

# FIITJEE INTERNAL MOCK TEST-1

for

## Mukhyamantri Vigyan Pratibha Pariksha (All Class IX Batches)

**(MAT & SAT)**  
QP CODE: 100703

**Forthcoming  
Exam – FTRE on  
15th Sept. 2024.**

*Time: 3 hours 20 Minutes*

*Maximum Marks: 200*

*Please read the instructions carefully.*

### INSTRUCTIONS

**A: General :**

1. Immediately fill in the particulars on this page of the Test Booklet with Blue/Black Ball point pen.
2. Use **Blue/Black Ball Point Pen only** for writing particulars on **Side-1** and **Side-2** of the Answer Sheet. **Use of pencil is strictly prohibited.**
3. Darken the appropriate bubbles with **HB Pencil** only.
4. Blank papers, clipboards, log tables, slide rules, calculators, cellular phones, pagers and electronic gadgets in any form are not allowed.
5. The answer sheet, a machine-gradable Objective Response Sheet (ORS) is provided separately.
6. Do not Tamper/mutilate the **ORS** or this booklet.
7. No additional sheets will be provided for rough work
8. On completion of this test, the candidate must hand over the Answer Sheet to the Invigilator on duty in the Room/Hall. **However, the candidates are allowed to take away this Test Booklet with them.**

**B: Questions paper format and Marking Scheme:**

\* **In multiple choice questions the options are given as F,T,R & E which correspond to the options A,B,C & D respectively in the OMR sheet.**

1. This paper contains two parts:

**Part I: Section – I (MAT) Q.1 – 100 questions**

**Part II: SAT: 100 questions**

**Section – II (Physics) Q.1 – Q.13, Section – III (Chemistry) Q.1 – Q. 13, Section – IV (Biology) Q. 1 – Q.14, Section – V (Mathematics) Q. 1 – Q. 20 & Section – VI (Social Science) Q. 1 – Q. 40.**

2. For each question you will be **awarded +1 mark** if you darken the bubble corresponding to the correct answer and zero mark if no bubbles is darkened. **There will be no Negative marking.**

Enrollment No. :

Batch : \_\_\_\_\_

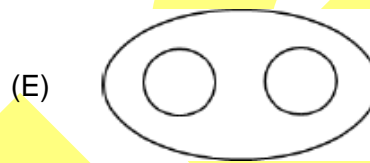
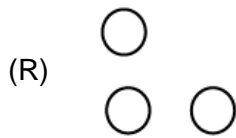
Name : \_\_\_\_\_

Candidate's Signature \_\_\_\_\_ Invigilator's Signature: \_\_\_\_\_

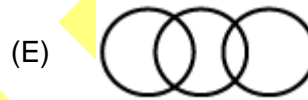
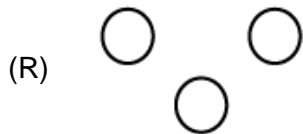
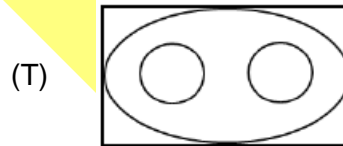
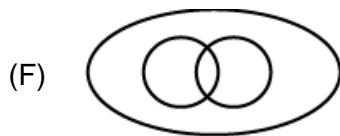
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**Part – I (MAT)**  
**SECTION – I**  
**(1 – 100)**

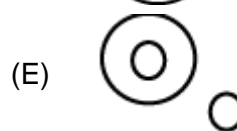
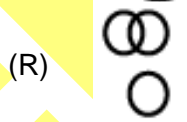
1. Which one of the following Venn diagrams represents the best relationship between Snake, Lizard, Reptiles?



2. Which diagram correctly represents the relationship between Human beings, Teachers, Graduates?

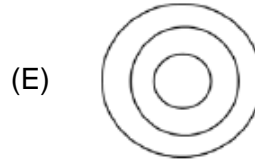
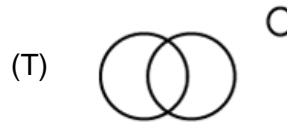
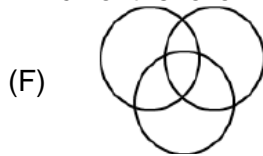


3. Which of the following diagram represents the relationship among sun, moon and stars?

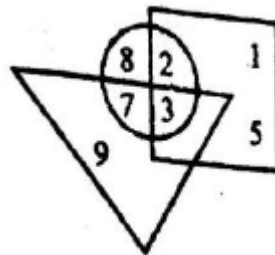


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4. Which of the following diagram represents correct relationship Judge, Thief, Criminal?



5. In the given figure in a garden, square represent the area where jackfruit trees are grown, circle represent mango trees and triangle represent coconut trees. Which numbers represent the common area in which all types of trees are grown.



- (F) 4  
(R) 7

- (T) 3  
(E) 8

**Directions (Q.6 – Q.9):** What should come in place of the question mark (?) in the following number series?

6. 9, 8, 10, 16, 11, ?, 12, 64  
(F) 28  
(R) 25

- (T) 36  
(E) 32

7. 9 11 15 ? 39 71  
(F) 29  
(R) 21

- (T) 23  
(E) 27

8. 2, 3, 8, 27, 112, ?  
(F) 226  
(R) 452

- (T) 339  
(E) 565

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9. 10, 14, 28, 32, 64, 68, ?  
 (F) 28 (T) 32  
 (R) 64 (E) 136

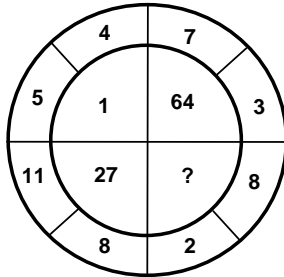
**Directions (Q.10 – Q.11):** Find the missing character in each of the following questions:

10.

6	9	15
8	12	20
4	6	?

- (F) 5 (T) 10  
 (R) 15 (E) 21

11.



- (F) 125 (T) 216  
 (R) 121 (E) 225

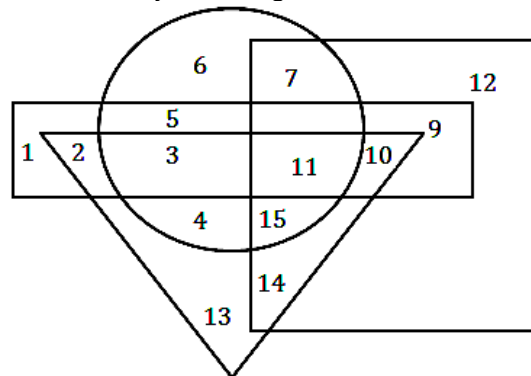
**Directions (Q.12 – Q.14):** Read the following information carefully and answer the questions, which follow.

