



**INDIAN INSTITUTE OF SCIENCE  
BANGALORE - 560012**

**ENTRANCE TEST FOR ADMISSIONS - 2010**

**Program : Research  
Entrance Paper : Management Studies  
Paper Code : MG**

Day & Date  
**SUNDAY, 25<sup>TH</sup> APRIL 2010**

Time  
**9.00 A.M. TO 12.00 NOON**

Directions: Read the following passage carefully and answer the questions 1-5 based on what is *stated* and *implied* in them.

The rich analyses of Fernand Braudel and his fellow Annales historians have made significant contributions to historical theory and research. In a departure from traditional historical approaches, the Annales historians assume (as do Marxists) that history cannot be limited to a simple recounting of conscious human actions, but must be understood in the context of forces that underlie human behavior. Braudel was the first Annales historian to gain widespread support for the idea that history should synthesize data from social sciences, especially economics, to provide a broader historical view of human societies over time (although Febvre and Bloch, founders of the Annales school, originated this approach).

Braudel conceived of history as the dynamic interaction of three temporalities. The first of these, the *evenementielle*, involved short-lived dramatic "events," such as battles, revolutions, and the actions of great men, which had preoccupied traditional historians like Carlyle. *Conjonctures* was Braudel's term for the larger, cyclical processes that might last up to half a century. The *longue duree*, a historical wave of great length, was for Braudel the most fascinating of the three temporalities. Here he focused on those aspects of everyday life that might remain relatively unchanged for centuries. What people ate, what they wore, their means and routes of travel-for Braudel these things create "structures" that define the limits of potential social change for hundreds of years at a time.

Braudel's concept of the *longue duree* extended the perspective of historical space as well as time. Until the Annales school, historians had taken the juridical political unit-the the nation-state, duchy, or whatever-as their starting point. Yet, when such enormous timespans are considered, geographical features may have more significance for human populations than national borders. In his doctoral thesis, a seminal work on the Mediterranean during the reign of Philip II, Braudel treated the geohistory of the entire region as a "structure" that exerted myriad influences on human lifeways since the first settlements on the shores of the Mediterranean Sea.

And so the reader is given such arcane information as the list of products that came to Spanish shores from North Africa, the seasonal routes followed by Mediterranean sheep and their shepherds, and the cities where the best ship timber could be bought.

Braudel has been faulted for the imprecision of his approach. With his Rabelaisian delight in concrete detail, Braudel vastly extended the realm of relevant phenomena; but this very achievement made it difficult to delimit the boundaries

of observation, a task necessary to beginning any social investigation. Further, Braudel and other Annales historians minimize the differences among the social sciences. Nevertheless, the many similarly designed studies aimed at both professional and popular audiences indicate that Braudel asked significant questions which traditional historians had overlooked.

1. The primary purpose of the passage is to
  - [A] evaluate Braudel's criticisms of traditional and Marxist historiography
  - [B] contrast the perspective of the *longue duree* with the actions of major historical figures
  - [C] illustrate the relevance of Braudel's concepts to other social sciences
  - [D] outline some of Braudel's influential conceptions and distinguish them from conventional approaches
  
2. The author refers to the work of Febvre and Bloch in order to
  - [A] illustrate the limitations of the Annales tradition of historical investigation
  - [B] debate the need for combining various sociological approaches
  - [C] show that previous Annales historians anticipated Braudel's focus on economics
  - [D] demonstrate that historical studies provide broad structures necessary for economic analysis
  
3. According to the passage, all of the following are aspects of Braudel's approach to history EXCEPT that he
  - [A] studied social and economic activities that occurred across national boundaries
  - [B] pointed out the link between increased economic activity and the rise of nationalism
  - [C] examined seemingly unexciting aspects of everyday life
  - [D] visualized history as involving several different time frames

4. The passage suggests that, compared to traditional historians, Annales historians are
- [A] more interested in other social sciences than in history
  - [B] more critical of the achievements of famous historical figures
  - [C] more skeptical of the validity of most economic research
  - [D] more interested in the underlying context of human behavior provided by social structure
5. The author is critical of Braudel's perspective for which of the following reasons?
- [A] It assumes a greater similarity among the social sciences than actually exists.
  - [B] It fails to consider the relationship between short-term events and long-term social activity.
  - [C] It clearly defines boundaries for social analysis.
  - [D] It attributes too much significance to conscious human actions.

