

No. : 30000061

DME3GS/16

Register
Number

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2016

Paper III
(Degree Standard)

ENGINEERING APTITUDE WITH GENERAL STUDIES

Time Allowed : 3 Hours]

[Maximum Marks : 300

Read the following instructions carefully before you begin to answer the questions.

IMPORTANT INSTRUCTIONS

1. This Booklet has a cover (this page) which should not be opened till the invigilator gives signal to open it at the commencement of the examination. As soon as the signal is received you should tear the right side of the booklet cover carefully to open the booklet. Then proceed to answer the questions.
2. This Question Booklet contains 200 questions. Prior to attempting to answer the candidates are requested to check whether all the questions are there in series without any omission and ensure there are no blank pages in the question booklet. In case any defect in the Question Paper is noticed it shall be reported to the Invigilator within first 10 minutes.
3. Answer all questions. All questions carry equal marks.
4. You must write your Register Number in the space provided on the top right side of this page. Do not write anything else on the Question Booklet.
5. An Answer Sheet will be supplied to you separately by the Invigilator to mark the answers.
6. You will also encode your Register Number, Subject Code, Question Booklet Sl. No. etc. with Blue or Black ink Ball point pen in the space provided on the side 2 of the Answer Sheet. If you do not encode properly or fail to encode the above information, action will be taken as per commission's notification.
7. Each question comprises *four* responses (A), (B), (C) and (D). You are to select ONLY ONE correct response and mark in your Answer Sheet. In case you feel that there are more than one correct response, mark the response which you consider the best. In any case, choose ONLY ONE response for each question. Your total marks will depend on the number of correct responses marked by you in the Answer Sheet.
8. In the Answer Sheet there are *four* circles (A), (B), (C) and (D) against each question. To answer the questions you are to mark with Blue or Black ink Ball point pen ONLY ONE circle of your choice for each question. Select one response for each question in the Question Booklet and mark in the Answer Sheet. If you mark more than one answer for one question, the answer will be treated as wrong. e.g. If for any item, (B) is the correct answer, you have to mark as follows :

(A) (C) (D)

9. You should not remove or tear off any sheet from this Question Booklet. You are not allowed to take this Question Booklet and the Answer Sheet out of the Examination Hall during the examination. After the examination is concluded, you must hand over your Answer Sheet to the Invigilator. You are allowed to take the Question Booklet with you only after the Examination is over.
10. The sheet before the last page of the Question Booklet can be used for Rough Work.
11. Failure to comply with any of the above instructions will render you liable to such action or penalty as the Commission may decide at their discretion.
12. Do not tick-mark or mark the answers in the Question booklet.

SEAL

SPACE FOR ROUGH WORK

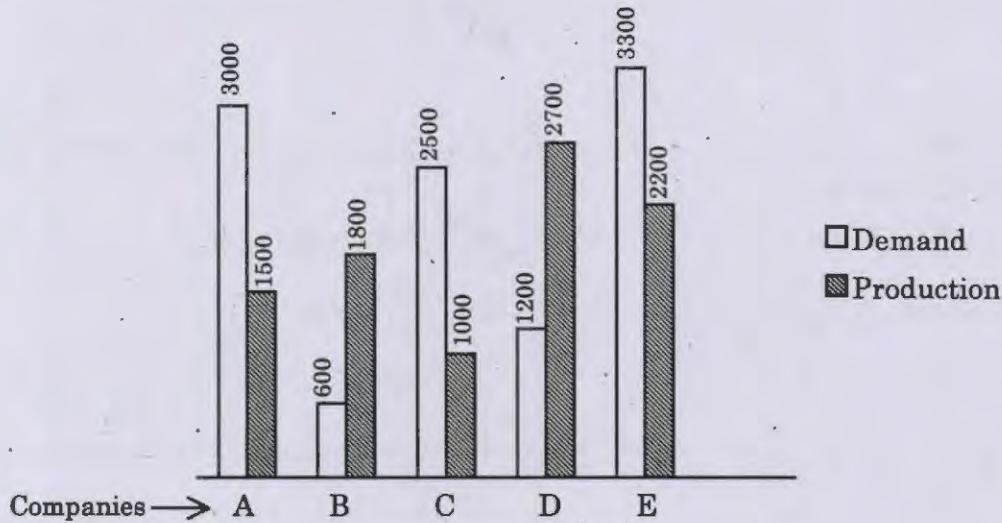
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1. A, B, C, D are four non-coplanar points. The number of planes that can be drawn passing through any three of these points is
 (A) 3 ~~(B)~~ 4 (C) 5 (D) 8
2. The tank-full of petrol in Arun's motorcycle lasts for 10 days. If he starts using 25% more everyday, how many days will the tank-full of petrol last?
~~(A)~~ 8 (B) 5 (C) 6 (D) 7
3. The value of $(\log \tan 1^\circ \cdot \log \tan 2^\circ \cdot \dots \cdot \log \tan 50^\circ)$ is equal to
 (A) 1 (B) -1 (C) $\log \tan 51^\circ$ ~~(D)~~ 0
4. The volume of air in a room is 204 m^3 . The height of the room is 6 m. What is the floor area of the room?
 (A) 46 m^2 (B) 32 m^2 ~~(C)~~ 34 m^2 (D) 44 m^2
5. If $nC_r = nC_{r-1}$ and $nP_r = nP_{r+1}$, then the value of n is
 (A) 4 ~~(B)~~ 3 (C) 2 (D) 5
6. The sum of two numbers is 15. If sum of their reciprocal is $\frac{3}{10}$, then larger number is
 (A) 25 ~~(B)~~ 10 (C) 50 (D) 15
7. The simplified value of $\frac{(0.55)^2 + (0.07)^2 + (0.027)^2}{(0.055)^2 + (0.007)^2 + (0.0027)^2}$ is
 (A) 10 (B) 10000 (C) 0.1 ~~(D)~~ 100
8. If A and B are two independent events such that $P(A') = \frac{7}{10}$, $P(B') = \alpha$ and $P(A \cup B) = \frac{4}{5}$, then the value of α is
 (A) 1 (B) $\frac{5}{7}$ ~~(C)~~ $\frac{2}{7}$ (D) $\frac{1}{4}$

