

**QUESTION BOOKLET**  
**Entrance test for B.Ed. Admission /**  
**B.Ed. Science Stream 2016**  
**General Instructions**

Question Booklet No:

Roll Number:

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QP Code: **82 C**

**INSTRUCTIONS FOR MARKING ANSWERS**

1. This Computerized OMR Answer Sheet is to be filled in by BLACK INK / BLUE BALL – POINT PEN Only.  
ଏହି କମ୍ପ୍ୟୁଟରୀକୃତ OMR ର ଉତ୍ତର ପତ୍ରିକା ପୂରଣ କରିବାପାଇଁ କଳା / ନୀଳ କାଳି ଥିବା ବଲପଏଣ୍ଟ ପେନ ବ୍ୟବହାର କରନ୍ତୁ।
2. Since answers and other particulars are to be filled in with Black / Blue Ink Ball-Point Pen, there is no provision for change of answers by eraser / blade / white fluid etc. Therefore, all particulars including answers are to be filled in VERY CAREFULLY. Kindly note that the OMR Answer Sheet will not be replaced under any circumstances.  
ଯେହେତୁ ଉତ୍ତର ଏବଂ ଅନ୍ୟ ବିବରଣୀ କଳା / ନୀଳ କାଳି ଥିବା ବଲପଏଣ୍ଟ ପେନ ବ୍ୟବହାର କରି ପୂରଣ କରାଯିବ, ତେଣୁ ରବର / ବ୍ଲେଡ୍ / ଧଳାରଙ୍ଗ ସାହାଯ୍ୟରେ ଲିଭାଇବାର ବ୍ୟବସ୍ଥାନାହିଁ । ତେଣୁ ଉତ୍ତରକୁ ଓ ସମସ୍ତ ବିବରଣୀ ଅତ୍ୟନ୍ତ ଧ୍ୟାନ ସହକାରେ ପୂରଣ କରନ୍ତୁ। ଦୟାକରି ଧ୍ୟାନ ଦିଅନ୍ତୁ, ଯେକୌଣସି ପରିସ୍ଥିତିରେ OMR ଉତ୍ତରପତ୍ରିକା ବଦଳ କରାଯିବ ନାହିଁ ।
3. Darken only one circle for Answer of each question as shown in the example given below. Marking should be dark and the circle is to be filled in completely as shown in the example.  
ନିମ୍ନ ଉଦାହରଣରେ ଦର୍ଶାଯାଇଥିବା ଭଳି ପ୍ରତ୍ୟେକ ପ୍ରଶ୍ନର ଉତ୍ତର ପାଇଁ କେବଳ ଗୋଟିଏ ହିଁ ଗୋଲ କଳା କରନ୍ତୁ । ଉଦାହରଣରେ ଦର୍ଶାଯାଇଥିବା ଭଳି ପୂରା ଗୋଲରେ ଗାଢ଼ କଳା / ନୀଳ ରଙ୍ଗ କରି ଚିହ୍ନ କରାଯିବା ଉଚିତ ।
4. There is only one correct response for each question. More than one response to a single question shall be treated as negative response. For each negative marking, 0.25 marks shall be deducted from your total marks.  
ପ୍ରତ୍ୟେକ ପ୍ରଶ୍ନ ପାଇଁ ଗୋଟିଏ ନିର୍ଦ୍ଦିଷ୍ଟ ଉତ୍ତର ଅଛି । ଯଦି ଗୋଟିଏ ନିର୍ଦ୍ଦିଷ୍ଟ ପ୍ରଶ୍ନର ଉତ୍ତର ପାଇଁ ଏକାଧିକ ଗୋଲକୁ ରଙ୍ଗ କରାଯାଇଥାଏ, ତେବେ ତାହା ଭୁଲ ଉତ୍ତର ଭାବେ ବିବେଚନା କରାଯିବ । ପ୍ରତ୍ୟେକ ଭୁଲ ଉତ୍ତର ପାଇଁ ୦.୨୫ ମାର୍କ କଟାଯିବ ।
5. Mark your answer only in the space provided. Please do not mark any other thing on the OMR answer sheet.  
କେବଳ ଦିଆଯାଇଥିବା ସ୍ଥାନରେ ହିଁ ନିଜର ଉତ୍ତର ଚିହ୍ନିତ କରନ୍ତୁ । ଏହି ପୁସ୍ତିକାର କୌଣସି ସ୍ଥାନରେ ଅନାବଶ୍ୟକ ଚିହ୍ନ ଦିଅନ୍ତୁ ନାହିଁ ।
6. Rough work should not be done on this OMR Answer sheet. Use rough sheets provided at the end of the question booklet, for rough work.  
OMR ଉତ୍ତର ପତ୍ରିକାରେ ରଫ କାମ କରନ୍ତୁ ନାହିଁ । ରଫ କାମ ପାଇଁ ପ୍ରଶ୍ନ ପୁସ୍ତିକାର ପଛପଟରେ ଥିବା ରଫ ସ୍ଥାନ / କାଗଜ ବ୍ୟବହାର କରନ୍ତୁ ।
7. Do not fold OMR Answer Sheet. Carbon copy of OMR answer sheet can be taken away by the candidate.  
OMR ଉତ୍ତର ପତ୍ରିକାକୁ ଭାଙ୍ଗ କରନ୍ତୁ ନାହିଁ । ଉତ୍ତର ପତ୍ରିକାର କାର୍ବନ କପି ପ୍ରାର୍ଥୀ ନେବା ଆବଶ୍ୟକ ।

Please read the following instructions carefully:

1. **Write your Roll Number, Question Booklet Number and Question Booklet Series on the OMR Answer Sheet carefully and sign at the appropriate place.** Please note that in absence of the correct Roll number, Question Booklet Number, Question Booklet Series and Signature on the OMR Answer Sheet, your OMR Answer Sheet will be treated as invalid and will not be evaluated.

