OPEN MERIT (JSTS) SCHOLARSHIP EXAM, 2009 - 2010
(GENERAL SCIENCE AND MATHEMATICS)

1. The acceleration due to gravity at Moon's surface is :
   (1) $\frac{1}{4}$th the value of 'g' on earth
   (2) $\frac{1}{8}$th the value of 'g' on earth
   (3) $\frac{1}{6}$th the value of 'g' on earth
   (4) $\frac{1}{16}$th the value of 'g' on earth

2. A stone tied with a thread whirled in a horizontal circle with angular speed π-rad/s. Suddenly the thread breaks, the stone will :
   (1) Fly away in upward direction
   (2) Fly away in downward direction
   (3) Fly away towards South
   (4) Fly away along the tangent at that point

3. A person of weight 100 N stands on a weighing machine in an elevator. Suddenly, cable of elevator breaks and it falls freely. The weight of the man shown by the weighing machine will be :
   (1) 100 Kg. wt.
   (2) 9800 Kg. wt.
   (3) Zero
   (4) 9.8 Kg. wt.

4. 'Atom Bomb' works on the phenomenon of :
   (1) Nuclear fusion
   (2) Nuclear fission
   (3) Linear momentum
   (4) Friction

5. Twinkling of stars can be explained with the phenomenon of :
   (1) Refraction of light
   (2) Reflection of light
   (3) Dispersion of light
   (D) Scattering of light

6. The conductivity of Semi conductors, with rise in temperature will :
   (1) decrease
   (2) increase
   (3) remain the same
   (4) None of the above

7. A body moving in a horizontal circle with constant angular speed, which physical quantity remains constant :
   (1) Velocity
   (2) Centrifugal force
   (3) Kinetic energy
   (4) Acceleration

8. Bats can detect the sound waves of :
   (1) Audible frequency
   (2) Ultrasonic frequency
   (3) Infrasonic frequency
   (4) None of the above

9. 100g of hot water at 90°C is mixed to 400g of cold water at 10°C, the equilibrium temperature of the mixture is :
   (1) 26°C
   (2) 45°C
   (3) 60°C
   (4) 50°C

10. The direction force acting on a charged particle moving in a uniform magnetic field is given by :
    (1) Fleming's right hand rule
    (2) Lorenz's rule
    (3) Newton's law
    (4) Kepler's law

11. A ball of mass of 1 Kg. is dropped from a height of 10 m. it loses 50% of its velocity when it strikes the ground, the height gained by the ball after strike will be :
    (1) 2.5 m
    (2) 4 m
    (3) 3 m
    (4) 1.25 m

12. Mechanical Equivalent of heat equals to :
(1) 4.18 J/cal
(2) 6.67×10^{-11} J/kg
(3) 9×10^{9} J/C^2
(4) 100 J/Kcal

13. Two satellites of masses 3 m and m revolves round the earth in their respective circular orbits of radii r and 3 r the ratio of their orbital speed is :
(1) 3 : 1
(2) 6 : 1
(3) 9 : 1
(4) $\sqrt{3}$:1

14. A car covers distance x_1 with velocity v_1 and x_2 with velocity v_2 between two cities A and B its average velocity will be :
(1) $\frac{v_1 + v_2}{2}$
(2) $\frac{v_2 - v_1}{2}$
(3) $\frac{(x_1 + x_2) v_1 v_2}{x_1 v_2 + x_2 v_1}$
(4) $\frac{x_1 v_2 + x_2 v_1}{(x_1 + x_2) v_1 v_2}$

15. The unit of coefficient of friction is :
(1) Newton
(2) Kg. wt.
(3) Pascal
(4) No unit

16. Rocket propulsion is based on the principle of :
(1) Conservation of linear momentum
(2) Conservation of force
(3) Conservation of angular momentum
(4) None of the above

17. 1 torr equals to :
(1) 76 cm of Hg column
(2) 96 mm of Hg column
(2) 1 mm of Hg column
(4) 106 mm of Hg column

18. If v-t graph of a body is parallel to time axis, then body :
(1) will be at rest
(2) will move with constant speed
(3) will move with uniform acceleration
(4) None of the above

