PAPER – II

Engineering Aptitude
(Deg. Std.)

Time Allowed : 1 Hour]   [Maximum Marks : 50

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

IMPORTANT INSTRUCTIONS

1. The applicant will be supplied with Question Booklet 15 minutes before commencement of the examination.
2. This Question Booklet contains **50** questions. Prior to attempting to answer the candidates are requested to check whether all the questions are there in series 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 and get it replaced with a complete Question Booklet. If any defect is noticed in the Question Booklet after the commencement of examination, it will not be replaced.**
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 Room Invigilator to mark the answers.
6. You will also encode your Question Booklet Number <u>with Blue or Black ink Ball point pen</u> 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 Ⓐ, Ⓑ, Ⓒ and Ⓓ 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, Ⓑ is the correct answer, you have to mark as follows :

Ⓐ ● Ⓒ Ⓓ

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 time of examination. <u>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.</u>
10. **Do not make any marking in the question booklet except in the sheet before the last page of the question booklet, which can be used for rough work. This should be strictly adhered.**
11. Applicants have to write and shade the total number of answer fields left blank on the boxes provided at side 2 of OMR Answer Sheet. An extra time of 5 minutes will be given to specify the number of answer fields left blank.
12. 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.

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SPACE FOR ROUGH WORK

2

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1. The value of $\dfrac{(35 \times 35) + (15 \times 15)}{25^2 + 10^2}$ is

   (A) 1700   (B) 725
   (C) 80   (D) 2 ✓

2. Find the wrong number in the series 0, 7, 26, 65, 124

   (A) 7   (B) 26
   (C) 65 ✓   (D) 124

3. In how many ways can a group of 5 women and 2 men be made out of a total of 6 men and 6 women?

   (A) 30   (B) 60
   (C) 90 ✓   (D) 120

4. The sum of two numbers is $\dfrac{53}{50}$ of the first number. The second number is what percent of the first?

   (A) 3%   (B) 6% ✓
   (C) 12%   (D) 50%

5. Two dice are thrown simultaneously. What is the probability of getting a sum greater than 3 is?

   (A) $\dfrac{1}{36}$ (B) $\dfrac{1}{18}$

   (C) $\dfrac{5}{12}$ (D) $\dfrac{11}{12}$ ✓

6. By selling an article for Rs.100, a man gains Rs.20. Then his gain percentage is

   (A) 20%   (B) 21%
   (C) 23%   (D) 25% ✓

7. Let $R = \{(1, 1), (1, 2), (2, 3), (2, 2), (3, 3)\}$ be a relation defined on a set $A = \{1, 2, 3\}$. Then which of the following is true?

    (A) ✓ R is reflexive   (B) R is symmetric

    (C) R is transitive   (D) R is an equivalence relation

8. The product of the L.C.M. and H.C.F of two numbers is 24. The sum of two numbers is 10. Find the numbers.

    (A) 5 and 5   (B) ✓ 6 and 4

    (C) 8 and 2   (D) 9 and 1

9. The H.C.F. of 0.15, 0.75, 0.6 is

    (A) 0.005   (B) 0.05

    (C) 0.5   (D) ✓ 0.15

10. If $P(A) = 0.2$, $P(B) = 0.5$ with A and B are independent events, then $P(A \cap B') =$

    (A) 0   (B) ✓ 0.1

    (C) 0.2   (D) 0.5

11. The number of permutations of letters in the word "APPLE" is

    (A) 120   (B) ✓ 60

    (C) 5   (D) 1

12. The relationship between permutation and combinations is

    (A) $nC_r = nP_r \times r\,!$ (B) $nP_r = \dfrac{nC_r}{2r\,!}$

    (C) $nC_r = nP_r \times (r\,!)^2$ (D) ✓ $nP_r = nC_r \times r\,!$

13. The variations in temperatures from 0°C to 100°C with respect to time of two liquids P, Q are shown in the graph.

Which one of the following statements is correct?
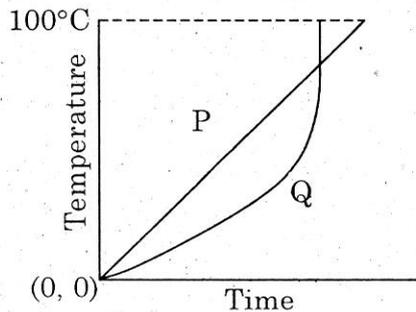
(A)   At no point the time during heating did the two liquids have the same temperature

