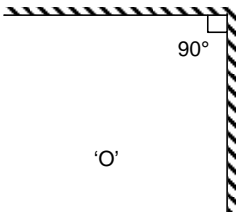


**OPEN MERIT (JSTS) SCHOLARSHIP EXAM, 2011- 2012
(GENERAL SCIENCE AND MATHEMATICS)**

1. S.I. unit of pressure is
(1) atmosphere (2) bar
(3) torr (4) pascal
2. Which of the following is not the basic unit of measurement?
(1) radian (2) Kelvin
(3) mole (4) candela
3. One degree (1°) is equal to
(1) $\frac{\pi}{360}$ rad (2) $\frac{\pi}{180}$ rad
(3) $\frac{\pi}{90}$ rad (4) $\frac{\pi}{60}$ rad
4. 'Ohm' is not the unit of which of the following quantities?
(1) Reluctance (2) Reactance
(3) Resistance (4) Impedance
5. Which among the following is the smallest unit of length?
(1) Angstrom (2) Fermi
(3) Micron (4) Nanometer
6. Two bodies A and B of masses $2m$ and m are released simultaneously from heights h_1 and h_2 respectively. The ratio of time taken by the two bodies to reach the ground is
(1) $\sqrt{\frac{h_1}{h_2}}$ (2) $\frac{h_1}{h_2}$
(3) $\frac{h_1}{2h_2}$ (4) $\frac{2h_1}{h_2}$
7. What drives a nail into wood when struck by a hammer?
(1) Force (2) Impulse
(3) Momentum (4) Acceleration
8. Impulse is
(I) The total effect of force
(II) the product of average force and the time for which the force acts.
(III) Equal to the total change in momentum which combination is false?
(1) (I) only (2) (II) only
(3) (III) only (4) None of there
9. Name the device which converts electrical energy into mechanical energy:
(1) Alternator (2) Transformer
(3) Dynamo (4) Motor
10. The numerical ratio of displacement to distance is
(1) always less than one (2) always more than one
(3) always equal to one (4) equal to or less than one
11. A stone is dropped from a bridge reaches the bottom in 4 sec. The height of the bridge is
(1) 78.4 m (2) 64 m
(3) 20 m (4) 260 m

12. A force of 5 N acts on a body of weight 9.8 N. The acceleration produced is
 (1) 40 ms^{-2} (2) 5 ms^{-2}
 (3) 1.46 ms^{-2} (4) 0.51 ms^{-2}
13. The kinetic energy of a body increases by 300%. The linear momentum of the body increases by
 (1) 300% (2) 150%
 (3) 100% (4) 50%
14. The inertial and gravitational mass of a body are
 (1) unequal (2) exactly equal
 (3) energy (4) density
15. A 4°C given mass of water has maximum
 (1) heat (2) volume
 (3) energy (4) density
16. The audible frequency range is
 (1) 20 Hz to 2000 Hz (2) 10 Hz to 20 Hz
 (3) 20 Hz to 20,000 Hz (4) 20 Hz to 100 Hz
17. A cube of ice floats in a beaker of water when the ice melts, the level of water in beaker
 (1) falls (2) rises
 (3) remains the same (4) may rises or fall
18. Clouds floats in the atmosphere on account of their
 (1) low temperature (2) low viscosity
 (3) low density (4) low pressure
19. A printed page is seen through a glass slab place on it. The printed words appear raised. This is due to
 (1) refraction of the upper surface of the slabs.
 (2) refraction of the lower surface of the slab.
 (3) partial reflection of the upper surface of the slab.
 (4) partial reflection of the lower surface of the slab.
20. Two mirrors are placed at right angles to each other as shown in the figure. The total number of images of an object 'O' placed between them, that are seen are:
 (1) Two
 (2) Three
 (3) Four
 (4) Six
- 
21. Lunar eclipse occurs when earth comes in between sun and moon. Solar eclipse occurs when moon comes in between sun and earth. This suggests that
 (1) both eclipses occur on a new moon day.
 (2) solar eclipses occurs on a new moon day.
 (3) Lunar eclipse occurs on a new moon day.
 (4) both eclipses occurs on a full moon day.
22. A ball of mass 1 kg is dropped from a height of 10 m it losses 50% of its velocity when it strike 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

