Fellowship

EXAMINATION QUESTION PAPERS
MAY 2009

भारतीय बीमा संस्थान
INSURANCE INSTITUTE OF INDIA
Universal Insurance Building,
Sir P. M. Road, Fort,
Mumbai - 400 001.
FELLOWSHIP EXAMINATION
MATHEMATICAL BASIS OF LIFE ASSURANCE

Time: 3 Hours] [Total Marks: 100

Answer any FIVE questions only.
All questions carry 20 marks each.

1. a) The amount of interest earned on A is Rs. 336, while the equivalent amount of discount is Rs. 300. Find A.
   Marks 5

b) Find the nominal rate of interest per annum convertible half-yearly, correct to two decimal places corresponding to:
   i) an effective rate of interest of 10.25% p.a.
   ii) a nominal rate of discount of 10% p.a. convertible half yearly.
   iii) a nominal rate of interest of 8% p.a. convertible quarterly.
   iv) a nominal rate of interest of 6.18% per half-year convertible once in two half-years.
   Marks 8

c) An insurance company has a liability to pay Rs. 25,00,000 three years from now, and another liability to pay Rs. 35,00,000 seven years from now. Instead of these liabilities, the insurance company would prefer to pay Rs. $x$ at the end of 1 year, Rs. $1.5x$ at the end of 1.5 years and Rs. $2x$ at the end of 2 years to satisfy the liabilities. At a nominal rate of interest of 8% p.a. convertible half-yearly, calculate $x$.
   Marks 7

Given at 4% p.a. effective: $v^2 = .92456$, $v^4 = .85480$ and $v^7 = .75992$

2. A loan of Rs. 80,000 is repayable by equated quarterly installments over 15 years at nominal rate of interest of 12% p.a. convertible quarterly. Calculate:
   Marks 2

a) the quarterly installment.
b) principal contained in the 20th installment.
c) interest paid during the years 6-20 (both inclusive).
d) principal repaid during the years 12-14 (both inclusive).
e) principal contained in the last installment.
f) principal contained in the first installment.

Given: at 3%: $a_{4\mid} = 3.7171$, $a_{16\mid} = 12.5611$, $a_{25\mid} = 14.8775$

$a_{30\mid} = 23.1148$, $v^{40} = .30656$ and $v^{60} = .16973$
3. a) A Government Bond was issued for a term of 5 years with interest payments made at the end of every year at the rate of 6% p.a. The bond is redeemed at the end of 5 years at par. Find the price an investor is willing to pay for a bond with face value of Rs. 1,00,000 if he expects a return of 8% on his investment.

**Given:**

\[ v^5 @ 6\% = 0.74726, \quad v^5 @ 8\% = 0.68058 \]

b) Prove that:

\[ \bar{a}_{x\mid n} - a_{x\mid n} = 1 - A_{x\mid n}^{\dagger} \]

c) Show that the assumption of uniform deaths over each year of age implies:

\[ d_{x+t} = (1-t)d_x + t \cdot d_{x+t} \quad \text{where} \quad 0 \leq t \leq 1 \]

d) If \( l_x = 100 - x \), find the value of \( A_{40:15}^{\dagger} \) @ 6% interest given that \( v^{15} \) at 6% = 0.417265

4. a) A student says: Premium rates under a whole life assurance policy are lower than those under endowment assurance policies. However, the rate of reversionary bonus under whole life assurance policy is significantly higher than these under endowment policies. Comment briefly giving actuarial reasoning.

b) A whole life assurance policy is effected on the life of a person aged 35 for sum assured of Rs. 20,000. Annual premiums are payable for 15 years or till death, whichever is earlier. Ignoring expenses, calculate:

i) the net annual premium.

ii) the prospective policy value at the end of 10 years.

iii) the retrospective policy value at the end of 20 years.

**Given:**

<table>
<thead>
<tr>
<th>x</th>
<th>Dx</th>
<th>Nx</th>
<th>Mr</th>
</tr>
</thead>
<tbody>
<tr>
<td>35</td>
<td>2507.40</td>
<td>52663.13</td>
<td>481.90</td>
</tr>
<tr>
<td>45</td>
<td>1677.97</td>
<td>31583.93</td>
<td>463.20</td>
</tr>
<tr>
<td>50</td>
<td>1366.61</td>
<td>23839.41</td>
<td>449.71</td>
</tr>
<tr>
<td>55</td>
<td>1105.41</td>
<td>17546.37</td>
<td>430.55</td>
</tr>
</tbody>
</table>
5. a) Prove that  
\[ m \ln q_x = m p_x - m + n p_x. \]

b) Calculate the net annual premium for a special money back policy of SA 50,000 for a person aged 40 years where 50% of the sum assured is paid at the end of 10th year on survival and the balance 50% on survival at the end of the term of 15 years. On death during the term of the policy sum assured is payable at the end of the year of death.

**Given:**

\[
\begin{align*}
N_{40} & = 138898.05 & D_{55} & = 3660.5858 \\
N_{55} & = 44326.169 & M_{40} & = 1598.1679 \\
D_{40} & = 9353.5601 & M_{55} & = 1258.3191 \\
D_{50} & = 5060.8614
\end{align*}
\]

c) 3 unbiased coins are tossed simultaneously. Find the probability that

i) All 3 are heads.

ii) At least one tail.

iii) If on a particular trial of the above experiment, it is found that 2 tails are realized. What is the probability that the third is a head.

d) A 10 year special term assurance policy provides a benefit of Rs. 1,00,000 at the end of year of death together with a return of premiums paid without interest. Allowing for expenses of 10% of each premium. Find the annual premium for a life aged 50 years at 6% interest.

**Given :-**

\[
\begin{align*}
N_{50} & = 66676.968 & M_{60} & = 1104.5519 \\
N_{60} & = 28268.269 & R_{50} & = 31331.215 \\
M_{50} & = 1393.4551 & R_{60} & = 18636.449
\end{align*}
\]

6. Write short notes on :

a) Life year method of investigation

b) Bonus loading in premium rates.

c) Consequences of withdrawal of a Life Insurance Contract.

