

## TET CUM TRT – 2018

### PGT - PHYSICS

1. Fungi are the plants that lack
  1. Oxygen
  2. Carbondioxide
  - 3. Chlorophyl**
  4. Nitrogen
  
2. The polymer used in making non-stick kitchen ware
  1. Nylon
  - 2. Teflon**
  3. Polystyrene
  4. Bakelite
  
3. Telescope was invented by
  1. John L. Baird
  2. Marconi
  3. Landstein
  - 4. Hans Lippershey**

4. Providing Urban Amenities in Rural Areas (PURA) was the brain child of
  1. C. Rangarajan
  2. **A.P.J. Abdul Kalam**
  3. Kasthuri Rangan
  4. Siva Rama Krishnan
  
5. Chief Justice of India at present is
  1. Justice Dipak Mishra
  2. Justice Patanjali Sastry
  3. **Justice Ranjan Gogoi**
  4. Justice Jagadish Singh Kekhar
  
6. What does Rector scale measure
  1. Humidity
  2. Cyclones
  3. **Earthquakes**
  4. Tides
  
7. BCG vaccination is injected to get immunity from
  1. **Tuberculosis**
  2. Polio
  3. Smallpox
  4. Cholera

8. The expanded form of NIOS is
1. National Institute of Organic Saplings
  2. **National Institute of Open Schooling**
  3. National Institute of Organized Sectors
  4. National Institute of Organized Service
9. National Cadet Corps has completed \_\_\_\_\_ years of its existence
1. **70**
  2. 69
  3. 77
  4. 60
10. One day Pelican Festival was held on February 4<sup>th</sup> 2018 in
1. **Atapaka Bird Sanctuary at Kolleru**
  2. Nelapattu Bird Sanctuary at Nellore
  3. Rangannathittu Bird Sanctuary in Karnataka
  4. Vedanthangal Bird Sanctuary in Tamil Nadu
11. Who was the first man to set foot on the moon
1. **Neil Armstrong**
  2. Yuri Gagarin
  3. Valentina Tereshkova
  4. Sunita Williams

12. The number of red balls in snooker
1. 13
  2. **15**
  3. 17
  4. 20
13. The present Cabinet Minister for Minority affairs is
1. Piyush Goyal
  2. **Mukhtar Abbas Naqvi**
  3. Dharmendra Pradhan
  4. Prakash Javadekar
14. Present Chief Election Commissioner in India is
1. **Sunil Arora**
  2. K.K. Venugopal
  3. Mangoo Singh
  4. Om Prakash Rawat
15. Mahavira was born at
1. Kapilavastu
  2. Pataliputra
  3. **Kundalgram**
  4. Peshawar

16. Megasthenese visited the court of
1. Ajatasatru
  2. **Chandragupta Maurya**
  3. Bimbisara
  4. Bindusara
17. Most spoken language in the World
1. English
  2. **Chinese**
  3. Latin
  4. Grease
18. The deepest point in the Pacific Ocean is called
1. **Mariana Trench**
  2. Bermudas Trench
  3. Sunda Trench
  4. Java Trench
19. Right to property was removed from fundamental rights through this amendment in the constitution
1. 42
  2. 356
  3. **44**
  4. 360

20. The founder of Arya Samaj
1. Swami Vivekananda
  2. **Swami Dayananda Saraswathi**
  3. Swami Virajananda Saraswathi
  4. Swami Swarupananda Saraswathi
21. 'European learning would enable Indians to recognise the advantages that flow from the expansion of trade and commerce, and make them see the importance of developing the resources of the country.' Which one of these emphasized on the above 'Education for Commerce'?
1. Ishwar Bhai Patel Committee 1977
  2. **Woods Despatch 1854**
  3. Hartog Committee-1929
  4. Hunter Commission-1882-83
22. Pabajja, the initiation of preliminary ordination for a child of 8 years willing to join the process of education is a ceremony under
1. **Buddhist Period**
  2. Jain Period
  3. Ancient Vedic Period
  4. Post- Vedic Period

23. Which of these is among the subjects taught in Madrasa during Medieval Period?
1. Sociology, Tafsir, Hadis
  2. **Tafsir, Hadis, Fiqh**
  3. Urdu, Persian, Tafsir
  4. Hadis, Fiqh, Sociology
24. What was the name given to the teacher in Post Vedic Period?
1. Guru
  2. Deva
  3. Chari
  4. **Acharya**
25. Which is a defect of the teacher's professional organizations in India?
1. Lack of infrastructural facilities in teacher's professional organizations
  2. Availability of long range academic programmes
  3. **Lack of unity among different organizations**
  4. Regular organization of programmes for the improvement of professional competence of teachers

26. If the student teacher is admitted into a teacher education institution as fresher from colleges without having any training earlier, it is called as
1. Extension teacher education
  2. In- service teacher education
  3. Collegiate teacher education
  4. **Pre- service teacher education**
27. Which of these involve in affiliating institutions conducting examinations at the Secondary and senior levels and developing and updating curriculum and textual materials?
1. **CBSE**
  2. NCERT
  3. UGC
  4. DIET
28. Which is a function of University Departments of Teacher Education?
1. **Developing the Post- Graduate studies and research work**
  2. Determining the standard of teacher education institutions
  3. Developing a guideline for general teacher education program
  4. Organizing extension programmes with collaboration of NCERT, NCTE, UGC

29. 'Population growth in cities under percentages', 'family members versus consumption of consumable articles under direct and indirect proportion' shows correlation between Mathematics and \_\_\_\_\_
1. Health Education
  2. **Population education**
  3. Urban development
  4. Depletion of resources
30. Which of these investments has the longest gestation periods?
1. Shares
  2. Investments in Small scale business
  3. Real estate investments
  4. **Educational Investments**
31. 'Diversity among children is to be viewed as a gift, not a problem for teachers'. This statement where inclusion is given due value was given by
1. **The 46<sup>th</sup> Session of UNESCO's International Conference in Education, Geneva, 2001**
  2. UNICEF, 2000
  3. Persons with Disability Act, 1995
  4. Dakar Framework for Action, 2000

