fabricated using custom-designed electrospinning setup (Fig. 1). The information of the fabrication the neat and hybrid nanofiber structure and their electrospinning conditions have presented in Table 1. In following the morphological and mechanical properties all structures were evaluated using Scanning Electron Microscopy (SEM), Fourier Transform InfraRed spectroscopy (FTIR) and tensile properties.

Table 1 Electrospinning conditions of structures

	Electrospinning Conditions			
Structures	Concentration	Voltage (kV)	Flow rate (ml/hr)	Distance (cm)
PET	15 %w/w	25	0.5	25
PU	15 %w/w	20	2	20
PCL	10 %w/w	18	3	25
PET75/PU25	8 % v/v	20	2	25
PET50/PU50	8 % v/v	20	2	25
PET25/PU75	8 % v/v	20	2	25
PCL75/PU25	8 % v/v	20	2	25
PCL50/PU50	8 % v/v	20	2	25
PCL25/PU75	8 % v/v	20	2	25

3. Results and Discussion

The morphology of the neat and hybrid nanofiber structures evaluated using scanning electron microscopy images, FTIR analysis, and obtaining the porosity of the electrospun scaffolds. According to the results (Table 2), the average fiber diameter in hybrid nanofiber structures is significantly smaller than the neat structures.

Table 2. Average fiber diameter and porosity of the neat and hybrid nanofiber structures

Samples	Average fiber diameter (nm)	Porosity (%)
PCL	433 ± 80	89.1 ± 0.69
PU	470 ± 95	63.0 ± 0.46
PET	404 ± 44	74.0 ± 1.37
PCL75/PU25	372 ± 122	81.0 ± 1.70
PCL50/PU50	363 ± 85	78.8 ± 3.20
PCL25/PU75	382 ± 83	74.3 ± 0.15
PET75/PU25	375 ± 89	69.5 ± 2.30
PET50/PU50	369 ± 91	65.0 ± 1.50
PET25/PU75	343 ± 94	58.6 ± 3.12

The results showed that with increasing the PCL and decreasing the PU ratios in the hybrid structures the porosity of the structures has increased.

The neat PET and PET50/PU50 as a hybrid nanofiber structures revealed the highest load, tensile and Young's modulus. According to the results (Table 3) the range of the maximum load, tensile stress, tensile strain and Young's modulus for the hybrid structures were obtained within 2.03 ± 0.33 to 40.88 ± 9.21 N, 2.66 ± 0.39 to 19.05 ± 3.20 MPa, 101 ± 14 to 421 ± 51.35 %, and 3.18 ± 0.09 to 41.4 ± 3.31 MPa, respectively.

The PET/PU as hybrid nanofiber structure due to high elasticity of PU and high tensile strength of PET has an optimum load, stress, strain and Young's modulus.

For the PCL/PU hybrid nanofiber structures with 75 % of PCL, the maximum load, maximum stress, and maximum Young's modulus were obtained. Interestingly, in a hybrid nanofiber structure containing an equal value of the PCL and PU, the minimum load and stress were observed. In addition, due to optimum strength between PET and PU, in PET/PU structure the highest strain were obtained.

4. Conclusions

According to the results it has been obtained that the neat PCL, PU and PET polymers, due to the difference in their degradation, elasticity and stiffness can improve the mechanical properties of the PCL/PU and PET/PU as the hybrid nanofiber structures. Also it has been demonstrated that PCL/PU and PET/PU nanofiber structures due to mimic the properties of the extracellular matrix of the native vessels can be applied for vascular tissue engineering applications.

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Table 3. Mechanical properties of the neat and hybrid nanofiber structures

Structures	Maximum load (N)	Tensile stress at maximum load (MPa)	Tensile strain at maximum load (%)	Young's modulus (MPa)
PET	10.03 ± 0.75	4.04± 0.45	100 ± 8	18.0 ± 1.8
PU	7.26 ± 0.90	3.19 ± 0.54	321 ± 71	1.2 ± 0.39
PCL	7.00 ± 1.68	2.7 ± 0.44	142 ± 17	4.8 ± 0.11
PCL75/PU25	19.39 ± 4.81	14.74 ± 4.47	101 ± 14	23.0 ± 3.42
PCL50/PU50	2.03 ± 0.33	3.00 ± 0.66	288 ± 12	6.0 ± 0.548
PCL25/PU75	9.81 ± 1.62	5.98 ± 1.21	271 ± 85	5.46 ± 1.68
PET75/PU25	7.11 ± 1.52	2.66 ± 0.39	388 ± 5.2	19.3 ± 2.04
PET50/PU50	40.88 ± 9.21	19.05 ± 3.20	339 ± 85	41.4 ± 3.31
PET25/PU75	18.60 ± 3.08	9.24 ± 0.61	421 ± 51.35	3.18 ± 0.09