7. a) Explain by general reasoning the relationship :-

\[ A_{x:n} = 1 - d \bar{a}_{x:n} \]
b) Given: \( p_{62} = .989888, \quad p_{63} = .988656, \quad p_{64} = .987284, \)

\[ \text{calculate - } A_{62:5} \text{ at interest of 4% p.a.} \]

c) Given: \( l_{61} = 9213, \quad d_{61} = 83, \quad d_{62} = 92 \text{ and } d_{63} = 103, \)

\[ \text{calculate - } a_{61:4} \text{ at interest of 6% p.a.} \]

d) What are natural premiums and what are their defects?

8. a) Calculate office annual premium under an endowment assurance policy for sum assured of Rs. 50,000 on the life of a person aged 40 years for term of 20 years. Premiums are payable for 20 years or till death, whichever is earlier. Provide for expenses:

First year: 3 per thousand Sum Assured and 60% of annual premium.
Renewal: 1 per thousand sum assured and 5% of annual premium.

\[ \text{Given: - } a_{40:15} \text{ at } 4\% = 12.927. \]

b) Calculate office single premium for an immediate annuity of Rs. 20,000 per annum payable quarterly in arrears for 20 years certain only. Basis: Interest 6% p.a. Provide for expenses at 3% of single premium and for payment of annuity at Rs. 50 per annuity installment.

\[ \text{Given: - at 6\%} \]

\[ v^{20} = .31180 \quad \text{and } i^{(4)} = .058695. \]

— END —
FL-82

FELLOWSHIP EXAMINATION
STATISTICS

Time: 3 Hours] [Total Marks: 100

Answer any FIVE questions only.
All questions carry 20 marks each.

(An extract from the table of areas of the standard normal curve
between 0 and x is given at the end)

1. a) An integer is chosen from the first 20,000 positive integers, if all are
equally likely to be selected, what is the probability that the integer chosen
is not divisible by 6 or 8?

Marks 10

b) A Company has two screw producing machines. Past records show that
Old machine produces 30% of the screws and New machine produces
70% of the screws in a day. Further, 5% of the screws produced by Old
machine are defective, whereas only 1% of the screws produced by New
machine are defective. If a defective screw is drawn at random, what is
the probability that the defective screw was from Old machine?

Marks 10

2. Calculate price and quantity indices for the year 2002 with 2002 as base year
from the following data by using:-

(i) Laspeyres (ii) Paasches and (iii) Fishers formula.

<table>
<thead>
<tr>
<th>Year</th>
<th>Commodity I</th>
<th>Commodity II</th>
<th>Commodity III</th>
<th>Commodity IV</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Price</td>
<td>quantity</td>
<td>Price</td>
<td>quantity</td>
</tr>
<tr>
<td>2002</td>
<td>5.00</td>
<td>5</td>
<td>7.75</td>
<td>6</td>
</tr>
<tr>
<td>2005</td>
<td>6.50</td>
<td>7</td>
<td>8.80</td>
<td>10</td>
</tr>
</tbody>
</table>

With reference to above, verify:-

i) Time Reversal Test is satisfied by Fishers formula.

ii) Fishers Price Index * Fishers quantity Index = Value Index (when expressed
as ratios and not percentages)
3. A book of 1000 pages was scanned and the number of printing errors in each page was noted. The distribution of number of errors in a page was found to be 'Poisson'. If there were exactly 301 pages free from error and 26 pages with exactly 4 errors each, estimate the average errors per page.

Also estimate:

a) i) the number of pages with exactly '1' error and
ii) the number of pages with exactly '2' errors

b) If for the second edition of the same book (published after 3 years), the average errors per page was found to be '1' estimate.

i) the number of pages with '0' error and
ii) the number of pages with exactly '1' error.

Given that: \( e^1 = 0.36788 \)

4. a) The following table gives the distribution of relatively defective items of certain product; according to their size groups.

<table>
<thead>
<tr>
<th>Size Group</th>
<th>X</th>
<th>15.5</th>
<th>16.5</th>
<th>17.5</th>
<th>18.5</th>
<th>19.5</th>
<th>20.5</th>
</tr>
</thead>
</table>

Defective items

<table>
<thead>
<tr>
<th>Y</th>
<th>75</th>
<th>60</th>
<th>50</th>
<th>50</th>
<th>45</th>
<th>50</th>
</tr>
</thead>
</table>

Based on above data, check whether there is any possibility of correlation between size and defect in quality.

b) Find the most appropriate missing value from the following data, if relationship between variables \( u \) & \( v \) is known to be linear.

\[
\begin{array}{c|cccccccc}
  u & 2 & 3 & 7 & 10 & 12 & 15 \\
  v & 18 & 16 & 10 & ? & 13 & 11 \\
\end{array}
\]

5. a) State the 'Commonly Used Estimators' for the following:

i) Population Mean, \( \mu \)

ii) Population Variance, \( \sigma^2 \) and

iii) The proportion \( \pi \) of units in the population, having a particular attribute.
b) What are the short-comings of the above estimates?

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c) Using the following data of ages of 20 employees, of a firm, randomly selected from total 1000 employees, find the estimate for
i) Population Mean, \( \mu \)
ii) Population Variance, \( \sigma^2 \) and
iii) the proportion of the employees aged more than 50 in the population,
21, 24, 26, 29, 31, 32, 33, 34, 35, 36, 43, 45, 46, 48, 49, 52, 53, 56, 56 & 59.

6. 550 students were examined for a competitive examination, in 'Mathematics'. The marks obtained by them ranged from 0 to 99, all being integers. The marks are grouped in 20 classes, each class of 5 marks interval. They are given below with respective frequencies.