32. Andhra Pradesh Government initiated Mid-day meal programme for Junior Colleges in August 2018. What is the objective behind this scheme?
1. To maintain regularity and punctuality in colleges
  2. **To reduce the drop-out rate in Junior Colleges**
  3. To make teachers follow strict schedule
  4. To motivate more girls to join Govt. Junior colleges and not private colleges
33. As per RTE Act 2009, every child completing his elementary education shall be
1. Awarded with cash prize
  2. **Awarded with a certificate**
  3. Awarded with a memento
  4. Awarded with School kit for next course
34. According to the National Commission for Protection of Child Rights (NCPCR), the Child is defined as
1. a person in the 0 to 8 years age group.
  2. a person in the 3 to 8 years age group.
  3. a person in the 6 to 14 years age group.
  4. **a person in the 0 to 18 years age group.**

35. If any applicant mutilates or destroys a record during inspection of records then,
1. PIO will ignore the issue
  2. **PIO will lodge a criminal complaint immediately**
  3. PIO will ask penalty on the spot from the person
  4. PO will make a copy of the same and let the matter go off
36. Salary of a Chief Information Commissioner is same as
1. The President
  2. The Prime Minister
  3. The Chief Justice of India
  4. **The Chief Election Commissioner**
37. As per NCF 2005, which is an intellectual space for teachers, learners and members of the community to deepen their knowledge and connect with the wider world?
1. School brochure
  2. Community theatre
  3. Science Laboratory
  4. **School library**
38. As per NCF 2005, to widen teachers' choices and provide for the diversity in children's needs and interests, there is a need for
1. Availability of multiple examination pattern
  2. Availability of online resources
  3. **Availability of multiple textbooks**
  4. Availability of play materials

39. As per NCF 2005, reducing stress and enhancing success in examinations necessitate:
1. **a shift towards shorter examinations**
  2. a shift towards content-based testing to problem solving skills and understanding
  3. a shift towards oral form of examination
  4. a shift towards no examination system
40. According to NCF 2005, which is the key feature of systemic reform which implies the system's capacity to reform itself by enhancing its ability to remedy its own weaknesses and to develop new capabilities?
1. Quantitative development
  2. Teaching competency
  3. **Quality concern**
  4. Organizational development
41. Child gains control over its head first then arms and legs last. This is called as
1. Proximodistal Direction
  2. **Cephalo-Caudal Direction**
  3. Continuous Development
  4. Specific Development
42. Which is the stage of moral development in social system morality
1. Stage 3
  2. Stage 2
  3. **Stage 4**
  4. Stage 5

43. A newly born child responds on reflexive level sucking and crying with gross bodily activity performed in
1. **0 to 1 month**
  2. 1 to 4 months
  3. 4 to 8 months
  4. 8 to 12 months
44. The identity status in which individuals are in the midst of exploring alternatives but have not yet made a commitment
1. Identify Diffusion
  2. Identify Foreclosure
  3. **Identify moratorium**
  4. Identify Achievement
45. Appropriate use of language in different controls is
1. Phonology
  2. Syntax
  3. Semantics
  4. **Pragmatics**
46. A relatively permanent influence on behavior, knowledge and thinking skills which comes out through experiences
1. **Learning**
  2. Thinking
  3. Problem Solving
  4. Creativity

47. A child who is good at utilizing rhyme, rhythm, music, visual impression, colour and pictures, looks for analogies and patterns is said to be the function of
1. **Right Brain**
  2. Left Brain
  3. Integrated Mode
  4. Learning
48. Children learn to walk, sit, run, climb, pick up objects. This is by
1. **Trial and Error Learning**
  2. Classical Conditioning
  3. Observational Learning
  4. Social Learning
49. Taking a positive reinforcer away from an individual
1. Time Out
  2. **Response Cost**
  3. Punishment
  4. Extinction
- 50 . The belief that one can master a situation and produce positive outcome is
1. Self-Concept
  2. Self-Esteem
  3. **Self-Efficacy**
  4. Self-Regulation

51. A student deficient in physical activities may show good result in academic field
1. Identification
  2. **Compensation**
  3. Regression
  4. Project
52. Ability to understand and effectively interact with others
1. Naturalist Skills
  2. Verbal Skills
  3. **Interpersonal Skills**
  4. Intrapersonal Skills
53. A test that is used to predict a student's ability to learn a skill or accomplish something with further education and training
1. **Aptitude Test**
  2. Achievement Test
  3. Ability Test
  4. Attitude Test
54. Learning that occurs when students work in small group to help each other learn
1. **Cooperative Learning**
  2. Collaborative Learning
  3. Group Learning
  4. Transfer of Learning

55. Assessment during the course of instruction rather than after it is completed
1. Summative Assessment
  2. Continuous and Comprehensive Assessment
  3. Pre Instructional Assessment
  4. **Formative Assessment**
56. A style that allows students considerable autonomy but provides them with little support for developing skills
1. Authoritative Classroom Management Style
  2. Authoritarian Classroom Management Style
  3. **Permissive Classroom Management Style**
  4. Withitness
57. Reasoning from the general to the specific is
1. Inductive Reasoning
  2. **Deductive Reasoning**
  3. Transductive Reasoning
  4. Critical Thinking
58. A students general knowledge about the world is
1. Episodic Memory
  2. Short Term Memory
  3. **Semantic Memory**
  4. Implicit Memory

59. Students attributing their failure to the stiff question paper is using defense mechanism of

1. **Rationalization**
2. Compensation
3. Projection
4. Denial

60. “Ink-blot test” is used to measure

1. Achievement
2. **Personality**
3. Attitude
4. Creativity

## CONTENT

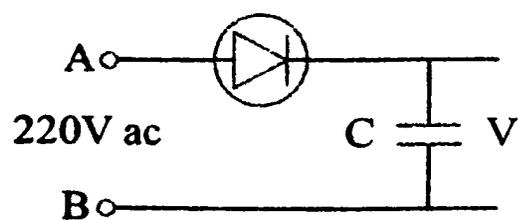
61. A doped semiconductor is
1. Positively charged
  2. Negatively charged
  3. **Electrically neutral**
  4. May be positive or negative
62. Pure silicon has equal electron and hole concentration of  $1.5 \times 10^{16} \text{ m}^{-3}$ . Doping by indium increases the hole concentration to  $4.5 \times 10^{22} \text{ m}^{-3}$ . Then the electron number density is
1.  **$5 \times 10^9 \text{ m}^{-3}$**
  2.  $2 \times 10^9 \text{ m}^{-3}$
  3.  $3 \times 10^{11} \text{ m}^{-3}$
  4.  $1 \times 10^{11} \text{ m}^{-3}$
63. The dominant mechanisms for motion of charge carriers in forward and reverse biased silicon p-n junctions are
1. Drift in forward bias, diffusion in reverse bias
  2. **Diffusion in forward bias, drift in reverse bias**
  3. Diffusion in both forward and reverse bias
  4. Drift in both forward and reverse bias

