SRMJEEE UG - Model Paper

Question Paper

General Instructions

(i) **Duration:** The total duration of the examination is 2 hours 30 minutes (150 minutes).

(ii) **Total Marks:** The complete paper carries a maximum of 130 marks.

(iii) **Structure:** The paper has 4 Sections:

- **Section A:** 35 Multiple Choice Questions (Physics)
- **Section B:** 35 Multiple Choice Questions (Chemistry)
- **Section C:** 40 Multiple Choice Questions (Mathematics)
- **Section D:** 20 Multiple Choice Questions (English)

(iv) **Compulsory Questions:** All 130 questions are compulsory.

(v) Each question has four options. Only **one** option is correct.

(vi) **Right Answer:** +1 marks correct answer.

(vii) **Incorrect Answer:** (No Negative marking).

(viii) **Unanswered/Marked for Review:** 0 marks.

1. The density of a metal is calculated as follows. The weight of 57.4 grams is divided by the volume 6.2 cm^3. Using the approximate rule for significant figures in this calculation, the value of the density, in g/cm^3, should be reported as:

(A) 9

(B) 9.3

(C) 9.26

(D) 9.258

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2. If the Reynolds number is less than 2000, the flow in a pipe is

(A) Turbulent

(B) Laminar

(C) Transition

(D) None of the above

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3. Maximum load a structure can bear before its failure is called

(A) Normal Load

(B) Shear load

(C) Ultimate load

(D) Safety load

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4. Three point charges $q+Q,\ q,\ q-Q$ are enclosed by the surface S. What net flux crosses S?

(A) $3q$

(B) $2q$

(C) $3q-Q$

(D) cannot be determine based on the data given in question

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5. Number of electrons in one coulomb of charge will be

(A) 5.46×10^{23}

(B) 5.25×10^{18}

(C) 1.6×10^{-19}

(D) 9×10^{11}

---

6. Choose the vector physical quantity

(A) Electric flux

(B) Electric potential

(C) Electric potential energy

(D) Electric intensity

---

7. The voltage is a form of

(A) Kinetic energy

(B) Potential energy

(C) Mechanical energy

(D) Both kinetic and potential energy

---

8. A charge of 60 **C passes through an electric lamp in** 2 **minutes. Then the current in the lamp is**

(A) 30 A

(B) 1 A

(C) 0.5 A

(D) 5 A

---

9. Four wires of equal length and of resistance $3\ \Omega$ each are connected in the form of a square. The equivalent resistance between the diagonally opposite corners of the square is

(A) $12\ \Omega$

(B) $3/4\ \Omega$

(C) $6\ \Omega$

(D) $3\ \Omega$

---

10. The number of free electrons per cm of copper wire is 2×10^{21}. The average drift speed of the electrons is 0.25 mm/s. The current flowing is

(A) 0.8 A

(B) 8 A

(C) 80 A

(D) 800 A

---

11. The sensitivity of a potentiometer can be increased by

(A) Increasing the emf of the cell

(B) Decreasing the emf of the cell

(C) Increasing the length of the potentiometer wire

(D) Decreasing the length of the potentiometer wire

---

12. _____ is the rule used to know the direction of the induced current in the circuit.

(A) Fleming's left hand rule

(B) Fleming's right hand rule

(C) Right hand thumb rule

(D) Ampere's rule

---

14. As the earth rotates, the magnetic poles:

(A) stay the same

(B) change a little

(C) switch completely

(D) disappear

---

15. Induced EMF's are always in such a direction as to _____ the change that generated them

(A) oppose

(B) against

(C) favor

(D) unfavour

---

16. An electric circuit consists of a charged capacitor C, a resistor R and a switch S. Initially, the switch is open and all devices are connected in series. A circular loop of wire is placed in the same plane as the circuit. Which one of the following is true about the induced current in the loop after the switch is closed?

