Directions: Answer the following questions by selecting the most appropriate option:

1. Present day education cuts off the man from life because
   (1) it is not an integral part of life
   (2) it is unable to provide bread and butter to man
   (3) it is unable to provide job to man
   (4) it is unable to fulfill the basic needs of a man

2. According to modern concept of teaching, teacher should play mainly the role of a
   (1) Philosopher
   (2) Friend
   (3) Working partner
   (4) Instructor

3. Which source will provide maximum and up-to-date information about a subject?
   (1) Encyclopaedias
   (2) Internet
   (3) Latest academic journals
   (4) International conferences
4. Some students of your class have become inattentive; which strategy would you use to regain their attention?

(1) A brief physical activity
(2) Suspending the class for sometime
(3) Asking children to be attentive
(4) Sending the class out for games

5. When a teacher enters in the class room for the first time he should talk about

(1) school building
(2) school headmaster
(3) textbook
(4) himself and students

6. The education system developed by Mahatma Gandhi is known as

(1) Basic education system
(2) Vocational education system
(3) Child centred education system
(4) Handicraft education system
7. Which of the following acts of the teacher does not help in creating proper learning environment?

(1) Providing the children with feeling of security
(2) Giving the children sense of freedom
(3) Allowing children to criticize other children
(4) Making children fearless

8. Which of the following is not the cause of truancy of students?

(1) Uninteresting school programme
(2) Teacher's partial behaviour
(3) Too much home work
(4) Too many holidays

9. When a teacher gives the learner the sense of success, he is using

(1) the law of readiness
(2) the law of practice
(3) the law of effect
(4) the law of mental set

10. According to Naturalism, the centre of education should be

(1) Teacher
(2) Child
(3) Curriculum
(4) None of the above
11. A student of your class is in the habit of telling a lie. How would you deal with him?
(1) tell him not to tell a lie
(2) punish him
(3) just ignore him
(4) will take him into confidence and counsel

12. The best provision for the education of the talented children is
(1) Ability grouping
(2) Giving double promotion
(3) Enriching programme
(4) Providing special schools

13. As per National Policy on Education, 1986 percentage of national production must be invested on education
(1) 6%  (2) 10%
(3) 4%  (4) 3%

14. School administration assigned you some extra classes which are meant for weak students. What will be your reaction as a teacher?
(1) Protest and not take classes
(2) Request reconsideration of decision
(3) Tell student to prepare on their own
(4) Accept it as your responsibility
15. Study the following statements about lecturing as a method of teaching:

A. It is an efficient method of giving information.
B. It is an efficient way of making students think critically.

Which of these statements is/are correct?

(1) A only       (2) B only
(3) Both A & B   (4) Neither A nor B

16. Before starting to teach a teacher must

(1) make the students stand
(2) make the students mentally ready
(3) clean the black board
(4) ask the students to keep silence

17. While teaching if you realize that what you have taught is not correct, you would

(1) leave the topic unfinished and shift to another
(2) tell the students that it was a mistake and correct it
(3) divert the attention of the students
(4) Scold students
18. Salim is very good in Music but is not able to do well in Mathematics. As a teacher of Mathematics, how will you handle Salim?

(1) Tell him that Music does not have a future
(2) Tell him to leave Music and study Maths
(3) Call his parents and talk to them
(4) Tell him that he can do well in Mathematics and explain the Mathematical concepts to him

19. A talented child can not be identified through observation because

(1) observation is not an objective technique
(2) observation is a subjective technique
(3) observation is used by those who are expert
(4) All of the above

20. While delivering a long lecture what a teacher should do?

(1) Should break in between
(2) Should speak continuously
(3) Should ask questions in between
(4) Should change own posture
21. आपकी कक्षा की एक लड़की की रुचि स्पोर्ट्स में है और वह स्पोर्ट्स में अपने कैरियर को बढ़ाना चाहती है। आप उसे क्या परामर्श देंगे?
(1) लड़कियों का खेल जगत में कोई भविष्य नहीं है
(2) उसे अपनी आकांक्षा की पूर्ति हेतु कठोर परिश्रम करना चाहिए
(3) उसे सिर्फ पढ़ाई में ध्यान लगाने को कहेंगे
(4) लड़कियों खेलों में उत्कृष्ट नहीं कर सकतीं क्योंकि वे शारीरिक रूप से कमजोर होतीं हैं

22. बुद्धि के लिए कौन-सा कथन सत्य नहीं है?
(1) बुद्धि सीखने की योग्यता है
(2) बुद्धि समस्या हल करने की योग्यता है
(3) बुद्धि परिश्रम करने की योग्यता है
(4) बुद्धि नवीन परिस्थितियों के साथ अनुकूलन करने की योग्यता है

23. सर्वाधिक प्रभावी मूल्यांकन पद्धति है
(1) वार्षिक परीक्षा प्रणाली
(2) सयुतक परीक्षा प्रणाली
(3) सेमेस्टर प्रणाली
(4) वास्तुनिष्ठ प्रश्नपत्र पद्धति