64. If a full wave rectifier is used to convert 'n' Hz A.C into D.C, then the number of pulses per second present in the rectified voltage is

1. n
2.  $\frac{n}{2}$
3. **2n**
4. 4n

65. A 220 V ac supply is connected between points A and B as shown in figure. The potential difference across the capacitor is

1. 220 V
2. 110 V
3. 0 V
4.  **$220\sqrt{2}$  V**



66. In common emitter configuration of a transistor, the current gain is 40 and base current is 25  $\mu$ A. Then the emitter current is

1. 1 mA
2. **1.025 mA**
3. 2 mA
4. 2.025 mA

67. An oscillator is an amplifier with

1. A large gain
2. Negative feedback
3. **Positive feedback**
4. No feedback



71. A transistor-oscillator using a resonant circuit with an inductor  $L$  and a capacitor  $C$  in series produce oscillations of frequency  $f$ . If  $L$  is doubled and  $C$  is changed to  $4C$ , the frequency will be

1.  $\frac{f}{2}$

2.  $\frac{f}{4}$

3.  $8f$

**4.  $\frac{f}{2\sqrt{2}}$**

72. The number of AND, OR and XOR gates are required for the configuration of full adder

1. 1, 2, 2

**2. 2, 1, 2**

3. 3, 1, 2

4. 4, 0, 1

73. The values of  $C_v$  and  $C_p$  of a gas are  $25.18 \text{ J/mol-K}$  and  $33.49 \text{ J/mol-K}$ , the atomicity of the gas is

**1. 6**

2. 3

3. 5

4. 8

74. For a gas the r.m.s speed at 800 K is
1. Same as at 200 K
  2. Half the value of 200 K
  3. **Twice the value of 200 K**
  4. Four times the value of 200 K
75. The number of collisions per second of a molecule of a gas having mean free path  $1.876 \times 10^{-7}$  m is (Take average speed of the molecule as 511 m/s)
1.  $3.67 \times 10^{-9}$
  2.  $3.67 \times 10^{-10}$
  3.  $2.72 \times 10^7$
  4.  **$2.72 \times 10^9$**
76. An ideal refrigerator has to transfer an average of 200 Joule of heat per second from  $-10^\circ\text{C}$  to  $27^\circ\text{C}$ . The average power consumed
1. **28.13 Watt**
  2. 38.17 Watt
  3. 125.9 Watt
  4. 225 Watt
77. A piece of ice is added to water in a cup. The entropy
1. Decreased
  2. **Increased**
  3. Undergoes no change
  4. Sometimes increase, sometimes not

78. The change in entropy when 10 gram of ice at 0 °C is converted into water at the same temperature is  
(Given Latent heat of ice = 80 cal/gram)
1. **2.93 cal/K**
  2. 4 cal/K
  3. 5.3 cal/K
  4. 8 cal/K
79. If U, P, V, T and S represents internal energy, pressure, volume, temperature and entropy respectively, then Helmholtz free energy function (F) is defined by
1.  $F = U + TS$
  2.  $F = U + PV$
  3.  **$F = U - TS$**
  4.  $F = U + PV - TS$
80. A body at 1500 K emits maximum energy of wavelength 2000 nm. If the sun emits maximum energy of wavelength 550 nm, the temperature of the sun is
1. 500 K
  2. 4500 K
  3. 1500 K
  4. **5454 K**
81. Pouli's exclusion principle applies to
1. Maxwell-Boltzmann Statistics
  2. Bose-Einstein Statistics
  3. **Fermi-Dirac Statistics**
  4. Maxwell-Bose Statistics

82. The order of magnitude of the energy received from sun at earth's surface is  $10^{-1} \text{ Jcm}^{-2}\text{s}^{-1}$ . The order of magnitude of the total force due to solar radiation on the earth is (assumed perfectly absorbing and earth's diameter =  $10^7 \text{ m}$ )
1.  **$10^9 \text{ N}$**
  2.  $10^7 \text{ N}$
  3.  $10^{-5} \text{ N}$
  4.  $10^{-9} \text{ N}$
83. The following material could not be used as a porous material in porous plug experiment
1. Cotton
  2. Wool
  3. Silk fibre
  4. **Wood**
84. For hydrogen  $C_p - C_v = m$  and for nitrogen  $C_p - C_v = n$ , where  $C_p$  and  $C_v$  refer to specific heats per unit mass at constant pressure and constant volume respectively. The relation between 'm' and 'n' is
1.  $n = 14m$
  2.  $n = 7m$
  3.  **$m = 7n$**
  4.  $m = 14n$

85. The lattice constant of a diamond structure is  $5\text{Å}$ , the distance between two atoms of a basis of the diamond structure is
1.  $3.14\text{ Å}$
  2.  **$2.16\text{ Å}$**
  3.  $6.12\text{ Å}$
  4.  $1.26\text{ Å}$
86. The primitive translation vectors of space lattice are  $\vec{a} = 2\hat{i} + \hat{j}$ ,  $\vec{b} = 2\hat{j}$  and  $\vec{c} = 2\hat{k}$ . The volume of the primitive cell is
1. **4**
  2. 3
  3. 2
  4. 1
87. The spacing between successive (100) planes =  $3.84\text{ Å}$ , grazing angle  $30^\circ$  and order of Bragg reflection = 1, the velocity of neutron beam is
1.  $4.3 \times 10^3\text{ ms}^{-1}$
  2.  **$1.03 \times 10^3\text{ ms}^{-1}$**
  3.  $43.3 \times 10^3\text{ ms}^{-1}$
  4.  $103 \times 10^3\text{ ms}^{-1}$

