No. of Printed Pages : **24**

00124

Entrance Test for
M.Sc. Actuarial Science 2011

Programme Code - 009

Total No. of Questions = 100 *Time : 3 Hours*

- All questions are *compulsory*.
- Programmed calculators are *not* allowed. Rough work may be done in the space provided at the end of the Test Booklet.
- The Test Booklet has the following *four* tests :

Test - I	Mathematics	No. of Questions 50 (1 to 50)
Test - II	Probability and Statistics	No. of Questions 20 (51 to 70)
Test - III	General English	No. of Questions 15 (71 to 85)
Test - IV	General Awareness of Economic Environment	No. of Questions 15 (86 to 100)

Read the instructions given on the OMR Answer Sheet carefully before you start.

Each question carries 1 mark. For each wrong answer there is negative marking of 0.25 mark.

HOW TO FILL UP THE INFORMATION ON THE ENTRANCE TEST OMR ANSWER SHEET

While filling up the OMR Answer Sheet, you should follow the following guidelines :

1. Write your complete Roll Number. This should correspond to the roll number already supplied to you. Also write your correct name, address with pin code in the space provided, in ink. Put your signatures on the Answer Sheet with date, in ink. Ensure that the Invigilator in your examination hall also puts his signatures with date on the OMR Answer Sheet at the space provided. You should use HB pencil to mark the answers of the questions on the OMR Answer Sheet.

2. Do not make any stray marks on the OMR Answer Sheet.

3. Write correct information in numerical digits in Roll No., Programme Code, Date and Month and Examination Centre Code Columns. **The column of Course Code should be left blank.** The corresponding circle should be dark enough and should be filled in completely.

4. Each question is followed by four probable answers which are numbered (1), (2), (3) and (4). You should select and show only one answer to each question considered by you as the most appropriate or the correct answer. Select the most appropriate answer. Then by using HB pencil, blacken the circle bearing the correct answer number against the serial number of the question. **If you find that answer to any question is none of the four alternatives given under the question you should darken the circle with '0'.**

5. If you wish to change your answer, **ERASE** completely the already darkened circle by using a good quality eraser and then blacken the circle bearing your revised answer number. If incorrect answer is not erased completely, smudges will be left on the erased circle and the question will be read as having two answers by the Optical Mark Reader (OMR) and will be ignored for giving any credit.

6. No credit will be given if more than one answer is given for one question. Therefore, you should select the most appropriate answer. 0.25 mark will be reduced if more than 1 answer is given for 1 question.

7. You should not spend too much time on any one question. If you find any particular question difficult, leave it and go to the next. If you have time left after answering all the questions, you may go back to the unanswered ones.

8. There is negative marking for wrong answers. For each wrong answer 0.25 mark will be deducted.

GENERAL INSTRUCTIONS

1. Mobile Phones, programmed calculators, books, slide-rules, foot rulers, note-books or written notes, etc. are not allowed inside the examination hall.

2. You should follow the instructions given by the Centre Superintendent, Observers and by the Invigilators at the examination venue. If you violate the instructions you will be disqualified.

3. Any candidate found copying or receiving or giving assistance in the examination will be disqualified.

4. The Test Booklet and the OMR Answer Sheet would be supplied to you by the Invigilators. **After the exam is over, you should hand over the Test Booklet and the OMR Answer Sheet to the Invigilator before leaving the examination hall.** Any candidate who does not return the Question Booklet and the OMR Answer Sheet will be disqualified.

5. All rough work is to be done on the test booklet itself and not on any other paper. Scrap paper is not permitted. For arriving at answers you may work in the margins, make some markings or underline in the test booklet itself.

6. The University reserves the right to cancel scores of any candidate who impersonates or uses malpractices. The examination is conducted under uniform conditions. The University would also follow a procedure to verify the validity of scores of all examinees uniformly. If there is substantial indication that your performance is not genuine, the University may cancel your score.

