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KALSEKAR TECHNICAL CAMPUS, NEW PANVEL

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DEPARTMENT OF CIVIL ENGINEERING

QUESTION PAPER UNIT TEST 01

REV:00		EXM-04(a)
CLASS:- T.E. 2nd shift		SEM:- V
SUBJECT:- Geotechnical Engineering I		DATE:- XX / 08 / 2017
DURATION:- 60 min.		MARKS:- 20

Q.01 Attempt all : (10 Marks)		marks	CO
a)	Define Soil Mechanics. liquidity index, consistency index, toughness index	2	CO1
b)	Define Liquid limit, plastic limit, shrinkage limit and plasticity index	2	CO1
c)	1 m^3 of wet soil weights 20 kN, its dry weight is 18kN, specific gravity of solids is 2.67. Determine the water content, porosity, void ratio and the degree of saturation. draw a phase diagram.	6	CO1

Q.02 Attempt any One: (10 Marks)

a)	In liquid limit test, specimen of a certain sample of clay at water content of 31%, 27%, 25%, 23% required 5, 16, 23 & 42 blows respectively to close the standard groove. The plastic limit of clay is 15%. Natural water content is 18%. Determine the liquid limit, plasticity index, liquidity index, consistency index, flow index and toughness index of the soil.	10	CO1
b)	500 g of dry soil was subjected to a sieve analysis. The weight of soil retained on each sieve is as follows: plot the grain size distribution curve and determine the following :- (a) percentage of gravel , coarse sand , medium sand, fine sand and silt clay fraction in the soil as per IS 1498-1970 (b) Effective size (c) uniformity coefficient (d) Coefficient of Curvature (e) the gradation of the soil.	10	CO1

IS. Sieve Size	Wt. of soil in gm	IS. Sieve Size	Wt. of soil in gm
4.75 mm	10	425	85
2 mm	165	212	40
1mm	100	150	30
		75	50

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QUESTION PAPER CLASS TEST 01

EXM-04(a)

REV:00

CLASS:- **TE (Civil) Second Shift**

SUBJECT:- __Transportation Engineering - 1___

DURATION:- **60 min.**

SEM:- _V__

DATE:- **23 / 08 / 2017**

MARKS:- **20**

Q.01 Attempt ALL Questions : (08 Marks)

		marks	CO
a)	Classify various modes of Transportation	02	CO1
b)	Comparison between railway and highway transport.	02	CO1
c)	Write a note on Tilting of Rails	02	CO2
d)	What would be the expression for sleeper density if the rail length used in track is 15 m of there are 22 sleepers under one rail length?	02	CO3

Q.02 Attempt any_TWO_ : (12 Marks)

a)	Write a Note on - i) Grade Compensation ii) Functions of ballast iii) Sleeper Density and spacing of sleeper.	06	CO2
b)	A 6 degree curve diverges out of a 4 degree main curve in opposite direction of A MG Track. If Speed is limited to 60kmph on main line and permissible cant deficiency is 4 cm, what would be the speed limit on branch line?	06	CO3
c)	Using sleeper density of M+6, estimate the quantity of track material required for constructing a B.G railway track that is 6 km long, if the length of the rail is 13 m.	06	CO3

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Subject: Structural Analysis-II		Date: 23/08/2017
Marks: 20	Unit test 1	Duration:1 Hr/s
Class: TECE-II		Branch: Civil

Q. No.	Questions Note- Question 1 is compulsory. Attempt any one out of 2 and 3.	CO addressed	Mark
1	a) Determine degree of static and kinematic indeterminacy of the structure shown in fig.1. Neglect axial deformations.	CO 1	04
	b) Analyse continuous beam as shown in fig.02 by three moment theorem. Draw BMD.	CO 3	06
2	Analyse continuous beam as shown in fig. 03 by force method.	CO 3	10
3	Analyse Rigid jointed frame as shown in fig. 04 by force method.	CO 3	10
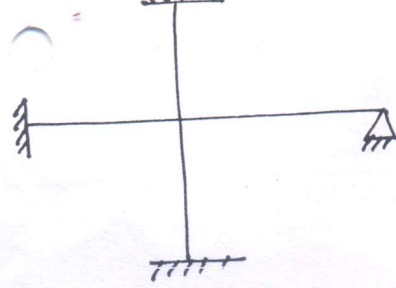
fig. 1

(a)

