GOVERNMENT POLYTECHNIC, KOLHAPUR 416004.

(An Autonomous Institute of Govt. of Maharashtra)

ODD TERM END EXAM NOV/DEC -2019

EXAM SEAT NO. | | | | | | |

LEVEL: **THIRD** PROGRAM: **CIVIL**

COURSE CODE:**CEF 311/CEE311/CE309/CE211**

COURSE NAME: **ADV. CONST. TECH. AND EQUIPMENTS**

MAX. MARKS: **80** TIME: **3 HRS.** DATE:**25/11/2019**

Instruction:-

1) Answers must be written in the main answer book provided. (and supplements if required)
2) Illustrate your answers with sketches where ever necessary.
3) Use of non-programmable pocket calculator is permissible.
4) Mathematical and other tables will be made available on request.
5) Assume and mention suitable additional data necessary.
6) Use of Mobile is strictly prohibited.
7) **QN**>Question No, **SQN**>Sub-Question No, **R**> Remembering, **U**>Understanding, **A**>Application **CO**>Course outcome

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QN	SQN	Question Text	RUA	CO CEF 311	Marks
Q.1		Attempt any **FOUR**			**(08)**
	a)	List any four equipments / accessories used for pre-stressing operations.	R	1	
	b)	State any two necessity of RMC.	U	1	
	c)	List the equipments used for tremix concreting.	A	1	
	d)	Enlist the various materials used for grouting.	R	2	
	e)	State any two advantages of clay grouting.	U	2	
	f)	Enlist the different types of materials used for form work.	R	4	
Q.2		Attempt any **FOUR**			**(16)**
	a)	Explain with sketch any one method of pretensioning.	U	1	
	b)	Draw a neat sketch of RMC plant.	A	1	
	c)	Explain any four properties of roller compacted concrete.	R	1	
	d)	What is grouting pressure ? Explain with neat sketch drilling pattern used for dams.	A	2	
	e)	State and explain any four uses of Geo synthetic.	R	3	
	f)	Explain the concept of maivan technology.	R	4	
Q.3		Attempt any **FOUR**			**(16)**
	a)	Explain with neat sketch construction of bored piles.	A	1	
	b)	State & explain any four uses of FRC.	A	1	
	c)	Enlist the equipments used for grouting & explain the procedure for cement grouting.	R	2	
	d)	Explain with neat sketch slop stabilization technique used for embankment by soil reinforcing technique.	U	3	
	e)	Explain the process of concreting with vertical slip form system.	A	4	
	f)	Explain with neat sketch form work used for heavy structures.	A	4	
Q.4		Attempt any **FOUR**			**(08)**
	a)	State the working principle of hoisting equipment.	A	5	
	b)	Enlist any two types of hoisting equipments and any two types of conveying equipments.	R	5	
	c)	State any two areas of application of plain rollers and sheep footed rollers.	A	6	
	d)	Enlist the types of stone crusher.	R	7	
	e)	Define the term standard equipment.	R	8	
	f)	Enlist any four types of miscellaneous equipments.	R	8	

Q.5		Attempt any **FOUR**			**(16)**
	a)	State a working principle of tower crane. Draw a neat labeled sketch of tower crane.	A U	5 5	
	b)	Draw a neat labeled sketch of power showel and explain its cycle of operation.	U	6	
	c)	State and explain any four factors affecting output of Bulldozers.	U	6	
	d)	For a concreting of bridge pier which type of vibrator you will prefer to use. Explain the working with a neat sketch.	A	7	
	e)	Explain working of transit mixer with a neat sketch.	U	7	
	f)	Explain in detail how maintenance of equipments is carried out.	R	8	
Q.6		Attempt any **FOUR**			**(16)**
	a)	Explain in detail the working of belt conveyor.	U	5	
	b)	Explain any four factors affecting on output of scrapper.	U	6	
	c)	State any four areas of application of sheep footed rollers.	A	6	
	d)	Enlist and describe any two equipments used for production of artificial sand.	U	7	
	e)	Explain in brief the automatic concrete plant.	U	7	
	f)	You are working with a construction company. Company has given you a responsibility of purchasing new equipments required for a road project. Enlist four factors you will consider for selection of equipment.	A	8	

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ODD TERM END EXAM NOV/DEC -2019

EXAM SEAT NO. | | | | | | |

LEVEL: **III** PROGRAM: **Civil Engineering**

COURSE CODE: **CEF306** COURSE NAME: **Hydraulics**

MAX. MARKS: **80** TIME: **3 HRS.** DATE: **22 /11/2019**

Instruction:-

1) Answers must be written in the main answer book provided. (and supplements if required)
2) Illustrate your answers with sketches where ever necessary.
3) Use of non-programmable pocket calculator is permissible.
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5) Assume and mention suitable additional data necessary.
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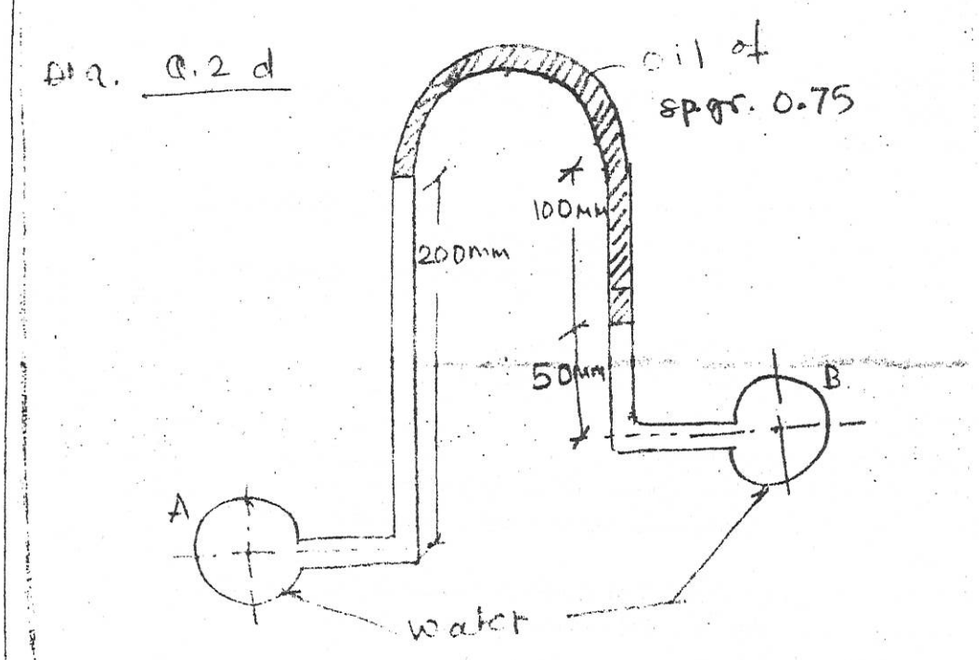
7) **QN**>Question No, **SQN**>Sub-Question No, **R**> Remembering, **U**>Understanding, **A**>Application **CO**>Course outcome

QN	SQN	Question Text	RUA	CO CEF306	Marks
Q.1		Attempt any **FOUR**			(08)
	a)	Define kinematics viscosity. State their units.	R	1	
	b)	State the importance of compressibility in fluid flow.	A	1	
	c)	Define atmospheric pressure and write it's value in terms of water column.	A	2	
	d)	Calculate pressure at a point 5.0m below the surface of mercury	A	2	
	e)	What do you understand by single column manometer ? How are they used for measurement of pressure	U	3	
	f)	Define pressure flow. Give an example.	R / U	4	
Q.2		Attempt any **FOUR**			(16)
	a)	Define 1) Relative density 2) Specific volume 3) Weight density 4) Mass density	R	1	
	b)	A cubical tank has sides of 1.50m. It contains water for lower 0.6m depth. The upper remaining part is filled with oil of specific gravity 0.9.Calculate for one vertical side of the tank. a) Total pressure & b) position of centre of pressure.	A	2	
	c)	Express 13.6 cm of mercury into meter of water absolute & in absolute pressure in terms of KN/m^2 , N/mm^2.	A	2	
	d)	An inverted differential manometer having an oil of specific gravity 0.75 was connected to two differential pipes carrying water under pressure as shown in fig. Determine the pressure in the pipe 'B' in terms of KPa, if manometer read shown in figure. Take pressure in the pipe A as 1.5m of water.  figure -- for Q.2 d.	A	3	

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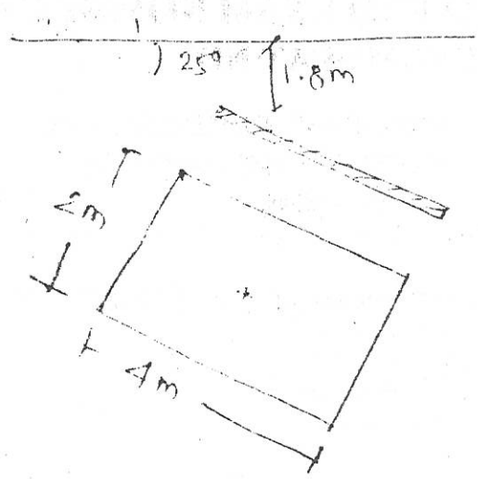
	e)	A rectangular plate 2m wide & 4m deep is immersed in wate in such a way that it's plane make an angle of 25^0 with the water surface as shown in fig. Determine the total pressure on one side of the plate & the position of centre of pressure. 	A	3	
	f)	Define Reynold's number. How it is useful in identifying the types of flow.	U	4	
Q.3		Attempt any **FOUR**			**(16)**
	a)	A closed cylinder tank of 1m diameter & 2m deep with vertical axis contains 1.5m deep water. If air, at a pressure 5KPa above atmosphere, is pumped into the cylinder, find the total pressure on vertical wall of the tank & the distance of the total pressure from the bottom.	A	3	
	b)	i) Convert the gauge pressure of 12.5m of oil of specific gravity 0.8 into the pressure in kN/m^2. Take atmospheric pressure as 74 cm of mercury. ii) Convert pressure head of 65cm of mercury into the pressure head of oil of specific gravity 0.8	A	2	
	c)	Discuss the working of Bourdon's pressure gauge with a neat labeled sketch.	U	3	
	d)	Water flows through a pipeline which gradually reduces from 450mm diameter at A to 300mm dia. At B. and then forks, one branch being 150mm dia discharging at C and other branch 225mm diameter discharging at D. If velocity at D is 4m/s. What will be the velocities at B & C. Also velocity at A is 2m/s.	A	4	
	e)	i) Write the statement & equation of Bernoulli's theorem. ii) Define pressure head & velocity head also, write their expression.	R U	4 4	
	f)	i) Define stream line & equipotential line . ii) Write meaning of flownet also, write any two uses of it.	R U	4 4	
Q.4		Attempt any **FOUR**			**(08)**
	a)	Define TEL & HGL	R	5	
	b)	Define hydraulic radius	R	6	
	c)	Define w.r.t. open channel flow : wetted area wetted perimeter.	R	6	
	d)	Enlist any two velocity measuring devices	R	7	
	e)	Define pump. Enlist its types.	R	8	
	f)	Define manometric head	R	8	
Q.5		Attempt any **FOUR**			**(16)**
	a)	Derive Dupit's equation.	A	5	
	b)	At a sudden enlargement of water line 250 mm diameter to 500 mm diameter pipe, the hydraulic gradient rises by 12mm. Calculate the discharge through pipe	A	5	
	c)	Find the discharge through most economical rectangular section of 6.5m width & bed slope of 1 in 1200. Take manning's constant n=0.016	U	6	
	d)	Explain in brief venturi flow meter & write the expression for calculation of discharge.	U	7	
	e)	Explain with neat sketch any one type of current meter.	U	7	
	f)	Explain working of centrifugal pump with suitable sketch.	A	8	
Q.6		Attempt any **FOUR**			**(16)**
	a)	Explain the phenomenon of water Hammer	U	5	
	b)	Define friction factor & state any four factors affecting friction factor.	U	5	
	c)	List the conditions for most economical section for rectangular section & trapezoidal section	A	6	
	d)	Find the slope of the rectangular channel of width 5m when depth of water is 2m & rate of flow is given as $20m^3/sec$. Take chezzy's constant c=50			
	e)	Differentiate between a notch & weir	U	7	
	f)	Explain with sketch the principal underlying the construction of a venturimeter	U	7	

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ODD TERM END EXAM NOV/DEC -2019

EXAM SEAT NO. | | | | | | |

LEVEL: **FOURTH** PROGRAM: **CIVIL ENGINEERING**

COURSE CODE: **CEF406/CE207/CEE406** COURSE NAME: **CONCRETE TECHNOLOGY.**

MAX. MARKS: **80** TIME: **3 HRS.** DATE: **23/11/2019**

Instruction:-

1) Answer to two sections must be written in separate section answer book provided
2) Illustrate your answers with sketches where ever necessary.
3) Use of non-programmable pocket calculator is permissible.
4) Mathematical and other tables will be made available on request.
5) Assume and mention suitable additional data necessary.
6) Use of Mobile is strictly prohibited.
7) **QN**>Question No, **SQN**>Sub-Question No, **R**> Remembering, **U**>Understanding, **A**>Application **CO**>Course outcome