2. Strictly follow the instructions given by the Centre Superintendent / Centre Observer/ Room Invigilator and instructions given on the Question Booklet.

*Please see the last page for complete instructions.*

Section – I

1. Select the correct synonym for the underlined word.  
"The world," said the old man, "requires a synergistic effort on the part of all countries for its continued survival".  
(A) coordinated  
(B) divergent  
(C) upended  
(D) stupendous
2. Select the correct synonym for the underlined word.  
Work, at times, gets bogged down by interminable arguments.  
(A) transient  
(B) ephemeral  
(C) intercepting  
(D) endless
3. Select the correct synonym for the underlined word.  
Several pristine habitats are now under the threat of the axe.  
(A) stained  
(B) unspoilt  
(C) appropriate  
(D) decaying
4. Select the INCORRECT statement.  
(A) The form must be filled out in capital letters.  
(B) The defendant tried to get his point along to the judge but she wouldn't listen.  
(C) No amount of support will see him through these difficult times.  
(D) His mother always refills the water jug, when she sees it empty.
5. Select the correct synonym for the underlined word.  
Very often employees feel that their colleagues have been silently spirited out of the company in a surreptitious manner.  
(A) disdainful  
(B) comradely  
(C) clandestine  
(D) rational

Directions for questions 6 to 10:

Read the passage and answer the questions that follow:

Even as car shoppers look over new models in dealer showrooms, some of them are being sized up themselves. In Cadillac, Mercedes and BMW showrooms around the United States, researchers hired by the Toyota Motor Corporation discretely watched prospective car buyers inspect the cars. The researchers noted not only whether the customers kicked the tyres but also how they dressed, what questions they asked and whether they appeared timid or confident.

"Just asking people questions is not going to reveal anything about them," said a professor of marketing and psychology." The best way to get an in-depth understanding of consumer values is to watch people buying and using products." Such people watching are the newest trend in consumer research, marketing experts say. A rather daring technique five years ago, the hiring of cultural anthropologists to observe and often videotape consumers in stores, shopping malls and even their own homes has become a standard

practice for many large corporations and some of the leading advertising agencies.

Companies with radically different approaches to marketing from Toyota, known for its adventuresome style to the far more conservative Procter & Gamble have come to rely on what is known in the industry as observational research. Such researchers study consumer attitudes towards a wide range of products and services, including fast food, over the counter medicines, household products, travel and personal care items.

What companies spend on such research is usually a closely held secret. Most marketers refuse to discuss details of people watching projects and the way in which the information is being used. But industry analysts estimate that companies spend millions of dollars watching Americans to discover the often hidden impulses that prompt them to buy an expensive car, eat gourmet ice cream, and wash their clothes with a particular detergent.

6. Companies, have come to rely frequently on which of the following methods to study the purchase pattern of consumers?
- (A) Psychological research
  - (B) Human resource development
  - (C) Technological research and development
  - (D) Observational research

7. According to the passage, the term, 'cultural anthropologists' in the passage refers to
- (A) the study of the structure of man as a rational animal
  - (B) one who studies mankind, its societies and customs
  - (C) a man who deals with the study of the origin of mankind
  - (D) one who organises cultural shows to study man's activities
8. Most companies do not let out information on
- (A) the expenditure incurred on people watching
  - (B) the hidden motives of the customer
  - (C) the money spent on personal care items
  - (D) the consumer's attitudes on products and services
9. The Toyota Corporation market researchers do all of the following EXCEPT:
- (A) Note the way customers kicked the tyres
  - (B) Note the costumes worn by the potential customers
  - (C) Note how the customers drive the cars
  - (D) Note the expressions of customers to know whether they are timid or confident
10. Recent studies point out that consumer research is best done by
- (A) Marketing analysts
  - (B) Watching people
  - (C) Giving out questionnaires
  - (D) Radical companies

11. Which of the following is one of the objectives of UGC?
- (A) To review In- service training of the IAS officers
  - (B) To provide technical assistance to schools and universities
  - (C) To coordinate, determine and maintain standards of university education
  - (D) To provide counselling service for university graduates
12. Which of the following committees was established to review In-service Training of the IAS officers (September 2003)?
- (A) Sarkar Committee
  - (B) Damodaran Committee
  - (C) Yugandhar Committee
  - (D) Prof. N R Madhava Menon Committee
13. Name the scheme launched by the Government for setting up residential schools at upper primary level for girls belonging predominantly to the SC, ST, OBC and minority communities.
- (A) Mid-Day meal
  - (B) Kasturba Gandhi Balika Vidyalaya
  - (C) Rashtriya Shiksha Abhiyan
  - (D) National Merit-cum-Means Scholarship Scheme
14. IETE is working in which one of the following areas?
- (A) Training for teachers
  - (B) Advancement of Science and Technology of Electronics, Telecommunication & IT
  - (C) Monitor educational policies
  - (D) Promote education for entrepreneurship
15. Which of the following is one of the objectives of 'Swachh Bharat: Swachh Vidyalaya' scheme initiated by the Government?
- (A) Clean premises in the school
  - (B) Remove corruption from school
  - (C) Water, Sanitation and Hygiene in Schools
  - (D) Increase the standard of Public Schools
16. Which of the following types of waves are used in Night Vision Apparatus?
- (A) Infra-red waves
  - (B) Radio waves
  - (C) Micro waves
  - (D) LASER waves
17. What is the other name of Rajya Sabha?
- (A) Cabinet
  - (B) Council of States
  - (C) Standing committee
  - (D) Council of Ministers
18. What is the process called through which solid is transformed into gas?
- (A) Condensation
  - (B) Vaporization
  - (C) Fusion
  - (D) Sublimation
19. When did the United Nations General Assembly adopt the Universal Declaration of Human Rights?
- (A) 10<sup>th</sup> December 1948
  - (B) 17<sup>th</sup> October 1948
  - (C) 15<sup>th</sup> August 1946
  - (D) 9<sup>th</sup> December 1946