(b)

fig. 02

16 KN/m

B ⟶⟶⟶ C
2I 4m

3m

5KN ⟶ I

2m

A

fig. 04

20KN   10KN

A   2m   2m   B   2m   2m   C
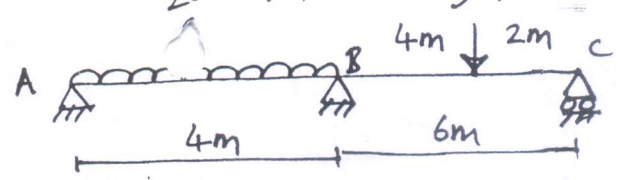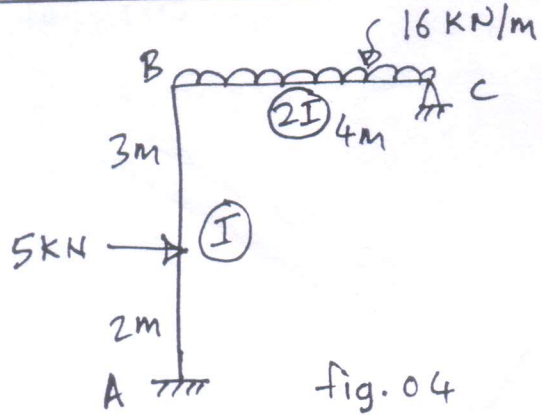
fig. 03

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REV:00	QUESTION PAPER CLASS TEST 01	

CLASS:- T.E.(SECOND SHIFT)	SEM:- V
SUBJECT:- Applied hydraulics-1 DURATION:- 60 min. MARKS:- 20	DATE:- 22 / 08 / 2017

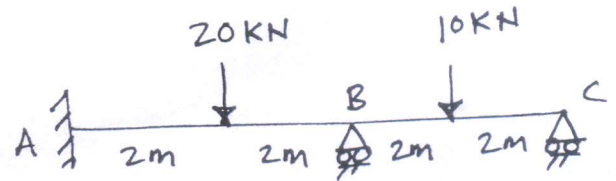| Q.01 Attempt any Two: (10 Marks)		marks	CO
a)	Buckingham's Π theorem	5	CO2
b)	Hydraulic intensifier	5	CO2
c)	Hydraulic accumulator	5	CO2
d)	Types of similarities or similitude	5	CO2
Q.02 Attempt any One: (10 Marks)			
a)	The drag force experienced by a flat plate of length 'l' immersed in a liquid of velocity V and viscosity μ and mass density ρ also depends on acceleration due to gravity g. Derive expression for the drag force D.	10	CO4
b)	A square plate of 30 cm side and weight 150N is suspended from a hinge and a jet of water 2 cm in diameter strikes it horizontally at its center with a velocity of 17 m/s. Find the force required to be applied at its lower edge to keep it vertical. If allowed to swing freely. Find the angle it makes with vertical.	10	CO4
c)	A jet of water of diameter 45mm strikes a fixed plate in such a way that angle between jet and plate is 30°.The force exerted in the direction of jet is 1470N. Determine the rate of flow of water.	10	CO4

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REV:00	CLASS TEST 01	EXM-04
CLASS:- TE Shift-I		SEM:- V
SUBJECT:- Structural Analysis -II		DATE:- 23 / 08 / 2017
DURATION:- 60 min.		MARKS:- 20

			Marks	CO
Attempt any one : (20 Marks)				
1	a)	Determine Degree of Static & Kinematic Indeterminacy (extensible & inextensible) of structures shown in Fig. 1.	06	CO1
	b)	Develop Flexibility Matrix with reference to given co-ordinates shown in Figure 2.	04	CO3
	c)	Analyse the beam and draw BMD as shown in figure 3 by **Flexibility method OR Clapeyron's theorem of three moment.**	10	CO2 & CO3
2	A portal frame ABCD is loaded and supported as shown in figure 4. Use **Flexibility method** for analysis, draw BMD and deflected shape of the frame.		20	CO3

P.T.O.

i.

P   4 P   2P

ii.

iii.

