From: THE REGISTRAR

To

Prof. Ch. Srinivasa Rao,
Chairman, Board of Studies in Mathematics (U.G.),
Mrs. A.V.N. College,
Visakhapatnam.

Sir,

Sub: Approval of Model Question Papers – Reg.

Ref: Email dated 05-07-2021 along with Model Question Papers.

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With reference to the above, I am by direction to inform that the Revised Choice Based Credit System, U.G. Courses (w.e.f. 2020-2021) B.C.A. First Year, First Semester, Model Question Paper of Numerical and Statistical Methods has been approved.

Hence, I request to arrange to circulate the same among the Teaching Staff and Students concerned and placed in A.U. website.

Yours faithfully,

(B. RAMACHANDER)
ASSISTANT REGISTRAR (ACADEMIC)

Copies to:
1. The Dean of Academic Affairs, A.U., VSP.
3. The Dean, CDC, A.U., Vsp.
4. The Dean, Confidential, A.U., Vsp.
5. All Principals, A.U. Affiliated Colleges Offered in U.G. courses.
7. The Superintendent S.I Section for taking necessary further action.
8. The Secretary to V.C., Rector Table, P.A. to Registrar, A.U., Vsp.
9. The Director, Computer Centre, A.U., Vsp.
10. O.C. & O.O.F.
Srinivasa Rao Chindirala <drcsr41@gmail.com>
To: Supdt4041@gmail.com

Mon, Jul 5, 2021 at 10:17 AM
Visakhapatnam,

Date: 05-04-2021

From: Prof. Ch. Srinivasa Rao,
Head, Dept. of Mathematics & Statistics,
Chairman, Board of Studies (U.G.),
Mou. A. V. N College, Visakhapatnam,
Pin code: 530001.

To,
The Registrar,
Andhra University,
Visakhapatnam.

Sir,

This is to inform you that I, Prof. Ch. Srinivasa Rao, am here with enclosing the model question paper of B.C.A. (CBCS) first year, first semester, Admitted Batch (2020-2021), "Numerical And Statistical Methods" for your reference.

Thanking you,

Yours faithfully,

Ch. Srinivasa Rao

*CH. SRINIVASA RAO*)
Answer any FIVE from the following Eight questions.

1. Explain: (a) Iteration method. (b) Bisection method.
   (a) లిటరేషన్ మెథడ్. (b) బిసెక్షన్ మెథడ్.

2. Find the Eigen values of the matrix \( A = \begin{bmatrix} 3 & 1 & 1 \\ 2 & 4 & 2 \\ 1 & 1 & 3 \end{bmatrix} \).
   
3. Evaluate \( \int x^3 \, dx \) with five sub-intervals by Trap rule.

4. By Lagrange's interpolation formula, find the function given by
   \[ x : -1 \quad 1 \quad 2 \quad 3 \]
   \[ f(x) : -21 \quad 15 \quad 12 \quad 3 \]

\[ b_{x_{1}, x_{2}, x_{3}, x_{4}} \text{ లాగ్రాంజీ పరీక్షలు లో ఫంక్షన్ పొందించండి.} \]
5. Let A and B be independent events with \( P(A) = 0.7 \quad \text{and} \quad P(B) = 0.5 \). Then find: (i) \( P(A \cap B) \) (ii) \( P(A \cup B) \) (iii) \( P(A \cup B) \) (iv) \( P(A \cap B) \).

A \( \cup \) B is the event that at least one of A or B occurs. Therefore, \( P(A \cup B) = 0.1 \).

6. If \( E_1, E_2 \) are any two events of a random experiment and \( P \) is probability function, then
\[
P(E_1 \cup E_2) = P(E_1) + P(E_2) - P(E_1 \cap E_2)
\]
\( E_1, E_2 \) are two events in the sample space of an experiment and \( P \) be the probability function. Then
\[
P(E_1 \cup E_2) = P(E_1) + P(E_2) - P(E_1 \cap E_2)
\]

7. Compute Karl Pearson Correlation Coefficient for the following data:

\[
\begin{array}{ccccccc}
x & 13 & 21 & 25 & 32 & 57 & 59 \\
y & 99 & 65 & 79 & 75 & 87 & 81 \\
\end{array}
\]

3. Write:
(a) Newton's forward Interpolation formula.
(b) Newton's backward Interpolation formula.
(c) Lagrange's Interpolation formula.
Answer the following (One question from each unit)

9(a) Find a real root of \( x^3 - 3x - 4 = 0 \) by the Newton Raphson method.

(b) Find a real root of the equation \( x^3 - 2x - 5 = 0 \) by the method of Regula falsa position.

10(a) Solve the equations \( 2x_1 + x_2 + x_3 = 2, \ x_1 + 3x_2 + 2x_3 = 2, \ 3x_1 + x_2 + 2x_3 = 2 \) by \( LU \) decomposition method.

(b) By using Gauss-Seidel iterative method solve the linear equations
\[
\begin{align*}
x_1 + 10x_2 + x_3 &= 6, \\
x_1 + x_2 + x_3 &= 6, \\
\end{align*}
\]
and
\[
\begin{align*}
x_1 + 10x_2 + x_3 &= 6, \\
x_1 + x_2 + x_3 &= 6, \\
\end{align*}
\]
1(a) Estimate the sale for 1966 using the Newton's backward interpolation formula.

Year \( n \) : 1931 1941 1951 1961 1971 1981
Sale in thousand \( y \) : 12 15 20 27 39 52

Newton's backward interpolation formula is used to estimate the sale for 1966.

(b) Evaluate \( \int \frac{1}{x} \, dx \) by using Simpson's \( \frac{1}{3} \) Rule

Simpson's \( \frac{3}{8} \) Rule:
\[ \int \frac{1}{x} \, dx = \ln|\frac{1}{x}| + C \]

Evaluate the integral using Simpson's \( \frac{3}{8} \) Rule.

UNIT IV

12(a) Find the variance and standard deviation of the following frequency distribution.

| \( x_i \) | 6 10 14 18 24 28 30 |
|---|---|---|---|---|---|---|
| \( f_i \) | 2 4 7 12 8 4 3 |

The frequency distribution is given as follows:

The variance and standard deviation are calculated as follows.
(b) Compute Spearman rank correlation co-efficient for the following data:

<table>
<thead>
<tr>
<th>x</th>
<th>150</th>
<th>300</th>
<th>450</th>
<th>600</th>
<th>750</th>
<th>900</th>
<th>1050</th>
<th>1200</th>
</tr>
</thead>
<tbody>
<tr>
<td>y</td>
<td>0.40</td>
<td>0.80</td>
<td>1.00</td>
<td>0.95</td>
<td>1.20</td>
<td>1.10</td>
<td>1.30</td>
<td>1.10</td>
</tr>
</tbody>
</table>

...remainder of the text...

UNIT V

13 (a) State and prove Baye's theorem.

13 (b) A pair of dice is thrown. Find the probability that either of the dice shows 2 when their sum is 6.

By

Ch. Srinivasa Rao

Chairman, Board of Studies

[Signature]

05/07/2021