

BSc OTT – 10+2 Maths

1. Which is the correct IV drip rate for 1000 ml over 8 hours using a 20 drops/ml set?
 - A. 25 drops/min
 - B. 33 drops/min
 - C. 42 drops/min
 - D. 50 drops/min
2. The most effective non-verbal way to express feelings of comfort, love, affection, anger, etc. is through
 - A. Gesticulation
 - B. Eye contact
 - C. Touch
 - D. Posture and gate
3. Which organ is affected by hepatitis?
 - A. Heart
 - B. Liver
 - C. Kidney
 - D. Lungs
4. Which condition requires airborne precautions?
 - A. Tuberculosis
 - B. Influenza
 - C. Hepatitis B
 - D. Urinary tract infection
5. Which of the following is the fastest route of absorption of a drug?
 - A. Intravenous
 - B. Subcutaneous
 - C. Intramuscular
 - D. Intradermal
6. Which of the following is known as the fifth vital sign?
 - A. Pain
 - B. Blood pressure
 - C. Respiration
 - D. Temperature
7. Professional values provide the foundation for nursing practice and guide nurses' interactions with patients. Which of the following is the professional value?
 - A. Altruism
 - B. Advocacy
 - C. Prizing
 - D. Acting
8. A written statement of policies and principles that guides the behaviour of the professionals is
 - A. Etiquette
 - B. Code of ethics
 - C. Standards
 - D. Guidelines
9. Self-talk is an example of which level of communication?
 - A. Interpersonal communication
 - B. Intrapersonal communication
 - C. Large group communication
 - D. Small group communication
10. Providing a review of the main points covered in an interaction with the patient is called
 - A. Reflecting
 - B. Interpreting
 - C. Summarizing
 - D. Restating
11. Which of the following actions supports patient dignity?
 - A. Leaving the patient uncovered
 - B. Speaking loudly about their condition
 - C. Maintaining privacy during care
 - D. Ignoring patient questions
12. Which one of the following is a common sign of dehydration in patients?
 - A. Sweating
 - B. Pale skin
 - C. Dry mucous membranes
 - D. Increased urination
13. The safest way to identify a patient before giving medication is
 - A. Ask the patient's name and check wrist band
 - B. Ask the relative
 - C. Check bed number
 - D. Check with roommate
14. What is the normal range of adult body temperature in Celsius?
 - A. 34.5- 35.5°C
 - B. 36.5- 37.5°C
 - C. 38.5- 39.5°C
 - D. 35.0- 36.0°C

15. Which is a key indicator of effective communication in patient care?

- A. Short conversations
- B. Patient nodding
- C. Patient's understanding and cooperation
- D. Use of complex medical terms

16. Select the odd one out-

- A. Neck
- B. Eyes
- C. Nose
- D. Tongue

17. Antiseptics are used to-

- A. Clean wounds
- B. Make skin soft
- C. Reduce fever
- D. Numb pain

18. What is First aid?

- A. A substitute for treatment
- B. A preventive measure
- C. An emergency care before professional help
- D. None of the above

19. What is the first step of nursing process?

- A. Diagnosis
- B. Assessment
- C. Planning
- D. Evaluation

20. What does the red cross on a white background symbolize?

- A. Medical stores
- B. Military hospital
- C. International humanitarian aid
- D. Blood donation

21. An object is dropped from a height h .

It hits the ground with a certain momentum p . If the same object is dropped from a height 100% more than the previous height, the momentum when it hits the ground will change by

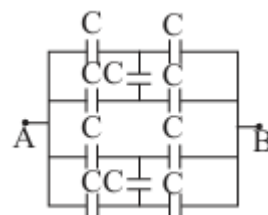
- A. A. 68%
- B. B. 41%
- C. C. 200%
- D. D. 100%

22. The density of ice is x gram/litre and that of water is y gram/litre. What is the

change in volume when m gram of ice melts?

- A. A. $mx y (x - y)$
- B. B. $\frac{m}{y-x}$
- C. C. $m \left(\frac{1}{y} - \frac{1}{x} \right)$
- D. D. $\frac{y-x}{x}$

23. The effective capacitance of combination of equal capacitors between points A and B shown in figure is:



- A. $2C$
- B. $3C$
- C. C
- D. $C/2$

24. Which of the following physical quantity is NOT dimensionless?

- A. Refractive Index
- B. Relative velocity
- C. Relative density
- D. Angular displacement

25. A proton and an α -particle enter a uniform v field at right angles to it with same velocity. The time period of revolution of α -particle as compared to that of proton, will be

- A. four times
- B. two times
- C. half
- D. one fourth

26. The angle of incidence of a ray falling on a plane mirror is 30° . The deviation produced by the plane mirror is

- A. 120°
- B. 90°
- C. 60°
- D. 30°

27. A wheel rotates with a constant acceleration of 2.0 rad/s^2 . If the wheel starts from rest, the number of revolutions it makes in first 10 seconds is (approx):

A. 8
B. 16
C. 24
D. 32

28. A monoatomic gas ($\gamma = 5/3$) at pressure P is suddenly compressed to $1/64$ th of its volume adiabatically. Then, pressure of gas is:

A. $8 P$
B. $14 P$
C. $256 P$
D. $1024 P$

29. A parallel beam of light of wavelength 600 nm is incident normally on a slit of width d . If the distance between the slits and the screen is 0.8 m and the distance of 2nd order maximum from the centre of the screen is 15 mm . The width of the slit is:

A. $180 \mu\text{m}$
B. $18 \mu\text{m}$
C. $80 \mu\text{m}$
D. $800 \mu\text{m}$

30. A radioactive decay can form an isotope of the original nucleus with the emission of particles:

A. four α and one β
B. one α and one β
C. one α and two β
D. one α and four β

31. If the ratio of the concentration of electrons and of holes in a semiconductor is $7/5$ and the ratio of currents is $7/4$ then the ratio of their drift velocities:

A. $4/7$
B. $5/4$
C. $5/7$
D. $4/5$

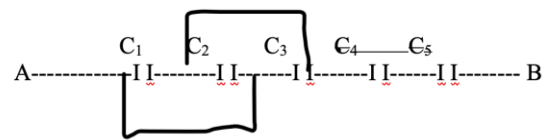
32. The near point and far point of a person are 40 cm and 250 cm respectively. Determine the power of the lens he/she should use while reading a book kept at a distance 25 cm from the eye.

A. 2.5 D
B. 5.0 D
C. 1.5 D
D. 3.5 D

33. A body has a charge of $-2 \mu\text{C}$. If it has 2.5×10^{13} proton, then the number of electrons in the body is:

A. 3.75×10^{13}
B. 1.25×10^{13}
C. 2.5×10^{13}
D. 1.25×10^{13}

- 34.



Given that each capacitor is of $2 \mu\text{F}$
The equivalent capacitance between A and B in the combination is:

A. $7/6 \mu\text{F}$
B. $6/7 \mu\text{F}$
C. $5/7 \mu\text{F}$
D. $7/5 \mu\text{F}$

35. By what percentage will the illumination of the lamp decrease if the current drops by 20% ?

A 46%
B 26%
C 36%
D 56%

36. Consider a galvanometer shunted with 5Ω resistance and 2% of current passes through it. The resistance of the galvanometer is:

A. 344Ω
B. 245Ω
C. 226Ω
D. 300Ω

37. Which of the following has its permeability less than that of free space?
 A. Copper
 B. Aluminium
 C. Copper chloride
 D. Nickel
38. A square shaped coil of side 10 cm, having 100 turns is placed perpendicular to a magnetic field which is increasing at 1 T/s. The induced emf in the coil is:
 A. 0.1 V
 B. 0.5 V
 C. 0.75 V
 D. 1.0 V
39. In a series LCR – circuit $L = 2 \text{ mH}$, $C = 0.2 \mu\text{F}$ and $R = 30 \Omega$ is connected to an a.c. source of variable frequency. The impedance of this circuit will be minimum at a frequency of:
 A. $10^5/4\pi \text{ Hz}$
 B. $10^5/2\pi \text{ Hz}$
 C. $10^4/4\pi \text{ Hz}$
 D. $10^4/2\pi \text{ Hz}$
40. A solid sphere and a hollow sphere of equal diameters are raised to the same potential. Then,
 A. hollow sphere has more charge
 B. both have equal charge
 C. only hollow sphere has charge
 D. solid sphere has more charge
41. According to modern periodic law, the physical and chemical properties of elements are periodic function of
 A. Atomic mass
 B. Atomic number
 C. Mass number
 D. Effective nuclear charge
42. The general electronic configuration of non-transition elements Zn, Cd, Hg is
 A. $(n-1)d^{10}ns^2$
 B. $(n-1)d^{10}ns^1$
 C. $(n-1)d^9ns^2$
 D. $(n-1)d^8ns^2$
43. Low concentration of oxygen in the blood and tissues of people living at high altitude is due to
 A. Low temperature
 B. Low atmospheric pressure
 C. High atmospheric pressure
 D. Both low temperature and high temperature
44. A device that converts energy of combustion of fuels like hydrogen and methane directly into electrical energy is known as
 A. dynamo
 B. Ni-Cd cell
 C. fuel cell
 D. electrolytic cell
45. X has 2 valence electrons Y has 5 valence electrons. The formula of compound is
 A. X_2Y_3
 B. XY
 C. XY_2
 D. X_3Y_2
46. Which of the following has intra molecular H-Bonding?
 A. p-nitro phenol
 B. o-nitro phenol
 C. m-nitro phenol
 D. All of these

47. Which of the following statement about transition element is not correct?

- A. They show variable oxidation states.
- B. They exhibit diamagnetic and paramagnetic properties.
- C. All ions are coloured.
- D. They exhibit catalytic property.