19. When a bomb explodes in air and breaks into 2 pieces its :
(1) Linear momentum decreases
(2) K.E. increases
(3) No change in kinetic energy and potential energy
(4) Kinetic energy decreases

20. A constant force acts on a body of mass 10 Kg for 5s. It covers a distance 100 m due to this force. If the body was initially at rest then force acting on the body is :
(1) 40 N
(2) 800 N
(3) 80 N
(4) 50 N

21. 'Local Action' is the defect of :
(1) Daniel cell
(2) Dry cell
(3) Laclanchi cell
(4) Voltaic cell

22. 'Echo' is an example of :
(1) Refraction of sound
(2) Reflection of sound
(3) Reflection of light
(4) Interference of light

23. To obtain a real, inverted and equal size image of an object from a convex lens of focal length 10 cm, the object should be placed at :
(1) 15 cm
(2) 10 cm
(3) 25 cm
(4) 20 cm

24. The order of wavelength of visible light is :
(1) 6×10^{-9} m (2) 3×10^{8} m
(3) 6×10^{-7} m (4) 5×10^{-10} m

25. 'Mirage' in deserts is the phenomenon of :
(1) Dispersion of light (2) Diffraction of light
(3) Total internal reflection of light (4) Polarisation of light

26. Which of the following material is used to make Standard resistances :
(1) Alloy (2) Insulators
(3) Conductors (4) Semi conductors

27. Time periods of two planets round the Sun are in the ratio 1 : 8 then their radii will be in the ratio :
(1) 1 : 2 (2) 1 : 4
(3) 1 : 64 (4) None of the above

28. 'Green House Effect' is due to :
(1) Trapping of Nitrogen (2) Trapping of Infrared radiation
(3) Radio activity (4) Trapping of ultra violet radiation

29. Which temperature is equal on both the scales i.e. on Celsius and Fahrenheit :
(1) 4°C (2) 40°C
(3) –40°C (4) 100°C

30. When soft iron core is inserted inside a current carrying solenoid, the magnetic field of the solenoid :
(1) Decreases (2) Increases
(3) Remains the same (4) None of the above

31. In an astronomical telescope :
(1) Both lenses are of same focal length
(2) Eyepiece is of larger focal length and objective is of smaller focal length
(3) Objective is of larger focal length and Eyepiece is of smaller focal length
(4) None of the above

32. A constant force of 20 N is applied on a body to rotate it on a circular path of radius 2 m. The work done by the body after completion of one rotation is :
(1) 80 π J (2) 80 J
(3) 40 J (4) Zero

33. A body of mass 10 Kg moves with velocity 10 m/s along x-direction. It strikes a wall and rebounds back with velocity 5 m/s. If the body remains in contact with wall for 5 s then the impulse acting on the body is :
(1) –300 Ns (2) 100 Ns
(3) –150 Ns (4) 300 Ns

34. The area of cross section of a wire of resistance R ohm is increased thrice, its new resistance will be :
(1) 2 R (2) R/6
(3) R/3 (4) R/9

35. When current is drawn from a cell, then terminal Potential difference of the cell is :
(1) less than emf of the cell (2) more than emf of the cell
(3) equal to the emf of the cell (4) None of the above

36. The optical instrument used to view and study the spectrum of light is :
(1) Barometer (2) Telescope
(3) Spectrometer (4) Microscope

37. The angular speed of the hour's hand of a clock is :
(1) $\pi/4$ rad./hour (2) $\pi/6$ rad./hour
(3) 2π rad./hour (4) $\pi/3$ rad./hour

38. The acceleration due to gravity on a planet, whose mass is twice and radius is half that of the earth, is :
(1) 8 times the value of 'g' on earth (2) 2 times the value of 'g' on earth
(3) 3 times the value of 'g' on earth (4) 4 times the value of 'g' on earth

39. If the kinetic energy of a body is increased by 300% then its linear momentum will be increased by :
(1) 150% (2) 75%
(3) 100% (4) 200%

