INDIAN INSTITUTE OF SCIENCE
BANGALORE - 560012

ENTRANCE TEST FOR ADMISSIONS - 2008

Program : Research

Entrance Paper : Management Studies

Paper Code : MG

Day & Date
SUNDAY, 27TH APRIL 2008

Time
9.00 A.M. TO 12.00 NOON

GENERAL INSTRUCTIONS

1. The question paper consists of three parts. PART A, PART B, AND PART C.

2. (a) Candidates seeking admission to **Research in Management** must compulsorily answer PART A and ONLY ONE of the sections in PART B.

    (b) Candidates with M.A. (Linguistics/German) seeking admission to **Research in Languages** must compulsorily answer ONLY PART C. Please note that such candidates <u>must not</u> attempt PART A or PART B.

3. Candidates are asked to fill in the required fields on the sheet attached to the answer book.

PART A

Analytical Ability and Management Aptitude

Instructions

1. This paper tests your analytical ability and management aptitude.
2. This section contains 50 questions and carries a weightage of *50%* (50 marks).
3. Answers to this section are to be marked in the OMR sheet provided.
4. For each question darken the appropriate bubble to indicate your answer
5. Use only HB pencils for bubbling answers.
6. Mark ONLY ONE bubble per question. If you mark more than one bubble, the question will be evaluated as incorrect.
7. If you wish to change your answer, please erase the existing mark completely before marking the *o*ther bubble.

1. What is the meaning of the word: Fortuitous

   (A) lucky
   (B) powerful
   (C) very smart
   (D) enriching

2. What is the meaning of the word: Admonition

   (A) Comment
   (B) Deep respect
   (C) Warning
   (D) Act responsibly

3. Complete the next two sentences: He wants to buy watermelons. He goes to the fruit seller and _____ the fruits available on the seller's cart.

   (A) Investigates
   (B) Examines
   (C) Discovers
   (D) Explores

4. Spot the error: Costa Rica's parks <u>are</u> like islands <u>on</u> wilderness <u>in</u> a vast sea of farmland but *do* not <u>have</u> enough guards.

   (A) Are
   (B) On
   (C) In
   (D) Have

5. Spot the error: I <u>see</u> a snake. His eyes <u>do</u> not move. Neither does the mouth, which <u>is</u> pulled back <u>inside</u> a silent grimace.

   (A) See
   (B) Do
   (C) Is
   (D) Inside

In questions 6 and 7, select the pair of words from the given option that best expresses a relationship SIMILAR to the pair in the CAPITAL letters

6. DECIMATE: CROWD

   (A) Destroy: Group
   (B) Ruin: Collection
   (C) Cut down: Structure
   (D) Reduce: Edifice

7. RESTLESS: AGITATED

    (A) Restive: Energized
    (B) Fidgety: Nervous
    (C) Twitchy: Worrying
    (D) Discontent: Excited

Questions 8 to 10 are based on the information given below:

Nobody likes to pay taxes - and most of us would agree that corporations are particularly successful in minimizing their tax. In fact, corporate lawyers and accountants have made an art form of dodging through the mazes that are most countries tax systems. Last December, for exarnple, a Norwegian court of appeals ruled that painting was an art form and painters should be exempt from value added tax. Painters working in the GST Art Gallery had refused to pay the tax of 25% on their share of the entry fee, on the basis that painters were artists and not employees. Over in Europe, Romania also faces its own unique tax problems. For every officially registered witch, who pays taxes on her mystical services, another 4000 cast their spells tax free, costing the treasury millions. In China, meanwhile, the tax office launched a drive last year. To persuade artists who earn more than $20,000 per year – a group estimated to number in million – to pay service tax. About 3000 painters volunteered in Beijing but in some cities not a single painter registered to pay. Another Chinese tax-raising idea had a very different result. Chinese, authorities in the Fujian province decided to give bonus marks in exams to schoolchildren whose parents were painters and earned more than $20,000. This caused an outrage.

