

# SJMSOM Ph.D. Entrance Test

(SAMPLE PAPER)

Time: 1 hour

Maximum Marks: 40

## General Instructions

1. This test booklet contains four sections with a total of 40 questions.
2. Each section has 10 questions with each carrying one mark.
3. Answers are to be provided in the last sheet of the test booklet by giving the appropriate choice among the given options.
- 4. For every incorrect answer, there will be a negative marking of -1/4.**
- 5. Calculators and mobile phones are not allowed.**
6. All rough work should be done only on the blank pages provided for this purpose.

## Section I: ENGLISH Comprehension

**Question (Q1 and Q2) is based on the following passage.**

Consider the humble jellyfish. Headless, spine-less, without a heart or brain, it has such a simple exterior that it seems the most primitive of creature. Unlike its sessile (attached to a surface, as an oyster is attached to its shell) relatives whose stalks cling to seaweed or tropical coral reefs, the free-swimming jellyfish, or medusa, drifts along the ocean shore, propelling itself by pulsing, muscular contractions of its bell-shaped body. Yet beneath the simple surface of this aimlessly drifting, supposedly primitive creature is an unusually sophisticated set of genes, as recent studies of the invertebrate animal phylum Cnidaria reveal.

1) Which assertion about jellyfish is supported by the passage?

- A) They move at rapid rate.
- B) They are cowardly.
- C) They have lack mobility.
- D) They have a certain degree of intelligence.
- E) They are unexpectedly complex.

2) The last sentence of the passage serves primarily to

- A) explain the origin of a term
- B) contradict an assumption
- C) provide an example
- D) cite a well-known fact
- E) describe a process

**The following sentence contains two blanks; each blank corresponds to a word or a set of words that has been left out. Select the alternative from the ones given below each sentence that best complete the sentence**

3. Those interested in learning more about how genetics applies to trees will have to \_\_\_\_\_ the excellent technical journals where most of the pertinent material is \_\_\_\_\_.

- A) subscribe to ... ignored
- B) suffer through ... located
- C) rely on ... unrepresented
- D) resort to... found
- E) see through ... published

4) Rent control restrictions on small apartment owners may unfortunately \_\_\_\_\_ rather than alleviate housing problems.

- A) resolve; B) diminish; C) castigate; D) minimize; E) exacerbate

### **5. Choose the correct alternative**

COMMAND: REQUEST

- (A) presume: inquire
- (B) recommend: propose
- (C) summon: invite

- (D) refuse: rebel  
 (E) authorize: permit

## SECTION 2: LOGICAL REASONING

Answer questions (Q6 and Q7) based on the following information:

The office staff of an organization presently consists of three accountants (*A*, *B* and *C*) and five secretaries (*D*, *E*, *F*, *G* and *H*). Management is planning to open a new office in another city using **three** secretaries and **two** accountants of the present staff. To do so they plan to separate certain individuals who do not function well together. The following guidelines were established to set up the new office.

Accountants *A* and *C* are constantly finding fault with one another and should not be sent as a team to the new office.

*C* and *E* function well alone but not as a team. They should be separated.

*D* and *G* have not been in speaking terms for many months. They should not go together.

Since *D* and *F* have been competing for promotion, they should not be a team.

6. If *A* is to be moved as one of the accountants, which of the following CANNOT be a possible working unit?

- (A) *ABDEH*      (B) *ABDGH*      (C) *ABEFH*      (D) *ABEGH*

7. If *C* and *F* are moved to the new office, how many combinations are possible?

- (A) 1    (B) 2    (C) 3    (D) 4

8. In a code, South-East becomes West; North-East becomes South and so on. What will West become?

- (A) South-East.      (B) East      (C) North-East      (D) North

## Section III: Quantitative

9. If the point (3, *y*) lies on the line joining (0, 3/2) and (9/4, 0), then *y* =

- A. -7/2  
 B. -2  
 C. -1/2  
 D. 1/2  
 E. 3/2

10. If both *a* and *b* belong to the set {1,2,3,4}, then the number of equations of the form  $ax^2 + bx + 1 = 0$  having real roots is