(A) it is clockwise and increases

(B) it is counter clockwise and increases

(C) it is clockwise and decreases

(D) it is counter clockwise and decreases

---

17. Two identical coaxial coils P and Q carrying equal amount of current in the same direction are brought nearer. The current in

(A) P increases while in Q decreases

(B) Q increases while in P decreases

(C) both P and Q increases

(D) both P and Q decreases

---

18. Alternating voltage (V) is represented by the equation

(A) $V(t) = V_m e^t$

(B) $V(t) = V_m \sin \omega t$

(C) $V(t) = V_m \cot \omega t$

(D) $V(t) = V_m \tan \omega t$

---

19. Power factor of the following circuit will be zero

(A) Resistance

(B) Inductance

(C) Capacitance

(D) Both (b) and (c)

---

20. The speed of electromagnetic waves in vacuum is

(A) 30×10^8 ms^{-1}

(B) 4×10^8 ms^{-1}

(C) 3.0×10^8 ms^{-1}

(D) 3.0×10^9 ms^{-1}

---

21. Rays that are used in taking photos during conditions of smoke, darkness is

(A) X-rays

(B) Gamma rays

(C) Ultraviolet rays

(D) Infrared rays

---

22. Angle which is formed between normal ray and ray entering a medium is known as

(A) critical angle

(B) angle of incidence

(C) angle of reflection

(D) angle of refraction

---

23. In projectors _____ lenses are used

(A) Convex

(B) Concave

(C) Bipolar

(D) Convex lens and Concave

---

24. Dispersion can be noticed by passing a white light through

(A) glass

(B) mirror

(C) water

(D) prism

---

25. Red light is used for signals because it has

(A) long wavelength

(B) high intensity

(C) high frequency

(D) low refraction in the medium

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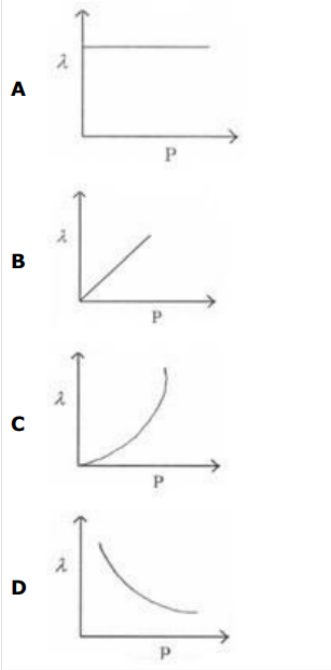
26. Kinetic energy of photo electron E_K changes with frequency (f) of light. Which of the following graph represents this emission?



(A) Graph A

(B) Graph B

(C) Graph C

(D) Graph D

---

27. If the kinetic energy of a free electron doubles, its de Broglie wavelength changes by the factor

(A) 2

(B) $1/2$

(C) $\sqrt{2}$

(D) $1/\sqrt{2}$

---

28. Light of two different frequencies whose photons have energies 1 eV and 2.5 eV respectively, successively illuminate a metallic surface whose work function is 0.5 eV. Ratio of maximum speeds of emitted electrons will be

(A) 1 : 2

(B) 1 : 5

(C) 1 : 1

(D) 1 : 4

---

29. If the energy of a particle is reduced to half then the percentage increase in the de-Broglie wavelength is about

(A) 100%

(B) 61%

(C) 34%

(D) 41%

---

30. Which of the following particles has a lepton number of +1?

(A) H^+

(B) μ^-

(C) e^+

(D) p

---

31. α-particles of energy 400 keV are bombarded on nucleus of ^{82}Pb. In scattering of α-particles, its minimum distance from nucleus will be

(A) 0.59 nm

(B) 0.59 Å

(C) 5.9 pm

(D) 0.59 pm

---

32. Two protons are kept at a distance of 40×10^{-10} m. F_n is the nuclear force and F_e is the electrostatic force between them. Then