(B) P attained temperature of 100°C faster than Q

(C)   ✓ Q attained temperature of 100°C faster than P

(D)   During heating, liquid P remained hotter than liquid Q throughout

14. Two distributions P and Q of the same area and mean are given in the following graph

Which one of the following statement is correct?
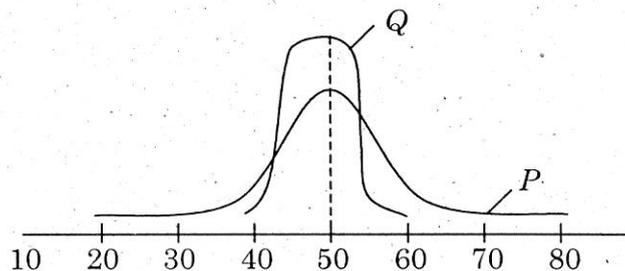
(A)   ✓ P has less dispersion than Q

(B) P has greater dispersion than Q

(C) Q has greater dispersion than P

(D)   With the given data we cannot compare

15. The following pie chart shows the marks obtained by a student in an examination. Who scored 750 marks in all, the subject in which the student scored 125 marks?

Maths
90

English
63

Soc. Science
72
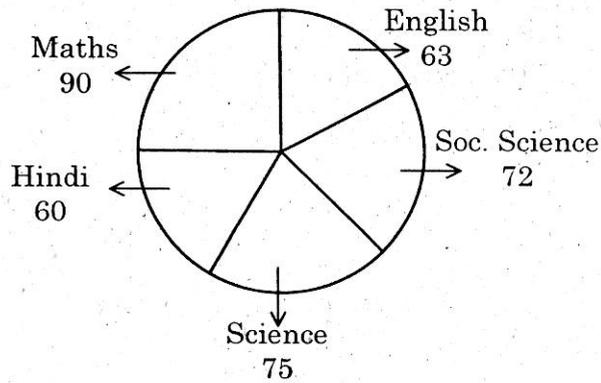
Hindi
60

Science
75

(A) Science

(B) ✓ Hindi

(C) Maths

(D) English

16. A 200 m long train crosses a man walking at a speed of 10 kmph in the opposite direction in 6 sec. The speed of the train (in kmph) is

(A) 130

(B) 120

(C) 55

(D) ✓ 110

17. The next pair of letters in the series AZ, CX, FU ——————— is

(A) JQ   (B) KP

(C) IR   (D) JP

18. If 'WHILE' is coded as 'XIJMF', then how will be the code 'HOTEL'?

(A) JQVGN   (B) IPUFM

(C) KRVHO   (D) LETOH

19. In the following figure R is the centre of the semicircle with diameter LP. T and U are centres of the semicircles LSR and RQP. $LR = RP = \dfrac{1}{2} LP$. Then the ratio of the perimeters of LNP and LSRQP is
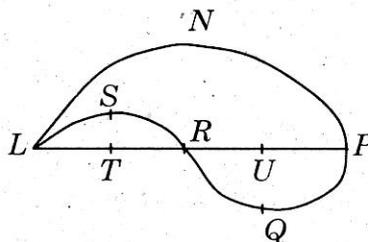
(A) 1 : 0.75   (B) 1 : 1

(C) 0.75 : 1   (D) 1.25 : 1

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20. Find the value of n in given series

68, 68.5, 69.5, 71, n, 75.5, 78.5

(A) 72   ✓(B) 73

(C) 74   (D) 75

21. A man rows 12 km/h in still water. When river is running at 2.4 km/h, it takes 1 h to row to a place and to come back. How far is the place?

✓(A) 5.76 km   (B) 5.67 km

(C) 6.57 km   (D) None of these

22. A factory makes custom sports car at an increasing rate. In the first month only one car is made, in the second month two cars are made and so, on with n cars made in the nth month. How many cars are produced in the first year?