9. If m men working m hours per day, can do m units of work in m days, then n men working n hours per day would be able to complete how many units of work in n days?
- (A) $\frac{m^3}{n^2}$ (B) $\frac{m^4}{n^2}$ (C) $\frac{n^4}{m^3}$ ~~(D)~~ $\frac{n^3}{m^2}$
10. A cone of height 7 cm and base radius 3 cm is carved from a rectangular block of wood $10 \text{ cm} \times 5 \text{ cm} \times 2 \text{ cm}$. The percentage of wood wasted is
- ~~(A)~~ 34% (B) 46% (C) 54% (D) 66%
11. If $\sqrt{5} = 2.236$ then the value of $\frac{\sqrt{5}}{2} - \frac{10}{\sqrt{5}} + \sqrt{125}$ is equal to
- (A) 5.59 ~~(B)~~ 7.826 (C) 8.944 (D) 10.062
12. $11^2 + 12^2 + 13^2 + \dots + 20^2 = ?$
- (A) 385 ~~(B)~~ 2485 (C) 2870 (D) 3255
13. What is the area between a square of side 10 cm and two inverted semi circular cross-sections each of radius 5 cm inscribed in the square?
- (A) 17.5 cm^2 (B) 18.5 cm^2 (C) 20.5 cm^2 ~~(D)~~ 21.5 cm^2
14. The value of k for which the lines $x + 2y = 9$ and $kx + 4y = -5$ are parallel, is
- ~~(A)~~ $k = 2$ (B) $k = 1$ (C) $k = -1$ (D) $k = 3$
15. In $\triangle ABC$, DE are points on sides AB and AC , such that DE parallel to BC . If $AD = x$, $DB = x - 2$, $AE = x + 2$, $EC = x - 1$ then the value of x is
- ~~(A)~~ 4 (B) 2 (C) 1 (D) 8
16. A function that assigns the same value to every member of its domain is called the
- (A) identity function (B) odd function
~~(C)~~ constant function (D) even function

17. The mean of a set of 50 items is 85. If each of the value is increased by 5, the mean of the set of new values is
(A) 80 (B) 85 ~~(C)~~ 90 (D) 95
18. How long will a boy take to go four times round a circular garden whose radius is 35 meters walking at 4 km per hour?
(A) 3 minutes 18 sec. ~~(B)~~ 13 minutes 12 sec.
(C) 52 minutes 48 sec. (D) $\frac{66}{5}$ hours
19. Which of the following sets of ordered pair is a function from $A = \{-2, 0, 3, 4\}$ to $B = \{5, 7, 9\}$?
(A) $\{(-2, 5), (0, 7), (3, 7)\}$ (B) $\{(-2, 9), (0, 5), (2, 5), (4, 7)\}$
(C) $\{(-2, 5), (0, 7), (3, 9)\}$ ~~(D)~~ $\{(-2, 9), (0, 9), (3, 9), (4, 9)\}$
20. The H.C.F and L.C.M of two numbers are 123 and 8856 respectively. If one number is 1107 then the other number is
(A) 8 (B) 72 (C) 246 ~~(D)~~ 984
21. The surface area of a sphere having diameter 21 cm is
(A) 693 sq.cm. ~~(B)~~ 1386 sq.cm. (C) 4851 c.c. (D) 5544 sq.cm.
22. Five persons entered a lift on the ground floor of an eight-floor apartment. The number of ways in which they can leave the lift is
(A) 5^7 ~~(B)~~ 7^5 (C) $7P_5$ (D) $7C_5$
23. If 9th and 20th terms of an arithmetic progression are 465 and 388 respectively, the 40th term is
~~(A)~~ 248 (B) 384 (C) 682 (D) 794
24. If α, β are roots of $x^2 + ax - b = 0$ and γ, δ are roots of $x^2 + ax + b = 0$, then value of $(\alpha - \gamma)(\beta - \delta)(\alpha - \delta)(\beta - \gamma)$ is
(A) $2b^2$ (B) $3b^2$ ~~(C)~~ $4b^2$ (D) $5b^2$

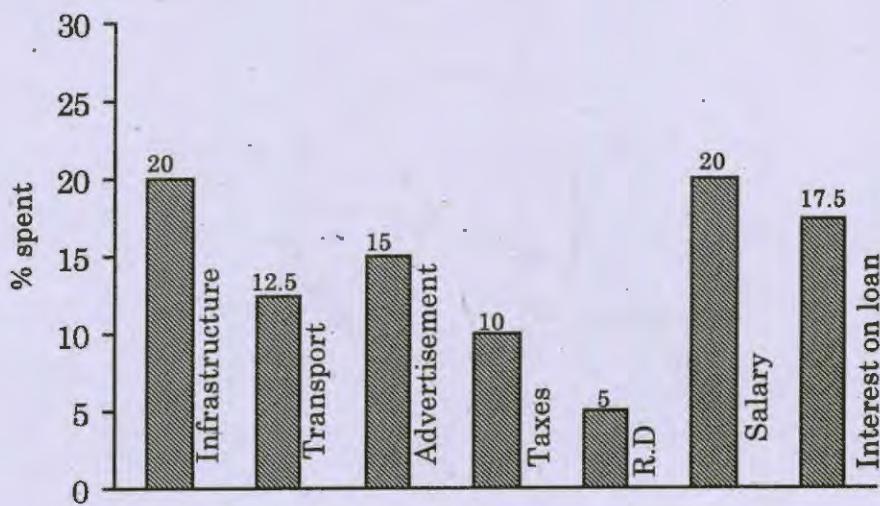
Direction for Q.Nos. 25 – 29 :



25. What is the ratio of companies having more demand than production to those having more production than demand?
- (A) 2 : 3 (B) 4 : 1 (C) 2 : 2 ~~(D) 3 : 2~~
26. What is the difference between average demand and average production of the five companies taken together?
- (A) 1400 (B) 400 ~~(C) 280~~ (D) 138
27. The production of company D is how many times that of production of the company A?
- ~~(A)~~ 1.8 (B) 1.5 (C) 2.5 (D) 1.11
28. The demand for company B is approximately what percent of the demand for company C?
- (A) 4 ~~(B)~~ 24 (C) 20 (D) 60
29. If company A desires to meet the demand by purchasing T.V. sets from a single company, which one of the following companies can meet the need adequately?
- (A) B (B) C ~~(C)~~ D (D) E

Direction for Q.Nos. 30 – 34 : Read the bar diagram and answer :

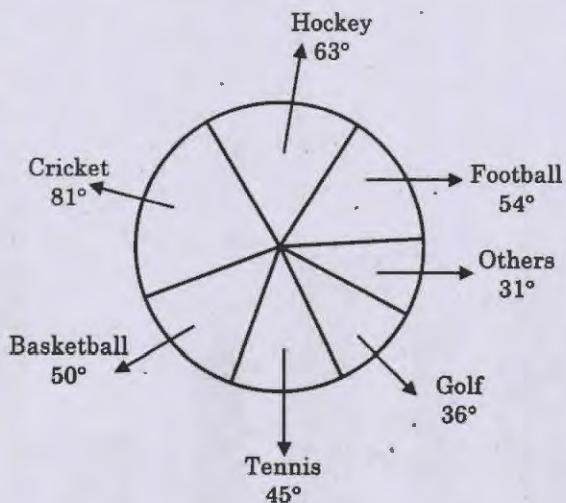
Percentage Distribution of Total Expenditures



