RRB-Senior Section Engineer (2015)

1. According to kinetic theory of heat
   (A) temperature should rise during boiling
   (B) temperature should fall during freezing
   (C) at low temperature all bodies are in solid state
   (D) at absolute zero there is absolutely no vibration of molecules

2. In a Carnot engine, when the working substance gives heat to the sink
   (A) The temperature of the sink increases
   (B) The temperature of the sink remains the same
   (C) The temperature of the sources decreases
   (D) The temperatures of both the sink and the source decrease

3. Availability function is expressed as
   (A) a = (u + poV – Tos)
   (B) a = (u + podv + Tods)
   (C) a = (du + podv – Tods)
   (D) a = (u + pov + Tos).

4. The outer surface of a long cylinder is maintained at constant temperature. The cylinder does not have any heat source The temperature in the cylinder will
   (A) increase linearly with radius
   (B) decrease linearly with radius
   (C) be independent of radius
   (D) vary logarithmically, with radius

5. What is the ratio of thermal conductivity to electrical conductivity equal to?
   (A) Prandtl number
   (B) Schmidt number
   (C) Lorenz number
   (D) Lewis number

6. Which is the most efficient of the following insulating materials?
   (A) Corkboard
   (B) Glass fibre sheet
   (C) Mineral fibre sheet
   (D) Foamed urethane sheet

7. The compression ratio generally used in diesel engines is
   (A) 7 : 1   **(B) 16 : 1**
   (C) 30 : 1   (D) 45 : 1

8. For each crankshaft revolution, the cam shaft revolves
   (A) one-half turn
   (B) two turns
   (C) four turns
   (D) as many turns as the number of valves in the engine

9. In a variable speed SI engine, the maximum torque occurs at the maximum
   (A) volumetric efficiency
   (B) brake power
   (C) indicated power
   (D) speed

10. What is the material of connecting rod?
    (A) mild steel
    (B) forged steel
    (C) tool steel
    (D) cast iron

11. One of the important advantages of metal patterns over wooden patterns is that
    (A) it is readily available
    (B) it is easy to make
    (C) it is useful in machine moulding
    (D) it is less costly

12. In milling operations
    (A) the work is fed against a reciprocating tool
    (B) the work is fed against a rotating multipoint cutter
    (C) the tool is fed against a rotating work
    (D) the tool is fed against a reciprocating work

13. The cold chisels are made by
    (A) drawing
    (B) rolling
    (C) piercing
    (D) forging

14. Weaving in arc welding refers to..........
    (A) side to side motion of electrode at right angles to the direction of the welding
    (B) side to side motion of the electrode along the direction of the welding
    (C) spiral motion given to electrode
    (D) a technique of striking the arc

15. A certain appliance uses 350 W. If it is allowed to run continuously for 24 days, how many kilowatt-hours of energy does it consume?
    (A) 20.16 kWh
    (B) 201.6 kWh
    (C) 2.01 kWh
    (D) 8.4 kWh

16. A given power supply is capable of providing 6 A for 3.5 h. Its ampere-hour rating is
    (A) 0.58 Ah   (B) 2.1Ah
    (C) 21 Ah   (D) 58 Ah

17. If you used 400 W of power for 30 h, you have used
    (A) 1.3 kWh   (B) 13.3 kWh
    (C) 1.2 kWh   **(D) 12 kWh**

18. Best protectioni s provided by HRC fuses in case of
    (A) Open circuits **(B) Short circuits**
    (C) Overloads   (D) Parallel circuit

19. A relay used for protection of motors against overload is
    (A) Impedance relay
    (B) Electromagnetic attration type
    (C) Thermal relay
    (D) Buchholz's relay

20. The acting contacts for a circuit breakers are made of
    (A) Stainless steel
    (B) Hard pressed carbon
    (C) Porcelain
    (D) Copper tungsten alloy

21. Fuse wire, protection, system is usually not used beyond
    (A) 10 A
    (B) 25 A
    (C) 50 A
    (D) 100 A

22. A fuse wire should have
    (A) Low specific resistance and high melting point
    (B) Low specific resistance and low melting point
    (C) High specific resistance and high melting point
    (D) High specific resistance and low melting point

23. Out of the following which one is not a unconventional source of energy?
    (A) Tidal power
    (B) Geothermal energy
    (C) Nuclear energy
    (D) Wind power

24. Which of the following 3-phase connection of a transformer causes interference with the neighbouring communication lines:
    (A) Delta-star   (B) Star-delta
    (C) Star-star   (D) Delta-delta