8. According to the paragraph above, the Norwegian government wants to consider

    (A) Artists as a corporation
    (B) Painters as employers
    (C) Artist association as corporation
    (D) Painters as corporation

9. In the light of the reading above, identify the option which comes closest to describing the foiiowing set of words: EXEMPT: MYSTICAL: DODGING

    (A) spare: magic: escaping
    (B) free from; magical; evading
    (C) excuse: spiritual: fudging
    (D) except: supernatural: avoiding

10. The main discussion in the passage is on

    (A) Attitude of painters towards tax
    (B) Tax issues faced by various governments
    (C) Avoidance of tax by artists
    (D) Various tax drives launched by governments

Questions 11 to 13 are based on the information given below:

Behold a perfect day in the late 21" century. Your eyes open to a perfect mug of coffee made automatically by your perfect coffee maker. You work out in the gym for a perfect body, talk on the cell phone in pursuit of a perfect reception, spend 10 hours in office in perfect isolation, come back home to a perfect pizza delivered for you and go to bed for a perfect sleep. The driving force behind this perfect world we have made for ourselves is the desire to eliminate intermediaries. Most things like entertainment, health and news is routinely acquired without mediation of authorities and contact with people. What was interesting about the 18th century was that with all its efforts at human moderation it was also the great and glorious times of political and social revolutions. Community was seen as a natural consequence of human impulses. Thinkers of the 18th century asked a question that applies to the people in the 21st century. How does one live freely and comfortably in the world and at the same time live *in* the world? With all the new science and technologies that make our lives so perfect, we have misplaced the standard of basic social usefulness. We most often refuse to make use of our common characteristics: courtesies and kindnesses, an aristocracy of spirit which recognizes the pain of others.

11. Which line best describes the theme of the passage

    (A) The 21" century outlook is less sociable
    (B) 18th century human being was more free and social
    (C) 21st century human being is less sensitive
    (D) Despite high tech life, we will always need each other

12. In the light of the above passage, identify the option which contains the set of words closest in meaning to the set of words in capitals.

    ISOLATION: INTERMEDIARIES

    (A) Separation: Mediators
    (B) Remoteness: Citizens
    (C) Loneliness: Native groups
    (D) Seclusion: Communities

13. In the light of the above passage, identify the option which contains the set of words closest in meaning to the set of words in capitals.

    IMPULSE: ARISTOCRACY

    (A) Urge: Nobility
    (B) Fancy: Large communities
    (C) Inclination: Upper class attitudes
    (D) Compulsion: Decency

In Hubli, *a city of about 900,000* people in northwestern Karnataka, *ABC* realtor company calculated that a family **with** Hubli's median family income of Rs.100,000 a year, could afford to buy ABC realtor's median-priced Rs.800,000 house. This calculation was based on a 12 percent mortgage interest rate and on the realtor's assumption that a family could only afford to pay up to 25 percent of its income for housing.

14. Of the figures appearing in the passage above, which of the following four corrections given below would yield a new calculation showing that even income below that of the median family income would enable families in Hubli to afford Hubli's median-priced house?

(A) Hubli's total population is 1,000,000.
(B) Hubli's median annual family income is Rs.90,000.
(C) Families in Hubli could only afford to pay up to 22 percent of their annual income for housing.
(D) The rate at which people in Hubli had to pay mortgage interest is only 10 percent.

Psychological research indicates that College Football and Hockey players are more quickly moved to hostility and aggression than are college athletes in non-contact sports such as Sprinting and Swimming. But the researchers' conclusion - that contact sports encourage and teach participants to be hostile and aggressive - is untenable. The Football and Hockey players were probably more hostile and aggressive to begin with than the Sprinters and Swimmers.

15. Which of the following, if true, would most strengthen the conclusion drawn by the psychological researchers?

(A) The Football and Hockey players became more hostile and aggressive during the season and remained so during the off-season, whereas there was no increase in aggressiveness among the Sprinters and Swimmers.
(B) The Football and Hockey players, but not the Sprinters and Swimmers, were aware at the start of the experiment that they were being tested for aggressiveness.
(C) The Sprinters and Swimmers, but not the Football and Hockey players, were aware at the start of the experiment that they were being tested for aggressiveness.
(D) The same psychological research indicated that the Football and Hockey players had a great respect for cooperation and team play, whereas the Sprinters and Swimmers were most concerned with excelling as individual competitors.

Neighboring Landholders: "Air pollution from the chemical factory that has been built next to our land is killing our plants". Company spokesperson: "The factory is not to blame, since our study shows that the damage is due to insects and fungi".

16. Which of the following, if true, most seriously weakens the conclusion drawn by the company spokesperson?

    (A) Air pollution from the chemical factory has changed the chemical balance in the plants' environment, allowing the harmful insects and fungi to thrive.

    (B) The study did not measure the quantity of pollutants emitted into the surrounding air by the chemical factory.

    (C) The neighboring landholders have made no change in the way they take care of their plants.

    (D) The various species of insects and fungi mentioned in the study have only been occasionally found in the locality before the chemical factory came up.

The city's public transportation system should be removed from the jurisdiction of the municipal government, which finds it politically impossible either to raise fares or to institute cost-saving reductions in service. If public transportation were handled by a private firm, profits would be vigorously pursued, thereby eliminating the necessity for covering operating costs with government funds.