30. The expenditures on the interest on loans is by what % more than the expenditures of transport?
- (A) 5% (B) 10% (C) 20% ~~(D)~~ 40%
31. What is the ratio of the total expenditure on infrastructure and transport to the total expenditure on taxes and interest on loans?
- (A) 5 : 4 (B) 8 : 7 (C) 9 : 7 ~~(D)~~ 13 : 11
32. If the expenditure on advertisement is Rs. 2.10 crores then the difference between the expenditures on transport and taxes is
- (A) Rs. 1.25 cr (B) Rs. 95 lakhs (C) Rs. 65 lakhs ~~(D)~~ Rs. 35 lakhs
33. The total amount of expenditures of the company is how many times the expenditure on Research and Development?
- (A) 27 ~~(B)~~ 20 (C) 18 (D) 8
34. If the interest on loans amounted to Rs. 2.45 Cr then the total amount of expenditure on advertisement, taxes and research and development is
- (A) Rs. 7 Cr (B) Rs. 5.4 Cr ~~(C)~~ Rs. 4.2 Cr (D) Rs. 3 Cr

Direction for Q.Nos. 35 – 39 : Refer the Pie-diagram and answer the following questions :

Spending of a country for various sports during a year



35. What percent of the total spending is spent on Tennis?
- (A) ~~12 $\frac{1}{2}$ %~~ (B) $22\frac{1}{2}\%$ (C) 25% (D) 45%.
36. How much percent more is spent on Hockey than that of Golf?
- (A) 27% (B) 35% (C) 37.5% (D) ~~75%~~
37. How much percent less is spent on Football than that of Cricket?
- (A) $22\frac{2}{9}\%$ (B) 27% (C) ~~33\frac{1}{3}\%~~ (D) $37\frac{1}{2}\%$
38. If the total amount spent on sports during the year was 2 crores the amount spent on Cricket and Hockey together was
- (A) ~~Rs. 80,00,000~~ (B) Rs. 3,60,000 (C) Rs. 3,75,000 (D) Rs. 4,10,000
39. If the total amount spent on sports during the year be Rs. 1,80,00,000 the amount spent on basketball exceeds that on Tennis by
- (A) ~~Rs. 2,50,000~~ (B) Rs. 3,60,000 (C) Rs. 3,75,000 (D) Rs. 4,10,000

Direction for Q.Nos. 40 – 44 : Classification of students (100 No's) based on marks obtained in Physics and Chemistry.

Study the table and answer.

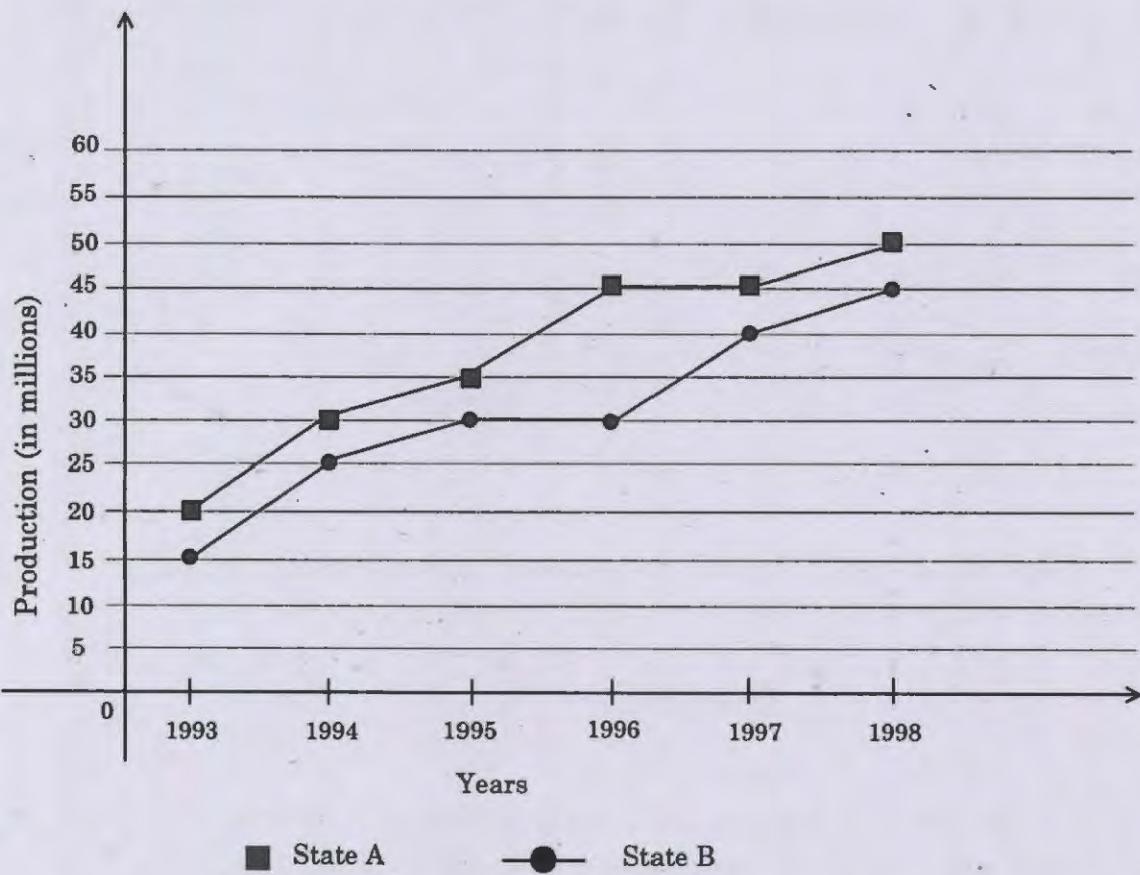
Subjects	Marks out of 50				
	40 and above	30 and above	20 and above	10 and above	0 and above
Physics	9	32	80	92	100
Chemistry	4	21	66	81	100
(Aggregate)	7	27	73	87	100
Average					

40. The no. of students scoring less than 40% marks in aggregate is
(A) 13 (B) 19 (C) 20 (D) 27 ~~(C)~~ 27
41. If atleast 60% marks in Physics are required for pursuing higher studies in Physics how many students are eligible to pursue higher studies in Physics?
(A) 27 ~~(D)~~ 32 (C) 34 (D) 41
42. What is the difference between the number of students passed with 30 as cut-off marks in Chemistry and those passed with 30 as cut-off marks in aggregate?
(A) 3 (B) 4 (C) 5 ~~(D)~~ 6
43. The percentage of the number of students getting atleast 60% marks in Chemistry over those getting atleast 40% marks in aggregate approximately
(A) 21% (B) 27% ~~(C)~~ 29% (D) 31%
44. If it is known that atleast 23 students were eligible for a symposium on Chemistry, the minimum qualifying marks in Chemistry for eligibility to symposium would lie in the range
(A) 40 – 50 (B) 30 – 40
~~(C)~~ 20 – 30 (D) Below 20

Direction for Q.Nos. 45 – 49 :

Study the following graph carefully and answer the questions that follow :