(A) $F_n \gg F_e$

(B) $F_n = F_e$

(C) $F_n \ll F_e$

(D) $F_n \neq F_e$

---

33. The inputs of a NAND gate are connected together. The resulting circuit is _____

(A) OR gate

(B) AND gate

(C) NOT gate

(D) None of the above

---

34. The current in a semiconductor is produced by

(A) electrons only

(B) holes only

(C) negative ions

(D) both electrons and holes

---

35. The V-I curve for a diode shows

(A) the voltage across the diode for a given current

(B) the amount of current for a given bias voltage

(C) the power dissipation

(D) voltage amplification

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36. The molecular mass of acetic acid dissolved in water is 60 and when dissolved in benzene it is 120. This difference in behaviour of CH_3COOH is because

(A) Water prevents association of acetic acid

(B) Acetic acid does not fully dissolve in water

(C) Acetic acid fully dissolves in benzene

(D) Acetic acid does not ionize in benzene

---

37. One mole of component X and two moles of component Y are mixed at room temperature to form an ideal binary solution. The ΔH_{mix} is

(A) 0

(B) 2

(C) 3

(D) 1

---

38. An increase in equivalent conductance of a strong electrolyte with dilution is mainly due to

(A) Increase in both i.e. number of ions and ionic mobility of ions.

(B) Increase in number of ions

(C) Increase in ionic mobility of ions

(D) 100% ionization of electrolyte at normal dilution

---

39. Saturated solution of KNO_3 is used to make salt bridge because

(A) Velocity of K^+ is greater than that of NO_3^-

(B) Velocity of NO_3^- is greater than that of K^+

(C) Velocity of both K^+ and NO_3^- are nearly the same

(D) KNO_3 is highly soluble in water

---

40. The half-cell reaction for the SHE is given by

(A) $2H^+(aq) + 2e^- \rightleftharpoons 2H_2(g)$

(B) $2H^+(aq) + 2e^- \rightleftharpoons H_2(g)$

(C) $H^+(aq) + e^- \rightleftharpoons H_2(g)$

(D) $Hg_2^{2+}(aq) + 2e^- \rightleftharpoons 2Hg(l)$

---

41. What will be the order of the reaction when the initial concentration is doubled the time of half reaction is doubled?

(A) Third

(B) Second

(C) Zero

(D) First

---

42. Surface tension of lyophilic sol is

(A) greater than H_2O

(B) equal to H_2O

(C) less than H_2O

(D) none of these

---

43. Name the method used for separation of sulphide ores?

(A) Hydraulic washing

(B) Magnetic separation

(C) Froth floatation

(D) Leaching

---

44. P_4 **reacts with** X **selectively to give** P_4O_6**. The** X **is**

(A) A mixture of O_2 and N_2

(B) $KMnO_4$

(C) Jones reagent

(D) $K_2Cr_2O_7$

---

45. ICl_2^- **is isostructural with**

(A) XeF_2

(B) $SbCl_3$

(C) $BaCl_2$

(D) TeF_2

---

46. Helium is preferred to be used in balloons instead of hydrogen because it is

(A) Incombustible

(B) Lighter than hydrogen

(C) More abundant than hydrogen

(D) Non-polarizable

---

47. Which of the following transition metal ion has magnetic moment 3.87 **BM?**

(A) Mn^{2+}

(B) Co^{3+}

(C) Fe^{2+}

(D) Co^{2+}

---

48. Lanthanoids are difficult to purify due to their

(A) large size

(B) similar chemical and physical properties

(C) paramagnetic nature

(D) radioactivity

---

49. Correct order of ionic radius of the following Ln^{3+} ions is

(A) $Ho > Lu > Ce > Sm$

(B) $Lu > Ce > Ho > Sm$

(C) $Ce > Sm > Ho > Lu$

(D) $Lu > Ho > Sm > Ce$

---

50. _____ ion forms colored aqua complexes.