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QN	SQN	Question Text	RUA	CO CEF406	Marks
		Section -I			
Q.1		Attempt any **FOUR**			**(08)**
	a)	Define concrete.	R	1	
	b)	Enlist two types of admixtures.	R	1	
	c)	Define Hydration.	R	2	
	d)	Define aggregate.	R	2	
	e)	Define workability	R	3	
	f)	Define segregation.	R	3	
Q.2		Attempt any **FOUR**			**(16)**
	a)	Define curing & Enlist methods of curing.	U	1	
	b)	Explain the working of transit mixer.	U	1	
	c)	Explain the function of accelerator as admixture.	U	1	
	d)	State the effect of aggregate properties on strength of concrete.	U	2	
	e)	Describe the applications of rapid hardening cement.	U	2	
	f)	State the precautions to be taken to avoid bleeding in concrete.	A	3	
Q.3		Attempt any **FOUR**			**(16)**
	a)	State the role of each ingredient of concrete.	U	1	

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	b)	State the precautions to be taken while planning of concrete.	U	1	
	c)	Explain the manufacturing process of Portland cement.	U	2	
	d)	Explain bulking of sand.	U	2	
	e)	Explain the meaning of flakiness Index & elongation index and effect on concrete properties.	U	2	
	f)	State the precautions to be taken to avoid segregation of concrete.	U	3	
		Section-II			
Q.4		Attempt any **FOUR**			**(08)**
	a)	List four methods of concrete mix design.			
	b)	State aim of inspection of concrete work.			
	c)	State application of fiber reinforced concrete.			
	d)	Enlist four requirement of good formwork.			
	e)	Give purposes of form work.			
	f)	State meaning of concrete mix design.			
Q.5		Attempt any **FOUR**			**(16)**
	a)	Without formwork concrete cannot be laid. If so why?			
	b)	Discus 'Rebound hammer' test w. r. t applications and limitations.			
	c)	Define impermeability of concrete. Enlist factor affecting it.			
	d)	What is durability of concrete? State factors affecting durability.			
	e)	State precautions to be observed is cold weather concreting.			
	f)	Explain Tremie method of concreting under water.			
Q.6		Attempt any **FOUR**			**(16)**
	a)	Justify that strength of concrete depends upon water cement ratio.			
	b)	What is polymer concrete? Explain w.r.t material and applications.			
	c)	List four factor causing variation in the quality of concrete. Explain any one in short.			
	d)	Draw a sketch of a formwork for column (Plan & Elevation)			
	e)	State effects of hot weather on concreting.			
	f)	Explain in brief IS method of concrete mix diagram.			

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ODD TERM END EXAM NOV-DEC-2019

EXAM SEAT NO. | | | | | | |

LEVEL : - **FIFTH** PROGRAM : **CIVIL ENGINEERING**

COURSE CODE :- **CEF504/CEE501/CE406**

COURSE NAME **CONTRACTS AND ACCOUNTS**

MAX. MARKS : **80** TIME : **3 HRS.** DATE :- **22/ 11 / 2019**

Instruction :-

1) Answers of two sections must be written in separate section answer book provided.
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4) Mathematical and other tables shall be made available on request.
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7) QN- Question No., SQN-Sub Question No. R- Remembering, U- Understanding, A- Application.

QN	SQN	**Section- I**	R/U/A	Co CEF 504	Marks
Q.1		Attempt any **FOUR:**			**08**
	a)	State the four important duties of junior engineer.	R	1	
	b)	What do you mean by contract?	U	1	
	c)	Explain the term budget provision.	U	1	
	d)	List classes of contractor.	R	2	
	e)	State the meaning of defect liability period and liquidated damage.	U	3	
	f)	What do you mean by ring formation?	U	4	
Q.2		Attempt any **FOUR:**			**16**
	a)	Explain administrative approval and technical sanction in connection with government works.	U	1	
	b)	Explain B.O.T. method adopted in government organization.	U/A	1	
	c)	Describe requirements of valid contract.	U	2	
	d)	Write meaning of negotiated contract and give situations where it is used.	U/A	2	
	e)	Explain cost plus percentage type of contract.	U/A	2	
	f)	State conditions of contract with respect to defective material and workmanship.	U	3	
Q.3		Attempt any **FOUR:**			**16**
	a)	State the classification of works and explain any two of it.	U	1	
	b)	Explain the following i) Liquidated damage. ii) Subletting of contract.	U	3	
	c)	Explain the situations when lowest tender is rejected.	U/A	4	
	d)	State what do you mean by Earnest money and when it is refunded.	U	4	
	e)	Draft a tender notice for construction of library building of estimated cost Rs. 2.0 Crore. Assume suitable data.	A	4	
	f)	Explain two envelop method related to tendering procedure.	U/A	4	

P.T.O.

QN	SQN	Section- II	R/U/A	Co CEF 504	Marks
Q.4		Attempt any **FOUR:**			**08**
	a)	State the meaning of income tax.	R	5	
	b)	What is muster roll?	R	6	
	c)	Define secured advance.	R	6	
	d)	Differentiate between cost and price.	U	7	
	e)	What is the meaning of net income?	R	7	
	f)	Differentiate between scrap values and salvage value.	U	7	
Q.5		Attempt any **FOUR** :			**16**
	a)	State the functions of financial management.	R	5	
	b)	State various sources of finance, explain any one.	R	5	
	c)	Write the types of taxes, explain any one.	R	5	
	d)	Explain the importance of maintaining accounts in P.W.D.	R	6	
	e)	What is measurement book? State the points to be observed in recording measurements.	R	6	
	f)	State different types of payments made by P.W.D. Explain any one.	R	6	
Q.6		Attempt any **FOUR:**			**16**
	a)	State the purpose of valuation.	R	7	
	b)	What is the meaning of outgoings? State various outgoings.	R	7	
	c)	State the factors affecting valuation.	R	7	
	d)	State the methods of calculating depreciation. Explain any one.	R	7	
	e)	A property fetches a monthly rent of Rs. 5000. The outgoings are as below: Sinking fund installment = Rs. 2000 /year Annual repairs = Rs. 1500. Other outgoings @ 30% of gross rent. Calculate capitalized value of the property if rate of interest is 8%.	A	7	
	f)	Suggest suitable monthly rent of the property with the given data: Area of land = 500 Sq.m Built up area = 150 Sq.m Cost of land = Rs. 3000/ Sq.m Cost of construction = Rs. 15000/Sq.m Return expected on land cost = 4%. Return expected on construction cost = 6%. Outgoings = 30% of gross income.	A	7	

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ODD TERM END EXAM NOV-DEC-2019

EXAM SEAT NO. | | | | | | |

LEVEL : - **FIFTH** PROGRAM : **CIVIL ENGINEERING**

COURSE CODE :- **CEF510/CEE509/CE408**

COURSE NAME **SOLID WASTE MANAGEMENT**

MAX. MARKS : **80** TIME : **3 HRS.** DATE :- **25/ 11 / 2019**

Instruction :-

1) Answers of two sections must be written in separate section answer book provided.
2) Illustrate your answers with sketches wherever necessary.
3) Use of non-programmable pocket calculator is permissible.
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7) QN- Question No., SQN-Sub Question No. R- Remembering, U- Understanding, A- Application.

QN	SQN	**Section- I**	R/ U/ A	Co CEF 510	Marks
Q.1		Attempt any **FOUR:**			**08**
	a)	Define solid waste.	R	1	
	b)	What do you mean by commercial waste?	R	1	
	c)	Enlist any four transportation verticals with their capacities.	R/ A	2	
	d)	State the use of solid waste as raw material in Industry.	U	2	
	e)	What do you mean by biological waste?	U	4	
	f)	State any two categories of hospital wastes with their collection equipment.	R/ A	4	
Q.2		Attempt any **FOUR:**			**16**
	a)	Explain in brief industrial and construction waste.	U	1	
	b)	State the factors affecting solid waste generation.	U	1	
	c)	Explain the necessity of transfer station and state its location.	U/A	2	
	d)	Describe in brief organization pattern of solid waste management.	U	2	
	e)	Explain street sweeping and E-waste.	U	1	
	f)	State the factors those should be taken into consideration while fixing the route for collection of municipal waste.	A	2	
Q.3		Attempt any **FOUR:**			**16**
	a)	Explain the terms i) Segregation ii) Salvage recovery.	R	2	
	b)	Explain health aspect in relation with solid waste handling and processing.	R	3	
	c)	What heath care needs to be taken at recycling and final disposal site.	U/A	3	
	d)	Describe importance of public involvement and participation in solid waste management.	U	3	
	e)	Explain incineration method of disposal of hospital waste.	U/A	4	
	f)	Describe in brief i) Collection of hospital waste. ii) Transportation of hospital waste.	R/A	4	

P.T.O.

QN	SQN	Section- II	R/U/A	Co CEF 510	Marks
Q.4		Attempt any **FOUR:**			**08**
	a)	State any four factors affecting site selection for sanitary landfilling.	U	5	
	b)	Enlist any four manual methods of composting.	R	6	
	c)	Define the term composting,	R	6	
	d)	Write any four disadvantages of incineration process.	U	7	
	e)	Define 'Pyrolysis'.	R	7	
	f)	Which types of solid waste generated from slaughter house waste?	A	8	
Q.5		Attempt any **FOUR** :			**16**
	a)	Discuss following landfilling method. i) Trench method ii) Ramp method.	A	5	
	b)	Define Leachate. Explain how it can be controlled.	A	5	
	c)	Explain any eight factors affecting the composting process.	U	6	
	d)	Write a short note on 'Vermicomposting'.	U	6	
	e)	Define i) Municipal incinerator, ii) Multiple chamber incinerator.	R	7	
	f)	Describe the problem of disposal of fly ash from Thermal power plant.	A	8	
Q.6		Attempt any **FOUR:**			**16**
	a)	State the reason for contamination of ground water. Explain how contamination of ground water can be controlled.	A	5	
	b)	How biogas energy from solid waste can be recovered?	A	6	
	c)	Discuss 'Anaerobic method of composting'.	A	6	
	d)	Explain following methods of Pyrolysis. i) Plasma Pyrolysis vitrification. ii) Slurry carb process.	U	7	
	e)	Explain in brief 'Recycling of industrial waste'.	A	8	
	f)	Write the precautions are taken by industries to control generation of industrial waste.	A	8	

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ODD TERM END EXAM NOV/DEC -2019

EXAM SEAT NO. | | | | | | |

LEVEL: **THIRD** PROGRAM: **CIVIL ENGINEERING**

COURSE CODE: **CEF309/CE205/CEE309** COURSE NAME: **SURVEYING-II**

MAX. MARKS: **80** TIME: **3 HRS.** DATE: **20/11/2019**

Instruction:-

1) Answers must be written in the main answer book provided. (and supplements if required)
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3) Use of non-programmable pocket calculator is permissible.
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5) Assume and mention suitable additional data necessary.
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QN	SQN	Question Text	RUA	CO CEF309	Marks
Q.1		Attempt any **FOUR**			**(08)**
	a)	What is 'transit theodolite?	U	1	
	b)	What are the functions of theodolite?	R	1	
	c)	What do you mean by latitude and departure?	U	1	
	d)	What do you mean by the terms? 'Face left' and 'Face right' .	A	1	
	e)	What is transiting?	U	1	
	f)	Why is an anallatic lens provided in a tachometer?	A	2	
Q.2		Attempt any **FOUR**			**(16)**
	a)	Describe the procedure of measuring horizontal angle by theodolite.	R	1	
	b)	Explain the procedure of doing 'Temporary adjustment' of theodolite.	A	1	
	c)	How will you extend the line by using theodolite?	A	1	
	d)	Describe the methods of checking the accuracy of closed traverse.	R	1	
	e)	Explain in brief 'Fixed hair method' of tachometry.	A	2	
	f)	What are the sources of error in tachometry?	R	2	
Q.3		Attempt any **FOUR**			**(16)**
	a)	Describe how tachometric surveying is conducted in the field.	A	2	
	b)	The following observations were taken with a transit theodolite	A	2	

Inst.station	Staff station	Target	Vertical angle	Staff reading	Remark
O	A	Lower	$+4^0 30'$	0.950	R.L.of instrument
		Upper	$+6^0 30'$	3.250	axis 250.00

Calculate the horizontal of distance between the instrument station and staff and also the R.L of staff station A.

	c)	Define the terms in reference with theodolite i) Centering ii) Telescope normal iii) Telescope inverted iv) Changing face	R	1	

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	d)	Explain the procedure of measuring the magnetic bearing of a line by theodolite.	U	1	
	e)	Describe how you would measure vertical angle by using theodolite.	R	1	
	f)	Explain the procedure of measurement of deflection angle by using theodolite.	R	1	
Q.4		Attempt any **FOUR**			**(08)**
	a)	State use of plumbing fork in plane table survey.	R	3	
	b)	State the situations where it is necessary to provide horizontal curves.	R	4	
	c)	State methods of setting simple circular curve.	R	4	
	d)	State instruments required for "Total station survey".	R	5	
	e)	State the use of Digital Theodolite.	R	5	
	f)	Define GPS.	R	6	
Q.5		Attempt any **FOUR**			**(16)**
	a)	Explain the procedure of orientation of plane. Table using back sight method.	U	3	
	b)	State functions of Alidade and Trough compass.	R	3	
	c)	Draw neat sketch of simple circular curve and show following elements i) Deflection angle ii) Long chord iii) Intersection Angle iv) Normal chord	U	4	
	d)	Explain stepwise procedure to observe R.L using digital level.	U	5	
	e)	Describe function of various components of total station.	U	5	
	f)	Explain an ideal remote sensing system.	U	6	
Q.6		Attempt any **FOUR**			**(16)**
	a)	Explain procedure of traversing method in plane table survey.	U	3	
	b)	The chainage of intersection point of two straights is 1060m and angle of intersection is 120^0. If radious of circular curve is 570m and peg interval is 30m Determine. i) Tangent length ii) Length of long chord iii) Chainage at beginning and end of curve.	A	4	
	c)	Explain procedure of setting curve by Rankine's method of deflection angle.	U	4	
	d)	Explain the use of GPS.	U	6	
	e)	Describe procedure of setting digital theodolite for it use.	U	5	
	f)	State uses of total station.	R	5	

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GOVERNMENT POLYTECHNIC, KOLHAPUR 416004.