- (i) 'A – B' mean 'A is father of B'.  
 (ii) 'A + B' means 'A is daughter of B'.  
 (iii) 'A ÷ B' means 'A is son of B'.  
 (iv) 'A × B' means 'A is wife of B'.
12. Which of the following means P is grandson of S?  
 (F)  $P + Q - S$  (T)  $P \div Q \times S$   
 (R)  $P \div Q + S$  (E)  $P \times Q \div S$
13. How is P related to T in the expression 'P + S – T'?  
 (F) Sister (T) Wife  
 (R) Son (E) Daughter
14. In the expression 'P + Q × T', how is T related to P?  
 (F) Mother (T) Father  
 (R) Son (E) Brother

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*Space For Rough Work*

15. In the Venn diagram given below, circle represents sportspersons, square, represents unmarried persons, triangle represents women and rectangle represents educated persons. Each section is numbered. Study this diagram to answer the following question.



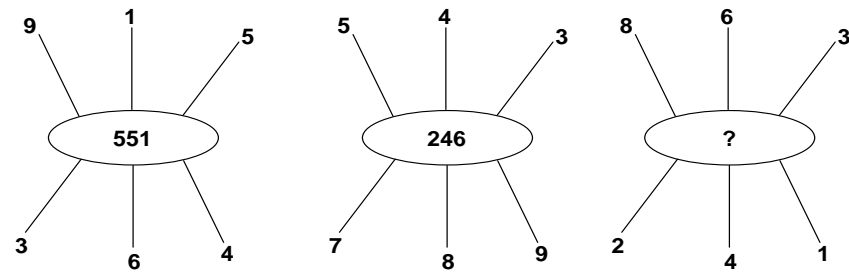
Which sections are represented by the region numbered 11?

- (F) Married educated sportswomen
- (T) Unmarried uneducated women sportspersons
- (R) Married educated sportsmen
- (E) Unmarried educated sportswomen

**Directions (Q.16 – Q.18):** In each of the following questions, find the missing letters from the given responses.

16. a, r, c, s, e, t, g, ?, ?  
 (F) x, z  
 (R) w, y  
 (T) u, i  
 (E) v, b
17. ?, PSVYB, EHKNQ, TWZCF, ILORU  
 (F) BEHKN  
 (R) SVYBE  
 (T) ADGJM  
 (E) ZCFIL
18. ?, DREQ, GUHT, JXKW  
 (F) EFRS  
 (R) JWVI  
 (T) TGSF  
 (E) AOBN
19. 21 boys turn out for an NCC parade. Of these 19 are wearing NCC caps and 11 are wearing NCC shoes. There are no boys without one or the other. How many boys are wearing the full uniform?  
 (F) 2  
 (R) 9  
 (T) 6  
 (E) 10

*Space For Rough Work*

20. 

(F) 262  
(R) 631

(T) 622  
(E) 753

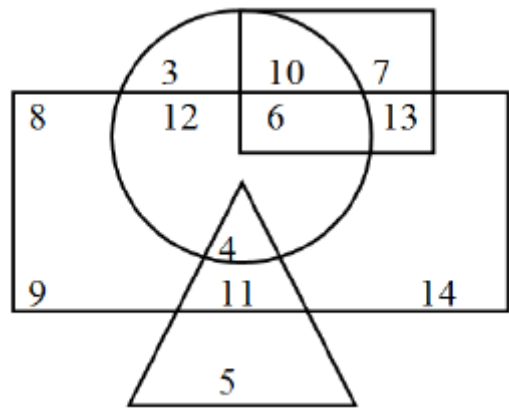
21. 

7	9	8
8	9	?
4	9	6
60	90	70

(F) 6  
(R) 8

(T) 7  
(E) 9

**Directions (Q.22 – Q.26):** The following questions are based on the diagram given below.



Rectangle represents males  
Triangle represents educated  
Circle represents urban  
Square represents civil servants

22. Who among the following is an educated male who is not an urban resident?  
(F) 4 (T) 5  
(R) 11 (E) 9
23. Who among the following is neither a civil servant nor educated but is urban and not a male?  
(F) 2 (T) 3  
(R) 6 (E) 10

*Space For Rough Work*

24. Who among the following is a female urban resident and also a civil servant?  
(F) 6 (T) 7  
(R) 10 (E) 13
25. Who among the following is an educated male who hails from urban?  
(F) 4 (T) 7  
(R) 10 (E) 13
26. Who among the following is uneducated and also an urban male?  
(F) 2 (T) 3  
(R) 18 (E) 12
27. In a row of forty children, P is thirteenth from the left end and Q is ninth from the right end. How many children are there between P and R if R is fourth to the left of Q?  
(F) 12 (T) 13  
(R) 14 (E) 15
28. In a class of 35 students, Kunal is placed seventh from the bottom whereas Sonali is placed ninth from the top. Pulkit is placed exactly in between the two. What is Kunal's position from Pulkit?  
(F) 9 (T) 10  
(R) 11 (E) 13
29. In a row of girls facing North, Reena is 10<sup>th</sup> to the left of Pallavi, who is 21<sup>st</sup> from the right end. If Malini, who is 17<sup>th</sup> from the left end, is fourth to the right of Reena, how many girls are there in the row?  
(F) 37 (T) 43  
(R) 44 (E) Data inadequate
30. George is fifth from the left and Peter is twelfth from the right end in a row of children. If Peter shifts by three places towards George, he becomes tenth from the left end. How many children are there in the row?  
(F) 21 (T) 22  
(R) 23 (E) 24
31. In a row of boys, if A who is tenth from the left and B who is ninth from the right interchange their positions, A becomes fifteenth from the left after interchange. How many boys are there in the row?  
(F) 23 (T) 27  
(R) 28 (E) 31

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*Space For Rough Work*

32. Students line up in a queue in which Ashish stands fifteenth from the left and Sachin is seventh from the right. If they interchange their places, Sachin would be fifteenth from the right. How many students are there in the queue?  
(F) 21 (T) 22  
(R) 29 (E) None of these
33. If the letters in the word POWERFUL are rearranged as they appear in the English alphabet, the position of how many letters will remain unchanged after the rearrangement?  
(F) None (T) One  
(R) Two (E) Three
34. If the first three letters of the word COMPREHENSION are reversed, then the last three letters are added and then the remaining letters are reversed and added, then which letter will be exactly in the middle?  
(F) H (T) N  
(R) R (E) S
35. 85 kg of mixture contains milk and water in the ratio 27 : 7. How much more water is to be added to get a new mixture containing milk and water in the ratio 3 : 1?  
(F) 5 kg (T) 6.5 kg  
(R) 7.25 kg (E) 8 kg
36. The ratio of the number of boys and girls in a school is 3:2. If 20% of the boys and 25% of the girls are scholarship holders, what percentage of the students does not get the scholarship?  
(F) 56 (T) 70  
(R) 78 (E) 80
37. If 10% of  $x = 20\%$  of  $y$ , then  $x : y$  is equal to:  
(F) 1 : 2 (T) 2 : 1  
(R) 5 : 1 (E) 10 : 1
38. The ratio of the incomes of A and B is 5 : 4 and the ratio of their expenditures is 3 : 2. If at the end of the year, each saves Rs 1600, then the income of A is:  
(F) Rs 3400 (T) Rs 3600  
(R) Rs 4000 (E) Rs 4400
39. If 0.4 of a number is equal to 0.06 of another number, the ratio of the numbers is:  
(F) 2 : 3 (T) 3 : 4  
(R) 3 : 20 (E) 20 : 3
40. In a certain code, 'BUILDER' is written as 'JVCKSFE'. How is 'SEALING' written in that same code?  
(F) BTFKHOJ (T) JOHKBT  
(R) TFBKHOJ (E) None of these