88. An electron has a momentum  $5.4 \times 10^{-26} \text{ kgms}^{-1}$  with an accuracy of 0.05%. The minimum uncertainty in the location of the electron is

1.  $1.95 \times 10^{-6} \text{ cm}$
2.  $2.95 \times 10^{-9} \text{ m}$
3.  $2.59 \times 10^{-3} \text{ cm}$
4.  **$1.95 \times 10^{-6} \text{ m}$**

89. In normal Zeeman effect a level of given  $l$  splits into

1.  $l$  levels
2.  $2l$  levels
3.  **$(2l + 1)$  levels**
4.  $(2l - 1)$  levels

90. The de-Broglie wavelength of a particle moving with a velocity  $2.25 \times 10^8 \text{ m/s}$  is equal to the wavelength of a photon. The ratio of kinetic energy of particle to that of photon is

1.  $\frac{1}{8}$
2.  **$\frac{3}{8}$**
3.  $\frac{5}{8}$
4.  $\frac{7}{8}$

91. Photons of energy 2.0 eV fall on a metal plate and release photoelectrons with a maximum velocity  $v$ . By decreasing by 25% the maximum velocity of photoelectrons is doubled. The work function of the metal in eV is
1. 2.22
  2. 1.12
  3. 2.35
  4. **1.80**
92. A photocell emits  $4 \times 10^{12}$  electrons per second with maximum kinetic energy of  $E$ , when the source of light is at a distance 'd' from the photocell. If the distance is made equal to  $2d$ , the number of electrons emitted per second and maximum kinetic energy will be
1.  $2 \times 10^{12}$ ,  $E$
  2.  **$10^{12}$ ,  $E$**
  3.  $4 \times 10^{12}$ ,  $2E$
  4.  $2 \times 10^{12}$ ,  $2E$
93. Compton shift depends on
1. Incident radiation
  2. Nature of scattering substance
  3. **Angle of scattering**
  4. Amplitude of frequency

94. A hydrogen atom emits a photon of energy 12.1 eV. Its orbital angular momentum changes by
1.  $1.05 \times 10^{-34} \text{Js}$
  - 2.  $2.11 \times 10^{-34} \text{Js}$**
  3.  $3.16 \times 10^{-34} \text{Js}$
  4.  $4.22 \times 10^{-34} \text{Js}$
95. In a nuclear reaction 0.1% mass is converted into energy. The energy released by the fission of 1 kg mass will be
1. 2.5 kwh
  2.  $2.5 \times 10^{-7} \text{ kwh}$
  3.  $2.5 \times 10^9 \text{ kwh}$
  - 4.  $2.5 \times 10^7 \text{ kwh}$**
96. A heavy nucleus at rest breaks into the fragments which fly off with velocities 27 : 1. The ratio of radii of fragments is
- 1. 1 : 3**
  2. 1 : 4
  3. 4 : 1
  4. 2 : 1

97. If  $V$  is the volume enclosed by the surface  $S$  and a vector  $\vec{r} = x\hat{i} + y\hat{j} + z\hat{k}$ . Then  $\iiint_S \vec{r} \cdot d\vec{s}$  is
1.  $1V$
  2.  $2V$
  3.  **$3V$**
  4.  $4V$
98. If the earth were to cease rotating about its axis then the change in the value of  $g$  at a place of latitude  $45^\circ$  is (radius of the earth is  $6.38 \times 10^8$  cm)
1.  **$1.686 \text{ cm/s}^2$**
  2.  $9.806 \text{ cm/s}^2$
  3.  $4.632 \text{ cm/s}^2$
  4.  $3.651 \text{ cm/s}^2$
99. An artificial satellite is in an elliptical orbit around the earth with aphelion of  $6R$  and perihelion of  $2R$ , where  $R$ , the radius of the earth is  $6400$  km. Then the eccentricity of the elliptical orbit is
1.  $0.2$
  2.  $0.8$
  3.  $0.3$
  4.  **$0.5$**

100. A Geiger-Mueller counter collects  $10^8$  electrons per discharge. The average current in the circuit is  $6.65 \times 10^{-6}$  A. Then the counting rate is

1.  $20 \times 10^6$  per minute
2.  **$25 \times 10^6$  per minute**
3.  $30 \times 10^6$  per second
4.  $25 \times 10^6$  per second

101. The potential function of a scalar field is  $V = 7x + 3y - 2z$ . The gradient of the field is

1.  **$7\vec{i} + 3\vec{j} - 2\vec{k}$**
2.  $7\vec{i} - 3\vec{j} + 2\vec{k}$
3.  $3\vec{i} + 7\vec{j} - 2\vec{k}$
4.  $2\vec{i} - 3\vec{j} + 7\vec{k}$

102. A vector  $\vec{A}$  is said to be solenoidal if

1.  $\nabla^2 \vec{A} = 0$
2.  $\nabla \times \vec{A} = 0$
3.  **$\nabla \cdot \vec{A} = 0$**
4.  $\nabla \cdot \vec{A} = 1$

103. The fuel is burnt at a rate of 0.02 kg/s in a rocket. Exhaust velocity of gases is 10,000 m/s. The thrust acting on the rocket is

1. 100 N
2. **200 N**
3. 300 N
4. 400 N

104. When external torque is not acting on the uniform sphere, its angular velocity

1. Increases
2. Decreases
3. First increase and then decrease
4. **Remains constant**

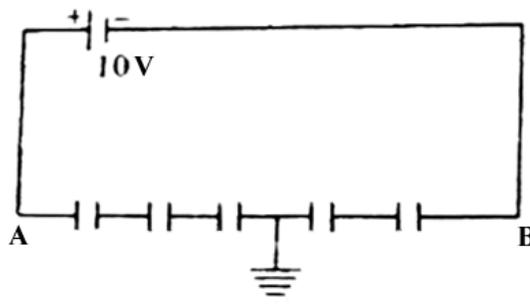
105. Expression for areal velocity is

1.  $\frac{1}{2} r^2 \frac{\Delta\theta}{\Delta t}$
2.  $\frac{1}{2} r \frac{\Delta\theta}{\Delta t}$
3.  $\frac{1}{2} r \frac{\Delta^2\theta}{\Delta t^2}$
4.  $\frac{1}{2} r^2 \frac{\Delta^2\theta}{\Delta t^2}$