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ODD TERM END EXAM NOV/DEC -2019

EXAM SEAT NO. | | | | | | |

LEVEL: **III** PROGRAM: **Civil Engineering**

COURSE CODE: **CEF310/CEE310/CE208** COURSE NAME: **Transportation Engineering**

MAX. MARKS: **80** TIME: **3 HRS.** DATE:**21 /11/2019**

Instruction:-

1) Answers must be written in the main answer book provided. (and supplements if required)
2) Illustrate your answers with sketches where ever necessary.
3) Use of non-programmable pocket calculator is permissible.
4) Mathematical and other tables will be made available on request.
5) Assume and mention suitable additional data necessary.
6) Use of Mobile is strictly prohibited.
7) QN>Question No, SQN>Sub-Question No, R> Remembering, U>Understanding, A>Application CO>Course outcome

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QN	SQN	Question Text	RUA	CO CEF310	Marks
Q.1		Attempt any **FOUR**			(08)
	a)	Write the meaning of 'Traffic volume study'	U	1	
	b)	Define camber. Write its two objects	U	2	
	c)	Define – i)Asphalt ii)Cutback	R	3	
	d)	Differentiate any four points between rigid pavement & flexible pavement	U	3	
	e)	State any two disadvantages of tunnels	U	4	
	f)	List out the operations involved in survey work of tunnel.	A	5	
Q.2		Attempt any **FOUR**			(16)
	a)	i)Define the term alignment of road ii)Discuss briefly the basic requirements of an ideal road alignment.	R A	1	01 03
	b)	Draw a cross section of National Highway in embankment, showing clearly the land width, formation width, pavement width, location of side drains etc.	A	2	
	c)	i)Identify the situation where exceptional gradient is to be adopted. ii)Write the values of exceptional gradients as recommended by Indian Road Congress(IRC).	A U	2	02 02
	d)	Draw a typical cross section showing the structure of water Bouend Mecadam road. Label all component parts of road	A	3	
	e)	Dicuss the construction procedure of bitumen carpet road.	A	3	
	f)	Sketch any four types of tunnel sections and state under what condition each is adopted.	A	4	
Q.3		Attempt any **FOUR**			(16)
	a)	Define the term super elevation.State any four objects of providing super elevation for roads.	U	2	
	b)	Explain alternet bay method of construction of concrete road with a neat labeled sketch.	A	3	
	c)	Write meaning of --- i)Prime coat ii)Tack coat iii)Surface dressing iv) Full grout	R	3	
	d)	Discuss the construction steps involved in construction of shaft.	A	5	
	e)	Explain shield method of tunneling	A	6	
	f)	i)State any four purposes of lining of tunnels. ii) State any four factors affecting types of lining to be provided in tunnel.	U	6	
Q.4		Attempt any **FOUR**			(08)
	a)	Define 'Creep of rail'	R	7	
	b)	Draw a neat sketch of flat footed Rail with dimensions	A	7	
	c)	Define 'Turn out'	R	8	
	d)	Define 'Station yard'	R	9	
	e)	State the factors affecting site selection of bridge	U	10	
	f)	State necessity of bearing for RCC Bridge	U	11	

Q.5		Attempt any **FOUR**			**(16)**
	a)	Draw a typical sketch of permanent way showing component part.	A	7	
	b)	State the four types of material used for ballast with their merits.	U	7	
	c)	State any four necessities of points & crossing.	R	8	
	d)	State the requirements for railway station	U	9	
	e)	Explain the term a)Substructure b)Superstructure	R	11	
	f)	Draw a neat labeled sketch of cross section of r.c.c. girder bridge	A	12	
Q.6		Attempt any **FOUR**			**(16)**
	a)	State the types of gauges with their gauge length	U	7	
	b)	State any four functions of sleepers	U	7	
	c)	Draw a neat labeled sketch of left hand turnout	A	8	
	d)	Outline the working of marshalling yard	U	9	
	e)	Define i)Afflux ii)Eoousmic span iii) Water way iv)Free board	R	11	
	f)	Identify two situations where causeways are provided.	A	12	

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ODD TERM END EXAM NOV-DEC-2019

EXAM SEAT NO. | | | | | | |

LEVEL : - **FOURTH** PROGRAM : **CIVIL ENGINEERING**

COURSE CODE :- **CEF404/CE303/CEE404**

COURSE NAME **ESTIMATING AND COSTING**

MAX. MARKS : **80** TIME : **4 HRS.** DATE :- **21/ 11 / 2019**

Instruction :-

1) Answers of two sections must be written in separate section answer book provided.
2) Illustrate your answers with sketches wherever necessary.
3) Use of non-programmable pocket calculator is permissible.
4) Mathematical and other tables shall be made available on request.
5) Assume and mention suitable additional data if necessary.
6) Use of Mobile is strictly prohibited.
7) QN- Question No., SQN-Sub Question No. R- Remembering, U- Understanding, A- Application.

QN	SQN	**Section- I**	R/U/A	Co CEF 404	Marks
Q.1		Attempt any **FOUR:**			**08**
	a)	Define the term estimating and costing.	R	1	
	b)	What do you mean by check list? State its purpose.	U	1	
	c)	State two important purposes of approximate estimate.	U	2	
	d)	State the different types of detailed estimate.	R	3	
	e)	State the basic principle of service unit method of preparing approximate estimate.	U	2	
	f)	Write the two important stages involved in preparation of detailed estimate.	R	3	
Q.2		Attempt any **FOUR:**			**16**
	a)	State the purposes of estimating and costing.	R	1	
	b)	Explain in brief the factors to be considered while preparing the detailed estimate.	U	3	
	c)	Write a short note on IS 1200 & D.S.R.	U	1	
	d)	List out the different methods preparing approximate estimate of buildings and explain the common method used for residential building.	A	2	
	e)	Explain in brief the provisions in detailed estimate for contingencies, w. e. charges and facilities provided in buildings.	U	3	
	f)	Explain in brief how you will prepare the approximate estimate of bridges and culverts.	U	2	
Q.3		Attempt the following			
	a)	Fig. 3A. Shows the plan of small residence with section of wall. Calculate the quantities of **any three** items from the following. i) Excavation for foundations of walls. ii) Brick work in footing. iii) R.C.C. work in slab and lintels over doors & windows. iv) Providing and laying ceramic tiles flooring work. v) Skirting work (full tile) in all rooms except bathroom.	A	4	12
	b)	Explain in brief the bar bending schedule and state how you will calculate the quantity of reinforcement for R.C.C. members slab, beam and column.	U	4	04

P.T.O.

QN	SQN	Section- II	R/U/A	Co CEF 404	Marks
Q.4		Attempt any **FOUR:**			**08**
	a)	Enlist points to be considered while forming specification of an item.	R	5	
	b)	Define specification.	R	5	
	c)	Give the market rate of i)Aggregate used for concrete. ii) Tor steel 16mm dia.	U	6	
	d)	Give transportation capacity of i) Truck for sand ii) Dumper for aggregate.	U	6	
	e)	What do you mean by General and Job overheads?	U	6	
	f)	What is necessity of rate analysis?	A	6	
Q.5		Attempt any **FOUR** :			**16**
	a)	Explain types of specifications.	R	5	
	b)	Define task work and explain factors affecting task work.	U	6	
	c)	Estimate quantities of materials required for brick work for a wall 8mt long and 2.5mt high. Thickness of wall 0.23 meter. C.M. used 1:5. Assume size of brick as 19 X 9X9 cm.	A	6	
	d)	Calculate number of bags of cement for $20m^3$ R.C.C. 1:3:6.	A	6	
	e)	Calculate the quantity of earthwork for embankment of canal from following data i) Top width = 2m ii) R.L. on top of bank = 103.00 iii) Side slope 1) 2 Horizontal to 1 vertical for one side. 2) 2 ½ Horizontal to 1 vertical for other side.	A	7	

Chainage	50	60	70
Ground level	101.50	101.00	99.00

	f)	Explain mean sectional area method of calculating earthwork.	U	7	
Q.6		Attempt any **TWO:**			**16**
	a)	Draft detailed specification of P.C.C. 1:3:6 for foundation.	A	5	
	b)	Prepare rate analysis for 20mm thick internal cement plaster with CM 1:3	A	6	
	c)	Calculate quantities of earthwork for a road with following data i) Formation width = 10m ii) Slope in cutting = 1 ½ :1 ii) Slope in Banking 2:1	A	7	

Chainage in m	0	50	100	150	200
Ground Level	400.00	399.30	398.45	394.90	394.00
Formation level	396.50	396.00	396.50	395.00	394.50

395.50

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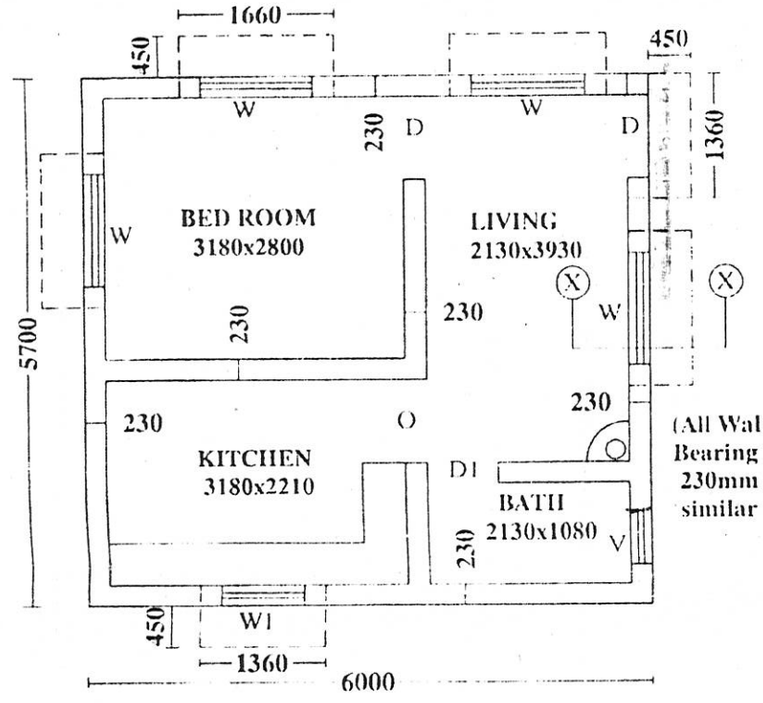
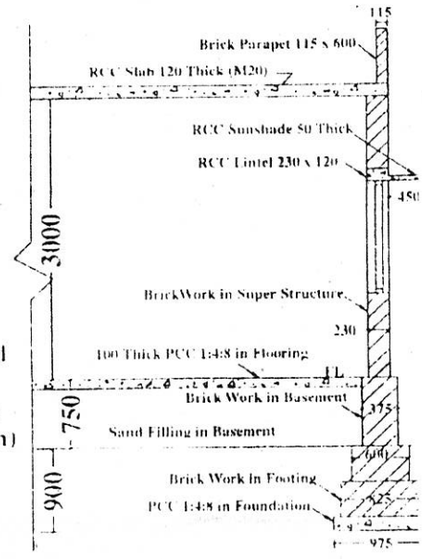
A SMALL RESIDENCE



(All Walls are Load Bearing Walls 230mm thick with similar foundation)



SECTION X-X

(All Dimensions are in mm)

N

SIZES: -

D-Door 900 x 2100 ; D1-Door 750 x 2100 ; W-Window 1200 x 1200 ; W1-Window 900 x 900 ; V-Ventilator 600 x 450 ; O- Open 900 x 2100

Fig. 3.A.