TEST - I

MATHEMATICS

1. The number of permutations of n dissimilar things taken r at a time when repetition of things is allowed any number of times is :

(1) n^r (2) n^{r^2} (3) nr (4) 2r

2. ${}^5P_2$ is equal to :

(1) 30 (2) 20 (3) 10 (4) 5

3. The number of permutations of n dissimilar things taken r at a time is :

(1) $\frac{n!}{(n-2r)!}$ (2) $\frac{2r!}{(n-r)!}$ (3) $\frac{n!}{(n-r)!}$ (4) $\frac{(n-r)!}{r!}$

4. 0! is equal to :

(1) 2 (2) 0 (3) -1 (4) 1

5. If ${}^nP_r = 3024$ then n and r are respectively :

(1) 9 and 4 (2) 4 and 2 (3) 1 and 2 (4) 4 and 9

6. How many different arrangements can be made out of the letters MISSISSIPI ?

(1) $\frac{10!}{2!\,2!}$ (2) $\frac{10!}{4!\,4!}$ (3) $\frac{2!}{4!\,4!}$ (4) $\frac{20!}{4!\,3!}$

7. If ${}^nC_r = 4$ and $r = 3$, then n is :

(1) 3 (2) 4 (3) 5 (4) 6

8. A man has 4 friends. In how many ways he can invite one or more of them to dinner ?

(1) 10 (2) 15 (3) 20 (4) 5

9. $(r+1)^{th}$ term of the expansion of $(x+a)^n$ is :

(1) ${}^{n}c_{r}\, x^{r}\, a^{r-1}$ (2) ${}^{n}c_{r}\, x^{r-1}\, a^{2}$ (3) ${}^{n}c_{r}\, x^{n-r}\, a^{r}$ (4) ${}^{n}c_{r}\, x^{n-2r}\, a^{2}$

10. $\int \log x \; dx = ?$

(1) $\frac{1}{x}$ (2) $x\log x$ (3) $x\log x - x$ (4) $\frac{\log x}{x}$

11. $\int_{0}^{\infty} k\, e^{-5x}\, dx = 1$, implies k is equal to :

(1) 1 (2) 5 (3) -5 (4) $\frac{1}{5}$

12. $\int x^{n}\; dx = \frac{x^{n+1}}{n+1} + c$

For what value of n, the above formula is not satisfied ?

(1) 0 (2) -1 (3) 1 (4) $\frac{1}{2}$

13. The derivative of $\sin xy = e^{y}$, with respect to x is :

(1) $\frac{y \sin xy}{e^{x} - y \cos xy}$ (2) $\frac{y \cos xy}{e^{y} - x \cos xy}$

(3) $\frac{x}{e^{x} - \cos xy}$ (4) $\frac{y}{e^{y} - x \sin xy}$

14. If $x^{m}y^{n} = (x+y)^{m+n}$ then $\frac{dy}{dx} =$

(1) $\frac{x}{y}$ (2) $\frac{1}{x}$ (3) $\frac{y}{x}$ (4) $\frac{x^{2}}{y^{2}}$

15. If $y = \frac{1}{ax + b}$, then the n^{th} derivative is :

(1) $\frac{(-1)^n \, n! \, a^n}{(ax + b)^{n+1}}$ (2) $\frac{(-1)^n \, (n-1)! \, b^n}{(ax + b)^n}$

(3) $\frac{(-1)^n \, n! \, b^n}{(ax + b)}$ (4) $\frac{(-1)^n \, (n-1)! \, a^n}{(ax + b)^n}$

16. $\frac{d}{dx}(k^x)$ is equal to :

(1) $\log_e k$ (2) $\log_e k^x$ (3) $k^x \log k$ (4) x^k

17. $\int e^{2x} (\cos 3x) \, dx =$

(1) $\frac{e^x}{12}(\cos x + \sin x)$ (2) $\frac{e^{2x}}{13}(2\cos 3x + 3\sin 3x)$

(3) $\frac{e^{2x}}{13}$ (4) $\frac{e^x}{15}$

18. The area bound by the curve $y^2 = 4ax$, the x-axis and the ordinate $x = h$ is :

(1) $\frac{4h\sqrt{ah}}{3}$ (2) $\frac{ah}{4}$ (3) $\frac{\sqrt{ah}}{2}$ (4) $\frac{2\sqrt{ah}}{h}$

