Name: **Enrolment No:**	UPES UNIVERSITY WITH A PURPOSE

UNIVERSITY OF PETROLEUM AND ENERGY STUDIES
End Semester Examination, May 2020 (ONLINE MODE)

Course: Design of Flexible and Rigid Pavements -IRC codes **Semester: VIII**
Program: B Tech Civil Engineering **Time 03 hrs.**
Course Code: CEEG 472 **Max. Marks: 100**
Instructions:

SECTION A

S. No.		Marks	CO
Q 1	a) The different layers of flexible pavement are _____, _____, _____ and _____. (4 marks) b) _____ coat is laid between base course and surface course. (1 mark)	**5**	**CO1**
Q 2	a) Higher the wheel loads, greater shall be the _____stresses in the pavement. (1 mark) b) Temperature stresses are divided into two type's _____ and _____ stresses. (2 marks) c) Moisture changes result in _____ cracks due to rapid _____ of moisture. (2 marks)	**5**	**CO2**
Q 3	a) Subgrade in a road pavement structure is the natural or _____ ground on which the road structure is _____. (2 marks) b) Subbase is an intermediate layer between _____ and granular _____. (2 marks) c) Surface course should provide acceptable riding quality and _____. (1 mark)	**5**	**CO3**
Q 4	_____, _____, _____, _____, and _____ are the major causes for defects in flexible pavement.	**5**	**CO4**
Q 5	a) ESWL stands for _____ _____ _____ _____. (4 marks) b) If the CBR value is less than _____, it is termed as weak material. (1 mark)	**5**	**CO1**
Q 6	For allowing _____, _____, and _____, joints are used in concrete slab. The _____, _____ and arrangement of joints is important in design of rigid pavements.	**5**	**CO2**

SECTION B

Q 7	Making use of the following, data calculate the cumulative number of standard axles for design of a flexible pavement. • Initial traffic=5000 cvpd • Design life= 15 years • Traffic growth rate = 8% • VDF = 4.5 • LDF = 0.75	**10**	**CO1**

	Hint: $\boxed{N = 365 \times \left[\frac{((1+r)^n - 1)}{r}\right] \times A \times D \times F}$		
Q 8	Calculate the temperature stresses in edge region of concrete slab with following data - • Modulus of Elasticity = 3 X 10^5 kg/ cm^2 • Coefficient of thermal expansion = 10X 10^{-6}/ °C • Maximum temperature differential during day between top and bottom of the slab = 15° C. • Bradbury's coefficient = 1.00 Hint: $\boxed{S_{te} = \frac{E \times \alpha \times t \times C}{2}}$	**10**	**CO2**
Q 9	Explain the steps of BBM construction.	**10**	**CO3**
Q 10	Describe reflective cracking in flexible pavements and suggest repairs for the same.	**10**	**CO4**
Q 11	Differentiate between alternate bay method and continuous construction method in rigid pavement construction.	**10**	**CO3**
SECTION-C			
Q 12	a) Describe resilient modulus value of unbound aggregates. (5 marks) b) Describe radius of relative stiffness used in design of concrete roads. (5marks) c) Explain the term 'skid resistance' and its importance in pavement evaluation. (10 marks)	**5+5+10**	**CO1, CO2, CO4**