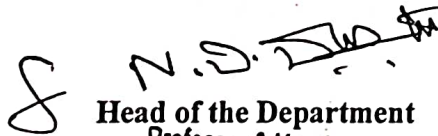
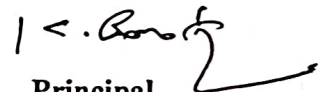




(b)	Design an FIR filter having the following specifications Pass band edge freq 1.5KHz Stop band edge freq 2KHz $K_s = 50\text{dB}$ Sampling Freq = 8KHz	5	Apply ng K3	CO4
(c)	Express the following decimal numbers into Q – 15 representation. (i) 0.68011 (ii) –0.68011	5	Apply ng K3	CO5
OR				
4(a)	Determine $H(w)$ if $H_d(w) = 0$ $ w  < \pi/4$ $e^{-j2w}$ $\pi/4 <  w  < \pi$ Use rectangular window	5	Apply ng K3	CO4
(b)	Design an FIR filter using frequency sampling technique if $w_c = \pi/2$ and $N = 7$	5	Apply ng K3	CO4
(c)	List the range of numbers that can be represented using signed magnitude 3bit 2's complement format.	5	Apply ng K3	CO5

  
Course Incharge

  
Head of the Department  
Professor & Head  
I. of Electronics & Communication Engineering  
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**K.S. SCHOOL OF ENGINEERING AND MANAGEMENT, BANGALORE - 560109**  
**DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING**  
**SESSION: 2020-2021 (ODD SEMESTER)**  
**III SESSIONAL TEST QUESTION PAPER**  
**Set-B**

USN									
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Degree : B.E  
 Branch : Electronics and Communication Engineering  
 Course Title : Digital Signal Processing  
 Duration : 90 Minutes

Semester : V A&B  
 Course Code : 18EC52  
 Date : 05/01/2021  
 Max Marks : 30

**Note: Answer ONE full question from each part.**

Q No.	Question	Marks	K-Level	CO mapping
<b>PART-A</b>				
1(a)	Derive the expression for BLT frequency mapping	5	Applying K3	CO4
(b)	Design an Butterworth filter having the following specifications Kp=-3dB at 50Hz and 20KHz Ks=20dB at 20Hz and 45KHz	5	Applying K3	CO4
(c)	Make use of diagram and explain address generators and shifters	5	Applying K3	CO5
<b>OR</b>				
2(a)	Determine H(w) if $H_d(w) = \begin{cases} 0 &  w  < \pi/4 \\ e^{-j2w} & \pi/4 <  w  < \pi \end{cases}$ Use rectangular window	5	Applying K3	CO4
(b)	Design an Butterworth digital filter having the following specifications Tolerance in passband 0.7 at 0.5pi rad Tolerance in passband 0.118 at 0.75pi rad Use BLT	5	Applying K3	CO4
(c)	Sketch and explain (i) Harvard architecture (ii) Von-Neumann architecture	5	Applying K3	CO5
<b>PART-B</b>				
3(a)	Tabulate the Analog to Analog transformation of IIR filter	5	Applying K3	CO4
(b)	A low pass filter is to be designed with the following desired frequency response: Determine the coefficients of a 25 – tap filter based on the window method with the Hamming window $H_d(\omega) = \begin{cases} 1, & \text{for }  \omega  \leq \pi/6 \\ 0, & \text{for } \pi/6 <  \omega  \leq \pi \end{cases}$	5	Applying K3	CO4



(c)	Convert the following decimal numbers into signed magnitude form check if overflow occurs  (i) $3 \times (-1)$ (ii) $2 \times (-2)$ (iii) $3 \times (-3)$	5	Understanding K2	CO5
OR				
4(a)	Design an FIR filter using hamming window with Pass band edge freq of 1500Hz, Stop band edge freq of 2000Hz and Sampling Freq of 8000Hz	5	Applying K3	CO4
(b)	Design an FIR filter using frequency sampling technique of order 7 and cutoff frequency $\pi/2$ .	5	Applying K3	CO4
(c)	Convert the following decimal numbers into Q – 15 representation. (i) -0.59111 (ii) 0.65902	5	Understanding K2	CO5

5

  
Course Incharge

  
Head of the Department

  
Principal