21. A girl of your class is interested in sports and wants to pursue her career in sports. What will you suggest her?
(1) Girls have no future in sports
(2) She should put in hard work to achieve her ambition
(3) Ask her to be focused only in academics
(4) Girls can not excel in sports as they are not physically strong

22. Which is not true about intelligence?
(1) Intelligence is the ability to learn
(2) Intelligence is the ability to solve problems
(3) Intelligence is the ability to work hard
(4) Intelligence is the ability to adapt to novel situation

23. The most effective evaluation method is
(1) Annual examination method
(2) Examination with book method
(3) Semestral method
(4) Objective question paper method

P. T. O.
24. Match the following:
A. Slide Projector (i) Visual mean
B. TV (ii) Audio mean
C. Chart (iii) Audio-visual mean
D. Voice Recorder (iv) Projective mean

25. The term 'comprehensive evaluation' means
(1) Evaluation conducted at several points of time
(2) Evaluation by a group of teachers
(3) Several test for long duration
(4) Evaluation of curricular & co-curricular aspects of pupil growth

26. The capacity to arrange objects serially is developed in the child when he is in
(1) Sensory motor stage
(2) Pre-operational stage
(3) Concrete operational stage
(4) Formal operational stage
27. For enhancing the ability of transfer of learning the teacher should not
(1) encourage self activity
(2) encourage the habit of rote learning
(3) develop the habit of learning by insight
(4) emphasise on generalization

28. When a child mispronounces a word, what will you do?
(1) Tell - don’t say like this
(2) Tell the correct pronunciation
(3) Rebuke the child for wrong pronunciation
(4) Ignore

29. The basis of effective and successful leadership is
(1) Appreciation
(2) The interest of entire group
(3) Service of group
(4) Self interest

30. How the virtue of good citizen can be inculcate among students?
(1) By lecturing them on good citizenship
(2) By familiarising them with national heroes
(3) By assigning them some community service work
(4) By familiarising them with Indian Constitution
31. निन्न में से ‘गंगा’ के पद्यांशवाची शब्दों का समूह है
(1) मदनकिनी, भागीरथी, निपणगा
(2) कृष्णा, निपणगा, अरुणा
(3) मदनकिनी, कलिन्दी, तरणि
(4) सरिता, शीलजा, तरगिनी

32. निन्न शब्दसूत्र का सही अर्थ चुनिए
‘लगन - लगन’
(1) उत्साह - मुहूर्त
(2) मुहूर्त - उत्साह
(3) एक दैवाकालिक अनुस्थान - लगाय
(4) एक तारा - निशिचत समय

33. ‘पाथेय’ का अर्थ है
(1) मांग का भोजन (2) मांग
(3) पथ प्रशासक (4) अनुचर

34. ‘न’ प्रश्न के से निर्मित शब्द चुनिए
(1) खून (2) चलन
(3) बाजुन (4) फलयुन

35. कौन-सा शब्द विशेषण नहीं है?
(1) सजल (2) जल
(3) जलमय (4) जलीय

निर्देश: अपेक्षित गद्यांश को पढ़कर दिये गये प्रश्नों (प्रश्न सं 36-39) के उत्तर सबसे उचित विकल्प पहले दीजिए;
नन फिर धूम गया कौशल्या की ओर, लाखों-करोड़ों कौशल्याओं की ओर और लाखों-करोड़ों कौशल्याओं के
द्वारा मुक्तिए एक अनाम अरूप कौशल्या की ओर, इस
सबके राम वन में निवासित है, पर ब्राह्मण बताते है कि

36. ‘दुनियार’ का विलोम है
(1) कठन (2) सरल
(3) आरंभिक (4) पीढ़ा दाबक

37. मनुष्य की निवासित है
(1) दुःख में निर्मम रहना
(2) दुःख व गुरु दोनों की अपरिहार्यता
(3) मिसाल भीमसेन रहना
(4) विरूपत्रों का शिकार होना
38. ‘भंगल नाना के नाती’ से लेखक का तात्पर्य है
   (1) बहुत आशावादी होना
   (2) बहुत निराशावादी होना
   (3) बहुत बैराज्वान होना
   (4) बहुत उत्साहित होना

39. ‘सति अच्छे समान’ का भाव है
   (1) सौ युगों के समान
   (2) सात युगों के समान
   (3) अच्छे ईश्वर चुकता
   (4) उपयुक्तता में से कोई नहीं

निर्देश : अथवा निकाह गायला की पहलक निये गये प्रश्नों (प्रश्न सं 40-44) के उत्तर सबसे उच्च विकल्प हुएकर निर्णय कीजिएः