106. In Galilean transformation, acceleration is
1. Variant
  2. Scalar
  3. Different for different frames
  4. **Invariant**
107. In Michelson-Morley experiment mirror is 5 m distance from glass plate. The fringe shift for wavelength  $5000 \text{ \AA}$  radiation is ( $v = 3 \times 10^4 \text{ m/s}$ )
1. 0.1
  2. **0.2**
  3. 0.3
  4. 0.4
108. Two electrons are moving towards a point in opposite directions with velocities  $0.8c$  and  $0.5c$  respectively. The relative velocity between them is
1.  $0.368c$
  2.  $0.641c$
  3.  **$0.928c$**
  4.  $1.272c$

109. In the following circuit, the potentials at points A and B are

1. **6 V, -4 V**
2. 10 V, 0 V
3. 4 V, -6 V
4. 5 V, -5 V



110. Electric charges  $q$ ,  $q$ ,  $-2q$  are placed at the corners of an equilateral triangle of side  $l$ . The magnitude of electric dipole moment of the system is

1.  $ql$
2.  $2ql$
3.  $4ql$
4.  **$\sqrt{3} ql$**

111. An infinitely long thin straight wire has uniform linear charge density of  $\frac{1}{3} \text{Cm}^{-1}$ . Then the magnitude of the electric intensity at a point 18 cm away is

1.  **$0.33 \times 10^{11} \text{NC}^{-1}$**
2.  $3 \times 10^{11} \text{NC}^{-1}$
3.  $0.66 \times 10^{11} \text{NC}^{-1}$
4.  $1.32 \times 10^{11} \text{NC}^{-1}$

112. The electrostatic potential inside a charged spherical ball is given by  $\phi = ar^2 + b$  where  $r$  is the distance from the centre;  $a$ ,  $b$  are constants. Then the charge density inside the ball is

1.  $-24\pi a\epsilon_0 r$
- 2.  $-6a\epsilon_0$**
3.  $-24\pi\epsilon_0 a$
4.  $-6a\epsilon_0 r$

113. Capacitance of a spherical conductor with radius 1 m is

1.  $9.0 \times 10^{-9} \text{ F}$
2.  $1.0 \times 10^{-6} \text{ F}$
- 3.  $1.1 \times 10^{-10} \text{ F}$**
4.  $1.0 \times 10^{-3} \text{ F}$

114. An electron is moving with constant velocity along x-axis. If a uniform electric field is applied along y-axis, then its path in the x-y plane will be

1. A straight line
2. A circle
- 3. A parabola**
4. An ellipse

115. The electric field at a point which is at a distance  $r$  from an electric dipole is proportional to

1.  $r^2$

2.  $\frac{1}{r}$

3.  $\frac{1}{r^2}$

4.  $\frac{1}{r^3}$

116. A charge  $Q$  is placed at the corner of a cube, the flux of the electric field through the square surface is

1.  $\frac{Q}{6\epsilon_0}$

2.  $\frac{Q}{24\epsilon_0}$

3.  $\frac{Q}{4\epsilon_0}$

4.  $\frac{Q}{2\epsilon_0}$

117. Two charges  $2 \mu\text{C}$  and  $8 \mu\text{C}$  are placed at a separation of  $10 \text{ cm}$ . The third charge should be placed so that it experiences no net force due to these charges is

1. **3.3 cm from smaller charge**

2. 3.3 cm from larger charge

3. 5.9 cm from smaller charge

4. 5.9 cm from larger charge

118. A hollow sphere of radius  $2R$  is charged to  $V$  Volts and another smaller sphere of radius  $R$  is charged to  $\frac{V}{2}$  Volts. Now the smaller sphere is placed inside the bigger sphere without changing the net charge on each sphere. The potential difference between the two spheres would be

1.  $\frac{3V}{2}$

2.  $V$

3.  $\frac{V}{2}$

4.  $\frac{V}{4}$

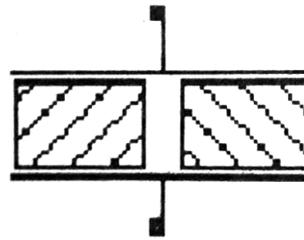
119. The capacity of a parallel plate condenser with air medium is  $5 \mu\text{F}$ . If the space between the plates is completely filled with two dielectric slabs of same area but of dielectric constants 3 and 5 as shown in figure, the capacity of the condenser becomes

1.  $40 \mu\text{F}$

2.  **$20 \mu\text{F}$**

3.  $10 \mu\text{F}$

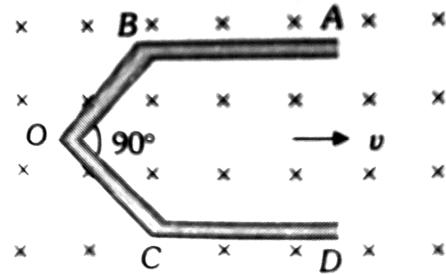
4.  $15 \mu\text{F}$



120. 64 liquid drops each of capacity  $C$  combine to form a large drop. The capacity of the large drop is
1.  **$4C$**
  2.  $16C$
  3.  $32C$
  4.  $8C$
121. Ferrites are
1. Ferrimagnetic having large electrical conductivity
  2. **Ferrimagnetic having negligible electrical conductivity**
  3. Diamagnetic having large electrical conductivity
  4. Ferromagnetic having negligible electrical conductivity
122. A domain in a ferromagnetic substance is in the form of a cube of side length  $1\ \mu\text{m}$ . If it contains  $8 \times 10^{10}$  atoms and each atomic dipole has a dipole moment of  $9 \times 10^{-24}\ \text{Am}^2$ , then magnetization of the domain is
1.  **$7.2 \times 10^5\ \text{Am}^{-1}$**
  2.  $7.2 \times 10^3\ \text{Am}^{-1}$
  3.  $7.2 \times 10^9\ \text{Am}^{-1}$
  4.  $7.2 \times 10^{12}\ \text{Am}^{-1}$
123. The magnetic susceptibility of a paramagnetic substance at  $-73\ ^\circ\text{C}$  is 0.0060, then its value at  $-173\ ^\circ\text{C}$  will be
1. 0.0030
  2. 0.0045
  3. 0.0180
  4. **0.0120**