40. If a body floats with quarter of its volume above the water surface then its density will be (density of water is 10^3 Kg/m^3) :
(1) 10^4 Kg/m^3 (2) 750 Kg/m^3
(3) 250 Kg/m^3 (4) 150 Kg/m^3

41. Radio telescope is a device to receive :
(1) Sound waves (2) Radiowaves
(3) Sunrays (4) None of the above

42. If the length of a simple pendulum is increased by 3% then the change in its time period will be :
(1) 3% (2) 1.5%
(3) 4% (4) 9%

43. North Pole of a bar magnet is approaching towards a horizontal metallic loop, the acceleration of the magnet :
(1) increases (2) Equals to 'g'
(3) Decreases (4) None of the above

44. 1 parsec is equal to :
(1) 3.08×10^{16}m (2) 1.49×10^{11}m
(3) 9.46×10^{15}m (4) 3×10^4m

45. Isotones are the :
(1) Atoms of the element with different atomic weights but same atomic number
(2) nuclides which contains same number of neutrons
(3) Atoms of different elements which have the same atomic weight, but different atomic number
(4) None of the above

46. Which of the following materials has least critical angle :
(1) Diamond (2) Water
(3) Crown Glass (4) Dense flint Glass

47. Joule/kilogram is the unit of :
(1) Specific heat (2) Heat
(3) Coefficient of linear expansion (4) Latent heat

48. The potential energy stored in a stretched spring is :
(1) ½ kx^2 (2) mgh
(3) $E = mc^2$ (4) ½ mv^2

49. The acceleration due to gravity :
(1) Increases with altitude
(2) Decreases with altitude
(3) Remains the same as on the earth
(4) Sometimes increases sometimes decreases

50. The velocity of sound is independent of :
(1) Temperature of a gas (2) Pressure of a gas
(3) Volume of gas (4) Density of a gas

51. The linear molecule among the following is
(1) CO_2 (2) SO_2
(3) NO_2 (4) H_2O

52. The types of bonds present in $CuSO_4 \cdot 5H_2O$ are
(1) Electrovalent and covalent
(2) Electrovalent and coordinate covalent
(3) Electrovalent, covalent and coordinate covalent
(4) Coordinate covalent and covalent

53. An atom of Iron (Fe), atomic No. 26 and atomic mass 56 contain in its nucleus
(1) 56 Protons (2) 56 Neutrons
(3) 26 Neutrons (4) 26 Protons + 30 Neutrons

54. The number of electrons shared in the outermost shell of Nitrogen atom is
(1) 2 (2) 3
(3) 4 (4) 5

55. The correct formula of bleaching powder is
(1) $CaOCl_2$ (2) $Ca(OCl)_2$
(3) $Ca(OH)_2Cl_2$ (4) $CaCl_2$

56. Δ H combustion (enthalpy of combustion) of a compound is
(1) Positive (2) Negative
(3) Zero (4) May be positive or negative

57. When pressure is applied on equilibrium system ice $\rightleftharpoons$ water which of the following phenomenon will happen
(1) More ice will be formed
(2) Water will evaporate
(3) More water will be formed due to melting of ice
(4) Equilibrium will not be disturbed

58. An aqueous solution whose pH is zero is
(1) Acidic (2) Basic
(3) Neutral (4) Amphoteric

59. Symbol of Metal Lead is
(1) La (2) Sn
(3) Pb (4) Ag

60. During electrolysis oxidation takes place at
(1) Anode (2) Cathode
(3) Both at anode and cathode (4) The surface of electrolyte solution

61. The most durable metal plating on iron to protect against rusting is
(1) Nickel plating (2) Copper plating
(3) Tin plating (4) Zinc plating

62. Electron was discovered by
(1) Henry Bacqueral (2) Rutherford
(3) J. J. Thomson (4) Madame Curie

63. In a nuclear reactor, speed of neutron is slowed by
(1) Water (2) Heavy water
(3) Zinc rod (4) Molten NaOH

64. The most radioactive isotope of Uranium is
(1) $^{235}_{92}U$ (2) $^{236}_{92}U$
(3) $^{237}_{92}U$ (4) $^{238}_{92}U$