25. To increase the voltage output, several cells are connected in:
    (A) parallel   (B) series-parallel
    (C) resonance   **(D) series**

26. What does the fourth color band on a resistor mean?
    (A) The value of the resistor in ohms
    (B) The power rating in watts
    (C) The resistance material
    (D) The resistance tolerance in percent

27. A current of one quarter ampere may be written as:
    (A) 0.5 amperes
    (B) 0.25 milliampere
    (C) 250 microampere
    (D) 250 milliamperes

28. Why do resistors sometimes get hot when in use?
    (A) Their reactance makes them heat up
    (B) Hotter circuit components nearby heat them up
    (C) Some electrical energy passing through them is lost as heat
    (D) They absorb magnetic energy which makes them hot

29. The reciprocal of resistance is:
    (A) conductance (B) reactance
    (C) reluctance   (D) permeability

30. What term means the number of times per second that an alternating current flows back and forth?
    (A) Speed   (B) Pulse rate
    (C) Frequency   (D) Inductance

31. A signal is composed of a fundamental frequency of 2 kHz and another of 4 kHz. This 4kHz signal is referred to as::
    (A) a fundamental of the 2 kHz signal
    (B) the DC component of the main signal
    (C) a dielectric signal of the main signal
    (D) a harmonic of the 2 kHz signal

32. In measuring volts and amperes, the connections should be made with:
    (A) the voltmeter in series and ammeter in series
    (B) the voltmeter in parallel and ammeter in series
    (C) both voltmeter and ammeter in series
    (D) both voltmeter and ammeter in parallel

33. A resistor in a circuit becomes very hot and starts to burn. This is because the resistor is dissipating too much:
    (A) voltage (B) resistance
    (C) current **(D) power**

34. In a parallel circuit with a voltage source and several branch resistors, how is the total current related to the current in the branch resistors?
    (A) It equals the sum of the branch current through each resistor
    (B) It equals the sum of the branch current through each resistor
    (C) It decreases as more parallel resistors are added to the circuit
    (D) It is the sum of each resistor's voltage drop multiplied by the total number of resistors

35. Regarding the idealization of support to a structural system, which of the following is false
    (A) Roller supports are free to rotate and translate along the surface upon which the roller rests.
    (B) A pinned support can resist both vertical and horizontal forces but not a moment
    (C) Fixed supports can resist vertical and horizontal forces as well as a moment.
    (D) Rigid supports can resist translation, but not the moments

36. A condition of timber during seasoning in which the different layers of wood are under stress by being under compression across the grain (usually due to rapid surface drying in the kiln).
    (A) Case hardening
    (B) Air seasoning
    (C) Air drying
    (D) Strain softening

37. The load at which an element, a member or a structure as a whole, either collapses in service or buckles in a load test and develops excessive lateral (out of plane) deformation or instability is called as.
    (A) Buckling load
    (B) Yielding load
    (C) Eccentric load
    (D) Failure load

38. According to IS 456, the modulus of elasticity of steel can be assumed as
    (A) 200 kN/mm²
    (B) 225 kN/mm²
    (C) 250 kN/mm²
    (D) 300 kN/mm²

39. The recommended slump for pumped concrete is
    (A) 1-2 inches
    (B) 2-4 inches
    (C) 3-4 inches
    (D) 4-6 inches

40. The point at which both foresight and back sight are taken during the course of levelling is called as
    (A) Intermediate site
    (B) Benchmark
    (C) Station
    (D) Change point

41. Which of the following is not true for the direct and indirect methods of contouring?
    (A) Direct method is most accurate but is low
    (B) Indirect method is less accurate but is faster
    (C) Direct method is expensive
    (D) Indirect method is relatively more expensive

42. According to IS 1200, the metal sheet roofing shall be described in terms of
    (A) meter
    (B) cubic meter
    (C) square meter
    (D) Thickness

43. The property of a soil which allows it to be deformed rapidly, without rupture, without elastic rebound and without volume changes is called as
    (A) Yielding
    (B) Strain softening
    (C) Strain hardening
    (D) Plasticity

44. If the water table is likely to permanently remain at or below a depth of sum of the depth and width of the foundation beneath the ground level supporting the footing, then the water table correction used in the Bearing capacity equation is
    (A) 1   (B) 0
    (C) 0.5   (D) 0.75

45. If a substance resists shear stress by elastic deformation, then the substance is
    (A) Fluid
    (B) Liquid
    (C) Solid
    (D) Gas