48. When 1 mol $\text{CrCl}_3 \cdot 6\text{H}_2\text{O}$ is treated with excess of AgNO_3 , 3 mol of AgCl are obtained. The formula of the complex is

- A. $[\text{CrCl}_3(\text{H}_2\text{O})_3] \cdot 3\text{H}_2\text{O}$
- B. $[\text{CrCl}_2(\text{H}_2\text{O})_4]\text{Cl} \cdot 2\text{H}_2\text{O}$
- C. $[\text{CrCl}(\text{H}_2\text{O})_5]\text{Cl}_2 \cdot \text{H}_2\text{O}$
- D. $[\text{Cr}(\text{H}_2\text{O})_6]\text{Cl}_3$

49. Reaction of $\text{C}_6\text{H}_5\text{CH}_2\text{Br}$ with aqueous sodium hydroxide follows_____.

- A. $\text{S}_{\text{N}}1$ mechanism
- B. $\text{S}_{\text{N}}2$ mechanism
- C. Any of the above two depending upon the temperature of reaction
- D. Saytzeff rule

50. $\text{CH}_3\text{CH}_2\text{OH}$ can be converted into CH_3CHO by

- A. catalytic hydrogenation
- B. treatment with LiAlH_4
- C. treatment with pyridinium chlorochromate
- D. treatment with KMnO_4

51. Butane nitrile may be prepared by heating

- A. Butyl alcohol with $\text{KCN}(\text{alc})$
- B. Butyl chloride with $\text{KCN}(\text{alc})$
- C. Propyl alcohol with $\text{KCN}(\text{alc})$
- D. Propyl chloride with $\text{KCN}(\text{alc})$

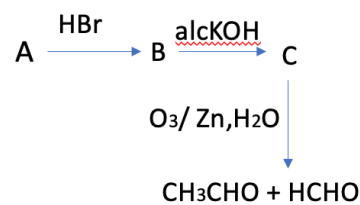
52. On adding AgNO_3 solution to 1mole of $\text{PdCl}_2 \cdot 4\text{NH}_3$, two moles of AgCl are formed. The secondary valency of Pd in complex will be

- A. 4
- B. 0
- C. 1
- D. 2

53. Charge carried by 1 mole of electrons is

- A. 1.6×10^{-19} coulomb
- B. 9.65×10^4 coulomb
- C. 6.023×10^{23} coulomb
- D. 6.28×10^{19} coulomb

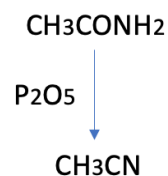
54. In the reaction:



the compound A is :

- A. Ethylene
- B. Acetic acid
- C. Propene
- D. 1-Butene

55. During the following reaction,



the hybridisation state of carbon changes from

- A. sp^3 to sp
- B. sp^3 to sp^2
- C. sp^2 to sp^3
- D. sp^2 to sp

56. The K_{sp} of $\text{Cr}(\text{OH})_3$ is 1.6×10^{-30} . The molar solubility of the compound in water is
 A. $(1.6 \times 10^{-30})^{1/3}$
 B. $(1.6 \times 10^{-30}/27)^{1/4}$
 C. $1.6 \times 10^{-30}/27$
 D. $(1.6 \times 10^{-30})^{1/2}$
57. If equilibrium constant for a reaction is K , then standard free energy change is
 A. $\Delta G^0 = -RT \log K$
 B. $\Delta G^0/RT = -\log K$
 C. $\Delta G^0 = RT \ln K$
 D. $\Delta G^0/RT = -2.303 \log K$
58. Which of the following has highest boiling point?
 A. NH_3
 B. PH_3
 C. SbH_3
 D. AsH_3
59. In which of the following pairs, the ions are isoelectronic?
 A. $\text{Na}^+, \text{O}^{2-}$
 B. $\text{Al}^{3+}, \text{O}^-$
 C. Na^+, Mg^+
 D. $\text{N}^{3-}, \text{Cl}^-$
60. An organic compound 'A' on treatment with benzene sulphonyl chloride gives compound 'B'. Compound B is soluble in diluted NaOH solution. Compound A is
 A. $\text{C}_6\text{H}_5\text{-N}(\text{CH}_3)_2$
 B. $\text{C}_6\text{H}_5\text{-NHCH}_2\text{CH}_3$
 C. $\text{C}_6\text{H}_5\text{-CH}_2\text{NHCH}_3$
 D. $\text{C}_6\text{H}_5\text{-CH}(\text{CH}_3)\text{NH}_2$
61. The number of elements in the Power set $P(S)$ of the set $S = \{1, 2, 3\}$ is:
 A. 4
 B. 8
 C. 2
 D. None of these
62. Which of the following two sets are equal?
 A. $A = \{1, 2\}$ and $B = \{1\}$
 B. $A = \{1, 2\}$ and $B = \{1, 2, 3\}$
 C. $A = \{1, 2, 3\}$ and $B = \{2, 1, 3\}$
 D. $A = \{1, 2, 4\}$ and $B = \{1, 2, 3\}$
63. The first term of a G.P is 1. The sum of the 3rd and 5th terms is 90. Then the common ratio is:
 A. 1
 B. 2
 C. 3
 D. 4
64. There are 10 true-false questions in an examination. These questions can be answered in:
 A. 20 ways
 B. 100 ways
 C. 512 ways
 D. 1024 ways
65. How many diagonals are there in a polygon with 6 sides?
 A. 9
 B. 12
 C. 15
 D. 18
66. If you have 7 different fruits, how many ways can you choose 3?
 A. 21
 B. 35
 C. 42
 D. 49
67. Find the equation perpendicular to $2x - y = 4$ and pass through (2, 4).
 A. $2x + y - 10 = 0$
 B. $x + 2y + 10 = 0$
 C. $x + 2y - 10 = 0$
 D. $x + y - 10 = 0$
68. What will be the point of x-axis which will be equidistant from the points (9, 8) and (3, 2)?
 A. (10, 0)
 B. (13, 0)
 C. (11, 0)
 D. (12, 0)

69. $(x+3) + i(y-2) = 5+i2$, find the values of x and y .
 A. $x=8$ and $y=4$
 B. $x=2$ and $y=4$
 C. $x=2$ and $y=0$
 D. $x=8$ and $y=0$
70. The distance between the points $(2,3)$ and $(5,7)$ is:
 A. 3
 B. 4
 C. 5
 D. 6
71. The objective function for a given linear programming problem is $Z = ax + by - 5$. If Z attains same value at $(1, 2)$ and $(3, 1)$, then
 A. $a + 2b = 0$
 B. $a + b = 0$
 C. $a = b$
 D. $2a - b = 0$
72. $\lim_{x \rightarrow \frac{\pi}{4}} \frac{\sec^2 x - 2}{\tan x - 1}$
 A. 3
 B. 2
 C. 1
 D. 0
73. Given set $A = \{a, b\}$ and set $B = \{1, 2, 3\}$. How many non-empty relations are possible from set A to set B ?
 A. 63
 B. 64
 C. 62
 D. 16
74. In the parabola $x^2 = 6y$, the focus and the equation of directrix are respectively.
 A. $(0, -\frac{3}{2})$, $y = \frac{3}{2}$
 B. $(0, \frac{3}{2})$, $y = -\frac{3}{2}$
 C. $(0, \frac{3}{2})$, $y = \frac{3}{2}$
 D. None of these
75. If A, B, C are three mutually exclusive and exhaustive events of an experiment such that $3P(A) = 2P(B) = P(C)$, then $P(A)$ is equal to
 A. $\frac{5}{11}$
 B. $\frac{6}{11}$
 C. $\frac{2}{11}$
 D. $\frac{1}{11}$
76. Integrating factor for the differential equation $(x \log x) \frac{dy}{dx} + y = 2 \log x$ is
 A. $\log(\log x)$
 B. $\log x$
 C. e^x
 D. x
77. If $y = a \sin^3 t$, $x = a \cos^3 t$, then value of $\frac{dy}{dx}$ at $t = \frac{3\pi}{4}$ is
 A. -1
 B. 0
 C. 2
 D. 1
78. The area of the region bounded by $y^2 = 4x$, y -axis and the line $y = 3$ is
 A. $2\sqrt{3}$ sq. units
 B. $\frac{1}{4}$ sq. units
 C. $\frac{9}{4}$ sq. units
 D. $\frac{4}{3}$ sq. units
79. The function $f(x) = 4 - 3x + 3x^2 - x^3$, $x \in \mathbb{R}$ is
 A. decreasing function
 B. increasing function
 C. strictly increasing on $\mathbb{R}$
 D. neither increasing nor decreasing on $\mathbb{R}$
80. Direction ratios of the line $\frac{4-2x}{2} = \frac{3y}{6} = \frac{1-z}{3}$ are
 A. 2, 6, 3
 B. -1, 2, -3
 C. 1, 2, 3
 D. -2, 6, -3