19. The area of the circle $r = 2a\cos\theta$ by integration is :

(1) πa (2) πa^3 (3) πa^2 (4) $\frac{\pi a^2}{4}$

20. $\int \frac{dx}{\left(a^2 + x^2\right)^{3/2}} =$

(1) $\frac{x}{a^2\sqrt{a^2 + x^2}}$ (2) $\frac{x^2}{a^2 + x^2}$ (3) $\frac{x}{a + x}$ (4) $\frac{x}{a\left(a^2 + x^2\right)}$

21. The integrating factor of $\frac{dy}{dx} + Py = Q$ is :

(1) $e^{\int P dx}$ (2) $e^{\int Q dx}$ (3) $e^{\int P dy}$ (4) $e^{\int PQ dx}$

22. The differential equation of simple harmonic motion given by $x = A\cos(nt + \alpha)$ is in the form :

(1) $\frac{dx}{dt} + nx = 0$ (2) $\frac{d^2x}{dt^2} + n^2 x = 0$

(3) $\frac{d^2x}{dt^2} = 0$ (4) $\frac{dx}{dt} + 2x = 0$

23. The necessary and sufficient condition for the differential equation $Mdx + Ndy = 0$ to be exact is :

(1) $\frac{dM}{dy} = \frac{dN}{dx}$ (2) $\frac{dN}{dy} = \frac{dM}{dx}$

(3) $\frac{dM}{dx} = -\frac{dN}{dy}$ (4) $\frac{dM}{dy} = -\frac{dN}{dx}$

24. The solution of $(D^3 + D^2 + 4D + 4) = 0$ is :

(1) $C_1 e^{-x} + C_2 \sin x$ (2) $C_1 e^{-x} + C_2 \cos 2x + C_3 \sin 2x$

(3) $C_1 e^{x} + C_2 \cos x$ (4) $C_1 e^{-x} + C_2 \cos x + C_3 \sin x$

25. The particular integral of $(D^2 + 5D + 6)y = e^x$ is :

(1) $\frac{e^x}{12}$ (2) $\frac{e^x}{6}$ (3) $\frac{e^{x^2}}{3}$ (4) $\frac{e^{2x}}{4}$

26. The particular integral of $\frac{d^3y}{dx^3} + 4\frac{dy}{dx} = \sin 2x$ is :

(1) $\frac{x}{8}\sin x$ (2) $\frac{-x\sin x}{4}$ (3) $\frac{-x}{8}\sin 2x$ (4) $\frac{\sin 2x}{16}$

27. The stationary values of $x^3+y^3-3axy=0$ are :

(1) (a, a) (2) (a, 0) (3) (0, a) (4) (0, 0)

28. If $rt-s^2<0$ at (a, b), then t(a, b) is _____ .

Where $r=\frac{\partial^2 t}{\partial x^2}$, $s=\frac{\partial^2 t}{\partial x\,\partial y}$, $t=\frac{\partial^2 t}{\partial y^2}$

(1) an extreme value (2) a minimum value

(3) not an extreme value (4) a maximum value

29. The complementary function of $\frac{d^2y}{dx^2}-4y=x\sin hx$ is :

(1) $C_1e^x+C_2e^{-x}$ (2) $C_1e^{2x}+C_2e^{-2x}$

(3) $C_1e^{-x}+C_2e^x$ (4) $C_1e^x+C_2e^{-2x}$

30. The solution of $\frac{dy}{dx}=e^{3x-2y}+x^2e^{-2y}$ is :

(1) $3\,e^y=2(e^x+x^2)$ (2) $e^{2y}=e^{2x}+x^2$

(3) $3\,e^{2y}=2(e^{3x}+x^3)+bc$ (4) $e^y=2(e^{2x}+x)+7c$

31. If $x=r\cos\theta$, $y=r\sin\theta$, then :

(1) $\frac{\partial r}{\partial x}=\frac{\partial x}{\partial r}$ (2) $\frac{\partial r}{\partial y}=\frac{\partial y}{\partial x}$ (3) $\frac{\partial r}{\partial x}=\frac{\partial y}{\partial x}$ (4) $\frac{\partial r}{\partial y}=\frac{\partial x}{\partial r}$