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ODD TERM END EXAM NOV/DEC -2019

EXAM SEAT NO. | | | | | | |

LEVEL: **FOURTH** PROGRAM: **CIVIL ENGG.**

COURSE CODE:**CEF 402/1303/C303/CE302/CEE402**

COURSE NAME: **DESIGN & DRAFTING OF RCC STRUCTURES**

MAX. MARKS: **80** TIME: **4 HRS.** DATE:**20/11/2019**

Instruction:-

1) Answer to two sections must be written in separate section answer book provided
2) Illustrate your answers with sketches where ever necessary.
3) Use of non-programmable pocket calculator is permissible.
4) Mathematical and other tables will be made available on request.
5) Assume and mention suitable additional data necessary.
6) Use of Mobile is strictly prohibited.
7) **QN**>Question No, **SQN**>Sub-Question No, **R**> Remembering, **U**>Understanding, **A**>Application **CO**>Course outcome

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QN	SQN	Question Text	RUA	CO CEF 402	Marks
		Section -I			
Q.1		Attempt any **FOUR**			**(08)**
	a)	Define the term limit state and partial safely factor.	R	1	
	b)	Show typical reinforcement detailing of T- shaped cantilever retaining wall.	R	1	
	c)	State two conditions for providing double reinforced beams.	R	2	
	d)	Differentiate between under reinforced section and over reinforced section. (for any four points)	R	2	
	e)	Draw a neat sketch of T-beam and state the effective flange width as per IS456-2000.	R	3	
	f)	State the conditions for formation of flanged beams (T or L) any two.	R	3	
Q.2		Attempt any **TWO**			**(16)**
	a)	State the meaning of pre-stressed concrete and state advantages and disadvantages of pre-stressed concrete. (any three)	U	1	
	b)	Define magnitude and intensity of earthquake & draw a neat labeled sketch of ductile detailing of column. beam junction and column footing junction as per IS 13920-2000.	A	1	
	c)	i) Draw typical reinforcement detailing sketch of circular water tank with flexible joint between vertical wall & base.	U	1	
		ii) State I.S. specification regarding spacing, cover, minimum reinforcement, effective span in beam.	U	2	
Q.3		Attempt any **TWO**			**(16)**
	a)	Find the moment of Resistance (M.R.) of a beam 250 x 500 mm effective reinforced on tension side with four 20 mm diameter bars. Assume M20 and Fe 415 steel and State section is under or over reinforced. Use neutral axis factor 0.48 and M.R. coefficient 0.138 fck.	A	2	
	b)	Design a double reinforced beam 230 x 600 mm overall for factored moment 300 kN-m. Cover on both side is 50 mm M20 and Fe 415 materials are used (Take fsc = 350mPa).	A	2	
	c)	A T-beam has the following dimensions. i. width of flange = 1500mm ii. Effective depth = 400mm iii. Thickness of slab = 150mm iv. Breath of web = 230 mm reinforcement on tensile side = 2000 mm^2. Find the moment of Resistance if M20 & Fe 250 grades of concrete and steel respectively used.	A	3	
		Section-II			
Q.4		Attempt any **FOUR**			**(08)**
	a)	Enlist different forms of shear reinforcement to resist shear force in beam.	R	4	
	b)	State any two factors on which shear strength of concrete is dependant.	R	4	
	c)	State any two functions of distribution steel in one way slab.	R	5	
	d)	Draw a neat labeled diagram of cantilever slab. Showing reinforcement detaining.	U	5	
	e)	State minimum of maximum steel provided in column as per IS specification.	R	6	
	f)	Define short column & long column.	R	6	

Q.5		Attempt any **FOUR**			**(16)**
	a)	Design the shear reinforcement for a beam of size b = 350mm, effective depth = 550 mm, factored shear force 125 kN, grade of concrete M20 & of steel Fe 415. Percentage of steel is 1.67%, τ_{cmax} = 2.8 N/mm^2 , Refer following table for τ_c. Pt: 1.50, τ_c = 0.74 N/mm^2 Pt: 1.75, τ_c = 0.78 N/mm^2	A	4	
	b)	A simply supported beam is 6 meter in span & carries service load of 60 kN/M. If 6 Numbers of 20 mm diameter bars are provided at the centre of the span & 4 numbers of these are continued into the support of thickness 300 mm. Take check for development length at support assuming M15 grade concrete Fe415 steel. τ_{bd} = 1 N/mm^2 for plain bars.	A	5	
	c)	Define development length & calculate development length required for 16 mm diameter bar in tension & compression. Use M20 concrete & Fe 500 steel. For M20 concrete τ_{bd} = 1.2 N/mm^2 for plain bars.	R	4	
	d)	State stepwise procedure to design one-way slab.	R	5	
	e)	i. State any two advantages of continuous slab over simply supported slab. ii. Draw a neat diagram of section of one way continuous slab showing reinforcements detailing.	R U	5 5	
	f)	Design a RCC column to carry working load 1600kN effective length of column is 3.15m. Check the column for minimum eccentricity. Use M20 concrete with Fe415 steel. Both ends of column are hinged.	A	6	
Q.6		Attempt any **TWO**			**(16)**
	a)	Design shear reinforcement for a reinforced beam of 350 mm wide x 500 mm deep effective is reinforced, with 4 bars of 25mm diameter on tension side. Beam having U.d.l. of 60kN/m over the span of 6.5 meter use M20 grade of concrete & Fe 415 grade steel & for stirrups use 8 mm diameter two legged stirrups. Assume two bars are bentup at the different sections in the beam. For M20 concrete grade. τ_c Max = 2.8N/mm^2 Refer following table for – Design shear strength of concrete Pt of steel: 0.50, τ_c = 0.48 N/mm^2 Pt of steel: 0.75, τ_c = 0.56 N/mm^2 Pt of steel: 1, τ_c = 0.62 N/mm^2	A	4	
	b)	Design a simply two way slab over a room 4.8m x 4 m effective size. It is subjected to U.d.l 5 kN/m^2 inclusive of all loads. Assume Pt = 0.25% & M.F. = 1.6 αx = 0.084 & αy = 0.059 use 8 mm diameter bars of Fe 415 steel & M20 grade of concrete.	A	5	
	c)	Design an isolated square footing for 300 mm x 300 mm column size to carry a working load 800kN. Soil bearing capacity of soil is 200 kPa use M20 concrete & Fe415 steel of 16 mm diameter. Take check only for Bending moment & two way shear.	A	6	

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ODD TERM END EXAM NOV/DEC -2019

EXAM SEAT NO. | | | | | | |

LEVEL: **FOURTH** PROGRAM: **CIVIL EGINEERING**

COURSE CODE: **CEF403/CEE403/1303** COURSE NAME: **DESIGN AND DRAFTING OF STEEL STRUCTURE**

MAX. MARKS: **80** TIME: **3 HRS.** DATE: **29/11/2019**

Instruction:-

1) Answer to two sections must be written in separate section answer book provided
2) Illustrate your answers with sketches where ever necessary.
3) Use of non-programmable pocket calculator is permissible.
4) Mathematical and other tables will be made available on request.
5) Assume and mention suitable additional data necessary.
6) Use of Mobile is strictly prohibited.
7) **QN**>Question No, **SQN**>Sub-Question No, **R**> Remembering, **U**>Understanding, **A**>Application **CO**>Course outcome

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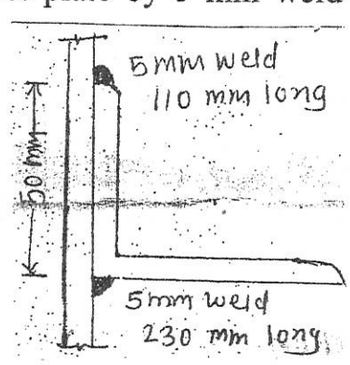
QN	SQN	Question Text	RUA	CO CEF403	Marks
		Section -I			
Q.1		Attempt any **FOUR**			**(08)**
	a)	State any two advantages & two disadvantages of steel as a building material.	R	1	
	b)	Draw a neat diagram of I Beam showing all components with geometrical properties.	U	1	
	c)	Define Bolt value of Bolted connection.	R	2	
	d)	State difference between end distance & edge distance in bolted connection with a neat diagram.	U	2	
	e)	Draw a neat diagram of block shear effect in the tension member & show shear length & tension length in this diagram.	U	3	
	f)	Define slenderness ratio & state its effect on the design compressive stress.	R	3	
Q.2		Attempt any **FOUR**			**(16)**
	a)	Describe classification of cross section of structural steel in accordance with their behaviour in bending as per I.S 800-2007	R	1	
	b)	i) Draw a neat diagram of fillet weld showing all components and labeling. ii) Define effective length of weld.	U & R	2 2	
	c)	Define tension member & Enlist any four types of sections used as a tension member with sketches.	R & U	3	
	d)	Determine the design strength of a single angle tension member consisting of single angle 80x50x8 mm. The shorter leg of angle connected to the gusset plate by 5 mm weld as shown in figure. Ag=978mm^2 	A	3	

	e)	A strut of a roof truss 2.2 m long of 65x65x6 mm. Double angle connected to a 12mm thick gusset plate on same side of it. It is connected by two rivets at each end. Then determine the design load the strut can carry. Properties of single angle 65x65x6 mm Ag=744 mm^2 $I_{XX}=I_{YY}=29.1x10^4$ mm^4 $C_{XX}=C_{YY}=18.1mm$	A	3	

Slenderness ratio	90	100	110	120
f_{cd} N/mm^2	121	107	94.6	83.7

	f)	State the necessary of lacing & battening to the columns.	R	3	
Q.3		Attempt any **TWO**			**(16)**
	a)	i) Describe live load calculation with neat diagram for live load on roof truss & on floor of building. ii) Describe wind load Analysis with neat diagram.	U U	1 1	
	b)	A tension member of a truss consist of 2ISA 70x70x6 mm connected on the same side of the gusset plate. Determine the design tensile strength of the member & number of bolts required for 20 mm diameter bolt. Bolt are required to develop design tensile strength. Ag of member 70x70x6 =806 (for single angle) Pitch =40 mm, edge dist=30 mm & gauge dist =30 mm. Also draw a neat diagram of connection.	A	2 & 3	
	c)	Decide suitability of ISA 90x60x8 mm to carry the service load of 200KN in compression & having center to center length 2.36 between the joints. The thickness of gusset plate is 10 mm. Also design the end connections with suitable weld. Properties of single ISA 90x60x8 mm. Ag=1137 mm^2 I_{XX}=28.4 mm $I_{YY}=32.4x10^4$ mm^2 C_{YY}=14.8 mm C_{XX}=29.6 mm Consider :- longer leg is connected to the gusset plate & left =0.70 *l*	A	2 & 3	

Slenderness ratio	f_{cd} N/ mm^2
60	168
70	152
80	136

Section-II

Q.4		Attempt any **FOUR**			**(08)**
	a)	Enlist common sections used for Beams.	R	4	
	b)	State under which circumstances plate Girder is used.	R	4	
	c)	Define laterally supported beam & draw sketch.	R	4	

	d)	Calculate permissible deflection of beam having span 6 m with simple supports for *w* kN/m.	A	4	
	e)	Draw a neat diagram of Gusseted base in elevation.	U	5	
	f)	Explain the criteria to decide plan area of slab base.	R	5	
Q.5		Attempt any **TWO**			**(16)**
	a)	Determine design bending strength of laterally supported beam ISMB 400 with b_f= 200 mm, t_f= 13 mm, t_w = 8.6 mm, R_1=13 mm with Ze = 1088 x10^3 mm^3. Also check for local buckling.	A	4	
	b)	Design simply supported beam of span 3.5 m to carry working UDL of 15KN/m over entire span. Beam is laterally supported. Check for deflection is not necessary.	A	4	

Section	Area (cm^2)	b_f(mm)	t_f(mm)	t_w(mm)	Z_{XX} (cm^3)
ISMB150	19.0	80	7.6	6.30	97
ISMB175	24.7	90	8.6	7.20	145
ISMB200	32.0	100	10.8	7.5	224

	c)	Check the suitability of angle purlin ISA 100x75x10 carrying dead load 250 N/m, imposed load of 500 N/M and wind load of 1200 N/m (upwords, parallel to longer leg). The spacing of roof truss is 3 m. Take Z_{XX} = 23.6 cm^3 & Z_{YY} = 16.5 cm^3.	A	6	
Q.6		Attempt any **TWO**			**(16)**
	a)	A column ISHB 400 carries an axial load of 1500 KN. Design suitable column base if grade concrete is M20 & SBC of soil is 200 KN/m^2. Given b_f = 250 mm & t_f =12.7 mm.	A	5	
	b)	An industrial building having Fink truss of span 12 m with six panels. The pitch of rood is 1/5. Calculate critical panel points load for dead & live load. Assume necessary data required.	A	6	
	c)	Calculate the wind load per panel point for designing of roof truss of span 12 m and pitch ¼. The height of eaves is 4.8 m above ground. Assume basic velocity of wind is 40 m/s, probability factor k_1=1, size factor k_2 =0.8 & topography factor k_3=1 with normal permeability. Given spacing between the trusses is 4.5 m and C_{pe}= -0.5 for wind parallel to ridge & for wind perpendicular to ridge. Take C_{pe}= -0.5 (windward) C_{pe}= -0.4 (Leeward)	A	6	

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ODD TERM END EXAM NOV-DEC-2019

EXAM SEAT NO. | | | | | | |

LEVEL : - **FIFTH** PROGRAM : **CIVIL ENGINEERING**

COURSE CODE :- **CEF507/CEE506/CE401**

COURSE NAME **IRRIGATION ENGINEERING**

MAX. MARKS : **80** TIME : **3 HRS.** DATE :- **23/ 11 / 2019**

Instruction :-

1) Answers of two sections must be written in separate section answer book provided.
2) Illustrate your answers with sketches wherever necessary.
3) Use of non-programmable pocket calculator is permissible.
4) Mathematical and other tables shall be made available on request.
5) Assume and mention suitable additional data if necessary.
6) Use of Mobile is strictly prohibited.
7) QN- Question No., SQN-Sub Question No. R- Remembering, U- Understanding, A- Application.