- A. 6  
 B. 7  
 C. 10  
 D. 12

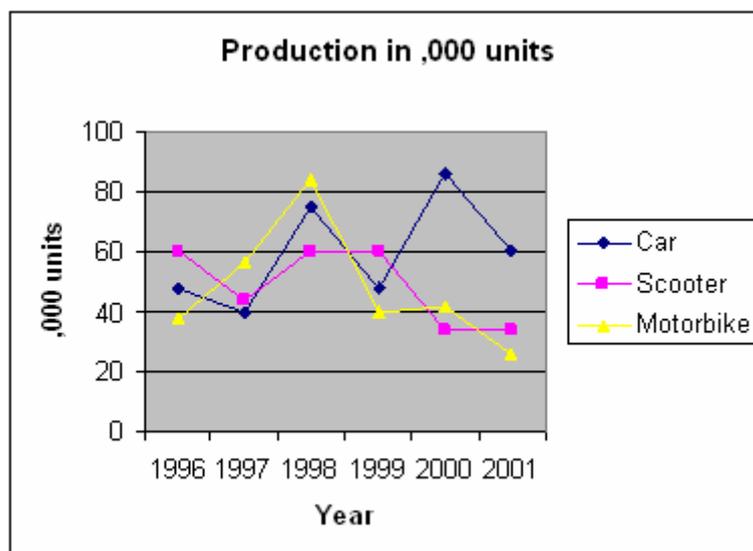
11. If  $x, y$  and  $z$  are distinct prime numbers, then
- A.  $x, y$  and  $z$  may be in A.P but not in G.P.
  - B.  $x, y$  and  $z$  may be in G.P but not in A.P.
  - C.  $x, y$  and  $z$  can neither be in A.P, nor in G.P
  - D. none of these
12. The points  $(-a, -b), (0, 0), (a, b)$  and  $(a^2, ab)$  are:
- A. Collinear
  - B. Vertices of a parallelogram
  - C. Vertices of a rectangle
  - D. None of these
13. A box contains fifteen cards numbered consecutively from 1 to 15. If 9 cards are taken random from this box without replacement, what is the probability that the median of the numbers selected is 7?
- A.  $6/143$
  - B.  $30/143$
  - C.  $8/121$
  - D.  $5/19$
  - E. None of these
14. If  $f(x) = \begin{cases} x & \text{for } x < 1 \\ x - 1 & \text{for } x \geq 1 \end{cases}$ , then  $\int_0^2 x^2 f(x) dx =$
- A. 1
  - B.  $4/3$
  - C.  $5/3$
  - D.  $5/2$
  - E. 4

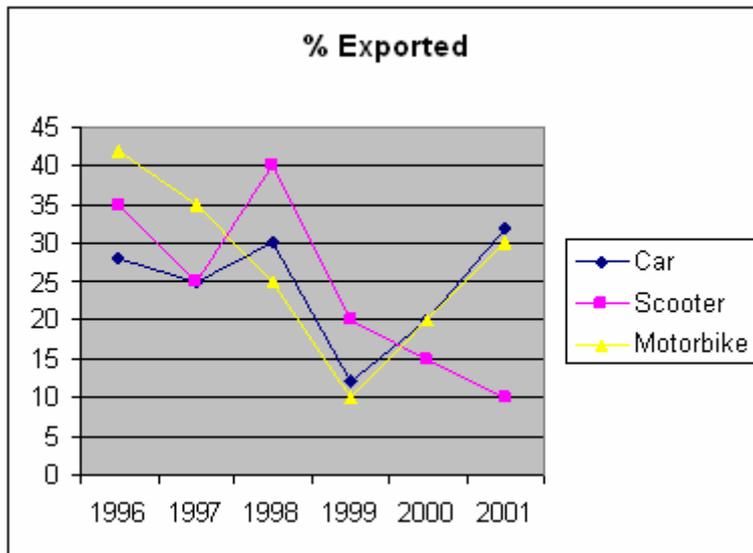
**Section IV: Data Interpretation**

15.  $w, x, y$  and  $z$ , are market shares of four players in the Indian aviation industry. Who has the largest market share?
- (1)  $y < z < x$   
 (2)  $x$  had a market share of 25 percent
- A. Statement 1 alone is sufficient but statement 2 alone is not sufficient to answer the question asked.  
 B. Statement 2 alone is sufficient but statement 1 alone is not sufficient to answer the question asked.  
 C. Both statements 1 and 2 together are sufficient to answer the question but neither statement is sufficient alone.  
 D. Each statement alone is sufficient to answer the question.  
 E. Statements 1 and 2 are not sufficient to answer the question asked and additional data is needed to answer the statements.

16. What is the average (arithmetic mean) of  $x$  and  $y$ ?
- (1)  $x/2 + y/2 = 10$   
 (2)  $x = 2y$
- A. Statement 1 alone is sufficient but statement 2 alone is not sufficient to answer the question asked.  
 B. Statement 2 alone is sufficient but statement 1 alone is not sufficient to answer the question asked.  
 C. Both statements 1 and 2 together are sufficient to answer the question but neither statement is sufficient alone.  
 D. Each statement alone is sufficient to answer the question.  
 E. Statements 1 and 2 are not sufficient to answer the question asked and additional data is needed to answer the statements

**Study the following line graph which show the production  $n$  (in'000 units) and percentage exported of scooter, motorbikes and cars respectively over the years.**





17. In which of the following years was the production of cars more than 50% of the total production?

- (A) 2000
- (B) 2001
- (C) 1998
- (D) 1996

Questions 18 is based on the following table.

Income (in lakhs of rupees)	Tax (in rupees)
0-4	10% of income
4-6	40000+20% of income over 4 lakhs
6-8	80000+30% of income over 6 lakhs
8-10	140000+40% of income over 8 lakhs
10-15	220000+50% of income over 10 lakhs
15-25	470000+ 60% of income over 15 lakhs
25-50	1070000+70% of income over 25 lakhs

18. How much tax is due on an income of Rs 7.5 lakhs?

- A. 75000
- B. 80000
- C. 125000
- D. 150000
- E. 225000

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