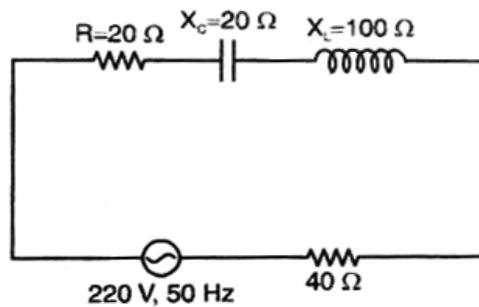
124. A conductor ABOCD moves along its bisector with a velocity of 1 m/s through a perpendicular magnetic field of  $1 \text{ wb/m}^2$ , as shown in figure. If all the four sides are of 1 m length each, then the induced e.m.f between points A and D is

1. 0 V
2. 1 V
3. **1.41 V**
4. 3.72 V



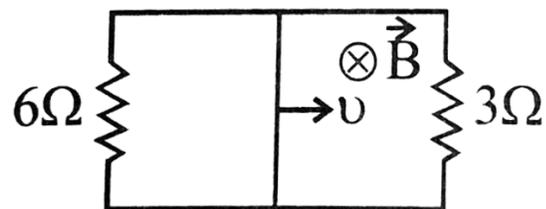
125. The power factor of the circuit shown in the figure is

1. 0.2
2. 0.4
3. **0.6**
4. 0.8



126. A rectangular loop with a sliding connector of length 2 m is situated in a uniform magnetic field 2 T perpendicular to the plane of loop. Resistance of connector is  $2 \Omega$ . Two resistances of  $6 \Omega$  and  $3 \Omega$  are connected as shown in figure. The external force required to keep the connector moving with a constant velocity of  $4 \text{ ms}^{-1}$  is

1. 32 N
2. **16 N**
3. 8 N
4. 4 N



127. According to Maxwell's equations, a time-dependent magnetic field will be produced under which of the following circumstances
1. The total magnetic flux through a surface is equal to zero
  2. A field exists that is the gradient of a scalar function
  3. The electric flux through surface is zero
  4. **An electric field varies with time**
128. The transmission coefficient of a wave propagating in the Brewster angle is
1. 0
  2. **1**
  3. -1
  4. Infinity
129. The self inductance of a solenoid of length 1 m and area of cross-section  $0.01 \text{ m}^2$  with 200 turns is
1. **0.05 H**
  2. 1.0 H
  3. 0.1 H
  4. 0.5 H
130. A step-up transformer works on 220 V and gives 2 A to an external resistor. The turn ratio between the primary and secondary coils is 2:25. Assuming 100% efficiency, the power delivered is
1. 55 W
  2. 550 W
  3. 5000 W
  4. **5500 W**

131. A coil of resistance  $10\Omega$  and an inductance  $5\text{H}$  is connected to a  $100\text{V}$  battery. Then the energy stored in the coil is
1. 125 erg
  2. 125 J
  - 3. 250 J**
  4. 250 erg
132. An alternating voltage  $E = 200\sqrt{2}\sin(100t)$  is connected to a  $1\mu\text{F}$  capacitor through an a.c ammeter. The reading of the ammeter is
1. 10 mA
  - 2. 20 mA**
  3. 40 mA
  4. 80 mA
133. If the distance between the two coherent sources is large, the fringes will become
1. Wide
  2. Move closer
  3. Disappear
  - 4. Narrow**

134. Two optically plane glass strips of length 10 cm are placed one over the other. A thin foil of thickness 0.010 mm is introduced between the plates at one end to form an air film. If the light used has wavelength  $5900 \text{ \AA}$ , the fringe width is
1. **0.3 cm**
  2. 0.6 cm
  3. 0.9 cm
  4. 1.2 cm
135. In Newton's rings experiment a plano-convex lens of radius 400 cm is used. The wavelength of light used is  $5320 \text{ \AA}$ . If rings are formed with water ( $\mu=1.33$ ), then the radius of the 10<sup>th</sup> dark ring
1. **0.4 cm**
  2. 0.8 cm
  3. 1.2 cm
  4. 0.2 cm
136. A zone plate has the radius of the first ring 0.05 cm. If plane waves ( $\lambda = 5000 \text{ \AA}$ ) fall on the plate, the screen be placed so that the light is focused to a bright spot is
1. 10 cm
  2. 30 cm
  3. **50 cm**
  4. 70 cm

137. If experimental setup of Fraunhofer diffraction for single slit is immersed in water, central maximum
1. Remains same
  2. Shifts to right
  3. Shifts to left
  - 4. Become sharper**
138. A ray of light is incident on the surface of a glass plate of refractive index 1.732 at the polarizing angle. The angle of refraction of the ray is
- 1.  $30^\circ$**
  2.  $45^\circ$
  3.  $60^\circ$
  4.  $90^\circ$
139. The thickness of a quarter wave plate when the wavelength of light is  $5890 \text{ \AA}$ ,  $\mu_e=1.553$  and  $\mu_o=1.544$
1.  $1.636 \times 10^{-3} \text{ m}$
  2.  $1.636 \times 10^{-3} \text{ mm}$
  3.  $1.636 \times 10^{-9} \text{ m}$
  - 4.  $1.636 \times 10^{-3} \text{ cm}$**

140. A tube 20 cm long containing sugar solution rotates the plane of polarization through an angle of  $13.5^\circ$ . If the specific rotation is  $66^\circ$ , the amount of sugar present in a litre of the solution is
1. 50 gm
  2. **100 gm**
  3. 150 gm
  4. 200 gm
141. Light produced by a Nicol prism is
1. **Plane polarized**
  2. Elliptically polarized
  3. Circularly polarized
  4. Unpolarized
142. Two thin lenses of focal length 4.5 cm and 1.5 cm are arranged co-axially. If chromatic and spherical aberrations both are eliminated, the ratio of focal lengths
1. 1 : 2
  2. **3 : 1**
  3. 1 : 3
  4. 2 : 1