<table>
<thead>
<tr>
<th>Interval</th>
<th>Mid-value</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-4</td>
<td>2</td>
<td>11</td>
</tr>
<tr>
<td>5-9</td>
<td>7</td>
<td>12</td>
</tr>
<tr>
<td>10-14</td>
<td>12</td>
<td>12</td>
</tr>
<tr>
<td>15-19</td>
<td>17</td>
<td>13</td>
</tr>
<tr>
<td>20-24</td>
<td>22</td>
<td>22</td>
</tr>
<tr>
<td>25-29</td>
<td>27</td>
<td>22</td>
</tr>
<tr>
<td>30-34</td>
<td>32</td>
<td>28</td>
</tr>
<tr>
<td>35-39</td>
<td>37</td>
<td>33</td>
</tr>
<tr>
<td>40-44</td>
<td>42</td>
<td>43</td>
</tr>
<tr>
<td>45-49</td>
<td>47</td>
<td>43</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Interval</th>
<th>Mid-value</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>50-54</td>
<td>52</td>
<td>49</td>
</tr>
<tr>
<td>55-59</td>
<td>57</td>
<td>51</td>
</tr>
<tr>
<td>60-64</td>
<td>62</td>
<td>60</td>
</tr>
<tr>
<td>65-69</td>
<td>67</td>
<td>40</td>
</tr>
<tr>
<td>70-74</td>
<td>72</td>
<td>31</td>
</tr>
<tr>
<td>75-79</td>
<td>77</td>
<td>26</td>
</tr>
<tr>
<td>80-84</td>
<td>82</td>
<td>22</td>
</tr>
<tr>
<td>85-89</td>
<td>87</td>
<td>16</td>
</tr>
<tr>
<td>90-94</td>
<td>92</td>
<td>12</td>
</tr>
<tr>
<td>95-99</td>
<td>97</td>
<td>4</td>
</tr>
</tbody>
</table>

a) Calculate: Mean, Mode, Median
b) Calculate: Standard Deviation
c) Calculate measure of skewness \( \alpha_3 \)

7. a) The mean score of a random sample of 60 subjects was found to be 145 with a standard deviation of 40. Construct a 95% confidence interval for true mean. Assume the sample size to be large enough for normal approximation. What size of the sample is required to estimate the population mean (true mean) within the difference of 5 from true mean, with 95% confidence?
b) The mean weekly sales of soap bars in departmental stores in certain city was 146.3 bars per store. After an advertising campaign the mean weekly sales in 22 stores for a typical week increased to 153.7 and showed a standard deviation of 17.2. Was the campaign successful?

\[ t_{0.05} = 1.72 \text{ at 21 d.f. for single tailed test.} \]

8. a) The heights (to the nearest half-inch) of 15 men selected at random are as follows:

63.0, 64.0, 64.0, 64.5, 65.0, 65.0, 66.5, 66.5, 67.0, 67.0, 68.5, 69.0, 70.0, & 72.0

Can the sample be regarded as taken from the population having height 68 inches as mean?

[Given that \( t_{0.025} = 2.145 \) for degrees of freedom 14]

b) Two samples A and B of size 15 & 7 respectively gave following results:

<table>
<thead>
<tr>
<th></th>
<th>Sample A</th>
<th>Sample B</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>( \overline{x}_1 = 70 )</td>
<td>( \overline{x}_2 = 68 )</td>
</tr>
<tr>
<td>Standard deviation</td>
<td>( s_1 = 2.4 )</td>
<td>( s_2 = 2.7 )</td>
</tr>
<tr>
<td>number</td>
<td>( n_1 = 15 )</td>
<td>( n_2 = 7 )</td>
</tr>
</tbody>
</table>

Is the difference of the mean significant at 5% level?

The value of \( t_{0.025} \) for degrees of freedom 20 is 2.086
<table>
<thead>
<tr>
<th>X</th>
<th>Area</th>
<th>X</th>
<th>Area</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.05</td>
<td>0.0199</td>
<td>1.1</td>
<td>0.3643</td>
</tr>
<tr>
<td>0.10</td>
<td>0.0398</td>
<td>1.2</td>
<td>0.3849</td>
</tr>
<tr>
<td>0.20</td>
<td>0.0793</td>
<td>1.3</td>
<td>0.4032</td>
</tr>
<tr>
<td>0.30</td>
<td>0.1179</td>
<td>1.4</td>
<td>0.4192</td>
</tr>
<tr>
<td>0.40</td>
<td>0.1554</td>
<td>1.5</td>
<td>0.4332</td>
</tr>
<tr>
<td>0.50</td>
<td>0.1915</td>
<td>1.6</td>
<td>0.4452</td>
</tr>
<tr>
<td>0.60</td>
<td>0.2257</td>
<td>1.65</td>
<td>0.4500</td>
</tr>
<tr>
<td>0.70</td>
<td>0.2580</td>
<td>1.7</td>
<td>0.4554</td>
</tr>
<tr>
<td>0.80</td>
<td>0.2881</td>
<td>1.8</td>
<td>0.4641</td>
</tr>
<tr>
<td>0.90</td>
<td>0.3159</td>
<td>1.9</td>
<td>0.4713</td>
</tr>
<tr>
<td>1.00</td>
<td>0.3413</td>
<td>1.96</td>
<td>0.4750</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2.00</td>
<td>0.4772</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2.58</td>
<td>0.4951</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3.0</td>
<td>0.4987</td>
</tr>
</tbody>
</table>
FELLOWSHIP EXAMINATION

GROUP INSURANCE & RETIREMENT BENEFIT SCHEMES

Time: 3 Hours] [Total Marks: 100

Answer any FIVE questions only.
All questions carry 20 marks each.

1. a) The Trust Deed and Rules of a Gratuity Fund should contain important provisions so that the fund will satisfy the conditions/provisions for approval under the Income Tax Act, 1961 and Income Tax Rules, 1962. Enumerate these important conditions/Provisions.
   Marks 14

   b) Briefly discuss the fairness of these conditions/provisions.
   Marks 6

2. A company has set up an approved pension fund on 1-1-1995 which is administered by the trustees. The main features of the fund are:

   Contribution :- Employees' contribution at 2% of their monthly salary. Employer's contribution as may be required to secure the pension determined on actuarial valuation of the fund. However, the company is contributing 17% of the salary for every member. In addition to their own contributions some 27 members have brought in their equitable interest from other superannuation funds of former employers.