Population of two States A and B over the years



45. For State B, the percentage rise in population from the previous year was the highest in which of the following years?
- (A) 1998 ~~(B) 1994~~ (C) 1996 (D) 1995
46. What was the percent rise in population of state A in 1997 from the previous year?
- (A) 25 (B) $33\frac{1}{3}$ ~~(C) 0~~ (D) 33
47. What was the average population of state B (in millions) for the years together?
- ~~(A)~~ 30.83 (B) 38.5 (C) 28.53 (D) 35

48. Population of state A in 1995 was what percent of its total population for all the years together?

~~(A)~~ $15\frac{5}{9}\%$

(B) $17\frac{8}{33}\%$

(C) $16\frac{8}{37}\%$

(D) $17\frac{8}{37}\%$

49. What was the ratio of the total population of state A to that of state B, for all the years together?

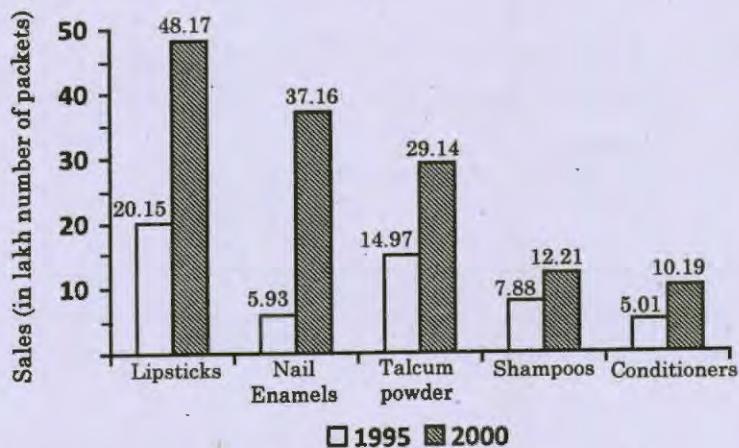
(A) $37 : 45$

(B) $37 : 43$

(C) $43 : 37$

~~(D)~~ $45 : 37$

Direction for Q.Nos. 50 – 54 : A cosmetic company produces five different products. The sales of these five products (in lakh number of packs) during 1995 to 2000 are shown in the following bar graph. The question given below are based on this graph.



50. The sales have increased by nearly 55% from 1995 to 2000 in the case of

(A) Lipsticks

(B) Nail enamels

(C) Talcum powders

~~(D)~~ Shampoos

51. During the period 1995-2000, the minimum rate of increase in sales in the case of

(A) Lipsticks

~~(B)~~ Shampoos

(C) Nail enamels

(D) Conditioners

52. The sales of lipsticks in 2000 was by what percent more than the sales of nail enamels in 2000? (rounded to nearest integer)

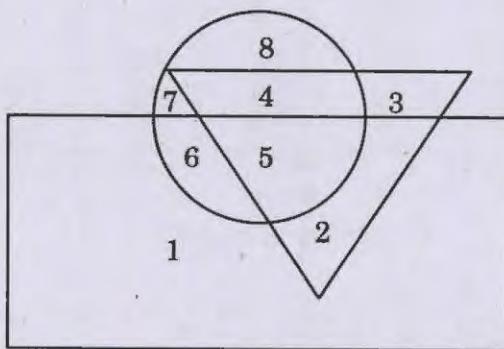
~~(A)~~ 28%

(B) 33%

(C) 22%

(D) 21%

Direction for Q.Nos. (55 – 57) : In the following questions, answers are to be based on the diagram given below, where the triangle represent doctors, the circle represent players and the rectangle represent artists.



55. Which number represents artists who are also players only?
(A) 4  6 (C) 7 (D) 8

56. Which number represent doctors who are neither players nor artists?
(A) 2  3 (C) 4 (D) 5

57. Which numbers represent players who are neither artists nor doctors?
(A) 1, 2 (B) 3, 4 (C) 6, 7  7, 8

Direction for Q.Nos. (64 – 66) : Study the following alphabet and answer the questions given below :

A B C D E F G H I J K L M N O P Q R S T U V W X Y Z

64. What will come in the place of question-mark (?) in the following series?
BIP, ELR, HOT, KRV, ?

65. If the first and second letters interchange their positions and similarly the third and fourth letters, the fifth and sixth letters and so on, which letter will be the eighth letter to the left of the twelfth letter from your left?

66. If the letters of word 'VEGETARIAN' which one of odd numbered position in the English alphabet are picked up and are arranged in alphabetical order from left and they are now substituted by Z, Y, X and so on, beginning from left which letter will get substituted by X?

- (A) T (B) I
~~(C)~~ E (D) A

Direction for Q.Nos. (67 – 71) : Study the given information carefully and answer the questions that follow :

- (i) A, B, C, D, E, F and G are sitting on a wall and all of them are facing east.
 - (ii) C is on the immediate right of D.
 - (iii) B is at an extreme end and has E as his neighbour.
 - (iv) G is between E and F.
 - (v) D is sitting third from the south end.

67. Who is sitting to the right of E?



68. Which of the following pairs of people are sitting at the extreme ends?

- (A) AB (B) AE (C) CB (D) FB

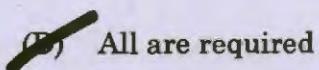
69. Name the person who should change place with C such that he gets the third place from the north end.



70. Immediately between which of the following pairs of people is D sitting?

71. Which of the condition (i) to (v) given above is not required to find out the place in which A is sitting?

- (A) (i) (B) (ii) (C) (iii)



72. If E = 5, PEN = 35, then PAGE = ?

- (A) 27 (B) 28 (C) 29 (D) 36

73. Who has the power to set up Inter-State Council?
- (A) National Development Council
(B) Prime Minister
~~(C)~~ President
(D) Supreme Court
74. S.R. Bommai Vs. Union of India case held that
- (A) The Governor has the power to dismiss an Individual Minister at any time
(B) Governor has the discretionary power to dismiss State Government
~~(C)~~ The only way to test the confidence of the House is "On the floor of the House"
(D) The State Government can prove its majority before the Governor
75. ASHA in the context of Panchayat Raj refers to
- (A) Accrued Support in Health Assurance
(B) Apprentice in Service of Health Advancement
(C) Appointed Senior House Attendant
~~(D)~~ Accredited Social Health Activist
76. In 1985 Dronacharya Award was instituted
- ~~(A)~~ to honour eminent coaches who have successfully trained sports persons or teams
(B) to honour sports persons to enhance their general status
(C) to encourage sports person who has performed consistently for three years at the international level
(D) for the sports persons who have contributed for sports
77. The Ministry of youth affair and sports organizes the National youth festival every year during the birth anniversary of
- (A) Baghat Singh
(B) Maulana Abul Kalam Azad
(C) Rajaram Mohan Roy
~~(D)~~ Swami Vivekananda

78. Which of the following organisation is the largest of all the regional organisations in terms of population?
(A) EU  SAARC
(C) APEC (D) NAFTA