श्रीराज उल्लम के आगमन के साथ लहक उठता है,
आधुनिक तक तो नित्यित रूप से मस्त बना रहता है।
मन रंग गया तो भावों में भी निर्धारित फूलला रहता है।
इस प्रकार श्रीराज कलंकी संज्ञान की भाँति जीवन की
अधिक्रिया का प्रति अभिज्ञा रहता है।
श्रीराज का फूल
संस्कृत साहित्य में बहुत कोमल माना गया।
श्रीराज के
फूलों की कोमलता देखकर परवर्ती कवियों ने समझा कि
उसका सब कुछ कोमल है।
यह शौक है।
इसके फल
इतने मजबूत होते हैं कि नये फूलों के निकल आने पर
भी स्थान नहीं छोड़ते।
जब तक नये फल पाते मिलकर
भर्तिक्याकर उन्हें बाहर नहीं कर देते तब तक दे दें रहते हैं।
वस्त्र के
आगमन के समय जब सारी
वथाली पुष्प-पत्र से मरम्मत होती रहती है,
श्रीराज के
पुराने फल बुरी तरह खड़कड़ते रहते हैं।
मुझे इनको
देखकर उन नेताओं की बात बड़ी आती है,
जो किसी
प्रकार जमाने का रूप नहीं पहचानते हैं और जब तक नयी
पौधे के हों तो
क्षक्का मारकर निकाल नहीं देते तब
tक जमे रहते हैं।

40. ‘जो फरा सो छरा’ में तुलसीदास ने किया और
sंकेत किया है?
   (1) जीवन की शाश्वतता पर
   (2) जीवन की निस्सारता पर
   (3) जीवन की श्रंगमंगुरता पर
   (4) उपयुक्तता सभी पर

41. संस्कृत साहित्य में किसे कोमल माना गया है?
   (1) श्रीराज के फलों को
   (2) श्रीराज के फूलों को
   (3) श्रीराज के पत्रों को
   (4) श्रीराज की शाखाओं को

42. ‘निर्धार’ का विलोम है
   (1) अपाध (2) आपाधत
   (3) निर्गाध (4) निर्गाधार

43. लेखक के अनुसार नेताओं के साथ तुलनीय है?
   (1) श्रीराज के फल
   (2) श्रीराज के फूल
   (3) वस्त्र की क्रूल
   (4) पताकाड़ की क्रूल

44. श्रीराज पुष्प का पल्लवन होता है?
   (1) जेठ में (2) आश्वाद में
   (3) भाद्र में (4) वसंत में
45. हिंदी शब्दकोश के अनुसार निम्न शब्दों का सही
क्रम है
'ज्ञानी, ज्ञानी, ज्ञेशु, जौहरी'
(1) ज्ञानी, ज्ञानी, ज्ञेशु, जौहरी
(2) जौहरी, ज्ञानी, ज्ञेशु, ज्ञानी
(3) ज्ञेशु, ज्ञानी, जौहरी, ज्ञानी
(4) जौहरी, ज्ञेशु, ज्ञानी, ज्ञानी

46. हमारे स्कूल में कई सचिव तेजस्विक हैं : इसलिए बीते थे हम सवेरा जीतते हैं। रेखांकित शब्द में
संज्ञा है
(1) व्यक्तिवाचक
(2) भ्रात्वाचक
(3) जातिवाचक
(4) परिभाषावाचक

47. 'अनु + इट' का संधि शब्द है
(1) अनिष्ट
(2) अनिष्ट
(3) अनुष्ट
(4) अनेष्ट

48. संयुक्त व्यंजन 'ज' की ध्वनियाँ हैं
(1) जू + अू
(2) जू + ज + अ
(3) ज + अ
(4) जू + ज + अ

49. 'प्रवचन' में उपसर्ग है
(1) प
(2) पः
(3) प्र
(4) प्रव

50. निम्न में से वर्तनी की हुस्त से शुद्ध शब्द चुनिए
(1) एवध
(2) संश्वारत
(3) कोमलाङ्गिनी
(4) तपुपारत

51. 'हरि' शब्द के अर्थों का सही समूह है
(1) विभू, सिंह, गज
(2) विभू, सिंह, बंदर
(3) अश्व, बाहु, विभू
(4) विभू, शिव, नारद

52. 'गुरुदास' में समास है
(1) तत्तुरुष
(2) दंड
(3) बहुबीलि
(4) अच्युतभाव

53. दिये गए शब्द के लिए उत्तिक पर्यायवाची चुनें
'सरस्वती'
(1) शारदा
(2) बनिता
(3) नलिनी
(4) पुरसरि

54. 'दौंट काटी रोटी' मुहावरे का अर्थ है
(1) परस्पर दन्तसिद्ध होना
(2) परस्पर प्रतिसाद होना
(3) परस्पर दूर होना
(4) परस्पर दौड़ होना

55. कौन-सा वाक्य मिश्र वाक्य नहीं है?
(1) शोभा मुझसे कहती है कि जाओ।
(2) एक जोकर देखा जो भारी भरकम था।
(3) तुम इससे अच्छे हो क्योंकि तुमें बेहतर हो।
(4) दरवाजा खुलने के कारण चोरी हो गई।

56. 'सावन हरे न भालो सूंडे' लोकोक्ति का अर्थ है
(1) परवाह ना करना
(2) बेशर्म होना
(3) हमेशा एक जैसा रहना
(4) निरूति रहना

57. निम्न में से मूर्ध्य वर्ण है
(1) ऋ
(2) ऋ
(3) ऋ
(4) ऋ

58. 'प्रोत्साहन' का संधि-विष्ठेद है
(1) प्र + उत्साहन
(2) प्र + उत्साहन
(3) प + उत्साहन
(4) प्र + साहन