46. The piezometric head in a stationary and static liquid
    (A) remains constant only on the horizontal plane
    (B) increases non-linearly with depth below the surface
    (C) increases linearly with depth below the surface
    (D) remains constant at all the points in the fluid

47. Most commion form of A.C. meters met with in every day domestic and industrial Installations are
    (A) mercury motor meters
    (B) commutator motor meters
    (C) induction type single phase energy meters
    (D) either mercury motor meters or commutator motor meters

48. Which of the following meters are not used on D.C. circuit Mercury motor meters
    (A) Commutator motor meters
    (B) Mercury motor meters
    (C) Induction meters
    (D) Integrating and recording meters

49. The pointer of an indicating instrument should be
    (A) very light   (B) very weighty
    (C) light   (D) weighty

50. In a portable instrument, the controlling torque is provided by
    (A) Spring   (B) Gravity
    (C) eddy currents   (D) damping friction

51. The multiplier and the meter coil in a voltmeter are in
    (A) Series
    (B) Parallel
    (C) series-parallel

    (D) bi-junction mode

52. In troposphere gaseous mixture containing oxygen, nitrogen and carbon dioxide cycle in nature through
    (A) biogeochemical cycle
    (B) physico-chemical cycle
    (C) bio-decomposition
    (D) biological cycle

53. The major portion of the alkalinity in natural water is caused by
    (A) hydroxyl, carbonate and sulphate ions
    (B) hydroxyl, carbonate and bicarbonate ions
    (C) hydroxyl, carbonate and ammonium ions
    (D) hydroxyl, carbonate and phosphate ions

54. The total coliform bacteria are reported as most probable number (MPN) per
    (A) 10 ml of water
    (B) 1000 ml of water
    (C) 100 ml of water
    (D) 1 ml of water

55. The anthropogenic sources of air pollution in well planned city is
    (A) construction activities, road traffics, rail traffic, fugitive emissions
    (B) construction activities, road traffic, domestic burning
    (C) construction activities, road traffics, bursting of crackers, dust storms
    (D) construction activities, road traffics, domestic burning, industrial emissions

56. When the measured and standard reference pressure level becomes equal, the sound pressure level (SPL) is equivalent to
    (A) 1 dBA
    (B) 10 dBA
    (C) 0 dBA
    (D) 1.012 dBA

57. The major green house gases contributing in global warming are
    (A) carbon dioxide, nitrous oxide, methane and water vapours
    (B) carbon dioxide, sulphur dioxide, water vapours and chlorofluorocarbons
    (C) carbon monoxide, nitrous oxide, methane and, hydro-chlorofluorocarbons
    (D) carbon dioxide, nitrogen dioxide, water vapours, methane and ozone

58. Program Counter (PC) register stores the
    (A) Address of the first memory block
    (B) Address of the last memory block
    (C) Address of the next instruction to be executed
    (D) Size of the primary memory

59. Number of bits needed to code 64 operations is
    (A) 4   **(B) 6**
    (C) 8   (D) 16

60. BIOS, which is a part of operating systems of PCs, is stored in
    (A) RAM
    (B) Hard Disk
    (C) Cache memory
    (D) ROM

61. For a memory of size 64K words with each word storing 8 bits, the size of Memory Data Register (MDR) is
    (A) 8 bits   (B) 16 bits
    (C) 32 bits   (D) 64 bits

62. Which of the following doesn't support WYSIWYG (what you see is what you get) display facility for documents?
    (A) MS-Word   **(B) Latex Editor**
    (C) NotePad   (D) WordPad

63. Logic programming language is also known as
    (A) Procedural language
    (B) Low-level language
    (C) Imperative language
    (D) Non-procedural language

64. Unicode _____ bits to code a large number of characters, including various special characters.
    (A) 8   **(B) 16**
    (C) 24   (D) 32

65. In Boolean Algebra, AB + AB' is equivalent to
    (A) 0   (B) 1
    (C) A   (D) B

66. In decimal-dotted notation of an IP address, the maximum value of each component can be
    (A) 255   (B) 256
    (C) 512   (D) 1024

67. Uniform Resource Locator (URL) is a(an) _____ scheme, which WWW browsers use to locate sites on the internet.
    (A) Addressing
    (B) Paging
    (C) Data management
    (D) Ranking

68. One end of a line rests on VP and the other on HP. It is inclined to VP and HP at 30° 60° respectively. Its "true length" will be visible in:
    (A) Plan
    (B) Profile