QN	SQN	**Section- I**	R/ U/ A	Co CEF 507	Marks
Q.1		Attempt any **FOUR:**			**08**
	a)	Define irrigation and irrigation engineering.	R	1	
	b)	Enlist four major irrigation projects in Maharashtra.	R	1	
	c)	State types of rain gauges.	R	2	
	d)	Define runoff.	R	2	
	e)	Define crop rotation and intensity of irrigation.	R	3	
	f)	Give any two disadvantages of Bandhara irrigation.	R	4	
Q.2		Attempt any **FOUR:**			**16**
	a)	Give any eight advantages of irrigation.	U	1	
	b)	Explain any four factors affecting duty.	U	3	
	c)	Discuss drip irrigation method with a neat sketch.	U	3	
	d)	Explain component parts of Bandhara irrigation scheme.	U	4	
	e)	Explain in brief salient features of K.T. weir.	U	4	
	f)	Give any four advantages and any four disadvantages of percolation tank.	R	4	
Q.3		Attempt any **FOUR:**			**16**
	a)	State methods of computing runoff. Explain any one.	A	2	
	b)	An irrigation canal has a gross command area (GCA) OF 80,000 hectors out of which 85% in cultivable area. The intensity of irrigation for Khariff season is 30% and for Rabi season 60%. Find the discharge required at the head of canal if duty at its head is 800 ha/cumec for Khariff season and 1700 ha/cumec for Rabi season.	A	3	
	c)	State any four important points considered for selecting site for percolation tank.	R	4	
	d)	State the circumstances under which lift irrigation is necessary.	U	4	
	e)	Give any four advantages and any four disadvantages of well irrigation.	U	4	
	f)	Enlist eight component parts of lift irrigation.	R	4	

QN	SQN	Section- II	R/U/A	Co CEF 507	Marks
Q.4		Attempt any **FOUR:**			**08**
	a)	Define the terms FRL & HFL.	R	5	
	b)	List the different types of galleries in gravity dams and state two important purposes.	U	6	
	c)	List the different types of C.D. works with their suitability.	U/A	7	
	d)	State the objectives of engineering survey in reservoir planning.	U	5	
	e)	What do you mean by spillway?	R	6	
	f)	State the effects of salt efflorescence.	R	7	
Q.5		Attempt any **FOUR** :			**16**
	a)	State the different points to be considered while selecting a site for reservoir.	U	5	
	b)	What are advantages and disadvantages of gravity dam?	U	6	
	c)	Write a short note on joints in gravity dams.	R	6	
	d)	What are the important points to be considered while fixing the alignment of canals?	U/A	7	
	e)	Distinguish between contour canal and ridge canal.	U/A	7	
	f)	What is energy dissipation? Explain any on e type of energy dissipator.	U	6	
Q.6		Attempt any **TWO:**			**16**
	a)	Explain the important criterias considered for deciding the most suitable type of dam.	U/A	6	
	b)	i) State the advantages of canal lining. ii) Fix control levels of a medium size reservoir from the data given below. Effective storage required for crops = 3200 ha.m. Tank losses = 20% of effective storage. Carry over allowance = 10% of effective storage. Dead storage = 10% of gross storage. Assume suitable flood lift and free board.	A	5	
	c)	i) State the preventive measures of water logging. ii) What are the functions of canal outlets? Explain in brief the simple or non-modular outlets.	U U	7 7	

Contour (RL)	250	253	256	--	278	281	284
Storage (Mm^3)	3.25	4.15	5.30	--	42.7	47.4	55.2

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GOVERNMENT POLYTECHNIC, KOLHAPUR – 416004.

(An Autonomous Institute of Govt. Of Maharashtra)

ODD TERM END EXAM NOV-DEC-2019

EXAM SEAT NO. | | | | | | |

LEVEL : - **THIRD** PROGRAM : **ELECTRICAL ENGINEERING**

COURSE CODE :- **EEF312**

COURSE NAME **BASIC MECHANICAL & CIVIL ENGINEERING**

MAX. MARKS : **80** TIME : **3 HRS.** DATE :- **26/ 11 / 2019**

Instruction :-

1) Answers of two sections must be written in separate section answer book provided.
2) Illustrate your answers with sketches wherever necessary.
3) Use of non-programmable pocket calculator is permissible.
4) Mathematical and other tables shall be made available on request.
5) Assume and mention suitable additional data if necessary.
6) Use of Mobile is strictly prohibited.
7) QN- Question No., SQN-Sub Question No. R- Remembering, U- Understanding, A- Application.

QN	SQN	**Section- I**	R/ U/ A	Co EEF 312	Marks
Q.1		Attempt any **FOUR:**			**08**
	a)	State the function of key.	R	1	
	b)	State various types of coupling.	R	1	
	c)	State various types of energy conversion devices.	R	5	
	d)	State types of belt drives.	R	6	
	e)	Enlist various types of gears.	R	5	
	f)	Classify gas turbine.	U	4	
Q.2		Attempt any **FOUR:**			**16**
	a)	Explain with neat sketch ' Muff coupling'.	U	1	
	b)	State the classification of Boiler.	R	3	
	c)	Suggest the power transmitting devices for following applications i) Flour mills/grinding mill ii) Sugar cane crushing machine.	A	4	
	d)	Draw neat sketches of various types of keys.	U	1	
	e)	Draw neat sketches of following. i) Spur gear ii) Helical gear.	U	4	
	f)	State the criterion for bearing selection.	R	2	
Q.3		Attempt any **TWO:**			**16**
	a)	Draw a neat sketch of I.C. engine and state the functions of each part.	U/ A	4	
	b)	i) Explain with neat sketch centrifugal pump. ii) Explain with neat sketch Axial flow compressor.	U U	5 5	
	c)	Explain open loop and closed loop gas turbine with neat sketch.	U	5	

P.T.O.

QN	SQN	Section- II	R/U/A	Co EEF 312	Marks
Q.4		Attempt any **FOUR:**			**08**
	a)	List any two types of flooring materials used in buildings.	R	4	
	b)	Distinguish between bricks and Stone. (any two points)	R	4	
	c)	Write the functions of i) Door ii) Road.	R	4	
	d)	Write any two benefits of 'painting'.	R	4	
	e)	Define the term 'Pointing'.	R	4	
	f)	Write any two means of vertical communication.	R	4	
Q.5		Attempt any **FOUR** :			**16**
	a)	Write any four advantages of 'plastering'. The exposed surfaces of building.	U	4	
	b)	Sketch a 'Door' and label the parts.	R	4	
	c)	Sketch a 'window' and label the parts.	R	4	
	d)	Define i) Built-up area ii) F.S.I.	U	4	
	e)	Define the term 'Plumbing'. And list any two materials of plumbing.	R	4	
	f)	Write the procedure of 'concreting' for a column footing.	U	4	
Q.6		Attempt any **FOUR:**			**16**
	a)	Define 'surveying and leveling' and write any two types of surveying.	R	5	
	b)	Write the uses of i) Prismatic compass. ii) Planimeter. iii) Theodolite iv) Total station.	A	5	
	c)	Define " irrigation-Engg." and write any two advantages of it.	R	6	
	d)	Sketch a line –diagram of water treatment plant.	U	6	
	e)	Sketch a line diagram of waste water treatment plant.	U	6	
	f)	Write any four means of transportation system.	U	4	

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ODD TERM END EXAM NOV/DEC -2019

EXAM SEAT NO. | | | | | | |

LEVEL: **III** PROGRAM: **CIVIL ENGINEERING**

COURSE CODE:**CEF302/CE206/CEE302** COURSE NAME: **BUILDING CONSTRUCION**

MAX. MARKS: **80** TIME: **3 HRS.** DATE: **28 /11/2019**

Instruction:-

1) Answers must be written in the main answer book provided. (and supplements if required)
2) Illustrate your answers with sketches where ever necessary.
3) Use of non-programmable pocket calculator is permissible.
4) Mathematical and other tables will be made available on request.
5) Assume and mention suitable additional data necessary.
6) Use of Mobile is strictly prohibited.
7) **QN**>Question No, **SQN**>Sub-Question No, **R**> Remembering, **U**>Understanding, **A**>Application **CO**>Course outcome

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QN	SQN	Question Text	RUA	CO CEF302	Marks
Q.1		Attempt any **FOUR**			**(08)**
	a)	Define super structure.	R	1	
	b)	Enlist tools & plants used for excavation.	U	2	
	c)	State any two requirements of good foundation.	A	2	
	d)	Define 'Hearting'.	R	3	
	e)	Give any two purposes of scaffolding.	U	3	
	f)	Enlist any four different types of doors.	R	4	
Q.2		Attempt any **FOUR**			**(16)**
	a)	Explain in detail composition of clay bricks.	A	1	
	b)	What is timbering & starting for foundation trench? Draw sketches.	U	2	
	c)	Explain in detail precautions while making layout on ground.	R	2	
	d)	Enlist different types of deep foundation. Explain any one in detail with neat sketch.	A	2	
	e)	Explain the terms --- a)Bat b)Closer c) Facing d)Backing.	R	3	
	f)	Draw a neat sketch of Rolling Shutter.	U	4	
Q.3		Attempt any **FOUR**			**(16)**
	a)	Describe the methods used for testing of bricks.	U	1	
	b)	Write note on formica.	R	1	
	c)	Explain purpose & function of foundation.	A	2	
	d)	Explain coursed random Rubble Masonary with neat sketch.	A	3	
	e)	Differentiate between English Bond & Flemish Bond.	U	3	
	f)	Describe types of scaffolding & their suitability.	R	3	
Q.4		Attempt any **FOUR**			**(08)**
	a)	State the necessity of painting.	R	7	
	b)	What is meant guniting?	U	8	
	c)	State the purpose of skirting and dado.	R	6	
	d)	Define stair.	R	5	
	e)	What do you mean by stripping time of form work?	U	8	

	f)	State the necessity of Termite Proofing.	R	8	
Q.5		Attempt any **FOUR**			**(16)**
	a)	Draw a neat labeled sketch of RCC. Simply supported stair case.	R	5	
	b)	State suitability of each of the following---- i)Elevator ii)Escalator iii)Ramp	U	5	
	c)	Enlist the types of floor finishes and suggest a suitable flooring for Hospital building with reason.	R	6	
	d)	State the procedure for pointing a UCR masonry of compound wall.	U	7	
	e)	Enlist any four causes of cracks in building and suggest its remedial measures.	R	8	
	f)	State and explain any four requirements of good form work.	U	8	
Q.6		Attempt any **FOUR**			**(16)**
	a)	Draw a neat labeled sketch of a dog-legged stair case.	R	5	
	b)	What do you mean by pavement block? Where it is used? Draw a sketch of any one pavement block.	U	6	
	c)	A living hall is to be painted, suggest a suitable type of paint along with its surface preparation.	U	7	
	d)	State and describe the procedure of doing internal plaster to a wall.	U	7	
	e)	State and describe the procedure of Rebarring technique.	U	8	
	f)	State and describe the procedure of doing water proofing for water closet.	U	8	

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ODD TERM END EXAM NOV/DEC -2019

EXAM SEAT NO. | | | | | | |

LEVEL: **FIFTH** PROGRAM: **CIVIL ENGINEERING**

COURSE CODE: **CEF506/CE403/CEE505** COURSE NAME: **ENVIRONMENTAL ENGINEERING**

MAX. MARKS: **80** TIME: **3 HRS.** DATE: **02/12/2019**

Instruction:-

1) Answer to two sections must be written in separate section answer book provided
2) Illustrate your answers with sketches where ever necessary.
3) Use of non-programmable pocket calculator is permissible.
4) Mathematical and other tables will be made available on request.
5) Assume and mention suitable additional data necessary.
6) Use of Mobile is strictly prohibited.
7) **QN**>Question No, **SQN**>Sub-Question No, **R**> Remembering, **U**>Understanding, **A**>Application **CO**>Course outcome

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QN	SQN	Question Text	RUA	CO CEF506	Marks
		Section -I			
Q.1		Attempt any **FOUR**			**(08)**
	a)	Define Intake structure & state its purpose.	R	1	
	b)	State the demands of water.	R	2	
	c)	Define meant by per capita demand?	U	2	
	d)	Define the term PH value & give PH scale.	R	3	
	e)	Define design period & detention period.	R	4	
	f)	Write two requirement of good disinfection.	U	4	
Q.2		Attempt any **FOUR**			**(16)**
	a)	Write necessity, importance & advantages of ground water recharging.	U	1	
	b)	Write briefly monthly and daily variation in water supply schemes.	U	2	
	c)	Explain wet feeding and dry feeding devices.	U	4	
	d)	Explain principle of coagulation. Write names of commonly used coagulants.	U	4	
	e)	Explain with sketch rapid sand gravity filter.	U	4	
	f)	Define disinfection. Write various methods of disinfection.	R	4	
Q.3		Attempt any **FOUR**			**(16)**
	a)	Enlist the methods of population forecasting & explain Incremental increase method.	U	2	