   Pension 1.5 % of final salary for each year of service :-

   The pension is subject to deduction of an amount which is actuarial equivalent of the gratuity received by the members. Amounts transferred to the fund by way of equitable interest will secure additional pension. The total funds to the credit of the fund as on 31-12-2008 in respect of 285 officers are Rs. 24.90 crores, which are deposited in fixed Deposits of public sector banks and post offices. No individual accounts of members are maintained so far.

   The trustees have sought your advice to reorganise the fund in the following manner:-

   i) Members not to contribute from 1-1-2010
   ii) Company to contribute at the rate of 15% of salary from 1-1-2010.
   iii) Gratuity to be delinked from pension.
   iv) Distribute the past accumulations to the members.
   v) Reorganise the investments on proper patterns.
Examine critically the working/present state of affairs of the fund, and make a report outlining various steps required to be taken for setting right the administration and switching over to "contribution defined" fund.

3. Write short notes:
   a) Shortfall in Gratuity on Withdrawal
   b) Conversion option
   c) Experience Rating
   d) Index Linked Pension Scheme.

4. a) Explain the importance of Social Security Scheme for Below Poverty Line people with reference to Janashree Bima Yojna of LIC.
   b) Examine the main features of "Aam Aadmi Bima Yojana" and "Shiksha Sahyog Yojana."

5. Pratham Pharma Ltd. is a joint stock company in private sector employing about 2300 employees. Provident fund and gratuity are the statutory service benefits available to the employees. As a third retirement benefit, the company has proposed to a Life Office an insured pension scheme on the following lines:
   - The scheme will be an arrangement to be approved under the Income Tax Act, 1961.
   - The scheme will be compulsory for all employees and will be wholly financed by employees' contributions expressed as percentage of annual salary according to age at entry into the scheme. It will be 2% for entry age up to 35, 4% for entry age 36-45 and 8% for entry age 46 and over. Employees who are due to retire within the next 5 years will be required to contribute a sum equal to 5 years’ contributions.
   - The employer will make a token contribution of Rs. 1,000 per annum for the scheme as a whole.
   - On retirement at age 60 or early retirement within 5 years prior to age 60, a pension equal to 0.8% of final salary for each year of past service plus 1.6% of final salary for each year of future salary will become payable. Commutation of any part of pension will not be allowed.
   - Benefits on death/leaving service will be total contributions paid by the employee without interest.
a) Critically examine the defects in the company’s proposal.
b) Briefly suggest important modifications to the proposal, so that a viable insured pension scheme can be set up from legal, actuarial, financial and ‘equity’ aspects.

6. a) Explain what is group selection of risk, stating as to why it is possible to grant insurance cover to members of group insurance schemes on the basis of simple insurability conditions in case of Employee-Employer groups.
b) State the manner in which insurability conditions are modified in case of voluntary groups and give reasons therefor.

7. State the Income Tax Position from the point of view of both an employee and employer (wherever applicable) in regard to the following, indicating the relevant sections of the Income Tax Act, 1961:-
   a) Commuted Value payable under Group Superannuation Scheme at the time of death.
   b) Maturity benefit received under GSLI Scheme consisting of savings portion with accumulated interest.
   c) Employer’s contribution towards second yearly installment of single premium towards past service Gratuity Liability.
   d) Gratuity payable under Gratuity Act.

8. a) “Superannuation schemes are not very popular in India.” Discuss
b) State the advantages of Pension as a Retirement Benefit.

----- END -----
<table>
<thead>
<tr>
<th></th>
<th>Debit</th>
<th>Credit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Commission Paid</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fire</td>
<td>200</td>
<td></td>
</tr>
<tr>
<td>Marine</td>
<td>40</td>
<td></td>
</tr>
<tr>
<td>Miscellaneous</td>
<td>400</td>
<td></td>
</tr>
<tr>
<td>Management Expenses</td>
<td>1200</td>
<td></td>
</tr>
<tr>
<td>Amount due from other insurers</td>
<td>1000</td>
<td></td>
</tr>
<tr>
<td>Amount due to other insurers</td>
<td></td>
<td>750</td>
</tr>
<tr>
<td>Share Capital</td>
<td></td>
<td>2000</td>
</tr>
<tr>
<td>General Reserves</td>
<td></td>
<td>1650</td>
</tr>
<tr>
<td>Cash at bank</td>
<td>1000</td>
<td></td>
</tr>
<tr>
<td>Cash on hand</td>
<td>250</td>
<td></td>
</tr>
<tr>
<td>Investments at book cost</td>
<td>10020</td>
<td></td>
</tr>
<tr>
<td>Income from investments</td>
<td></td>
<td>1800</td>
</tr>
<tr>
<td>Tax deducted at source</td>
<td>200</td>
<td></td>
</tr>
<tr>
<td>Building</td>
<td>300</td>
<td></td>
</tr>
<tr>
<td>Computers and Furniture</td>
<td>1000</td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>18680</td>
<td>18680</td>
</tr>
</tbody>
</table>

Additional information given are :-

(Rs. in Lakhs)

i) Claims outstanding:
   - Fire 200
   - Marine 100
   - Miscellaneous 2000

ii) Provide for unexpired risk reserve at 100% for marine and at 50% for other departments.

iii) Reinsurance recovery of 100 has been wrongly accounted as due to other insurer.

iv) Management expenses are to be apportioned among the 3 departments in the ratio of 4:1:7

v) Accrued interest is 200 and the market value of the investments is 14400

vi) Provide depreciation on building at 5% and at 30% on computers and furniture.

vii) Please provide income tax @ 40% including Surcharge.

2. a) What do you understand by the term “Approved investments?” List out at least 5 types of approved investments.
   b) What is a Non-Performing Assets? What are the provisions under IRDA Regulations regarding recognition of income from a NPA?
3. From the information given below of M/s ABC Ltd, you are required to prepare a fund flow for the year 2005-06.