**Directions:** For questions 6-10 select the word that is most nearly *opposite* in meaning to the given word.

6. OPTIMUM

- [A] pessimism
- [B] least favorable
- [C] mumble
- [D] involuntary

7. OPPORTUNE

- [A] neglected
- [B] fortune
- [C] misfortune
- [D] ill-chosen

8. LACONIC

- [A] open wound .
- [B] verbose
- [C] harmonic
- [D] taciturn

9. LACHRYMOSE

- [A] servile
- [B] tearful
- [C] morose
- [D] cheering

10. OPIATE

- [A] despair
- [B] distinctive
- [C] stimulant
- [D] distress

Directions: Each sentence below has one or two blanks, each blank indicating that something has been omitted. Beneath the sentence are four lettered words or sets of words. Choose the one that best fits the meaning of the sentence as a whole.

11. While \_\_\_\_\_ in his own approach to philosophy, the scholar was, illogically, \_\_\_\_\_ his colleagues who averred that a seeker of knowledge must be free to select such doctrines as pleased him in every school.

- [A] indiscriminate ... supportive of
- [B] eclectic ... intolerant of
- [C] theoretic ... impatient with
- [D] speculative ... cordial to

12. When those whom he had injured accused him of being a \_\_\_\_\_, he retorted curtly that he had never been a quack.
- [A] libertine
  - [B] sychophant
  - [C] charlatan
  - [D] reprobate
13. It is somewhat paradoxical that, nine times out of ten, the coarse word is the word that \_\_\_\_\_ an evil and the \_\_\_\_\_ word is the word that excuses it.
- [A] condemns ... refined
  - [B] exonerates ... vulgar
  - [C] contradicts ... crass
  - [D] admits ... clever
14. That Clement would reclaim psychoanalysis as a healing profession is the \_\_\_\_\_ of her argument, but it is exactly in this part of her critique, translated to the American psychoanalytic milieu, that her shafts \_\_\_\_\_.
- [A] crux ... fall down
  - [B] thrust ... glance away
  - [C] implication ... break down
  - [D] basis ... strike home
15. While the disease is in \_\_\_\_\_ state it is almost impossible to determine its existence by \_\_\_\_\_.
- [A] a latent ... observation
  - [B] a dormant ... postulate
  - [C] a critical ... examination
  - [D] an acute ... analysis

Directions: In each of the following questions (16-20), a related pair of words or phrases is followed by four pairs of words or phrases. Select the pair that best expresses a relationship similar to that expressed in the original pair.

16. BLEAT : SHEEP ::

- [A] bask : lizard
- [B] preen : peacock
- [C] chirp : sparrow
- [D] slither : snake

17. CHIDE : PILLORY ::

- [A] exalt : venerate
- [B] humor : mollycoddle
- [C] castigate : punish
- [D] quibble : cavil

18. HERO : ACCOLADE ::

- [A] mentor : advice
- [B] suitor : proposal
- [C] laughingstock : ridicule
- [D] defendant : indictment

19. RIDER : BILL ::

- [A] purchase : receipt
- [B] endorsement : policy
- [C] violation : ordinance
- [D] summons : citation

20. SHOT : SALVO ::

- [A] sword : hilt
- [B] ball : musket
- [C] arrow : volley
- [D] wound : ointment

**Directions:** Each of the following questions (21-25) consists of a sentence, in which some part is *italicized*. Each sentence is followed by four alternative versions of the underlined portion. Select the alternative that you consider correct and effective according to standards of written English.

21. Before starting a program of diet and exercise, *a consultation with your physician is advisable.*

- [A] a consultation with your physician is advisable
- [B] it is advisable to have a consultation with your physician
- [C] a physician's consultation is advisable
- [D] you should consult a physician

22. Economic conditions demand *that we not only cut wages and prices but also reduce inflation-raised tax rates.*

- [A] that we not only cut wages and prices but also
- [B] not only cutting wages and prices but also to
- [C] not only to cut wages and prices but also to
- [D] not only to cut wages and prices but that we also

23. Today this is a totally different world *than we have seen* in the last decade.

- [A] than we have seen
- [B] from what we have seen
- [C] from what we seen
- [D] then what we seen