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*Space For Rough Work*



41. In a certain code language, 'CURATIVE' is written as 'BSVDDUHS'. How 'STEAMING' is to be written in the same code language?  
 (F) BFUTFMHL (T) TUFBFMHL  
 (R) BFUTLHMF (E) BFUTHOJN
42. The speeds of three cars are in the ratio 5 : 4 : 6. The ratio between the time taken by them to travel the same distance is:  
 (F) 5 : 4 : 6 (T) 6 : 4 : 5  
 (R) 10 : 12 : 15 (E) 12 : 15 : 10
43. The sides of a triangle are in the ratio  $\frac{1}{2} : \frac{1}{3} : \frac{1}{4}$  and its perimeter is 104 cm. The length of the longest side is:  
 (F) 52 cm (T) 48 cm  
 (R) 32 cm (E) 26 cm

**Directions (Questions 44 – 48):** In each question below is given a statement followed by two assumptions numbered I and II. You have to consider the statement and the following assumptions and decide which of the assumptions is implicit in the statement.

Give answer

- (F) if only assumption I is implicit  
 (T) if only assumption II is implicit  
 (R) if either I or II is implicit  
 (E) if neither I nor II is implicit

44. Statement: Detergents should be used to clean clothes.  
 Assumptions: I. Detergents form more lather.  
 II. Detergents help to dislodge grease and dirt.
45. Statement: It is desirable to put the child in school at the age of 5 or so.  
 Assumptions: I. At the age the child reaches appropriate level of development and is ready to learn.  
 II. The schools do not admit children after six years of age.
46. Statement: His recent investment in the shares of Company A is only a gamble.  
 Assumptions: I. He may incur loss on his investment.  
 II. He may gain from his investment.
47. Statement: 'If you want to give any advertisement, give it in the newspaper X', A tells B.  
 Assumptions: I. A wants to publicise his products.  
 II. Newspaper X has a wide circulation

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*Space For Rough Work*

48. Statement: Beware of dogs, our dogs do not bark, but they are trained to distinguish between genuine guests and intruders.  
Assumptions: I. Barking dogs bite rarely.  
II. Our dogs could be dangerous for intruders
49. If  $\frac{x}{5} = \frac{y}{8}$  then,  $(x + 5) : (y + 8)$  is equal to:  
(F) 3 : 5 (T) 13 : 8  
(R) 8 : 5 (E) 5 : 8
50. 45 men can complete a work in 16 days. Six days after they started working, 30 more men joined them. How many days will they now take to complete the remaining work?  
(F) 8 days (T) 5 days  
(R) 6 days (E) 7 days
51. 2 men and 3 boys can do a piece of work in 10 days while 3 men and 2 boys can do the same work in 8 days. In how many days can 2 men and 1 boy do the work?  
(F)  $12\frac{1}{2}$  days (T)  $11\frac{1}{2}$  days  
(R)  $13\frac{1}{4}$  days (E)  $15\frac{1}{2}$  days

**Directions (Questions 52 – 54):** Study the following number sequence and answer the questions given below it:

5 1 4 7 3 9 8 5 7 2 6 3 1 5 8 6 3 8 5 2 2 4 3 4 9 6

52. How many odd numbers are there in the sequence each of which is immediately followed by an odd number?  
(F) 1 (T) 2  
(R) 3 (E) more than 4
53. How many even numbers are there in the sequence which are immediately preceded by an odd number & immediately followed by an even number?  
(F) 1 (T) 2  
(R) 3 (E) 4
54. How many odd numbers are there in the sequence which are immediately preceded and also immediately followed by an even number?  
(F) 1 (T) 2  
(R) 3 (E) 4

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*Space For Rough Work*

55. Harish travelled in the following path. 12km towards south west of house followed by 12km towards north west, then 12 km towards north east followed by 12km towards south east. How far is he from his starting point?  
 (F) 33km (T) 12km  
 (R) 18km (E) 0km

56. Mr. Sumit starts from his house and travels 14 km towards north and then turns left and travels 30 km. He then turns right to travel 2 km followed by another right to travel 6 km. Finally, he travels 9 km southwards. Approximately, how far is the starting point from the final point and in which direction?  
 (F) 85 km and north east (T) 9 km and north west  
 (R) 25 km and south east (E) 16 km and north east

**Directions (Questions 57 – 59):** Study the following information carefully and answer the question given below it:

I. Kamal is available at home from 12 noon to 4 pm on Tuesday, Thursday and Sunday.

II. His younger brother Navin is available at home on Monday, Thursday, Friday and Sunday between 10 am to 2 pm.

III. The eldest brother Rajiv is available between 9 am to 12 noon on Monday, Wednesday and Thursday and 2 pm to 4 pm on Friday, Saturday and Sunday.

57. At a time, on which day of a week all the three brothers are available at home?  
 (F) None (T) Sunday  
 (R) Thursday (E) Cannot be determined
58. For how many days only one brother is available at a particular time in a week?  
 (F) One (T) Two  
 (R) Three (E) Four or more
59. On which day(s) of a week, the youngest and the eldest brothers are available at home at the same time?  
 (F) Only Monday (T) Only Thursday  
 (R) Only Friday (E) Both Monday and Thursday
60. Two whole numbers whose sum is 72 cannot be in the ratio  
 (F) 5:7 (T) 3:5  
 (R) 3:4 (E) 4:5
61. Two pipes can fill a cistern in 14 hours and 16 hours respectively. The pipes are opened simultaneously and it is found that due to leakage in the bottom it took 32 minutes more to fill the cistern. When the cistern is full, in what time will the leak empty it?  
 (F) 102 hrs (T) 99 hrs  
 (R) 112 hrs (E) 123 hrs

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*Space For Rough Work*

62. Two pipes A and B can fill a tank in 36 min and 45 min respectively. A water pipe C can empty the tank in 30 min. First A and B are opened. After 7 minutes, C is also opened. In how much time, the tank is full?  
 (F) 49 min (T) 42 min  
 (R) 39 min (E) 46 min

**Directions (Questions 63 – 64):** Select the combination of numbers so that letters arranged accordingly will form a meaningful word.

