INSTRUCTIONS TO CANDIDATES

Read the following instructions carefully before you answer the questions. Answers should be marked in the OMR sheet using black ball point pen.

1. This booklet consists of 100 questions for four subjects at the rate of 25 questions to each subject.

2. Each question carries one mark.

3. Since all questions are compulsory, do not try to read through the whole question paper before beginning to answer it.

4. If you do not know the answer to any question, do not spend much time on it and pass on to the next one. If time permits, you can come back to the questions which you have left in the first instance and try them again.

5. Since the time allotted to the question paper is very limited, you should make the best use of it by not spending too much time on any question.

6. Blank pages are provided for rough work at the end of the booklet.

7. Choose the correct answer from the options given for each question and darken the corresponding circle with black ball point-pen in the OMR answer sheet.

8. Handover the OMR answer sheet only to the invigilator.
1. The additive inverse of \( \frac{-3}{5} \) is ------
   (1) \( \frac{-3}{5} \)
   (2) \( \frac{5}{3} \)
   (3) \( \frac{3}{5} \)
   (4) \( \frac{-5}{3} \)

2. \( y^0 = \) \( \frac{1}{y} \)
   (1) 1
   (2) -1
   (3) 0
   (4) \( y \)

3. \( \frac{6^4}{6^2} = \) \( 6^2 \)
   (1) \( 6^4 \)
   (2) \( 6^2 \)
   (3) \( 6^8 \)
   (4) \( 6^{-2} \)

4. Find the cube root of 27
   (1) \( \sqrt[3]{3} \)
   (2) 3
   (3) 2
   (4) \( \sqrt[3]{2} \)

5. Complete the following pattern 44, 55, 66, 77, ----
   (1) 80
   (2) 88
   (3) 70
   (4) 75

6. The central angle of a quadrant is
   (1) \( 90^\circ \)
   (2) \( 180^\circ \)
   (3) \( 270^\circ \)
   (4) \( 360^\circ \)

7. Which of the following will be the angles of a triangle?
   (1) \( 35^\circ, 45^\circ, 90^\circ \)
   (2) \( 26^\circ, 58^\circ, 96^\circ \)
   (3) \( 38^\circ, 56^\circ, 96^\circ \)
   (4) \( 30^\circ, 55^\circ, 90^\circ \)

8. In a triangle \( \triangle ABC \), \( \angle A = 40^\circ \) and \( AB = AC \) then \( \triangle ABC \) is --------- triangle
   (1) a right angled
   (2) an equilateral
   (3) an isosceles
   (4) a scalene
9. In \( \triangle ABC \) \( \angle A = 70^\circ \), \( \angle B = 60^\circ \).
Find \( \angle C = ? \)

10. Perimeter of the semi-circle is -------

11. Quadrant of a circle is ------- of the circle

12. When \( p=\text{Rs.} 2400 \) \( n=2 \) years and rate of interest is 5% find the difference between compound interest and simple interest is

13. Profit = -------

14. In \( \triangle ABC \) \( \angle C = 90^\circ \) \( AB = 5 \) cm, \( AC = 4 \) cm. Find \( BC = ? \)

\[
\begin{align*}
\text{(1)} & \quad 3 \text{ cm} \\
\text{(2)} & \quad 5 \text{ cm} \\
\text{(3)} & \quad 4 \text{ cm} \\
\text{(4)} & \quad 9 \text{ cm}
\end{align*}
\]

15. The side of an isosceles triangle is
10 cm find the height?

\[
\begin{align*}
\text{(1)} & \quad \sqrt{3} \text{ cm} \\
\text{(2)} & \quad 5 \sqrt{3} \text{ cm} \\
\text{(3)} & \quad 5 \text{ cm} \\
\text{(4)} & \quad \sqrt{5} \text{ cm}
\end{align*}
\]

16. \( x^2 + y^2 - 2z^2 + 5x - 7 \) is a -------

\[
\begin{align*}
\text{(1)} & \quad \text{Monomial} \\
\text{(2)} & \quad \text{Binomial} \\
\text{(3)} & \quad \text{Trinomial} \\
\text{(4)} & \quad \text{Polynomial}
\end{align*}
\]

17. \( 3 \times 7x = ------- \)

\[
\begin{align*}
\text{(1)} & \quad 21 \\
\text{(2)} & \quad 21x \\
\text{(3)} & \quad x \\
\text{(4)} & \quad 21x^2
\end{align*}
\]