(C) Elevation
(D) Its true length will not be visible in any of the orthographic views

69. The joint shown below represents a:
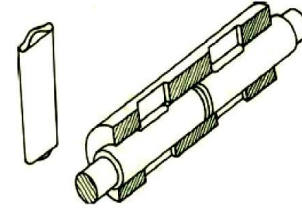
    (A) Spigot joint,
    (B) cotter joint,
    (C) knuckle joint,
    (D) keyed coupling

70. The most commonly used term "R.F." of a scale is:
    (A) Reprographic Factor
    (B) Refracrtive Factor,
    (C) Representative Fraction,
    (D) Reducing Fraction.

71. The *asymptote* of a *hyperbola* is the one:
    (A) which passes through its focus and is normal to its axis,
    (B) it joins focus to its vertex,
    (C) it joins focus to its centre
    (D) will be tangent to it at infinity.

72. When drawing "isometric view" of an object its horizontal edges are drawn along *iso-axes* which are inclined to horizontal at:
    (A) 30°   (B) 90°
    (C) 15°   (D) 75°

73. P and Q are two points at same distance from the Centre of a short electric dipole on axial line and equatorial line respectively. V_1 and V_2 are the resultant electric potential due to the dipole at P and Q. The only correct condition for V_1 and V_2 for this situation is
    (A) $V_1 = 2V_2$
    (B) $V_2 = 2V_1$
    (C) $V_1 = 0; V_2 \neq 0$
    (D) $V_2 = 0; V_1 \neq 0$

74. Kirchhoff's junction rule and loop rule for an electrical network are respectively based on
    (A) Conservation of energy, Conservation of charge
    (B) Conservation of charge, conservation of momentum
    (C) Conservation of energy, conservation of momentum
    (D) Conservation of charge, conservation of energy

75. Which one of the following is the correct statement for a photon of blue and red light of electromagnetic spectrum?
    - (A) Blue light and red light have equal energy and equal momentum.
    - **(B) Blue light has higher momentum than red light.**
    - (C) Red light has higher momentum than blue light.
    - (D) Red light has higher energy than blue light.

76. A double convex lens of focal length f is cut into two exactly similar parts in two different ways, once along the vertical line and second time along the horizontal line. The focal length of each part after cutting in two cases respectively will be

    - (A) $\dfrac{f}{2}; \dfrac{f}{2}$
    - (B) $\dfrac{f}{2}; f$
    - (C) $2f; \dfrac{f}{2}$
    - **(D) $2f; f$**

77. N_s and N_p represent the number of turns, E_s and E_p represent e.m.f and ls and lp represent current for the secondary coil and primary coli of an ideal transformer respectively. The completely correct relation between these quantities is

    - (A) $\dfrac{N_s}{N_p} = \dfrac{E_s}{E_p} = \dfrac{I_s}{I_p}$

    - (B) $\dfrac{N_s}{N_p} = \dfrac{E_p}{E_s} = \dfrac{I_p}{I_s}$

    - (C) $\dfrac{N_s}{N_p} = \dfrac{E_s}{E_p} = \dfrac{I_p}{I_s}$

    - (D) $\dfrac{N_s}{N_p} = \dfrac{E_p}{E_s} = \dfrac{I_s}{I_p}$

78. While conducting an experiment on photo – electric effect, the incident radiations of yellow light are replaced with radiations of violet light, keeping the same intensity. This will result in

    (A) increase in photo electric current without any change in the kinetic energy of emitted electrons

   (B) Decrease in kinetic energy of the emitted electrons without any chante in the photo electric current.

    (C) Increase in kinetic energy of the emitted electrons without any change in photoelectric current

    (D) Decrease in photo electric current and increase in kinetic energy of the emitted electrons

79. The molecules of elements and compounds exist in different structures. The molecule which is linear, is
    - (A) NO_2
    - (B) SO_2
    - (C) CO_2
    - (D) ClO_2

80. The correct order of first ionization enthalpy of the elements of oxygen family in the periodic table is
    - **(A) O > S > Se**
    - (B) S > O > Se
    - (C) S > Se > O
    - (D) Se > O > S

81. In a volumetric analysis, $KMnO_4$ reacts with oxalic acid according to the following equation,

    $2MnO_4^- + 5C2O_4^{2-} + 16^+ \rightarrow 2Mn^{2+} + 10CO_2 + 8H_2O$

    According to the above equation, 20mL of 0.1M $KMnO_4$ will be equivalent to
    - (A) 120 mL of 0.25M $H_2C_2O_4$
    - (B) 150 mL of 0.10M $H_2C_2O_4$
    - (C) 50 mL of 0.10M $H_2C_2O_4$
    - (D) 50 mL of 0.2 M $H_2C_2O_4$