65. The lightest metal in the periodic table is
(1) Sodium (2) Mercury
(3) Calcium (4) Lithium

66. In the long form of periodic table, all non-metals are placed in
(1) s-block (2) p-block
(3) d-block (4) f-block

67. Number of elements in the fifth period of periodic table are
(1) 8 (2) 10
(3) 18 (3) 32

68. Wire of flash bulb is made of
(1) Magnesium (2) Copper
(3) Barium (4) Silver

69. The best conductor of electricity, metal is
(1) Aluminum (2) Copper
(3) Barium (4) Silver

70. An aqueous solution of Potash Alum $K_2SO_4 \cdot Al_2\ (SO_4)_3 \cdot 24H_2O$ is
(1) Acidic
(2) Basic
(3) Neutral
(4) First acidic then slowly changes to alkaline

71. Orthoboric acid used as mild antiseptic for eyes is
(1) H_3BO_2 (2) $H_2B_4O_7$
(3) $B(OH)_3$ (4) $Na_2B_4O_7$

72. Galena is an ore of
(1) Galium (2) Lead
(3) Tin (4) Germanium

73. Watergas is an important fuel. It is a mixture of
(1) $H_2O + air$ (2) $CO + H_2$
(3) $CO + CO_2$ (4) $H_2 + CO_2$

74. Chemically soft glass is
(1) $Na_2SiO_3 \cdot CaSiO_3 \cdot SiO_2$ (2) $NiSiO_3 \cdot PbSiO_3 \cdot SiO_2$
(3) $Al_2(SiO_3)_3 \cdot K_2SiO_3 \cdot SiO_2$ (4) $ZnSiO_3 \cdot CaCO_3 \cdot SiO_2$

75. Solar cells contain
(1) Caesium (2) Silicon
(3) Tin (4) Titanium

76. Ammonia can by dried by passing over
(1) Conc. H_2SO_4 (2) P_4O_{10}
(3) CaO (4) Anhydrous $CaCl_2$

77. The acid used in lead storage cell is
(1) Phosphoric acid (2) Nitric acid
(3) Sulphuric acid (4) Hydrochloric acid

78. The element among the following exist in liquid state is
(1) F_2 (2) Cl_2
(3) Br_2 (4) I_2

79. The element which liberates O_2 from water is
(1) Phosphorus (2) Nitrogen
(3) Fluorine (4) Iodine

80. Sea divers go deep in the sea water with a mixture of
(1) O_2 and He (2) O_2 and Ar
(3) O_2 and CO_2 (4) CO_2 and Ar

81. Water is permanently hard when it contains
(1) Bicarbonates of Calcium and Magnesium
(2) Chloride and sulphate of Magnesium and Calcium
(3) Bicarbonate of Sodium and Potassium
(4) Chloride and phosphate of Sodium and Potassium

82. Hydrogen combine with other elements by
(1) losing an electron and remain positive in the compound
(2) gain an electron and remain as negative in the compound
(3) sharing of electron and remain as covalent
(4) loosing, gaining and sharing of electrons

83. The alum used for purifying water is
(1) Ferric alum (2) Chrome alum
(3) Potash alum (4) Aluminum alum

84. The most abundant element in the earth crust (by mass) is
(1) Silicon (2) Aluminum
(3) Oxygen (4) Iron

85. Bell metal is an alloy of
(1) Copper, Zinc and Tin (2) Copper, Zinc and Nickel
(3) Copper and Zinc (4) Copper and Tin

86. Parker's process is used in the extraction of
(1) Iron (2) Zinc
(3) Silver (4) Sodium

87. The term "fools gold" is used for a mineral which shines like gold. It is
(1) Iron pyrites (2) Copper pyrites
(3) Cinnabar (4) Cadmium sulphide

88. 18 carat gold contains
(1) 18% gold (2) 24% gold
(3) 75% gold (4) 60% gold

89. The following reaction :
$CH_4 + Cl_2 \longrightarrow CH_3Cl + HCl$ is known
(1) Substitution (2) Addition
(3) Hydrolysis (4) Decomposition

