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Total No. of Sections : 3 Total No. of Printed Pages : 5

Code No. : A.B.C-200

Annual Online Examination 2021

B.C.A. Part I/II/III BRIDGE COURSE Paper 101

Time : Three Hours] [Maximum Marks : 80 Note : Section 'A', containing 10 very short answer type questions, is compulsory. Section 'B' consists of short answer type questions and Section 'C' consists of long answer type questions. Section 'A' has to be solved first.

Section 'A'

Answer the following very short answer type questions in one or two sentences. $2 \times 10=20$

1. Write first two terms of $a_n = n \frac{n^2 + 5}{4}$.

- Convert the following angle in radian measurement : 75°.
- 3. Find the coefficient of x^5 in $(x + 3)^8$.
- 4. Find the distance between two parallel lines 15x + 8y

-34 = 0 and 15x + 8y + 31 = 0.

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Code No. : A.B.C-200

- 5. Write the value of a (major axis) and b (minor axis) for hyperbola $9x^2 - 4y^2 = 36$.
- 6. Find mode of the following :

10, 13, 17, 12, 11, 13, 18, 19, 13.

7. Find median of the following :

20, 25, 33, 21, 19, 23, 29.

- 8. Find mean of the terms : 25, 12, 45, 22.
- 9. Define Identity matrix.

10. Find the value of $\begin{vmatrix} 1 & 2 & 4 \\ -1 & 3 & 0 \\ 4 & 1 & 0 \end{vmatrix}$.



Answer the following short answer type questions with word limit 150-200. 4×5=20

1. Find partial fraction of $\frac{1}{r^2 - 4}$.

Or

Find the value of a, b, c, d from the following equation :

$$\begin{bmatrix} 2a+b & a-2b \\ 5c-d & 4c+3d \end{bmatrix} = \begin{bmatrix} 4 & -3 \\ 11 & 24 \end{bmatrix}.$$

2. If
$$\frac{e^{2y} - e^{-2y}}{e^{2y} + e^{-2y}} = \sin \alpha$$
, then find the value of y.

[2]

- Code No. : A.B.C-200
- 4. Prove that the points (1, 5), (3, 9) and (5, 13) are collinear.

Or

Find foci and eccentricity of the hyperbola

$$49y^2 - 16x^2 = 784$$

5. The mean of 4, 7, 2, 8, 6 and 9 is 7. Find mean deviation about median of these observations.

Or

Find mean and standard deviation for the following frequency distribution :

Class	0-30	30-60	60-90	90-120	120-150	150-180	180 210
Frequency	2	3	5	10	3	5	100-210
					2	5	2

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5/30

Code No. : A.B.C-200

Or

Show that :
$$\log\left(\frac{4}{3}\right) = \frac{1}{3} - \frac{1}{2}\frac{1}{3^2} + \frac{1}{3}\frac{1}{3^3} - \frac{1}{4}\frac{1}{3^4} + \dots$$

3. Show that $\frac{\sin 5x + \sin 3x}{\cos 5x + \cos 3x} = \tan 4x.$

Or

In $\triangle ABC$ if a = 18, b = 24, c = 30, find $\cos A$ and $\cos B$.

4. Find the equation of line parallel to the line 3x - 4y + 2 = 0 and passing through (-2, 3).

Or

Find the focus of the parabola $y = x^2 - 2x + 3$.

5. The mean of the 5 numbers is 27. If one of the number is excluded, the mean becomes 25. Determine excluded number.

Or

Find the median salary of the following salaries of the workers in Rs. :

Code No. : A.C-200 Section 'C'

Answer the following long answer type questions with word limit 300–350. 8×5=40

1. Three numbers are in A.P., their sum is 15. If 1, 3, 9 be added to them they form a G.P. Find the numbers.

Or

Divide 24 into 4 parts which are in A.P., such that the sum of their squares is 164.

2. By principle of Mathematical Induction, show that $3^{2n+2} - 8n - 9$ is divisible by 8.

Or

If the coefficients of 3 consecutive terms in the expansion of $(1 + x)^n$ are in ratio 1 : 7 : 42, find *n*.

3. If $\cos\theta + \sin\theta = \sqrt{2} \cdot \cos\theta$, show that

$$\cos\theta - \sin\theta = \sqrt{2} \cdot \sin\theta$$
.

Or

$$\sqrt{\frac{1+\sin\theta}{1-\sin\theta}} + \sqrt{\frac{1-\sin\theta}{1+\sin\theta}} = 2\sec\theta.$$

[4]