32. If $x=r\cos\theta$, $y=r\sin\theta$, then $\frac{\partial^2\theta}{\partial x^2}+\frac{\partial^2\theta}{\partial y^2}$ is :

(1) 1 (2) $2\cos\theta$ (3) $\sin\theta$ (4) 0

33. The area of a plate in the form of a quadrant of the ellipse $\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$ is :

(1) $\frac{\pi ab}{2}$ (2) $\frac{\pi ab}{4}$ (3) πab (4) πa^2b^2

34. After changing the order of integration in the integral $\int_{-a}^{a} \int_{0}^{\sqrt{a^2 - y^2}} f(x, y)\, dx\, dy$, we have :

(1) $\int_{0}^{a} \int_{-\sqrt{a^2-x^2}}^{\sqrt{a^2-x^2}} f(x, y)\, dx\, dy$ (2) $\int_{0}^{1} \int_{0}^{a} f(x, y)\, dx\, dy$

(3) $\int_{0}^{a} \int_{0}^{\sqrt{a^2-x^2}} f(x, y)\, dx\, dy$ (4) $\int_{0}^{1} \int_{0}^{\sqrt{a^2-x^2}} f(x, y)\, dx\, dy$

35. The value of $\iint_A xy\, dx\, dy$, where A is the domain bounded by x-axis, ordinate $x = 2a$ and the curve $x^2 = 4ay$ is :

(1) $\frac{a^3}{3}$ (2) $\frac{a^4}{4}$ (3) $\frac{a^4}{3}$ (4) $\frac{a^3}{12}$

36. The curve $y = x^2(3 - x)$ has a point of inflexion at :

(1) (0, 1) (2) (1, 2) (3) (2, 3) (4) (0, 3)

37. The maximum value of $x^3 - 2x^2 - 4x - 1$ is :

(1) $\frac{11}{27}$ (2) $\frac{15}{27}$ (3) $\frac{13}{27}$ (4) $\frac{25}{26}$

38. The function $x^3 - 3x^2 + 3x + 7$ has a :

(1) maximum (2) minimum

(3) either maximum or minimum (4) neither maximum nor minimum

39. If $u = e^{xy}$, the value of $\frac{\partial u}{\partial y}$ is :

(1) $y\, e^{xy}$ (2) $x\, e^{xy}$ (3) e^{xy} (4) $e^{\frac{xy}{2}}$

40. If $x = a\cos\theta$, $y = b\sin\theta$, then $\frac{d^2y}{dx^2}$ is :

(1) $-\frac{a}{a^2 \sin^3\theta}$ (2) $\frac{b}{a^2 \cos^2\theta}$ (3) $\frac{-b}{a^2 \sin^3\theta}$ (4) $\frac{a}{b^2 \sin^2\theta}$

41. If $\begin{bmatrix} x+y & 2z+w \\ x-y & z-w \end{bmatrix} = \begin{bmatrix} 3 & 5 \\ 1 & 4 \end{bmatrix}$ then :

(1) $x=2$, $y=1$, $z=3$ and $w=-1$ (2) $x=1$, $y=2$, $z=3$ and $w=1$

(3) $x=2$, $y=0$, $z=2$ and $w=0$ (4) $x=1$, $y=4$, $z=1$ and $w=2$

42. When $A = \begin{bmatrix} 1 & 1 \\ -1 & 1 \end{bmatrix}$, $B = \begin{bmatrix} 1 & -1 \\ -1 & -1 \end{bmatrix}$ the value of AB is :

(1) $\begin{bmatrix} 1 & 1 \\ 1 & 1 \end{bmatrix}$ (2) $\begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}$ (3) $\begin{bmatrix} 0 & -2 \\ -2 & 0 \end{bmatrix}$ (4) $\begin{bmatrix} 1 & 1 \\ 0 & 0 \end{bmatrix}$