(A) Cu^{2+}

(B) Zn^{2+}

(C) Ti^{4+}

(D) Mn^{7+}

---

51. A ligand can also be regarded as

(A) Lewis acid

(B) Bronsted base

(C) Lewis base

(D) Bronsted acid

---

52. Monomer which is used to make Poly Vinyl Chloride (PVC) is called

(A) chloroethene

(B) chloromethane

(C) chloropropane

(D) chlorobutane

---

53. Which carbon-halogen bond has the lowest bond enthalpy?

(A) C-Br

(B) C-Cl

(C) C-F

(D) C-I

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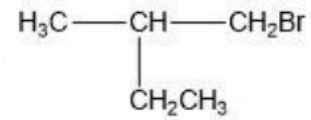
54. What is the correct IUPAC name of the given compound?



(A) 1-Bromo-2-ethylpropane

(B) 1-Bromo-2-ethyl-2-methyl ethane

(C) 1-Bromo-2-methylbutane

(D) 2-Methyl-1-bromobutane

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55. Molecules whose mirror image is non-superimposable over them are known as chiral. Which of the following molecules is chiral in nature?

(A) 2-Bromobutane

(B) 1-Bromobutane

(C) 2-Bromopropane

(D) 2-Bromopropan-2-ol

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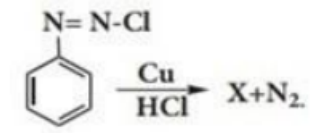
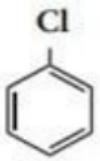
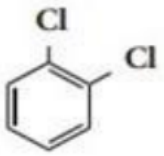
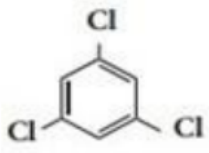
56. In the given reaction, X is _____.



A 

B 

C 

D 

(A) Benzene

(B) Chlorobenzene

(C) 1,2-Dichlorobenzene

(D) 1,3,5-Trichlorobenzene

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57. Benzoyl chloride can be prepared from benzoic acid by

(A) SO_2Cl_2

(B) Cl_2/Light

(C) $SOCl_2$

(D) $Cl_2 + H_2O$

---

58. Phenol can be converted to *o*-hydroxybenzaldehyde by

(A) Riemer-Tiemann reaction

(B) Tischenko reaction

(C) Sandmeyer reaction

(D) Wurtz reaction

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59. What happens when glycol reacts with lead tetraacetate?

(A) No reaction

(B) Ketones will be formed

(C) Aldehyde will not be formed

(D) Monohydric alcohols will be formed

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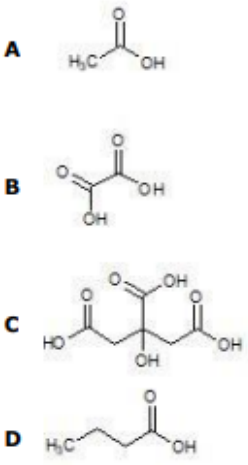
60. Which of the following acids is manufactured using sawdust?



(A) Option A structure

(B) Option B structure

(C) Option C structure

(D) Option D structure

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61. Hydrolysis of $CH_3CH_2NO_2$ with 85% H_2SO_4 gives which of the following compound

(A) CH_3CH_2OH

(B) C_2H_6

(C) CH_3CHNO

(D) CH_3COOH

---

62. The hydrolysis of an ester (A) gives an Acid (B) and an Alcohol (C). The acid (B) reduces Fehling solution. Oxidation of the alcohol (C) gives the acid (B). The ester (A) is

(A) Methyl formate

(B) Ethyl formate

(C) Methyl acetate

(D) Ethyl acetate

---

63. Which of the following statement about primary amines is false?

(A) Alkyl amines are stronger bases than aryl amines

(B) Alkyl amines react with nitrous acid to produce alcohols

(C) Aryl amines react with nitrous acid to produce phenols

(D) Alkyl amines are stronger bases than ammonia

---

64. Nucleic acid is a polymer of

(A) Nucleosides

(B) Amino acids

(C) Nucleotides

(D) Glucose

---

65. Which is not a macromolecule

(A) DNA

(B) Starch

(C) Palmitate

(D) Insulin

---

66. Sugars are

(A) Optically active polyhydroxy aldehydes

(B) Optically active polyhydroxy ketones

(C) Optically active polyhydroxy aldehydes or ketones

(D) Polyhydroxy aldehydes or ketones which may or may not be optically active

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67. Rayon yarns are obtained from