24. Ever since the bombing of Cambodia, there has been much opposition *from* *they who maintain that it was an unauthorised war*.
- [A] from they who maintain that it was an unauthorized war
  - [B] from they who maintain that it had been an unauthorized war
  - [C] from those who maintain that it was an unauthorized war
  - [D] from those maintaining that it is unauthorized
25. Most students like to read *these kind of books* during their spare time.
- [A] these kind of books
  - [B] these kind of book
  - [C] this kind of book
  - [D] this kinds of books
26. In  $\triangle ABC$ ,  $AB = AC$ . All of the following statements are true except
- [A]  $AC < AB + BC$
  - [B]  $AC < AB + AC$
  - [C]  $AC + BC = AB + BC$
  - [D]  $BC + AC > AB + BC$
27. Which of the following numbers is the largest?
- [A]  $(2 + 2 + 2)^2$
  - [B]  $((2 + 2)^2)^2$
  - [C]  $(2 \times 2 \times 2)^2$
  - [D]  $2 + 2^2 + (2^2)^2$

Answer questions 28 to 30 based on the following information.

In a round robin cricket match 5 teams are playing. Each team is required to play each other once. The current position for each of the team is as follows.

Team	Played	Won	Tie	Lost
B	3	3	0	0
A	3	2	1	0
C	3	1	1	1
D	2	0	0	2
E	3	0	0	3

28. How many more matches are to be played?

- [A] 6
- [B] 3
- [C] 2
- [D] 4

29. Which team will B play next?

- [A] A
- [B] C
- [C] E
- [D] None

30. Which team has E not played?

- [A] A
- [B] B
- [C] D
- [D] None

31. Given that  $a$  and  $b$  are real numbers, let  $f(a, b) = ab$  and let  $g(a) = a^2 + 2$ . Then  $f(3, g(3)) =$
- [A]  $3a^2 + 2$   
[B]  $3a^2 + 6$   
[C] 27  
[D] 33
32. The cost of manufacturing  $x$  refrigerators is  $9000 + 400x$ . The amount received when selling these  $x$  refrigerators is  $500x$ . What is the least number of refrigerators that must be manufactured and sold so that the amount received is at least equal to the manufacturing cost?
- [A] 10  
[B] 18  
[C] 45  
[D] 90
33. In a computer programming language only the following four operations are performed  $\leftarrow, \oplus, \otimes, \oslash$  where  $X \leftarrow Y$  implies that  $X$  takes on the value of  $Y$ , and  $\oplus, \otimes, \oslash$  have the meaning of addition, multiplication, and division respectively. What will be the value of  $X$  after the following set of instructions.
- (1)  $X \leftarrow a \otimes b$   
(2)  $Y \leftarrow X \oslash b$   
(3)  $Y \leftarrow Y \oslash b$   
(4)  $X \leftarrow X \otimes Y$
- [A]  $a^2$   
[B]  $b^2$   
[C]  $a/b$   
[D]  $b/a$

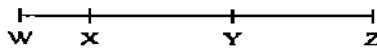
34. If it takes 3 hours for machine A to produce  $N$  identical parts, and it takes machine B only 2 hours to do the same job, how many hours would it take to do the job if both machines worked simultaneously?

- [A]  $\frac{5}{6}$
- [B]  $\frac{6}{5}$
- [C]  $\frac{5}{4}$
- [D]  $\frac{4}{5}$

35. In a survey of 250 European travelers, 93 have traveled to Africa, 155 have traveled to Asia, and 70 have traveled to both these continents. How many of the travelers have traveled neither to Africa nor Asia?

- [A] 72
- [B] 102
- [C] 148
- [D] 150

36. On line segment  $WZ$  shown below, if  $WY = 21$ ,  $XZ = 26$ , and  $YZ$  is twice  $WX$ , what is the value of  $XY$ ?



- [A] 10
  - [B] 11
  - [C] 16
  - [D] It cannot be determined from the information given
37. Before Maria changed jobs, her salary was 24% more than Julio's salary. After Maria changed jobs, her new salary was 24% less than her old salary.
- [A] Julio's salary  $>$  Maria's new salary
  - [B] Julio's salary  $<$  Maria's new salary
  - [C] Julio's salary = Maria's new salary
  - [D] Relationship cannot be determined from the information given

38. If  $xy \neq 0$ ,  $\frac{x-1}{xy} =$

[A]  $\frac{1}{x} - \frac{1}{xy}$

[B]  $\frac{x}{y} - \frac{1}{xy}$

[C]  $\frac{1}{y} - \frac{1}{xy}$

[D]  $\frac{1}{xy} - \frac{1}{y}$

39. A certain cake recipe states that the cake should be baked in a pan 8 inches diameter. If Jules wants to use the recipe to make a cake of the same depth but 12 inches in diameter, by what factor should he multiply the recipe ingredients?