(A) 66   ✓(B) 78

(C) 12   (D) 72

23. In secret message 'HOTEL' is coded as 300. What will be code for 'ALTO'?

(A) 75   (B) 160

✓(C) 192   (D) 48

24. Kumar drives 10 kms towards south from his house and turns left and drives another 25 kms, again he turns left and drive 40 km straight, then turns right and drives another 5 kms to reach the factory where he works. In which direction is the factory from his house?

✓(A) North-East   (B) North

(C) East   (D) West

25. The base of a parallelogram is 12 cm. If the area of the parallelogram is 72 sq.cm, then the height is

   (A)   4   (B)   6 ✓

   (C)   12   (D)   18

26. If the height of an equilateral triangle is $2\sqrt{3}$, then its area is

   (A) $\dfrac{\sqrt{3}}{2}$ (B) $\sqrt{3}$

   (C) $2\sqrt{3}$ (D) $4\sqrt{3}$ ✓

27. Let $A = 1^3 + 2^3 + 3^3 + 4^3 + 5^3$ and $B = 1^2 + 2^2 + 3^2 + 4^2 + 5^2$. The value of $A - B$ is

   (A)   55   (B)   170 ✓

   (C)   225   (D)   280

28. The total area of the 11 squares whose sides are 1 cm, 2 cm, 3 cm, ...,11 cm respectively is

   (A)   66   (B)   206

   (C)   506 ✓   (D)   516

29. The sum of all even numbers between 1 and 101 is

   (A)   50   (B)   2550 ✓

   (C)   3151   (D)   5151

30. $1 + \dfrac{1}{3} + \dfrac{1}{9} + \dfrac{1}{27} + \ldots$

   (A) $\dfrac{2}{3}$ (B) $\dfrac{3}{2}$ ✓

   (C)   2   (D)   3

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31. The ratio of the cost price and the selling price is 5:6. Then the profit percent is

    (A) 10%   (B) ✓ 20%

    (C) 25%   (D) 30%

32. The value of $\log_{10} 250 + \log_{10} 8 - \log_{10} 2$ is

    (A) 250   (B) 8

    (C) ✓ 3   (D) 2

33. Which of the following relation defined on a set $A = \{1, 2, 3\}$ is not transitive?

    (A) $R = \{(1, 1)\}$ (B) $R = \{(1, 2), (2, 2)\}$

    (C) ✓ $R = \{(1, 2), (2, 3), (1, 3), (2, 1)\}$ (D) $R = \{(1, 2), (2, 3), (1, 3)\}$

34. If $\overline{a} = 2\overline{i} - \overline{j} + \overline{k}, \overline{b} = \overline{i} + 2\overline{j} - 3\overline{k}$ and $\overline{c} = 3\overline{i} + b\overline{j} + 5\overline{k}$ are coplanar, then the value of b is

    (A) ✓ −4   (B) 4

    (C) −7   (D) 7

35. Let $X = \{a, b, c\}$ and $Y = \{0, 1\}$. Then the number of distinct functions from the set A to the set B is

    (A) 9   (B) ✓ 8

    (C) 3   (D) 2

36. Let $f : R \to R$ and $g : R \to R$ denote the functions defined by $f(x) = 2x + 3, g(x) = x^2$ for every $x \in R$. Then the composition function $(f \circ g)(x)$ is