90. The following reaction is an example of
$H_2C = CH_2 + Br_2 \longrightarrow Br - CH_2 - CH_2 - Br$
(1) Substitution (2) Addition
(3) Hydrolysis (4) Decomposition

91. The following reaction is an example of
$H_2C = CH_2 + HOH \xrightarrow{H_2SO_4} CH_3CH_2OH$
(1) Substitution (2) Decomposition
(3) Hydrolysis (4) Oxidation

92. A salt releases CO_2 with H_2SO_4, salt may contain
(1) Chloride (2) Sulphate ion
(3) Nitrate ion (4) Carbonate ion

93. Formula of Epsom salt is
(1) $Na_2SO_4 \cdot 10H_2O$ (2) $CuSO_4 \cdot 5H_2O$
(3) $MgSO_4 \cdot 7H_2O$ (4) $FeSO_4 \cdot 7H_2O$

94. Carbon monoxide CO is
(1) Acidic oxide (2) Alkaline oxide
(3) Amphoteric oxide (4) Neutral oxide

95. Aspirin is
(1) Analgesics (2) Antiseptic
(3) Disinfectant (4) Tranquilizer

96. Carbohydrate present in cane sugar juice is
(1) Maltose (2) Glucose
(3) Sucrose (4) Fructose

97. Milk of Magnesia used to neutralize acidity in stomach is an
(1) Antibiotic (2) Antacid
(3) Analgesic (4) Anasthetic

98. Haemoglobin, used to transport O_2, in blood by
(1) Iron (2) Magnesium
(3) Cobalt (4) Nickel

99. Which of the following ore cannot be concentrated by electromagnetic separation
(1) Chromite (2) Magnetite
(3) Pyrolusite (4) Cuprite

100. When a radioactive substance emit β-particle
(1) Its atomic mass increases by one unit and atomic number remain same
(2) Its atomic number increases by one unit and atomic mass remain unchanged
(3) Its mass decreases by 2 units
(4) Its atomic number decreases by 2 units and mass by 4 units

101. When a plant cell is placed in a hypertonic solution it undergoes
(1) No change (2) Deplasmolysis
(3) Plasmolysis (4) Replasmolysis

102. Which of the cell organelles is involved in membrane biogenesis
(1) Ribosomes (2) Golgi body
(3) Endoplsamic reticulum (4) Peroxisomes

103. Amoeba takes the food by the process of
(1) Diffusion (2) Exocytosis
(3) Osmosis (4) Endocytosis

104. The structural and functional unit of striated muscle fiber is
(1) Sarcomere (2) Sarcoplasm
(3) Sarcolemma (4) Myofibril

105. The longitudinal canals of b one are called
(1) Marrow Cavity (2) Volkmann's Canal
(3) Eustachian Canal (4) Haversian Canal

106. The white fibres are chemical formed of
(1) Myosin (2) Collagen
(3) Elastin (4) Actin

107. Who stated 'Omnis cellula e Cellula' :
(1) Robert Hooke (2) Robert Brown
(3) Rudolf Virchow (4) Purkinje

108. Which of the following is a unicellular green alga
(1) Spirogyra (2) Cycas
(3) Fern (4) Chlamydomqnas

109. Which type of food is stored in fungi
(1) Starch (2) Maltose
(3) Protein (4) Glycogen

110. Maize is a
(1) Dicot angiospermic plant (2) Pteridophyte
(3) Monocot angiospermic plant (4) Gymnosperm

111. Which of the following is a diploblsatic animal
(1) Hydra (2) Ascaris
(3) Leech (4) Fasicola

112. Water vascular system and tube feet for locomotion are found in
(1) Poriferans (2) Arthropods
(3) Nematodes (4) Echinodermates

