Centred Cubic

(c) Face Centred cubic

(d) Tetragonal

120. Select the true statement about the amorphous solids:

(a) The amorphous substances have sharp melting point

(b) The amorphous substances do not have fixed melting point

(c) The amorphous substances have proper geometrical shapes

(d) The particles in amorphous substances are arranged in an orderly manner

121. Select the relationship between wave and particle nature of radiation?

(a) $E = \dfrac{hc}{\pi}$

(b) $E = \dfrac{h\pi}{c}$

(c) $E = \dfrac{\pi c}{h}$

(d) $E = h\pi c$

122. The d-Broglie wavelengths of a rifle bullet of mass 0.02kg which is moving at a speed of 300ms⁻¹ is (where h-6.63x10⁻³⁴ Js)

(a) 7.3×10^{-34}m

(b) 1.1×10^{34}m

(c) 1.8×10^{-35}m

(d) 9.9×10^{-34}m

123. The minimum frequency of incident light required to emit photoelectrons from the metal surface is called:

(a) Critical frequency

(b) Intermediate frequency

(c) Work Function

(d) Threshold frequency

124. The internal energy of a fixed mass of an ideal gas depends on:

(a) Pressure but not volume or temperature

(b) Temperature but not pressure or volume

(c) Volume but not pressure or temperature

(d) Pressure and temperature but not volume

125. The statement that heat cannot spontaneously flown from a colder to hotter body is a result of:

(a) Henry's Law

(b) The first law of thermodynamic

(c) The second law of thermodynamic

(d) the third law of thermodynamic.

126. The valid sec of units for a specific heat capacity is:

(a) Kg J⁻¹k

(b) Kg J⁻¹k⁻¹

(c) KgJk⁻¹

(d) Kg s⁻¹K¹

127. Which of the following is the same unit as the farad?

(a) Ωs

(b) Ωs⁻¹

(c) Ω⁻¹s

(d) Ω⁻¹ s⁻¹

128. In the direction indicated by an electric field line:

(a) The potential must increase

(b) The potential must decrease

(c) The electric field strength must increase

(d) The electric field strength must decrease.

129. The electric field between the plates of an isolated air spaced parallel plate capacitor is E. What is the field between the plates after immersing the capacitor in a liquid of relative permittivity 10?

(a) $\sqrt{10}E$

(b) $E/\sqrt{10}$

(c) 10E

(d) All of the above

130. A capacitor which has a capacitance of 1 Farad will:

(a) Fully charged in 1 second by a current of 1 ampere

(b) Store 1 Coulomb of charge at potential difference of 1 volt

(c) Gain 1 joule of energy when 1 coulomb of charge is stored on it

(d) Discharge in 1 second when connected across a resistor of resistance 3 ohm

131. The potential difference between a pair of similar. Parallel conducting plates is known. What additional information is needed in order to find the electric field strength between the plates?

(a) Separation of the plates

(b) Separation and dress of the plates

(c) Permittivity of the medium separation of the plates

(d) Permittivity of the medium separation and area of the plates.

132. A battery is marked 9.0V. What does it mean?

(a) Each coulomb of charge from the battery supplies 9.0J of electric energy to the whole circuit

(b) The battery supplies 9.0J to an external circuit for each coulomb of charge

(c) The potential difference across any component connected to the battery will be 9.0V

(d) There will always be 9.0V across the battery terminals

133. A wire of resistance 3.0 Ω is stretched to twice its original length. The resistance of new wire will be

(a) 1.5Ω   (b) 3.0Ω

(c) 6.0Ω   (d) 32.0Ω

134. A current of 20.0 a flows through a battery with an emf of 6.20 V. If the internal resistance of the battery is 0.01Ω, what is the terminal voltage?

(a) 6.40V   (b) 31.0V

(c) 1.24V   (d) 6.00V

Hints: Vt=E-IR

135. By how many times does doubling the diameter of a wire and making it 10 times longer increase is resistance?

(a) 2.5 times   (b) 5 times

(c) 10 times   (d) 30 times

136. A student connect a 6 volt battery and a 12 volt battery in series and then connects this combination across a 10Ω resistor. What is the current in the resistor?

(a) 0.8A   (b) 1.8A

(c) 0.9A   (d) 2.6A

137. Several resistors are connected in parallel the resistance of their equivalent resistors will:

(a) Increase   (b) Decrease

(c) Not change   (d) none of these

138.   The prefix "Pico" stands for:

(a) 10^6 (b) 10^9
(c) 10^{-12} (d) 10^{12}

139. During the experiment one measured the mass of Mosquito and found it 1.20×10^{-5}Kg. The numbers of significant figures in this case are:

(a) Five   (b) One
(c) Two   (d) Three

140. The vectors A and B are such that |A+B|=|A-B|. Then the angle between the two vectors is:

(a) 0°   (b) 90°
(c) 60°   (d) 180°

141. The forces having magnitude 3.5N and 5.5N are acting on a body, which one of the following cannot be the resultant of their possible sum?