    (A) $(2x + 3)^2$ (B) $2x + 3$

    (C) ✓ $2x^2 + 3$ (D) $4x^2 + 9$

37. The standard deviation of 9, 9, 9, 9 is

(A) 0 ✓   (B) 3

(C) 9   (D) 81

38. If the Geometric mean of x, 5, 25 is 5, then the possible value of x is

(A) 25   (B) 20

(C) 5   (D) 1 ✓

39. What is the probability that a leap year selected at random will contain 53 Fridays?

(A) 0   (B) $\dfrac{1}{7}$

(C) $\dfrac{2}{7}$ ✓   (D) 1

40. The relationship between mean, median and mode is

(A) mode = 3 median – 2 mean ✓   (B) mode = 3 mean – 2 mode

(C) mode = median – 2 mean   (D) mode = mean – 2 mode

41. The median of the following data is data : 4100, 4150, 6080, 7120, 5200, 6160, 7400

(A) 5200   (B) 6080 ✓

(C) 7120   (D) 7400

42. A man sells an article at a profit of 25%. If the cost price of an article is 2000, then the selling price is

(A) 500   (B) 1500

(C) 2250   (D) 2500 ✓

43. The pie chart given below shows the expenditure in bringing out a book by a publisher. What is the central angle showing the miscellaneous expenditure?
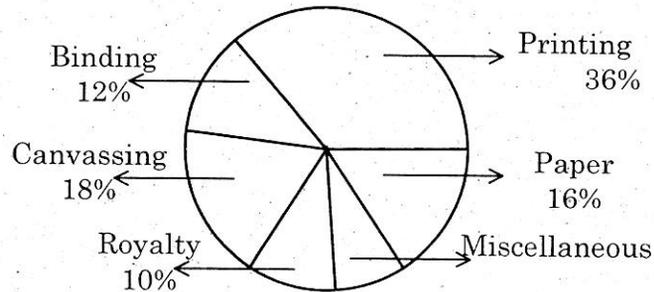

(A)   7.2   (B)   14.4

✓(C)   28.8   (D)   57.6

44. If

☐ — Factory workers

△ — Hardworking workers

◯ — Honest workers, then which of the following diagram best suits?
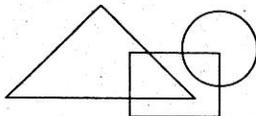
(A)   (B)
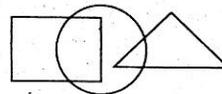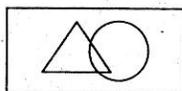
✓(C)   (D)

45. Strips of two metals A and B are firmly joined together, as shown in the figure on heating, A expands more than B does. If this joined strip is heated, then it will appear as

(A)

(B) ✓
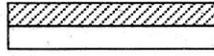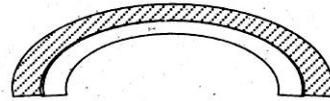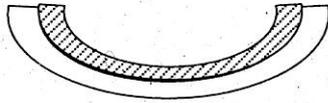
(C)
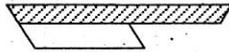
(D)

46. The following are the relationship among members of a family of six persons A, B, C, D, E, and F

1.   The number of males equal that of females

2.   A and E are sons of F

3.   D is the mother of two, one boy and one girl

4.   B is the son of A

5.   There is only one married couple in the family at present.

Which of the following can be drawn from the above?

(A)   A, B and C are all females   (B) ✓   A is the husband of D

(C)   E and F are children of D   (D)   D is the grand daughter of F

47. The following bar diagram shows the registration of cars and total vehicles during first six months of the year 2017 in Chennai.

What was the increase in registration of vehicles other than cars from January to April?

Months
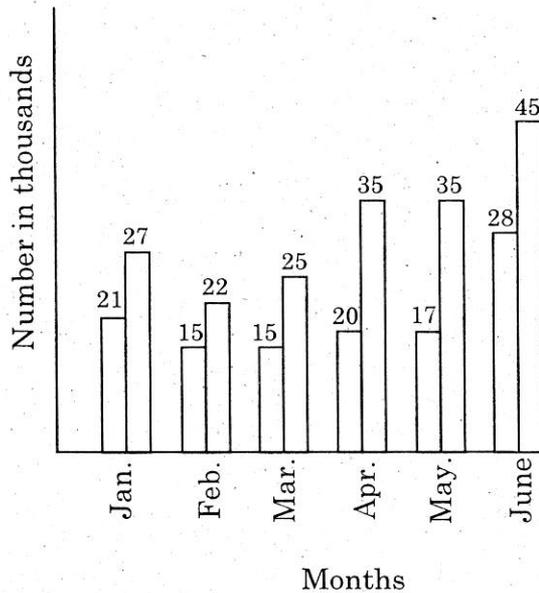
(A) 5000   (B) 9000
(C) 10000   (D) 15000

48. What was the percentage increase in registration of cars from May to June?
    (A) 11%   (B) 39.28%
    (C) 64.7%   (D) 72.6%

49. What was the number of vehicles other than cars registered in March?
    (A) 5000   (B) 10000
    (C) 35000   (D) 37000

50. The wrong number in the series given below
    2, 3, 13, 37, 86, 167, 288 is
    (A) 86   (B) 167
    (C) 3   (D) 13

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