43. For the matrices, $A = \begin{bmatrix} 2 & 3 & -1 \\ 3 & 0 & 2 \end{bmatrix}$, $B = \begin{bmatrix} 1 \\ 1 \\ 2 \end{bmatrix}$ and $C = (1 \ -2)$ then :

(1) $AB + C$ (2) $(AB)C = A(BC)$

(3) $A(B+C) = AB + BC$ (4) $A + BC = B + AC$

44. If $A = \begin{bmatrix} 4 & 1 \\ 2 & 3 \end{bmatrix}$ and $A + 2B = A^2$, then $B =$

(1) $\begin{bmatrix} 6 & 4 \\ 7 & 3 \end{bmatrix}$ (2) $\begin{bmatrix} 7 & 3 \\ 6 & 4 \end{bmatrix}$ (3) $\begin{bmatrix} 1 & 5 \\ 6 & 7 \end{bmatrix}$ (4) $\begin{bmatrix} 6 & 3 \\ 2 & 1 \end{bmatrix}$

45. The solution of the equations, $2x - y = 5$, $3x + 2y = -3$ is :

(1) $x = 1,\ y = 3$ (2) $x = 1,\ y = 2$ (3) $x = 1,\ y = -3$ (4) $x = 2,\ y = 1$

46. For a system of n linear homogeneous equations, if the rank of coefficient matrix is r then its number of linearly independent solution is :

(1) n (2) r (3) $n - r$ (4) $r - n$

47. The matrix A is said to be skew-symmetric if :

(1) $A^T = A$ (2) $A^T = -A$ (3) $A^T = A^{-1}$ (4) $A^T = I$

48. The period of $\sin 5x$ is :

(1) π (2) 2π (3) $\frac{\pi}{5}$ (4) $\frac{2\pi}{5}$

49. If $z = x + iy$, the real part of $exp(z^2)$ is :

(1) $e^x(\cos xy)$ (2) $e^{x^2 - y^2}(\cos 2xy)$

(3) $e^{x^2}(\sin 2xy)$ (4) $e^{-y^2}(\cos 2xy)$

50. The value of $(\cos\theta + i \sin\theta)^n$ is :

(1) $\cos n\theta - i \sin n\theta$ (2) $n(\cos\theta + i \sin\theta)$

(3) $\cos n\theta + i \sin n\theta$ (4) $2n(\cos\theta - i \sin\theta)$

TEST - II

PROBABILITY AND STATISTICS

51. Arithmetic Mean (AM), Geometric Mean (GM) and Harmonic Mean (HM) are related as follows :

(1) $AM = GM = HM$ (2) $GM \geq AM \geq HM$

(3) $HM \geq GM \geq AM$ (4) $AM \geq GM \geq HM$

52. Which of the following measures of dispersion is the best ?

(1) Standard deviation (2) Range

(3) Mean deviation (4) Co-efficient of variation

53. If $\overline{X}$ and σ are the mean and standard deviation of a frequency distribution then co-efficient of variation is given by :

(1) $\frac{\sigma \overline{X}}{100}$ (2) $\frac{\sigma}{\overline{X}} 100$ (3) $\frac{\overline{X}}{\sigma} 100$ (4) $\frac{100}{\sigma \overline{X}}$

54. Q_1, Q_2 and Q_3 are the quartiles of a frequency distribution. If the distribution is positively skewed, then :

(1) $Q_1 + Q_3 > 2Q_2$ (2) $Q_1 + Q_2 > 2Q_3$

(3) $Q_1 + Q_3 > Q_2$ (4) $Q_3 - Q_1 > Q_2$

55. For a negatively skewed distribution :

(1) Mean = Median = Mode (2) Median<Mean<Mode

(3) Mean < Median < Mode (4) Mode < Mean < Median

56. The term regression was introduced by :

(1) R.A. Fisher (2) Sir Francis Galton

(3) Karl Pearson (4) C.R. Rao

57. $8X - 10Y + 66 = 0$ and $40X - 18Y = 214$ are regression equations. The correlation coefficient between X and Y is :