20. Ordinary soaps DO NOT form lather in hard water because
- (A) Formation of precipitate occurs with  $\text{Ca}^{2+}$  and  $\text{Mg}^{2+}$  ions
  - (B) Decomposition of soap occurs
  - (C) Sedimentation of dissolved salts occurs
  - (D) Formation of carbonated  $\text{Na}^{2+}$  and  $\text{Mg}^{2+}$  ions occurs
21. Aditi is running around a circular track. She starts running when she is facing North-West direction. Which direction would she be facing when she has run three and a half rounds?
- (A) North-East
  - (B) North
  - (C) South-West
  - (D) South-East
22. In a certain language, FACTUAL is coded as CAFTLAU. How would MORNING be coded in this language?
- (A) MORNGNI
  - (B) ROMNGNI
  - (C) GNINMOR
  - (D) GNINROM
23. If Radha is the mother of the father of Sunil, then what will be the relation of Radha's husband with Sunil?
- (A) Father
  - (B) Grandfather
  - (C) Brother
  - (D) Uncle
24. I am a geometrical figure. I have no corners and no edges. I am three dimensional. What am I?
- (A) Pyramid
  - (B) Cube
  - (C) Sphere
  - (D) Prism
25. Under a scheme, if 7 empty bottles of soda are returned to the shopkeeper, then 1 bottle of soda is given back. Farid has purchased 21 bottles of soda. How many bottles of soda can he drink at most?
- (A) 21
  - (B) 23
  - (C) 24
  - (D) 25
26. With every 7 pairs of shoes that you buy, you will get a pair of socks free of cost. If you buy 62 pairs of shoes, how many pairs of socks will you get free of cost?
- (A) 7
  - (B) 8
  - (C) 9
  - (D) 10
27. Vishwas is the father-in-law of Sushma. Mahesh is the husband of Sushma. Vibha is the mother of Mahesh. What is the relation of Vibha with Vishwas?
- (A) Husband
  - (B) Wife
  - (C) Sister-in-law
  - (D) Daughter

28. In a certain language, ADVENTUROUS is coded as DVNTRS. How would ABSOLUTELY be coded in this language?
- (A) ABSTL  
(B) BSTEOL  
(C) BSLTLY  
(D) LYABST
29. The minute and the hour hands of a clock make an acute angle between them. Which of these could be the time that the clock is showing?
- (A) 2:30  
(B) 6:30  
(C) 4:00  
(D) 5:45
30. Some persons are standing in a queue. If the last person moves to the front, then the position of the middle person changes to fourteenth from last. What will be the position of the third person from last when seen from front?
- (A) 13<sup>th</sup>  
(B) 18<sup>th</sup>  
(C) 9<sup>th</sup>  
(D) 27<sup>th</sup>
31. Which of the following resolutions were passed at Wardha Education conference 1937?
- (A) Free and Compulsory Education  
(B) English medium in selected schools  
(C) Develop only social skills  
(D) Increase funds to all rural schools
32. In which of the following activities does a teacher present a question or situation and gives learners a short time to answer freely and suggest solutions or ideas?
- (A) Demonstration  
(B) Brain storming  
(C) Dramatization  
(D) Case studies
33. Setting goals and deciding strategies of teaching occurs in which phase of teaching?
- (A) Pre active phase  
(B) Post active phase  
(C) Interactive phase  
(D) Exit Phase
34. Nitya Prakash, a specialist at Kennedy High School, Hyderabad, says teachers there have found that classroom rules are most effective when teachers, parents, and students are equally committed to follow them. At the beginning of each year, a note with specific responsibilities is signed by each of the parties involved. In this context, as a teacher you would accept which of the following?
- (A) Develop classroom rules I am unwilling to enforce  
(B) Send the student out from the classroom for the misbehaviour  
(C) Ignore when there is a small disturbance at the backside of the classroom  
(D) Supply students and parents with evaluation of progress

35. Which of the following is advised by the teacher in whose class there are a few gifted students?
- (A) The students are treated equally along with the class
  - (B) The students will be asked to be in the higher classes
  - (C) Special classes with enriched programmes can be conducted
  - (D) Whenever the students want, they will be taught
36. What does UGC stand for?
- (A) University Grants Commission
  - (B) Universal Grants Commission
  - (C) University Governing Council
  - (D) University Governance Commission
37. Determining factors of individual differences in human beings are related to
- (A) Differences in environment
  - (B) Differences in heredity
  - (C) Differences in assimilation and accommodation
  - (D) Interaction between heredity and environment
38. The first condition for increasing emotional integration in the country is the development of
- (A) A regional Education Policy
  - (B) An All India language
  - (C) One's own cultural understanding
  - (D) Solidarity with one's community
39. Integral Education is the true aim of education, according to
- (A) Sri Vivekananda
  - (B) Sri Aurobindo
  - (C) Sri Rabindranath Tagore
  - (D) Mrs. Annie Besant
40. In which of the following methods, to promote active learning, a teacher asks questions to students during the course of teaching?
- (A) Scientific method
  - (B) Lecture method
  - (C) Playway method
  - (D) Socratic method
41. Identify from the following, the agencies which are developed with the specific and exclusive aim of imparting education.
- (A) Informal agencies of education
  - (B) Non-formal agencies of education
  - (C) Passive agencies of education
  - (D) Formal Agencies of Education
42. Name the dimension of equality and social justice for which the school system will have to strive for
- (A) Social disturbance
  - (B) Moral difference
  - (C) Economic disparity
  - (D) Psychological disparity
43. Identify the reading disorder, which is characterized by trouble with reading although the person has normal intelligence. Problems may include difficulties in spelling words, reading quickly, writing words, "sounding out" words in the head, pronouncing words when reading aloud and understanding what one reads.
- (A) Alexia
  - (B) Schizoaffective disorder
  - (C) Dyslexia
  - (D) Dissociative identity disorder