[A] 2.5

[B] 2.25

[C] 1.5

[D] 1.33

Answer questions 40 to 44 based on the following information.

The gross energy generated in India by various means during the last 9 years is given in the following table.

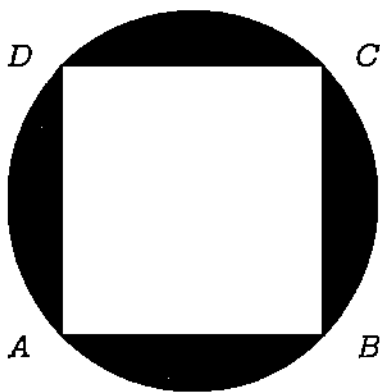
Year	Utilities			Non-Utilities
	Hydro	Thermal	Nuclear	
1994-95	82.7	262.1	5.6	35.1
1995-96	72.6	299.3	8.0	38.2
1996-97	68.9	317.9	9.1	40.8
1997-98	74.6	337.0	10.1	44.1
1998-99	82.9	353.7	11.9	48.4
1999-00	80.6	386.8	13.3	51.5
2000-01	74.5	408.1	16.9	55.0
2001-02	73.5	424.4	19.5	61.7
2002-03	64.0	449.3	19.4	63.8

40. If the Non-utilities had tripled their production in the last nine years then the gross energy generated in these nine years would have grown by
- [A] 60%
  - [B] 65%
  - [C] 70%
  - [D] None of the above
41. In the last 9 years, the contribution of nuclear energy to the gross production has approximately grown by
- [A] 125%
  - [B] 100%
  - [C] 150%
  - [D] None of the above
42. The fastest growing energy generating method has been
- [A] Hydro
  - [B] Thermal
  - [C] Nuclear
  - [D] Non-utilities
43. The least reliable energy generating method has been
- [A] Hydro
  - [B] Thermal
  - [C] Nuclear
  - [D] Non-utilities
44. The gross energy production over the last nine years has grown by
- [A] 50%
  - [B] 55%
  - [C] 60%
  - [D] 65%

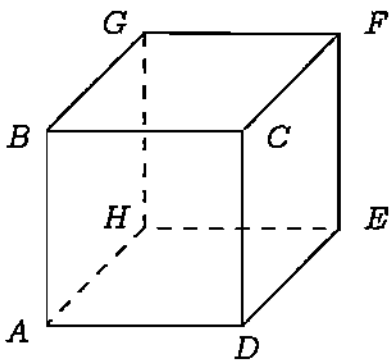
Directions: Each of the following questions (45-50), has four alternative answers. Select the correct answer.

45. In a group of people solicited by a charity, 30% contributed \$40, 45% contributed \$20, and the rest contributed \$2. If the charity received a total of \$300 from the people who contributed \$2, how much was contributed by the entire group?
- [A] \$1,200  
[B] \$2,400  
[C] \$12,600  
[D] \$12,900
46. If  $x$  is an odd integer and  $y$  is an even integer, which of the following statements are always true?
- (I)  $x + y$  is odd      (II)  $xy$  is odd      (III)  $2x + y$  is even
- [A] I only  
[B] I and III only  
[C] II and III only  
[D] II only
47. For each dollar spent by the sales department, the research department spends 20 cents. For every \$4 spent by the research department, the packing department spends \$1.50. The triple ratio of the money spent by the sales department to the money spent by the research department to the money spent by the packing department can be expressed as
- [A] 40 : 8 : 3  
[B] 20 : 4 : 1  
[C] 8 : 4 : 1  
[D] 4 : 1 : 5

48. Find the area of the shaded region in the adjoining figure. ABCD is a square with the points A, B, C, and D are points on the circle. The radius of the circle is 4.



- [A]  $16\pi - 36$   
 [B]  $16(\pi - 2)$   
 [C]  $16(\pi - 1)$   
 [D]  $16\pi - 4$
49. The figure ABCDEFGH is a cube.  $AB = 10$ . What is the length of the line segment AF?