23. A car covers distance S_1 with velocity V_1 and distance S_2 with velocity V_2 between two cities P and Q, its average velocity will be

(1) $\frac{V_1 + V_2}{2}$

(2) $\frac{V_1 - V_2}{2}$

(3) $\frac{(S_1 + S_2)V_1V_2}{S_1V_2 + S_2V_1}$

(4) $\frac{S_1 + V_2 + V_2V_1}{(S_1 + S_2) + V_1V_2}$

24. Pascal's law related to

(1) atmospheric pressure

(2) Fluid pressure

(3) Viscous flow

(4) Stream line flow

25. The particles which actually move in a current carrying conductor are

(1) protons in a direction opposite to that of current.

(2) protons in a direction which is same as that of current.

(3) electrons in the direction opposite to that of current

(4) electrons in the direction of the current.

26. A technician has 10 resistors, each of resistance 0.1Ω . The largest and smallest resistance that he can obtain by combing thee resistors are:

(1) 10Ω and 1Ω respectively

(2) 1Ω and 1Ω respectively

(3) 1Ω and 0.01Ω respectively

(4) 0.1Ω and 0.01Ω respectively

27. The Neutron was discovered by

(1) Rutherford

(2) Chadwick

(3) Neils Bohr

(4) Summerfield

28. Ocean wave striking the shore were found to move with a speed of 10 m/s. If the time interval between two consecutive waves be 5 secs. Their wave length will be

(1) 100 m

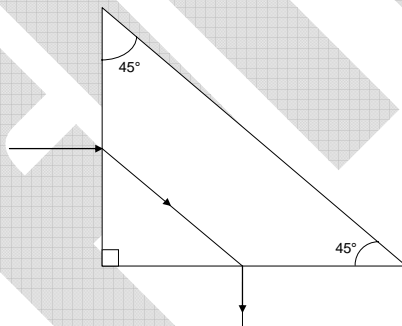
(2) 50 m

(3) 2 m

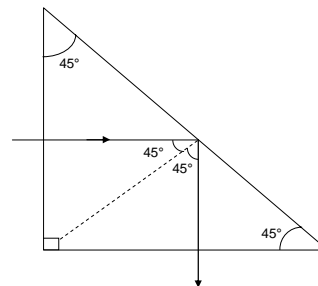
(4) 0.5 m

29. Which one of the following figures represents correct path of a ray of light through a glass prism:

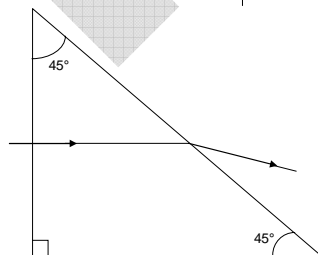
(1)



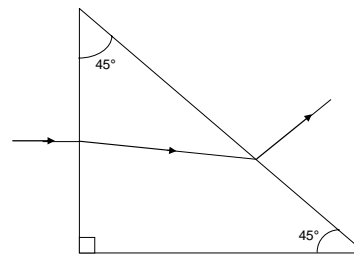
(2)



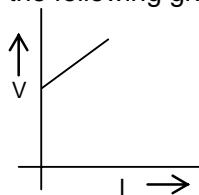
(3)



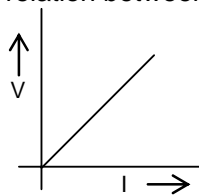
(4)



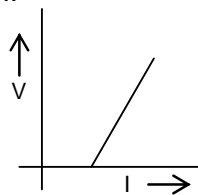
30. If a voltage (V) is applied to a copper conductor and a current (I) flows through it which one of the following gives the relation between V and I .