(1) -0.6 (2) 0.40 (3) 0.60 (4) 0.55

58. The regression co-efficient of the regression equation X on Y is given by :

(1) $\dfrac{\sum_i (X_i - \bar{X})(Y_i - \bar{Y})}{\sum_i (X_i - \bar{X})^2}$

(2) $\dfrac{\sum_{i=1}^{n} (X_i - \bar{X})(Y_i - \bar{Y})}{\sum_i (Y_i - \bar{Y})^2}$

(3) $\dfrac{\sum_i (X_i - \bar{X})(Y_i - \bar{Y})}{\sqrt{\sum_i (X_i - \bar{X})^2}}$

(4) $\dfrac{\sum_i (X_i - \bar{X})(Y_i - \bar{Y})}{\sqrt{\sum_i (Y_i - \bar{Y})^2}}$

59. The following are two regression equations :

$3X + 12Y = 19$, $3Y + 9X = 46$. Then $(\bar{X}, \bar{Y}) =$

(1) $\left(\frac{1}{3}, 5\right)$ (2) $\left(\frac{1}{4}, 4\right)$ (3) $\left(\frac{1}{4}, 7\right)$ (4) $\left(5, \frac{1}{3}\right)$

60. The regression co-efficient is :

(1) independent of change of origin and scale

(2) independent of change of origin but not scale

(3) independent of change of scale but not origin

(4) independent of neither change of scale nor origin

61. The probability that a leap year selected at random will contain 53 Sundays is _____ .

(1) $\frac{2}{7}$ (2) $\frac{3}{7}$ (3) $\frac{2}{5}$ (4) $\frac{3}{5}$

62. For any two events A and B, if $\bar{A}$ denotes the complement of A, then $P(\bar{A} \cap B) =$

(1) $P(A) - P(A \cap B)$ (2) $P(\bar{B}) - P(A)$

(3) $P(A) - P(B)$ (4) $P(B) - P(A \cap B)$

If two dice are thrown, the probability that the sum is greater than 8 is :

(1) $\frac{2}{9}$ (2) $\frac{1}{4}$ (3) $\frac{5}{18}$ (4) $\frac{3}{17}$

X is a random variable for which ,

X	:	1	2	3	4
$P(X=x)$	:	k	2k	3k	4k

then, the value of k is :

(1) $\frac{1}{10}$ (2) $\frac{1}{5}$ (3) $\frac{1}{4}$ (4) $\frac{1}{8}$

Bernoulli random variables give rise to :

(1) Poisson Distribution (2) Geometric Distribution
(3) Uniform Distribution (4) Binomial Distribution

The probability distribution with lack of memory property is :

(1) Binomial Distribution (2) Normal Distribution
(3) Exponential Distribution (4) Poisson Distribution

The points of inflexion of normal distribution with mean μ and variance σ^2 are :

(1) $\mu \pm \sigma$ (2) $\mu \pm 2\sigma$ (3) $\mu \pm 3\sigma$ (4) $\mu \pm \frac{\sigma}{2}$

The characteristic function $\phi(t)$ of a random variable X is :

(1) continuous from left but not from right
(2) continuous from right but not from left
(3) continuous but not uniformly continuous
(4) uniformly continuous

All higher odd order moments vanish for the following probability distribution :

(1) Normal Distribution (2) Binomial Distribution
(3) Poisson Distribution (4) Exponential Distribution

Mean and variance are equal in :

(1) Normal Distribution (2) Binomial Distribution
(3) Uniform Distribution (4) Poisson Distribution

TEST - III

GENERAL ENGLISH

Read the following passage and choose the option 1, 2, 3 or 4 which best answers the questions 71 to 75.

There is a problem that will touch us all-men, women and children - in the not too distant future, a problem that resolves itself into a question : what is education for ? At the moment most of us can answer that fairly practically and without too much soul-searching. On the lowest level education is for enabling us to cope in an adult world where money must be added up, tax forms filled in, numbers looked up in telephone directories, maps read, curtains measured and street signs understood. On the next level it is for getting some kind of job that will pay a living wage.