<table>
<thead>
<tr>
<th></th>
<th>31 Mar 2005</th>
<th>31 Mar 2006</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Assets</strong></td>
<td>Rs.</td>
<td>Rs.</td>
</tr>
<tr>
<td>Net fixed Assets</td>
<td>4,10,000</td>
<td>7,00,000</td>
</tr>
<tr>
<td>Investments</td>
<td>3,00,000</td>
<td>4,00,000</td>
</tr>
<tr>
<td>Current Assets</td>
<td>1,20,000</td>
<td>2,50,000</td>
</tr>
<tr>
<td>Discount on issue of Debentures</td>
<td>20,000</td>
<td>10,000</td>
</tr>
<tr>
<td><strong>Total Assets</strong></td>
<td>8,50,000</td>
<td>13,60,000</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Capital and Liabilities:</strong></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Equity share capital</td>
<td>4,00,000</td>
<td>4,50,000</td>
</tr>
<tr>
<td>12% Debentures</td>
<td>2,00,000</td>
<td>3,00,000</td>
</tr>
<tr>
<td>Provision for Doubtful debts</td>
<td>20,000</td>
<td>25,000</td>
</tr>
<tr>
<td>Current Liabilities</td>
<td>80,000</td>
<td>85,000</td>
</tr>
<tr>
<td>Reserves</td>
<td>1,50,000</td>
<td>5,00,000</td>
</tr>
<tr>
<td><strong>Total Capital and Liabilities</strong></td>
<td>8,50,000</td>
<td>13,60,000</td>
</tr>
</tbody>
</table>

The provision for depreciation stood at Rs. 1,50,000/- as on 31-03-2005 and at Rs. 2,00,000/- on 30-03-2006.

During the year:

i) A machine costing Rs. 1,00,000/- (Book value Rs. 60,000) was disposed off for Rs. 40,000/-

ii) Dividend at 20% was paid on equity shares for the year 2004-05.

iii) It was also decided to write off the discount on issue of debentures out of the free reserves as on 31-03-2006.

4. a) Explain 'Limiting Factor' with reference to a manufacturing unit and its marginal cost.

b) Delhi Manufacturing Co. Ltd. is operating at 60% of its installed capacity. To increase the sales, following 2 options are available.

**Option 1:** An overseas contract for Rs. 15,00,000 where the deliveries have to be effected equally during the next 3 years.

**Option 2:** Local sales can be increased by 50% if Rs. 50,000/- is spent on special advertising. The following is a summarized Profit and Loss a/c for the previous year.
FELLOWSHIP EXAMINATION
RISK MANAGEMENT

Time: 3 Hours] [Total Marks: 100

Answer any FIVE questions only.
All questions carry 20 marks each.

1. a) Elaborate the three categories of partial loss arrangements. 6
   b) What are the reasons for Partial Insurance? 6
   c) State the disadvantages of Partial Insurance arrangements. 4
   d) Mention the difficulties in agreement for reduction for deductibles and first loss insurance. 4

2. Discuss the pros and cons of check-list method in risk identification process. 20

3. What are the ways of handling risks? 20

4. Write short notes on:
   a) Risk avoidance 5 each
   b) The Loss of large numbers planning
   c) Classification of risks
   d) Contents of Risk and Insurance Manuals

5. “For effective results, a risk manager needs visible support from top management and cooperation of all functional management.” Elaborate this statement. 20

6. a) What are the reasons for buying insurance? 10 each
    b) What are the limitations to the benefits of insurance?

7. Why and how subjective probability is used by risk manager in decision making. 20
8. a) What are the fundamentals in Training of Employees and contractors 10 each with the aim of risk reduction?

b) Under “Risk Reduction”, what are the first steps in preparing a contingency plan to deal with business interruptions?
FELLOWSHIP EXAMINATION

LAW AND ECONOMICS OF INSURANCE

Time: 3 Hours] [Total Marks : 100

Attempt at least 2 questions each from Section 'A' and Section 'B'.

Total Questions to be attempted are 5 only.

All questions carry 20 marks each.

Section - 'A'

1. Discuss in detail with examples the Agreements which are void under the Indian Contract Act. 20

2. a) Insurance is a Contract Under the Indian Contract Act. What are the distinguishing features of an Insurance Contract? 10 each
   b) Explain in detail the rights, duties and authority of an Agent.

3. Explain the nature of Contract of Agency. How is the relationship of Principal and Agent created? 20

4. a) State the provisions of Section 64 VB (i) of Insurance Act, 1938. 10 each
   b) How are requirements of Section 64 VB(i) are relaxed in following cases:
      i) Policies issued to Government and Semi-Government bodies.
      ii) Policies issued for a period of more than one year.
      iii) Policies of reinsurance.

Section - 'B'

5. a) What is planned Economy? How does it differ from market Economy? 10 each
   b) Explain in detail the determinants of Supply.

6. What are the factors of production? Explain their inter-dependence. 20

7. a) Explain in detail the factors which affect the elasticity of demand. 10 each
   b) What is Perfect Competition? Compare Perfect Competition with Monopoly.
8. How is the efficiency of an insurance enterprise measured? Elaborate the different techniques available to measure such efficiency.
FELLOWSHIP EXAMINATION
MARKETING AND PUBLIC RELATIONS

Time: 3 Hours] [Total Marks: 100

Answer any FIVE questions only.
All questions carry 20 marks each.

(Note: Answer to questions pertaining to the Insurance Industry may be given with reference to either Life or General Insurance Industry)

1. Identify the different customers and their needs, of the following services.
   a) A daily newspaper dealing with the capital market.
   b) A taxi company with a fleet of 100 motor cars.
   c) A FM radio channel.
   d) An expert in designing landscapes for townships.

   Marks: 20

2. a) What are the various ways of segmentation?
   b) Which of these would be useful for life insurance?

   Marks: 8, 12

3. a) It has been emphasized that it is important to build relationships. Who are the persons with whom (i) the Branch Manager of a life insurance company and (ii) an agent must build relationships. Give reasons.
   b) How can 'Ease of Access' be improved by a life insurer.