Figure 1

16 kN → B ⌒⌒⌒ 6 kN/m ⌒⌒⌒ C

4I

2 m   5 m   1.5 m

I   → 10 kN

20 kN →   4I

1 m

3 m

A   D

Figure 4

A   ①   ②⌐C   B

⟵ 2 M ⟶ ⟵ 3 M ⟶

Figure 2

20 kN   12 kN/m

A   B ⌒⌒⌒⌒⌒⌒⌒ C

⟵1M⟶⟵1M⟶ ⟵ 4 M ⟶
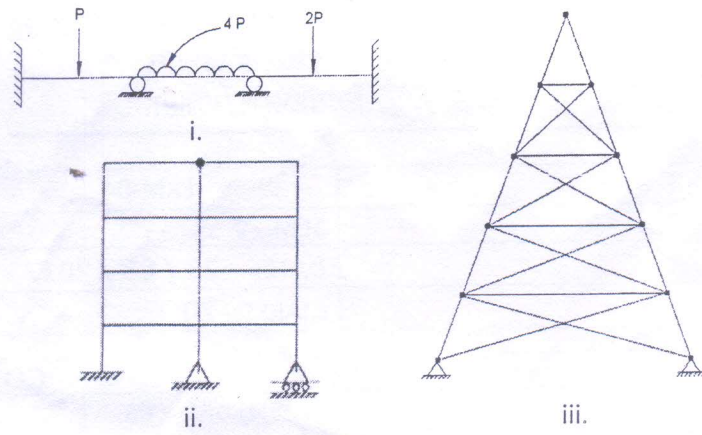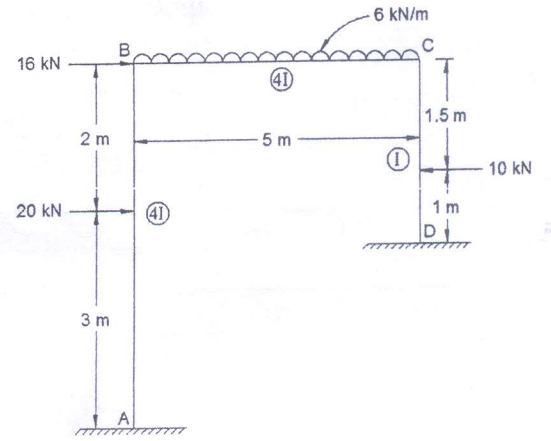
Figure 3

*********************************ALL THE BEST******************************

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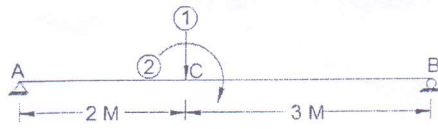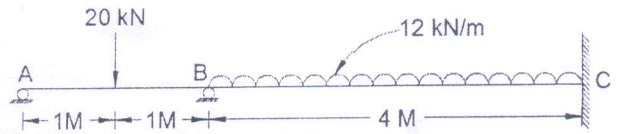Recognised by : Directorate of Technical Education, Govt. of Maharashtra, Affiliated to : University of Mumbai.

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REV:00	QUESTION PAPER CLASS TEST 01	EXM-04(a)

CLASS:- T.E. (Shift 1)	SEM:- **V (CBSGS)**
SUBJECT:- Building Design and Drawing – II	DATE:- 24 / 08 / 2017
DURATION:- 90 min.	MARKS:- **20**

		Marks	CO
Q.01 Attempt any two: (08 Marks)			
a)	Write a short note on built environment.	4	6
b)	Explain massing and composition.	4	6
c)	Write a short note on green buildings.	4	6
Q.02 (12 Marks)			
	It is proposed to construct a hospital building in a city area as a (G+1) RCC framed structure. Following are the area requirements of various units: i) consulting rooms: 3 nos. 20 m^2 each, ii) Male ward: 100 m^2, iii) Female ward: 100 m^2, iv) Operation theatre: 30 m^2 v) Special rooms (5 nos.) – 20 m^{2x} each, vi) ICU – 50 m^2 each, vii) Pathology lab – 20 m^2, viii) medical store – 20 m^2, ix) Administrative unit – 30 m^2, x) Nurse room – 20 m^2. Provide entrance lobby, reception counter, waiting area, common toilets and staircase etc. as per building bye-laws. Show the grouping of units on ground floor and first floor in a table format and draw line plan of ground floor to a suitable scale. Show openings.	12	1, 2, 3

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REV:00	QUESTION PAPER CLASS TEST 01/ 02	EXM-04(b)

