parameters availability, reliability function and preventive maintenance. The Levenberg-Marquardt (LM) algorithm with feed-forward backpropagation is used in deriving the optimal present model. The LM learning algorithms with 4 neurons for availability, 7 neurons for reliability function and 8 neurons for preventive maintenance in the hidden layer has been discovered as optimal on the basis of statistical error analysis. The obtained and predicted values of availability, reliability function and preventive maintenance shovel-dumper system in a surface coal mine with the highest R^2 value gives satisfactory results.

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NOMENCLATURE

TBF	Time between failures
TTR	Time to repair
MTBF	Mean time between failures
RMSE	Root mean square error
MLE	Maximum likelihood estimation
K-S test	Kolmogorov–Smirnov test
FB Propogation	Forward back propagation
R(t)	Reliability function
Y	Obtained values
X_A	Actual value
X_P	Predicated value
$\overline{X}$	Average value
Y	Obtained value
R^2	Coefficient of determinations
b_j	Bias
W_{ij}	Weights

Greek letters

β	Shape parameter
η	Scale parameter
γ	Location parameter