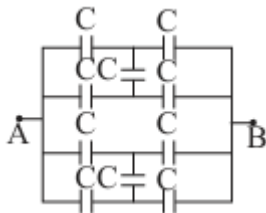
81. Choose the sentence that uses "whom" correctly:
- A. Whom is going to the party tonight?
 - B. Whom do you think she is?
 - C. To whom did you speak yesterday?
 - D. Whom made the announcement?
82. Choose the antonym of "ascend"
- A. Rise
 - B. Descend
 - C. Elevate
 - D. Soar
83. What is the meaning of the idiom "to beat around the bush"?
- A. To argue fiercely
 - B. To avoid the main topic
 - C. To be poetic
 - D. To prepare thoroughly
84. Choose the correct option: "If he _____ more careful, this wouldn't have happened."
- A. had been
 - B. was
 - C. has been
 - D. would have been
85. Which sentence contains a misplaced modifier?
- A. She often jogs in the evening.
 - B. Running quickly, the gate was reached by the cat.
 - C. The boy, though tired, finished his homework.
 - D. We visited the museum before it closed.
86. What is the tense in the sentence: "She had been reading all day."
- A. Present perfect
 - B. Past perfect continuous
 - C. Past simple
 - D. Present continuous
87. Choose the word with the correct spelling.
- A. Definately
 - B. Recieve
 - C. Seperately
 - D. Conscientious
88. What is the passive voice of the sentence: "They will complete the project by Friday"?
- A. They will have completed the project by Friday.
 - B. The project will be completed on Friday.
 - C. The project will be completed by Friday.
 - D. By Friday, the project completes itself.
89. Identify the type of clause in the sentence: "Although she was tired, she kept working."
- A. Independent clause
 - B. Dependent (subordinate) clause
 - C. Relative clause
 - D. Noun clause
90. The phrase "Et tu, Brute?" appears in which Shakespearean play?
- A. Othello
 - B. Julius Caesar
 - C. Macbeth
 - D. Romeo and Juliet
91. I prevailed _____ him to sing for us.
- A. Of
 - B. With
 - C. Upon
 - D. No word
92. I _____ the rope with all my strength waiting for help to arrive.
- A. held on with
 - B. held on to
 - C. held out on
 - D. held out of

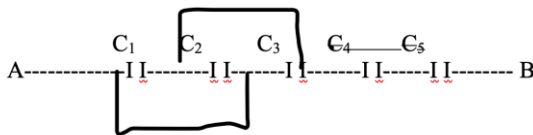
In the following questions (93-95), four alternatives are given for the idiom/phrase underlined in the sentence. Chose the alternative which best expresses the meaning of the idiom/phrase

93. He made my day by telling me how important I was to him
A. Gave me a great pleasure
B. Displeased me
C. Spoiled my day
D. Made me resentful
94. Despite harsh criticism, she's sticking to her guns on this issue.
A. Prefer to disobey them
B. Hold on to my decision
C. Refuse to listen to them
D. Show them that they are wrong
95. His friend turned out to be a snake in the grass.
A. Cowardly and brutal
B. Low and mean
C. A hidden enemy
D. An unreliable and deceitful person
96. Sentences of a paragraph are given below in a jumbled order.
I. He picked it up and read the postmark.
II. He sat at his desk to go through that day's post
III. Prof Hardy stepped into his study
IV. Among them was a fat envelope
Arrange the sentences in the correct order.
A. III, II, I, IV
B. III, IV, I, II
C. III, II, IV, I
D. III, IV, I, II
97. Following are the parts of a sentence.
I. The amount of melanin
II. Depends upon
III. Present in the skin
IV. The color of the skin
Arrange them in the correct order to form a meaningful sentence.
A. I, III, IV, II
B. IV, II, I, III
C. I, II, IV, III
D. IV, III, II, I
98. Fill in the blanks with the most appropriate set of options.
The _____ boy _____ enjoyed _____ mathematics and science. So his teachers _____ him to pursue these subjects. He _____ deep into these areas. He tried to _____ the theories taught to him.
A. researching, forced, got, understand
B. learning, pushed, swam, solve
C. reading, motivated, went, write
D. studying, encouraged, delved, verify
99. Select the synonym of 'adversary'
A. Antagonist
B. Advocate
C. Ally
D. Accomplice
100. Select the option that can be used as a one-word substitution for: 'A person in charge of a museum'
A. Curator
B. Connoisseur
C. Councillor
D. Concierge

10+2 Science

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 C. International humanitarian aid
 D. Blood donation
21. An object is dropped from a height h . It hits the ground with a certain momentum p . If the same object is dropped from a height 100% more than the previous height, the momentum when it hits the ground will change by
 A. 68%
 B. 41%
 C. 200%
 D. 100%
22. The density of ice is x gram/litre and that of water is y gram/litre. What is the change in volume when m gram of ice melts?
 A. $mx y (x - y)$
 B. $\frac{m}{y-x}$
 C. $m \left(\frac{1}{y} - \frac{1}{x} \right)$
 D. $\frac{y-x}{x}$
23. The effective capacitance of combination of equal capacitors between points A and B shown in figure is:

 A. $2C$
 B. $3C$
 C. C
 D. $C/2$
24. Which of the following physical quantity is NOT dimensionless?
 A. Refractive Index
 B. Relative velocity
 C. Relative density
 D. Angular displacement
25. A proton and an α -particle enter a uniform v field at right angles to it with same velocity. The time period of revolution of α -particle as compared to that of proton, will be
 A. four times
 B. two times
 C. half
 D. one fourth

26. The angle of incidence of a ray falling on a plane mirror is 30° . The deviation produced by the plane mirror is
 A. 120°
 B. 90°
 C. 60°
 D. 30°
27. 7. A wheel rotates with a constant acceleration of 2.0 rad/s^2 . If the wheel starts from rest, the number of revolutions it makes in first 10 seconds is (approx):
 A. 8
 B. 16
 C. 24
 D. 32
28. A monoatomic gas ($\gamma = 5/3$) at pressure P is suddenly compressed to $1/64$ th of its volume adiabatically. Then, pressure of gas is:
 A. $8 P$
 B. $14 P$
 C. $256 P$
 D. $1024 P$
29. A parallel beam of light of wavelength 600 nm is incident normally on a slit of width d. If the distance between the slits and the screen is 0.8 m and the distance of 2nd order maximum from the centre of the screen is 15 mm. The width of the slit is:
 A. $180 \mu\text{m}$
 B. $18 \mu\text{m}$
 C. $80 \mu\text{m}$
 D. $800 \mu\text{m}$
30. A radioactive decay can form an isotope of the original nucleus with the emission of particles:
 A. four α and one β
 B. one α and one β
 C. one α and two β
 D. one α and four β
31. If the ratio of the concentration of electrons and of holes in a semiconductor is $7/5$ and the ratio of currents is $7/4$ then the ratio of their drift velocities:
 A. $4/7$
 B. $5/4$
 C. $5/7$
 D. $4/5$
32. The near point and far point of a person are 40 cm and 250 cm respectively. Determine the power of the lens he/she should use while reading a book kept at a distance 25 cm from the eye.
 A. 2.5 D
 B. 5.0 D
 C. 1.5 D
 D. 3.5 D
33. A body has a charge of $-2\mu\text{C}$. If it has 2.5×10^{13} proton, then the number of electrons in the body is:
 A. 3.75×10^{13}
 B. 1.25×10^{13}
 C. 2.5×10^{13}
 D. 1.25×10^{13}
- 34.
- 
- Given that each capacitor is of $2 \mu\text{F}$
 The equivalent capacitance between A and B in the combination is:
 A. $7/6 \mu\text{F}$
 B. $6/7 \mu\text{F}$
 C. $5/7 \mu\text{F}$
 D. $7/5 \mu\text{F}$
35. By what percentage will the illumination of the lamp decrease if the current drops by 20%?
 A. 46 %
 B. 26 %
 C. 36 %
 D. 56 %

36. Consider a galvanometer shunted with $5\ \Omega$ resistance and 2 % of current passes through it. The resistance of the galvanometer is:
 A. $344\ \Omega$
 B. $245\ \Omega$
 C. $226\ \Omega$
 D. $300\ \Omega$
37. Which of the following has its permeability less than that of free space?
 A. Copper
 B. Aluminium
 C. Copper chloride
 D. Nickel
38. A square shaped coil of side 10 cm, having 100 turns is placed perpendicular to a magnetic field which is increasing at 1 T/s. The induced emf in the coil is:
 A. 0.1 V
 B. 0.5 V
 C. 0.75 V
 D. 1.0 V
39. In a series LCR – circuit $L = 2\text{ mH}$, $C = 0.2\mu\text{F}$ and $R = 30\ \Omega$ is connected to an a.c. source of variable frequency. The impedance of this circuit will be minimum at a frequency of:
 A. $10^5/4\pi\text{ Hz}$
 B. $10^5/2\pi\text{ Hz}$
 C. $10^4/4\pi\text{ Hz}$
 D. $10^4/2\pi\text{ Hz}$
40. A solid sphere and a hollow sphere of equal diameters are raised to the same potential. Then,
 A. hollow sphere has more charge
 B. both have equal charge
 C. only hollow sphere has charge
 D. solid sphere has more charge
41. According to modern periodic law, the physical and chemical properties of elements are periodic function of
 A. Atomic mass
 B. Atomic number
 C. Mass number
 D. Effective nuclear charge
42. The general electronic configuration of non-transition elements Zn, Cd, Hg is
 A. $(n-1)d^{10}ns^2$
 B. $(n-1)d^{10}ns^1$
 C. $(n-1)d^9ns^2$
 D. $(n-1)d^8ns^2$
43. Low concentration of oxygen in the blood and tissues of people living at high altitude is due to
 A. Low temperature
 B. Low atmospheric pressure
 C. High atmospheric pressure
 D. Both low temperature and high temperature
44. A device that converts energy of combustion of fuels like hydrogen and methane directly into electrical energy is known as
 A. dynamo
 B. Ni-Cd cell
 C. fuel cell
 D. electrolytic cell
45. X has 2 valence electrons Y has 5 valence electrons. The formula of compound is
 A. X_2Y_3
 B. XY
 C. XY_2
 D. X_3Y_2
46. Which of the following has intra molecular H-Bonding?
 A. p-nitro phenol
 B. o-nitro phenol
 C. m-nitro phenol
 D. All of these

47. Which of the following statement about transition element is not correct?

- A. They show variable oxidation states.
- B. They exhibit diamagnetic and paramagnetic properties.
- C. All ions are coloured.
- D. They exhibit catalytic property.