79. Which credit rating agency undertakes the rating of fixed deposit programmes, convertible and non-convertible debentures and also credit assessment of companies?
~~(A)~~ CRISIL (B) IL and FS
(C) SHCIL (D) All of the above

80. Consider the following reason and assertion and choose answer from the codes given below
Reason (R) : There is an increase in cereal production however the per capital consumption of pulses have decreased.
Assertion (A) : Self-Sufficiency of food production has been achieved the population still lacks access to balanced food.
~~(A)~~ (R) and (A) are correct, (A) is the correct explanation of (R)
(B) (R) and (A) are correct but (A) is not the correct assertion of (R)
(C) (R) is true but (A) is wrong
(D) (R) is wrong but (A) is true

81. The Central Statistical Organisation (CSO), prepared the first estimates of national income with base year 1946-49 in the year
(A) 1949 (B) 1946
(C) 1950  1956

82. Who among the following Governor Generals was responsible for suppression of Pindaris?
(A) Richard Colley Wellesley
(B) Warren Hastings
~~(C)~~ Lord Hastings
(D) Lord Dalhousie

83. Which of the following statements about Banabhatta's Harshacharita is incorrect?

- (A) the narrative completely documents the reign of Harsha
(B) it is the oldest surviving biography in India
(C) the genre is itihasa tradition
(D) it hints at a fratricidal struggle for the throne

84. Pick the odd one out

- (A) Hathigumpha of Orissa
(B) Mount Abu of Rajasthan
(C) Shravana Belagola of Karnataka
(D) Orchha of Madhya Pradesh

85. Consider the following reason and assertion and choose answer from the codes given below

- (A) : Jainism came into prominence in the 6th century B.C.
(R) : 6th century B.C. was an age of intellectual and philosophical upsurge
(A) (A) is correct (R) is a correct explanation for it
(B) (A) and (R) both are correct but (R) is not correct explanation
(C) (A) is correct but (R) is incorrect
(D) (A) is incorrect but (R) is correct

86. The oldest deciphered script of the Indian subcontinent is

- (A) Harappan
(B) Kharoshti
(C) Brahmi
(D) Devangiri

87. In ancient times the term 'Talapatra' referred to

- (A) Palm leaf manuscript
(B) Head of religious sect
(C) Special chants for rain
(D) Daily prayer to be recited

88. Given below are two statements, one labelled as Assertion (A) and the other labelled as reasons (R) choose the correct answer from codes.

Assertion (A) : Presidential system is suitable for meeting crises

Reason (R) : The President has a fixed tenure

(A) Both (A) and (R) are true and (R) is the correct explanation of (A)

(B) (A) is true but (R) is false

(C) (A) is false but (R) is true

~~(D)~~ Both (A) and (R) are correct but (R) is not the correct explanation of (A)

89. Consider the following statements :

Assertion (A) : The President of India is the constitutional head of the state

Reason (R) : All powers are vested in the council of Ministers headed by the Prime Ministers

Select the correct answer from the codes given below :

~~(A)~~ Both (A) and (R) are true and (R) is the correct explanation of (A)

(B) Both (A) and (R) are true but (R) is not the correct explanation of (A)

(C) (A) is true but (R) is false

(D) (A) is false but (R) is true

90. Various welfare schemes of the government are sought to be linked to

(A) Voter Identity cards

~~(B)~~ Aadhaar cards

(C) Any identity card with a photo

(D) Bank account to receive benefits

91. Under the provisions of RTI, 2005, any citizen may request information from any

(A) Group of organisations

~~(B)~~ Public authority

(C) Private organisations

(D) NGOs that are marginally funded by the government

98. 20 women can finish a piece of work in 16 days and 16 men can finish it in 15 days. What is the ratio of the working capacities of a man and a woman?
- (A) 3 : 4 ~~(B)~~ 4 : 3 (C) 5 : 3 (D) 3 : 5
99. The solution to the system of equations $|x + y| = 1$ and $x - y = 0$ is given by
- (A) $x = y = -1/2$ (B) $x = y = 1/2$
(C) $x = 1, y = 0$ ~~(D)~~ $x = y = -1/2$ or $x = y = 1/2$
100. If $a^x = b$, $b^y = c$ and $c^z = a$, then xyz equals
- (A) $\frac{1}{abc}$ (B) abc (C) $\log(abc)$ ~~(D)~~ 1
101. 4, 8, 24, 60, ?, 224
- (A) 96 (B) 109 ~~(C)~~ 124 (D) 178
102. The diagonal of a square having an area of $1/2$ hectare is
- (A) 50 m (B) $50\sqrt{2}$ m ~~(C)~~ 100 m (D) 250 m
103. If E and F are independent events such that $P(E) = 0.7$ and $P(F) = 0.3$ then $P(\bar{E} \cap F)$ is
- ~~(A)~~ .09 (B) .9 (C) .21 (D) .49
104. If the geometric mean of $x, 16, 50$ be 20, then the value of x is
- (A) 4 ~~(B)~~ 10 (C) 20 (D) 40
105. The slope of the line joining $A(-3, 5)$ and $B(4, 2)$ is
- ~~(A)~~ $-3/7$ (B) $-7/3$ (C) $3/7$ (D) $7/3$