143. High information carrying capability of optical fibers is measured with their
1. Low losses
  2. Low costs
  - 3. High band width**
  4. High efficiency
144. A double convex lens has radii of curvature of 40 cm and 10 cm. The longitudinal chromatic aberration for object at infinity is ( $\mu_v=1.5230$  and  $\mu_R=1.5145$ )
- 1. 0.253 cm**
  2. 0.514 cm
  3. 0.523 cm
  4. 1.253 cm
145. The Lissajous figures make a figure of eight, if the frequency ratio is
1. 2 : 1
  2. 1 : 4
  3. 2 : 3
  - 4. 1 : 2**
146. When the amplitude of particle executing S.H.M decreases, its time period
1. Decreases
  - 2. Remains unchanged**
  3. Increases
  4. May increase or decrease depending upon the phase

147. If the resonant (angular) frequency of acoustic system is 280 Hz and half power frequencies are 200 Hz and 360 Hz respectively, the quality factor is
1. 0.25
  2. 2.50
  - 3. 1.75**
  4. 0.55
148. The power transported by a transverse wave in a string is directly proportional to
- 1. Square of the amplitude and square of frequency**
  2. Amplitude and frequency
  3. Square root of amplitude and square root of frequency
  4. Amplitude and square of frequency
149. If tension in a wire is 100 N, velocity of transverse wave is  $200 \text{ ms}^{-1}$ , the mechanical impedance is
1. 1.0
  2. 0.75
  - 3. 0.5**
  4. Zero
150. The following effect can be used to produce ultrasonic waves
- 1. Magnetostriction effect**
  2. Doppler effect
  3. Magnetic effect
  4. Sound effect

151. A mass of 0.3 kg is tied to a spring. Its frequency is 2 Hz and Q-factor is 60, the damping factor is
1. 0.209
  2. 0.402
  - 3. 0.063**
  4. 1
152. In a spring block system, length of the spring is reduced by 1%, the time period will
1. Increase by 2%
  2. Increase by 0.5%
  3. Decrease by 2%
  - 4. Decrease by 0.5%**
153. When kinetic energy is 90% of total energy then the ratio of displacement to amplitude for a simple harmonic motion is
1. 2.125
  2. 1.306
  - 3. 0.316**
  4. 3.610

154. The speed of transverse waves in a stretched string is 700 cm/s. If the string is 2 m long, the frequency with which it resonates in fundamental mode is

1.  $\frac{7}{12}$  Hz

2.  $\frac{7}{4}$  Hz

3.  $\frac{2}{7}$  Hz

4. 14 Hz

155. The displacement of a particle in S.H.M is in opposite phase with

1. **Acceleration**

2. Velocity

3. Amplitude

4. Frequency

156. In a transformer the mutual inductance of two coils is 0.3H. Where as the self inductance of primary and secondary coils are 0.28H and 0.36H respectively. The coefficient of coupling is

1. 0.25

2. 0.55

3. 1.25

4. **0.95**

157. A particle of charge  $2C$  and mass  $5g$  moves in a circular orbit of radius  $3cm$  with angular speed  $10 \text{ rad/s}$ . The ratio of the magnitude of its magnetic moment to that of its angular momentum is
1. **200**
  2. 300
  3. 400
  4. 100
158. The gravitational force between two bodies is decreased by  $36\%$  when the distance between them is increased by  $4 \text{ m}$ . The initial distance between them is
1.  $4 \text{ m}$
  2.  **$16 \text{ m}$**
  3.  $36 \text{ m}$
  4.  $72 \text{ m}$
159. Two copper discs are of the same thickness. The diameter of A is twice that of B. The moment of inertia of A as compared to that of B is
1. 2 times
  2. 4 times
  3. 8 times
  4. **16 times**

160. Two identical capacitors each of capacitance  $5\ \mu\text{F}$  are charged to potential  $2\ \text{kV}$  and  $1\ \text{kV}$  respectively, when the negative ends are connected together. When the positive ends are also connected together, the loss of energy of the system is

1.  $160\ \text{J}$
2.  $0\ \text{J}$
- 3.  $1.25\ \text{J}$**
4.  $5\ \text{J}$

## METHODOLOGY

161. All conclusions made in science are based on
1. **Evidence**
  2. Opinion
  3. Hypothesis
  4. Belief
162. This is not a theory
1. An explanation for how the entire universe was created
  2. An explanation for how species have changed over time
  3. **The explanation that the Earth's temperature is rising only as a result of pollution**
  4. An equation for the relationship between force , mass and acceleration
163. After observing the melting rates of an ice cube sprinkled with salt and one without salt, the student concluding that salt reduces the freezing point of water, is
1. Observing
  2. **Inferring**
  3. Hypothesizing
  4. Measuring

164. This is a question that can best be investigated by a scientist

1. Should I paint the lab white or cream?
2. **Does plant need sunlight to grow?**
3. Does coffee or tea taste better?
4. Which feels softer, cat fur or dog fur?

165. “The moon eclipses the sun, and the great shadow of the earth eclipses the moon.” was deduced by

1. **Aryabhata**
2. Bhaskaracharya
3. Varahamihira
4. Vatsayana

166. Static Electricity is discovered by

1. Benjamin Franklin
2. **Volta**
3. Coloumb
4. Ampere

167. This is not the contribution of Newton

1. Law of Universal gravitation
2. Laws of Motion
3. Law of cooling
4. **Special relativity**

168. This is an illustration of Correlation between Biology and Chemistry

1. Study of metabolism in living cells/ genetics
2. Census of wild animals like tigers, lions etc,
3. **Study of Physiological activities such as transpiration, conduction of water and salts in plants and animals**
4. Study of human beings related with to their origin, distribution, relationship, culture etc.

169. The creative and critical thinking of students is developed with science refers to this value

1. Moral value
2. **Intellectual value**
3. Cultural value
4. Aesthetic value

170. This is an objective of teaching science

1. To increase pupils' interest in things and phenomena of nature
2. To cultivate scientific temper, objectivity, and critical thinking
3. **To be able to compare the energy output of aerobic and anaerobic respiration**
4. To develop the interest of the pupils in the conservation and utilization of nature.