48. When 1 mol $\text{CrCl}_3 \cdot 6\text{H}_2\text{O}$ is treated with excess of AgNO_3 , 3 mol of AgCl are obtained. The formula of the complex is

- A. $[\text{CrCl}_3(\text{H}_2\text{O})_3] \cdot 3\text{H}_2\text{O}$
- B. $[\text{CrCl}_2(\text{H}_2\text{O})_4]\text{Cl} \cdot 2\text{H}_2\text{O}$
- C. $[\text{CrCl}(\text{H}_2\text{O})_5]\text{Cl}_2 \cdot \text{H}_2\text{O}$
- D. $[\text{Cr}(\text{H}_2\text{O})_6]\text{Cl}_3$

49. Reaction of $\text{C}_6\text{H}_5\text{CH}_2\text{Br}$ with aqueous

sodium hydroxide follows _____.

- A. $\text{S}_{\text{N}}1$ mechanism
- B. $\text{S}_{\text{N}}2$ mechanism
- C. Any of the above two depending upon the temperature of reaction
- D. Saytzeff rule

50. $\text{CH}_3\text{CH}_2\text{OH}$ can be converted into CH_3CHO by

- A. catalytic hydrogenation
- B. treatment with LiAlH_4
- C. treatment with pyridinium chlorochromate
- D. treatment with KMnO_4

51. Butane nitrile may be prepared by heating

- A. Butyl alcohol with $\text{KCN}(\text{alc})$
- B. Butyl chloride with $\text{KCN}(\text{alc})$
- C. Propyl alcohol with $\text{KCN}(\text{alc})$
- D. Propyl chloride with $\text{KCN}(\text{alc})$

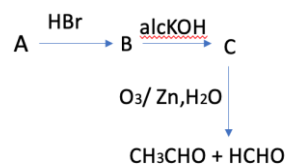
52. On adding AgNO_3 solution to 1mole of $\text{PdCl}_2 \cdot 4\text{NH}_3$, two moles of AgCl are formed. The secondary valency of Pd in complex will be

- A. 4
- B. 0
- C. 1
- D. 2

53. Charge carried by 1 mole of electrons is

- A. 1.6×10^{-19} coulomb
- B. 9.65×10^4 coulomb
- C. 6.023×10^{23} coulomb
- D. 6.28×10^{19} coulomb

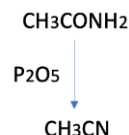
54. In the reaction:



the compound A is :

- A. Ethylene
- B. Acetic acid
- C. Propene
- D. 1-Butene

55. During the following reaction,



the hybridisation state of carbon changes from

- A. sp^3 to sp
- B. sp^3 to sp^2
- C. sp^2 to sp^3
- D. sp^2 to sp

56. The K_{sp} of $\text{Cr}(\text{OH})_3$ is 1.6×10^{-30} . The molar solubility of the compound in water is

- A. $(1.6 \times 10^{-30})^{1/3}$
- B. $(1.6 \times 10^{-30}/27)^{1/4}$
- C. $1.6 \times 10^{-30}/27$
- D. $(1.6 \times 10^{-30})^{1/2}$

57. If equilibrium constant for a reaction is K , then standard free energy change is
- $\Delta G^0 = -RT \log K$
 - $\Delta G^0/RT = -\log K$
 - $\Delta G^0 = RT \ln K$
 - $\Delta G^0/RT = -2.303 \log K$
58. Which of the following has highest boiling point?
- NH_3
 - PH_3
 - SbH_3
 - AsH_3
59. In which of the following pairs, the ions are isoelectronic?
- $\text{Na}^+, \text{O}^{2-}$
 - $\text{Al}^{3+}, \text{O}^-$
 - Na^+, Mg^+
 - $\text{N}^{3-}, \text{Cl}^-$
60. An organic compound 'A' on treatment with benzene sulphonyl chloride gives compound 'B'. Compound B is soluble in diluted NaOH solution. Compound A is
- $\text{C}_6\text{H}_5\text{-N}(\text{CH}_3)_2$
 - $\text{C}_6\text{H}_5\text{-NHCH}_2\text{CH}_3$
 - $\text{C}_6\text{H}_5\text{-CH}_2\text{NHCH}_3$
 - $\text{C}_6\text{H}_5\text{-CH}(\text{CH}_3)\text{NH}_2$
61. Binomial nomenclature include:
- Family and Genus
 - Class and Order
 - Genus and species
 - Kingdom and phylum
62. Which of the following is a biodiversity hotspot in India?
- Western Ghats
 - Deccan Plateau
 - Indo – Gangetic Plane
 - Thar Desert
63. Which plant hormone promotes fruit ripening?
- Auxin
 - Cytokinin
 - Gibberellin
 - Ethylene
64. Which type of pollination occurs when pollen is transferred from one flower to another flower of the same species?
- Autogamy
 - Geitonogamy
 - Asexual pollination
 - Xenogamy
65. Which of the following is a transgenic crop?
- Hybrid maize
 - Bt cotton
 - Organic wheat
 - Sugarcane
66. What is the function of diaphragm in breathing?
- Filters air
 - Controls lung expansion
 - Produces sound
 - Stores oxygen
67. Which pyramid always remain upright in an ecosystem?
- Pyramid of energy
 - Pyramid of biomass
 - Pyramid of numbers
 - Pyramid of species
68. Which enzyme is responsible for DNA replication?
- RNA polymerase
 - Helicase
 - DNA polymerase
 - Ligase
69. Pneumonia is caused by
- Streptococcus pneumonia
 - Haemophilus influenza
 - Both A and B
 - Salmonella typhi
70. Which organelle is involved in cell division in animal cells?
- Golgi bodies
 - Lysosomes
 - Endoplasmic reticulum
 - Centrioles
71. Which of the following is an example of oviparous animal?
- Dog
 - Cow
 - Hen
 - Human

10+2 Science

72. What does the term “Keystone species” mean?
- A. A species that has a significant impact on ecosystem balance
 - B. A species that is dominant
 - C. A species with no predators
 - D. A species with a short life span
73. Where are red blood cells produce?
- A. Liver
 - B. Bone marrow
 - C. Spleen
 - D. Heart
74. Which of the following is a sex linked recessive disorder?
- A. Diabetes
 - B. Hemophilia
 - C. Cancer
 - D. Sickle cell anemia
75. The rough endoplasmic reticulum is associated with
- A. Protein synthesis
 - B. Lipid synthesis
 - C. Carbohydrate metabolism
 - D. DNA replication
76. Which pigment is essential for photosynthesis?
- A. Haemoglobin
 - B. Melanin
 - C. Chlorophyll
 - D. Carotene
77. What is a biome?
- A. A large ecological area with similar climate and vegetation
 - B. A single food chain
 - C. A group of related species
 - D. A type of soil
78. What factors influence enzyme activity?
- A. Temperature and pH
 - B. DNA structure
 - C. Cell division
 - D. Light intensity
79. Which hormone regulates blood sugar levels?
- A. Thyroxine
 - B. Insulin
 - C. Adrenaline
 - D. Estrogen
80. What is ovulation?
- A. Fusion of egg and sperm
 - B. Attachment if embryo
 - C. Release of an egg from the ovary
 - D. Menstrual flow
81. Choose the sentence that uses "whom" correctly:
- A. Whom is going to the party tonight?
 - B. Whom do you think she is?
 - C. To whom did you speak yesterday?
 - D. Whom made the announcement?
82. Choose the antonym of “ascend”
- A. Rise
 - B. Descend
 - C. Elevate
 - D. Soar
83. What is the meaning of the idiom “to beat around the bush”?
- A. To argue fiercely
 - B. To avoid the main topic
 - C. To be poetic
 - D. To prepare thoroughly
84. Choose the correct option: “If he _____ more careful, this wouldn't have happened.”
- A. had been
 - B. was
 - C. has been
 - D. would have been

10+2 Science

85. Which sentence contains a misplaced modifier?
- A. She often jogs in the evening.
 - B. Running quickly, the gate was reached by the cat.
 - C. The boy, though tired, finished his homework.
 - D. We visited the museum before it closed.
86. What is the tense in the sentence: "She had been reading all day."
- A. Present perfect
 - B. Past perfect continuous
 - C. Past simple
 - D. Present continuous
87. Choose the word with the correct spelling.
- A. Definatly
 - B. Recieve
 - C. Seperately
 - D. Conscientious
88. What is the passive voice of the sentence: "They will complete the project by Friday"?
- A. They will have completed the project by Friday.
 - B. The project will be completed on Friday.
 - C. The project will be completed by Friday.
 - D. By Friday, the project completes itself.
89. Identify the type of clause in the sentence: "Although she was tired, she kept working."
- A. Independent clause
 - B. Dependent (subordinate) clause
 - C. Relative clause
 - D. Noun clause
90. The phrase "Et tu, Brute?" appears in which Shakespearean play?
- A. Othello
 - B. Julius Caesar
 - C. Macbeth
 - D. Romeo and Juliet
91. I prevailed _____ him to sing for us.
- A. Of
 - B. With
 - C. Upon
 - D. No word
92. I _____ the rope with all my strength waiting for help to arrive.
- A. held on with
 - B. held on to
 - C. held out on
 - D. held out of
- In the following questions (93-95), four alternatives are given for the idiom/phrase underlined in the sentence. Chose the alternative which best expresses the meaning of the idiom/phrase**
93. He made my day by telling me how important I was to him
- A. Gave me a great pleasure
 - B. Displeased me
 - C. Spoiled my day
 - D. Made me resentful
94. Despite harsh criticism, she's sticking to her guns on this issue.
- A. Prefer to disobey them
 - B. Hold on to my decision
 - C. Refuse to listen to them
 - D. Show them that they are wrong
95. His friend turned out to be a snake in the grass.
- A. Cowardly and brutal
 - B. Low and mean
 - C. A hidden enemy
 - D. An unreliable and deceitful person

10+2 Science

96. Sentences of a paragraph are given below in a jumbled order.

- I. He picked it up and read the postmark.
- II. He sat at his desk to go through that day's post
- III. Prof Hardy stepped into his study
- IV. Among them was a fat envelope

Arrange the sentences in the correct order.