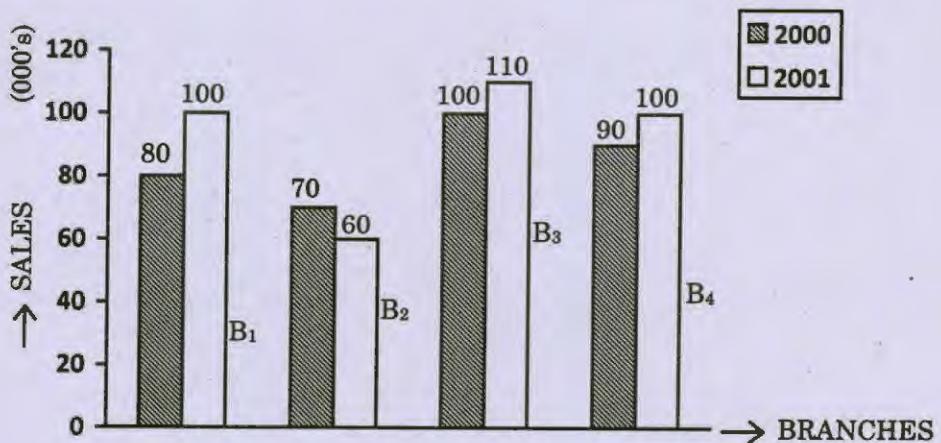
106. If in a frequency distribution, the mean and median are 21 and 22 respectively, then its mode is approximately
- (A) 24 (B) 25.5 (C) 20.5 (D) 22
107. If a variable takes the discrete values $\alpha + 4, \alpha - \frac{7}{2}, \alpha - \frac{5}{2}, \alpha - 3, \alpha - 2, \alpha + \frac{1}{2}, \alpha - \frac{1}{2}, \alpha + 5 (\alpha > 0)$, then the median is
- (A) $\alpha - \frac{5}{4}$ (B) $\alpha - \frac{1}{2}$ (C) $\alpha - 2$ (D) $\alpha + \frac{5}{4}$
108. If the vectors $p\bar{i} + \bar{j} + \bar{k}$, $\bar{i} + q\bar{j} + \bar{k}$ and $\bar{i} + \bar{j} + r\bar{k}$ ($p \neq q \neq r \neq 1$) are coplanar, then the value of $pqr - (p + q + r)$ is
- (A) 2 (B) -2 (C) 0 (D) -1
109. If $\bar{a} = \lambda\bar{i} + 2\bar{j} - 3\bar{k}$, $\bar{b} = 2\bar{i} + \lambda\bar{j} - \bar{k}$, $\bar{c} = \bar{i} + 2\bar{j} + \bar{k}$ and $[\bar{a}\bar{b}\bar{c}] = 6$, then λ is equal to
- (A) -8 or 3 (B) -9 or 3 (C) -3 or 9 (D) 8 or 5
110. If $f(x) = \frac{x}{x-1}$, $x \neq 1$, then $(f \circ f \circ f \dots \dots \text{19 times})(x)$ is equal to
- (A) $\frac{x}{x-1}$ (B) $\left(\frac{x}{x-1}\right)^{19}$ (C) $\frac{19x}{x-1}$ (D) x
111. If a relation S is defined on the set R of real numbers as $S = \{(a, b) | b = a^2 : a, b \in R\}$. Then, the range of S is
- (A) set of integers (B) set of rationals numbers
 (C) set of natural numbers (D) set of non-negative real numbers
112. The successive terms of an arithmetic progression are a_1, a_2, \dots . If $a_6 + a_9 + a_{12} + a_{15} = 20$, then $\sum_{r=1}^{20} a_r$ is equal to
- (A) 75 (B) 100 (C) 120 (D) 150

113. Four different electronic devices make a beep after every 30 minutes, 1 hour, $1\frac{1}{2}$ hour and 1 hr 45 minutes respectively. All the devices beeped together at 12 noon. They will again beep together at
 (A) 12 midnight (B) 3 a.m. (C) 6 a.m. ~~(D)~~ 9 a.m.
114. Sum of first 15 multiples of 8 is
~~(A)~~ 960 (B) 1200 (C) 660 (D) 1060
115. A two digit number is such that the product of the digits is 8. When 18 is added to the number, the digits are reversed, the number is
 (A) 18 ~~(B)~~ 24 (C) 81 (D) 42
116. A and B can do a work in 12 days, B and C in 15 days, C and A in 20 days. If A, B and C work together, they will complete the work in
 (A) 5 days (B) $7\frac{5}{6}$ days ~~(C)~~ 10 days (D) $15\frac{2}{3}$ days
117. The profit earned by selling an article for Rs. 832 is equal to the loss incurred when the same article is sold for Rs. 448. What should be the sale price for making 50% profit?
 (A) Rs. 920 ~~(B)~~ Rs. 960 (C) Rs. 1,060 (D) Rs. 1,200
118. A coin is tossed 10 times. The probability of getting exactly six heads is
 (A) $\frac{512}{513}$ ~~(B)~~ $\frac{105}{512}$ (C) $\frac{100}{153}$ (D) $10C_6$
119. The sum of three consecutive odd numbers is 20 more than the first of these numbers. Then the middle number is a/an
 (A) prime number (B) even number
~~(C)~~ perfect square (D) irrational number
120. The H.C.F. of $\frac{2}{3}, \frac{8}{9}, \frac{16}{81}$ and $\frac{10}{27}$ is
~~(A)~~ $\frac{2}{81}$ (B) $\frac{2}{3}$ (C) $\frac{10}{27}$ (D) $\frac{80}{3}$

121. The standard deviation of the sample 2, 4, 8, 6, 10, 12 is
 (A) 2.86 (B) 3.40 ~~(C)~~ 3.42 (D) 3.62
122. The volume of a cuboid is twice that of a cube. If the dimensions of the cuboid are (9 m \times 8 m \times 6 m), the total surface area of the cube is
 (A) 72 cm² ~~(B)~~ 216 cm² (C) 108 cm² (D) 432 cm²
123. A can do $\frac{1}{2}$ of a work in 5 days; B can do $\frac{3}{5}$ of the work in 9 days and C can do $\frac{2}{3}$ of the work in 8 days. Working together, in how many days they can complete the work?
 (A) 3 days ~~(B)~~ 4 days (C) $4\frac{1}{2}$ days (D) 5 days
124. The average of 25 results is 18; that of first 12 is 14 and that of the last 12 is 17. The 13th result is
~~(A)~~ 78 (B) 85 (C) 28 (D) 72
125. A man covers half of his journey at 6 km/hr and the remaining half at 3 km/hr. His average speed is
 (A) 4.5 km/hr (B) 3 km/hr ~~(C)~~ 4 km/hr (D) 9 km/hr
126. The equation of a straight line through (1, 5) perpendicular to $3x + 5y + 7 = 0$ is
 (A) $2x - 3y = 9$ (B) $2x - 3y = -7$
 (C) $2x + 3y = 4$ ~~(D)~~ $3y - 5x = 10$
127. If for an AP $a_1, a_2, a_3, \dots, a_n, \dots$, $a_1 + a_3 + a_5 = -12$ and $a_1 a_2 a_3 = 8$ then the value of $a_2 + a_4 + a_6$ equals
 (A) -12 (B) -16 (C) -18 ~~(D)~~ -21
128. Which term of the sequence $15, 13\frac{3}{4}, 12\frac{1}{2}, 11\frac{1}{4}, \dots$ is the first negative term?
 (A) 12th ~~(B)~~ 14th (C) 13th (D) 11th
129. A trader gains 15% after selling an item at 10% discount on the printed price. The ratio of the cost price and the printed price is
~~(A)~~ 18 : 23 (B) 17 : 18 (C) 17 : 23 (D) 18 : 25

Direction for Q.Nos. 130 – 134 : Refer the following diagram and answer :

Sales of Books (in 1000's) from 4 branches in 2000 and 2001.



130. Total sales of branches B_1 and B_2 together for both the years

(A) 250 ~~(B)~~ 310 (C) 560 (D) 435

131. Total sales of B_2 for both the years is what percentage of B_4 for both the years?
(Approximately)

~~(A)~~ 68.42% (B) 56.94% (C) 42.68% (D) 36.24%

132. What is the average sales of all the branches for the year 2000?

~~(A)~~ 85,000 (B) 78,000 (C) 62,000 (D) 46,000

133. What is the ratio of the total sales of branch B_2 for both the years to the total sales of branch B_4 for both the years?