- [A] 10  
 [B]  $10\sqrt{2}$   
 [C]  $10\sqrt{3}$   
 [D]  $10\sqrt{5}$



50. If  $8a = 6b$  and  $3a = 0$  then

[A]  $a$  and  $b$  are equal

[B]  $a = 6$

[C]  $a = 6$  and  $b = 8$

[D]  $3b = 4a$

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## PART B

ANSWER THIS PART ONLY IF YOUR  
ARE SEEKING ADMISSION TO  
RESEARCH IN MANAGEMENT

### Instructions

1. This part contains FIVE sections, each carrying a weightage of 50%(50 marks). Please answer ONLY ONE of the five sections that is relevant to your background.

Section I Business Administration  
Section II Economics  
Section III Social Work  
Section IV Psychology  
Section V Management Science

2. Answers to this section are to be written in the separate answer book provided.

## SECTION I BUSINESS ADMINISTRATION

Answer all the questions.

All questions carry equal marks

1. Marketing is the science of actualizing, the buying potential of a market for a specific product". Does this definition reflect a product, selling or marketing concept? Explain by taking an Indian example.
2. Suppose a sales person can make 1600 calls an year. If he has been writing Rs.4,20,000 worth of business a year, how many calls can the sales person make to a Rs.10000 a year account without diluting the total business returns during the year?
3. The soap market in India has seen a proliferation of brands in recent times. There are various kinds of segments - economy, value, premium, mid-price and super premium. *Dove* has positioned itself as a moisturizing bar with a high premium in the soap market. *Pond's* also has a moisturizing cream based soap at a much lower price. *Dove* during its initial launch used attractive models to convey the proposition. In recent times, it is using a "common man" appeal (the user in the TV commercial is a lady who looks like a regular consumer who says she does not have much time to care for her complexion and that *Dove* is effective). *Pond's* does not seem to have created a high visibility about its offering.

Examine the pricing approach of *Pond's* with an explanation on how it is relying on other marketing mix elements to support the pricing?

4. (a) Discuss the relationship between the order release times and lead time of orders.  
(b) What are the assumptions made in the process of developing the EOQ model?
5. (a) What is the significance of Mean Squared Error(MSE) as a measure in evaluating the accuracy of a forecasting model?  
(b) Write short notes on KANBAN and CONWIP production systems.

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## SECTION II ECONOMICS

Answer all the five questions.  
All questions carry equal marks

1. In periods of high economic growth, if the Finance Minister announces in his budget certain duty concessions for Fast Moving Consumer Goods (FMCG), how would the industry react? What would happen to consumer demand and firm revenue? Examine in the context of theories of Elasticity of demand.
2. In general, Policy Makers prefer to promote competitive markets rather than monopoly markets because the former produces much more at a much lower price compared to the latter, which generates dead-weight losses to the Society. Do you agree with this statement? Substantiate with the help of a figure.
3. In Indian consumer goods industries, companies often practice price - discrimination combined with product differentiation. What are the merits of such a combined competitive strategy to a firm? Explain with an example.
4. How would fiscal policy be more effective in tackling recessionary economic conditions compared to monetary policy? Why in developing countries like India, monetary policy is more effectively used to counter inflationary conditions relative to fiscal policy? Elucidate.
5. The Balance of Payments (BoP) of a country always remains balanced. This is true even if there are imbalances in trade account, current account and/or capital account. How are the imbalances in trade account, current account and capital account taken care of in the BoP? Explain with an example.

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## SECTION III SOCIAL WORK

Answer all the five questions.  
All questions carry equal marks

1. What is meant by Outsourcing? Critically comment about the advantages and disadvantages of this in the Indian IT sector.
2. Define field forces in the context of a small group and explain the concept of group dynamics?
3. What are the characteristics of a good questionnaire? How do you go about designing a questionnaire to measure the attitudes of workmen about safety practices in a manufacturing organization?
4. Briefly explain theories of work motivation. Illustrate any one of the theories in improving motivation in a medium size organization.
5. Discuss briefly the scope of Employment Standing Orders Act.