17. The statements above best support the conclusion that

    (A) Private firms would receive government funding if it were needed to cover operating costs.

    (B) Political considerations would not prevent private firms from ensuring that revenues cover operating costs.

    (C) The public would approve the cost-cutting actions taken by the private firm.

    (D) The municipal government would not be resigned to accumulating merely enough income to cover costs.

Direction for questions 18 to 20 are as follows: Each question contains a few sentences numbered in lower case roman numerals. Select the appropriate order of these sentences as your answer, so that when read in that particular order, the resultant passage becomes most logically coherent.

18. i. Mira went to Google and found several papers pertaining to the effect of Foreign Institutional Investments on GDP.

    ii. There she found two papers on the effect of Foreign Institutional Investments on the GDP of India.

    iii. Mira was interested in studying the effect of Foreign Institutional Investments on the GDP of India.

    iv. However none of them were on India.

    v. Mira tried Google Scholar next.

    (A) i-ii-iii-iv-v.

    (B) i-iv-iii-v-ii

    (C) iii-i-iv-v-ii

    (D) iii-i-ii-v-iv

19. i. Customer Relationship Managers access the data warehouse.
    ii. The databases are assembled into a data warehouse.
    iii. Spread-sheets are integrated into databases.
    iv. Data entry folks key in information into spread-sheets.

    (A) i-ii-ii-iv
    (B) i-iv-iii-ii
    (C) iii-iv-i-ii
    (D) iv-iii-ii-i

20. i. Secure in its island home, the dodo had lost the power of flight since there were no enemies to fly from.
    ii. The goats ate the undergrowth which provided the dodo with cover; dogs and cats hunted and harried the old birds; while pigs grunted their way round the island, eating the eggs and young, and the rats followed behind to finish the feast.
    iii. Man discovered the dodo's paradise in about 1507, and with him came his enemies: dogs, cats, pigs, rats and goats.
    iv. The dodo, the ponderous waddling pigeon, inhabited the island of Mauritius.
    v. By 1681, the fat, ungainly and harmless pigeon was extinct.
    vi. Then the slaughter began.

    (A) iv-i-iii-vi-ii-v
    (B) iv-iii-vi-i-ii-v
    (C) i-iii-iv-vi-ii-v
    (D) iii-iv-i-vi-ii-v

Questions 21 to 25 are based on the information given below:

Six movies named I, J, K, L, M and N of six different directors named P, Q, R, S, T and U, not necessarily in the same order, of six different genres namely, Action, Comedy, Drama, Horror, Romance and Science Fiction, again not necessarily in the same order, are screened in a film festival one after another, again not necessarily in the same order. Following information is available:

- The first movie screened is the Science Fiction.
- S directed M.
- J is a Comedy.
- The genre of the fifth movie screened is Romance.
- T is the director of the Science Fiction movie.
- The last movie screened is directed by R.
- Drama is screened immediately following Action.
- N is screened immediately following K.
- The movie directed by Q is screened immediately following the movie directed by P.
- L is screened immediately following the Horror movie.
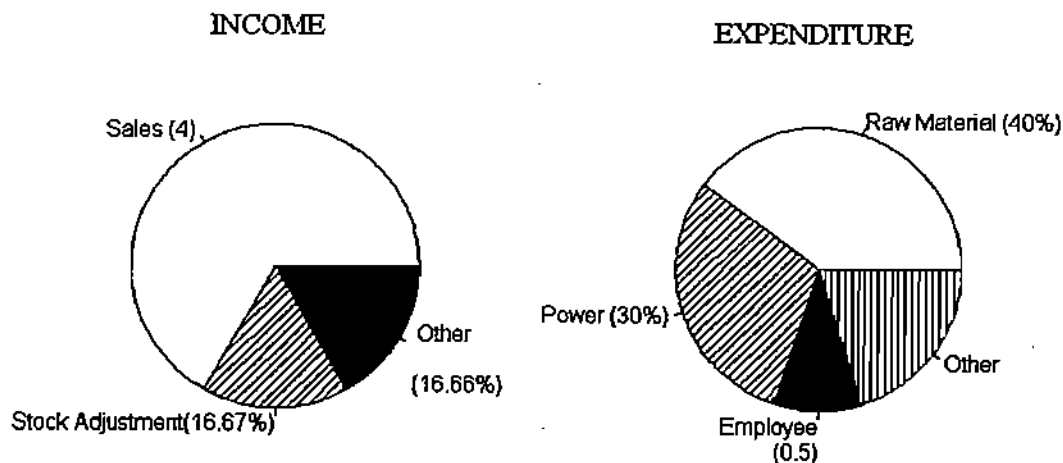- The movie directed by U is screened immediately before the Action movie.