18. \( (4.9)^2 = ------- \)

\[
\begin{align*}
\text{(1)} & \quad 2401 \\
\text{(2)} & \quad 240.1 \\
\text{(3)} & \quad 24.01 \\
\text{(4)} & \quad 2.401
\end{align*}
\]
19. \((a+b)^2 - (a-b)^2 = \quad \quad \quad \quad \quad\)

\[ \sqrt{1} \quad 4ab \\
\sqrt{2} \quad 2ab \\
\sqrt{3} \quad a^2 + 2ab + b^2 \\
\sqrt{4} \quad 2(a^2 + b^2) \]

20. If \(5y + 9 = 24\), find \(y=\)?

\[ \sqrt{1} \quad 3 \\
\sqrt{2} \quad 4 \\
\sqrt{3} \quad 5 \\
\sqrt{4} \quad 6 \]

21. Area of the rhombus is

\[ \sqrt{1} \quad d_1 \times d_2 \text{ sq. units} \]
\[ \sqrt{2} \quad \frac{1}{2} (d_1 \times d_2) \text{ sq. units} \]
\[ \sqrt{3} \quad \frac{1}{2} (d_1 + d_2) \text{ sq. units} \]
\[ \sqrt{4} \quad (d_1 + d_2) \text{ sq. units} \]

22. Find the degree of polynomial in \(5x^2 - 3x + 2\)

\[ \sqrt{1} \quad 2 \\
\sqrt{2} \quad 1 \\
\sqrt{3} \quad 0 \\
\sqrt{4} \quad 3 \]

23. A bicycle, market price at Rs.1500/- is sold for Rs.1350/-. What is the percentage of discount?

\[ \sqrt{1} \quad 10\% \\
\sqrt{2} \quad 20\% \\
\sqrt{3} \quad 8\% \\
\sqrt{4} \quad .12\% \]

24. Find the average of 2, 4, 6, 8, 10, 12, 14, 16

\[ \sqrt{1} \quad 9 \\
\sqrt{2} \quad 10 \\
\sqrt{3} \quad 11 \\
\sqrt{4} \quad 12 \]

25. Find the median of 83, 86, 66, 30, 81

\[ \sqrt{1} \quad 30 \\
\sqrt{2} \quad 81 \\
\sqrt{3} \quad 83 \\
\sqrt{4} \quad 86 \]
PHYSICS AND CHEMISTRY

26. The chief element in coal is
   (1) Nitrogen
   (2) Silicon
   (3) Carbon
   (4) Iron

27. Chemical name of washing soda
   (1) Sodium bicarbonate
   (2) Sodium carbonate
   (3) Sodium Chloride
   (4) Calcium Carbonate

28. _______ is a positive charge particle
   (1) electron
   (2) proton
   (3) neutron
   (4) cathode

29. The fuel used in Jet Aircraft is
   (1) Petroleum Gas
   (2) Kerosene
   (3) Petrol
   (4) Diesel

30. Unit of Luminous Intensity
   (1) Candela
   (2) Kelvin
   (3) Kilogram
   (4) Radian

31. The atmospheric pressure at sea level is approximately
   (1) 10,000 N/m²
   (2) 1,00,000 N/m
   (3) 1,00,000 N/m²
   (4) 1,000 NM

32. Lightning Arrester was invented by
   (1) Michael Faraday
   (2) J.J. Thomson
   (3) Pascal
   (4) Benjamin Franklin

33. _______ works on the principle of multiple reflection
   (1) Káleidoscope
   (2) Laparoscope
   (3) Thermo flask
   (4) Electroscope

34. Sound cannot travel in
   (1) Water
   (2) Air
   (3) Vacuum
   (4) Glass

35. Solar cells converts solar energy into _______ energy
   (1) Thermal energy
   (2) Electrical energy
   (3) Wind energy
   (4) Hydro energy
36. ------- is used in manufacture of cement and glass.