59. 'बन्धु' शब्द का विलोम चुनिए
(1) उद्धर
(2) उपजाऊ
(3) उद्धर
(4) बंजर

60. निम्न शब्दों में से लघुभाव शब्द है
(1) पापा
(2) परख
(3) प्रहरी
(4) पृष्ठ
61. 'He hardly works.'
The underlined word means
(1) arduously  (2) mostly
(3) scarcely  (4) strenuously

62. Choose the correct word for the following phrase:
'Fear of foreigners'

(1) Hydrophobia
(2) Xenophobia
(3) Homophobia
(4) Claustrophobia

63. Give one word for 'That which can be eaten.'

(1) edible  (2) chewable
(3) palatable  (4) digestive

64. She had a headache; otherwise she ............. with me.

(1) would come
(2) would have come
(3) came
(4) will come

65. Which sentence is incorrect?
(1) I left without any one knowing.
(2) I hope you will excuse my leaving early.
(3) As he was going up the hill, he saw an old temple.
(4) I dislike your behaving in this way.

66. Complete the given sentence:
'The human body is like an engine. It requires fuel to ......'

(1) work  (2) keep it going
(3) run from  (4) keep it on action

67. He ............. not oppose me.

(1) dare  (2) dares
(3) did dare  (4) was dare

68. Choose the correct Article for the blank:
'Give me ........... yellow teapot which is on the table.'

(1) a  (2) an
(3) the  (4) Zero article

69. They told me that he ........... in Jaipur.

(1) were  (2) was
(3) will be  (4) can be
Directions: Read the passage given below and answer the questions that follow (Q. Nos. 76 to 85) by selecting the most appropriate option:

Conversation is indeed the most easily teachable of all arts. All you need to do in order to become a good conversationalist is to find a subject that interests you and your listeners. There are, for example, numberless hobbies to talk about. But the important thing is that you must talk about the other fellow’s hobby rather than your own. Therein lies the secret of your popularity. Talk to your friends about the things that interest them and you will make your reputation for good fellowship, charming wit and a brilliant mind. There is nothing that pleases people more than your interest in their interest.

It is as important to know what subject to avoid, as what subjects to select for good conversation. If you don’t want to be set down as a wet blanket or a bore, be careful to avoid certain unpleasant topics. Avoid talking about yourself, unless you are asked to do so. People are interested in their problems, not in yours. Sickness and death bore everybody. The only one who willingly listens to such talk is a doctor, but he gets paid for it. To be a good conversationalist you must know not only what to say but how to say it. Be civil and modest. Don’t overemphasize your own happiness. Be mentally quick and witty, but don’t hurt others with your wit.

70. His score is higher than .........
   (1) you    (2) yours
   (3) your   (4) yourself

71. Choose the correct Pronoun for the blank:
   'He is the only person ......... can help you.'
   (1) who    (2) that
   (3) he     (4) which

72. Choose the correct Preposition for the blank:
   'One must abide ......... one's promise'.
   (1) in      (2) by
   (3) for     (4) to

73. I have been here ............. Monday.
   (1) from    (2) since
   (3) for     (4) till

74. Change the Voice of the following sentence:
   'We were let go.'
   (1) They let us go.
   (2) We were let to go.
   (3) They were let us to go.
   (4) Let us go.

75. Which word is wrongly spelt?
   (1) believe    (2) relieve
   (3) brief      (4) deceive
Finally, try to avoid mannerism in your conversation. Don’t bite your lips, or click your tongue, or roll your eyes, or use your hands excessively as you speak.

76. The secret of your popularity lies in
   (1) cultivating good hobbies
   (2) being able to converse about what is of interest to the listener
   (3) having a knowledge about a large variety of hobbies
   (4) talking about your hobby

77. The secret of becoming a good conversationalist is
   (1) talking about problems
   (2) avoiding mannerism in conversation
   (3) using your wit
   (4) knowing what to say and how to say it

78. A doctor is the only one who readily listens to conversation about sickness because
   (1) it is his job and he earns from that
   (2) he is not interested in anything’s else
   (3) sickness and death interest everybody
   (4) he is a kind person

79. Courtesy and politeness are recommended through which word in the passage
   (1) willingly
   (2) civil
   (3) overemphasize
   (4) None of the above

80. To become a good conversationalist, you need to
   (1) find a good teacher
   (2) find an interesting subject
   (3) practice the art of conversation
   (4) converse about what you and the listener find interesting

81. You should avoid talking about yourself because
   (1) you are a bore
   (2) it will make you appear unpleasant
   (3) you don’t know how to choose the subject of a good conversation
   (4) people are not interested in you or your problems

82. ‘Mannerism’ in the passage means
   (1) not hurting others with your wit
   (2) having good manners
   (3) gesture or way of speaking typical to a person
   (4) using polite language
83. Which word in the passage is the opposite of 'arrogant'?
   (1) witty
   (2) mentally quick
   (3) conversationalist
   (4) modest