P.T.O

	b)	Explain with neat sketch sluice valve, air relief valve.	U	5	
	c)	Define aeration of water. Enlist the methods of aeration of water & explain any one with labeled sketch.	R	4	
	d)	What do you mean by wholesome water? State the requirement of wholesome water.	R	2	
	e)	Write joints in CI & concrete pipes.	U	5	
	f)	Enlist and explain factors governing the location of intake.	R	1	
		Section-II			
Q.4		Attempt any **FOUR**			**(08)**
	a)	Define the terms: i) Sewage ii) Garbage	R	6	
	b)	Enlist the methods of collection of solid waste.	R	8	
	c)	State the necessity of disposal of solid waste.	U	8	
	d)	Define wet. weather flow.	R	9	
	e)	State two advantages of combined system of conveying sewage.	R	9	
	f)	Define BOD.	R	10	
Q.5		Attempt any **FOUR**			**(16)**
	a)	Enlist and explain the principle of sanitation.	U	6	
	b)	Draw a neat lebelled sketch of 'Q' and 'S' trap.	R	7	
	c)	List various plumbing systems and explain one pipe system with sketch.	U	7	
	d)	Explain the characteristics of hazardous waste.	R	8	
	e)	Differentiate aerobic process with anaerobic process.	U	10	
	f)	Explain with sketch 'oxidation pond'	R	11	
Q.6		Attempt any **FOUR**			**(16)**
	a)	Define trap and state requirement of good trap.	U	7	
	b)	Explain any two advantages and disadvantages of water carriage system.	R	9	
	c)	Explain with sketch working of septic tank.	U	9	
	d)	State the factors affecting quantity of sewage.	R	9	
	e)	Draw a general layout of sewage treatment plant.	U	11	
	f)	State any four objects of sewage treatment.	R	11	

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ODD TERM END EXAM NOV/DEC -2019

EXAM SEAT NO. | | | | | | |

LEVEL: **THIRD** PROGRAM: **CIVIL ENGINEERING**

COURSE CODE: **CEF305/CEE305** COURSE NAME: **SOIL MECHANICS AND FOUNDATION ENGINEERING**

MAX. MARKS: **80** TIME: **3 HRS.** DATE: **03/12/2019**

Instruction:-

1) Answers must be written in the main answer book provided. (and supplements if required)
2) Illustrate your answers with sketches where ever necessary.
3) Use of non-programmable pocket calculator is permissible.
4) Mathematical and other tables will be made available on request.
5) Assume and mention suitable additional data necessary.
6) Use of Mobile is strictly prohibited.
7) **QN**>Question No, **SQN**>Sub-Question No, **R**> Remembering, **U**>Understanding, **A**>Application **CO**>Course outcome

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QN	SQN	Question Text	RUA	CO CEF305	Marks
Q.1		Attempt any **FOUR**			**(08)**
	a)	Define soil.	R	1	
	b)	Define sp.Gravity state SI unit.	R	1	
	c)	Define uniformity coefficient and coefficient of curvature.	R	1	
	d)	State Darcy's law of permeability.	R	2	
	e)	Define phreatic line & flow line.	R	2	
	f)	Define soil stabilization.	R	3	
Q.2		Attempt any **FOUR**			**(16)**
	a)	Explain in brief "soil as a construction material".	U	1	
	b)	A fully saturated soil sample has a volume 20 cm^3 and weight 38 gm. After drying it in oven, its weight is 29 gm. Determine i) void ratio ii) Porosity iii) Water content iv) Degree of saturation. If G=2.6	A	1	
	c)	Explain Atterberg's limits of consistency.	A	1	
	d)	For given soil sample D_{10}=150 μ, D_{30}=4.75 mm, D_{60}=20 mm. Calculate coefficient of curvature.	A	1	
	e)	Explain in brief "Particle size distribution curve".	U	1	
	f)	Explain soil as two phase and three phase system with neat sketch.	A	1	
Q.3		Attempt any **FOUR**			**(16)**
	a)	Explain how you will determine coefficient of permeability by constant head method.	U	2	
	b)	State & explain in brief, factors affecting coefficient of permeability (any four)	U	2	

P.T.O

	c)	Explain Coulomb's theory and failure envelop.	U	3	
	d)	Draw a Mohr's circle for C-soil, ϕ soil and C- ϕ soil.	A	3	
	e)	Explain in brief "standard Proctertest".	U	3	
	f)	State advantages and disadvantages of direct shear test.	U	3	
Q.4		Attempt any **FOUR**			**(08)**
	a)	State necessity of soil investigation.	R	4	
	b)	State application of disturbed & undisturbed soil sample.	R	4	
	c)	Define shallow foundation.	R	5	
	d)	Define safe bearing capacity of soil.	R	5	
	e)	Draw a neat sketch of under reamed. Pile with labelling.	U	5	
	f)	Enlist any four dewatering methods during excavation for foundation.	R	6	
Q.5		Attempt any **FOUR**			**(16)**
	a)	Explain criteria for deciding location & number of pit & bores for soil investigation.	R	4	
	b)	Explain any one geophysical method of soil investigation.	R	4	
	c)	Explain stability consideration for earth retaining structures.	R	4	
	d)	State presumptive bearing capacity values for following type of soil i) Hard rock ii) Soft rock iii) Black cotton soil iv) Silt.	R	5	
	e)	Explain effect of water table on bearing capacity when. i) Water table is well below foundation Base. ii) Water table is above foundation Base.	R	5	
	f)	Explain how to protect foundation from corrosion of reinforcement.	R	6	
Q.6		Attempt any **FOUR**			**(16)**
	a)	Explain plate load test with a neat labeled diagram.	R	5	
	b)	State any four factors considering while foundation on sloping ground.	R	5	
	c)	Define cassions & explain any one type of cassion.	R	5	
	d)	Explain any two soil support methods while excavation for foundation.	R	6	
	e)	Explain sea action on the foundation made up of concrete.	R	6	
	f)	Define vibration isolation & explain any two methods of it.	R	6	

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ODD TERM END EXAM NOV/DEC -2019

EXAM SEAT NO. | | | | | | |

LEVEL: **FORUTH** PROGRAM: **CIVIL ENGINEERING**

COURSE CODE: **CEF407/CE307/CEE407** COURSE NAME: **BUILDING SERVICES**

MAX. MARKS: **80** TIME: **3 HRS.** DATE: **04/12/2019**

Instruction:-

1) Answer to two sections must be written in separate section answer book provided
2) Illustrate your answers with sketches where ever necessary.
3) Use of non-programmable pocket calculator is permissible.
4) Mathematical and other tables will be made available on request.
5) Assume and mention suitable additional data necessary.
6) Use of Mobile is strictly prohibited.
7) **QN**>Question No, **SQN**>Sub-Question No, **R**> Remembering, **U**>Understanding, **A**>Application **CO**>Course outcome

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QN	SQN	Question Text	RUA	CO CEF 407	Marks
		Section –I			
Q.1		Attempt any **FOUR**			**(08)**
	a)	Enlist any two functions of plumber.	U	1	
	b)	List any four advantages of G.I pipes.	U	1	
	c)	State any four sanitary fittings for buildings.	R	1	
	d)	List the material required for water proofing.	R	2	
	e)	State any two sources of dampness.	U	3	
	f)	List any two types of Antitermite treatment.	U	4	
Q.2		Attempt any **FOUR**			**(16)**
	a)	List any two types of traps along with sketch & suitability.	A	1	
	b)	State the purpose of i) Sluice valve ii) Reflux valve iii) Scour valve iv) Air relief valve	U	1	
	c)	Describe in detail the functions of i) Sewer air supply pipes ii) Drainage vent pipes.	R	1	
	d)	Explain the construction procedure for basement water proofing along with chemical used.	U	1	
	e)	Describe the various materials used for damp proofing with its specifications.	R	2	
	f)	Describe the procedure for doing Antitermite treatment for a building.	R	3	
Q.3		Attempt any **FOUR**			**(16)**
	a)	Describe any two methods in brief used for testing of pipes.	A	1	
	b)	State the purpose of i) Pressure relief valve ii) gate valve iii) Stop valve iv) Flush valve.	R	1	

P.T.O

	c)	Describe in detail the construction procedure of water proofing for bathroom, along with its cross section.	R	2	
	d)	Describe any four precautions to be taken while doing water proofing for terrace.	R	2	
	e)	Explain in detail the construction procedure of doing damp proofing treatment for walls along with chemical available in market.	R	3	
	f)	Describe the various materials required for water proofing along with its specifications.	U	2	
		Section-II			
Q.4		Attempt any **FOUR**			**(08)**
	a)	What is meant by Rain water Harvesting.	R	8	
	b)	Enlist any four types of Elevators.	R	5	
	c)	Define Electrification layout.	U	6	
	d)	Define package unite.	R	7	
	e)	Enlist different types of Lamps.	U	6	
	f)	State types of wiring used in Building construction.	U	6	
Q.5		Attempt any **FOUR**			**(16)**
	a)	Explain open & concealed wiring system.	U	6	
	b)	Draw a neat labeled sketch of lift showing all components & explain any two in details.	A	5	
	c)	Define earthing & explain procedure of erthing.	U	6	
	d)	State importance of ground water recharging.	U	8	
	e)	Explain in brief the system of ventilations in Air conditioning.	U	7	
	f)	Explain general principle of ducting and distribution.	U	7	
Q.6		Attempt any **FOUR**			**(16)**
	a)	Explain Air cooling & its normal Distribution.	U	7	
	b)	State precautions to be taken to avoid electrical accidents and fire.	U	6	
	c)	Write the suitabilities of different types of escalators.	U	5	
	d)	Write note on i) Transformer & low tension room ii) Feeder pillar.	U	6	
	e)	Give the function of basic components of lifts.	U	5	
	f)	Draw typical layout of air conditioning plant.	U	7	

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ODD TERM END EXAM NOV/DEC -2019

EXAM SEAT NO. | | | | | | |

LEVEL: **THIRD** PROGRAM: **CIVIL**

COURSE CODE: **CEF 303/CEE 303** COURSE NAME: **BUILDING DRAWING**

MAX. MARKS: **80** TIME: **4 HRS.** DATE:**30/11/2019**

Instruction:-

1) Answers must be written in the main answer book provided. (and supplements if required)
2) Illustrate your answers with sketches where ever necessary.
3) Use of non-programmable pocket calculator is permissible.
4) Mathematical and other tables will be made available on request.
5) Assume and mention suitable additional data necessary.
6) Use of Mobile is strictly prohibited.
7) **QN**>Question No, **SQN**>Sub-Question No, **R**> Remembering, **U**>Understanding, **A**>Application **CO**>Course outcome

QN	SQN	Question Text	RUA	CO CEF 303	Marks
Q.1		Attempt any **FOUR**			**(08)**
	a)	Enlist any two types of lines used in civil engineering drawing.	R	1	
	b)	State any two requirement of good drawing.	U	1	
	c)	Enlist any two documents to be submitted for getting approval from sanctioning authority.	R	2	
	d)	State the minimum height of – i) Basement ii) Headroom in staircase.	U	2	
	e)	State the following – i) Sill level of window in bedroom. ii) Minimum size of bathroom.	U	3	
	f)	Enlist any four principles of residential building.	R	3	
Q.2		Attempt any **FOUR**			**(16)**
	a)	Draw the symbols for – i) Centre line ii) Hidden line iii) Section line iv) Dimension line	A	1	
	b)	State the significance of site plan.	U	1	
	c)	Explain the role of contractor in building construction.	U	2	
	d)	Enlist various agencies required for building construction work.	R	2	
	e)	Draw to a suitable scale line plan of a bank building.	A	4	
	f)	List the various units required for planning of hospital building.	R	4	
Q.3		Attempt any **TWO**			**(16)**
	a)	Explain in short – i) Aspect ii) Prospect iii) Grouping iv) Flexibility.	U	3	
	b)	Explain one point and two point perspective in short.	U	5	
	c)	Figure 1. shows plan and elevation of pedestal. The longer side of pedestal is inclined at 30^0 to the picture plane. The observer is standing at a distance 3.5m along central visual ray. Assuming eye level is at 1.8m above G.L. Retain all the construction lines. Draw perspective view for the same.	A	5	
Q.4		Attempt any **FOUR**			~~(08)~~ 40
	a)	Following figure 2. shows a line plan of a residential building. Draw to a suitable scale the following views :- i) Detailed plan ii) Front elevation iii) Section along AB iv) Schedule of doors & windows v) Area statement vi) North line Use the following data i) Depth of foundation 1.30m below G.L. ii) Plinth height above G.L. 800mm iii) Ceiling height 2850mm. iv) Wall thickness 300mm for external & 230mm for internal walls. v) Slab thickness 120mm vi) Chhajja 600mm projection vii) UCR masonry 500 and 700mm wide in foundation and depth 550mm each. viii) Assume suitable data if required.	A	6	 10 06 12 06 05 01