44. Effectiveness of teaching is more when there is the use of
- (A) Words
  - (B) Projects or excursions
  - (C) Coloured slides
  - (D) Working models
45. Which of the following is a typical behaviour exhibited by an adolescent?
- (A) Religious
  - (B) Rebellious
  - (C) Obedient
  - (D) Submissive
46. 'Aimlessness' is one of the problems of secondary education. Which of the following should be aimed at, to counter this problem?
- (A) Development of private schools
  - (B) Development of attitudes
  - (C) Development of democratic citizens
  - (D) Development of communication skills
47. Identify the disadvantage of the Lecture method from the following.
- (A) Direct experience
  - (B) Facts presentation in short time
  - (C) Results in dictation
  - (D) Emphasis on independent reading
48. Which of the following DOES NOT belong to the group of merits of Community as an Agency of education?
- (A) Community education is meaningful
  - (B) It imparts theoretical experiences of objects
  - (C) It emphasizes the principle of utility
  - (D) It lays emphasis on activity
49. Which of the following is one of the purposes of performance appraisal?
- (A) To provide feedback
  - (B) To identify the background
  - (C) To provide more marks
  - (D) To emphasize the negative
50. The maximum goal of education is
- (A) Diffusion of knowledge, values, attitudes and norms of relationships required for playing adult role
  - (B) Upbringing of the progeny
  - (C) Management of the organization
  - (D) Working for the nation



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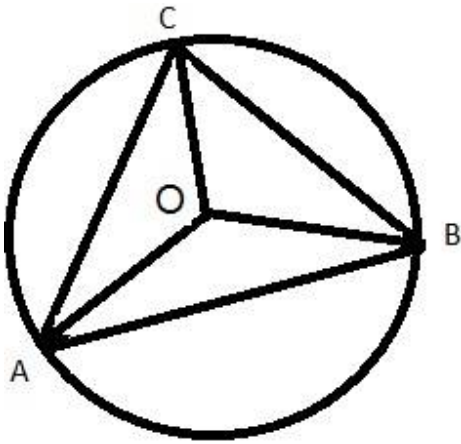
Section – II

51. What is the value of  $(5\sqrt{5} \times 4(3/2))/(5 \times 16)$  ?
- (A)  $\sqrt{5/4}$   
(B)  $5\sqrt{4}$   
(C)  $4\sqrt{5}$   
(D)  $\sqrt{4/5}$
52. If  $\sin A + \cos A = \sqrt{2}$ , then find the value of  $\sin 2A$ ?
- (A) 0  
(B) 1  
(C)  $1/2$   
(D)  $1/\sqrt{2}$
53. Find the total number of factors of 108.
- (A) 10  
(B) 11  
(C) 12  
(D) 13
54. How many set of ordered pairs  $(x,y)$  satisfy these two simultaneous equations?
- $$8x + 3y = 25$$
- $$32x + 12y = 100$$
- (A) Zero  
(B) One  
(C) Two  
(D) Infinity
55. If  $2(\log x)^2 + 5(\log x) - 18 = 0$ , then which among these can be the value of  $x$ ? [ $\log x$  when mentioned without base, has to be assumed that it is of base 10].
- (A) 10  
(B) 100  
(C) 1000  
(D) 10000
56. Set  $A = \{1,2,4,6,8\}$ , Set  $B = \{0,1,4,8,9\}$ , Set  $C = \{4,6,9,10\}$ . Find  $(A \cup B) \cap C$ .
- (A)  $\{1,4,9\}$   
(B)  $\{2,8,9\}$   
(C)  $\{4,6,9\}$   
(D)  $\{6,8,9\}$
57. Let  $T$  be a set such that  $T = \{x \mid (2x+6) = x^2 + 6x + 9, x > 0\}$ . Which of these could be true about set  $T$ ?
- (A)  $T$  is an empty set  
(B) Set  $T$  has only one element  
(C)  $x = -2$  is a member of  $T$   
(D) Set  $T$  has infinitely many elements
58. The diagonal of a square is  $5\sqrt{2}$  cm. What is the perimeter of the square?
- (A) 10 cm  
(B) 16 cm  
(C) 20 cm  
(D) 24 cm
59. Find the value of  $a \times a^{(3/2)} \times a^{(2)} \times a^{(5/2)} \times \dots \times a^{(5)}$
- (A)  $a^{22}$   
(B)  $a^{27}$   
(C)  $a^{29}$   
(D)  $a^{31}$
60. What is the remainder when  $(x^3 + 6x^2 - 4x + 2)$  is divided by  $(x-3)$ ?
- (A) 40  
(B) 71  
(C) 76  
(D) 80