84. What pleases people most is
   (1) your reputation for good fellowship
   (2) your clever use of language
   (3) your taking interest in what is of interest to them
   (4) your brilliant mind

85. Which word in the passage means to strongly stress that something is particularly important?
   (1) overemphasize
   (2) mentally
   (3) excessively
   (4) mannerism

86. I am .......... after ten years in the business.
   (1) wise
   (2) wisest
   (3) more wise
   (4) wiser

87. Choose the correct Adverb for the blank:
   'The sun .......... rises in the east'.
   (1) sometimes
   (2) often
   (3) always
   (4) rarely

88. The dumb .......... not speak.
   (1) has     (2) does
   (3) is      (4) do

89. Choose the correct Phrase for the blank:
   'The craft in which I sailed rapidly .......... the open sea.'
   (1) made out
   (2) made up
   (3) made for
   (4) made off

90. He is poor, .......... he is satisfied with his situation.
   (1) yet     (2) but
   (3) so      (4) while
91. The true statement regarding β decay is that

(1) in β decay mass number of the nucleus changes by unity
(2) the energy spectrum for β rays is continuous
(3) momentum is not conserved
(4) β rays have discontinuous energy spectrum due to emission of neutrino or antineutrino

92. Two metal plates separated by a distance $d$ forms a parallel plate capacitor of capacitance $C_0$. A metal plate of thickness $t$ and same area is now inserted completely between the plates. The new capacitance of the system will be

(1) $C_0 \left( \frac{d+t}{d} \right)$
(2) $C_0 \left( \frac{d}{d-t} \right)$
(3) $C_0 \frac{d}{t}$
(4) $C_0 \left( \frac{d-t}{d} \right)$
93. दो कण जिन्हें आवेश $Q$ व $-Q$ है, एक रामबाण त्रिभुज जिसकी भुजाओं की लंबाई $a$ है, के दो शीर्षों पर रिहर रखे हैं। यदि $k = \frac{1}{4\pi \varepsilon_0}$, तो एक कण जिसका आवेश $q$ है को त्रिभुज के तीसरे शीर्ष से $Q$ व $-Q$ को मिलाने वाली रेखा के मध्य विन्दु तक लाने में आवश्यक कार्य होगा।

\[
\begin{align*}
(1) & \quad 0 \\
(2) & \quad \frac{kQq}{a} \\
(3) & \quad \frac{2kQq}{a} \\
(4) & \quad \sqrt{2} \frac{kQq}{a}
\end{align*}
\]

94. पलावन वेग $V_e$ एवं कक्षीय वेग $V_o$ में कौन-सा संबंध है?

\[
\begin{align*}
(1) & \quad V_e = 2V_o \\
(2) & \quad V_e = \sqrt{2} V_o \\
(3) & \quad V_o = \sqrt{2} V_e \\
(4) & \quad V_o = 2V_e
\end{align*}
\]

95. एक गुब्बारे से, जो भरतल से 300 m ऊपर है एवं 5 m/s की गति कर रहा है, एक बैग गिराया जाता है। बैग द्वारा भरतल में पहुँचने का समय होगा?

\[
\begin{align*}
(1) & \quad 7.82 \text{ sec.} \\
(2) & \quad 6.25 \text{ sec.} \\
(3) & \quad 7.33 \text{ sec.} \\
(4) & \quad 8.36 \text{ sec.}
\end{align*}
\]

93. Two particles with charge $Q$ and $-Q$ are fixed at the vertices of an equilateral triangle with sides of length $a$. If $k = \frac{1}{4\pi \varepsilon_0}$, the work required to move a particle with charge $q$ from other vertex to the centre of line joining $Q$ and $-Q$ is.

\[
\begin{align*}
(1) & \quad 0 \\
(2) & \quad \frac{kQq}{a} \\
(3) & \quad \frac{2kQq}{a} \\
(4) & \quad \sqrt{2} \frac{kQq}{a}
\end{align*}
\]

94. Which is the correct relation between escape velocity $V_e$ and orbital velocity $V_o$?

\[
\begin{align*}
(1) & \quad V_e = 2V_o \\
(2) & \quad V_e = \sqrt{2} V_o \\
(3) & \quad V_o = \sqrt{2} V_e \\
(4) & \quad V_o = 2V_e
\end{align*}
\]

95. A bag is dropped from a balloon that is 300 m above ground and moving up at a speed of 5 m/s. How long will the bag take to reach the ground?

\[
\begin{align*}
(1) & \quad 7.82 \text{ sec.} \\
(2) & \quad 6.25 \text{ sec.} \\
(3) & \quad 7.33 \text{ sec.} \\
(4) & \quad 8.36 \text{ sec.}
\end{align*}
\]
96. If we assume that the entire polar ice of the earth melts, then the following quantity related with earth does not change:

1. moment of inertia
2. angular velocity of rotation of earth
3. duration of day on earth
4. inertia of earth

97. Which of the following quantity remains unchanged when light travels from one medium to another?

1. Wavelength (2) Amplitude
2. Velocity (4) Frequency

98. The average kinetic energy of a gas molecule is:

1. \( \frac{3}{2} kT \)  
2. \( \frac{1}{2} kT \)  
3. \( \frac{3}{2} RT \)  
4. \( \frac{1}{2} RT \)