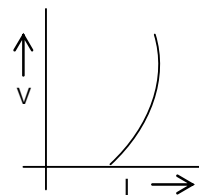
(1)



(2)



(3)

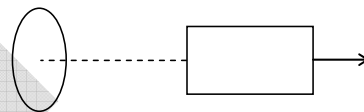


(4)

31. A magnet NS is placed along the axis of a circular coil. The magnet is moved away from the coil as shown.

The induced current in the coil is

- (1) zero
 (2) clockwise
 (3) anti-clockwise
 (4) none of these



32. Who first established the fact that the earth revolves round the sun?

- (1) Kepler
 (2) Copernicus
 (3) Newton
 (4) Galileo

33. At what point the centigrade and Fahrenheit temperatures are same, that point is

- (1) 10°
 (2) 0°
 (3) -10°
 (4) -40°

34. If there were no atmosphere, what would be the colour of sky?

- (1) Red
 (2) Blue
 (3) White
 (4) Black

35. Red, yellow and blue are:

- (1) primary pigments
 (2) primary colours
 (3) secondary colours
 (4) complementary colours

36. Tungsten is used for the manufacture of an electric bulb because:

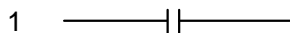
- (1) it is malleable
 (2) it is unexpensive
 (3) it has a very high melting point
 (4) it is a good conductor

37. Water pipes are apt to burst in cold weather because:

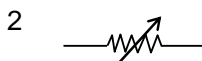
- (1) heavy pressure is exerted by snow
 (2) they contract in cold
 (3) the water in the pipe turns into ice and expands
 (4) they expand on cooling

38. Match the following:

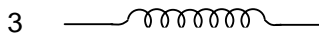
(A) inductance



(B) capacitance



(C) Variable resistance



(1) A B

(2) A B

1 2

2 1

(3) A B

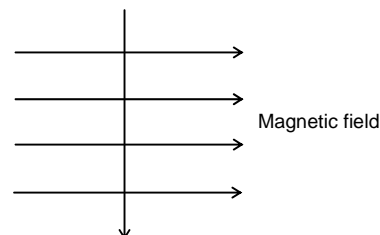
(4) A B

3 1

3 2

39. 100 w bulb in 5 hrs consumers energy:
 (1) 0.5 units (2) 1 unit
 (3) 2 units (4) 5 units

40. An electron enters a magnetic field at right angles to it shown in figure. The direction of force acting on the electron will be
 (1) to the right
 (2) to the left
 (3) out of the page
 (4) into the page



41. Which chemical is mixed in LPG to detect its leakage
 (1) H₂S (2) MIC
 (3) Mustard gas (4) Ethanethiol
42. Chemically the water gas is
 (1) H₂O(gaseous) (2) CO + H₂
 (3) CO₂ + H₂ (4) CO + N₂
43. The composition of german silver alloy is
 (1) 70% Cu + 30% Zn (2) 60% Cu + 30% Zn + 10% Ag
 (3) 60% Ag + 40% Cu (4) 20% Cu + 30% Zn + 40% Ag
44. The Latin name of metal Tungusten is
 (1) Natrium (2) Ferrym
 (3) Wolfram (4) Kalium
45. Which is not related to colloidal solution
 (1) Tyndall effect (2) Electrophoresis
 (3) Very unstable (4) Brownian movement
46. One amu equals to:
 (1) 1.66×10^{-24} kg (2) 1.66×10^{-24} g
 (3) 1.66×10^{-24} mg (4) 1.66×10^{-24} pounds
47. Number of neutrons in 8 g He is
 (1) 6.022×10^{23} (2) $2 \times 6.022 \times 10^{23}$
 (3) $3 \times 6.022 \times 10^{23}$ (4) $4 \times 6.022 \times 10^{23}$
48. Who discovered the nucleus
 (1) J.J Thomson (2) Goldstein
 (3) Rutherford (4) Chadwick
49. Cinnabar is an ore of
 (1) Copper (2) Mercury
 (3) Silver (4) Zinc
50. Which cell is used in wrist watches?
 (1) Mercury cell (2) Daniel cell
 (3) Leclanche cell (4) Fuel cell
51. Which rule is applicable on the dissolution of CO₂ gas in cold drinks?
 (1) Hess' law (2) Henry's law
 (3) Kohlrausch law (4) Dalton's law