- A. III, II, I, IV
- B. III, IV, I, II
- C. III, II, IV, I
- D. III, IV, I, II

97. Following are the parts of a sentence.

- I. The amount of melanin
- II. Depends upon
- III. Present in the skin
- IV. The color of the skin

Arrange them in the correct order to form a meaningful sentence.

- A. I, III, IV, II
- B. IV, II, I, III
- C. I, II, IV, III
- D. IV, III, II, I

98. Fill in the blanks with the most appropriate set of options.

The _____ boy _____ enjoyed _____ mathematics and science. So his teachers _____ him to pursue these subjects. He _____ deep into these areas. He tried to _____ the theories taught to him.

- A. researching, forced, got, understand
- B. learning, pushed, swam, solve
- C. reading, motivated, went, write
- D. studying, encouraged, delved, verify

99. Select the synonym of 'adversary'

- A. Antagonist
- B. Advocate
- C. Ally
- D. Accomplice

100. Select the option that can be used as a one-word substitution for: 'A person in charge of a museum'

- A. Curator
- B. Connoisseur
- C. Councillor
- D. Concierge

Diploma X-ray

1. Which of the following is a multiaxial synovial joint
 - A. Elbow joint
 - B. Wrist joint
 - C. Ankle joint
 - D. Shoulder joint
2. Cerebrospinal fluid is the content of
 - A. Auditory canal
 - B. Central canal of spinal cord
 - C. Carotid canal
 - D. Anal canal
3. Which of the following is a skeletal muscle.
 - A. Limb muscles
 - B. Heart
 - C. Wall of stomach
 - D. Dartos muscle
4. Suicidal bag of a cell is
 - A. Mitochondrion
 - B. Vacuole
 - C. Lysosome
 - D. Ribosome
5. Which hormone helps in milk ejection
 - A. Growth hormone
 - B. Testosterone
 - C. ADH
 - D. Oxytocin
6. Spleen is located in
 - A. Right upper quadrant of abdomen
 - B. Left upper quadrant of abdomen
 - C. Right lower quadrant of abdomen
 - D. Left lower quadrant of abdomen
7. Heart receives deoxygenated blood in
 - A. Right atrium
 - B. Left atrium
 - C. Right ventricle
 - D. Left ventricle
8. How many vertebrae forms the sacrum
 - A. 4
 - B. 5
 - C. 3
 - D. 6
9. How many chromosomes are present in sperm
 - A. 23 pairs
 - B. 21 pairs
 - C. 23
 - D. 24
10. Following is an example of elastic cartilage
 - A. Thyroid cartilage
 - B. Cricoid cartilage
 - C. Articular cartilage
 - D. Epiglottic cartilage
11. How many pairs of ribs are there
 - A. 9
 - B. 10
 - C. 12
 - D. 13
12. Sweat glands are supplied by
 - A. Sympathetic nerves
 - B. Parasympathetic nerves
 - C. Sensory nerves
 - D. Motor nerves
13. Thigh bone is
 - A. Humerus
 - B. Radius
 - C. Femur
 - D. Tibia
14. Pectoral girdle is made up of
 - A. Clavicle and sternum
 - B. Clavicle and humerus
 - C. Clavicle and scapula
 - D. Clavicle and rib
15. Artery to the brain is
 - A. Subclavian artery
 - B. Internal carotid artery
 - C. External carotid artery
 - D. Internal iliac artery
16. Substance secreted by renal tubule is
 - A. Creatinine
 - B. Glucose
 - C. Bicarbonate
 - D. Amino acids
17. The communication between a neuron and muscle is an example of
 - A. Synaptic transmission
 - B. Gap junction
 - C. Intercalated disc
 - D. Tight junction

Diploma X-ray

18. When a skeletal muscle with an intact nerve supply is stretched, it contracts, this is
 - A. Inverse stretch reflex
 - B. Stretch reflex
 - C. Flexion reflex
 - D. Withdrawal reflex
19. Pain sensation is carried by
 - A. Dorsal column pathway
 - B. Lateral spinothalamic tract
 - C. Corticospinal pathway
 - D. Spino-cerebellar tract
20. Myopia is corrected by placing which type of lens in front of eye
 - A. Cylindrical lens
 - B. Biconcave lens
 - C. Biconvex lens
 - D. Convexo-concave lens
21. The three bony ossicles, Incus, Malleus and Stapes are a part of
 - A. Middle ear
 - B. External ear
 - C. Inner ear
 - D. Pinna
22. The primary function of cerebellum is
 - A. Sensory integration
 - B. Planning of movement
 - C. Co-ordination of movement
 - D. Neuroendocrine control
23. The increase in plasma level of calcium is caused by
 - A. TSH
 - B. Glucagon
 - C. Aldosterone
 - D. Parathyroid hormone
24. Insulin increases glucose uptake in
 - A. All tissues
 - B. Brain cells
 - C. Renal tubular cells
 - D. Skeletal muscle
25. Leydig cells secrete
 - A. Androgen binding protein
 - B. Testosterone
 - C. Inhibin
 - D. MIS
26. In humans, fertilization usually occurs in
 - A. Uterine tube
 - B. Vagina
 - C. Cervix
 - D. Uterine cavity
27. Which part of the ECG correspond to ventricular repolarization?
 - A. The P wave
 - B. The QRS complex
 - C. The T wave
 - D. The PR interval
28. The second heart sound is caused by
 - A. Closure of aortic and pulmonary valve
 - B. Vibration of the ventricular wall during systole
 - C. Closure of the mitral and tricuspid valve
 - D. Retrograde flow in the vena cava
29. The baroreceptors are
 - A. Located in the walls of the large blood vessels
 - B. Low pressure receptors present in macula densa
 - C. Located in the carotid body
 - D. Volume receptors
30. Surfactant lining the alveoli
 - A. Are glycoproteins
 - B. Is increased in the smokers
 - C. Is produced by type I alveolar cells
 - D. Prevents alveolar collapse
31. Nucleus of an atom consists of following structures except
 - A. Neutron
 - B. Electron
 - C. Proton
 - D. All above
32. HVL stands for
 - A. Half value level
 - B. Half value layer
 - C. Heat volume thickness
 - D. Heavy volume thickness

Diploma X-ray

33. Radioisotope used for Teletherapy is
- A. Ir 192
 - B. I 125
 - C. Co 60
 - D. Cs 137
34. Which of the following volumes are not related to IMRT treatment
- A. ITV
 - B. PTV
 - C. GTV
 - D. DTV
35. What will be the wedge angle for optimal plan for two beams angled at 90 degrees to each other
- A. 15
 - B. 30
 - C. 45
 - D. 60
36. Size of the source is important as it determines the
- A. Dmax
 - B. Percentage depth dose
 - C. Penumbra
 - D. Scatter
37. SI unit for absorbed dose
- A. Sievert
 - B. Roentgen
 - C. Gray
 - D. Becquerel
38. Which of the following effect is important in radiotherapy treatment
- A. Photoelectric effect
 - B. Compton effect
 - C. Pair production
 - D. Coherent effect
39. Half-life of a radioactive isotope is the time taken for
- A. One quarter atoms to decay
 - B. Half of the atoms to decay
 - C. One third of atoms to decay
 - D. All atoms to decay
40. What is the function of Multi Leaf Collimators (MLC) in Intensity Modulated Radiotherapy
- A. Patient Immobilization
 - B. Patient Imaging
 - C. Intensity modulation of radiation beam
 - D. All of the above
41. Thermoluminescent Dosimeter (TLD) is useful for personnel monitoring due to all except
- A. Small size
 - B. Tissue equivalent
 - C. Useful over wide range of radiation qualities
 - D. All above
42. Advantage of megavoltage beams over kilovoltage beams for radiotherapy treatment include all except
- A. Skin sparing effect
 - B. Small amount of scattered radiation
 - C. Greater percentage depth dose
 - D. Greater shielding of tissues by bone
43. All of the following are beam modifying devices except
- A. Immobilization devices
 - B. Compensators
 - C. Wedge filters
 - D. Shielding blocks
44. All of the following are Megavoltage equipment except
- A. Linear accelerator
 - B. Diagnostic Imaging
 - C. Particle accelerator
 - D. Telecobalt
45. Which material is commonly used for shielding against X rays
- A. Aluminium
 - B. Iron
 - C. Plastic
 - D. Lead
46. Which Radiation does a Linear Accelerator produce
- A. Gamma Rays
 - B. Alpha particles
 - C. High energy X rays
 - D. Neutrons
47. Brachytherapy includes treatment by
- A. Chemotherapy
 - B. Immunotherapy
 - C. Radioactive isotopes
 - D. External beam radiation