(a) 1.5N   (b) 2.5N
(c) 4.5N   (d) 6.5N

142. The racing car accelerates uniformly through their gear changes with the following average speed:
$20ms^{-1}$ for 2.0s, $40ms^{-1}$ for 2.0s and $60ms^{-1}$ for 6.0. What is the overall average speed of the car?

(a) $12ms^{-1}$ (b) $13.3ms^{-1}$
(c) $48ms^{-1}$ (d) $40ms^{-1}$

143. A mass accelerates uniformly when the resultant force acting on it:
    (a) Is Zero
    (b) Is constant but not zero
    (c) Increases uniformly with respect to time
    (d) Is proportional to the displacement of the mass from a fixed point

144. A ball is dropped from the roof of a very tall building. What is its velocity after falling for 5.0s?
    (a) 1.96m/s   (b) 9.80m/s
    (c) 49.0m/s   (d) 98.0m/s

145. A projectile is launched at 45° to the horizontal with initial kinetic energy E. Assuming air resistance to be negligible, what will be the kinetic energy of the projectile when it reaches its highest point?

(a) 0.50E   (b) 0.71E
(c) 0.87E   (d) E
Hints: Initial K.E=E
K.E at highest point is $=\frac{1}{2}mv^2\cos^2\theta = (E)\cos^2 45°$, $E\times(0.7)^2=.49E=.50E$

146. At what angle should a projectile be fired in order for its range to be at maximum?
    (a) 30°   (b) 45°
    (c) 90°   (d) 60°

147. A shot is fired at an angle of 60° to the horizontal with kinetic energy E. If air resistance is ignored, the kinetic energy at the top of the trajectory is:
    (a) Zero   (b) E/8
    (c) E/4   (d) e/2

148. Which is a statement of the principle of conservation of momentum?

    (a) Momentum is the product of mass and velocity
    (b) Momentum is conserved only in elastic collisions
    (c) Momentum is conserved by all bodies in a collision
    (d) Momentum is conserved providing no external force act.

149. The gravitational field strength on the surface of the earth is g. The gravitational field strength on the surface of a planet of twice the radius and the same density is:

    (a) 4g   (b) 2g
    (c) g   (d) g/4

150. The displacement "x" of a particle at time "t" is given by x=10 sin 4t. The particle oscillates with period:

    (a) λ/10s   (b) λ/5s

    (c) λ/4s   (d) λ/2s

151. I a vibrating cord the point where the particles are stationary is called:

    (a) Crest   (b) Anti-Node
    (c) Node   (d) Trough

152. If a hole is bored through the centre of the earth and the pebble is dropped on it. Then it will:

    (a) Execute SHM   (b) Drop the other side
    (c) Step at the centre of the earth   (d) None of the above

153. A spring obeying Hook's law has an upstretched length of 50mm and a spring constant of 400Mm⁻¹. What is the tension in the spring when it's over all length is 70mm?

    (a) 8.0N   (b) 28N
    (c) 160N   (d) 400N

154. The period of a simple pendulum can be increase by:

(a) Decreasing the length of the pendulum
(b) Increasing the length of the pendulum
(c) Increasing the mass of the bob
(d) Decreasing the mass of the bob

155. The 3m long string resonates in 3 loops. The frequency of stationary wave having velocity of 30m/s mainly:

(a) 5H₂   (b) 30H₂
(b) 15H₂   (c) 10H₂

Hints: $f_3 = \frac{3v}{2l} = \frac{3x30}{2x3} = 15H_2$

156. In vacuum all electromagnetic waves have the same:

(a) Speed   (b) Energy
(c) Frequency   (d) Wavelength

157. The waves which do not require any medium for their propagation are called:

(a) Mechanical waves   (b) Sound Waved
(c) Tidal Waves   (d) Electromagnetic waves

158. What is the relationship between the intensity "I" and the amplitude "a" of a wave?

(a) I a = constant   (b) I a ²=constant
(c) I/a - = constant   (d) I/a² = constant

159. The sound wave and light waves cannot be both:

(a) Polarized   (b) Refracted
(c) Reflected   (d) Diffracted

160. Which of the following physical phenomena cannot be described only by the wave theory of the electromagnetic radiation?

(a) Diffraction   (b) Interference
(c) Photoelectric Effect   (d) Polarization

161. Using monochromatic light interference fringes are produced on a screen placed at a distance D from a pair of slits of separation a, the separation of fringes is x, both a &D are now doubled. What is the new fringe separation?

(a) 2x   (b) x

(c) 3x   (d) 4x

162. Which is the correct statement?

(a) The average kinetic energy of molecules depend s on the volume on which the gas is enclosed

(b) The average kinetic energy of the molecules in the gaseous state is proportional to the pressure

(c) The average kinetic energy of the molecules in the gaseous state is proportional to the temperature

(d) All of the above

163. Which thermodynamic temperature is equivalent to 501.85°C?

(a) 775.00K   (b) 774.85K

(c) 228.85K   (d) 228.70K