21. The genre of the movie directed by R is

   (A) Action
   (B) Comedy
   (C) Drama
   (D) Horror

22. The director of the Horror movie is

   (A) P
   (B) Q
   (C) S
   (D) U

23. The name of the movie directed by P is

   (A) I
   (B) K
   (C) L
   (D) N

24. The movie N is screened in which slot?

   (A) Second
   (B) Third
   (C) Fourth
   (D) Fifth

25. The name of the Drama is

   (A) I
   (B) K
   (C) M
   (D) N

26. All MBAs are Graduates. Some MBAs work in the Financial Sector. Given this information, which of the following can never be true? (The either-or pair below refers to "inclusive or" i.e. either A or B means either A, or B or both.)

   (A) Everybody is either not a Graduate or does not work in the Financial Sector.
   (B) Everybody is either not a Graduate or works in the Financial Sector.
   (C) Everybody is either a Graduate or does not work in the Financial Sector.
   (D) Everybody is either a Graduate or works in the Financial Sector.

27. Anything which cannot fly is a human. No tiger is a human. Therefore,

   (A) Some tigers can fly.
   (B) Some tigers cannot fly.
   (C) All tigers can fly.
   (D) No tiger can fly.

28. Whenever the sky is cloudy in the morning it does not rain in the afternoon. Whenever there is no sunshine in the afternoon it rains in the afternoon. From these it follows that,

(A) Whenever the sky is not cloudy in the morning there is no sunshine in the afternoon.
(B) Whenever there is no sunshine in the afternoon the sky is not cloudy in the morning.
(C) Whenever the sky is cloudy in the morning there is no sunshine in the afternoon.
(D) Whenever there is no sunshine in the afternoon the sky is cloudy in the morning.

29. It takes Rita 6 minutes to swim upstream from point X to Y and 3 minutes to swim downstream from Y to X in a river. If a toy-paper-boat is floated at point Y, the amount of time it will take it to reach X

(A) is 9 minutes
(B) is 12 minutes
(C) is 15 minutes
(D) is 16 minutes

30. If Ram makes a round trip from point P to Q in 12 hours and travels at 3 km per hour while going on a upwards slope, 9 km per hour on a downwards slope, and 4.5 km per hour on a horizontal surface, the distance between P and Q

(A) is 18 km
(B) is 27 km
(C) is 54 km
(D) is 67 km

31. The sum of digits in the integer 10^{104}-2008 equals

(A) 7992
(B) 7993
(C) 8883
(D) 8892

32. The set of $x \in \Re$ which satisfies the inequality $\dfrac{2}{|x-1|} < \dfrac{5}{x}$ is given by

(A) $\left(\dfrac{5}{7}, \dfrac{5}{3}\right)$
(B) $\left(-\infty, \dfrac{5}{7}\right) \cup \left(\dfrac{5}{3}, \infty\right)$
(C) $\left(\dfrac{5}{7}, \infty\right)$
(D) $\left(0, \dfrac{5}{7}\right) \cup \left(\dfrac{5}{3}, \infty\right)$

33. In a circle with center O two chords AC and BD are perpendicular to each other intersecting at E. It is given that $\overline{BE}=8$, $\overline{DE}=3$ and $\overline{CE}=4$. Then the radius of the circle equals

   (A) $10\sqrt{5}$
   (B) $5\sqrt{5}$
   (C) $2.5\sqrt{5}$
   (D) $\sqrt{5}$

Questions 34 to 36 are based on the following pie-charts, drawn to scale:

The pie-charts below give the break-up of Income and Expenditure of XYZ Ltd., a manufacturing firm, in the financial year 2007-08. The numbers indicated in parenthesis under a given head is either a percentage of the total pie or if it is a number, it indicates the absolute amount in crores of Rs.
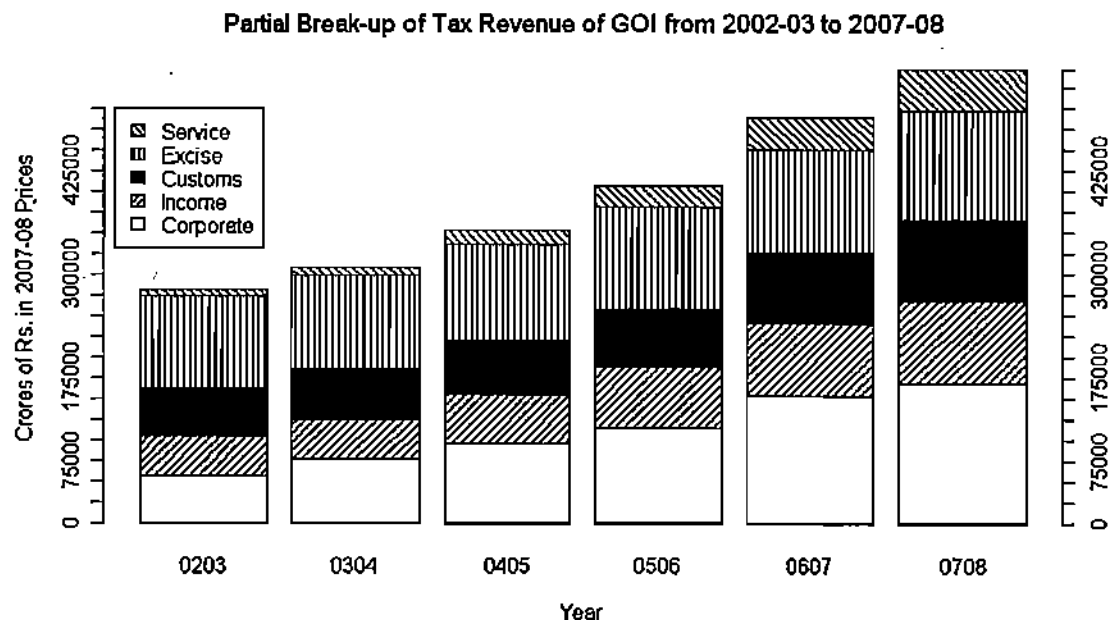
INCOME

Sales (4)
Other (16.66%)
Stock Adjustment(16.67%)

EXPENDITURE

Raw Material (40%)
Power (30%)
Other
Employee (0.5)

34. How much did XYZ Ltd. earn from Stock Adjustments in the financial year 2007-08?

   (A) Rs. 0.5 Crore.
   (B) Rs. 1 Crore
   (C) Rs 1.5 Crore
   (D) Rs. 2 Crore

35. What percentage of the Income was spent on Employees?

   (A) 8.33%
   (B) 10%
   (C) 12%
   (D) 15%

36. How much Profit did XYZ Ltd. make in the financial year 2007-08?

    (A) Rs. -1 Crore
    (B) Rs, 0 Crore
    (C) Rs. 1 Crore
    (D) Cannot be determined from the information given above.

Questions 37 to 41 are based on the following bar-chart, drawn to scale:

A partial break-up of Taxes collected by the Union Government of India under different heads, in crores of Rs., inflation adjusted in 2007-08 prices, from financial years 2002-03 to 2007-08, are depicted in the following chart (the break-up is partial because taxes from Union Territories and Other Sources, which are negligible compared to the five other major heads considered here, have been omitted and should be ignored for answering the questions that follow *e.g.* "Total Tax" collected in 2003-04 should be taken as slightly above Rs. 3 lakh crores):

Partial Break-up of Tax Revenue of GOI from 2002-03 to 2007-08

Consecutive tick-marks on the Y-axis (on either side) are Rs.25,000 crores apart.

37. Excise tax remains the largest contributor to the total tax revenue from years

    (A) 2002-03 to 2005-06
    (B) 2003-04 to 2006-07
    (C) 2004-05 to 2007-08
    (D) 2002-03 to 2006-07

38. In 2007-08 the contribution of the Corporate tax to the "Total Tax" has been roughly

    (A) 20%
    (B) 25%
    (C) 30%
    (D) 35%

39. Overall from 2002-03 to 2007-08, the rate of revenue collection, compared to the previous year, has been maximum for which tax?

(A) Excise
(B) Corporate
(C) Income
(D) Service

40. The Customs tax as a proportion of the Excise tax has:

I.   Averaged around 50% during 2002-03 to 2007-08.
II.   Remained more or less constant from 2002-03 to 2005-06.
III. Been the maximum in 2007-08.

Which of the following are true?

(A) I and II
(B) I and III
(C) II and III
(D) I, II and III

41. The overall trend or pattern in tax collection can be summarized by saying that

I.   The Corporate and Income tax revenues are slowly taking over traditional tax revenue sources like Excise and Customs.
II.   Between Corporate and Income taxes, the rate of growth of the former is more promising.
III. The most phenomenal source of tax revenue collection has however been the Service.

Which of the following are true?

(A) I and II
(B) I and III
(C) II and III
(D) I, II and III

42. What are the flowers that I have if all of them are roses except two, all of them are tulips except two, and all of them are daises except two?