Diploma X-ray

48. Which of the following sites is treated by intracavitary brachytherapy
- A. Prostate
 - B. Cervix
 - C. Eye plaque
 - D. Skin cancer
49. Advantage of Intensity Modulated Radiotherapy over conventional 2D treatment
- A. Shorter treatment time
 - B. Simple planning process
 - C. Better dose conformity and normal tissue sparing
 - D. All of the above
50. Which of the following is an Ionizing Radiation
- A. X rays
 - B. Microwaves
 - C. Infrared radiation
 - D. Radio waves
51. What is oxygen effect in radiobiology
- A. Oxygen decreases the effect of radiation
 - B. Oxygen increases the effect of radiation
 - C. Oxygen protects normal tissues from radiation
 - D. Radiation effect is independent of oxygen
52. Stochastic Effects are also called
- A. Deterministic effects
 - B. Non - deterministic effects
 - C. Lethal effects
 - D. Acute effects
53. Which radiation has the highest Linear Energy Transfer
- A. Alpha particles
 - B. Beta particles
 - C. Gamma rays
 - D. X rays
54. What is the key principle for radiation protection
- A. Inverse square law
 - B. Increasing exposure time
 - C. Time, distance, shielding
 - D. All of the above
55. Which cell is most sensitive to radiation
- A. Neurons
 - B. Muscle cells
 - C. Erythrocytes
 - D. Lymphocytes
56. Ionizing radiation causes cell death by damaging the
- A. RNA
 - B. DNA
 - C. Mitochondria
 - D. Cytoplasm
57. Which phase of cell cycle is most sensitive to radiation
- A. G2/M phase
 - B. S phase
 - C. G1 phase
 - D. G0 phase
58. The 4R's of radiobiology include all except
- A. Repair
 - B. Redistribution
 - C. Refraction
 - D. Reoxygenation
59. Why is fractionation used in radiotherapy
- A. To reduce overall treatment time
 - B. To allow repair of normal tissues
 - C. To treat more patients
 - D. All of the above
60. A dosimeter is used for
- A. Scan the tumors
 - B. Shield the patient
 - C. Immobilize the patient
 - D. Measure the radiation dose
61. What is full form of ALARA
- A. As long as radiation is allowed
 - B. All levels are reasonably approved
 - C. As low as reasonably achievable
 - D. As late as radiation achieved

Diploma X-ray

62. Why is chemotherapy used with radiation
- A. To protect normal tissues from radiation
 - B. To increase the sensitivity of tumor cells to radiation
 - C. To decrease treatment time
 - D. To allow tissue repair
63. Dose per fraction for conventional fractionation ranges between
- A. <1 Gy
 - B. 1.5-3 Gy
 - C. 5-10 Gy
 - D. >10 Gy
64. A cell survival curve shows the relation between
- A. Radiation dose and time
 - B. Radiation dose and oxygen
 - C. Radiation dose and fractionation
 - D. Radiation dose and surviving cells
65. Which of the following is acute effect of radiation
- A. Nausea and vomiting
 - B. Cataract formation
 - C. Genetic mutation
 - D. Second malignancy
66. Orthopantomogram is taken to rule out lesion in
- A. Mandible
 - B. Zygomatic bone
 - C. Facial Bone
 - D. Skull
67. Stenvers view is used for assessment of
- A. Sella
 - B. Maxilla
 - C. Petrous temporal bone
 - D. Squamous temporal bone
68. In a chest x ray PA view
- A. Cardiac shadow is magnified
 - B. Scapula is projected over upper lobes
 - C. Appears more diffusely opaque if over-penetrated
 - D. Adequate if 8-10th posterior ribs are seen above the diaphragm
69. FLAIR stands for-
- A. Fat labelled attenuated inversion recovery
 - B. Fluid attenuated inversion recovery
 - C. Fat attenuated inversion recovery
 - D. Fluid labelled attenuation inversion recovery
70. Mortise view is associated with
- A. Cervical spine
 - B. Hip Joint
 - C. Ankle joint
 - D. Lumbar spine
71. Air under the diaphragm is best visualised in
- A. Chest X-ray Supine
 - B. Chest X ray erect
 - C. Abdominal X-ray supine
 - D. Abdominal X-ray erect
72. Cuneiform bone is present in which part of the body
- A. Foot
 - B. Hand
 - C. Skull
 - D. Ear
73. Which view is performed as an alternative to the chest PA erect view to assess for free gas in the abdominal cavity
- A. Lateral decubitus view
 - B. Dorsal decubitus view
 - C. Lateral view
 - D. Oblique view
74. Velpeau view x-ray is taken for which joint
- A. Wrist Joint
 - B. Ankle Joint
 - C. Shoulder Joint
 - D. Knee joint
75. Lordotic view is used to demonstrate
- A. Exaggerated lumbar lordosis
 - B. Paranasal sinuses
 - C. Lung apices
 - D. Middle lobe collapse

Diploma X-ray

76. Which part of electromagnetic spectrum does X-rays belong to?
- A. Ionizing
 - B. Ultraviolet
 - C. Microwave
 - D. Infrared
77. The photoelectric effect in radiography contributes primarily to:
- A. Radiation scatter
 - B. Background noise
 - C. Equipment shielding
 - D. Image formation
78. A positive contrast cystogram describes a radiograph of the bladder using -
- A. Air as contrast medium
 - B. Water as contrast medium
 - C. Barium sulphate as contrast medium
 - D. Iodine as contrast medium
79. Dysphagia means difficulty in?
- A. Walking
 - B. Breathing
 - C. Swallowing
 - D. Talking
80. Investigation of choice to demonstrate vesico ureteric reflux is
- A. Ultrasound
 - B. MRI
 - C. MCU
 - D. IVP
81. Best position for chest X-ray to detect small left pleural effusion is
- A. Left lateral
 - B. Supine
 - C. Left lateral decubitus
 - D. Right lateral decubitus
82. Which type of radiographic image shows real time movement?
- A. Fluoroscopy
 - B. CT scan
 - C. MRI
 - D. Mammography
83. Which material is commonly used for anode in X-ray tube?
- A. Tungsten
 - B. Copper
 - C. Lead
 - D. Aluminium
84. Tissue compression is used in
- A. MRI
 - B. Chest X ray
 - C. X ray mammography
 - D. Skull X ray
85. What is True about fluorescence?
- A. It is also named as phosphorescence.
 - B. It is seen about seconds to hours after absorption of light.
 - C. This helps in reducing the patient exposure dose in radiography.
 - D. It does not fall in visible spectrum.
86. Collimators are helpful in all Except in:
- A. Limiting the exposure field and thereby irradiated tissue volume.
 - B. Improving the image contrast.
 - C. Limiting the scatter radiation.
 - D. Overexposure of imaged tissues
87. Bilbao Dotter tube and guide wire are used in which of the following radiological investigations:
- A. Barium enema
 - B. Small bowel enema
 - C. Barium meal follow through
 - D. Barium meal study for stomach and duodenum
88. What is Not true for lateral X-rays view of sacrum and coccyx?
- A. Suspended respiration is required after expiration.
 - B. Bucky is not needed for acquiring this X-ray.
 - C. Gonads shielding placed for males.
 - D. A large focal spot is used
89. Tick the wrong option when viewing criteria of a good anteroposterior radiographic view of hip joint
- A. Greater trochanter should form the inner margin of the femoral neck.
 - B. The hip joint should be in complete visualization from the lower part of iliac wing to proximal femur.
 - C. Femoral neck should not be foreshortened.
 - D. Lesser trochanter form the inner margin of femur.