(A) Polymethylene

(B) Polyesters

(C) Cellulose

(D) Styrene

---

68. Terylene is the polymer of

(A) Melamine and formaldehyde

(B) Ethylene glycol and terephthalic acid

(C) Vinyl chloride and formaldehyde

(D) Hexamethylene diamine and adipic acid

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69. Condensation product of caprolactam is

(A) Nylon-6

(B) Nylon-66

(C) Nylon-60

(D) Nylon-6,10

---

70. An azo dye is fixed on fabrics by the process applicable in

(A) Vat dyes

(B) Mordant dyes

(C) Developed dyes

(D) Substantive dyes

---

71. The domain of the function $f(x) = \sqrt{x-1} + \sqrt{6-x}$ is

(A) $[0, \infty)$

(B) $(-\infty, 6)$

(C) $[1, 6]$

(D) None of these

---

72. Let R be a relation in N defined by $R = \{(x, y) : x + 2y = 8\}$. The range of R is

(A) $\{2, 4, 6\}$

(B) $\{1, 2, 3\}$

(C) $\{1, 2, 3, 4, 6\}$

(D) None of these

---

73. Two finite sets have m and n elements. Then total number of subsets of the first set is 56 more than that of the total number of subsets of the second. The value of m and n are

(A) $7, 6$

(B) $6, 3$

(C) $5, 1$

(D) $8, 7$

---

74. If $aN = \{ax : x \in N\}$ and $bN \cap cN = dN$ where $b, c \in N$ are relatively prime then

(A) $d = bc$

(B) $c = bd$

(C) $b = cd$

(D) $a = bd$

---

75. If a, b are the roots of $x^2 + px + 1 = 0$ and c, d are the roots of $x^2 + qx + 1 = 0$, the value of $E = (a - c)(b - c)(a + d)(b + d)$ is

(A) $p^2 - q^2$

(B) $q^2 - p^2$

(C) $q^2 + p^2$

(D) $(p + q)^2$

---

76. If α, β are the roots of $ax^2 + bx + c = 0$ and $\alpha + h, \beta + h$ are the roots of $px^2 + qx + r = 0$, then $h =$

(A) $\left[\frac{b}{a} - \frac{q}{p}\right]$

(B) $\frac{1}{2}\left[\frac{b}{a} - \frac{q}{p}\right]$

(C) $-\frac{1}{2}\left[\frac{a}{b} - \frac{p}{q}\right]$

(D) $\frac{1}{2}\left[\frac{a}{b} - \frac{p}{q}\right]$

---

77. The common roots of the equations $x^3 + 2x^2 + 2x + 1 = 0$ and $1 + x^{2002} + x^{2003} = 0$ are (where ω is a complex cube root of unity)