(A) rose, tulip, daisy
(B) rose, tulip, daisy, carnation
(C) rose, tulip, carnation
(D) rose, daisy, carnation

43. A box contains two coins. One coin has heads on both sides, while the other has heads on one side and tails on the other side. One coin is selected from the box at random and the face of one side is observed. If the face is heads, what is the probability that the other side is heads also?

(A) 1/3
(B) 2/4
(C) 2/3
(D) 1/4

44. Your job allows you to work any number of hours per week you desire. Your pay is proportioned to the number of hours worked. After accounting for sleeping and daily tasks you are left with 80 hours/week for work and pleasure. You wish to maximize your income multiplied by the amount of pleasure time you have to enjoy it. How many hours per week should you work.

(A) 40
(B) 80
(C) 1
(D) 79

45. Person X and Y have the following conversation:

X: I forgot how old your three kids are.
Y: The product of their ages is 36.
X: I still don't know their ages.
Y: The sum of their ages is the same as your house number.
X: I still don't know their ages.
Y: My youngest children are twins.
X: Now I know their ages!

The correct ages are:

(A) 1, 1, 36
(B) 2, 2, 9
(C) 3, 3, 4
(D) 1, 6, 6

46. A jar contains exactly one amoeba. Every minute, an amoeba turns into 0 or 1 amoeba with a probability of 0.5 each. What is the probability that the amoeba population eventually dies out?

(A) 0.5
(B) 1
(C) 0.25
(D) 0.75

47. Which one of the following is true?

   (A) $e^\pi = \pi^e$
   (B) $e^\pi > \pi^e$
   (C) $\pi^e > e^\pi$
   (D) $\pi^e = e^\pi + 1/e$

48. Consider a digital clock that runs from 00:00 to 23:59. How many times per day does it display a palindromic number?

   (A) 114
   (B) 16
   (C) 70
   (D) 14

49. An urn contains 3 balls of different colours. Randomly select a pair, repaint the first to match the second and replace the pair in the urn. What is the expected # of drawings until all the balls are of the same colour.

   (A) 4
   (B) 3
   (C) 9
   (D) 8

50. Water flows into a tank at the rate of 1 Ltr/sec. Water leaves the tank at the rate of 1 Ltr/sec for each 100 Ltrs in the tank. The tank is initially empty. How long (in seconds) will it take to fill 50 Ltrs. Of water in the tank?

   (A) $2\,e^{100}$
   (B) $100\,e^2$
   (C) $2\,lu(100)$
   (D) $100\,lu(2)$

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PART B

Instructions

2. This paper 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

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

SECTION I

BUSINESS ADMINISTRATION

Answer the given five 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) When do we go for process design? And, which type of process is generally more appropriate for a product at each stage in its life cycle?

    (b) A manufacturing company is planning the process for making a new product. A consultant has suggested that companies making similar products have costs that depend on the type of process as follows:

Process type	Annual fixed cost (in Rs)	Variable cost (in Rs)
Job shop	1,00,000	50
Batch	2,50,000	40
Mass production	10,00,000	15

The company has forecast demand for the product at 25,000 units a year. Which process will probably suit it best? Within what ranges is each type of process best?

5. (a) What are the assumptions behind the basic EOQ model?

   (b) Tata Book House, a large retailer of popular books, demand is constant at 32,000 books per year. The cost of placing an order to replenish stock is Rs. 100/-, and the annual cost of holding is Rs. 40/- per book. Stock is received 5 working days after an order has been placed. No back ordering is allowed. Assume 300 working days a year.

   i.   What is Tata Book House's optimal ordering quantity?

   ii.   What is the optimal number of orders per year?

   iii. What is the optimal interval (in working days) between orders?

   iv.   What is demand during the lead time?

   v.   What is the reorder point?

   vi.   What is the inventory position immediately after an order has been placed?

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SECTION II

ECONOMICS

Answer any five questions
All questions carry equal marks

1. In the Fast Moving Consumers Goods (FMCG) sector such as bathing soap, shampoo, etc. companies like Hindustan Uni Lever, Godrej, P&G devote a significant proportion of their budget on different forms of selling costs for product promotion. What market structure does FMCG sector resemble? Why do they have to incur a huge expenditure on "selling costs"? Is it unavoidable?

2. NDTV 24X7 TV News Channel started by Mr Pranoy Roy, subsequently launched NDTV Life Style Channel and NDTV Business News Channel. Is this an example for scale expansion or scope expansion? Justify your answer.