CLASS:- TE CE I	SEM:- V
SUBJECT:- AH-I	DATE:- XX / XX / XXXX
DURATION:- 60 min.	MARKS:- 20

CLASS TEST 01

Q.01 Attempt any Five: (10 Marks)	marks	CO
a) Define moment of momentum equation. State its practical applications.	02	CO1
b) Define the terms dynamic similarity and kinematic similarity between a model and a prototype.	02	CO2
c) What do you understand by scale effect in models?	02	CO2
d) Explain jet propulsion of ships.	02	CO3
e) What is impulse-momentum equation?	02	CO1
f) Prove that the force exerted by a jet of water on a fixed flat plate is $F = \rho a V^2$.	02	CO3

TURN OVER

Q.02 Attempt any One: (05 Marks)			
a)	A pipe of 20 cm diameter conveying 0.2 m³/sec of water has a right angled bend in a horizontal plane. Find the resultant force exerted on bend if the pressure at inlet and outlet of bend are 22.563 N/cm² and 21.582 N/cm² respectively.	05	CO1
b)	Water is admitted at the axis of rotation of a four arm lawn sprinkler. The nozzle has a diameter of 6mm. Sprinkler arms have a distance of 28 cm. For a flow of 1.2 lit/sec, find the torque required to keep the rotating arm stationary.	05	CO1
Q.03 Attempt any One: (05 Marks)			
a)	Find the expression for the drag force on smooth sphere of diameter D, moving with a uniform velocity V in a fluid of density ρ and dynamic viscosity μ.	05	CO2
b)	A ship model of scale 1:50 is towed through sea water at a speed of 1m/s. A force of 2 N is required to tow the model. Determine the speed of ship and the propulsive force on the ship, if the prototype is subjected to wave resistance only.	05	CO2

--END--

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REV:00	**QUESTION PAPER CLASS TEST 01**	EXM-04(a)

CLASS:- TE CE-SHIFT 1	SEM:- V
SUBJECT:- Transportation Engg	DATE:- 23/08/ 2017
DURATION:- 60 min.	MARKS:- 20

Q.01	Attempt any TWO : 8 Marks	marks	CO
a)	What is meant by Grade compensation for curvature? To what extent should a ruling gradient of 1 in 150 on a BG line be downgraded to accommodate a 3^0 curve ?	4	CO3
b)	Explain the various components that make a permanent way along with their significance?	4	CO2
c)	Draw a neat sketch of right hand turnout with naming all the components	4	CO2

Q.02	Attempt any TWO: 12 Marks		
a)	Calculate and show in the diagram the elements required to set out a 1 in 8.5 turnout with switch angle of 1^0 34' 27". Use Indian Railway Specification method (IRS)	6	CO3
b)	Define Creep of rails? What are the various theories that causes the development of creep? How it can be arrested ?	6	CO2
c)	A 6^0 degree curve branches off from a 3^0 main curve in an opposite direction in the layout on a BG track .If the speed on the branch line is restricted to 35kmph.Determine the speed restriction on the main line. Assume permissible deficiency in cant as 75mm.	6	CO3

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REV:00	**QUESTION PAPER CLASS TEST 01**	EXM-04(a)
CLASS:- **T.E. (Shift 1)**		SEM:- **V (CBSGS)**
SUBJECT:- Geotechnical Engineering - I		DATE:- 22/ 08 / 2017
DURATION:- **60 min.**		MARKS:- **20**

	Q.01 Attempt any one: (08 Marks)	Marks	CO
a)	For the construction of embankment, the soil is transported from the borrow area using a truck which can carry 7 m³ soil at a time. With the following details, determine the number of truck loads required to obtain 110 m³ compacted earth fill and volume of soil to be excavated from borrow pit.	8	1

Property	Borrow Area	Truck	Field
Bulk Unit Wt.	17.7 kN/m³	12.6 kN/m³	19.3 kN/m³
Water Content	9%	7%	15%

		Marks	CO
b)	A sand stratum is 10 m thick. The water table is 2 m below ground level. The unit weight of sand layer above and below water table are 17 kN/m³ and are 21 kN/m³ respectively. The capillary rise above water table is 1 m. Draw the effective stress and pore pressure diagrams for sand stratum	8	2

	Q.02 Attempt any two: (12 Marks)	Marks	CO
a)	What is the scope of geotechnical engineering?	6	1
b)	Classify the following soil as per IS classification system systematically with justifications: % passing 75 micron sieve = 8%, retained on 4.75 mm sieve = 35 %, coefficient of curvature = 2.5, uniformity coefficient = 7, liquid limit = 15, plasticity index = 3.	6	1
c)	What are the factors affecting compaction?	6	3