(A) 19 : 13 (B) 1 : 2 (C) 3 : 1 ~~(D)~~ 13 : 19

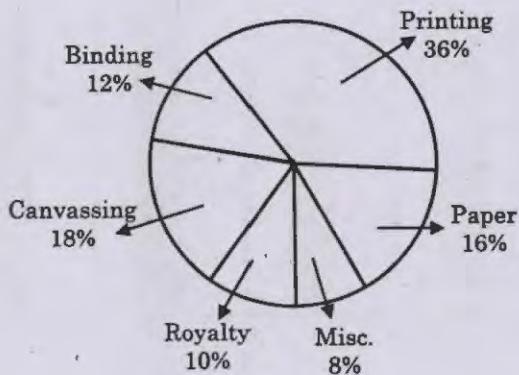
134. What percentage of the average sales of B_1 and B_3 in 2001 is the average sales of branches B_2 and B_4 in 2000?

(A) 67.29% approximately
~~(B)~~ 76.19% approximately
(C) 39.27% approximately
(D) 45% approximately

Direction for Q.Nos. 135 – 139:

The pie chart given below shows the expenditure incurred in bringing out a book, by a publisher.

Study the graph and answer the questions given below:



135. What is the central angle showing the cost of paper?

(A) 16°

(B) 28.8°

(C) 32°

~~(D)~~ 57.6°

136. If the cost of printing is Rs. 23,400, the royalty is

(A) Rs. 2,340

(B) Rs. 4,680

~~(C)~~ Rs. 6,500

(D) Rs. 7,840

137. If miscellaneous expenditures amount to Rs. 18,000, the expenditure on canvassing will be

(A) Rs. 8,000

(B) Rs. 14,400

~~(C)~~ Rs. 40,500

(D) Rs. 46,800

138. Royalty on the book is less than canvassing expenditure by

(A) 8%

(B) 16%

~~(C)~~ $44\frac{4}{9}\%$

(D) 80%

139. If 5,500 copies are published and miscellaneous expenditure amount to Rs. 36,960 and the marked price is 40% above cost price, then the marked price of each copy is

(A) Rs. 92.40

~~(B)~~ Rs. 117.60

(C) Rs. 122.50

(D) Rs. 126.40

Direction for Q.Nos. 140–144 : Study the following table carefully and answer the questions given below it.

Sugarcane production by six major states during 1986 to 1990

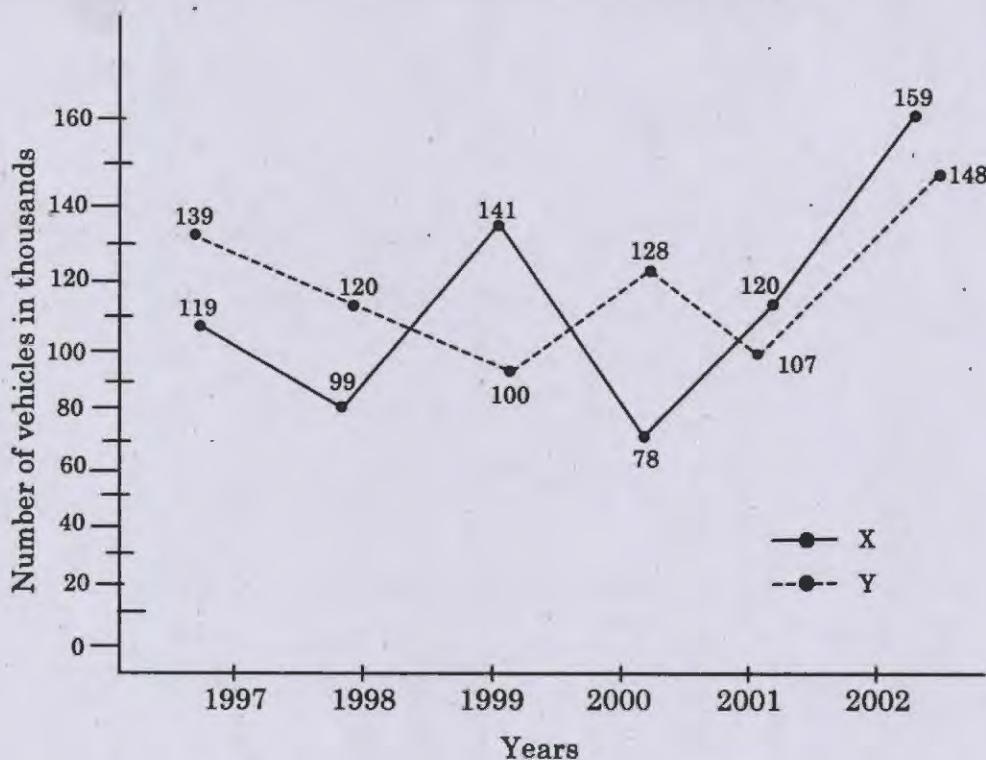
(in million tonnes)

States Year	P	Q	R	S	T	U
1986	140	65	48	38	39	22
1987	132	63	62	56	40	23
1988	150	55	72	49	36	27
1989	168	60	45	65	43	25
1990	170	45	70	62	42	23

140. Which of the following states shows constant fall in sugarcane production every year?
- (A) P ~~(P)~~ Q (C) R (D) S
141. In which year during the given period was the percentage of Q's share the highest in the total production?
- ~~(A)~~ 1986 (B) 1987 (C) 1988 (D) 1989
142. In which year does P have a share about 39.77% in the total sugarcane production?
- ~~(A)~~ 1986 (B) 1987 (C) 1988 (D) 1989
143. In the year 1990, how many of the given states have a share of 15% or more in the total sugarcane production?
- ~~(A)~~ 3 (B) 4 (C) 5 (D) 6
144. What was the approximate percentage increase in sugarcane production in S from 1987 to 1990?
- (A) 6% (B) 8.7% ~~(C)~~ 10.7% (D) 12.3%

Direction for Q.Nos. 145 – 149 :

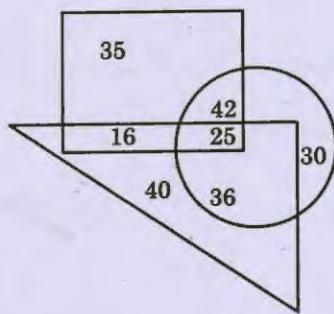
Study the following line-graph and answer the question which follow :



145. What is the difference between the total productions of the two companies between 1997 and 2002?
- (A) 19000 (B) 22000 ~~(C) 26000~~ (D) 28000
146. What is the difference between the numbers of vehicles manufactured by Company X in 2002 and 2001?
- (A) 21000 (B) 29000 ~~(C) 42000~~ (D) 63000
147. What is the average number of vehicles manufactured by Company X over the given period? (rounded off to the nearest integer)
- (A) 111223 (B) 112778 (C) 113666 ~~(D) 119333~~
148. In which of the following years, the difference between the production of Companies X and Y was the maximum among the given years?
- (A) 1997 (B) 1998 (C) 1999 ~~(D) 2000~~
149. The production of Company Y in 2000 was approximately what percent of the production of Company X in the same year?
- (A) 97 (B) 132 ~~(C) 164~~ (D) 173

Direction for Q.Nos. (150–154) : Answer the questions using Venn Diagram.