But we are already peering into a future so different from anything we would now recognise as familiar that the last of these two educational aims may become as obsolete as a dodo. Basic skills (reading, writing and arithmetic) will continue to be necessary but these, after all, can be taught to children in from one to two years during their childhood. But education with a view to working for a living, at least in the sense of earning daily bread, may well be on its way out right now for the majority of us. Then the question 'what is education for?' becomes much more complex. Because what the future proclaims is : an education is an education is an education.

In other words, our grandchildren may well spend their lives learning as, today, we spend our lives working. This does not simply involve a straightforward substitution of activity but a complete transformation of motive. We work for things basically unconnected with that work - usually money, prestige, success, security. We will learn for learning's sake alone : a rose is a rose because it *is* and not what we can get out of it. Nor need any cynic doubt that we shall not wish to work without there being any obvious end in view. Already, adult education classes are overcrowded - one friend of mine teaching French literature says she could have had 10 pupils for every one she has and though a few of these students (plumbers, bus conductors, housewives) may have had some earning outcome in mind, most do not and are perfectly happy to study Racine for Racine.

Nevertheless, we still live in a very competitive society and most of us will need to reshuffle the furniture of our minds in order to gear our children towards a future in which outer rewards - keeping up with the Joneses - become less relevant than inner and more individual spurs. The existence of competition has always meant doing things because they win us some essentially unconnected advantage but the aim of the future must be to integrate the doing with its own reward, like virtue.

Oddly enough it is in America, that citadel of competitiveness, that the first experiments in this change of mind are taking place. In that New World, there are already organisations set up to examine ways in which competitiveness can be replaced by other inner-directed forms of rewards and pleasures. Take one interesting example in a Foundation whose aim is to transform competitive sport. A tug-of-war, as we all know, consists of one team pitting its strength against another team. The aim is to tug the opposing team over a line and, by doing so, win.

In the brand-new non-competitive version, things are very different. There are still two teams on either end of a rope but now the aim is not to win but to maintain the struggle. As the two teams tug, any individual on either team who senses a coming victory must let go the winning end of the rope and rush over to lend his weight to the other side, thus redressing the balance, and keeping the tug-of-war going as long as possible. If you actually imagine doing this, the startling fact that emerges is that the new game offers more possibilities of individual judgement and skill just because victory is not the aim and the tug-of-war is ended only by defeat of those judgements and skills. What's more, I think most people would get more pleasure out of the neo-tug than the old winners-take-all concept.

So could it be for learning. Most of us, at some time or another, have glimpsed one of the real inner pleasures of education - a sort of one-person chase after an elusive goal that pits You only against You or, at the very most, against the discoveries of the greatest minds of other generations. On a more humble level, most of us have already got some pleasurable hobby that we enjoy for its own sake and become expert in for that enjoyment. In my own stumbling efforts, since last year, to learn the piano, I have seen the future and it works.

71. According to the writer, the purpose of education is :

(1) to help us cope with practical adult demands
(2) to learn as a life-long process
(3) to get employment
(4) to pursue a hobby

72. According to the writer, the most difficult adjustment for us to make will be :

(1) getting used to having more free time

(2) working without the hope of material reward

(3) seeing education as being its own reward

(4) learning essentially impractical subjects

73. Our duty towards our children will be to :

(1) prepare them to set their own goals

(2) encourage them to be more ambitious

(3) improve their chances of employment

(4) teach them basic moral values in life

74. According to the writer, future learning will resemble the new-style tug-of-war in that :

(1) there will be no possibility of failing

(2) the object will be to avoid winning

(3) it will depend on operating as a team

(4) it will involve a personal challenge

75. The reason for the writer's optimistic conclusion is that she has :

(1) discovered how satisfying learning can be

(2) found in herself a new talent for playing the piano

(3) found how easy it is to develop a new skill

(4) taken up a hobby for the first time

Choose the word / phrase (1, 2, 3 or 4) which best completes each sentence.