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## SECTION IV PSYCHOLOGY

QUESTIONS 1-10 are compulsory

10 × 2

Complete the following sentences and fill in the blanks

1. The main contribution of Elton Mayo's study was that \_\_\_\_\_.
2. The influence that low power distance *Hofstede* has on organizational structure is that \_\_\_\_\_.
3. The objectives of scientific research in Psychology are \_\_\_\_\_.
4. Persons high on the nMach scale have traits such as \_\_\_\_\_.
5. "Selective perception" refers to \_\_\_\_\_.
6. The Muller-Lyer illusion implies that humans \_\_\_\_\_.
7. Thorndike's experiments focused on \_\_\_\_\_ reinforcements and \_\_\_\_\_ conditioning.
8. The first component one addresses to change an attitude is the \_\_\_\_\_.
9. Psychometry is a field that deals with \_\_\_\_\_.
10. The two theories of personality are the \_\_\_\_\_ and \_\_\_\_\_.

Answer any five from the following six questions:

5 × 6

11. What do social learning theorists propound?
12. What are defense mechanisms? Illustrate them with examples.
13. What behavioral characteristics will a person high on nMach, nPow and nAff show?
14. What is meant by scientific research? Describe it in the context of Psychology.
15. Draw and describe a block diagram of social perception.
16. Describe any two types of psychological disorders that people in the workplace may also show.

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## SECTION V MANAGEMENT SCIENCE

Answer the following questions:

- A.1 For  $0 < t < \pi$ , the matrix  $\begin{pmatrix} \cos t & -\sin t \\ \sin t & \cos t \end{pmatrix}$  has distinct eigen values  $\lambda_1$  and  $\lambda_2$ . For what value of  $t$ ,  $0 < t < \pi$ , is  $\lambda_1 + \lambda_2 = 1$ ?
- A.2 If  $F(x) = \int_e^x \log t \, dt$  for all positive  $x$ , what is  $F'(x)$ ?

Answer any four from the following questions:

- B.1 Consider the following linear programming problem:

$$\text{minimize } z = 2x_1 + 3x_2$$

subject to

$$2x_1 + 3x_2 \leq 30$$

$$x_1 + 2x_2 \geq 10$$

$$x_1 - x_2 \geq 0$$

$$x_1 \geq 5$$

$$x_2 \geq 0$$

- (a) Solve the above problem graphically.
- (b) Write its dual problem.
- (c) Indicate the dual variables that will definitely appear in the optimal basic solution for the dual problem.

- B.2 Assume a Poisson arrival process with mean 2 per unit time. Suppose an arrival occurred at  $t = 30$ . What is the probability that an arrival will occur by  $t = 40$ ? What is the probability that an arrival will occur before  $t = 40$  and  $t = 35$ ?

Some tabulated values that might be useful:

$$t_{11,0.05} = 1.796, t_{11,0.025} = 2.201, t_{17,0.05} = 1.740, t_{17,0.025} = 2.110, t_{18,0.05} = 1.734, \\ t_{18,0.025} = 2.101, t_{19,0.05} = 1.729, t_{19,0.25} = 2.093, t_{20,0.05} = 1.725, t_{20,0.025} = 2.086$$

$$\chi_{2,0.05}^2 = 5.99, \chi_{3,0.05}^2 = 7.81, \chi_{4,0.05}^2 = 9.49$$

$$F_{3,15}^{0.05} = 3.29, F_{3,42}^{0.05} = 2.83, F_{3,45}^{0.05} = 2.81, F_{2,15}^{0.05} = 3.68, F_{2,42}^{0.05} = 3.22, F_{2,45}^{0.05} = 3.20, \\ F_{1,4}^{0.05} = 7.71, F_{2,4}^{0.05} = 6.94, F_{3,4}^{0.05} = 6.59, F_{1,5}^{0.05} = 6.61, F_{2,5}^{0.05} = 5.79, F_{3,5}^{0.05} = 5.41.$$

B.3 Consider the function

$$f(x_1, x_2, x_3) = x_1 + 2x_3 + x_2x_3 - x_1^2 - x_2^2 - x_3^2.$$

Determine if  $(1/2, 2/3, 4/3)$  is a local maximum of the above function.

B.4 Consider the inventory problem with three items. The parameters of the inventory problem are given below.

Item $i$	Setup cost	Demand per unit time	Holding cost per unit time	Storage area ft. <sup>2</sup> per unit
1	10	2	0.3	1
2	5	4	0.1	1
3	15	3	0.2	1

If the total available storage area is 25 ft<sup>2</sup>, find the optimal order quantity for each of the three items.