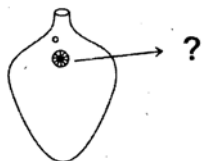
52. Which one is not acidic in nature?
 (1) BF_3 (2) NH_3
 (3) $\text{B}(\text{OH})_3$ (4) AlCl_3
53. Chemically the P.O.P is
 (1) $\text{CaSO}_4 \cdot 2\text{H}_2\text{O}$ (2) $(\text{CaSO}_4)_2 \cdot \text{H}_2\text{O}$
 (3) $\text{Ca}(\text{OH})_2$ (4) $(\text{CaSO}_4)_2 \cdot \frac{1}{2} \text{H}_2\text{O}$
54. Sodalime is
 (1) $\text{NaOH} + \text{KOH}$ (2) $\text{CaO} + \text{Ca}(\text{OH})_2$
 (3) $\text{NaHCO}_3 + \text{Na}_2\text{CO}_3$ (4) $\text{NaOH} + \text{CaO}$
55. Which is not an alum?
 (1) $\text{K}_2\text{SO}_4 \cdot \text{Al}_2(\text{SO}_4)_3 \cdot 24\text{H}_2\text{O}$ (2) $\text{Na}_2\text{SO}_4 \cdot \text{Al}_2(\text{SO}_4)_3 \cdot 24\text{H}_2\text{O}$
 (3) $\text{K}_2\text{SO}_4 \cdot \text{Cr}_2(\text{SO}_4)_3 \cdot 24\text{H}_2\text{O}$ (4) $\text{FeSO}_4 \cdot (\text{NH}_4)_2\text{SO}_4 \cdot 24\text{H}_2\text{O}$
56. Metal present in chloroplast is:
 (1) Iron (2) Copper
 (3) Cobalt (4) Magnesium
57. Which water soluble vitamin can be stored in our body?
 (1) Vit. B_1 (2) Vit. B_2
 (3) Vit. B_4 (4) Vit. B_{12}
58. The main component of LPG is
 (1) Methane (2) Ethane
 (3) Propane (4) Butane
59. The most abundant element of the universe is:
 (1) Oxygen (2) Silicon
 (3) Hydrogen (4) Sodium
60. BHA and BHT are used as:
 (1) Insecticide (2) Food preservatives
 (3) Drugs (4) Fuels
61. TEL is used as
 (1) Telephone device (2) Medicine
 (3) Antiknock agent (4) Food preservative
62. BOD and COD are
 (1) Research organisation (2) Organic compounds
 (3) Parameters to measure air pollution (4) Parameters to measure water pollution
63. The energy of an electron in an atom is:
 (1) Always negative (2) Always positive
 (3) Always zero (4) All the above
64. Tear gas is
 (1) N_2O (2) O_2NCCl_3
 (3) SO_2 (4) H_2S
65. Which one is not a green house gas?
 (1) N_2O (2) CH_4
 (3) H_2O (Vapour) (4) CO_2

