University of Mumbai
Examination 2020

Examinations Commencing from 23rd December 2020 to 6th January 2021 and from 7th January 2021 to 20th January 2021

Program: B.E.(CIVIL)(Sem V)(REV-2016) (CBCGS)

Curriculum Scheme: Rev2016
Examination: BE Semester V
Course Code: CE-C505 and Course Name: Transportation Engineering - I

Time: 2 hour Max. Marks: 80

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Q1.	
1.	Express highways are added in _____ road plan
Option A:	Nagpur
Option B:	Bombay
Option C:	Nasik
Option D:	Delhi
2.	The star and grid pattern of road networks are adopted in
Option A:	Lucknow road plan
Option B:	Bombay road plan
Option C:	Nagpur road plan
Option D:	Delhi road plan
3.	If 8 % ruling gradient exists on a curve of radius 60 meters. the compensated gradient to be provided is _____ %
Option A:	1.25
Option B:	1.50
Option C:	6.75
Option D:	9.25
4.	A truck weighing 2500 kg is moving through a curve of radius 100 meters on a road with a speed of 50 kmph. the amount of centrifugal force developed will be = _____ kg
Option A:	491.59
Option B:	562.31
Option C:	378.24
Option D:	233.85
5.	Head light sight distance for a one way road is considered equal to
Option A:	Overtaking sight distance
Option B:	Stopping sight distance
Option C:	Intermediate sight distance
Option D:	Compromising sight distance
6.	If the outer circumference of wheel is 1 meter and on application of break,

	vehicle travels 210 meters before stopping. But it was found that wheel takes 200 revolutions. This is an example of _____
Option A:	Slipping
Option B:	Skidding
Option C:	Turning
Option D:	Cambering
7.	The weaving manoeuvres is a type of
Option A:	Merging
Option B:	Diverging
Option C:	Intersection
Option D:	Crossing
8.	If space mean speed of a vehicle is 50kmph, then the time mean speed will be _____
Option A:	Less than 50kmph
Option B:	Greater than 50kmph
Option C:	Equal to 50kmph
Option D:	Depends on the vehicle
9.	To reduce the conflict points which method is preferable?
Option A:	Restricting the entry in one side
Option B:	Widening of the roads
Option C:	Use of traffic signals
Option D:	Diverting the traffic
10.	The wearing course in the case of flexible pavements consist of
Option A:	Hard well burnt clinker
Option B:	Broken stone and granular material mixed with tar
Option C:	A mixture of bituminous material and aggregate
Option D:	Tar and well burnt clinker
11.	The capability of aggregate to resist more weathering action and wheel load is called _____
Option A:	Hardness
Option B:	Toughness
Option C:	Durability
Option D:	Angularity
12.	The solvent used in cut back bitumen is _____
Option A:	Kerosene
Option B:	Oil
Option C:	Petrol
Option D:	Diesel
13.	Which layer is also called as drainage layer?

Option A:	Surface course
Option B:	Sub base
Option C:	Base
Option D:	Sub grade
14.	The radius of relative stiffness for a 20cm thick slab with E = 3 x 10^5 kg/cm^2 and poisson's ratio = 0.15, resting on a subgrade having modulus of 5 kg/m^3 is
Option A:	10 cm
Option B:	320 cm
Option C:	100 cm
Option D:	80 cm
15.	The load dispersion is assumed at an angle of _____
Option A:	45°
Option B:	60°
Option C:	75°
Option D:	90°
16.	The slender beam used in benkleman beam method is_____
Option A:	3.5m
Option B:	3.66m
Option C:	3.8m
Option D:	3.7m
17.	The term 'a' denotes?
Option A:	Radius of wheel
Option B:	Radius of the area of contact
Option C:	Radius of the equivalent area of contact
Option D:	Radius of axle
18.	The deflection in Westergaard analysis is _____
Option A:	0.125
Option B:	0.250
Option C:	0.375
Option D:	0.500
19.	The warping stress is dependent on _____
Option A:	Length of slab
Option B:	length and width of slab
Option C:	Thickness of slab
Option D:	Water content in slab
20.	The structural evaluation can't be evaluated by _____
Option A:	Dynaflect
Option B:	Road rater
Option C:	FWD
Option D:	Bump integrator

Q2	**Solve any Four out of Six** **5 marks each**
A	Describe in short, the Salient Features of Dedicated Freight Corridor, Golden Quadrangle & PMGSY.
B	The radius of curve is 100 m & design speed is 50 kmph. Assume f = 0.15. Calculate superelevation, if full friction is assumed. Also find 'f' if no superelevation is provided.
C	Write a note on Q-K-V Curve. Also give relation between Speed Density and Volume.
D	Explain the desirable properties of Pavement Materials.
E	Find percentage increase in CSA if rate of growth of traffic increases from 7% to 12%. The traffic after end of construction period is 300 cvpd design life is 10 years, VDF is 2.5 and LDF is 0.75.
F	Explain in detail the stepwise procedure of construction of WBM road

Q3	**Solve any Four out of Six** **5 marks each**
A	Derive formula for Overtaking Sight Distance
B	Explain types of road signs, there comparison with few sketches of each.
C	Write note on use of Geosynthetics in highways.
D	Calculate the load carried by outer dowel bar for pavement thickness of 25 cm, E = 2.8 x 10^5 kg/cm^2, μ = 0.15, k = 28 kg/cm^3, design axle load = 8 tons.
E	Find out the warping stress of 25 cm thick CC pavement with transverse joint at 5 m & longitudinal joint at 3.6 m interval. Take k = 6.9 kg/cm^3, a = 15 cm, temperature difference is 0.6°C /cm slab thickness in day, temperature difference is 0.4°C /cm slab thickness in night. Take E = 3 x 10^5 kg/cm^2, e = 10 x 10^{-6}/°C, l = 87.2 cm.
F	Determine characteristic deflection for the following readings taken on a road having traffic 1800 cvpd. 1.48, 1.62, 1.40, 1.28, 1.32, 1.71, 1.63, 1.22, 1.13, 1.53