B.5 Efficiency of two algorithms are being compared by observing the amount of time it takes to solve a problem. Both the algorithms were applied on 12 problem instances and let  $X$  and  $Y$  denote the number of minutes it took to solve them by the two algorithms with the following raw data:

$X$	12.8	10.0	11.3	15.1	8.8	14.2	13.7	10.9	11.2	13.5	7.6	12.6
$Y$	12.2	10.1	11.1	14.7	8.8	13.9	12.9	10.4	11.4	13.1	8.0	12.1

Following summary statistics are also available:  $\bar{X} = 11.80833$ ,  $SD_X = 2.2581$ ,  $\bar{Y} = 11.55833$ ,  $SD_Y = 2.004748$ , and  $SD_D = 0.3580249$ , where  $D = X - Y$ . Is there sufficient evidence to conclude that one algorithm is superior to another?

B.6 The number of calls handled daily by three different centres of a BPO company in nearest thousands on 15 randomly selected days are as follows:

Center A	20	20	20	20	20	20	25	25	25	30	30	30	30	30
Center B	20	20	20	20	20	25	25	25	25	25	30	30	30	30
Center C	20	25	25	25	25	25	25	25	25	25	25	25	25	30

Is there any evidence in stating that the distribution of the number of calls handled by the three centres significantly differ from one another?

B.7 An experiment was conducted to study how the strength of paper is affected by Hardwood Concentration, say HC, and Cooking Time, say CT, of the raw pulp. Two observations on paper strengths were obtained for each combination of levels of two different Hardwood Concentrations and two different Cooking Times, with the following summary statistics:



HC→ CT↓	2%	8%
3 hrs.	Mean=196.3, SD=0.42	Mean=197.1, SD=0.56
4 hrs.	Mean=198.0, SD=0.48	Mean=198.5, SD=0.52

Analyse the data and write your conclusions.

- B.8 Let  $Y$  denote the average trading price per share in BSE, and  $X$  denote the average book-value of the corresponding share of 19 private sector banks during the last financial year (2004-05), both in Rs. Following summary statistics are available:  $\bar{X} = 100.34$ ,  $\bar{Y} = 183.05$ ,  $\sum(X_i - \bar{X})^2 = 167403.5$ ,  $\sum(Y_i - \bar{Y})^2 = 563317$ ,  $\sum(X_i - \bar{X})(Y_i - \bar{Y}) = 250062$ . Using a simple linear regression model forecast a 95% range for the trading price in BSE of a share of a private sector bank, given that its book-value is Rs.150.

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# PART C

## LANGUAGES

ANSWER THIS PART ONLY IF YOUR  
ARE SEEKING ADMISSION TO  
RESEARCH IN LANGUAGES

### Instructions

1. This part carries a weightage of 100% (100 marks).
2. Answers to this part are to be written in the separate answer book provided.

## SECTION I GERMAN

1. (20 Punkte) Schildern Sie über eine Sprechstunde, die aus didaktischer Perspektive Ihnen sehr gelungen ist. Warum war diese Unterrichtsstunde, nach Ihrer Meinung, erfolgreich?
2. (20 Punkte) Die Grenzen einer Kultur sind die Grenzen der Toleranz. Nehmen Sie Stellung zu dieser Aussage! Begründen Sie Ihren Standpunkt mit Beispielen!
3. (30 Punkte) Erklären Sie drei von den folgenden Begriffen im Kontext des DaF-Unterrichts in Indien!
  - (a) Interferenzprobleme
  - (b) kulturelle Prägung
  - (c) Vielsprachigkeit
  - (d) das Auswendiglernen
  - (e) regionale Lehrwerke
4. (30 Punkte) Nehmen Sie Stellung zu einer Aussage und begründen Sie Ihren Standpunkt!
  - (a) Kulturelle Unterschiede führen nicht unbedingt zu Konflikten, da man sich heutzutage der globalen Sprache Englisch bedient. Nehmen Sie Stellung zu dieser Aussage und begründen Sie Ihren Standpunkt!
  - (b) Über das Internet kann man sehr leicht mit anderen Kulturen in Verbindung treten. Aus diesem Grund erübrigen sich fremdsprachliche und kulturelle Kenntnisse im heutigen globalen Kontext. Nehmen Sie Stellung zu dieser Aussage und begründen Sie Ihren Standpunkt!

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