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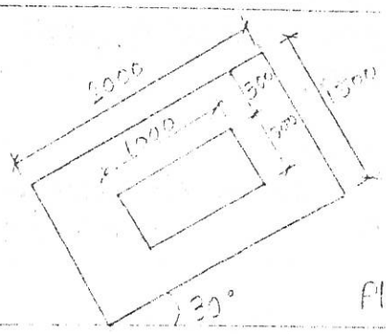
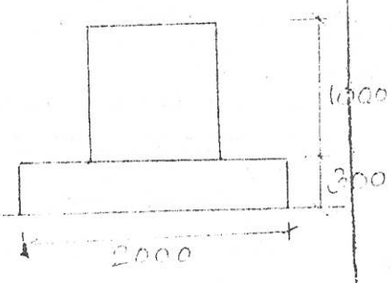
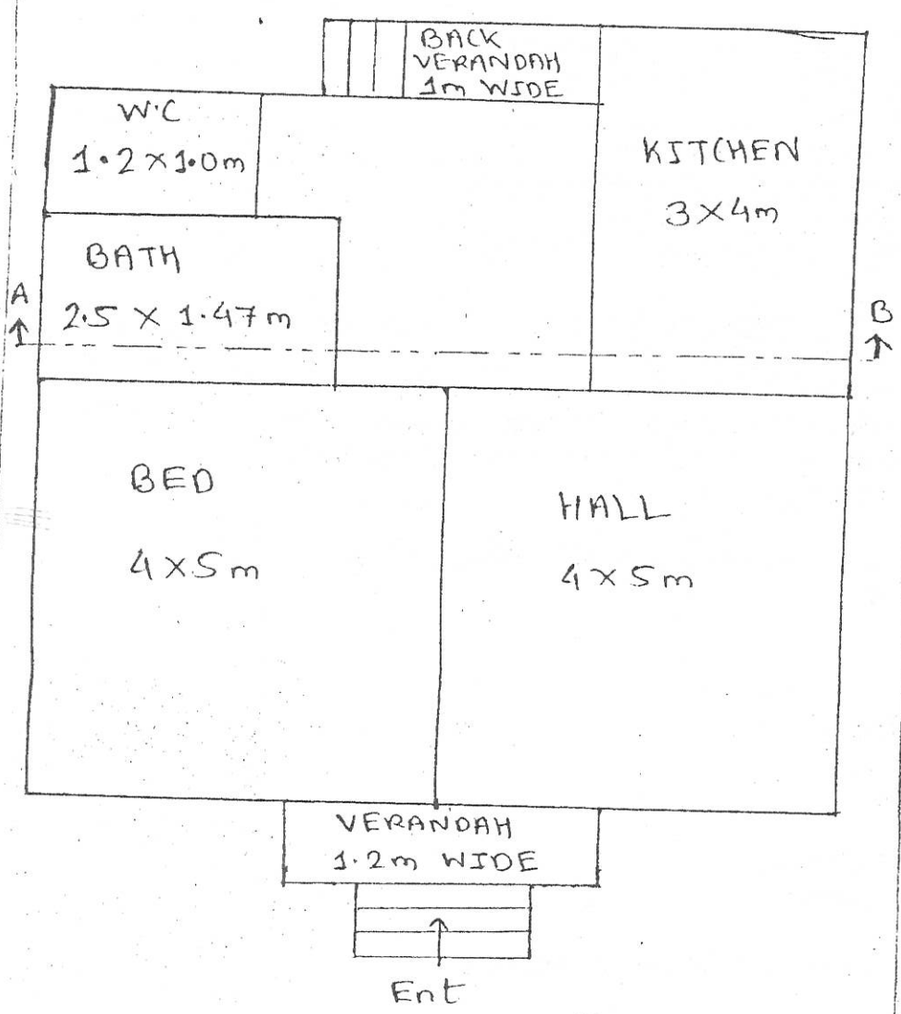
N	K N	Question Text	Level R/U/A	CO Code	Marks out of
3	C.	 P.P. Plan  Elevation (All dimensions are in mm) Figure - 1			
Q 4		 Question No. 4. Figure - 2	A	CEF303-6	40

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ODD TERM END EXAM NOV/DEC -2019

EXAM SEAT NO. | | | | | | |

LEVEL: **FOURTH** PROGRAM: **CIVIL**

COURSE CODE:**CEF401/1302/CE301/CEE401** COURSE NAME: **ANALYSIS OF STRUCTURE**

MAX. MARKS: **80** TIME: **3 HRS.** DATE:**27/11/2019**

Instruction:-

1) Answer to two sections must be written in separate section answer book provided
2) Illustrate your answers with sketches where ever necessary.
3) Use of non-programmable pocket calculator is permissible.
4) Mathematical and other tables will be made available on request.
5) Assume and mention suitable additional data necessary.
6) Use of Mobile is strictly prohibited.
7) **QN**>Question No, **SQN**>Sub-Question No, **R**> Remembering, **U**>Understanding, **A**>Application **CO**>Course outcome

QN	SQN	Question Text	RUA	CO CEF401	Marks
		Section -I			
Q.1		Attempt any **FOUR**			**(08)**
	a)	Define – i) Resultant stress ii) Major and minor principle stress.	R	1	
	b)	Explain middle third rule.	U	2	
	c)	State the effect of eccentric load wrt stresses development.	U	2	
	d)	State critical eccentricity for a rectangular column bxd.	R	2	
	e)	State the condition for no tension. Write equation.	R	2	
	f)	State four assumptions made in Euler's column theory.	R	3	
Q.2		Attempt any **FOUR**			**(16)**
	a)	At a point in a strained material, the normal stresses are 80 MPa (Tensile) and 40 MPa (Compressive). Find the normal, tangential and resultant stresses and their inclinations across a plane inclined at 35^0 to the plane carrying 80 MPa stress. Use Mohr's circle method.	A	1	
	b)	A steel bar having cross section area 500 mm^2 is subjected to an axial tension 25 kN and shearing force 20 kN. Determine the intensities of normal and shear stresses across a plane inclined at an angle 30^0 to the longitudinal axis of the bar.	A	1	
	c)	A hollow circular column having external diameter 250 mm and internal diameter 200 mm carries a vertical load of 90 kN at an eccentricity of 80 mm from the geometric centre of the column. Calculate Tmax and Tmin at the base of column.	A	2	
	d)	A line of thrust in a compression testing specimen 20 mm in diameter is parallel to the axis of the specimen but is displaced from it. Find the eccentricity if the maximum compressive stress is 20% greater than the direct stress on a normal cross section.	A	2	
	e)	A column having diameter 300 is 6m length. Both ends of columns are hinged. Determine Euler's crippling load. Take $E = 2 \times 10^5$ N/mm^2	A	3	
	f)	A C.I. column is circular in cross section having external diameter 100 mm and internal diameter 80 mm. It is used as a column of length 3m with both ends fixed. Using Rankine's Formula, determine the crippling load. Take C = 550 MPa and Rankines constant = 1/1600	A	3	
Q.3		Attempt any **TWO**			**(16)**
	a)	At a point in a stained material, two planes at right angle to each other carry normal stresses of 80 N/mm^2 and 40 N/mm^2 both tensile. Planes also carry the shears of certain intensity. Find it if major principle stress is 96 N/mm^2 tensile. Find corresponding minor principle stresses. Locate the position of planes carrying theses stress.	A	1	
	b)	A circular chimney 2.5 m internal diameter and uniform thickness of 0.75 m is subjected to a uniform horizontal wind pressure of 1 kN/m^2. Find the maximum height to which the chimney can be raised to have no tension anywhere at the base. Masonry weight is 20 kN/m^3. Also find stresses developed at the base. Coeff.of wind resistance is 0.6.	A	2	

P.T.O.

	c)	A hollow C.I. column hinged at both ends has external diameter 250 mm, thickness of metal 50 mm and length 5m. Find limiting value of slenderness ratio up to which Euler's formula is applicable. Also calculate the safe load by Euler's formula by taking factor of safety. 5 Take E = 100 kN/mm^2 and Tc = 570 N/mm^2	A	3	
		Section-II			
Q.4		Attempt any **FOUR**			**(08)**
	a)	State any two advantages of fixed beam over simply supported beam.	R	4	
	b)	Explain with sketch the effect of fixing on the bending moment of a beam.	U	4	
	c)	Draw deflected shape for a continuous beam ABC with fixed ends A & C simple support at B with U.d.l. on entire span ABC.	U	4	
	d)	Define stiffness factor.	R	5	
	e)	State carry over factor for i) A beam fixed at one end & simply supported at the other end. ii) A beam simply supported at both ends.	R	5	
	f)	State any two boundry conditions for different nature of beam supports.	R	6	
Q.5		Attempt any **TWO**			**(16)**
	a)	A fixed beam of 8 meter span is subjected to a U.d.l. of 5 kN/m over entire span & a point load 10kN at the centre of the beam. Draw SFD & BMD for the fixed Beam. Also find points of contra flexure from left hand support.	A	4	
	b)	A continuous beam ABCD is supported at A,B,C, D. Span AB & BC subjected to U.d.l. 3 kN/m. There is no load on span CD. Calculate the support moments & support reactions using three moments only. AB = 6m, BC = 8m & CD = 4m	A	4	
	c)	i) A continuous beam ABC is simply supported at A, B, & C. Span AB = 6m, BC = 8m. There is point load 40 kN acting on span AB at distance 4 meter from A & span BC is subjected to 80 kN point load at distance 5 meter from support C. Determine support moments using moment distribution method. ii) A cantilever beam of span 5 meter carries two concentrated loads of 1 kN at 3m from fixed end & other 3 kN at the free end. If flexural rigidity EI is 8000 kN.m^2. Then determine slope at the 3 kN laod.	A A	5 6	
Q.6		Attempt any **TWO**			**(16)**
	a)	A continuous beam ABC is fixed at A & simply supported at B & C. only span BC is loaded with U.d.l 2kN/m, span AB = 6m, span BC = 8m. Draw SFD & BMD diagrams using three moment theorem.	A	4	
	b)	For the beam given in Q. 6 a). Draw SFD & BMD using moment distribution method.	A	5	
	c)	A simply supported beam ABCD is supported at A & D. AB = BC = 1 meter. CD = 2 meter. It is subjected to a point load of 8 kN at B & U.d.l of 5 kN/m over Cd. Using Macaulay's method calculate maximum deflection of Beam. Take E = 200 GPa. I = 8.345 x 10^6 mm^4	A	6	

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GOVERNMENT POLYTECHNIC, KOLHAPUR 416004.

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ODD TERM END EXAM NOV/DEC -2019

EXAM SEAT NO. | | | | | | |

LEVEL: **THIRD** PROGRAM: **CIVIL ENGINEERING**

COURSE CODE: **CEF307/1301/CE210/CEE307** COURSE NAME: **MECHANICS OF STRUCTURES**

MAX. MARKS: **80** TIME: **3 HRS.** DATE: **05/12/2019**

Instruction:-

1) Answers must be written in the main answer book provided. (and supplements if required)
2) Illustrate your answers with sketches where ever necessary.
3) Use of non-programmable pocket calculator is permissible.
4) Mathematical and other tables will be made available on request.
5) Assume and mention suitable additional data necessary.
6) Use of Mobile is strictly prohibited.
7) **QN**>Question No, **SQN**>Sub-Question No, **R**> Remembering, **U**>Understanding, **A**>Application **CO**>Course outcome

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QN	SQN	Question Text	RUA	CO CEF307	Marks
Q.1		Attempt any **FOUR**			**(08)**
	a)	Enlist any four basic requirements of a structure.	R	1	
	b)	State any four structural materials & their suitability.	R	1	
	c)	Define modulus of rigidity.	R	2	
	d)	Stare any two relations between elastic constants with meaning of each term.	R	2	
	e)	Define point of contra flexure also state its significance.	R	3	
	f)	A simply supported beam of span *l* is subjected to u.d.l of intensity *w* N/m over entire span. State valve of maximum bending moment & also state location of maximum bending moment on the beam.	U	3	
Q.2		Attempt any **FOUR**			**(16)**
	a)	State any four basic actions on structure with their field examples.	R	1	
	b)	Describe types of structural system with their field examples.	R	1	
	c)	A simply supported beam of span 4 meter carries a point load of 20 KN at the center of the span. Draw SFD & BMD for the beam, with calculations.	A	3	
	d)	A 6 meter long hollow bar of circular section has 140 mm diameter for a length 4 meter, 120 mm diameter for a length 2 meter. The diameter is 80 mm throughout the length 6 meter. Determine the elongation of the bar when it is subjected to an axial tensile force of 300 KN. Take E= 200 GPa.	A	2	
	e)	A load of 270 KN is carried by a short concrete column 250 mm x 250 mm in size. The column is reinforced with 8 bars of 16 mm diameter. Determine the stresses in concrete & steel. If the modulus of elasticity for the steel is 18 times that of concrete.	A	2	
	f)	A cantilever beam of 2 m span carries uniformly distributed load of 1.5 KN/m over a length of 1.6 m from the free end. Draw shear force & bending moment diagram with calculations.	A	3	
Q.3		Attempt any **TWO**			**(16)**
	a)	A copper bar 250 mm long & 50 mm x 50 mm in cross section is subjected to an axial pull in the direction of its length. If the increase in volume of bar is 37.5 mm^3. Determine the magnitude of the pull.	A	2	
	b)	A beam ABC is supported at A & B. Portion BC is overhang. u.d.l of 6 KN/m is acting over entire length of ABC, AB=4 m, BC=1 m. Draw SFD & BMD with calculations. Also determine point of contra flexure from the point A.	A	3	