113. A nematode causing elephantiasis in man is
(1) Schistosoma (2) Ancylostoma
(3) Ascaris (4) Wuchereria

114. Which one of the following is not an infectious disease?
(1) AIDS (2) Typhoid
(3) Arthritis (4) Malaria

115. B.C.G. is used against
(1) Typhoid (2) Tuberculosis
(3) Rabies (4) Hepatitis

116. One of the following is called Triple Antigen
(1) DPT (2) Australian Antigen
(3) BCG (4) TAB

117. Eitology is
(1) Presentation of diseases (2) Cause of disease
(3) Transmission of diseases (4) Treatment of disease

118. An inoculation which induces the development of immunity is called
(1) Antibody (2) Serum
(3) Antigen (4) Vaccine

119. Ammonification in the nitrogen cycle is brought about by the activity of
(1) Nitrobacter (2) Rizobium
(3) Pseudomonas (4) Nitrosomonas

120. Which amongst the following is a fungicide?
(1) 2-4-D (2) Bordeaux mixture
(3) DDT (4) BHC

121. The Pesticides need to be replaced, because these
(1) are very costly (2) are mostly toxic and non-biodegradable
(3) can't be stored for a long time (4) cause abnormalities in the target population

122. Storage grains produced aflatoxin due to growth of
(1) Yeast (2) Aspergillus
(3) Mould (4) Virus

123. Which one of the following is the indigenous breed of chickens?
(1) L mouth rock (2) Aseel
(3) White leghom (4) Rhods Island Red

124. Rearing and breeding of fish in ponds, tanks and artificial reservoirs is called
(1) Aquaculture (2) Pisciculture
(3) Fishing (4) Apiculture

125. Percentage of Protein in fish meal is
(1) 15 – 20% (2) 40 – 50%
(3) 25 – 50% (4) 55 – 70%

126. Males of honey bee colony are called
(1) Drones (2) Solidiers
(3) Workers (4) Queen

127. Haemophilia is a
(1) Chronic disease (2) Acute disease
(3) Congential disease (4) Deficiency disease

128. Organism like lichens are very sensitive to the levels of
(1) CO_2 (2) CO
(3) SO_2 (4) CH_4

129. Which of the following is non-Pathogenic Bacteria of Colon
(1) Escherichia Coli (2) Entamoeba Coli
(3) Balantidium Coli (4) Enterobius Vermicularis

130. Wooden doors swell up and get stuck during the rainy season. This is due to the phenomenon of
(1) Imbibition (2) Capillary
(3) Endosmosis (4) Deplasmolysis

131. Penicillin does not allow the growth of bacterium staphylococcus. This sort of relationship is called
(1) Antagonism (2) Common salism
(3) Mutualism (4) Ammensalism

132. Lac is a
(1) Plant product (2) Mineral Product
(3) Insect Product (4) Synthetic Product

133. Cell inclusions are
(1) Another name of cell organell
(2) Cytoskeletal framework of cell
(3) Non-living material present in cytoplasm
(4) Combined name for cell wall and cell membrane

134. Which of the following is not a method of A sexual reproduction?
(1) Sporulation (2) Fragmentation
(3) Conjugation (4) Fission

135. Cell recognition and adhesion is facilitated by certain components of cell membrane. These components are generally
(1) Protein and lipid (2) Lipid only
(3) Glycoprotin and Glycolipid (4) Protein only

136. Parallel venation is a characteristic of
(1) Leguminous plants (2) Parasitic plants
(3) Grasses (4) Xerophytic

137. Age of a tree is calculated by its:
(1) Height (2) Number of branches
(3) Girth (4) Number of annual rings

138. Ripening of banana is accompanied with sudden rise in
(1) Auxin (2) Cytokinins
(3) Gibberelins (4) Ethylene

139. Water rises in stem due to
(1) Cohesion and transpiration pull (2) Osmotic pressure
(3) Turgor pressure (4) None of the above

140. Mesophyll cells in a leaf are
(1) Parenchymatous (2) Schlerenchymatouos
(3) Collienchymalous (4) Meristematic

141. Which one of the following can cause a disease in human beings?
(1) Rhizopus (2) Puccinia
(3) Aspergillus (4) Cystopus

142. Multiples alleles control the inheritance of
(1) Skin colours (2) Intelligence
(3) Blood groups (4) All of the above