   Marks: 10 each

4. Who is the 'Marketeer' and who is the 'Customer' in the following cases? If there is more than one customer or marketeer, say so. Give reasons.
   a) Laptops being supplied free to all students by a management institute.
   b) Books being displayed in the foyer when a professional conference is going on.
   c) A product being advertised in the course of a cinema, when the product or its name is prominently displayed in several scenes.
   d) Books being purchased centrally by the Head Office on request from its subordinate offices.

   Marks: 5 each

5. a) State whether the following statements are true or false. Give reasons.
   i) A customer charter is a demand made by a customer on a producer of services.
   ii) Every complainant expects to get an acknowledgement in writing.

   Marks: 10
iii) Rating marked on a printed feedback form provide the most reliable feedback.

iv) WOW experiences will happen every time the same service is rendered.

v) All claimants in life insurance are in tragic circumstances.

b) State five significant changes in the characteristics of the rural market that would affect the potential for life insurance in the rural areas.

6. How can the following persons in an insurance office contribute to quality of service?

i) Training manager in Head Office.

ii) Receptionist in the Branch office.

iii) Public Relations Officer in the Head office.

iv) Marketing Manager in Branch Office.

7. a) What is the significance of a 'Problem Child'?

b) How important is 'Place' important in life insurance.

c) Why is it said that 'People are more first than customers'?

8. a) What is the difference between 'Product Image' and 'Positioning'?

b) What is the importance of 'Product Image'?

c) What is the popular image of Life Insurance?

d) If the image is as you have suggested above, what is the competition for life insurance?

----- END -----
FELLOWSHIP EXAMINATION
MANAGEMENT ACCOUNTING

Time: 3 Hours

[Total Marks: 100

Question ONE is compulsory. Total questions to be attempted are FIVE. All questions carry 20 equal marks.

1. From the following Trial Balance as on 31.03.2001 of Professional Life Insurance Co. Ltd, prepare its Revenue account and Balance Sheet as on that date.

<table>
<thead>
<tr>
<th>(Rs. in Lakhs)</th>
<th>Debit</th>
<th>Credit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Share capital</td>
<td></td>
<td>2,000</td>
</tr>
<tr>
<td>Annuities</td>
<td>200</td>
<td></td>
</tr>
<tr>
<td>Claims Paid less Reinsurance</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Death</td>
<td>820</td>
<td></td>
</tr>
<tr>
<td>Maturity</td>
<td>170</td>
<td></td>
</tr>
<tr>
<td>Surrenders</td>
<td>240</td>
<td></td>
</tr>
<tr>
<td>Agents Balances</td>
<td>60</td>
<td></td>
</tr>
<tr>
<td>Loans on Policies</td>
<td>70</td>
<td></td>
</tr>
<tr>
<td>Loans on Mortgages</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>Building at Cost</td>
<td>200</td>
<td></td>
</tr>
<tr>
<td>Furniture and Fixtures</td>
<td>70</td>
<td></td>
</tr>
<tr>
<td>Cash at Bank</td>
<td>1230</td>
<td></td>
</tr>
<tr>
<td>Cash on Hand</td>
<td>600</td>
<td></td>
</tr>
<tr>
<td>Investments (at Cost)</td>
<td>4200</td>
<td></td>
</tr>
<tr>
<td>Life Fund (1.4.2000)</td>
<td></td>
<td>2860</td>
</tr>
<tr>
<td>Premium (Net)</td>
<td></td>
<td>2100</td>
</tr>
<tr>
<td>Consideration for Annuities</td>
<td></td>
<td>140</td>
</tr>
<tr>
<td>Commission</td>
<td>400</td>
<td></td>
</tr>
<tr>
<td>Management Expenses</td>
<td>150</td>
<td></td>
</tr>
<tr>
<td>Sundry Creditors</td>
<td></td>
<td>210</td>
</tr>
<tr>
<td>Premium Deposits</td>
<td></td>
<td>200</td>
</tr>
<tr>
<td>Interest and dividends</td>
<td></td>
<td>1000</td>
</tr>
<tr>
<td>Total</td>
<td>8510</td>
<td>8510</td>
</tr>
</tbody>
</table>
Other adjustments to be accounted are :-

a) Claims outstanding
   i) Death  60
   ii) Maturity  130

b) Depreciation at 5% on building and at 20% on furniture are to be
   provided.

c) On verification it is seen that loans amounting 30 has been wrongly
   treated as surrenders.

d) Accrued interest    25

e) Outstanding expenses    15

f) Market Value of investments    8000

g) There were no claims outstanding at the beginning.

OR

1. Trial Balance as on 31-03-2005 of the Great Indian General Insurance
   Company Ltd. is given below. You are advised to prepare the related
   Revenue Accounts, Profit & Loss Accounts, Profit and Loss appropriation
   Account for the year ending 31-03-2005 and the Balance Sheet as on that
   date.

   (Rs. in Lakhs)

<table>
<thead>
<tr>
<th></th>
<th>Debit</th>
<th>Credit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unexpired Risk Reserve A/c (1-04-2004)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fire</td>
<td>1000</td>
<td></td>
</tr>
<tr>
<td>Marine</td>
<td>300</td>
<td></td>
</tr>
<tr>
<td>Miscellaneous</td>
<td>1500</td>
<td></td>
</tr>
<tr>
<td>Claims outstanding (1-04-2004)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fire</td>
<td>300</td>
<td></td>
</tr>
<tr>
<td>Marine</td>
<td>280</td>
<td></td>
</tr>
<tr>
<td>Miscellaneous</td>
<td>2750</td>
<td></td>
</tr>
<tr>
<td>Claims Paid less Reinsurances</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fire</td>
<td>700</td>
<td></td>
</tr>
<tr>
<td>Marine</td>
<td>120</td>
<td></td>
</tr>
<tr>
<td>Miscellaneous</td>
<td>2250</td>
<td></td>
</tr>
<tr>
<td>Premium (After adjusting for reinsurances)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fire</td>
<td>2250</td>
<td></td>
</tr>
<tr>
<td>Marine</td>
<td>360</td>
<td></td>
</tr>
<tr>
<td>Miscellaneous</td>
<td>3740</td>
<td></td>
</tr>
</tbody>
</table>
Materials used Rs./Lakhs
Direct Labour 4.50
5.10
Manufacturing expenses:
  Fixed 1.75
  Variable 0.75
  Selling expenses Variable 1.50
  Administration expenses - Fixed 1.00
  14.60
Profit 0.40
  15.00

Export sales will involve additional selling expenses at 5% of the sales value.