Diploma X-ray

90. Which KVP brings out best contrast on chest radiography
- 65
 - 75
 - 85
 - 125
91. Sialography is the radiographic study of-----by injecting contrast
- Nasolacrimal duct
 - Salivary glands
 - Joints
 - Branchial sinus
92. When the distance from the source of radiation is doubled, the amount of radiation received will be
- Doubled
 - Halved
 - Reduced by one fourth
 - Reduced by one third
93. For the AP view of the pelvis with bilateral hips what is the position of legs
- 15-25° externally rotated
 - 75° externally rotated
 - 15-25° internally rotated
 - Neutral
94. The plane that divides the body into right and left halves is
- Coronal plane
 - Mid sagittal plane
 - Axial plane
 - Mid axillary plane
95. Which of the following radiological modality higher radiation exposure to the technician than others
- Mobile X-Ray
 - Interventional radiology
 - CT scan
 - Mammography
96. Which of the following is **NOT** a primary radiation barrier
- Glass
 - Concrete
 - Lead
 - Barium
97. Which of the following interactions of the X-ray with matter produce scattering primarily?
- Compton effect
 - Photoelectric effect
 - Coherent effect
 - Pair production
98. The background colour in radiation protection symbol is
- White
 - Yellow
 - Blue
 - Red
99. What is the annual effective dose limit for occupational radiation workers, as recommended by AERB, averaged over a 5-year period?
- 1 mSv
 - 5 mSv
 - 20 mSv
 - 50 mSv
100. Which of the following is commonly used to measure personal radiation exposure in radiodiagnosis department?
- Gamma camera
 - Scintillation counter
 - Thermoluminescence dosimeter
 - Geiger-Muller counter

Diploma MLT/ Vocational course (Medical Diagnostics/ Vocational course (MLT)

1. Which of the following is a multiaxial synovial joint
 - A. Elbow joint
 - B. Wrist joint
 - C. Ankle joint
 - D. Shoulder joint
2. Cerebrospinal fluid is the content of
 - A. Auditory canal
 - B. Central canal of spinal cord
 - C. Carotid canal
 - D. Anal canal
3. Which of the following is a skeletal muscle.
 - A. Limb muscles
 - B. Heart
 - C. Wall of stomach
 - D. Dartos muscle
4. Suicidal bag of a cell is
 - A. Mitochondrion
 - B. Vacuole
 - C. Lysosome
 - D. Ribosome
5. Which hormone helps in milk ejection
 - A. Growth hormone
 - B. Testosterone
 - C. ADH
 - D. Oxytocin
6. Spleen is located in abdomen in
 - A. Right upper quadrant
 - B. Left upper quadrant
 - C. Right lower quadrant
 - D. Left lower quadrant
7. Heart receives deoxygenated blood in
 - A. Right atrium
 - B. Left atrium
 - C. Right ventricle
 - D. Left ventricle
8. How many vertebrae forms the sacrum
 - A. 4
 - B. 5
 - C. 3
 - D. 6
9. How many chromosomes are present in sperm
 - A. 23 pairs
 - B. 21 pairs
 - C. 23
 - D. 24
10. Following is an example of elastic cartilage
 - A. Thyroid cartilage
 - B. Cricoid cartilage
 - C. Articular cartilage
 - D. Epiglottic cartilage
11. How many pairs of ribs are there
 - A. 9
 - B. 10
 - C. 12
 - D. 13
12. Sweat glands are supplied by
 - A. Sympathetic nerves
 - B. Parasympathetic nerves
 - C. Sensory nerves
 - D. Motor nerves
13. Thigh bone is
 - A. Humerus
 - B. Radius
 - C. Femur
 - D. Tibia
14. Pectoral girdle is made up of
 - A. Clavicle and sternum
 - B. Clavicle and humerus
 - C. Clavicle and scapula
 - D. Clavicle and rib
15. Artery to the brain is
 - A. Subclavian artery
 - B. Internal carotid artery
 - C. External carotid artery
 - D. Internal iliac artery
16. Substance secreted by renal tubule is
 - A. Creatinine
 - B. Glucose
 - C. Bicarbonate
 - D. Amino acids
17. The communication between a neuron and muscle is an example of
 - A. Synaptic transmission
 - B. Gap junction
 - C. Intercalated disc
 - D. Tight junction

Diploma MLT/ Vocational course (Medical Diagnostics/ Vocational course (MLT)

18. When a skeletal muscle with an intact nerve supply is stretched, it contracts, this is
 - A. Inverse stretch reflex
 - B. Stretch reflex
 - C. Flexion reflex
 - D. Withdrawal reflex
19. Pain sensation is carried by
 - A. Dorsal column pathway
 - B. Lateral spinothalamic tract
 - C. Corticospinal pathway
 - D. Spino-cerebellar tract
20. Myopia is corrected by placing which type of lens in front of eye
 - A. Cylindrical lens
 - B. Biconcave lens
 - C. Biconvex lens
 - D. Convexo-concave lens
21. The three bony ossicles, Incus, Malleus and Stapes are a part of
 - A. Middle ear
 - B. External ear
 - C. Inner ear
 - D. Pinna
22. The primary function of cerebellum is
 - A. Sensory integration
 - B. Planning of movement
 - C. Co-ordination of movement
 - D. Neuroendocrine control
23. The increase in plasma level of calcium is caused by
 - A. TSH
 - B. Glucagon
 - C. Aldosterone
 - D. Parathyroid hormone
24. Insulin increases glucose uptake in
 - A. All tissues
 - B. Brain cells
 - C. Renal tubular cells
 - D. Skeletal muscle
25. Leydig cells secrete
 - A. Androgen binding protein
 - B. Testosterone
 - C. Inhibin
 - D. MIS
26. In humans, fertilization usually occurs in
 - A. Uterine tube
 - B. Vagina
 - C. Cervix
 - D. Uterine cavity
27. Which part of the ECG correspond to ventricular repolarization?
 - A. The P wave
 - B. The QRS complex
 - C. The T wave
 - D. The PR interval
28. The second heart sound is caused by
 - A. Closure of aortic and pulmonary valve
 - B. Vibration of the ventricular wall during systole
 - C. Closure of the mitral and tricuspid valve
 - D. Retrograde flow in the vena cava
29. The baroreceptors are
 - A. Located in the walls of the large blood vessels
 - B. Low pressure receptors present in macula densa
 - C. Located in the carotid body
 - D. Volume receptors
30. Surfactant lining the alveoli
 - A. Are glycoproteins
 - B. Is increased in the smokers
 - C. Is produced by type I alveolar cells
 - D. Prevents alveolar collapse
31. Binomial nomenclature include:
 - A. Family and Genus
 - B. Class and Order
 - C. Genus and species
 - D. Kingdom and phylum
32. Which of the following is a biodiversity hotspot in India?
 - A. Western Ghats
 - B. Deccan Plateau
 - C. Indo – Gangetic Plan
 - D. Thar Desert

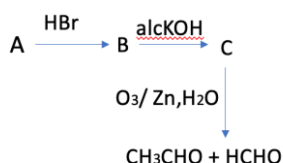
33. Which plant hormone promotes fruit ripening?
A. Auxin
B. Cytokinin
C. Gibberellin
D. Ethylene
34. Which type of pollination occurs when pollen is transferred from one flower to another flower of the same species?
A. Autogamy
B. Geitonogamy
C. Asexual pollination
D. Xenogamy
35. Which of the following is a transgenic crop?
A. Hybrid maize
B. Bt cotton
C. Organic wheat
D. Sugarcane
36. What is the function of diaphragm in breathing?
A. Filters air
B. Controls lung expansion
C. Produces sound
D. Stores oxygen
37. Which pyramid always remain upright in an ecosystem?
A. Pyramid of energy
B. Pyramid of biomass
C. Pyramid of numbers
D. Pyramid of species
38. Which enzyme is responsible for DNA replication?
A. RNA polymerase
B. Helicase
C. DNA polymerase
D. Ligase
39. Pneumonia is caused by
A. Streptococcus pneumonia
B. Haemophilus influenza
C. Both A and B
D. Salmonella typhi
40. Which organelle is involved in cell division in animal cells?
A. Golgi bodies
B. Lysosomes
C. Endoplasmic reticulum
D. Centrioles
41. Which of the following is an example of oviparous animal?
A. Dog
B. Cow
C. Hen
D. Human
42. What does the term “Keystone species” mean?
A. A species that has a significant impact on ecosystem balance
B. A species that is dominant
C. A species with no predators
D. A species with a short life span
43. Where are red blood cells produce?
A. Liver
B. Bone marrow
C. Spleen
D. Heart
44. Which of the following is a sex-linked recessive disorder?
A. Diabetes
B. Hemophilia
C. Cancer
D. Sickle cell anemia
45. The rough endoplasmic reticulum is associated with
A. Protein synthesis
B. Lipid synthesis
C. Carbohydrate metabolism
D. DNA replication
46. Which pigment is essential for photosynthesis?
A. Haemoglobin
B. Melanin
C. Chlorophyll
D. Carotene

47. What is a biome?
- A. A large ecological area with similar climate and vegetation
 - B. A single food chain
 - C. A group of related species
 - D. A type of soil
48. According to modern periodic law, the physical and chemical properties of elements are periodic function of
- A. Atomic mass
 - B. Atomic number
 - C. Mass number
 - D. Effective nuclear charge
49. The general electronic configuration of non-transition elements Zn, Cd, Hg is
- A. $(n-1)d^{10}ns^2$
 - B. $(n-1)d^{10}ns^1$
 - C. $(n-1)d^9ns^2$
 - D. $(n-1)d^8ns^2$
50. Low concentration of oxygen in the blood and tissues of people living at high altitude is due to
- A. Low temperature
 - B. Low atmospheric pressure
 - C. High atmospheric pressure
 - D. Both low temperature and high temperature
51. A device that converts energy of combustion of fuels like hydrogen and methane directly into electrical energy is known as
- A. dynamo
 - B. Ni-Cd cell
 - C. fuel cell
 - D. electrolytic cell
52. X has 2 valence electrons Y has 5 valence electrons. The formula of compound is
- A. X_2Y_3
 - B. XY
 - C. XY_2
 - D. X_3Y_2
53. Which of the following has intra molecular H-Bonding?
- A. p-nitro phenol
 - B. o-nitro phenol
 - C. m-nitro phenol
 - D. All of these
54. Which of the following statement about transition element is not correct?
- A. They show variable oxidation states.
 - B. They exhibit diamagnetic and paramagnetic properties.
 - C. All ions are coloured.
 - D. They exhibit catalytic property.
55. When 1 mol $CrCl_3 \cdot 6H_2O$ is treated with excess of $AgNO_3$, 3 mol of $AgCl$ are obtained. The formula of the complex is
- A. $[CrCl_3(H_2O)_3] \cdot 3H_2O$
 - B. $[CrCl_2(H_2O)_4]Cl \cdot 2H_2O$
 - C. $[CrCl(H_2O)_5]Cl_2 \cdot H_2O$
 - D. $[Cr(H_2O)_6]Cl_3$
56. Reaction of $C_6H_5CH_2Br$ with aqueous sodium hydroxide follows_____.
- A. S_N1 mechanism
 - B. S_N2 mechanism
 - C. Any of the above two depending upon the temperature of reaction
 - D. Saytzeff rule