99. A 3 kg block attached to a spring executes simple harmonic motion according to \( x = 2 \cos (50 t) \) where \( x \) is in meters and \( t \) is in seconds. The spring constant of the spring is:

1. 1 N/m  
2. 100 N/m  
3. 1500 N/m  
4. 7500 N/m

100. A series ac circuit has a resistance of 4Ω and reactance of 3Ω. The power factor of the circuit is:

1. \( \cos^{-1}\left(\frac{4}{5}\right) \)  
2. \( \cos^{-1}\left(\frac{3}{5}\right) \)  
3. \( \cos^{-1}\left(\frac{3}{4}\right) \)  
4. Zero
101. Four identical copper cylinders are painted, if they are all heated to the same temperature and left in vacuum, which will cool most rapidly?

(1) painted shiny white
(2) painted rough black
(3) painted shiny black
(4) painted rough white

102. In Rutherford model of hydrogen atom, the nucleus contains a proton (mass $m_p$, charge $e$) and an electron (mass $m_e$, charge $e$) moves around the proton in a circle of radius $R$. Let $K$ denotes the coulomb force constant $\left(\frac{1}{4\pi\varepsilon_0}\right)$ and $G$ the universal gravitational constant. Then the term $\frac{Ke^2}{G m_e m_p}$ has the dimensions

(1) $M^{-2} L^0 T^{-2} A^2$
(2) $M^0 L^0 T^0 A^0$
(3) $M^{-2} L^0 T^2 C^2$
(4) $M^{-2} L^1 T^2 C^2$

103. The SI unit of radioactivity is

(1) Becquerel
(2) Curie
(3) Rutherford
(4) Rontzen
104. Out of the four curves shown in the given figure which one describes correctly the variation of resistivity of an intrinsic semiconductor with temperature.

105. The poles of a bar magnet of magnetic moment 5.0 Am$^2$ are 20 cm apart. Its pole strength is

106. The diagram shows a plot of potential energy as a function of $x$ for a particle moving along the $x$ axis. The points of stable equilibrium are
107. डिजाई सिद्धांत के अनुसार न्यून तापकमान पर जालक विशिष्ट ऊष्मा का परिवर्तन निम्नानुसार है

(1) \(C_{VL} \alpha T\) (2) \(C_{VL} \alpha T^3\)
(3) \(C_{VL} \alpha T^6\) (4) \(C_{VL} \alpha T^9\)

108. 10 keV के इलेक्ट्रॉन पुंज की तरंगदैर्घ्य 0.1227Å है। जब यह पुंज 0.55 Å चौड़ाई की एक लिंक से विभाजित होता है तो प्रथम उच्चतम कोण \(\theta\) पर प्राप्त होगा, जहाँ \(\sin\theta\) है

(1) 0.1116 (2) 0.2232
(3) 0.4464 (4) 0.8928

109. हवा में ध्वनि का वेग 330m/s है। श्रवण पराम 20Hz से 20KHz है। तो सामान्य मानव कर्न द्वारा सुनी जा सकने वाली तरंग दैर्घ्य है

(1) 0.001 m (2) 0.0001 m
(3) 10.0 m (4) 100 m

110. एक \(\beta\) कण तथा एक \(\alpha\) कण किन्हीं वेग समान है, एक नियत चुम्बकीय क्षेत्र में वृत्ताकार पथों पर गतिमान है। यदि \(r_\beta\) व \(r_\alpha\) क्रमशः \(\beta\) कण व \(\alpha\) कण के पथों की त्रिज्याएँ हैं, तो

(1) \(r_\beta > r_\alpha\) (2) \(r_\alpha = r_\beta\)
(3) \(r_\alpha > r_\beta\) (4) कुछ कहा नहीं जा सकता

111. ध्रुव तरंग

(1) विभाजित दशाती हैं
(2) प्रकाश की चाल से संचरण करती हैं
(3) अनुदैर्घ्य प्रकृति की होती हैं
(4) विद्युत चुम्बकीय प्रकृति की होती हैं

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112. For a gas consisting of molecules of diameter $d$ each, the mean free path of a gas molecule is proportional to

1. $d^2$
2. $d^{-2}$
3. $d^{-1}$
4. $d^{-1/2}$

113. A monochromatic light source used in Young's double slit experiment is replaced by another monochromatic source of comparatively low frequency but of same intensity, then the

1. fringe width will decrease
2. fringe width will increase
3. fringe width will remain unchanged
4. fringes will become less intense

114. The expression $Y = \overline{A} + \overline{B}$ is true for

1. AND gate
2. OR gate
3. NAND gate
4. NOR gate

115. A dc motor

1. converts mechanical energy into electrical energy
2. converts electrical energy into mechanical energy
3. is based on the principle of electromagnetic induction
4. converts heat energy into electrical energy
116. 'प्रकाश तरंगें अनुपस्थ प्रकृति की होती है। यह तथ्य निस परिस्थितियों से स्थापित होता है, यह है

(1) विक्षेपण
(2) धुरण
(3) व्यतिकरण
(4) पूर्ण आत्मरिक परवर्तन

117. पृथ्वी के लिए 'g' का मान

(1) विषुवल रेखा पर धुरों की अपेक्षा अधिक है
(2) धुरों पर विषुवल रेखा की अपेक्षा अधिक है
(3) धुरों पर शून्य है
(4) विषुवल रेखा एवं धुरों पर बराबर है

118. तापमान बढ़ने के साथ बर्बाद का गुणांक परिवर्तन किस प्रकार होता है?