82. Correct formula of the conjugate acid for each fo the followign Bronsted bases,

    $HO_2^-, SO_4^{2-}, NH_2^-$ and NH_3 will be respectively,

    - (A) H_3^+O, H_2SO_4, NH^- and NH_3

    - **(B) H_2O_2, HSO_4^-, NH_3 and NH_4^+**

    - (C) H_2O, HSO_3^-, NH_4^+ and NH_2^{2-}

    - (D) H_3O^+, SO_3^{2-}, NH_3 and NH_2^{2-}

83. Cr_2O_3 can be converted into Cr by reduction with
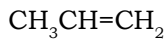   - (A) CO
    - (B) Carbon
    - (C) Hydrogen
    - **(D) Aluminum**

84. Consider the following compounds :

$CH_3CH_2 \equiv CCH3$ $CH_3CH_2CH_2CH_3$
    I   II
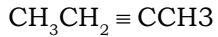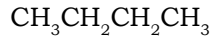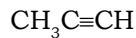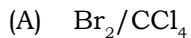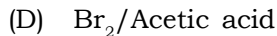
$CH_3CH=CH_2$ $CH_3C\equiv CH$
    III   IV

Which reagent will you use to distinguish compount IV from the rest of compounds?

(A) Br_2/CCl_4

(B) Ammonia Cal AgNO$_3$

(C) Cold Alkaline $KMnO_4$

(D) Br_2/Acetic acid
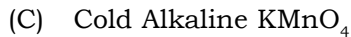
85. The largest gland in the body, the liver, is not responsible for one function mentioned below. The liver

(A) protects the gallbladder

(B) removes certain wastes from the body

(C) stores glycogen

(D) produces bile

86. In plants, which hormones can promote growth of plant parts?

(A) Cytokinin

(B) Only Auxin

(C) Only gibberellin

(D) Both auxin and gibberellin

87. Which of the following are commonly called warm blooded?

(A) Invertebrates and Fish

(B) Amphibian and Reptiles

(C) Reptiles and Birds

(D) Birds and Mammals

88. Global warming does not lead to

(A) Melting of ice caps

(B) Ozone hole

(C) Climate change

(D) Rising of levels of the sea

89. What is not true about the diaphragm?

(A) It is a muscular partition between the thorax and abdomen

(B) Diaphragm contracts and relaxes to make breathing possible

(C) It is dome shaped when relaxed

(D) It is heavily supplied with nerves and blood vessels

90. AIDS is caused by

(A) Bacteria

(B) HIV virus

(C) Zoster virus

(D) Eating junk food

91. Let x be the least number which upon being divided by 2, 3, 4, 5, 6 leaves in each case a remainder 1, but leaves no remainder when divided by 7. The sum of digits of x is

(A) 3   **(B) 4**

(C) 5   (D) 7

92. Let $a = 2^5 \times 3^6 \times 7^7$, $b = 2^5 \times 3^6 \times 7^8$,

$c = 2^5 \times 3^7 \times 7^9$ and $d = 2^4 \times 3^7 \times 7^{10}$

HCF of a, b, c and d is

(A) $96 \times (21)^6$

(B) $96 \times (21)^7$

(C) $112 \times (21)^6$

(D) $112 \times (21)^7$

93. If the price of an article is increased by 12% and the sale is decrease by 10%, then what will be the effect on the revenue ?

(A) 0.8% increase

(B) 0.8% decrease

(C) 8% increase

(D) 8% decrease

94. If 3a = 4b, 5b = 6c, 7c = 8d, then a: d is

(A) 35:32

(B) 32:35

(C) 35:64

(D) 64:35

95. A company reduces the number of its employees in the ratio 9:8 and increase their wages in the ratio 14:15. The bill of total wages of the employees

(A) Increases by 5%

(B) Increase by $4\dfrac{16}{21}\%$

(C) Decrease by $4\dfrac{16}{21}\%$

(D) Decrease by 5%

96. A vessel X contains a solution of two liquids A and B in the ratio 5:2 and another vessel Y contains the solution of the liquids A and B in the ratio 8:5. In what ratio should quantities be taken from X and Y so as to form a solution of A and B in the ratio 9:4?