66. 2, 4 – D —
(1) Fungicide (2) Insecticide
(3) Bactericide (4) Weedicide
67. The pH of acid rain water is
(1) < 5.6 (2) < 7.0
(3) < 8.0 (4) > 7.0
68. The name of a polymeric plastic on which oil and water do not stick and is used to make non-sticky cook-ware is:
(1) Polythene (2) Bakelite
(3) Dacron (4) Teflon
69. The chemical composition of rust of copper (green coating) is;
(1) $\text{CuSO}_4 \cdot 5\text{H}_2\text{O}$ (2) $\text{Cu}(\text{OH})_2 + \text{CuCO}_3$
(3) $\text{CuSO}_4 + \text{Fe}_2\text{O}_3$ (4) $\text{CuSO}_4 + \text{CuCO}_3$
70. Choose the incorrect pair
(1) MgO – Basic oxide (2) SO_2 – Acidic oxide
(3) CO – Neutral oxide (4) P_4O_{10} – Basic oxide
71. Bitumen is
(1) a petroleum product used in place of coal tar
(2) an insecticide used to kill pests
(3) a fossil fuel used to burn in heavy vehicle
(4) a polymer used to make cloths
72. What is gasohol?
(1) Green house gas (2) a hole in space
(3) mixture of petrol and ethyl alcohol (4) mixture of petrol & kerosene oil
73. Which one has highest calorific value?
(1) CNG (2) LPG
(3) Hydrogen gas (4) Bio gas
74. Choose incorrect pair
(1) Hair - protein (2) Bones – calcium phosphate
(3) Cotton - carbohydrate (4) Silk – fat
75. Which hormone is used for induced lactation?
(1) Adrenaline (2) Oxytocin
(3) Vasopressin (4) Auxin
76. The heat energy in sun/stars is produced by
(1) Nuclear fission reaction (2) Combustion reaction
(3) Nuclear fusion reaction (4) Thermochemical reaction
77. What is wrong about fatty acids?
(1) A component of fat
(2) Found in fatty men only
(3) Always contain even number of carbon atom
(4) Used to make soaps
78. Which of the following will not sublime?
(1) Camphor (2) Ammonium chloride
(3) Calcium Chloride (4) Iodine

79. The temperature at which vapour pressure of a liquid becomes equal to the atmospheric pressure is:
(1) Boiling point (2) Melting point
(3) Freezing point (4) Sublimation point
80. In which sodium metal cannot be stored
(1) Kerosene oil (2) Paraffin wax
(3) Ether (4) Alcohol
81. Hybridisation refers to crossing between
(1) genetically dissimilar plants (2) two different varieties
(3) two different genera (4) all statements
82. Plant Micronutrient
(1) Nitrogen (2) Calcium
(3) Zinc (4) Sulphur
83. Intercropping is:
(1) growing of different crops on a piece of land in a pre – planned succession
(2) removal of unwanted plants from the cultivated field
(3) growing two or more crops simultaneously on the same field in a definite pattern
(4) all statements true
84. Internal parasites like worms affect stomach and intestine while flukes damage
(1) Kidney (2) Heart
(3) Lungs (4) Liver
85. Live supporting zone of Earth is known as
(1) Hydrosphere (2) Biosphere
(3) Atmosphere (4) Lithosphere
86. Acute diseases last for
(1) Life time (2) Very short period
(3) A long time (4) None of the above
87. Sleeping sickness is caused by
(1) Slaphylococci (2) Leishmania
(3) Ascaris lumbricoides (4) Trypanosoma
88. Antibiotic block biochemical pathway important for
(1) Bacteria (2) Virus
(3) Protozoa (4) Worms
89. The commonest vectors are
(1) Flies (2) Parasites
(3) Mosquitoes (4) Amoeba
90. The disease spread through air
(1) Pneumonia (2) Jaundice
(3) AIDS (4) Cholera
91. Japanese – encephalitis causing virus will go
(1) Lungs (2) Liver
(3) Heart (4) Brain