(1) बढ़ता है
(2) घटता है
(3) एक समान रहता है
(4) उपरोक्त कोई नहीं

119. क्षमथागतिकी के द्वितीय नियम के अनुसार

(1) क्षमथा ऊर्जा को पूर्णता कार्य में नहीं बदला जा सकता
(2) कार्य को पूर्णता: क्षमथा में नहीं बदला जा सकता
(3) सभी चक्रीय प्रक्रमों हेतु \( \frac{dQ}{T} < 0 \) होता है
(4) उपरोक्त सभी सत्य है

116. 'Light waves are of transverse nature'.
This fact is established through the phenomenon of

(1) diffraction
(2) polarization
(3) interference
(4) total internal reflection

117. The value of 'g' for earth is

(1) more at equator than poles
(2) more at poles than equator
(3) Zero at poles
(4) same both at equator and poles

118. How does Young's modulus changes with rise in temperature?

(1) increases
(2) decreases
(3) remains same
(4) none of the above

119. According to the second law of thermodynamics

(1) heat energy cannot be completely converted into work
(2) work cannot be completely converted into heat
(3) for all cyclic process we have \( \frac{dQ}{T} < 0 \)
(4) All the above are true
120. A body of mass $m$ is moving parallel to $x$-axis with constant velocity. Its angular momentum with respect to origin is

(1) increasing (2) decreasing

(3) zero  (4) constant

121. The wavelength of an ultraviolet photon and the de-Broglie wavelength of a non-relativistic electron are same. Then, the energy of photon is

(1) greater than the kinetic energy of the electron

(2) less than the kinetic energy of the electron

(3) equal to kinetic energy of the electron

(4) four times greater than the kinetic energy of the electron

122. If the diameter of earth is doubled maintaining its mass, then the weight of the body as compared to initial weight on the earth's surface will become

(1) double

(2) four times

(3) one fourth

(4) eight times
123. Which graph correctly gives the magnitude of the magnetic field along the axis of a circular loop as a function of the distance $x$ from its centre?

(1) \[\text{Graph A}\]
(2) \[\text{Graph B}\]
(3) \[\text{Graph C}\]
(4) \[\text{Graph D}\]

124. A player catches a ball of 200g moving with a speed of 20 m/s. If the time taken to complete the catch is 0.5 sec, the force exerted on the player's hand is

(1) 8 N  
(2) 4 N  
(3) 2 N  
(4) 16 N
125. Metal pipes used to carry water some times burst in winter because
(1) outside of the pipe contracts more than the inside
(2) metal becomes brittle when cold
(3) ice expands when it melts
(4) water expands when it freezes

126. Which of the following statement is not correct?
(1) A body may have zero instantaneous velocity but finite acceleration
(2) A body may have zero instantaneous acceleration but finite velocity
(3) Magnitude of instantaneous velocity is equal to instantaneous speed
(4) Magnitude of average velocity is equal to average speed

127. For the circuit shown in figure given below the equivalent resistance between point 'A' and 'B' is

\[ R_{eq} = \frac{1}{\frac{1}{10} + \frac{1}{7} + \frac{1}{3} + \frac{1}{5}} \]

(1) 10 Ω  (2) 5 Ω  (3) 10/3 Ω  (4) 2 Ω

128. Two notes are an 'octave' apart. The ratio of their frequencies is

(1) 8  (2) 10  (3) 2  (4) \( \sqrt{2} \)
129. Vander Waals equation of state is

\[ \left( P + \frac{a}{V^2} \right) (V + b) = RT \]

\[ \left( P - \frac{a}{V^2} \right) (V - b) = RT \]

\[ \left( P + \frac{a}{V^2} \right) (V - b) = RT \]

\[ \left( P - \frac{a}{V^2} \right) (V + b) = RT \]

130. An electric dipole placed in a uniform electric field experiences, in general

(1) a force and a torque
(2) a force only
(3) a torque only
(4) neither a force nor a torque

131. If A and B be the slopes of adiabatic and isothermal curves respectively and let \( \gamma = C_p/C_v \), then the correct relation is

(1) \( A = \gamma/B \)  
(2) \( A = \gamma B \)
(3) \( A = B^7 \)  
(4) \( B = A^7 \)

132. The root mean square speed of the molecules of a gas with density 1.2 Kg/m³ at a pressure of 10^5 N/m² is (in m/s)

(1) 5 × 10^2  
(2) 3.6 × 10^2  
(3) 0.5 × 10^2  
(4) 36 × 10^2

133. A magnetic field \( \vec{B}_0 \) is applied to a diamagnetic substance. In the interior the magnetic field produced by the magnetic dipoles of the substance is