63. T A E W R  
 1 2 3 4 5  
 (F) 5 2 1 3 4 (T) 3 1 5 2 4  
 (R) 2 4 1 3 5 (E) 4 2 1 3 5
64. U R B N E M  
 1 2 3 4 5 6  
 (F) 6 4 3 5 1 2 (T) 4 1 6 3 5 2  
 (R) 5 3 1 2 4 6 (E) 3 5 1 2 4 6
65. If in a certain language 'MIRACLE' is coded as 'NKUEHRL', then how 'GAMBLE' codes in that same language?  
 (F) JDOCMF (T) CLEMNK  
 (R) HCPFQK (E) AELGMN
66. If in a certain code language, 'BROWSER' is written as 'RESWORB', then how 'TEACHER' coded in that same language?  
 (F) REHCEAT (T) REHCAET  
 (R) REHCTEA (E) AHRCTEA
67. If in a certain code language, 'FRIEND' is written as 'ETKDPF', then how 'REVEAL' be coded in that language?  
 (F) LAEVER (T) VERQLM  
 (R) QXGCDN (E) QGXDCN
68. This question is based on the following alphabet series:  
 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  
 If the letters of the given alphabet interchange positions, so that A takes the place of Z and Z takes the place of A; B takes the place of Y and Y takes the place of B and so on, what will be the thirteenth letter from the right?  
 (F) M (T) N  
 (R) O (E) L

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*Space For Rough Work*

69. If every alternate letter starting from B of the given alphabet is written in small letters, rest all are written in capital letters, how will the month of 'September' be written?  
 (F) SEpteMbeR (T) SEptembER  
 (R) SEptEMbeR (E) sePTemBeR
70. How many A's are there in the following series which are immediately followed by B as well as immediately preceded by Z?  
 A M B Z A N A A B Z A B A Z B A P Z A B A Z A B  
 (F) Nil (T) One  
 (R) Two (E) Three
71. Arrange the following words according to the dictionary.  
 1. Sound 2. Socks 3. Shock 4. Sharp 5. Snooker  
 (F) 5 4 3 1 2 (T) 4 3 5 2 1  
 (R) 3 4 5 1 2 (E) 4 3 2 5 1
72. Karan facing towards south moved straight 2 km and from there turned to his right  $90^\circ$  and travelled 2 km. Then he took a  $45^\circ$  turn to his left and travelled 1 km. Where would he be now with respect to the starting point?  
 (F) South region (T) South – east region  
 (R) North – west region (E) South – west region
73. A man drives his car 50 km towards eastward direction. He turned right & went for 30 km, then he turned towards west and drive for 10 km. How far is he from the starting point?  
 (F) 50km (T) 60km  
 (R) 100km (E) 20km
74. A man starts walking from a point and walks 12 kms towards North. He, turns  $90^\circ$  left and walks a distance and stopped. If the distance between initial point and final positions is 13 kms, how much distance he travelled after turning from the North?  
 (F) 1 km (T) 5 km  
 (R) 7 km (E) 2 km
75. 25 men were employed to do a piece of work in 24 days. After 15 days, 10 more men were engaged and the work was finished a day before the schedule. In what time could they finish the work if extra men were not employed?  
 (F) 25 days (T) 25.2 days  
 (R) 26 days (E) 26.2 days
76. A and B undertake to do a piece of work for Rs 600. A alone can do it in 6 days, while B alone can do it in 8 days. With the help of C, they finish it in 3 days. Find B's share.  
 (F) Rs 230 (T) Rs 225  
 (R) Rs 235 (E) Rs 220

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*Space For Rough Work*

77. A and B can separately do a piece of work in 20 and 15 days respectively. They worked together for 6 days, after which B was replaced by C. If the work was finished in next 4 days, then the number of days in which C alone could do the work will be?  
 (F) 39 (T) 40  
 (R) 41 (E) 42
78. If South-East becomes North, North-East becomes West and so on. What will West become?  
 (F) North – East (T) North – West  
 (R) South – East (E) South – West
79. If 'ZEBRA' is written as '2652181', then how can 'COBRA' be written?  
 (F) 302181 (T) 3152181  
 (R) 31822151 (E) 1182153

**Directions (Questions 80 – 82):** In each of the questions below, a group of numerals is given followed by four groups of symbol / letter combinations labelled (F), (T), (R) and (E). Numerals are to be coded as per the codes and conditions given below. You have to find out which of the combinations (F), (T), (R) and (E) is correct and indicate your answer accordingly.

Numerals	3	5	7	4	2	6	8	1	0	9
Letters/ Symbol code	*	B	E	A	@	F	K	%	R	M

Following conditions apply:

- (i) In the first digit as well as the last digit is odd, both are to be coded as 'X'.  
 (ii) If the first digit as well as the last digit is even, both are to be codes as '\$'.  
 (iii) If the last digit is 0, it is to be coded as '#'.  
 (iv) If the last digit is 9, it is to be coded as 'M'.

80. 546839  
 (F) XAFK\*M (T) BAFK\*M  
 (R) XAFK\*X (E) BAFK\*K
81. 713540  
 (F) E%\*BA# (T) X%\*BA#  
 (R) X%\*BAR (E) E%\*BAR
82. 765082  
 (F) XFBRK@ (T) EFB#K@  
 (R) EFBR#K (E) EFBRK@
83. If blue is called black, black is called green, green is called white, white is called red, red is called yellow, and yellow is called gray, then what is the colour of milk?  
 (F) white (T) blue  
 (R) red (E) yellow

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*Space For Rough Work*

84. If tree means mountain, mountain means water, water means jungle, jungle means bus, bus means truck and truck means house, then where do the fish live?  
 (F) water (T) jungle  
 (R) mountain (E) bus

**Directions (Questions 85 – 86):** Study the following arrangement carefully and answer the questions.

C E B A C D B C D A C E B E D C A B A D A C E D U B A U B D B U

85. How much such A's are there in the given arrangement each of which is immediately preceded by a B and also immediately followed by a consonant?  
 (F) One (T) None  
 (R) More and three (E) Two
86. How many D's are there in the given arrangement each of which is immediately preceded by a consonant and also immediately followed by a vowel?  
 (F) More than four (T) Four  
 (R) Two (E) One

**Directions (Questions 87 – 90):** There is a family of six persons P, Q, R, S, T and U. Their professions are engineer, doctor, teacher, salesman, manager and lawyer.

I. There are two married couples in the family.

II. The manager is the grandfather of U, who is an engineer.

III. R, the salesman, is married to the lady teacher.

IV. Q is the mother of U and T.

V. The doctor, S is married to the manager.

87. How many male members are there in the family?  
 (F) Two (T) Three  
 (R) Data inadequate (E) None of these
88. Who are the two married couples in the family?  
 (F) PQ and SR (T) PS and RQ  
 (R) PT and SR (E) RU and ST
89. What is the profession of P?  
 (F) Lawyer or Teacher (T) Lawyer  
 (R) Engineer (E) Manager
90. How P is related to T?  
 (F) Father (T) Grandmother  
 (R) Grandfather (E) Mother