(A) ω, ω^2

(B) $1, \omega^2$

(C) $-1, -\omega$

(D) $\omega, -\omega^2$

---

78. The area of the triangle whose vertices are $(3, 8)$, $(-4, 2)$ and $(5, 1)$ is

(A) $63/2$

(B) $61/2$

(C) $59/2$

(D) $57/2$

---

79. The largest value of the third determinant whose elements are equal to 1 or 0 is

(A) 0

(B) 2

(C) 4

(D) 6

---

80. If $A = (a_{ij})$ is a 3×3 diagonal matrix such that $a_{11} = 1$, $a_{22} = 2$ and $a_{33} = 3$, then $|A|$

(A) 6

(B) 7

(C) -6

(D) -7

---

81. If the determinant of the matrix

$$\begin{vmatrix} 1 & 3 & 2 \\ 0 & 5 & -6 \\ 2 & 7 & 8 \end{vmatrix}$$

is 26**, then the determinant of the matrix**

$$\begin{vmatrix} 2 & 7 & 8 \\ 0 & 5 & -6 \\ 1 & 3 & 2 \end{vmatrix}$$

is

(A) -26

(B) 26

(C) 0

(D) 52

---

82. The lines $px + qy + r = 0$**,** $qx + ry + p = 0$ **and** $rx + py + q = 0$ **are concurrent if**

(A) $pq + qr + rp = 0$

(B) $p^2 + q^2 + r^2 = 2pqr$

(C) $p^3 + q^3 + r^3 = 3pqr$

(D) $p^4 + q^4 + r^4 = 4pqr$

---

83. If A **and** B **are two square matrices of order** 3 **such that** $|A| = -2,\ |B| = 5$**, then** $|4AB| =$

(A) -40

(B) -256

(C) -640

(D) -90

---

84. If A and B are two skew symmetric matrices of the same order then AB is skew symmetric if and only if

(A) $AB + BA = 0$

(B) $AB - BA = 0$

(C) $AB + BA = 1$

(D) $AB - BA = 1$

---

86. In a class tournament when the participants were to play one game with another, two class players fell ill, having played three games each. If the total number of games played is 84, the number of participants at the beginning was

(A) 15

(B) 30

(C) 78

(D) 48

---

87. Rajdhani express going from Bombay to Delhi stops at five intermediate stations ten passengers enter the train during the journey with ten different tickets of two classes. The number of different sets of tickets they may have is

(A) ${}^{15}C_{10}$

(B) ${}^{20}C_{10}$

(C) ${}^{30}C_{10}$

(D) ${}^{40}C_{10}$

---

88. N different objects can be arranged taken all at a time in

(A) $(N-1)!$ ways

(B) $(N+1)!$ ways

(C) $N!$ ways

(D) $(2N)!$ ways

---

89. A locker in bank has 3 digit lock. Mahesh forgot his password and was trying all possible combinations. He took 6 seconds for each try. The problem was that each digit can be from 0 to 9. How much time will be needed by Mahesh to try all the combinations?

(A) 90 minutes

(B) 120 minutes

(C) 60 minutes

(D) 100 minutes

---

90. If $C_r = {}^{10}C_r$, then

$$2C_0 + \frac{2^2}{2}C_1 + \frac{2^3}{3}C_2 + \cdots + \frac{2^{11}}{11}C_{10}$$

is equal to:

(A) $\frac{3^{11}-1}{11}$

(B) $\frac{2^{11}-1}{11}$

(C) $\frac{3^{11}-1}{12}$

(D) $\frac{2^{11}-1}{12}$

---

91. If α, β are the roots of $x^2 - 3x + a = 0$, and γ, δ are the roots of $x^2 - 12x + b = 0$, and the numbers $\alpha, \beta, \gamma, \delta$ in order form an increasing G.P., then:

(A) $a = 3, b = 12$

(B) $a = 12, b = 3$

(C) $a = 2, b = 32$

(D) $a = 4, b = 16$

---

92. If the product of three positive real numbers say a, b, c be 27, then the minimum value of $ab + bc + ca$ is equal to

(A) $27^{4/3}$

(B) $27^{1/3}$

(C) $27^{2/3}$

(D) 27

---

93. If $x^2 + y^2 = t - \frac{1}{t}$ and $x^4 + y^4 = t^2 + \frac{1}{t^2}$, then $\frac{x}{y}\frac{dy}{dx}$ is equal to

(A) 1

(B) t

(C) -1

(D) $-t$

---

94. The value of c satisfied by Rolle's theorem for the function $f(x) = \log\left(\frac{x^2+6}{5x}\right)$ in the interval $[2, 3]$ is

(A) $\sqrt{6}$

(B) $-\sqrt{6}$

(C) $5\sqrt{6}$

(D) $-5\sqrt{6}$

---

95. Find the solution of $(x^2 - 3y^2)dx + 2xydy = 0$

(A) $x^2 - y^2 = kx^2$

(B) $y^2 - x^2 = kx^3$

(C) $y^2 - x^2 = -kx^3$

(D) $x^2 - y^2 = -kx^2$

---

96. If $I = \int_0^1 \frac{x^2}{1+x^6}\,dx$, then $I =$

(A) $\frac{\pi}{8}$

(B) $\frac{\pi}{4}$

(C) $\frac{\pi}{12}$

(D) $\frac{\pi}{2}$

---

97. The distance between the circumcenter and orthocenter of the triangle whose vertices are $(0,0)$, $(6,8)$ and $(-4,3)$ is

