```
   import numpy as np
import tensorflow as tf
from tensorflow.keras.models import Sequential
from tensorflow.keras.layers import LSTM, Dense

# Sample text data for training
text = """
    Deep learning is a subset of machine learning in artificial intelligence (AI) that has networks
    capable of learning unsupervised from data that is unstructured or unlabeled. Also known as
    deep neural learning or deep neural network.
"""

# Preprocessing the text
chars = sorted(list(set(text)))
char_indices = dict((c, i) for i, c in enumerate(chars))
indices_char = dict((i, c) for i, c in enumerate(chars))
maxlen = 40
step = 3
sentences = []
next_chars = []

for i in range(0, len(text) - maxlen, step):
    sentences.append(text[i: i + maxlen])
    next_chars.append(text[i + maxlen])
x = np.zeros((len(sentences), maxlen, len(chars)), dtype=np.float32)
y = np.zeros((len(sentences), len(chars)), dtype=np.float32)
for i, sentence in enumerate(sentences):
    for t, char in enumerate(sentence):
        x[i, t, char_indices[char]] = 1
    y[i, char_indices[next_chars[i]]] = 1

# Define the model
model = Sequential([
    LSTM(128, input_shape=(maxlen, len(chars))),
    Dense(len(chars), activation='softmax')
])
model.compile(loss='categorical_crossentropy', optimizer='adam')

# Train the model
model.fit(x, y, batch_size=128, epochs=50)

# Function to sample the next character given the model's predictions
def sample(preds, temperature=1.0):
    preds = np.asarray(preds).astype('float64')
    preds = np.log(preds) / temperature
    exp_preds = np.exp(preds)
    preds = exp_preds / np.sum(exp_preds)
    probas = np.random.multinomial(1, preds, 1)
    return np.argmax(probas)

# Generate text with correct format
def generate_text(model, seed_text, temperature=1.0, num_chars=400):
    generated_text = seed_text
    for _ in range(num_chars):
        sampled = np.zeros((1, maxlen, len(chars)))
        for t, char in enumerate(generated_text):
            sampled[0, t, char_indices[char]] = 1.
        preds = model.predict(sampled, verbose=0)[0]
        next_index = sample(preds, temperature)
        next_char = indices_char[next_index]
        generated_text += next_char
        generated_text = generated_text[1:]
    return generated_text

# Generate text with different temperatures
start_index = np.random.randint(0, len(text) - maxlen - 1)
seed_text = text[start_index: start_index + maxlen]
for temperature in [0.2, 0.5, 1.0, 1.2]:
    print(f'----- temperature: {temperature}')
    generated_text = generate_text(model, seed_text, temperature)
    print(generated_text)
    print()
```

```
Epoch 31/50
1/1 [==============================] - 0s 73ms/step - loss: 2.6272
Epoch 32/50
1/1 [==============================] - 0s 64ms/step - loss: 2.6215
Epoch 33/50
1/1 [==============================] - 0s 69ms/step - loss: 2.6141
Epoch 34/50
1/1 [==============================] - 0s 78ms/step - loss: 2.6068
Epoch 35/50
1/1 [==============================] - 0s 65ms/step - loss: 2.5974
Epoch 36/50
1/1 [==============================] - 0s 73ms/step - loss: 2.5875
Epoch 37/50
1/1 [==============================] - 0s 69ms/step - loss: 2.5797
Epoch 38/50
1/1 [==============================] - 0s 62ms/step - loss: 2.5714
Epoch 39/50
1/1 [==============================] - 0s 57ms/step - loss: 2.5673
Epoch 40/50
1/1 [==============================] - 0s 58ms/step - loss: 2.5566
Epoch 41/50
1/1 [==============================] - 0s 63ms/step - loss: 2.5406
Epoch 42/50
1/1 [==============================] - 0s 66ms/step - loss: 2.5280
Epoch 43/50
1/1 [==============================] - 0s 58ms/step - loss: 2.5184
Epoch 44/50
1/1 [==============================] - 0s 63ms/step - loss: 2.5164
Epoch 45/50
1/1 [==============================] - 0s 59ms/step - loss: 2.4959
Epoch 46/50
1/1 [==============================] - 0s 57ms/step - loss: 2.4719
Epoch 47/50
1/1 [==============================] - 0s 61ms/step - loss: 2.4616
Epoch 48/50
1/1 [==============================] - 0s 56ms/step - loss: 2.4533
Epoch 49/50
1/1 [==============================] - 0s 76ms/step - loss: 2.4272
Epoch 50/50
1/1 [==============================] - 0s 59ms/step - loss: 2.4100
----- temperature: 0.2
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----- temperature: 0.5
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----- temperature: 1.0
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l l  io

----- temperature: 1.2
 a.uaul hetr te
ttornanhsu .e  itdatt
e
```