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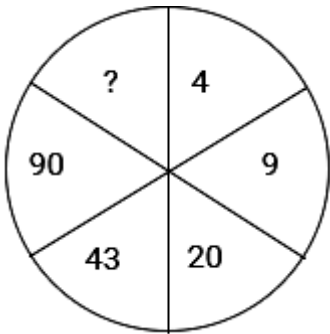
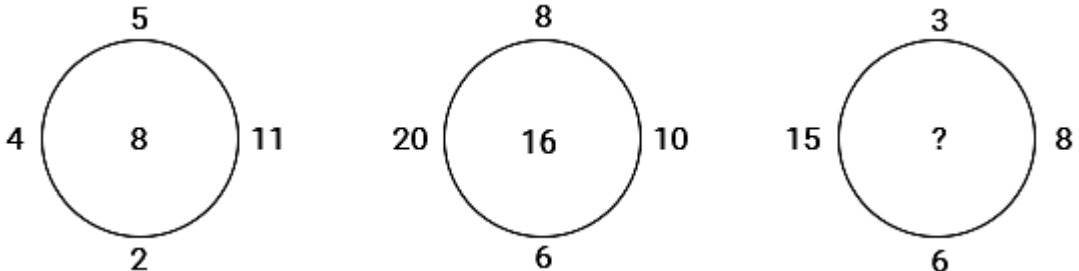
*Space For Rough Work*

91. Hitesh said to Nitin, "The girl playing with the football is the younger of the two sisters of the son of my mother's husband." How is the girl playing football related to Hitesh?  
 (F) Cousin (T) Sister  
 (R) Daughter (E) Sister-in-law
92. Amit told Banita, "Yesterday I met the only brother of the daughter of my father's mother." Whom did Amit meet?  
 (F) Cousin (T) Brother  
 (R) Nephew (E) Father

**Directions (Q.93 – Q.94):** Select the correct alternative from the given choices.

93. 2, 4, 9, ?, 91, 348  
 (F) 38 (T) 26 (R) 56 (E) 44
94. 4, 5, 9, 20, ?, 160.5  
 (F) 52.5 (T) 47.5 (R) 37.5 (E) 67.5

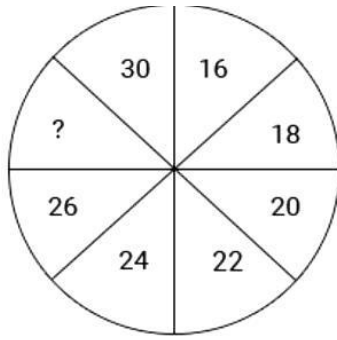
**Direction (Q.95 – Q.97):** Insert the missing number in each of the following.

95.   
 (F) 185 (T) 126 (R) 239 (E) 145
96.   
 (F) 5 (T) 6 (R) 14 (E) 8

*Space For Rough Work*



97.



(F) 19

(T) 28

(R) 32

(E) 34

**Direction (98 – 99):** A statement is given & then two conclusions – 1 & 2 are given. You have to consider the statement as true though it seems to be different from the actual facts. Then give your answer regarding the given statement that which of the conclusions/is/ are followed by it Properly.

98. **Statement:** The people with religion thoughts & afraid of God will not betray.

**Conclusion:**

1. Betraying people are atheists

2. The religion develops the virtues

(F) Only 1 is followed

(T) Only 2 is followed

(R) 1 & 2 – both are followed

(E) Neither 1 nor 2 is followed

99. **Statement:** India is multi lingual country. Hindi is the National Language of India.

**Conclusion:**

1. All Indians should learn multiple languages.

2. Hindi should be learnt to be an Indian.

(F) Only 1 is followed

(T) Only 2 is followed

(R) Neither 1 nor 2 is followed

(E) 1 & 2 – both are followed

100. In a queue, Arun is 10<sup>th</sup> from the front while Mukesh is 25<sup>th</sup> from behind and Maha is just in the middle of the two. If there be 50 persons in the queue, what position does Maha occupy from the front?

(F) 17<sup>th</sup>

(T) 18<sup>th</sup>

(R) 19<sup>th</sup>

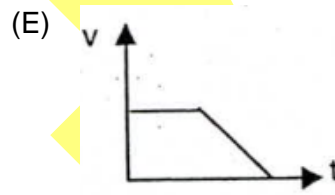
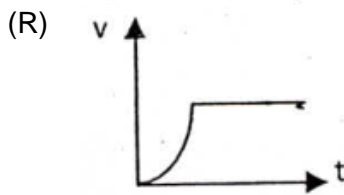
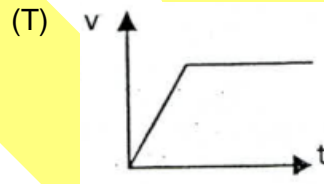
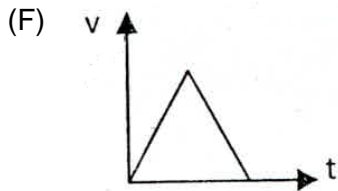
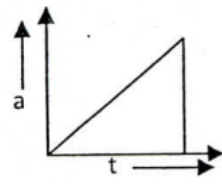
(E) 20<sup>th</sup>

*Space For Rough Work*

**Part – II (SAT)**  
**SECTION – II (Physics)**

- The area under velocity-time graph for a particle in a given interval of time represents  
(F) speed (T) velocity (R) acceleration (E) displacement
- An object starts moving from rest with a uniform acceleration of  $6 \text{ m/s}^2$ . The distance travelled by it in 3<sup>rd</sup>, 4<sup>th</sup> and 5<sup>th</sup> seconds of its journey are respectively in the ratio:  
(F) 27 : 48 : 75 (T) 5 : 7 : 9 (R) 9 : 13 : 15 (E) 25 : 36 : 49
- A car accelerates from rest for time  $t_1$  at constant rate  $a_1$  and then it retards at the constant rate  $a_2$  for time  $t_2$  and comes to rest.  $t_1/t_2 =$   
(F)  $a_1/a_2$  (T)  $a_2/a_1$  (R)  $a_1^2/a_2^2$  (E)  $a_2^2/a_1^2$

- For given acceleration – time graph the most suitable velocity time graph will be:



- If two bodies of different masses 6 kg and 10 kg are dropped from different heights 4 m and 9 m respectively. Then the ratio of the time taken by the mass to drop through these heights is  
(F) 3 : 5 (T) 4 : 9 (R) 2 : 3 (E) 16 : 81
- A car travelling on a straight road moves with a uniform velocity  $v_1$  for a time  $t$  and with uniform velocity  $v_2$  for the time  $t$  following the first period  $t$ . The average velocity of the car is  
(F)  $\sqrt{v_1 v_2}$  (T)  $\frac{1}{v_1} + \frac{1}{v_2}$  (R)  $\frac{1}{2} \left( \frac{1}{v_1} + \frac{1}{v_2} \right)$  (E)  $\frac{v_1 + v_2}{2}$