(A) $\frac{125}{8}$ units

(B) $\frac{\sqrt{5}}{2}$ units

(C) $\frac{5\sqrt{5}}{2}$ units

(D) $5\sqrt{5}$ units

---

98. The lines $2x-3y=5$ and $3x-4y=7$ are the diameters of a circle of area 154 sq.unit. The equation of this circle is

(A) $x^2+y^2+2x-2y=62$

(B) $x^2+y^2+2x-2y=47$

(C) $x^2+y^2-2x+2y=47$

(D) $x^2+y^2-2x+2y=62$

---

99. If $\vec{a}=2\hat{i}+\hat{j}-8\hat{k}$ and $\vec{b}=\hat{i}+3\hat{j}-4\hat{k}$, then the magnitude of $\vec{a}+\vec{b}$ is

(A) 13

(B) $\frac{13}{3}$

(C) $\frac{3}{13}$

(D) $\frac{4}{13}$

---

100. The point of intersection of the lines

$$\frac{x-6}{-6} = \frac{y+4}{4} = \frac{z-4}{-8}$$

and

$$\frac{x+1}{2} = \frac{y+2}{4} = \frac{z+3}{-2}$$

is

(A) $(0, 0, -4)$

(B) $(1, 0, 0)$

(C) $(0, 2, 0)$

(D) $(1, 2, 0)$

---

101. If $|\vec{a} + \vec{b}| = |\vec{a} - \vec{b}|$, then

(A) $\vec{a}$ is parallel to $\vec{b}$

(B) $\vec{a}$ is perpendicular to $\vec{b}$

(C) $|\vec{a}| = |\vec{b}|$

(D) $\vec{a}$ and $\vec{b}$ are unit vectors

---

102. $\begin{vmatrix} x_1 & y_1 \\ x_2 & y_2 \end{vmatrix}$ represents the area of

(A) Circle

(B) Ellipse

(C) Triangle

(D) Parallelogram

---

103. A random variable X has the following probability mass function as follows:

X	-2	3	1
$P(X=x)$	$\frac{a}{6}$	$\frac{a}{4}$	$\frac{a}{12}$

Then the value of a is

(A) 1

(B) 2

(C) 3

(D) 4

---

104. The diameter of an electric cable X is a continuous random variable with probability density function

$$f(x) = kx(1-x), \quad 0 \le x \le 1.$$

Find

$$P\left(X < \frac{1}{2} \,\middle|\, \frac{1}{3} < X < \frac{2}{3}\right)$$

(A) $\frac{1}{4}$

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

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

(D) $\frac{3}{4}$

---

105. The mean of a binomial distribution is 5 and its standard deviation is 2. Then the value of n and p are

(A) $\left(\frac{4}{5}, 25\right)$

(B) $\left(25, \frac{4}{5}\right)$

(C) $\left(\frac{1}{5}, 25\right)$

(D) $\left(25, \frac{1}{5}\right)$

---

106. A coin is biased so that a head is twice as likely to occur as a tail. If the coin is tossed 3 times, what is the probability of getting 2 tails and 1 head.

(A) 2/9

(B) 1/9

(C) 2/27

(D) 4/27

---

107. If $\triangle ABC$ and $\triangle PQR$ are similar triangles in which $\angle A = 47^\circ$ and $\angle Q = 83^\circ$, then $\angle C$ is

(A) 60°

(B) 70°

(C) 90°

(D) 50°

---

108. Two adjacent angles are said to form a linear pair of angles, if their non-common arms are two

(A) adjacent rays

(B) linear rays

(C) Multiple rays

(D) opposite rays

---

109. If $\sin\theta = \frac{24}{25}$ and $0^\circ < \theta < 90^\circ$, then what is the value of $\cos\theta$?

(A) $\frac{12}{15}$

(B) $\frac{7}{25}$

(C) $\frac{3}{5}$

(D) $\frac{4}{5}$

---

110. Rewrite the expression as single function of an angle, if

$$\frac{2\tan 31^\circ}{1-\tan^2 31^\circ} = ?$$

(A) $\tan 62^\circ$

(B) $\tan 31^\circ$

(C) $\tan 15^\circ$

(D) $\tan 10^\circ$

---

111. According to the passage, why does water travel through plants in unbroken columns?

(A) Root pressure moves the water very rapidly.