You are requested to prepare a statement showing profits by adopting option 1 or 2 or a combination of both the options. Please also indicate assumptions, if any, made by you.

5. Universal Pharmaceuticals Limited follows a standard costing system. The standard fixed for the year are as under:

<table>
<thead>
<tr>
<th>Description</th>
<th>Rs. (Per unit)</th>
</tr>
</thead>
<tbody>
<tr>
<td>a) Standard Output – 20000 units.</td>
<td>6</td>
</tr>
<tr>
<td>b) Direct Materials (2 units @ Rs. 3/-)</td>
<td>3</td>
</tr>
<tr>
<td>c) Direct Labour (3 units @ Re. 1/-)</td>
<td>1</td>
</tr>
<tr>
<td>d) Direct Expenses</td>
<td></td>
</tr>
<tr>
<td>e) Factory Overhead</td>
<td></td>
</tr>
<tr>
<td>Variable</td>
<td>0.50</td>
</tr>
<tr>
<td>Fixed</td>
<td>1</td>
</tr>
<tr>
<td>f) Administrative Overhead</td>
<td></td>
</tr>
<tr>
<td>Variable</td>
<td>0.50</td>
</tr>
<tr>
<td>Fixed</td>
<td>1</td>
</tr>
<tr>
<td>Total Cost</td>
<td>12</td>
</tr>
<tr>
<td>Profit</td>
<td>3</td>
</tr>
<tr>
<td>Selling Price (Fixed by Government)</td>
<td>15</td>
</tr>
<tr>
<td>g) Actual Production and sales were 15000 units.</td>
<td></td>
</tr>
</tbody>
</table>

At the end of the period the variances observed as under:

<table>
<thead>
<tr>
<th>Description</th>
<th>Favorable</th>
<th>Unfavorable</th>
</tr>
</thead>
<tbody>
<tr>
<td>h) Direct Material</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Price</td>
<td>—</td>
<td>4500</td>
</tr>
<tr>
<td>Usage</td>
<td>1200</td>
<td>—</td>
</tr>
<tr>
<td>i) Direct Labour Rate</td>
<td></td>
<td>5000</td>
</tr>
<tr>
<td>Efficiency</td>
<td>3000</td>
<td>—</td>
</tr>
</tbody>
</table>
j) Factory overheads 600
k) Administrative overheads 3000

Please prepare a statement showing the actual cost and profit or loss for the above period. Using the variances given, reconcile the standard profit and actual profit.

6. A plastic manufacturer has under consideration the proposal of production of high quality plastic buckets. The Cost of plant and machinery is Rs. 20 lakhs and will serve for 5 years. Salvage value at the end of 5 years is Rs. 1,00,000/- while the variable cost per unit will be Rs. 20/- the selling price per unit will be Rs. 60/-. The manufacturer is confident of selling 50000 buckets. Working capital needed is Rs. 2,50,000/- Depreciation is at 20% on WDV basis and income tax rate is 30%.

If the cost of capital is 15%, find out whether it is worthwhile to go in for this machinery. PV Factor @ 15%

yr. 1  –  0.870
yr. 2  –  0.756
yr. 3  –  0.658
yr. 4  –  0.572 and
yr. 5  –  0.497

7. a) What is “Margin of Safety”? In what way is it different from Break Even Point.

b) i) Find out the margin of safety when sales – Rs. 20,00,000/- Fixed cost Rs. 4,00,000/- and Break Even point is Rs. 16,00,000/-

ii) Ascertain sales where Fixed cost is Rs. 6,00,000/- Profit is Rs. 1,00,000/- and Break Even point is Rs. 4,00,000/-

8. Write short notes on :-

a) Elements of Cost
b) Financial Management
c) Reserves and Provisions
d) Solvency Margin

-----THE END-----
FELLOWSHIP EXAMINATION
HUMAN RESOURCES MANAGEMENT

Time: 3 Hours] [Total Marks : 100

Answer any FIVE questions only.
All questions carry 20 marks each.

1. State giving reasons, whether the following statements are correct.
   a) Routine transfers are effectively on-the-job training.
   b) The main benefit from passing examination is the increment or promotion.
   c) Consensus is better than Unanimity.
   d) Reward influence motivation.

   Marks 5 each

2. Write short notes on the following:
   a) Standards for effecting controls
   b) Leadership Continuum
   c) Halo Error
   d) Likert’s System

   Marks 5 each

3. a) Explain the background to the development of the human relations approach.
   b) Give two instances from your experience to show that the social system is a reality in organizations.
   c) All your staff members have applied for casual leave in the afternoon to be able to attend to the funeral of their colleague who died in an accident that morning. Your boss has told you to refuse the leave and tell them that any one absent will lose that day’s salary and be also subject to disciplinary action. Discuss the options that you have and the consequences of each option.

   Marks
   a) 6
   b) 6
   c) 8

4. Distinguish between the following:
   a) Career Development and personal Development
   b) Mentoring and Coaching
   c) Empowerment and Delegation
   d) Discipline and Grievance procedures.

   Marks 5 each
5. a) A company introduced a system by which employees of every department were required, at the end of a year, to nominate one of themselves for outstanding work. The person so nominated would be given a valuable gift or cash. How do you think, this scheme will affect team work?

b) Describe in brief, the system of appraisal followed in by your office for supervisory staff and discuss how adequate it is to arrive at fair decisions on increments and/or promotions.