92. Local general effect of inflammation is:
 (1) Cough (2) Fever
 (3) Drowsiness (4) Rashes
93. In HIV infection, virus damages the
 (1) Muscular system (2) Nervous system
 (3) Immune system (4) Circulatory system
94. The scheme of classification is:
 (1) Phylum, Kingdom, Family (2) Kingdom, Phylum, Class
 (3) Phylum Kingdom only (4) Kingdom, Order, Family
95. Widely used classification is proposed by
 (1) Haeckel (2) Whittaker
 (3) Woese (4) Edison
96. Monera group includes
 (1) Green algae (2) Amoeba
 (3) Plantae (4) Cyanobacteria
97. Lichens is the symbiotic relationship between
 (1) Fungus and bacteria (2) Fungus and green algae
 (3) Fungus and funaria (4) Fungi and blue green algae
98. These are called the amphibians of the plant kingdom
 (1) Algae (2) Pteridophyta
 (3) Bryophyta (4) Fungus
99. Naked embryos of thallophytes and pteridophytes are called
 (1) egg (2) gametes
 (3) spores (4) seed
100. Seeds are enclosed in fruits
 (1) Gymnosperm (2) Angiosperm
 (3) Phanerogam (4) Bryophyta
101. Tamarind is a
 (1) Gymnosperm plant (2) Dicot plant
 (3) Monocot plant (4) Saprophyte
102. An animal have two layers of cells
 (1) Jelly fish (2) Sponge
 (3) Fluke (4) Spirogyra
103. Annelid animals have
 (1) Triploblastic but no coelom (2) Triploblastic and pseudocoelom
 (3) Triploblastic and dorsoventrally flattened (4) Triploblastic and true body cavity
104. Palaemon, Scolopendra, Palamnaeus are animals of group
 (1) Echinodermata (2) Mollusca
 (3) Arthropoda (4) Annelida

105.

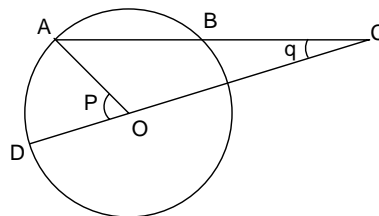


- (1) Mouth
(2) Eyes
(3) Scolex
(4) Acetabulum
106. Shark fish have
(1) Three chambered heart
(2) Two chambered heart
(3) No heart
(4) Four chambered heart
107. The girth of stem or root increases due to
(1) Lateral meristem
(2) Apical meristem
(3) Epidermis
(4) Intercalary meristem
108. Flexibility in plants is due to
(1) Parenchyma
(2) Chlorenchyma
(3) Aerenchyma
(4) Collenchyma
109. The cell of the tissue are dead, walls are thickness due to lignin, the tissue is
(1) Collenchyma
(2) Sclerenchyma
(3) Cambium
(4) Aerenchyma
110. Desert plants, epidermis had a coating of
(1) Lignin
(2) Cutin
(3) Melanin
(4) Iodine
111. Tissue that connects muscle to bone in humans
(1) Cartilage
(2) Ligament
(3) Tendon
(4) Areolar connective tissue
112. Reflex action is a function of
(1) Spinal cord
(2) Medulla
(3) Cerebrum
(4) Cerebellum
113. Red blood corpuscles formed in
(1) Liver
(2) Stomach
(3) Kidney
(4) Bone marrow
114. The part of cinchona plant, which yields quinine is:
(1) Leaf
(2) Root
(3) Bark
(4) Flower
115. Which is not warm blooded animal?
(1) Pigeon
(2) Fish
(3) Rat
(4) Bat
116. Information necessary for constructing and organising cells is contained in
(1) DNA
(2) Nucleus
(3) Mitochondria
(4) RNA
117. The organelle responsible for storage of starch, oil and protein granules is:
(1) Chloroplast
(2) Plastid
(3) Leucoplast
(4) Ribosome