(B) The attraction between water molecules is strong.

(C) The living cell of plants pushes the water molecules together.

(D) Atmospheric pressure supports the columns.

---

112. All the following may be components of a virus EXCEPT

(A) RNA

(B) Plant cells

(C) Carbohydrates

(D) a coat of protein

---

113. The synonym of 'profusion' is

(A) abundance

(B) bleed

(C) blend

(D) express

---

114. All the following sentences about Nicaraguan sign language are true EXCEPT

(A) The language has been created since 1979.

(B) The language is based on speech and lip reading.

(C) The language incorporates signs which children used at home.

(D) The language was perfected by younger children.

---

115. Which idea is presented in the final paragraph?

(A) English was probably once a creole.

(B) The English past tense system is inaccurate.

(C) Linguists have proven that English was created by children.

(D) Children say English past tenses differently from adults.

---

116. Enjoyment is the motto of the

(A) youth who usher humanity into the third millennium

(B) youth who rebel against the establishment

(C) youth looking for an alternative mode of development

(D) vast majority of the youth today

---

117. Summer vacation in old time means

(A) Grand get together with friends

(B) Recalling father’s tales

(C) Playing modern Indian games

(D) Enjoying with family members

---

118. What does "a good conversationalist" refer to?

(A) sympathetic communicator

(B) efficient communicator

(C) who reads others emotion and talk accordingly

(D) who can talk pleasantly to ameliorate the situation

---

119. In the given passage who considers Interviews to be immoral?

(A) V.S. Naipaul

(B) Rudyard Kipling

(C) Mark Twain

(D) Rudyard Kipling and Mark Twain

---

120. According to the author, what is the benefit of public reasoning or argumentation?

(A) It produces a rich and dynamic democracy.

(B) It creates chaos and public disagreements that make governing difficult.

(C) It allowed the British to divide and rule Indians.

(D) By promoting arguments and discord it hurts the cause of secularism.

---

121. The author is making a comparison between

(A) Science-fiction and Epics

(B) Science fiction and non-fiction

(C) Science-Fiction and Romance

(D) Pulp Fiction and Epics

---

123. Based on the given passage which of the following statements is true

(A) Human beings are awfully close to their material possessions

(B) Civilizations are built through great efforts.

(C) One must always try to acquire better things.

(D) Human existence is casual and haphazard.

---

124. The word 'cavalier' as used in the passage means all of the following except

(A) Haughty

(B) Rash

(C) Prudent

(D) Frenetic

---

125. The expression $x^2 - x + 1 = 0$ has

(A) One proper linear factor

(B) Two proper linear factors

(C) No proper linear factor

(D) Cannot be determined

---

126. If '+' means 'divided by', '-' means 'add', ' ' means 'minus' and '/' means 'multiplied by', what will be the value of the following expression?

$\{(17\ 12) - (4/2)\} + (23 - 6)$**/0**

(A) infinite

(B) 0

(C) 118

(D) 219

---

127. Starting from a Point 'M' Harish walked 18 m towards South. He turned to his left and walked 5m. He then turned to his left and walked 18 m. He again turned to his left and walked 35 m and reached a point 'P'. How far is Harish from the point 'M' and in which direction?

(A) 10 m East

(B) 10 m South

(C) 10 m West

(D) None of these

---

128. $(1+\tan A+\sec A)(1+\sec A-\tan A)-2\sec A=$

(A) 0

(B) -2

(C) 1

(D) 2