61. If  $\sin \theta = (5/13)$  and  $\theta$  is in the first quadrant, then find the value of  $\tan \theta$ .
- (A)  $5/12$   
(B)  $12/13$   
(C)  $12/5$   
(D)  $13/5$
62. The diameter of a circle is 28 cm. What is the length of its circumference?
- (A) 44 cm  
(B) 88 cm  
(C) 22 cm  
(D) 176 cm
63. When viewed from the top of a tower of height 100 metres, the angle of elevation of a boat is 30 degrees. The boat moved "x" metres towards the tower and the angle of elevation changed to 5 degrees. Find the value of "x"?
- (A) 100  
(B) 50  
(C)  $100(\sqrt{3} - 1)$   
(D)  $100(\sqrt{3} + 1)$
64. Given that  $f(x) = 3x^2 + 2x + 5$ . For how many values of x,  $f(x)$  lies between 0 and 50, both inclusive? [given that x is a natural number].
- (A) 2  
(B) 3  
(C) 4  
(D) 5
65. What is the octal number corresponding to 110 in decimal number system?
- (A) 143  
(B) 150  
(C) 156  
(D) 163
66. If  $\sin \theta = 3/5$ , then find the value of  $\tan 2\theta$
- (A)  $24/25$   
(B)  $12/13$   
(C)  $24/7$   
(D)  $7/24$
67. Seeta and Rashmi have chocolates in the ratio 3:2. If Seeta gives 2 chocolates to Rashmi, both of them will have equal number of chocolates. How many chocolates did Seeta have initially?
- (A) 9  
(B) 12  
(C) 15  
(D) 18
68. In a city 250 people read Times of India, 300 people read Economic times and 160 people read Hindu. 40 people read both Times of India and Economic times. 60 people read both Economic times and Hindu and 30 people read both Times of India and Hindu. 10 people read all the three. If all residents in that city read at least one of the newspaper, then how many residents are there in that city?
- (A) 570  
(B) 590  
(C) 710  
(D) 800

69. If  $\log 2 = 0.3010$  and  $\log 3 = 0.4771$ , then find the value of  $\log 12$ .
- (A) 1.1234  
(B) 1.0791  
(C) 1.0032  
(D) 1.8896
70. A two-digit number is 3 more than 7 times the sum of its digits. How many such numbers are there?
- (A) 4  
(B) 5  
(C) 6  
(D) 7
71. What is the sum of all the factors of 48?
- (A) 76  
(B) 124  
(C) 148  
(D) 196
72. One of the diagonal of a rhombus is 48 cm. If the sides are of length 25 cm, then find the area of rhombus.
- (A) 168 sq.cm  
(B) 336 sq.cm  
(C) 424 sq.cm  
(D) 526 sq.cm
73. What is the value of  $\log a^2 + \log b^2 - 2 \log ab$ ?
- (A) 0  
(B) 1  
(C) 2  
(D) 3
74. A number when divided by 18 leaves a remainder 2. What is the remainder when the same number is divided by 6?
- (A) 2  
(B) 3  
(C) 4  
(D) 5
75. In a class, 30 students passed in Maths, 20 passed in Physics and 8 passed in both. How many students failed in both if the class has 45 students?
- (A) 3  
(B) 6  
(C) 8  
(D) 10
76. What are the roots of the equation  $x^2 - 7x + 12 = 0$ ?
- (A) (4, 3)  
(B) (-3, -4)  
(C) (1, 2)  
(D) (5, 7)
77. What is the value of  $(\cos 10^\circ \times \cos 20^\circ \times \cos 30^\circ \times \dots \times \cos 120^\circ)$ ?
- (A) 0  
(B) 1  
(C)  $\frac{3}{4}$   
(D)  $\frac{432}{664}$

78. In the given figure, O is the centre of the circle. Angle  $\text{BCO} = 35$  degrees. Find the measure of the angle  $\text{BAC}$  in degrees.



- (A) 45  
(B) 50  
(C) 55  
(D) 60
79. Four angles of a quadrilateral are in arithmetic progression with a common difference of 20 degrees. What is the smallest angle of that quadrilateral?  
(A) 40 degrees  
(B) 60 degrees  
(C) 80 degrees  
(D) 100 degrees
80. If one root of a quadratic equation is  $3+\sqrt{2}$ , then what is the product of the roots?  
(A) 6  
(B) 7  
(C) 9  
(D) 12
81. An electron in the hydrogen atom moves from the state  $n=2$  to  $n=1$ . If  $E_K$  and  $E_P$  represent the kinetic energy and potential energy of an electron, due to transition  
(A)  $E_K$  and  $E_P$  remain the same  
(B)  $E_K$  decreases 4 times,  $E_P$  increases 4 times  
(C)  $E_K$  increases 4 times,  $E_P$  decreases 4 times  
(D)  $E_K$  increases twice,  $E_P$  decreases twice
82. A sound wave is passing through air column in the form of compression and rarefaction. In consecutive compressions and rarefactions  
(A) There is no transfer of heat  
(B) Boyle's law is obeyed  
(C) Bulk modulus of air oscillates  
(D) Density remains constant
83. Magnetic lines of force of a bar magnet  
(A) Never intersect  
(B) Intersect at north pole  
(C) Intersect at south pole  
(D) Intersect at the centre of the magnet
84. Which one of the following transitions in a hydrogen atom emits photons of highest frequency?  
(A)  $n = 1$  to  $n = 2$   
(B)  $n = 2$  to  $n = 1$   
(C)  $n = 2$  to  $n = 4$   
(D)  $n = 6$  to  $n = 3$