118. Which part do not have voluntary muscles?
 (1) Leg (2) Shoulder
 (3) Heart (4) Hand
119. Which statement correctly explain the 'Test Tube Baby'?
 (1) the embryo develops in a test tube
 (2) fertilization internal and development of embryo external
 (3) fertilization is external and development of embryo internal
 (4) fertilization external and development of embryo too external
120. Colour blind person has difficulty in distinguishing between
 (1) Red and Blue (2) Green and Red
 (3) Orange and Red (4) Red and Black
121. Simplify $6\frac{1}{7} + 5\frac{1}{4} + 8\frac{1}{2} - 6\frac{1}{4} = ?$
 (1) $13\frac{1}{7}$ (2) $6\frac{1}{5}$
 (3) $23\frac{1}{7}$ (4) 29
122. 30% of 150 + ? of 300 = 40% of 450
 (1) 65 (2) 35
 (3) 45 (4) 125
123. In $\triangle ACB$, $AB = 3\text{cm}$, $BC = 5\text{cm}$, $AC = 4\text{cm}$. Then right angle will be formed at
 (1) Vertex A (2) Vertex B
 (3) Vertex C (4) Not at all
-
124. Find the wrong term in the following series:
 9359, 1558, 311, 17, 25, 12, 12
 (1) 77 (2) 25
 (3) 12 (4) 1558
125. The difference between 31% and 12% of a number is 576. Find 17% of the same number.
 (1) 640 (2) 888
 (3) 544 (4) 442
126. If the selling price of 10 pens is same as cost price of 8 pens, then loss % is
 (1) 15% (2) 20%
 (3) 8% (4) 30%
127. In a mixture of 75 litres, the ratio of milk of water is 2 : 1. The amount of water to be further added to the mixture so as to make the ratio of milk to water 1 : 2 will be :
 (1) 60 lts. (2) 45 lts.
 (3) 75 lts. (4) 30 lts.
128. The sum of the three consecutive odd numbers is 285. The smallest number is :
 (1) 95 (2) 97
 (3) 93 (4) 99

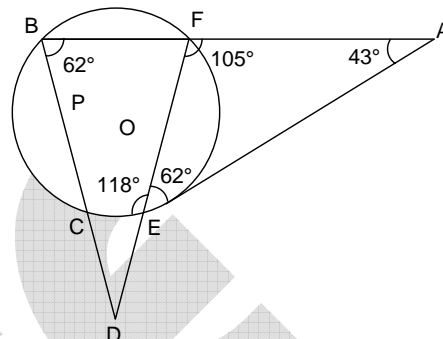
129. A sum of money doubles in 7 years of simple interest it will become four fold in :
 (1) 10 years (2) 35 years
 (3) 21 years (4) 14 years
130. By travelling at $\frac{4}{5}$ th of his usual speed a person is late by 20 minutes. Initial time to cover the distance was :
 (1) 80 minutes (2) 65 minutes
 (3) 45 minutes (4) 50 minutes
131. A tap can fill an empty tank in 12 hours and a leakage can empty the whole tank in 20 hours. If the tap and the leakage are working simultaneously the whole tank to fill will take :
 (1) 25 hours (2) 40 hours
 (3) 30 hours (4) 35 hours
132. Ratio of angle of a quadrilateral is 1:2:3:4. The sum of twice the smallest angle and half of the largest angle is :
 (1) 144° (2) 150°
 (3) 156° (4) 162°
133. Difference of circumference of two circles is 132 cm. Radius of the smallest circle is 14 cm. The radius of the largest circle is :
 (1) 35 cm (2) 40 cm
 (3) 46 cm (3) 54 cm
134. Raj, Ritik and Piyush begin to jog around a circular stadium. They complete their revolutions in 42 secs, 56 secs and 63 secs respectively. They will be together at starting points after :
 (1) 336 secs (2) 504 secs
 (3) 252 secs (4) Can't be determined
135. Rashmi sets alarm in two different clocks. The first alarm rings after every 30 minutes and the second rings after every 90 minutes. If they ring together at 11 pm. They will ring again together at :
 (1) 12.30 am (2) 2.00 am
 (3) 1.30 am (4) 1.00 am
136. Simplifying : $\frac{2^n + 2^{n-1}}{2^{n-1} - 2^n}$ we get :
 (1) $\frac{1}{2}$ (2) -3
 (3) $\frac{1}{2}(2^n - 1)$ (4) $\frac{3}{2}2^n + 1$
137. The value of the expression : $\sqrt{2 + \sqrt{2 + \sqrt{2} + \dots + \alpha}}$ is
 (1) 2 (2) 3
 (3) 4 (4) 10
138. The solution of $3^{3K+5} \times 3^{3K+3} = 9$ is
 (1) $K = 1$ (2) $L = -1$
 (3) $K = \frac{-5}{3}$ (4) $K = \frac{1}{2}$