3. The total cost function of a firm in a perfectly competitive market is given as T.C.= $6000+8Q-48Q^2 +2Q^3$. Find out the rate of output at which AVC is at the minimum. If Price is equal to AVC, should the firm continue to produce? Comment.

4. How is inflation measured in India? What are the merits of Producers Price Index (PPI) as compared to CPI and WPI? Do you favor a shift towards PPI as the base for inflation measurement in India? Why?

5. India's current monetary policy aims at curbing the liquidity in the market rather than encouraging economic expansion. Do you agree? What kind of a monetary policy would you advocate for economic expansion? Elaborate

6. How does Keynes' Fundamental Psychological Law help in explaining the role of multiplier in achieving macroeconomic equilibrium? What is the significance of balanced budget theorem? What are the major limitations of Keynesian economics? Does it have any current world relevance?

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SECTION III

SOCIAL WORK

All questions carry equal marks and all questions are compulsory.

1. What are some of the issues related to "Employee Retention"? How a new start-up can address some of the issues?

2. What is employee motivation? Elaborate on any one of the theories of work motivation.

3. Describe different types of research design in Social Science research and give examples of some of the research questions linked to a specific design.

4. Define Organization Development. Mention some of the possible O D interventions at the team level.

5. Discuss issues of employee management during a case of merger or acquisition in a large organization?

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SECTION IV

PSYCHOLOGY

Questions 1 –10 are compulsory (20 marks)
Answer any five questions from questions 11-16 (30 marks)

1. The four different scales commonly used in Social Psychology are _____.
2. Variance in a 5 point rating scale refers to _____.
3. In Psychophysics the minimal physical intensity of a stimulus that can be perceived is called _____.
4. The 4 reinforcement schedules in conditioning theory are _____.
5. The Yerkes Dodson Law states _____.
6. The 16 personality factors was given by _____ and they consist of _____ traits and _____ traits.
7. The Rorschach and TAT tests are _____ _____, aimed at helping subjects _____.
8. The basis of RET in Allert Ellis's contributions had the premise that _____.
9. The visual cliff is an experiment consisting of _____ .
10. The reticular activating system or RAS is said to be strongly linked to _____ in the human body while the limbic system is said to be linked to_____.

11. Draw a block model describing stages of *information – processing* in human beings, label and describe the model using any one illustration.
12. Describe the contributions of developmental psychologists.
13. Draw and label the Freudian representation of the structure of personality and show how it is related to transactional analysis.
14. Describe the ways one can build in reliability and validity into questionnaire development.
15. Explain the laws of the Gestalt Psychologists and relate them to Social Psychology.
16. What is meant by a research design? Describe designs useful in Psychology.

6 marks each = 30 marks

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SECTION V

MANAGEMENT SCIENCE

Answer any 5. Everyone has to answer at least two questions from questions 1-3.

1. Given a continuous function $f : \Re \to \Re$ define $g : \Re^2 \to \Re$ by $g(x,y) = \int_x^{e^y} f(t)dt$.

   Find the partial derivatives $g_x(x,y) = \dfrac{\partial}{\partial x} g(x,y)$ and $g_y(x,y) = \dfrac{\partial}{\partial y} g(x,y)$ in terms of $f(\cdot)$.

2. If $(\lambda_1, \mathbf{x}_1), \ldots, (\lambda_n, \mathbf{x}_n)$ are the n (eigen-value, eigen-vector) pairs of an $n \times n$ matrix $\mathbf{A}$, then given a non-singular matrix $\mathbf{P}$, find the n (eigen-value, eigen-vector) pairs for the matrix $\mathbf{P}^{-1}\mathbf{A}\mathbf{P}$ in terms of $(\lambda_1, \mathbf{x}_1), \ldots, (\lambda_n, \mathbf{x}_n)$ and $\mathbf{P}$.

3. Agent 001 is trapped at the bottom of a right-cylindrical abysmal well. He swung his gun around and fired a wild (random) shot. Assume that the angle his pistol makes with the horizontal plane is uniformly distributed between 0^0 and 90^0. Find the distribution and mean of the height (from the plane of the pistol) where the bullet hit the well-wall.

