

Name:
Enrolment No:



UNIVERSITY OF PETROLEUM AND ENERGY STUDIES

End Semester Examination, September 2022

Programme Name: B Tech (Mechanical)

Semester : III

Course Name : Applied Machine Learning

Time : 03 hrs

Course Code : MECH 2040

Max. Marks: 100

Nos. of page(s) : 2

Instructions:

**SECTION A
ALL QUESTIONS ARE COMPULSORY.**

S. No.		Marks	CO
Q 1	Explain Logistic Regression with its mathematical form.	4	2
Q 2	Explain learning processes of machines with or without supervision.	4	1
Q 3	Explain about R-squared (multiple and adjusted), confusion matrix and precision.	4	2
Q 4	Describe any two useful applications of machine learning.	4	1
Q 5	Explain the conditions to reject null hypothesis as well as to accept alternative hypothesis through <i>p-value</i> and slope.	4	2

**SECTION B
ALL QUESTIONS ARE COMPULSORY. ATTEMPT ANY ONE FROM Q6**

Q 6	Explain the usefulness of following python libraries with their python syntax: a. keras b. tensor c. scipy d. OpenCV e. matplotlib <p style="text-align: center;">OR</p> Explain HSV/HSL and its all four components.	10	2
Q 7	Explain five benefits of neural network.	10	2

Q 8	Explain about lossless and lossy Compression.	10	3
Q 9	Explain neural model and their equations, and components with model diagram.	10	3

SECTION-C

ALL QUESTIONS ARE COMPULSORY. ATTEMPT ANY ONE FROM Q10

Q 10	Build python code to convert HSV to RGB from scratch. OR Build Image classification model using CNN on 28X28 image	20	3
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Q 11	<p>I. Answer following questions based on model summary analysis shown in Fig. 1:</p> <p>a. Name the list of predictors, response and number of observations used for generating model' summary in Fig. 2 (2)</p> <p>b. Is the given formula belong to simple or multiple linear regression? Explain your observations? (4)</p> <p>c. Is there any relationship between predictor and responses? Why or why not? (2)</p> <p>d. Determine the strength of relationship between the predictor and the response and how? (6)</p> <p>e. Which type of relationship (either positive or negative) you observed between the predictor and the response? (6)</p>	20	2,3
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OLS Regression Results						
Dep. Variable:	Sales	R-squared:	0.897			
Model:	OLS	Adj. R-squared:	0.896			
Method:	Least Squares	F-statistic:	570.3			
Date:	Wed, 14 Sep 2022	Prob (F-statistic):	1.58e-96			
Time:	11:57:02	Log-Likelihood:	-386.18			
No. Observations:	200	AIC:	780.4			
Df Residuals:	196	BIC:	793.6			
Df Model:	3					
Covariance Type:	nonrobust					
	coef	std err	t	P> t	[0.025	0.975]
Intercept	2.9389	0.312	9.422	0.000	2.324	3.554
TV	0.0458	0.001	32.809	0.000	0.043	0.049
Radio	0.1885	0.009	21.893	0.000	0.172	0.206
Newspaper	-0.0010	0.006	-0.177	0.860	-0.013	0.011

Fig. 1