(1) Quick Lime
(2) Slaked Lime
(3) Lime Stone
(4) Bleaching Powder

37. Laws of reflection shows -------

(1) \( \angle i > \angle y \)
(2) \( \angle i < \angle y \)
(3) \( \angle i = \angle y \)
(4) \( \angle i \neq \angle y \)
39. Deficiency of ——— causes diabetes mellitus
   (1) Glucagon
   (2) Insulin
   ✓ (3) Thyroxin
   (4) Adrenalin

40. Cervical region (neck region) consists of
   ———
   ✓ (1) 7 vertebrae
   (2) 8 vertebrae
   (3) 5 vertebrae
   (4) 6 vertebrae

41. The fermented food is ———
   (1) Wine
   ✓ (2) Milk
   (3) Fresh Juice
   (4) Tea

42. Vascular cryptogams are ———
   (1) Bryophytes
   (2) Gymnosperms
   (3) Angiosperms
   ✓ (4) pteridophytes

43. ——— bacteria present inside the root nodules and also responsible for nitrogen fixation.
   ✓ (1) Acetobactor
   (2) Bacillus Ramosus
   (3) Nitrobactor
   (4) Nitrosommonas

44. ——— are called suicidal bags
   (1) Mitochondria
   (2) Golgi apparatus
   (3) Centrioles
   ✓ (4) Lysosomes

45. Gir national park is located at ———
   (1) Karnataka
   ✓ (2) Gujarat
   (3) Uttarpradesh
   (4) Tamilnadu

46. Ozone is found in ——— layer
   (1) Thermosphere
   (2) Troposphere
   ✓ (3) Stratosphere
   (4) Lithosphere

47. ——— is the structural and functional unit of kidney.
   (1) Neuron
   (2) Dendron
   ✓ (3) Nephron
   (4) Axon

48. Prevention and Control of Water Pollution Act ———
   ✓ (1) 1974
   (2) 1981
   (3) 1986
   (4) 1994

49. ——— conduct food in plants
   (1) Cambium
   (2) Xylem
   ✓ (3) Phloem
   (4) Cuticle

50. The word dinosaur itself means ———
   (1) Dragon lizard
   (2) Very big lizard
   ✓ (3) Terrible lizard
   (4) Tallest lizard
SOCIAL SCIENCE

51. The first Battle of Panipat was fought in A.D. -------

(1) 1536
✓(2) 1526
(3) 1506
(4) 1516

52. ------- became the head quarters of the French settlements in India

(1) Chandranagore
✓(2) Pondicherry
(3) Mahe
(4) Chennai

53. The battle of Plassey was fought in -------

(1) AD 1764
✓(2) AD 1757
(3) AD 1765
(4) AD 1775

54. Count-de-Lally was defeated by Sir Eyre Coote at the battle of -------

(1) Madras
(2) St. Thomas
✓(3) Wandiwash
(4) Mir Jafar

55. The first Chief Justice of British India was -------

(1) Sir Thomas
✓(2) Sir Elijah Impey
(3) Sir Morse
(4) Tipu Sultan

56. The first Governor General of Bengal was -------

(1) Clive
✓(2) Warren Hastings
(3) Cornwallis
(4) Wandiwash

57. The ------- emblem was sculptured on Tipu's throne.

(1) Lion
✓(2) Tiger
(3) Fish
(4) Elephant

58. The ------- system of revenue was introduced during the period of Lord Hastings

(1) Mahalwari
(2) Ryotwari
✓(3) Permanent
(4) Tenancy Act

59. Lord William Bentinck is famous for his -------

(1) Appearance
(2) Wars
✓(3) Reforms
(4) Ryotwari

60. ------- was the first soldier who refused to use the greased cartridge.

✓(1) Mangal Pandey
(2) Nana Sahib
(3) Bahadur Shah
(4) Jancy Rani
61. In India the states are divided on the basis of -------
   ✓ (1) Language
   (2) Literature
   (3) Heritage
   (4) Natural resource

62. The National Integration Day is observed on -------
   (1) 14th November
   ✓ (2) 19th November
   (3) 1st November
   (4) 5th November

63. The UNO declared ------- year as the international year of children.
   (1) 1697
   (2) 1779
   (3) 1879
   ✓ (4) 1979

64. In Traffic Light ------- colour indicates stop.
   ✓ (1) Red
   (2) Blue
   (3) Green
   (4) Yellow

65. Road signals are classified into ------- types.
   ✓ (1) Two
   (2) Three
   (3) Four
   (4) Five
66. Minerals are -------- resources.
   (1) Renewable
   (2) Non renewable
   (3) Biotic
   (4) Lignite

67. The ------ harbour is at the west cost of India
   (1) Mumbai
   (2) Chennai
   (3) Vishakapatnam
   (4) Cuddalore

68. This is primary activity ------
   (1) Lumbering
   (2) Banking
   (3) Consultation
   (4) Hunting

69. Eskimos of Canada are ------
   (1) Hunters
   (2) Gatherers
   (3) Herders
   (4) Mining

70. The mineral found in alluvial deposits is _________
   (1) Gold
   (2) Iron
   (3) Coal
   (4) Salt

71. Shifting agriculture in Brazil is known as ------
   (1) Jhum
   (2) Roco
   (3) Plantation
   (4) Shifting

72. Asia accounts for ---- of the world's rice production.
   (1) 98%
   (2) 80%
   (3) 75%
   (4) 90%

73. -------- are fragile goods.
   (1) Glass items
   (2) Vegetables
   (3) Cars
   (4) Iron