76. The T.V. channel _____ a young composer to write a piece of music for its Silver Jubilee Celebrations.

(1) ordered (2) consulted (3) commissioned (4) appointed

77. After months of bitter arguing the couple had to accept that they were _____ .

(1) incongruous (2) incompatible (3) dissident (4) disaffected

78. The railway line has been closed for ten years and the station buildings are now sadly _____ .

(1) decrepit (2) derelict (3) decomposed (4) discarded

79. Apart from the _____ cough and cold, I've been remarkably healthy all my life.

(1) odd (2) opportune (3) irregular (4) timely

80. There were so many people _____ me in the crowd that I almost lost my balance.

(1) jerking (2) agitating (3) jostling (4) obstructing

Choose the correct option (1, 2, 3 or 4) which best completes each sentence.

81. I sometimes despair _____ ever seeing him again.

(1) of (2) about (3) over (4) at

82. A good friend is one who will _____ you when you're in trouble.

(1) stand by (2) stand for (3) stand up to (4) stand over

83. The man prevented the bear _____ the little girl.

(1) to attack (2) against attacking

(3) not to attack (4) from attacking

84. We have been working on this problem _____ .

(1) since two days (2) for two days

(3) from two days (4) during two days

85. No one could understand _____ .

(1) what did he say (2) What he was saying

(3) what was he saying (4) what did he say

TEST - IV

GENERAL AWARENESS OF ECONOMIC ENVIRONMENT

86. Elasticity of demand with respect to own price :

(1) change in demand per unit change in price

(2) change in price per unit change in demand

(3) proportionate change in demand in response to proportionate change in price

(4) proportionate change in price in response to proportionate change in demand

87. If $u=f(v)$ is utility function, u and v being utility and the quantity consumed respectively, then marginal utility is :

(1) negative (2) positive

(3) zero (4) negative or positive or zero

88. The consumer's indifference curve is :

(1) convex to the origin

(2) concave to the origin

(3) neither convex nor concave to the origin

(4) either convex or concave to the origin

89. If $y=f(x)$ is a one input and one output production function, the diminishing returns refer to :

(1) $f'(x)=0$ (2) $f'(x)>0, f''(x)<0$

(3) $f'(x)>0, f''(x)>0$ (4) $f'(x)>0, f''(x)=0$

90. $R(v)$ and $C(v)$ are respectively the revenue and cost functions and v being the output.

If $\pi(v)=R(v)-C(v)$ is the profit function and $R''(v)$ and $C''(v)$ are the second derivatives, then profit maximization requires :

(1) $R''(v)=C''(v)$ (2) $R''(v)<C''(v)$

(3) $R''(v)>C''(v)$ (4) None of the above

91. $u = A\ x_1^{\alpha}\ x_2^{\beta}$ is a production function which combines inputs x_1 and x_2 to produce output u. Increasing returns to scale requires :

(1) $\alpha + \beta = 1$ (2) $\alpha + \beta = 0$ (3) $\alpha + \beta < 1$ (4) $\alpha + \beta > 1$

92. National Income =

(1) Consumption

(2) Sum of Consumption and Investment

(3) Sum of Investment and Govt. expenditure

(4) Sum of Consumption, Investment and Govt. Expenditure

93. A condition where the volume of purchasing power is permanently running ahead of the output of goods and services available to consumers and producers is called :

(1) Inflation on Gold Standard (2) Persistent Inflation

(3) Hyper Inflation (4) Inflationary Gap

94. Balance of payments constitute :

(1) Balance of Trade alone

(2) Invisible items

(3) Sum of Balance of Trade and Invisible items

(4) None of the above

95. The rate at which one currency can be exchanged for another is called :

(1) Exchange restriction (2) Exchange Rate

(3) Exchange stabilization (4) Exchange in intervention

96. Basal norms refer to :

(1) Agriculture (2) Industry (3) Banking (4) International Trade

97. Insolvent Risk Efficiency of a commercial bank is measured by its :

(1) Deposits (2) Investments

(3) Advances (4) Capital Adequacy Ratio

98. Non-performing assets refer to :

(1) Banks (2) Agriculture (3) Industry (4) International Trade

99. The effect on total employment is called :

(1) Accelerator (2) Multiplier (3) Inflation (4) Deflation

100. Cash Reserve Ratio (CRR) is imposed by :

(1) a Commercial Bank (2) a Cooperative Bank

(3) Reserve Bank of India (4) State Finance Corporations

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