Represents students learning computers, represents no. of students learning music.
 represents photography learners.



150. How many students are enrolled?



117

(B) 40

(C) 147

(D) 92

151. The number of students who are learning photography is how much more or less than the students who are learning computers?

(A) 21 more

15 more

(C) 7 less

(D) 15 less

152. What approximately is the percentage of the students who are learning one thing only?

(A) 39%

(B) 33%

(C) 41%

47%

153. What approximately is the percentage of the students who are learning all the three?



11%

(B) 21%

(C) 17%

(D) 19%

154. Find the approximate percentage of the students who are learning any of the two things mentioned.

(A) 29%

(B) 46%

42%

(D) 37%

155. There are 35 steps to reach a temple. On descending from the temple Soni takes two steps in the same time Gunjan ascends four steps. If they start to work simultaneously, at which step will they meet each other?

(A) 18th

(B) 10th

(C) 24th

(D) 17th

156. In a certain code 'DELHI' is written as 'CDKGH', 'MADRAS' as 'IZCQZP', how will PATNA be coded then?

(A) OZTMZ

(C) OZSMZ

(B) OZTZM

(D) OZMSZ

157. H3M, I5O, L9S, Q17A,?

(A) X33Q

(B) Z33P

(C) X33P

(D) W33R

158. The reflex angle between the hands of a clock at 10.25 is

(A) 180°

(B) 192 $\frac{1}{2}$ °

(C) 195°

(D) 197 $\frac{1}{2}$ °

159. If in a certain code 'CANDLE' is written as 'FDQGOH' then how will 'MINUTE' be written in the same code?

(A) PQLHXW

(B) PHWQLX

(C) PLQHWX

(D) PLQXWH

160. Which one of the alternatives is different from the rest?

(A) 2731

(B) 1357

(C) 2571

(D) 2357

161. Rearrange the letters and select from the given alternatives the words which is almost similar in meaning to the rearranged words

H R A D T E

(A) Decrease

(B) Loss

(C) Reduction

(D) Scarcity

Direction for Q.Nos. 162 – 164 : Read the following letter symbol sequence and answer the questions.

\$AFIS@#USR\$OMPS@S#EQSOY\$#WS@LK

162. How many times the symbol \$ precedes a symbol and follows a letter?

(A) 1

(B) 4

(C) 2

(D) 3

163. If all the symbols from the above sequence are dropped and all the letters are written in the reverse order, what will be the position of 'P' from your left?

(A) 13th

(B) 10th

(C) 12th

(D) 9th

164. If the second half of the above sequence is written in the reverse order, which of the following will be the middle pair of elements?

(A) S#

(B)

SK

(C) S@

(D) KS

165. Rasik walks 20 m North. Then he turns right and walks 30 m. Then turns right and walks 35 m. Then he turns left and walks 15 m. Then he again turns left and walks 15 m. In which direction and how many metres away is he from his original position?

(A) 15 metres West

(B) 30 metres West

(C) 45 metres East

(D) 45 metres West

166. Today is Monday. What will be the day after 64 days?

(A) Saturday

(B) Monday

(C) Friday

(D) Tuesday

167. Calendar for the year 2008 will be same for which of the following years?

(A) 2017

(B) 2019

(C) 2016

(D) 2020

181. CSO refers to
- (A) Central Survey Organisation
 - ~~(B)~~ Central Statistical Organisation
 - (C) Central System Organisation
 - (D) Central Share Organisation
182. The charitable destitute home established by Mother Teresa for the care of the dying and homeless is called
- (A) Shanti Bhavan
 - (B) Mukti Sadan
 - ~~(C)~~ Shanti Nilayam
 - ~~(D)~~ Nirmal Hriday
183. Pachori, Dasori, Navjote, Nahn and Achoo Michoo are some of the rituals practised by
- ~~(A)~~ Sikhs
 - ~~(B)~~ Parsis
 - (C) Armenians
 - (D) Jews
184. Which of the twenty four Jain Tirthankaras are mentioned in the Rig Veda?
- (A) Rishabhdeva
 - ~~(B)~~ Aristanemi
 - (C) Parsvanath
 - ~~(D)~~ Rishabhdeva and Aristanemi
185. One of the reasons for the downfall of Razia Sultana was her fondness for an Abyssinian slave called
- (A) Rukn-ud-Din Farooq
 - ~~(B)~~ Jamal-ud-Din Yaqt
 - (C) Taj-ud-Din Rezab
 - (D) Taj-ud-Din Yildoz

190. Identify the British General credited with the subduing of Oudh during The Revolt of 1857
- (A) Hugh Ross
(B) Hodson
~~(C)~~ Colin Campbell
(D) Henry Lawrence
191. Peasants emerged as the main force in the agrarian movements after 1857 mainly because
- (A) They fought directly for their own demands
~~(B)~~ Princes, chiefs and landlords had been crushed
(C) They were inspired by Revolt of 1857
(D) Both (A) and (B)
192. One of the most militant and widespread peasant movements that took place after 1857 was
- (A) Kol uprising
(B) Chuar revolt
~~(C)~~ Indigo revolt
(D) Bundela uprising
193. "NAMA" means
- (A) Non Agricultural Management Access
(B) Non Agricultural Machinery Access
~~(C)~~ Non Agricultural Market Access
(D) Non Agricultural Modern Access
194. Which country has been recognised as the first in the world to officially adopt family planning programme?
- (A) China (B) Russia
~~(C)~~ India (D) America

195. Which of the following matches is incorrect?

Features	Sources
(A) Federal scheme	- Govt. of India Act of 1935
(B) Rule of law	- Irish constitution
(C) Concurrent list	- Australian constitution
(D) Fundamental rights	- US constitution

196. Bill related to tainted legislators was withdrawn by

- ~~(A)~~ 15th Lok Sabha (B) 14th Lok Sabha
(C) 13th Lok Sabha (D) 16th Lok Sabha

197. The concept of a multi-member Election Commission was introduced in

- ~~(A)~~ 1993 (B) 2011 (C) 1985 (D) 1951

198. The first state to introduce the law on RTI was

- (A) Gujarat (B) Tamil Nadu
(C) Rajasthan (D) Madhya Pradesh

199. The extinction of the Wahabi Movement in 1870 was due to

- (A) Internal bickerings amongst its leaders
(B) Decision to maintain communal harmony
~~(C)~~ British Policy of Repression
(D) Achievement of its objectives

200. Which of the following statements about Bipin Chandra Pal is incorrect?

- (A) He joined Brahmo Samaj and was editor of New India
(B) Played important role in development of extremist movement
~~(C)~~ He was Chosen Congress President in 1907
(D) He was tried for his article 'Anthology of The Bomb'

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