(A) 2:7   **(B) 7:2**

(C) 3:7   (D) 7:3

97. 1.5 kg of sugar solution has 40% sugar in it. How much sugar (in kg) should be added to make it 50% in the solution?

(A) 0.5   (B) 0.45

(C) 0.3   (D) 0.25

98. A man buys a car at a cash down payment of Rs.1 lakh and another three equal annual installments of Rs.109760 each. If the rate of interest is 12% per annum compounded annually, then the present value (in Rs. of the car is
(A) **363625**　　(B) 340183
(C) 333625　　(D) 320183

99. A person borrowed a certain sum of money at 4% simple interest and in 8 years if the interest amounted to Rs.23120 less than the sum borrowed, than the sum (in Rs.) was
(A) 36000　　(B) 35500
(C) **34000**　　(D) 34500

100. A dealer bought an article at 40% discount on it original price. If he sold it at a 20% gain on the original price, then his percentage profit is
(A) 60　　(B) 80
(C) **100**　　(D) 120

101. A person buys a table listed at certain price and gets successive discounts of 10% and 20%. he spends 10% of the cost price on its transportation. If he finally sells it at Rs.9108 and gets a profit of 15% then the listed price of the article (in Rs.) is
(A) 11800　　(B) 11500
(C) 11000　　**(D) 10000**

102. A motor boat goes 10 km upstream and back again to the startign point in 55 minutes. If the stream is running at the speed of 2 km/hour, the speed in km/hour fo the motor boat in still water is
(A) 18　　(B) 20
(C) **22**　　(D) 24

103. A person travels for 3 hours at the speed of 42 km/hour and for $4\frac{1}{2}$ hours at the speed of 60 km/hour. Now he finds that she has covered $\frac{11}{20}$ of the total distance. At what average speed (km/hour) should she travel to cover the remaining distance in $4\frac{1}{2}$ hours?
(A) 62
(B) 72
(C) 78
(D) 82

104. Two pipes P and Q can fill up a tank with water in 24 hours and 40 hours respectively. Both the pipes are open simultaneously. If the tank is filled up in 16 hours, then the pipe Q must be turned off after
(A) 13 hours 20 minutes
(B) 12 hours 10 minutes
(C) 13 hours 30 minutes
(D) 12 hours 20 minutes

105. Four women and five men can finish a piece of work in 5 days whereas 12 men and 11 women can finish the same work in 2 days. The time (in days) taken by 2 men and one women to finish the same work is
(A) 10　　(B) 12
(C) 14　　(D) 15

106. The average of 100 numbers is 100. If the first number is increase by 1, second by 2, third by 3 and so on, then the average of the numbers so obtained exceeds the original average by
(A) 25.5　　(B) 50
(C) 50.5　　(D) 60

107. A class has 75 students and their average marks in an examination is 40. If the average marks of passed students is 60 and that of failed students is 35, then the percentage of students who passed the examination is
(A) 15　　**(B) 20**
(C) 25　　(D) 30

108. The roots of the equation $px^2 - 2(p+2)x + 3p = 0$, $p \neq 0$, differ by 2, then the values of p are
(A) $2, \dfrac{-2}{3}$　　(B) $-2, \dfrac{2}{3}$
(C) $-3, -1$　　(D) 1, 3

109. If $x^2 - 11x + k = 0$ and $x^2 - 14x + 2k = 0$, where $k \neq 0$, have a common root, then the value of k is
(A) 10　　(B) 12
(C) 20　　**(D) 24**

110. One of the factors of $(p + q)(q + r)(r + p) + pqr$ is:
(A) P+q-r　　(B) q+r-p
(C) p-q+r　　**(D) pq+qr+rp**

111. Factorization of $(x+1)(x+2)(x+3)(x+4) - 120$ is
(A) $(x-1)(x-6)(x^2+5x+16)$
(B) $(x+1)(x^2+5x+16)$
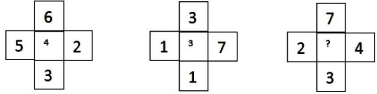(C) $(x-1)(x-6)(x^2+5x+16)$
(D) $(x-1)(x-6)(x^2-5x+16)$

112. If the sum of first n terms of an arithmetic progression is $3n^2+2n$, then its 100th term is
   (A) 499 **(B) 599**
   (C) 600 (D) 601

113. The sum of an infinite geometric series with first term 28 and the fourth term $\frac{4}{49}$ is
   (A) $49\frac{1}{3}$ (B) $35\frac{2}{3}$
   (C) $30\frac{1}{3}$ **(D) $32\frac{2}{3}$**

