**ANNUAL EXAMINATION 2020**

**(Only for Regular Students)**

***Centre No. 135 Centre Name- Disha College, Raipur (C.G.)***

**Class-B.Sc.-II Subject- Mathematics**

**Paper No- I Paper Name-Advanced Calculus**

**Time- 3 hrs. M.M.-50**

**Note:- All questions are compulsory. Solve any two parts of each question. All question carry equal marks.**

**UNIT-I**

Q1(a) n’kkZb;s dh vuqØe tgk¡

vfHklkjh gSA

Prove that the sequence where

is convergent sequence.

(b) fuEufyf[kr Js.kh dh vfHklkfjrk ;k vilkfjrk dk ijh{k.k dhft,%

Test the convergence of the following series:

(c) fl) dhft, fd çR;sd fujis{k vfHklkjh Js.kh ,d vfHklkjh Js.kh gksrk gS fdurq bldk foykse lR; ugha gSA

Prove that every absolutely convergence series is convergent but not conversely.

**UNIT-II**

Q2(a) jkSys çesl dks fn, x, Qyu ds fy, lR;kfir dhft,%

Verify Rolle’s theorem for the function:

(b) tc ,oa rks fl) dhft, fd ij larr gS ijUrq vodyuh; ughaA

If when and then show that is continuous

but not differentiable at x = 0

(c) Qyu f(x) = logx ds fy, vUrjky [1,e] esa ySxzkat e/;eku çes; dks lR;kfir dhft,A

Verify Lagrange’s Mean value theorem for the function f(x) = logx in the interval [1,e].

**UNIT-III**

Q3(a) fl) dhft, fd Qyu fo|eku ugha gS] ijUrq iqujkd`r lhek,W cjkcj gSA

Show that : for doesn’t

exist where as iterated limits are equal.

(b) ;fn , rks n’kkbZ, fd%&

If , then show that:

(c) Qyu : dk (x-2) and (y-3) vkSj ds ?kkrks esa Vsyj çlkj Kkr dhft,A

Expand the function: by Taylor’s expansion in power of (x-2) and (y-3)

**UNIT-IV**

Q4(a) ljy js[kkvksa x cos + y sin = l sin . cos ds dqy dk vUokyksi Kkr dhft, tgkW dks.k çkpy gSA

Find the envelope of the family of straight lines : x cos + y sin = l sin . cos

where angle is a parameter.

(b) Qyu ds mfPp”B vFkok fufEu”B eku dh foospuk dhft,A

Discuss the minimum or maximum value of the function:

(c) vfoijoy; 2xy = a2 dk dsUnzt Kkr dhft,A

Find the evolutes of the hyperbola 2xy = a2

**UNIT-V**

Q5(a) fl) dhft,:

Prove that:

(b) flekdy dk Øe ifjorZu dhft,%

Change the order of integration in the double integral:

(c) eku fudkfy,:

Evaluate:

**---000---**