57. On adding AgNO_3 solution to 1mole of $\text{PdCl}_2 \cdot 4\text{NH}_3$, two moles of AgCl are formed. The secondary valency of Pd in complex will be
- 4
 - 0
 - 1
 - 2

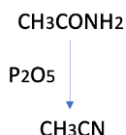
58. Charge carried by 1 mole of electrons is
- 1.6×10^{-19} coulomb
 - 9.65×10^4 coulomb
 - 6.023×10^{23} coulomb
 - 6.28×10^{19} coulomb

59. In the reaction:



the compound A is :

- Ethylene
 - Acetic acid
 - Propene
 - 1-Butene
60. During the following reaction,



the hybridisation state of carbon changes from

- sp^3 to sp
 - sp^3 to sp^2
 - sp^2 to sp^3
 - sp^2 to sp
61. The K_{sp} of $\text{Cr}(\text{OH})_3$ is 1.6×10^{-30} . The molar solubility of the compound in water is
- $(1.6 \times 10^{-30})^{1/3}$
 - $(1.6 \times 10^{-30}/27)^{1/4}$
 - $1.6 \times 10^{-30}/27$
 - $(1.6 \times 10^{-30})^{1/2}$

62. If equilibrium constant for a reaction is K, then standard free energy change is
- $\Delta G^0 = -RT \log K$
 - $\Delta G^0/RT = -\log K$
 - $\Delta G^0 = RT \ln K$
 - $\Delta G^0/RT = -2.303 \log K$

63. Which of the following has highest boiling point?
- NH_3
 - PH_3
 - SbH_3
 - AsH_3

64. In which of the following pairs, the ions are isoelectronic?
- $\text{Na}^+, \text{O}^{2-}$
 - $\text{Al}^{3+}, \text{O}^-$
 - Na^+, Mg^+
 - $\text{N}^{3-}, \text{Cl}^-$

65. An organic compound 'A' on treatment with benzene sulphonyl chloride gives compound 'B'. B is soluble in dil NaOH solution. Compound A is
- $\text{C}_6\text{H}_5\text{-N}(\text{CH}_3)_2$
 - $\text{C}_6\text{H}_5\text{-NHCH}_2\text{CH}_3$
 - $\text{C}_6\text{H}_5\text{-CH}_2\text{NHCH}_3$
 - $\text{C}_6\text{H}_5\text{-CH}(\text{CH}_3)\text{NH}_2$

66. Choose the correct option related to Mycoplasma
- They can not survive without oxygen
 - They completely lack a cell wall
 - They are non-pathogenic
 - They are the largest bacterial cell

67. Match list I with list II

List I	List II
i. Phycomycetes	a. <i>Alternaria</i>
ii. Ascomycetes	a. <i>Agaricus</i>
iii. Basidiomycetes	b. <i>Mucor</i>
iv. Deuteromycetes	d. <i>Aspergillus</i>

- A. i-d, ii-b, iii-c, iv-a
B. i-b, ii-a, iii-d, iv-c
C. i-c, ii-d, iii-b, iv-a
D. i-c, ii-b, iii-a, iv-d
68. Choose the correct option about viroids
- A. They have free RNA without protein coat
B. They have free DNA without protein coat
C. They have RNA with protein coat
D. They have DNA with protein coat
69. Choose the correct pair from the following
- A. i gene- encodes repressor protein
B. z gene- encodes permease
C. y gene- encodes transacetylase
D. a gene- encodes beta-galactosidase
70. The first phase of translation is
- A. Binding of mRNA to ribosome
B. Recognition of DNA molecule
C. Recognition of an anti-codon
D. Charging of tRNA
71. The infective stage of Plasmodium is-
- A. Trophozoite
B. Merozoite
C. Sporozoite
D. Gametocyte
72. Which among the following is not the part of innate immunity ?
- A. Interferons
B. NK cells
C. Mucosal coating
D. Antibodies

73. Which of the following is not a selectable marker of cloning vectors
- A. Amphotericin
B. Ampicillin
C. Kanamycin
D. Tetracycline
74. Which among the following is not true related to gel electrophoresis
- A. DNA fragments can be visualized with the help of Ethidium bromide in UV radiation
B. The presence of chromogenic substrate gives blue coloured DNA bands on the gel
C. The process of extraction of separated DNA strands from gel is called elution
D. The DNA fragments purified can be used in recombinant DNA technology
75. The vector for Chikungunya is-
- A. Culex mosquitoes
B. Anopheles mosquitoes
C. Aedes mosquitoes
D. Mansonia mosquitoes
76. Which organelle is known as the powerhouse of the cell?
- A. Nucleus
B. Ribosome
C. Mitochondria
D. Endoplasmic Reticulum
77. Which enzyme is responsible for unwinding the DNA helix during replication?
- A. DNA polymerase
B. Helicase
C. Ligase
D. Topoisomerase

Diploma MLT/ Vocational course (Medical Diagnostics/ Vocational course (MLT)

78. In spectrophotometry, which law relates absorbance to concentration?
- A. Boyle's law
 - B. Beer-Lambert law
 - C. Avogadro's law
 - D. Raoult's law
79. PCR is used to:
- A. Transfer genes
 - B. Cut DNA
 - C. Amplify DNA
 - D. Synthesize proteins
80. A genetic disorder caused by a trisomy of chromosome 21 is:
- A. Klinefelter syndrome
 - B. Down syndrome
 - C. Turner syndrome
 - D. Edward syndrome
81. Which blood vessel carries oxygenated blood from lungs to heart?
- A. Pulmonary artery
 - B. Pulmonary vein
 - C. Aorta
 - D. Vena cava
82. Which of the following helps in maintaining body posture and balance?
- A. Cerebrum
 - B. Medulla
 - C. Cerebellum
 - D. Spinal cord
83. A man with blood group A marries a woman with blood group B. What are the possible blood groups of their children?
- A. A and B only
 - B. AB only
 - C. A, B, AB, and O
 - D. O only
84. A sudden heritable change in DNA is called:
- A. Translation
 - B. Mutation
 - C. Recombination
 - D. Replication
85. Who proposed the theory of Natural Selection?
- A. Darwin
 - B. Lamarck
 - C. Mendel
 - D. Wallace
86. Which method is used for estimation of creatinine:
- A. O-Toluidine method
 - B. Uricase method
 - C. Diacetyl Monoxime method
 - D. Jaffe's method
87. Universally accepted disinfectant for the medical workplace is
- A. 1% Glutaraldehyde
 - B. 1% Hypochlorite
 - C. 1% Formalin
 - D. 1% Isopropyl alcohol
88. The RPM of a Centrifuge is
- A. Relative centrifugal force per minute
 - B. Revolutions per minute
 - C. Rotations per minute
 - D. Resting Potential per minute
89. What is the effect of increasing the temperature on the rate of a reaction?
- A. Increases the rate of the reaction.
 - B. Decreases the rate of the reaction.
 - C. Has no effect on the rate of the reaction.
 - D. Depends on the nature of the reactants.
90. A beaker contains a solution of substance 'A'. Precipitation of substance 'A' takes place when small amount of 'A' is added to the solution. The solution is _____.
- A. Saturated
 - B. Unsaturated
 - C. Supersaturated
 - D. Concentrated

91. Low concentration of oxygen in the blood and tissues of people living at high altitude is due to _____
- A. low temperature
 - B. low atmospheric pressure
 - C. high atmospheric pressure
 - D. both low temperature and high atmospheric pressure
92. Name the simplest amino acid
- A. Alanine
 - B. Tyrosine
 - C. Asparagine
 - D. Glycine
93. Which of the following polymer is stored in the liver of animals
- A. Amylose
 - B. Amylopectin
 - C. Glycogen
 - D. Cellulose
94. Sucrose (cane sugar) is a disaccharide. One molecule of sucrose on hydrolysis produces
- A. 2 molecules of glucose
 - B. 2 molecules of glucose + 1 molecule of fructose
 - C. 1 molecule of glucose + 1 molecule of fructose
 - D. 2 molecules of fructose
95. Which of the following acids is a vitamin?
- A. Aspartic acid
 - B. Ascorbic acid
 - C. Adipic acid
 - D. Saccharic acid
96. Human blood consists of all of the following **EXCEPT**?
- A. Red blood cells
 - B. Plasma
 - C. Platelets
 - D. Epithelium
97. Which are the four major blood groups?
- A. A, B, C, D
 - B. A, B, AB, O
 - C. A, B, C, O
 - D. A, B, A2, O
98. What is the function of Ethylene Diamine tetra acetic acid (EDTA) in a blood sample?
- A. Promotes clotting of blood
 - B. Prevents clotting of blood
 - C. Promotes hemolysis of blood
 - D. Prevents hemolysis of blood
99. According to latest biomedical waste disposal guidelines, all plastic waste is disposed off in which colour coded container?
- A. Red
 - B. Green
 - C. Yellow
 - D. Blue
100. Which individuals are considered universal donors of red blood cells for transfusion?
- A. AB negative
 - B. O negative
 - C. AB positive
 - D. B negative