85. A sphere, a cube and a thin circular plate all of same material and same mass are initially heated to same high temperature. Then
- (A) Plate will cool fastest and cube the slowest
  - (B) Plate will cool fastest and sphere the slowest
  - (C) Sphere will cool fastest and cube the slowest
  - (D) Cube will cool fastest and plate the slowest
86. Areas where moving air converge have
- (A) Low pressure only
  - (B) High pressure only
  - (C) Both high and low pressure
  - (D) Zero pressure
87. A force of 1.5 N is applied on a ball of mass 150 gm for a time of 2 seconds. If it starts from rest, what is its velocity when force ceases?
- (A) 10 m/s
  - (B) 15 m/s
  - (C) 20 m/s
  - (D) 30 m/s
88. The kinetic energy of a moving body is K. If its mass and velocity becomes doubled, then its kinetic energy will be
- (A) 2K
  - (B) 4K
  - (C) 8K
  - (D) 16K
89. What happens when zinc metal is added into dilute hydrochloric acid?
- (A) Hydrogen gas and zinc chloride are produced
  - (B) Zinc salt and water are produced
  - (C) Chlorine gas and iron hydroxide are produced
  - (D) No reaction takes place
90. The ionisation potential of the hydrogen atom is 13.6 eV. Calculate the speed of the electron which could just ionise the hydrogen atom.
- (A)  $28 \times 10^6 \text{ m/s}$
  - (B)  $2.18 \times 10^6 \text{ m/s}$
  - (C)  $218 \times 10^6 \text{ m/s}$
  - (D)  $21.8 \times 10^6 \text{ m/s}$
91. For the conductors which obey Ohm's law of electricity, voltage-current graph is always a/an
- (A) Circle
  - (B) Ellipse
  - (C) Straight line
  - (D) Parabola
92. Which of the following is a non-decomposition reaction?
- (A) Thermal decomposition
  - (B) Electrolysis
  - (C) Photolysis
  - (D) Addition reaction
93. Which of the following phenomena proves that light has wave properties?
- (A) Interference patterns formed when light passes through a diffraction grating
  - (B) Images formed by lenses
  - (C) Light reflecting off a mirror
  - (D) The refraction of light as it passes from air to water

94. Light travels fastest through which of the following materials?
- (A) Diamond  
(B) Water  
(C) Glass  
(D) Air
95. The neutralization reaction is  
*(symbols/notations carry their usual meaning)*
- (A)  $\text{HCl} + \text{NaOH} \rightarrow \text{NaCl} + \text{H}_2\text{O}$   
(B)  $\text{BaCl}_2(\text{aq}) + \text{Na}_2\text{SO}_4(\text{aq}) \rightarrow \text{BaSO}_4(\text{s}) + \text{NaCl}(\text{aq})$   
(C)  $\text{N}_2(\text{g}) + \text{O}_2(\text{g}) + \text{Heat} \rightarrow 2\text{NO}$   
(D)  $\text{CH}_4(\text{g}) + 2\text{O}_2(\text{g}) \rightarrow \text{CO}_2(\text{g}) + 2\text{H}_2\text{O}(\text{l}) + \text{heat}$
96. A man lifts a box of 10 kg to the roof of a building through stairs of slant length 13 m. The work done by the man is ( $g = 10 \text{ m/s}^2$ )
- (A) Equal to 1300 J  
(B) Less than 1300 J  
(C) Greater than 1300 J  
(D) Zero
97. Fraunhofer lines are due to
- (A) Magnetic field of sun  
(B) Absorption by dust particles in the sky  
(C) Scattering of light by dust particles in the sky  
(D) Absorption by elements in the solar atmosphere
98. The speed of a gaseous reaction increases in presence of a catalyst because
- (A) Adsorption of the gases on the catalyst surface lowers the temperature of the surface  
(B) Adsorption of the gases on the catalyst surface increases the temperature of the surface  
(C) Adsorption of the gases on the catalyst surface lowers the activation energy of the reaction  
(D) Adsorption of the gases on the catalyst surface increases the activation energy of the reaction
99. A fuse is placed with an appliance in a/an
- (A) Parallel arrangement  
(B) Series arrangement  
(C) Open circuit arrangement  
(D) Loop circuit arrangement
100. A body of mass 2 kg moves 30 m against a frictional force of 100 N. If the work is completely converted into heat, the rise in temperature of the body due to the absorption of heat is (given specific heat of the material = 600 J / kgK)
- (A) 2.5 K  
(B) 2.0 K  
(C) 1.5 K  
(D) 1 K
101. Which of the following is formed when iron is heated in steam?
- (A) Ferric chloride  
(B) Ferrous chloride  
(C) Ferric oxide  
(D) Iron powder