171. At the knowledge level students will

1. Apply Newton's Third law of Motion
2. **Recall Boyle's law**
3. Categorise Animals into Vertebrates and Invertebrates
4. Calculate Velocity and Acceleration

172. This is not a critique of Blooms taxonomy
1. Bloom concentrated his efforts on learning, but there is little about motivation or about classroom management.
  2. Bloom's Taxonomy focuses heavily on how an individual learns and it misses what occurs when there are social forces.
  3. **Bloom's Taxonomy is a good heuristic for teachers to understand the varying cognitive, psychomotor, and affective levels of learning.**
  4. Bloom's Hierarchy seems too artificially constructed and learning is not sequential.
173. The objective in asking the question - Am I as 'explosive' as Potassium metal in the way I interact with people around me? is related to
1. Knowledge
  2. **Valuing**
  3. Synthesis
  4. Understanding
174. Inductive method involves a thinking process wherein students
1. **Draw a generalisation**
  2. Give examples for a law
  3. Verify a law
  4. See how accurately the law predict events

175. Problem-solving method differs from the lecture and demonstration methods of teaching as the focus of problem solving method is on
1. presenting ideas
  2. demonstrating skills
  3. presenting concepts
  4. **facilitating investigations**
176. Project method in teaching of Science is suited most to
1. strengthen reasoning skill of students
  2. **promote scientific method of working**
  3. enable understanding of basic concepts in Science
  4. enhance numerical abilities of students
177. The best way to teach about concept of rusting is to
1. present the process of rusting using a pictorial chart
  2. explain the process of rusting orally
  3. **make the students to undertake a project on rusting – its causes and prevention**
  4. make the students read aloud about rusting from the science text book
178. In order to achieve the objective of acquisition of science process skills the combination of methods best suited are
1. **Project-cum-Laboratory method**
  2. Lecture-cum-Demonstration method
  3. Historical-cum-Lecture method
  4. Lecture-cum-Scientific method

179. The most appropriate way of explaining the topic “Purification of Water” is
1. Demonstrating the process with the help of a chart
  2. Asking the students to make a model of the purification plant
  - 3. Taking students to plant where the water is purified**
  4. Reading from text book
180. This micro skill involves change in body movements, gestures, speech pattern and interaction style
1. Reinforcement
  - 2. Stimulus variation**
  3. Illustration
  4. Explanation
181. This is a plan designed to plot out the learning of a student in order that the student reaches a given pre determined knowledge, and education level
- 1. Annual Plan**
  2. Unit Plan
  3. Lesson Plan
  4. Period plan
182. This is not a Herbartian step of lesson planning
1. Application
  2. Preparation
  3. Presentation
  - 4. Content Analysis**

183. This criteria is not suitable for a good science text book
1. suitable to the age, ability and interest of the students
  2. explanation is provided using illustrative pictures
  3. language used is simple and clear
  4. **designed to suit the requirements of the teacher**
184. These pair of aids represents visual aids
1. **Posters, Transparencies**
  2. Audio tapes , Radio recordings
  3. Film strips , DVD's
  4. Videos , Computer graphics
185. The most concrete experience of the following is
1. students define key terms associated with the structure of DNA
  2. **students construct a model of the structure of the DNA molecule**
  3. students identify the four nitrogen bases that compose DNA in a chart
  4. students summarize the history of human knowledge about DNA
186. Concept mapping is also known as
1. **Mind mapping**
  2. Concept diagram
  3. Knowledge diagram
  4. Word mapping

187. The balance that will be used to verify elasticity is
1. **Spring balance**
  2. Beam balance
  3. Physical balance
  4. Chemical balance
188. Examples of personal protective equipment do NOT include:
1. goggles and long pants
  2. long-sleeve shirts
  3. **contact lenses**
  4. lab coats
189. The procedure teachers should use to make Library as an instructional aid is
1. Guiding students to choose books that might be of their interest in the library.
  2. Allowing pupils to go to the Library as the need for reference material arises.
  3. **Sending the students to the library in their free time without instruction**
  4. Making students to write assignments requiring the pupils to use Library resources.
190. This register contains details of articles which are not liable to be used up or easily broken like magnets, test tube racks, lenses, thermometers etc.
1. Breakable stock register
  2. Indent/Order register
  3. **Permanent stock register**
  4. Requirement register

191. Presenting the concept of periodic table that it was initially based on atomic weight, later based on atomic number, and finally explained by quantum theory refers to this validity as per NCF (2005)
1. Process Validity
  2. **Historical Validity**
  3. Environmental Validity
  4. Ethical Validity
192. Raman Science Centre and Planetarium are located at
1. Thiruvananthapuram
  2. Bangalore
  3. Ahmedabad
  4. **Nagpur**
193. The Curriculum approach being used by a science teacher who is planning to start with the most concrete concepts first and step-by-step work her way up to the more abstract concepts is
1. Topical approach
  2. Concentric approach
  3. Integrated approach
  4. **Logical approach**
194. Subject Centered curriculum revolves around:
1. Learner
  2. Social values
  3. **Content**
  4. Social problems

195. This is not characteristic feature of syllabus
1. **Syllabus formulates curriculum**
  2. Syllabus is organized from curriculum
  3. Syllabus is content based
  4. Syllabus is subject centered
196. This is not a characteristic feature of a science fair
1. Research based activity
  2. Original concept, publishable
  3. **Display already established facts and results**
  4. Research base activity, publishable
197. The student draws neatly the various forms in which energy comes to Earth from the Sun will help in evaluating
1. Knowledge
  2. Application
  3. **Skill**
  4. Attitude
198. This is not a characteristic of a good question paper
1. **Subjectivity**
  2. Reliability
  3. Validity
  4. Objectivity

199. This is the purpose of the formative evaluation of students.

1. **For assessing the student level of learning**
2. For assessing progress of student at the end of term
3. For assessing a project report for grading
4. For awarding a grade for promotion to next level

200. This is not a benefit of diagnostic assessment

1. It guides a teacher in lesson planning
2. It helps teachers to refer students for special education services
3. It helps teachers to identify students who are in need of remedial teaching
4. **It helps determine what a student has learnt through instruction**