Space For Rough Work

7. A passenger in a moving train tosses a coin which falls behind him, this shows that the motion of train is:  
 (F) Accelerated (T) Uniform (R) Retarded (E) Along circular track
8. A ball is thrown up with a speed of 15 m/sec. How high will it go before it begins to fall? ( $g = 9.8 \text{ m/sec}^2$ )  
 (F) 22.8 m (T) 13.9 m (R) 17.2 m (E) 11.5 m
9. A particle starts from rest. Its acceleration 'a' versus time 't' graph is shown in the figure. The maximum velocity of the particle will be:  
 (F) 110 m/s (T) 55 m/s  
 (R) 550 m/s (E) 660 m/s
- 
10. An athlete completes one round of circular track of diameter 200 m in 40 s. What will be the distance covered and the displacement at end of 2 minutes 20 seconds?  
 (F) 2200 m, 200 m (T) 1000 m, 200 m (R) 2000 m, 200 m (E) 2200 m, 0 m
11. A stone is allowed to fall from the top of a tower 100 m high and at the same time another stone is projected vertically upwards from the ground with a velocity of 25 m/s. The distance from the ground they meet is :  
 (F) 2.16 m (T) 21.6 m (R) 20.6 m (E) 15.6 m
12. If a car covers  $\frac{2}{5}$  of the total distance with speed  $v_1$  &  $\frac{3}{5}$  of distance with speed  $v_2$ , then average speed is  
 (F)  $\frac{1}{2} \sqrt{v_1 v_2}$  (T)  $\frac{v_1 + v_2}{2}$  (R)  $\frac{2v_1 v_2}{v_1 + v_2}$  (E)  $\frac{5v_1 v_2}{3v_1 + 2v_2}$
13. The numerical ratio of displacement to the distance covered is  
 (F) Less than one (T) Equal to one  
 (R) Equal to or less than one (E) Equal to or greater than one

### SECTION – III (Chemistry)

1. Rate of diffusion of a gas is  
 (F) directly proportional to its density  
 (T) directly proportional to its molecular mass  
 (R) directly proportional to the square of its molecular mass  
 (E) inversely proportional to the square of its molecular mass

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*Space For Rough Work*

2. Rusting of an article made up of iron is called  
(F) Corrosion and it is a physical as well as chemical change  
(T) Dissolution and it is a physical change  
(R) Corrosion and it is a chemical change  
(E) Dissolution and it is a chemical change
3. Which one of the following sets of phenomena would increase on raising the temperature?  
(F) Diffusion, evaporation, compression of gases  
(T) Evaporation, compression of gases, solubility  
(R) Evaporation, diffusion, expansion of gases  
(E) Evaporation, solubility, diffusion, compression of gases
4. A mixing of sulphur and carbon disulphide is  
(F) heterogeneous and shows tyndall effect  
(T) homogeneous and shows tyndall effect  
(R) heterogeneous and does not show tyndall effect  
(E) homogeneous and does not show tyndall effect
5. A few substances are arranged in the increasing order of 'forces of attraction' between their particle. Which one of the following represents a correct arrangement?  
(F) Water, air, wind  
(R) Oxygen, water, sugar  
(T) Air, sugar, oil  
(E) Salt, juice, air
6. Scattering of light occurs when a beam of light is passed through.  
(F) Blood  
(R) Copper sulphate solution  
(T) Water  
(E) Brine
7. Which one of the following processes involves fractional distillation?  
X. Separation of components of a liquid state.  
Y. Separation of crude petroleum into useful fractions like gasoline, kerosene oil, diesel etc  
Z. Separation of kerosene oil and water  
(F) X, Y, Z  
(T) X, Y  
(R) X, Z  
(E) Y, Z
8. Identify the element from the following  
(F) Air  
(R) Water  
(T) Iodine vapour  
(E) Amalgam
9. Which of the following mixture cannot be separated by the process of sublimation?  
(F) Iodine and naphthalene  
(R) NaCl and  $\text{NH}_4\text{Cl}$   
(T) Camphor and NaCl  
(E) NaCl and Iodine
10. Tincture of Iodine has antiseptic properties. This solution is made by dissolving  
(F) Iodine in potassium iodide  
(R) Iodine in water  
(T) Iodine in vaseline  
(E) Iodine in alcohol

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*Space For Rough Work*

11. During summer water kept in an earthen pot becomes cool because of the phenomenon of  
(F) diffusion (T) transpiration (R) osmosis (E) evaporation
12. The latent heat of fusion of ice and latent heat of vaporization of water in(J/kg) respectively are  
(F)  $3.35 \times 10^5$ ,  $22.60 \times 10^5$  (T)  $3.35 \times 10^5$ ,  $3.35 \times 10^5$   
(R)  $22.60 \times 10^5$ ,  $3.35 \times 10^5$  (E)  $22.60 \times 10^5$ ,  $22.60 \times 10^5$
13. Arun has prepared 1% (by mass) solution of NaCl in water. Which of the following correctly represents the composition of the solution?  
(F) 1g NaCl + 100 g water (T) 1 g NaCl + 99 g water  
(R) 1g NaCl + 1000 g water (E) 1 g NaCl + 999 g water

### SECTION – IV (Biology)

1. The endomembrane system does not include which of the following?  
(F) Lysosome (T) Vacuole (R) Golgi complex (E) Peroxisome
2. Which organelles serve as major packaging regions for molecules distributed throughout the cell?  
(F) Vacuole (T) Plastid (R) Mitochondria (E) Golgi bodies
3. Cell theory does not apply to  
(F) Fungus (T) Algae (R) Virus (E) Bacteria
4. The middle lamella is mainly composed of:  
(F) Hemicellulose (T) Muramic acid  
(R) Calcium pectate (E) Phosphoglycerides
5. Which among the following statements is incorrect about collenchyma?  
(F) These are the tissue responsible for flexibility in plants and provides support and strength for the plants  
(T) They have less intercellular spaces in between them  
(R) They allow bending of stems and leaves without breaking  
(E) Their cell walls are regularly thickened
6. The plant tissues that are known for photosynthesis, secretion and storage are \_\_\_\_\_.  
(F) Parenchyma (T) Collenchyma (R) Sclerenchyma (E) Vascular cambium
7. Aerenchyma and chlorenchyma are types of \_\_\_\_\_.  
(F) Xylem (T) Phloem (R) Vascular bundle (E) Parenchyma
8. Which one of these is not a eukaryote?  
(F) Euglena (T) Anabaena (R) Spirogyra (E) Agaricus

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*Space For Rough Work*

9. What is a tonoplast?  
 (F) Outer membrane of mitochondria  
 (T) Inner membrane of chloroplast  
 (R) Membrane boundary of the vacuole of plant cell  
 (E) Cell membrane of a plant cell
10. \_\_\_\_\_ is not found in xylem tissues.  
 (F) Sieve tubes (T) Xylem parenchyma  
 (R) Tracheids (E) Vessels
11. Match the following and choose the correct option from below:

Column-I		Column-II	
(a)	Meristem	(i)	Photosynthesis, storage
(b)	Parenchyma	(ii)	Mechanical support
(c)	Collenchyma	(iii)	Actively dividing cells
(d)	Sclerenchyma	(iv)	Stomata
(e)	Epidermal tissue	(v)	Scleireids

- (F) (a)-(i); (b)-(iii); (c)-(v); (d)-(ii); (e)-(iv) (T) (a)-(iii); (b)-(i); (c)-(ii); (d)-(v); (e)-(iv)  
 (R) (a)-(v); (b)-(iii); (c)-(i); (d)-(ii); (e)-(iv) (E) (a)-(i); (b)-(v); (c)-(iii); (d)-(ii); (e)-(iv)
12. Which of the following tissues has dead cells?  
 (F) Parenchyma (T) Sclerenchyma (R) Collenchyma (E) Epithelial tissue
13. Which of the following is not true of a eukaryotic cell?  
 (F) Cell wall is made up of peptidoglycans  
 (T) 80S type of ribosomes are present in the cytoplasm  
 (R) Mitochondria contain circular DNA  
 (E) Membrane bound organelles are present
14. Who explained that new cells are formed from pre-existing cells?  
 (F) Theodore Schwann (T) Schleiden and Schwann  
 (R) Robert Hooke (E) Rudolf Virchow