102. Oil undergoes oxidation, becomes rancid and its smell and taste changes. This can be avoided by
- (A) Boiling the oil
  - (B) Keeping the oil in an air tight container
  - (C) Filtering the oil
  - (D) Keeping the oil under sunlight
103. An electron revolves around a nucleus of charge  $Ze$ . An energy of 40.8 eV is needed to excite an electron from the  $n=1$  to  $n=2$  state. The value of  $Z$  is
- (A) 2
  - (B) 4
  - (C) 6
  - (D) 8
104. Magnetic field lines inside a solenoid are
- (A) Converging lines
  - (B) Zig-zag curves
  - (C) Parallel straight lines
  - (D) Diverging lines
105. In an atom two electrons move round the nucleus in circular orbits of radii  $R$  and  $4R$ . What is the ratio of the time taken by them to complete one revolution?
- (A) 1 : 4
  - (B) 4 : 1
  - (C) 1 : 8
  - (D) 8 : 1
106. The atmospheric pressure is the pressure exerted by
- (A) Solar System
  - (B) Winds blowing on the surface of earth
  - (C) All layers of space
  - (D) Overhead atmosphere 100 km above the surface of earth
107. One coulomb is defined as the amount of total charge accumulated on
- (A)  $3.2 \times 10^{18}$  electrons
  - (B)  $1.6 \times 10^{18}$  electrons
  - (C)  $1.6 \times 10^{-19}$  electrons
  - (D)  $6.24 \times 10^{18}$  electrons
108. A pressure of 1000 millibars is equal to the weight of a column of mercury having height of
- (A) 1.00 m
  - (B) 7.6 m
  - (C) 0.76 m
  - (D) 0.076 m
109. A ray of light is incident on a plane mirror at an angle of 30 degrees to the normal. What will be the angle of reflection?
- (A) 15 degrees
  - (B) 30 degrees
  - (C) 45 degrees
  - (D) 60 degrees
110. In case of reflection of light at a plane mirror, the angle of incidence and angle of reflection are
- (A) Equal
  - (B) Unequal
  - (C) Always zero degrees
  - (D) Always 90 degrees
111. In the hydrogen atom  $E_3 - E_2 = E$ . Find the ionisation potential in volt.
- (A) 1.9 eV
  - (B) 13.2 eV
  - (C) 5.6 eV
  - (D) 10.2 eV

112. Which of the following is an insulator of electricity?  
(A) Copper  
(B) Silver  
(C) Aluminium  
(D) Glass
113. In domestic electrical circuits the electric appliances are used/connected  
(A) In series arrangement only  
(B) In parallel arrangement only  
(C) In both series and parallel arrangement  
(D) Randomly as per requirements of appliance utility
114. In exothermic reaction  
(A) Gas is liberated  
(B) Precipitation happens  
(C) Heat is liberated  
(D) Heat is absorbed
115. Which one of the following vehicles offers largest inertia?  
(A) Cycle  
(B) Scooter  
(C) Motor Bike  
(D) Car
116. Which of the following uses fragmentation (vegetative) mode of reproduction?  
(A) Mucor  
(B) Nostoc  
(C) Amoeba  
(D) Yeast
117. Which of the following is NOT a cause for loss of Biodiversity?  
(A) Destruction of habitat  
(B) Invasion of alien species  
(C) Keeping animals in zoological parks  
(D) Over-exploitation of natural resources
118. Biosphere is  
(A) A component in the ecosystem  
(B) Composed of the plants present in the soil  
(C) Life in the outer space  
(D) Composed of all living organisms present on earth which interact with the physical environment
119. Which one of the following tissues retains the capacity to divide at maturity?  
(A) Parenchyma  
(B) Sclerenchyma  
(C) Phloem  
(D) Xylem
120. Name the event which precedes reformation of nuclear envelopes during M-phase of cell cycle?  
(A) Decondensation of chromosomes appearance of nuclear lamina  
(B) Formation of contractile ring and phragmoplast  
(C) Transcription from chromosomes and reassemble of nuclear lamina  
(D) Formation of contractile ring and transcription



121. Ecological niche is
- (A) The surface area of the ocean
  - (B) An ecologically adapted zone
  - (C) The physical position and functional role of a species within the community
  - (D) Formed by all living organisms living at the bottom of the lake
122. To produce 128 cells from a single cell, how many number of mitotic divisions are required?
- (A) 7
  - (B) 8
  - (C) 16
  - (D) 32
123. Rivet popper hypothesis was given by
- (A) Mishra
  - (B) Odum
  - (C) Ehrlich and Ehrlich
  - (D) Reiter
124. Which one of the following has irregular nuclei?
- (A) Neutrophils
  - (B) Basophils
  - (C) Eosinophils
  - (D) Monocytes
125. How do algal blooms in a water body affect the environment?
- (A) By causing global warming
  - (B) By causing eutrophication
  - (C) By causing biomagnification
  - (D) By increasing the salinity of water
126. Nitrogen oxides formed during emission from automobiles and power plants are a source of fine air particles which lead to
- (A) Dry acid deposition
  - (B) Photochemical smog
  - (C) Wet acid deposition
  - (D) Industrial smog
127. Ecotone is
- (A) A polluted area
  - (B) The bottom of a lake
  - (C) A zone of transition between two communities
  - (D) A zone of developing community
128. Which structure is absent in male cockroach?
- (A) Labium
  - (B) Phallomeres
  - (C) Spermatheca
  - (D) Anal cerci
129. Autecology is study of
- (A) Relation of a population to its environment
  - (B) Relation of an individual to its environment
  - (C) Relation of a niche to its environment
  - (D) Relation of a biome to its environment
130. On which segment of *Pheretima posthuma*, is the female genital pore located?
- (A) 14<sup>th</sup>
  - (B) 16<sup>th</sup>
  - (C) 18<sup>th</sup>
  - (D) 15<sup>th</sup>