(1) greater than \( B_0 \) and in the opposite direction
(2) less than \( B_0 \) and in the opposite direction
(3) less than \( B_0 \) and in the same direction
(4) greater than \( B_0 \) and in the same direction
134. In Germanium, the energy gap is about 0.72 eV. The maximum wave length of light which the germanium starts absorbing is about

(1) 35000 Å  (2) 17240 Å  (3) 25000 Å  (4) 51600 Å

135. A particle of mass \( m \) and charge \( q \) is accelerated from rest through a potential difference of \( V \) volt and then deflected by a magnetic field \( B \) that is perpendicular to its velocity. The radius of the resulting particle trajectory is

(1) \( \frac{2mV}{qB^2} \)  (2) \( \frac{2mB}{qV^2} \)  (3) \( \frac{mV}{qB^2} \)  (4) \( \frac{2mV}{qB} \)

136. The length of an organ pipe open at both ends is \( L \). If the pipe is closed at one end, the fundamental frequency now

(1) gets doubled  (2) gets halved  (3) remains unchanged  (4) reduces to 1/4 of its earlier value

137. The magnitude of vectors \( \vec{A}, \vec{B}, \vec{C} \) are 12, 5 and 13 units respectively. The angle between \( \vec{A} \) & \( \vec{B} \) is

(1) 90°  (2) 0°  (3) 180°  (4) 45°
138. Magnetic force per unit length on a wire carrying current of 8A, making an angle of 30° with magnetic field of 0.15T is

(1) $1.6 \text{ Nm}^{-1}$  
(2) $0.6 \text{ Nm}^{-1}$  
(3) $\frac{0.15}{4} \text{ Nm}^{-1}$  
(4) $0.16 \text{ Nm}^{-1}$

139. One kilowatt hour is equivalent to

(1) $3.6 \times 10^6 \text{ J}$  
(2) $1.6 \times 10^{-19} \text{ J}$  
(3) $746 \text{ J}$  
(4) $3.6 \times 10^5 \text{ J}$

140. A capacitor is most likely to behave as a short circuit when connected across

(1) a Denial cell  
(2) a dry cell  
(3) an ac source of low frequency  
(4) an ac source of high frequency

141. The **true** statement according to Bohr's model of Hydrogen atom is

(1) the speed of electron in the orbit is inversely proportional to 'n'  
(2) the radius of a permitted orbit is proportional to $\frac{1}{n^2}$  
(3) the energy of electron in the orbit is proportional to $n^2$  
(4) while revolving in orbit, electrons do not experience electrostatic force

142. Newton's law of cooling can be derived from

(1) Wien's law  
(2) Kirchhoff's law  
(3) Planck's law  
(4) Stefan's law
143. Consider radio waves (r), visible light (v), infra red light (i), x-rays (x) and ultraviolet light (u). In order of increasing frequency they are

(1) \( r, v, i, x, u \)  (2) \( r, i, v, u, x \)
(3) \( i, r, v, u, x \)  (4) \( i, v, r, u, x \)

144. A coil of resistance \( R \) and inductance \( L \) is connected to a battery of \( E \) volt emf. The final current flowing in the coil is

(1) \( \frac{E}{R} \)  (2) \( \frac{E}{L} \)
(3) \( \frac{E}{(R^2 + W^2L^2)^{1/2}} \)  (4) \( \frac{E}{(R^2 + L^2)^{1/2}} \)

145. The correctly matched pair is

(1) Meissner Effect  —  Superconductivity
(2) Brewster's law  —  Diffraction
(3) Malus's law  —  Scattering
(4) Stefan's law  —  Radiation pressure

146. The relation \( n_1 \sin \theta_1 = n_2 \sin \theta_2 \) which applies as a ray of light strikes an interface between two mediums, is known as

(1) Gauss's Law  (2) Snell's Law
(3) Cole's Law  (4) Faraday's Law

147. A particle, starting from rest, moves with a uniform acceleration and covers \( x \) meters in the first 5 seconds. The same particle will cover the following distance in the next 5 seconds

(1) \( x \) meter  (2) \( 2x \) meters
(3) \( 3x \) meters  (4) \( 4x \) meters

P. T. O.
148. A coil of copper wire is moved parallel to a uniform magnetic field, the \( emf \) induced in the coil will 
(1) depend on the intensity of magnetic field
(2) depend on the velocity of coil
(3) be zero
(4) be infinite

149. An oscillator is subjected to a damping force that is proportional to its velocity. A sinusoidal force is applied to it. After a long time 
(1) its amplitude is an increasing functions of time
(2) its amplitude is a decreasing function of time
(3) its amplitude is constant
(4) its amplitude is a decreasing function of time only if initial amplitude is large

150. The excess pressure for two soap bubbles are in the ratio of 3 : 1. The ratio of their volume is 
(1) 1 : 3
(2) 1 : 9
(3) 1 : 27
(4) 1 : 81