114. If $\cos\theta-\sin\theta = 1$ and $\tan\theta = m \sec^2\theta$, then the value of $\frac{l^2 + 2m}{2}$ is
   (A) $\frac{1}{2}$ (B) $\frac{1}{4}$
   (C) $\frac{2}{4}$ (D) 1

115. A person is standing on the ground and flying a kite with a strong of length 140 m at an angle of 30°. Another person is standing on the roof of a building 20 m high and is flying a kite at an angle of 45°. If both persons are on opposite sides of both the kites, the length (in m) of the string that the second person must have so that the two kites meets, is
   (A) 70 (B) $60\sqrt{2}$
   (C) $50\sqrt{2}$ (D) 50

116. To which period would rock engravings with geometrical designs like triangle, circle, square sun and flower belong?
   (A) Megalithic at the end of Neolithic
   (B) Paleolithic period to Chalcolithic.
   (C) End of Iron Age and beginning of Bronze age
   (D) End of Neolithic beginning of Iron Age

117. Which Gupta ruler does the historian Vincent Smith call 'The Napoleon of India'?
   (A) Samudragupta
   (B) Chandragupta I
   (C) Chandragupta II
   (D) Skanda Gupta

118. In which Movement was the slogan 'Do or Die' given and there were mass arrests
   (A) Home rule
   (B) Non Cooperation
   (C) Quit India Movement
   (D) Khilafat

119. Which one of the given process increases the length of the river?
   (A) Deepening of the gorge and excess water flows in
   (B) Headward erosion in a waterfall when the cap rock falls off.
   (C) Hard rocks fall into the channel and the river course changes
   (D) River water gets diverted by another river near the source

120. When the cyclones develop into storms they take away the energy of the monsoon depression. What is the effect of this on the India?
   (A) Weak monsoon over West Coast
   (B) Sea Surges in the Narmada
   (C) Stormy weather in the Arabian Sea
   (D) Upwelling of sea water and high tide.

121. Which of the following is not a positive effect of Foreign Direct Investment on the Indian Market?
   (A) Stimulates economic activity
   (B) Increase in prices
   (C) Cheaper goods for consumers
   (D) Increased employment

122. Why has the government excluded some wealthy groups from availing benefits related their status as backward classes?
   (A) Increase opportunity to be employed
   (B) Bring more backward groups for benefits
   (C) To ensure that there is equality
   (D) Increase the right of the poorest

123. Where in the constitution has it been stated that the Judiciary must be separated from the Executive?
   (A) Directive principles of State Policy
   (B) Fundamental Rights
   (C) Preamble of the Constitution
   (D) Schedules

124. What will be the special e-commerce facility offered by the Indian Postal Services?
   (A) Rural artisans can sell goods online
   (B) Farmers can buy seeds and fertilisers easily.
   (C) Health services in rural areas can be provided promptly
   (D) Same day delivery of letters to villages

125. Why have the Solar Panels been located over water canals in Gujarat?

    (A) Increase the temperature of the canal water

    (B) To reduce evaporation and generate electricity

    (C) Reduce the heating of the panels by cool water

    (D) Keeping the panels clean and dry.

126. What are the components of development?

    (A) Institutions, political structure, rights

    (B) Roads, electricity, banks

    (C) Savings, Insurance, Salries

    (D) Resources, environment, Food, health

127. What is special about the way the Commonwealth Games are inaugurated?

    (A) The Queen of England sends a baton which travels.

    (B) A fire is lit in London and then in the city of the Games

    (C) All athletes carry the flags of their country and the British flag

    (D) The mascot for each game is decided by the Queen of England.

128. Who is the captain of the women's hockey team of India?

    (A) Mamta Kharab

    (B) Suraj Lata Devi

    (C) Ritu Rani

    (D) Chanchana Devi

129. Which type of collaboration is India gettign from Singapore in building smart cities?

    (A) Expansion of tourism, building fast metros and railways and water purification

    (B) Information Technology management of cities, and efficient sewarage treatment

    (C) Cleaning the rivers, converting sea water to potable water and expanding facilities of ports.