143. Artificial pearls are grown from
(1) Shrimps (2) Lobsters
(3) Prawn (4) Oysters

144. Plants producing quinine used in the treatment of malaria
(1) Cinchona (2) Bay
(3) Pyrethrum (4) Mahogany

145. Whose living cells provide tensile and mechanical strength?
(1) Collenchyma (2) Phloem
(3) Sclerenchyma (4) Sclerelds

146. Choanocyles are unique to
(1) Protozoa (2) Mollusca
(3) Porifera (4) Echinodermata

147. In Whittaker's classification, unicellular organism are grouped under
(1) Protista (2) Porifera
(3) Fungi (4) Protozoa

148. Organic Farming does not include
(1) Green Manure (2) Crop rotation
(3) Chemical Fertilizers (4) Compost and Farmyard manure

149. A plant breeder wants to develop a disease resistant variety, what he should do first?
(1) Mutation (2) Hybridization
(3) Selection (4) Production of crop

150. Raymond Lindman (1942) used the term trophic level. Trophic levels are formed by:
(1) Animals only (2) Organisms linked in food chains
(3) Plants only (4) Top consumer in food chain

151. The decimal expansion of $\frac{17}{3125}$ will be :
(1) Terminating (2) Non-terminating
(3) Non-terminating repeating (4) None of the above

152. If $x + x^{-1} = 4$, then the value of $x^{-3} + x^3$ will be :
(1) 64 (2) 52
(3) 32 (4) 12

153. If $x = \frac{1}{2-\sqrt{3}}$, then the value of $x^2 - 4x - \sqrt{3}$ will be :

(1) $1-\sqrt{3}$ (2) $-2+\sqrt{3}$

(3) $-1-\sqrt{3}$ (4) $2+\sqrt{3}$

154. Simplifying $\frac{2^n + 2^{n-1}}{2^{n+1} - 2^n}$ we get :

(1) $\frac{1}{2}$ (2) $\frac{3}{2}$

(3) $\frac{1}{2}\left(2^n - 1\right)$ (4) $\frac{3}{2}\left(2^n + 1\right)$

155. If both x – 2 and $x - \frac{1}{2}$ are the factors of $px^3 + 5x + r$ then :

(1) p = r (2) p > r

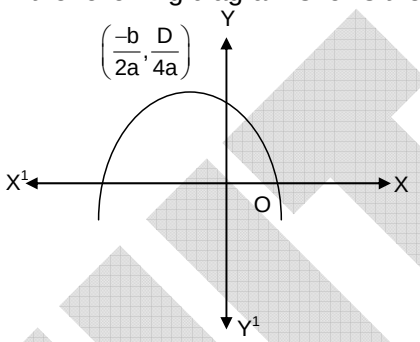
(3) P < r (4) None of these

156. If $f(x) = ax^2 + bx + c$ has no real zeros and a + b + c < 0 then :

(1) c = 0 (2) c > 0

(3) c < 0 (4) None of these

157. In the following diagram shows the graph of polynomial $f(x) = ax^2 + bx + c$:



(1) a < 0, b < 0 and c > 0 (2) a < 0, b < 0 and c < 0

(3) a < 0, b > 0 and c > 0 (4) a < 0, b > 0 and c < 0

158. If $am \neq bl$, then system of equations :

ax + by = c

lx + my = n

(1) has infinitely many solutions (2) has no solution

(3) has a unique solution (4) may or may not have a solution

159. If a and b can take values, 1, 2, 3, 4, then the number of equations of the form $ax^2 + bx + 1 = 0$ having real roots is :

(1) 12 (2) 10

(3) 7 (4) 6

160. The first and last term of an A.P. are a and l respectively. If S is sum of all terms of AP and common difference is given by $\frac{l^2 - a^2}{k - (l + a)}$ then k will be equal to :

(1) S (2) 2 S

(3) 3 S (4) None of the above

161. The value of tan 1° tan 2° tan 3° ……. tan 89° is :
(1) 1 (2) –1
(3) 0 (4) None of the above

162. $\frac{1+\tan^2\theta}{1+\cot^2\theta}$ is equal to :
(1) $\sec^2\theta$ (2) –1
(3) $\cot^2\theta$ (4) $\tan^2\theta$