139. In the figure, O is the centre of the circle is $BC = OD$, $\angle AOD = P$ and $\angle ACO = q$



- (1) $p = \frac{3}{2}q$
 (2) $p = 2q$
 (3) $p = 3q$
 (4) There is no special relationship between P and q

140. In the figure if $\angle FBD = 62^\circ$, $\angle BAC = 43^\circ$. Then $\angle EDC$ will be :



- (1) 10°
 (2) 43°
 (3) 16°
 (4) 31°

141. If cube of surface S has volume V, then volume of cube of surface area 2S is :

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

142. If $x + x^{-1} = \frac{1}{4}$ then $x^3 + \frac{1}{x^3}$ would be :

- (1) 64
 (2) 52
 (3) 32
 (4) 12

143. $\frac{1 + \tan^2 \theta}{1 + \cot^2 \theta}$ is equal to

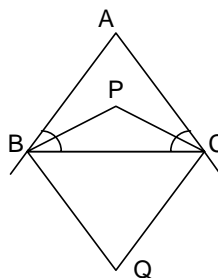
- (1) $\sec^2 \theta$
 (2) -1
 (3) $\cot^2 \theta$
 (4) $\tan^2 \theta$

144. 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°

145. In a $\triangle ABC$, internal bisectors of $\angle B$ and $\angle C$ meet at P. External bisectors of $\angle B$ and $\angle C$ meet at Q. Then $\angle BPC + \angle BQC$ will be

- (1) 90°
 (2) $90^\circ - \frac{1}{2} \angle A$
 (3) $90^\circ + \frac{1}{2} \angle A$
 (4) 180°



146. The radius and slant height of a cone are in the ratio 4 : 7. If the curved surface area of the cone is 792 cm^2 . Then radius of the cone is :

- (1) 3 cm
 (2) 11 cm
 (3) 12 cm
 (4) 28 cm

147. The volume of the sphere curved out of a cube of side 7 cm is :

(1) $\frac{343}{6} \pi \text{ cm}^2$

(2) $\frac{343}{7} \pi \text{ cm}^3$

(3) $\frac{343}{8} \pi \text{ cm}^3$

(4) None of these

148. If $a \sin \phi = b \cos \phi$, then value of $\sec^2 \phi$ is :

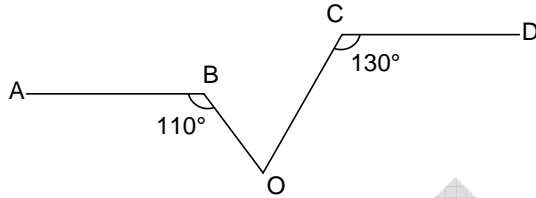
(1) $\frac{a^2}{b^2}$

(2) $\frac{b^2}{a^2}$

(3) $\frac{b^2}{a^2 + b^2}$

(4) $\frac{a^2 + b^2}{a^2}$

149. In the figure, the value of $\angle BOC$, if $AB \parallel CD$



(1) 50°

(2) 60°

(3) 70°

(4) 120°