74. Trade within the country is called ----
   (1) Internal trade
   (2) International trade
   (3) Open trade
   (4) Primary trade

75. ------ is considered the most density populated country
   (1) China
   (2) Mexico
   (3) Bangladesh
   (4) Egypt
MENTAL ABILITY TEST

SECTION – A
In each of the questions 76 to 80 there are four items. Three of them have something in common, while the fourth is different. Find out the different item and write its number in the answer sheet.

76. (1) Chennai
(2) Mumbai
(3) New Delhi
(4) Madurai

77. (1) Mahatma Gandhi
(2) Pandit Jawaharlal Nehru
(3) Subash Chandra Bose
(4) Rajiv Gandhi

78. (1) Groundnut
(2) Potato
(3) Radish
(4) Bitter Guard

79. (1) Cell Phone
(2) SIM Card
(3) Vibration
(4) Phone

80. (1) Jasmine Flower
(2) Rose Flower
(3) Lotus Flower
(4) Banana Flower

SECTION – B
In each of the questions 81 to 85 a series as per rule is given with one term missing. Pick the missing item from among the four alternatives given and write its numbers in the answer sheet.

81. 4, 5, 7, 10, 14, ----
(1) 24
(2) 18
(3) 19
(4) 36

82. 81, 64, 49, 36, 25, ----
(1) 9
(2) 16
(3) 100
(4) 4

83. 625, 125, 25, 5, ----
(1) 0
(2) 1
(3) -5
(4) 10

84. 21, 19, 16, 12, 7, ----
(1) 4
(2) 3
(3) 5
(4) 1

85. 1000, 200, 40, ----
(1) 8
(2) 20
(3) 10
(4) 5
SECTION C

In each of the questions 86 to 90 there is blank. Four responses to fill the blank are given. Identify the correct response and write the appropriate number in the answer sheet.

86.

\[
\begin{array}{cccc}
6 & 2 & 16 & 4 \\
1 & 3 & 5 & 7 \\
\end{array}
\]

(1) 24
(2) 18
(3) 26
(4) 20

89.

\[
\begin{array}{ccc}
10 & 2 & 100 \quad 4 \\
5 & 25 & 125 \\
\end{array}
\]

(1) 8
(2) 15
(3) 16
(4) 12

87.

\[
\begin{array}{cccc}
1 & 3 & 5 & ? \\
1 & 3 & 27 & 5 \\
\end{array}
\]

(1) 100
(2) 15
(3) 150
(4) 125

88.

\[
\begin{array}{cccc}
8 & 48 & 120 & \\
2 & 6 & 8 & ? \\
\end{array}
\]

(1) 12
(2) 8
(3) 10
(4) 6

90.

\[
\begin{array}{cccc}
1 & 2 & 3 & \\
3 & 5 & 10 & ? \\
\end{array}
\]

(1) 42
(2) 46
(3) 35
(4) 52
SECTION D

Find the pattern and write the number of alternative that fits in.

91. If 'COURSE' is 'CUS' then what is 'ANSWER'?
   (1) SAE (2) RWN (3) ASE (4) NWR

92. BPA, DQC, FRE, HSG, __________
   (1) ITJ (2) JTI (3) TJI (4) JIT

93. If 'LEDGER' is written as 654321
    then 'RED' is written as
       (1) 142 (2) 421 (3) 441 (4) 124

94. If X=3, Y=2, Z=1 then XY+YZ+ZX = ?
   (1) 21 (2) 11 (3) 6 (4) 4

95. 4X2=7, 6X3=17, 8X4=?
   (1) 13 (2) 19 (3) 31 (4) 16
SECTION E

96. Identify the different one and write its number in the answer sheet.

(1) △
(2) △→
(3) △✓
(4) △←

97.

(1) ↔
(2) ↔
(3) V→
(4) V←

98.

(1) □
(2) □
(3) □
(4) □

99.

(1) M
(2) W
(3) M
(4) M

100.

(1) ⬇️
(2) ⬇️
(3) ⬇️
(4) ⬇️
Rough work