### SECTION – V (Mathematics)

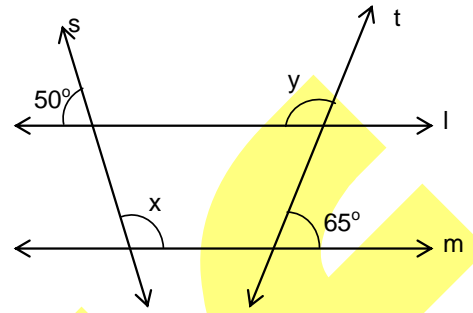
1. If  $x = \frac{1}{2 - \sqrt{3}}$ , then the value of  $x^2 - 4x - \sqrt{3}$  will be \_\_\_\_\_.  
 (F)  $1 - \sqrt{3}$  (T)  $-1 + \sqrt{3}$  (R)  $-1 - \sqrt{3}$  (E)  $1 + \sqrt{3}$
2. If  $x - \frac{1}{x} = 3$ , then find value of  $x^3 - \frac{1}{x^3}$ ?  
 (F) 27 (T) 36 (R) 38 (E) none of these

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*Space For Rough Work*

3. If  $5^n = 200$  then find value of  $5^{n-2}$  ?  
 (F) 7 (T) 10 (R) 8 (E) 9

4. In the given figure,  $l \parallel m$ . Find  $x - y$ .  
 (F)  $0^\circ$  (T)  $15^\circ$   
 (R)  $20^\circ$  (E)  $25^\circ$

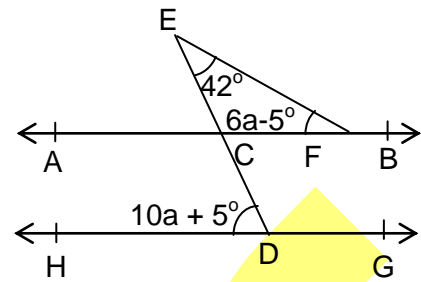


5. Simplifying  $\frac{2^n + 2^{n-1}}{2^{n+1} - 2^n}$  we get:  
 (F)  $\frac{1}{2}$  (T)  $\frac{3}{2}$  (R)  $\frac{1}{2}(2^n - 1)$  (E)  $\frac{3}{2}(2^n + 1)$
6. Find the product of zeros of quadratic polynomial with rational coefficients whose one zero is  $3 + \sqrt{2}$ .  
 (F) 2 (T) 0 (R) 7 (E) none of these
7. If  $64^{2x-5} = 4 \times 8^{x-5}$ , then the value of x is \_\_\_\_\_.  
 (F)  $\frac{17}{9}$  (T)  $\frac{17}{10}$  (R)  $\frac{20}{9}$  (E)  $\frac{9}{17}$
8. Find the number of decimal places after which decimal expansion of  $\frac{23}{2^6 \times 5^4}$  will terminate.  
 (F) 3 (T) 5 (R) 4 (E) 6
9. Value of  $(x+y)^{-1}(x^{-1}+y^{-1})$  is \_\_\_\_\_.  
 (F) 1 (T)  $(x+y)^2$  (R)  $x^{-1}y^{-1}$  (E)  $(xy)^{-1}(x+y)^{-1}$

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*Space For Rough Work*

10. In the given figure,  $AB \parallel HG$ ,  $\angle CEF = 42^\circ$ ,  $\angle EFC = 6a - 5^\circ$  and  $\angle CDH = 10a + 5^\circ$  then the value of 'a' is \_\_\_\_\_.
- (F) 8 (T) 9  
(R) 7.5 (E) 10



11.  $f(x) = x^4 - 2x^3 + 3x^2 - ax + b$  leaves remainder 5 and 19 on division by  $(x - 1)$  and  $(x + 1)$  respectively. Find the remainder when  $f(x)$  is divided by  $(x - 2)$ .
- (F) 5 (T) 10 (R) 9 (E) 8
12. The smallest number from among  $\sqrt{2}$ ,  $\sqrt[4]{3}$ ,  $\sqrt[3]{4}$  and  $\sqrt[6]{5}$  is \_\_\_\_\_.
- (F)  $\sqrt{2}$  (T)  $\sqrt[4]{3}$  (R)  $\sqrt[3]{4}$  (E)  $\sqrt[6]{5}$
13. If  $\frac{3\sqrt{2} + 2\sqrt{3}}{5\sqrt{2} - 4\sqrt{3}} = x + y\sqrt{6}$ , then the value of  $(x - y)$  is \_\_\_\_\_.
- (F) 16 (T) 38 (R) 22 (E) 21
14.  $\frac{1}{\sqrt{9} - \sqrt{8}} - \frac{1}{\sqrt{8} - \sqrt{7}} + \frac{1}{\sqrt{7} - \sqrt{6}} - \frac{1}{\sqrt{6} - \sqrt{5}} + \frac{1}{\sqrt{5} - \sqrt{4}} = ?$
- (F) 0 (T)  $\frac{1}{3}$  (R) 1 (E) 5
15. If  $5^{x+3} = 25^{3x-4}$  then  $x = ?$
- (F)  $\frac{5}{11}$  (T)  $\frac{11}{5}$  (R)  $\frac{11}{3}$  (E)  $\frac{13}{5}$
16. If  $5^{2m-1} = 25^{m-1} + 100$ , then the value of  $3^{2+m}$  is \_\_\_\_\_.
- (F) 27 (T) 81 (R) 9 (E) 343
17.  $(a^2 - b^2)^3 + (b^2 - c^2)^3 + (c^2 - a^2)^3 = k(a^2 - b^2)(b^2 - c^2)(c^2 - a^2)$  find the value of k.
- (F) 3 (T) 7 (R) 9 (E) 6
18. If a, b and c are all real  $a^2 + b^2 + c^2 + 4 = ab + bc + 2c + 2a$ , then find value of  $a + b + c$ .
- (F) 3 (T) 12 (R) 6 (E) 8

Space For Rough Work



19. If an angle is  $24^\circ$  more than half of its complement then the angle is \_\_\_\_\_.  
 (F)  $14^\circ$  (T)  $38^\circ$  (R)  $46^\circ$  (E)  $76^\circ$
20. Find the remainder if  $f(x) = 2x^2 + (2\sqrt{2} - \sqrt{3})x - \sqrt{16}$  is divided by  $(2x - \sqrt{3})$   
 (F) 0 (T) 5 (R) 1 (E) 7