For questions 4 through 6 following quantiles of standard distributions are available:

Quantiles	Z	t_{10}	t_{11}	t_{12}	t_{22}	t_{24}	$F_{1,37}$	$F_{1,40}$	$F_{3,37}$	$F_{3,40}$
0.90	1.282	1.372	1.363	1.356	1.321	1.318	2.846	2.835	2.238	2.226
0.95	1.960	1.812	1.796	1.782	1.717	1.711	4.105	4.085	2.859	2.839
0.975	1.645	2.228	2.201	2.179	2.074	2.064	5.458	5.424	3.493	3.463
0.99	2.326	2.764	2.718	2.681	2.508	2.492	7.373	7.314	4.360	4.313

4. HR department of a BPO firm is interested in figuring out whether offering flexi-timing to its employees has helped reducing the attrition rate. Based on the records of a random sample of 100 of its employees it found the following:

No. of Employees Who Have	Been Offered Flexi-Timing	Not Been Offered Flexi-Timing
Attrited	25	15
Not Attrited	40	20

Is there any significant evidence to conclude that offering flexi-timing help reduce attrition by employees?

5. Annual import amounts (mostly in hardware equipments), say X, and software exports, say Y, of 12 randomly chosen IT companies in millions of US \$'s is as follows:

Co.	1	2.	3	4	5	6	7	8	9	10	11	12
X	2.37	2.84	4.87	4.51	4.18	3.22	2.77	3.59	3.23	4.43	3.48	4.04
Y	2.26	3.51	5.80	4.74	4.55	3.68	2.38	3.62	3.34	4.69	3.97	4.23

Following summary statistics are also available:

$$\overline{X} = 3.62, \ \sum(X_i - \overline{X})^2 = 6.726, \ \sum(X_i - \overline{X})(Y_i - \overline{Y}) = 8.216, \ \sum(Y_i - \overline{Y})^2 = 11.068, \ \overline{Y} = 3.89$$

Is there enough evidence to suggest that on an average the IT companies are earning more foreign currency in exports than they are spending on imports?

6. Performance of assembly line employees in an automobile manufacturing company was appraised in a 0 to 100 scale (larger the better) at the end of the year. Jobs of some of the employees were rotated (from up the line to down the line) from time to time, while some of the employees worked in a fixed position through out the year. Some of the employees were young (age less than 30 years) while some were not, in both the groups (whose jobs were rotated and whose were not). Summary of the performance appraisal scores of 10 randomly sampled employees in each category, cross-classified according to job rotation status and age, is as follows:

Job↓ Age→	<30	≥30
Rotated	Mean=80, SD=8	Mean=40, SD=12
Not Rotated	Mean=60, SD=10	Mean=70, SD=10

How is the performance of an employee getting affected by job-rotation status and age?

7. Write brief notes on the following:
   a) Assumptions made in the EOQ inventory model without shortages.
   b) Slack and surplus variables.
   c) Shadow price.

8. Draw an E R diagram that best represents the following stipulations. Indicate keys, many-one relationships, weak entity sets, and other features of E R Diagrams covered in class, as appropriate.
   a) There are hospitals, with a name and address.
   b) There are rooms in hospitals, with a room number.
   c) There are people, with a name and social-security number.
   d) Some people are doctors, and doctors have a specialty; some people are patients, and patients have an age.
   e) An operation involves a patient and a doctor, and takes place in a hospital room. An operation has a date and time. For full credit, do not make operations an entity set; rather, make it a relationship.

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PART C

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

TOTAL MARKS: 100

1. Schildern Sie über eine Untterichtsstunde, die einen starken Einfluss auf Ihre Entscheidung Deutsch zu studieren, geübt hat. Eklären Sie aus didaktischer Perspektive, warum die Unterrichtsstunde so beeindrückend war.

(20 Punkte)

2. Johann Wolfgang von Goethe meint: "Wer fremde Sprachen nicht kennt, weiß nichts von seiner eigenen". Nehmen Sie Stellung zu dieser Aussage! Begründen Sie Ihren Standpunkt mit Beispielen!

(20 Punkte)

3. Erklären Sie **drei** von den folgenden Begriffen im Kontext des DaF-Unterrichts in Indien! (30 Punkte)

   a) medienunterstützte Fremdsprachenunterricht
   b) berufsorientierter DaF-Unterricht
   c) interkultureller Fremdsprachenerwerb
   d) positives Sprachtransfer
   e) lernerorientierte Grammatik .

4. Nehmen Sie Stellungen zu **einer** Aussage und begründen Sie Ihren Standpunkt! (30 Punkte)

   a) Englisch ist eine globale Sprache. Da viele Inder Englisch gut beherrschen, brauchen Inder genauso wie die Engländer und Amerikaner keine weiteren Fremdsprachen zu lernen.
   b) Die eigene Muttersprache verleiht mir meine kulturelle Identität. Sobald ich eine Fremdsprache lerne, stelle ich meine Identität in Frage. Deshalb ist der Erwerb von Fremdsprachen für Inder, die ohnehin kaum monolingual sind, nicht emfehlenswert.

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* END OF QUESTION PAPER*