131. Prokaryotic genetic system consists of  
(A) DNA but no histones  
(B) Neither DNA nor histones  
(C) Both DNA and histones  
(D) Either DNA or histones
132. Ozone present in stratosphere is called good ozone because it dissipates the harmful radiation of  
(A) UV-A  
(B) UV-B  
(C) UV-C  
(D) UV-C and partly UV-B
133. Replication of DNA takes place in  
(A) S-Phase  
(B) Metaphase  
(C) Prophase  
(D) Anaphase
134. Where among the following will you find Pitcher plant?  
(A) Rain forest of North east India  
(B) Sunderbans  
(C) Thar desert  
(D) Western ghats
135. What is the trend of biodiversity towards equator?  
(A) Biodiversity increases towards equator  
(B) Biodiversity remains same at all latitudes  
(C) Biodiversity becomes zero towards equator  
(D) Biodiversity first decreases then increases at equator
136. Methaemoglobinaemia is caused due to  
(A) Pathogenic microorganisms  
(B) Excess of nitrates present in drinking water  
(C) Increased concentration of non-degradable pesticides  
(D) Non availability of adequate oxygen
137. The correct statement with respect to microsomes is that  
(A) Microsomes as discrete entities are found only in the nucleolus and are revealed by E.M picture  
(B) Microsomes as discrete entities are not found in the intact cell but are the result of fragmentation of most of the cytoplasmic membranous components  
(C) Microsomes as discrete entities are always found attached to the outer surface of RER  
(D) Microsomes as discrete entities are found in all living cells, uniformly distributed throughout the cell
138. The highest chromosome number is found in the meiocytes of  
(A) Human beings  
(B) Fruit fly  
(C) Housefly  
(D) Ophioglossum
139. The decrease in pH level of soil and water mainly due to human intervention is called  
(A) Eutrophication  
(B) Acidification  
(C) Alkalization  
(D) Biomagnification

140. Eutrophication means
- (A) Process of nutrition enrichment in water bodies
  - (B) Dominance of less desirable form of plant
  - (C) Decrease in crop yield
  - (D) Death and decay of submerged plants
141. Given below are the events of meiosis:
- I. Terminalization
  - II. Crossing over
  - III. Synapsis
  - IV. Disjunction of genomes
- Arrange them in correct sequence:
- (A) II, I, IV, III
  - (B) III, II, I, IV
  - (C) IV, III, II, I
  - (D) I, IV, III, II
142. Which one of the following impurities is easiest to remove from waste water?
- (A) Bacteria
  - (B) Colloids
  - (C) Dissolved solids
  - (D) Suspended solids
143. Which of the following show maximum biodiversity?
- (A) Mangroves
  - (B) Coral reefs
  - (C) Temperate rain forest region
  - (D) Taiga region
144. The acid rains are caused due to
- (A)  $\text{NO}_2$  and  $\text{SO}_2$
  - (B)  $\text{NH}_3$  and  $\text{SO}_3$
  - (C)  $\text{CO}$  and  $\text{CO}_2$
  - (D)  $\text{O}_3$  and  $\text{CO}_2$
145. What is the indication of high BOD of water?
- (A) High microbial pollution
  - (B) Low microbial pollution
  - (C) Water is pure
  - (D) Water is saline
146. Diversity found between adjacent communities of ecosystem is called
- (A) Alpha diversity
  - (B) Beta diversity
  - (C) Gamma diversity
  - (D) Genetic diversity
147. Maximum endemism occurs in India in case of
- (A) Amphibians
  - (B) Fresh water fishes
  - (C) Flowering plants
  - (D) Reptiles
148. Which of the following countries has highest biodiversity?
- (A) Brazil
  - (B) South Africa
  - (C) Russia
  - (D) India
149. Name the event which takes place during Diplotene stage of prophase I of meiosis?
- (A) Compaction of chromosomes
  - (B) Formation of synaptonemal complexes
  - (C) Formation of recombinational nodules
  - (D) Dissolution of synaptonemal complex

150. Which of the following is NOT a by-product of respiration?
- (A) Energy
  - (B) Water
  - (C) Carbon dioxide
  - (D) Oxygen

Space for Rough Work:

82 C

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Space for Rough Work:

Space for Rough Work:

Space for Rough Work:

3. Candidates are not allowed to carry any papers, notes, books, calculators, cellular phones, earphones, scanning devices, pagers, log tables etc. to the Examination Hall.

Any candidate found using, or in possession of such unauthorized material or involved in copying or impersonation or adopting unfair means or behaviors will be disqualified and may be subjected to penal action.

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4. **This examination is of objective type. The Question Booklet consists of two sections: Section I and Section II. Both sections are compulsory.** Section I contains 50 questions from General English, Education, General Awareness, Reasoning and Teaching Aptitude. Section II consists of 100 questions from Physical Science, Bio-Science and Mathematics.

5. There are a total of 150 questions and the total time allotted is 2½ hours. All questions are compulsory and carry 1 marks each. Every correct answer will get 1 marks and 0.25 marks will be deducted for every wrong answer.

6. The candidates must check that the Question Booklet has 150 questions with multiple choice answers. If any discrepancy is found, immediately report to the Invigilator, so that Question Booklet may be replaced.

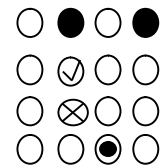
7. Each objective question is followed by four answers out of which one is correct. Your task is to choose the correct answer and mark your answer on the OMR Answer Sheet, NOT on Question Booklet.

8. Completely darken the CIRCLE so that the alphabet inside the CIRCLE is not visible. Darken only one circle for each answer. The CORRECT and the WRONG method of darkening the CIRCLE on the OMR answer sheet are given in the example below:

Correct Method



Wrong Method



9. Use blue/black ink ball point pen only for filling the boxes and darkening the circle on OMR Answer Sheet. Do not use pencil.

10. Folding/ wrinkling or putting any unwanted mark or damaging the OMR Answer sheet is prohibited. The candidate will be responsible for invalidation of the OMR Answer sheet for doing such deeds.

11. Space has been provided at the end of the Question Booklet for rough work.

12. The candidates are not allowed to leave the examination hall before the OMR answer sheets are collected and counted by the invigilator.

13. Candidates are provided with carbonless OMR answer sheet. They must submit the original copy to the invigilator and take away the carbon copy with them.