### SECTION – VI (Social Science)

1. Which social class made up the majority of the French population during the Revolution?  
 (F) Nobility (T) Clergy (R) Bourgeoisie (E) Peasants
2. The Declaration of the Rights of Man and of the Citizen was influenced by which other significant document?  
 (F) Magna Carta (T) Code of Hammurabi  
 (R) Bill of Rights (E) Communist Manifesto
3. What economic crisis led to the calling of the Estates-General in 1789?  
 (F) Crop failures (T) Rise in taxation  
 (R) Financial bankruptcy (E) Inflation
4. Who were the sans-culottes during the French Revolution?  
 (F) Nobles who supported the revolution  
 (T) Peasants who rebelled against the monarchy  
 (R) Middle-class merchants  
 (E) Radical urban workers
5. Which assembly abolished the feudal system in France?  
 (F) Estates-General (T) National Assembly  
 (R) Legislative Assembly (E) National Convention
6. Which revolutionary leader is associated with the motto "Liberty, Equality, Fraternity"?  
 (F) Maximilien Robespierre (T) Georges Danton  
 (R) Jean-Paul Marat (E) Napoleon Bonaparte
7. The three main social classes in France before the Revolution were known as:  
 (F) Nobles, Bourgeoisie, Proletariat (T) Clergy, Nobility, Peasantry  
 (R) Aristocrats, Serfs, Middle class (E) Monarchs, Bourgeoisie, Proletariat
8. The Declaration of the Rights of Man and of the Citizen proclaimed:  
 (F) The divine right of kings  
 (T) The supremacy of the clergy  
 (R) The equality of all citizens before the law  
 (E) The absolute power of the monarchy

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*Space For Rough Work*

9. The period of the Directory in France came after:  
 (F) The Reign of Terror (T) The Storming of the Bastille  
 (R) The Tennis Court Oath (E) The execution of Louis XVI
10. Which work is attributed to John Locke?  
 (F) The Spirit of the Laws (T) Two Treatises on Government  
 (R) The Social Contract (E) Das Capital
11. Who said “ the task of representing the people has to be given to the rich”?  
 (F) Mirabeau (T) Jean Paul Marat  
 (R) Rousseau (E) Georges Denton
12. Who wrote the influential pamphlet- ‘What is the Third Estate’?  
 (F) Mirabeau (T) Jean Paul Marat  
 (R) Abbe Sieyes (E) Georges Denton
13. Which group of people did not join the Jacobin Club?  
 (F) Artisans (T) Shopkeepers  
 (R) Daily wage workers (E) Men with property
14. Upon becoming free, slave wore  
 (F) Blue Cap (T) Red Cap (R) White Cap (E) Green Cap
15. Which of the following decisions was taken by the convention?  
 (F) Declared France as a constitutional monarchy  
 (T) Abolished the Monarchy  
 (R) All men and women above 21 years got right to vote  
 (E) Declared France a republic
16. What does “Taille” refer to?  
 (F) Tax levied on clothing (T) Tax levied on property  
 (R) Tax levied on income (E) Tax to be paid directly to the state
17. Who were the main groups within the third estate that advocated for social and economic change?  
 (F) Peasants and workers  
 (T) Clergy and nobility  
 (R) Middle class and educated professionals  
 (E) Merchants and manufacturers
18. What governmental model did Montesquieu propose in “The Spirit of the Laws”?  
 (F) Monarchy (T) Oligarchy  
 (R) Democracy (E) Separation of powers
19. What fueled the turmoil in France during the drafting of the constitution by the National Assembly?  
 (F) Economic prosperity  
 (T) Severe winter and bad harvest leading to a rise in bread prices  
 (R) Social equality  
 (E) Increase in government efficiency
20. What decree did the National Assembly pass on the night of 4 August 1789?  
 (F) A decree granting more power to the monarchy  
 (T) A decree abolishing the feudal system of obligations and taxes  
 (R) A decree imposing stricter regulations on the clergy  
 (E) A decree banning all political parties

21. What does the term "Chateau" refer to?  
 (F) A type of bread  
 (T) A castle or stately residence belonging to a king or a nobleman  
 (R) A form of government  
 (E) A type of military unit
22. The Southern latitude of India is \_\_\_\_\_  
 (F) 8°4'N (T) 37°6'N (R) 68°7'E (E) 97°25'E.
23. The land mass of India has an area of \_\_\_\_\_ million square km.  
 (F) 32.8 (T) 328 (R) 3.28 (E) 0.328
24. India has a land boundary of about \_\_\_\_\_ km  
 (F) 16,520 (T) 14,200 (R) 7,516.6 (E) 15,200
25. When Suez Canal open \_\_\_\_\_  
 (F) 1869 (T) 1879 (R) 1870 (E) 1845
26. Which of the following state do not share border with Pakistan?  
 (F) Gujarat (T) Rajasthan (R) Punjab (E) Haryana
27. India's southern neighbours across the sea consist of the two island countries, namely Sri Lanka and \_\_\_\_\_.  
 (F) Myanmar (T) Bangladesh (R) Maldives (E) Indonesia
28. Which of the following rivers originates from the Amarkantak plateau?  
 (F) Ganga (T) Godavari (R) Narmada (E) Krishna
29. The Kaveri River flows through which states of India?  
 (F) Andhra Pradesh and Tamil Nadu (T) Tamil Nadu and Karnataka  
 (R) Karnataka and Andhra Pradesh (E) Andhra Pradesh and Telangana
30. The Narmada and Tapti rivers flow into which body of water?  
 (F) Arabian Sea (T) Bay of Bengal (R) Indian Ocean (E) Gulf of Cambay
31. The river known as the "Dakshin Ganga" (South Ganga) is:  
 (F) Godavari (T) Krishna (R) Mahanadi (E) Tapti
32. The river that flows through the Thar Desert in India is:  
 (F) Yamuna (T) Betwa (R) Sabarmati (E) Luni
33. The river that forms the famous Bhakra Nangal Dam in India is:  
 (F) Yamuna (T) Sutlej (R) Beas (E) Raavi
34. What is the aim of the National Rural Employment Guarantee Act (NREGA)?  
 (F) To promote industrial growth  
 (T) To provide employment opportunities in rural areas  
 (R) To improve agricultural productivity  
 (E) To conserve natural resources
35. Which of the following is NOT a factor that influences human capital formation?  
 (F) Education and healthcare facilities (T) Government policies  
 (R) Cultural and social factors (E) None of the above
36. The Gross Enrolment Ratio (GER) in higher education in the age group of 18 to 23 years is \_\_\_\_\_ in 2019–20  
 (F) 24% (T) 25% (R) 26% (E) 27%

37. In Pakistan, General Pervez Musharraf led a military coup in  
(F) October 1999 (T) November 1999  
(R) September 1998 (E) November 2002
38. Since its independence in 1930, Mexico holds elections after \_\_\_\_\_ to elect its President  
(F) every seven years (T) every five years  
(R) every six years (E) every four years
39. Which is the main production activity in Palampur?  
(F) Dairy (T) Rearing of animals  
(R) Farming (E) Construction of roads
40. The Green Revolution was started in the late  
(F) 1970s (T) 1980s  
(R) 1990s (E) 1960s