6. Explain, with illustrations the meaning of the following statements.
   a) Formal authority is effective only when the subordinates accept the authority.
   b) Motivation is a chain reaction.
   c) In large organization it is common to see rules being broken.
   d) In many issues, there could be more than one ethically correct response.

7. a) Does your office approach Employment Exchange for recruitment? If the answer is ‘No’, why not? If the answer is ‘Yes’, for what kind of jobs?

b) Do you prefer that new employees should be selected by the Personal Department or by the Department where he is to be posted?

8. a) What is the relationship between cohesiveness and synergy?

b) Why is it said that conflicts are inevitable in organizations?

---THE END---
FELLOWSHIP EXAMINATION
LEGAL ASPECTS OF INDUSTRIAL RELATIONS

Time: 3 Hours

[Total Marks: 100]

Answer any FIVE questions only.
All questions carry 20 marks each.

1. a) Explain in detail the two fundamental maxims of 'Natural Justice' which ensure that law is applied fairly
   b) What is a Works Committee? How is it constituted? What are its functions?

2. “The declaration of fundamental rights would be meaningless unless the fundamental rights can be enforced at the instance of the persons on whom they are conferred. The Supreme Court and the High Courts are empowered to issue writs for the enforcement of fundamental rights against any authority of the state.” Describe the writs which the courts are empowered to issue.

3. a) Define 'industry'. Is cricket club of India an Industry? Justify your answer with reason.
   b) Who constitutes national Tribunal? What are the issues referred for adjudication to national Tribunal?

4. The provisions of Sec II – A of the Industrial Disputes Act is a clear departure from the traditional law relating to master and servant. Elaborate the above section with particular reference to the case of Fixture tyre and Rubber Company V/s The Management.

5. a) Define Award. When does an award Commence? Who are the persons on whom settlement and awards are binding.
   b) Explain the provision relating to prohibition of strike in Public Utility services.

6. “A Trade Union is any combination whether temporary or permanent formed primarily for the purpose of regulating the relations between workmen and
employers or between workmen and workmen or between employers and
employers of for imposing restrictive conditions on the conduct of any
trade or business.” Discuss in detail the provisions for registration of Trade
Unions under the Trade Union Act, 1926.

7. Write short notes on any four:
   1) Trade Dispute and Industrial Dispute.
   3) A.V. Nachne v/s Union of India.
   4) Retrenchment.
   5) Grievance Settlement Authority.

8. What is the test to ascertain whether the dispute is an industrial dispute as
distinct from an individual dispute? Explain with the help of relevant case-
laws.

----- END -----
FELLOWSHIP EXAMINATION
ADVANCED INFORMATION TECHNOLOGY

Time: 3 Hours] [Total Marks : 100

Answer any FIVE questions only.
All questions carry 20 marks each.
(Template is not required for drawing flow charts.)

1. i) Management Information System (MIS) serves the need of managers and executives at all levels and also operating personnel. Explain. 15
   ii) What are the types of reports extracted for Decision making? 5

2. “Computer Security Concept” pertains to two areas, Administrative areas and Technical Area. Discuss that relating to Technical Areas. 20

3. a) What is Data Mining? In what way can data mining be applied in insurance companies? 10
   b) With reference to Object Orientated Programming, write a note on
      i) Abstract data types 5 each
      ii) Class

4. Write short notes on:
   a) Line Printers 5 each
   b) Decision tables
   c) Content Management (e-content services)
   d) Types of RAM

5. Describe the different steps in Program Development. 20

6. Explain the concepts, architecture and information retrieval in DBMS (Data Base Management System). 20

7. Describe the functions of an operating system. 20

8. a) Narrate the features of Microsoft PowerPoint. 10
    b) State the relevance of systems Audit. 5
    c) List out the differences between windows 2000 and Windows XP. 5
FELLOWSHIP EXAMINATION
ASSET MANAGEMENT

Time: 3 Hours]  [Total Marks : 100
Answer any FIVE questions only.
All questions carry 20 marks each.

1. a) What are the factors affecting the value of a bond?
   b) Differentiate between, “Yield to Maturity” and “Holding Period
       Returns”.

2. i) What are the portfolio classification of funds which may be offered to
    the Investors?
   ii) Define ‘Leveraged Funds’ Do they differ with “Bond Funds”?

3. Define the following: (any four)
   i) Money Changers
   ii) In the money under option markets
   iii) Beta
   iv) Hedging
   v) “Drawal” under FEMA.

4. a) Explain how options work in the derivative market.
   b) Equity share of Wonderland Ltd. is selling at present at Rs. 100/- In a
      year’s time it can rise by 75% or fall by 25%. The risk free rate is
      10%. The exercise price of a call option a year from now is Rs. 120/-
      Using the risk neutral method find out the value of the call option.

5. Explain in brief the entities involved in managing a mutual fund and their
   role.

6. “Within an industry, the prospects of a specific firm depend not only on the
   prospects of the industry but also on its operating and competitive position
   within that industry.” How can we identify a firm’s relative position within
   an industry?
7. i) Evaluation of a portfolio's performance has to consider both risk and return. Explain any one of the following measures.
   a) Treynor Measure
   b) Sharpe Measure
   c) Jensen Measure

   ii) Consider the following information for 3 mutual funds X, Y, Z and the Market:

<table>
<thead>
<tr>
<th>Mean Return</th>
<th>Standard Deviation (%)</th>
<th>Beta</th>
</tr>
</thead>
<tbody>
<tr>
<td>X</td>
<td>10</td>
<td>15</td>
</tr>
<tr>
<td>Y</td>
<td>8</td>
<td>10</td>
</tr>
<tr>
<td>Z</td>
<td>11</td>
<td>16</td>
</tr>
<tr>
<td>Market</td>
<td>10</td>
<td>12</td>
</tr>
</tbody>
</table>

   The mean risk free rate is 6%.

   Calculate the :
   a) Treynor Measure
   b) Sharpe Measure and
   c) Jensen Measure

8. Write Short notes on any four of the following :-
   a) Technical Analysis
   b) Non Resident Indian
   c) Futures
   d) Non Convertible Debentures
   e) Constitution of SEBI

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