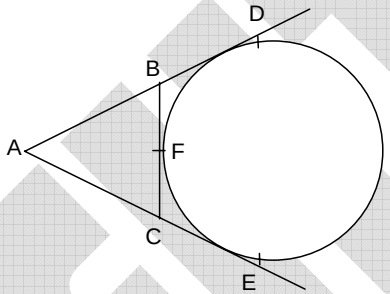
163. The ratio of length of a pole and its shadow is $1:\sqrt{3}$. The angle of elevation of Sun is :
(1) 90° (2) 60°
(3) 45° (4) 30°

164. The distance between the points ($\cos\theta$, $\sin\theta$) and ($\sin\theta$, $-\cos\theta$) is :
(1) $\sqrt{3}$ (2) $\sqrt{2}$
(3) 2 (4) 1

165. A triangular region is formed in first quadrant by the line y = 2, x = 6 and y = x. The area of this triangular region is :
(1) 4 sq. units (2) 6 sq. units
(3) 8 sq. units (4) 18 sq. units

166. If D, E, F are the mid points of sides BC, CA and AB respectively of ΔABC, then, ratio of areas of triangle DEF and ABC is :
(1) 1 : 4 (2) 1 : 2
(3) 2 : 3 (4) 4 : 5

167. In the fig, if AD, AE and BC are tangents to the circle at D, E and F respectively, then :

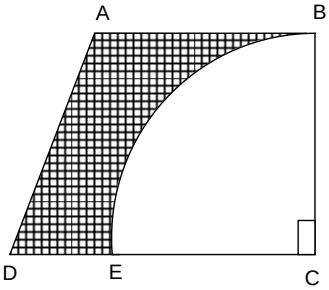


(1) AD = AB + BC + CA (2) 2 AD = AB + BC + CA
(3) 3 AD = AB + BC + CA (4) None of the above

168. A solid is hemispherical at the bottom and conical above. If surface area of two parts are equal, then the ratio of its radius and the slant height of its conical part is :
(1) 1 : 3 (2) $\sqrt{3}$:
(3) $1:\sqrt{3}$ (4) 1 : 1

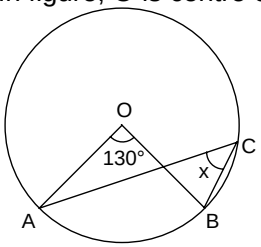
169. A number is selected from numbers 1 to 27. The probability that it is prime is :
(1) $\frac{5}{6}$ (2) $\frac{1}{6}$
(3) $\frac{2}{3}$ (4) $\frac{1}{3}$

170. In given figure, AB = BC = 7 cm and DE = 2 cm, then shaded area is :



(1) 22.5 cm^2
(2) 38.5 cm^2
(3) 17.5 cm^2
(4) None of these

171. In figure, O is centre of circle, value of x is :

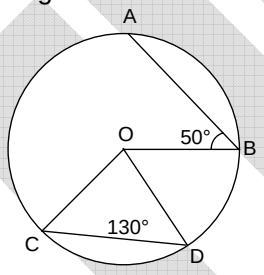


(1) 43°
(2) 65°
(3) 108°
(4) 115°

172. AD is a median of ΔABC and DE is median of ΔABD. If area of (ΔABC) = 80 cm^2, then area ACDE will be :
(1) 66.3 cm^2
(2) 60 cm^2
(3) 40 cm^2
(4) None of the above

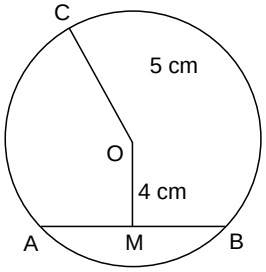
173. If $29^x = 1$, then x will be :
(1) Non negative integer
(2) 0
(3) Not defined
(4) None of the above

174. If figure AB = CD and $\angle ABO = 50°$ then $\angle COD$ is :



(1) 50°
(2) 60°
(3) 75°
(4) 80°

175. In figure, OM $\perp$ AB, O is centre, then AB is :



(1) 5 cm
(2) 6 cm
(3) 9 cm
(4) 10 cm