    (D) Building the broad roads, and increasing the living areas for the urban poor

130. Which award was given to ISRO for the Lunar Probe Mission in 2009?

    (A) Sir Arthur Clarke Award

    (B) NASA award

    (C) Space Pioneer Award

    (D) IAF World Space Award

131. Which island will now on be the centre for immigration check of luxury cruises to India?

    (A) Kerala

    (B) Andaman Islands

    (C) Minicoy

    (D) Lakshwadweep Islands

132. In which one of the following scales of temperature are both freezing and boiling points of water higher than the others?

    (A) Reaumur scale

    (B) Kelvin scale

    (C) Fahrenheit scale

    (D) Centigrade scale

133. The unit of heat is calorie. 1 calorie yields the amount of heat required for raising the temperature of 1 gram of water by 1 degree centigrade from

    (A) 14.5 degree centigrade to 15.5 degree centigrade

    (B) 15.5 degree centigrade to 16.5 degree centigrade

    (C) 16.5 degree centigrade to 17.5 degree centigrade

    (D) 17.5 degree centigrade to 18.5 degree centigrade

134. Which one of the following types of lenses is used for correcting the defect of focus in the eye called astigmatism?

    (A) Prismatic Lens

    (B) Concave Lens

    (C) Convex Lens

    (D) Cylindrical lens

135. Presence of which salts cause the Temporary hardness of water?

    (A) Hydrogen Chloride and Sulphides

    (B) Carbonates Calcium and Magnesium

    (C) Sulphur and Silicates of Iron

    (D) Silicates Calcium and Magnesium

136. Salts of which of the following elements are used for providign colour to fireworks?

    (A) Strontium and Barium

    (B) Chromium and Nickel

    (C) Potassium and Mercury

    (D) Zinc and Sulphur

137. On the basis of which of the following compounds in the sweat from Human feet do the trained dogs track people?

    (A) Sulphuric Acid

    (B) Nitric Acid

    (C) Carboxylic Acid

    (D) Uric Acid

138. What is the result of having more vitamins and minerals than the body needs?

(A) Increased weight gain

(B) Memory loss

(C) Excessive sweating and lack of appetite

(D) Liver and Kidney failure

139. What are genes?

(A) Blood groups

(B) D.N.A. code

(C) Cells in bone marrow

(D) Type of human characteristic

140. Which part of the cell is called the 'power house' of the Cell?

(A) Mitochondria

(B) Plasma membrane"

(C) Ribosome

(D) Cytoplasm

141. Pointing to a photograph, a boy said, 'The man in the blue shirt is my father's brother's wife's father's son's sister's husband'. said a girl. He is her ......

(A) Father   (B) Grandfather

(C) Uncle   (D) Cousin

142. ROMAN : MANORRAMON :: CIDER : ?

The letters of the word ROMAN: MANORRAMON are related in a certain way. The same relationship holds for the second pair of terms on the right side of the :: sign of which one is missing. Find the missing one from the alternatives.

(A) RIDESSIRED

(B) DERCICEDIR

(C) DERICECDIR

(D) DERICCEDIR

143. What should be the missing term in the following number series?

61, 67, 71, 73, 79, 83, ..., 97,

(A) 89   (B) 87

(C) 85   (D) 91

144. Which is the next term in the following sequence of letter clusters?

PLaN, OJbP, NHcR, MFdT, LDeV,

(A) KBgX   **(B) KBfX**

(C) JCfX   (D) JBfX

145. Which is the odd number-pair?

(A) 14 – 392

(B) 13 – 338

(C) 15 – 480

(D) 16 – 512

146. In a code, LIBRARIANS IS CODED AS ILRBRAAISN. In that code, what will be the code for PHOSPHATIC?

(A) BMBKXSOBBK

(B) EMEKXSOBEK

(C) HPSOHPTACI

(D) BMBKXSOBEK

147. If, in a certain code language, FIN is written as 138, SAG as 246, ERR as 077 and RIG as 147, in that code language, GINGER will be written as:

(A) 314704   (B) 413407

(C) 314307   **(D) 013447**

148. I asked my aunt how old she was. Instead of giving a direct reply, she said 'When I am n yeard old, the year will be the square of n × n'. What was her age in 2010?

(A) 30   (B) 31

(C) 29   (D) 28

149. A shepherd taking rest in the shade of a tree woke up to find that one of his sheep was missing. He set out west looking for the sheep. After walking a short distance, he turned to the left and reached the bank of a river. Turning right there, he walked along the river bank and he noticed that he was walking against the flow of the river. In which direction does the river flow?

(A) North to South

(B) South to North

(C) East to West

(D) West to East

150. Choose the number missing in the thrid cross:

(A) 0   (B) 1

(C) 4   (D) 3