P.T.O

	c)	i) In an experiment a bar of 30 mm diameter is subjected to a pull of 60 KN. The measured extension on gauge length of 200 mm is 0.09 mm and the change in diameter is 0.0039 mm. Calculate poisson's ratio & Young's modulus. ii) Draw SFD and BMD with calculations for a beam of 5 m span which is subjected to a clockwise moment of 15 KN.m at a distance of 2 m from the left end.	A A	2 3	
Q.4		Attempt any **FOUR**			**(08)**
	a)	State parallel axis theorem and its expression.	R	4	
	b)	State the moment of inertia of a triangular section about its base and apex.	R	4	
	c)	State flexural formula and meaning of terms in it.	R	5	
	d)	Draw shear stress distribution for rectangular cross section.	U	5	
	e)	Differentiate between static load and impact load.	U	6	
	f)	Define i) Redundant frame ii) Deficient frame.	R	6	
Q.5		Attempt any **FOUR**			**(16)**
	a)	Determine the moment of inertia of a T-section with flange 250 mm x 25 mm and web 150 mm x 25 mm about an axis passing through the center of gravity of section and parallel to x-x axis.	A	4	
	b)	Determine moment of inertia of shaded area as shown in figure 1) about an horizontal axis PQ.	A	4	
	c)	A simply supported beam of symmetrical I- section of depth 200 mm is subjected to a bending moment of 15 KN.m at its neutral axis. Determine the maximum bending stress induced in the beam. [Take I_{XX} =1250 x10 m^3 mm^4]	A	5	
	d)	Determine the diameter of circular section of a cantilever beam of 4 m span to carry a load of 50 KN at the center of the span. If permissible bending stress is 9 N/mm^2.	A	5	
	e)	A simply supported beam of span 2 m and cross section 100 mm x 200 mm carries udl of 10 KN/m over the entire span. Determine maximum shear stress in the beam a section 0.75 m to the right of left hand support.	A	5	
	f)	A cantilever beam carries udl of 20 KN/m over the entire span of 4 m. Beam has circular section of diameter 150 mm. Determine shear stress at a section 2 m from the support.	A	5	
Q.6	**A**	Attempt **The following**			**(16)**
	a)	A rectangular section having dimension 250 mm x 450 mm is subjected to a shear force of 90 KN. Determine shear stress induced on a layer at 120 mm above NA and 50 mm below NA.	U	5	
	b)	An unknown weight falls through 20 mm on a collar attached rigidly to the lower end of rod 2 m long and 600 mm^2 in cross-section. Determine the unknown weight if the maximum stress in the rod is 150 MPa. Take E= 200 KN/mm^2.	A	6	
	B	Attempt **Any ONE** of the following			
	a)	Using method of joints find the forces in all members of a truss as shown in figure 2.	A	6	
	b)	In a plane truss as shown in figure 3. Determine i) Reactions at A and E ii) Force in member BC, BF and CD by method of section.	A	6	

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5(b)

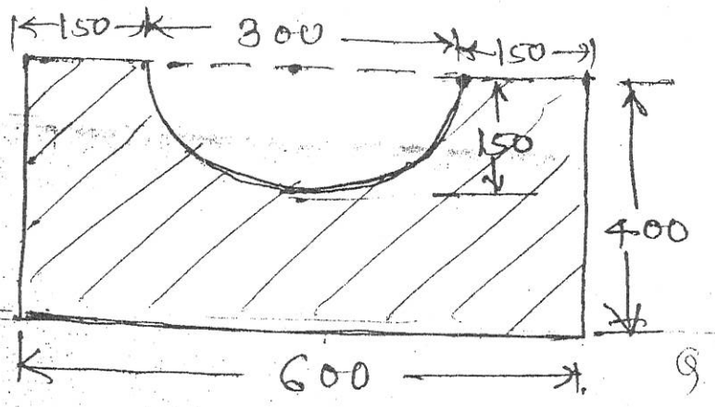

Figure (1)

6(A)(B)

(a)

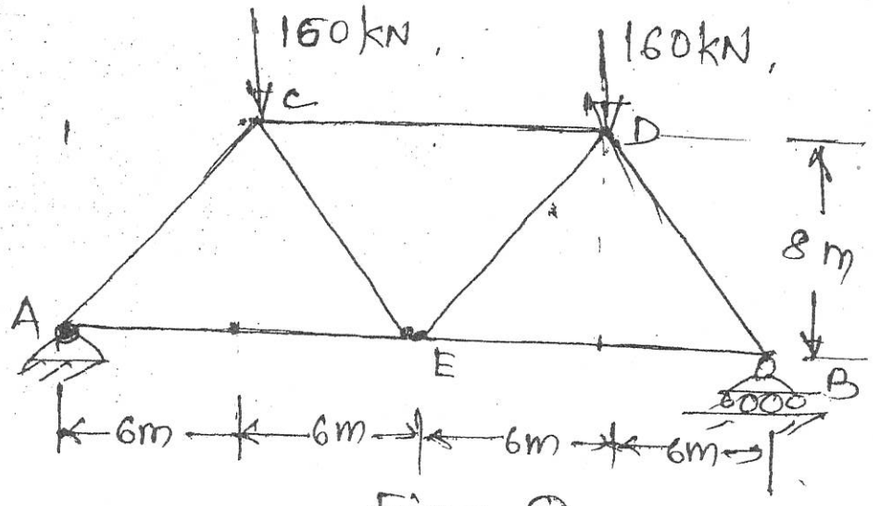

Figure (2)

6(B)

(b)

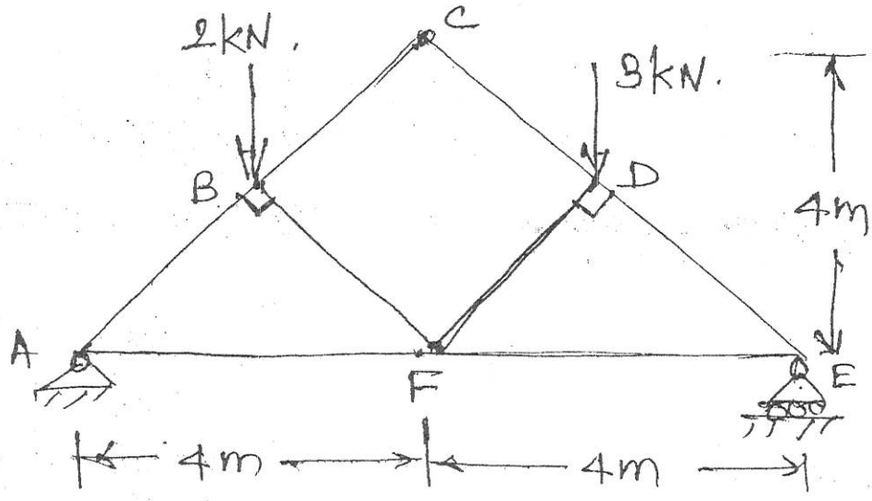

Figure (3)

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ODD TERM END EXAM NOV/DEC -2019

EXAM SEAT NO. | | | | | | |

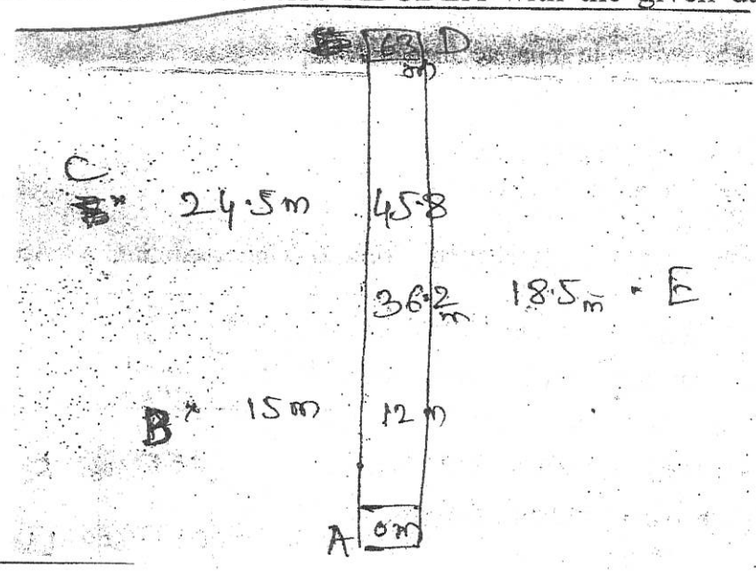
LEVEL: **THIRD** PROGRAM: **CIVIL ENGINEERING**

COURSE CODE: **CEF308/CE204/CEE308** COURSE NAME: **SURVEYING-I**

MAX. MARKS: **80** TIME: **3 HRS.** DATE: **11/12/2019**

Instruction:-

1) Answers must be written in the main answer book provided. (and supplements if required)
2) Illustrate your answers with sketches where ever necessary.
3) Use of non-programmable pocket calculator is permissible.
4) Mathematical and other tables will be made available on request.
5) Assume and mention suitable additional data necessary.
6) Use of Mobile is strictly prohibited.
7) **QN**>Question No, **SQN**>Sub-Question No, **R**> Remembering, **U**>Understanding, **A**>Application **CO**>Course outcome

QN	SQN	Question Text	RUA	CO CEF 308	Marks
Q.1		Attempt any **FOUR**			**(08)**
	a)	State the principles of surveying.	R	1	
	b)	Distinguish between plane surveying & Geodetic surveying.	U	1	
	c)	Distinguish between topographical survey & city survey.	U	1	
	d)	Define ranging. State types of ranging.	R	2	
	e)	Define well conditional triangle.	R	3	
	f)	Show conventional signs for: i) Railway ii) Orchard	R	3	
Q.2		Attempt any **FOUR**			**(16)**
	a)	State types of tapes. Explain any one in short.	R	3	
	b)	Explain indirect method of raging with neat sketch.	R	2	
	c)	A 30 m chain was found to be 0.06 m too short after chaining 460 m. It was found to be 0.10 m too short after chaining a total length of 780 m. If the chain was correct before commencement of the work, find the true distance.	A	2	
	d)	State the factors to be considered for selection of main survey stations.	R	2	
	e)	Explain any one method to overcome the obstacle of pond in surveying.	U	3	
	f)	Calculate the area of the traverse ABCDEA with the given data Fig. 	A	3	

P.T.O

Q.3		Attempt any **FOUR**			**(16)**
	a)	Distinguish between whole circle bearing and quadrantal bearing.	U	4	
	b)	Define i) Magnetic meridian ii) Fore bearing iii) Local Attraction iv) Dip of the needle.	R	4	
	c)	Convert the given W.C.B to QB & QB to W.C.B i) $88^0\ 30'$ ii) $264^0\ 40'$ iii) $S27^0\ 30'E$ iv) $N18^0\ 20'W$	A	4	
	d)	The following bearings were taken during compass traversing. Line — FB — BB AB — $156^0 0'$ — $335^0 30'$ BC — $237^0 30'$ — $57^0 30'$ CD — $355^0 0'$ — $173^0 45'$ DA — $54^0 15'$ — $236^0\ 0'$ At what stations do you suspect local attraction. Calculate correct Fore & Back bearing?	A	4	
	e)	What do you mean by magnetic declination? Calculate true bearing if the magnetic bearing is $125^0 30'$ & the declination is $2^0 40'$E	R / A	4	
	f)	Explain the Graphical adjustment of closing error in compass traversing.	U	4	
Q.4		Attempt any **FOUR**			**(08)**
	a)	Define Height of collimation.	R	5	
	b)	What is leveling staff? State its types.	R	5	
	c)	Define contour.	U	6	
	d)	State the factors on which contour interval depend.	R	6	
	e)	State interpolation of contour?	R	6	
	f)	Define zero circles.	U	7	
Q.5		Attempt any **FOUR**			**(16)**
	a)	Define fly leveling. State purpose of it.	A	5	
	b)	State the types of bench marks. Explain any one in detail.	R	5	
	c)	Describe any four personal errors in leveling work.	U	5	
	d)	Following readings were taken by a level & 4 m leveling staff. Prepare the standard level book page & calculate R.L. by H.I method. 0.578, 0.933, 1.768, 2.450, 3.005, 0.567, 1.781, 1.888, 3.679, 0.612, 0.705, 1.810. The instrument is shifted after 6th and 9th reading. The R.L of first station is 68.250 m.	A	5	

	e)	Explain with neat sketch any four characteristics of contour line.	A	6	
	f)	State any four precautions to be taken while using polar planimeter.	U	7	
Q.6		Attempt any **FOUR**			**(16)**
	a)	Write note on Auto level.	R	5	
	b)	State various difficulties in leveling.	U	5	
	c)	Explain in detail precautions to be taken to eliminate the errors in leveling.	R	5	
	d)	Following is a incomplete page of level field book. Insert missing readings. Complete the page. Apply the usual Arithmetical check.	A	5	

Observed Readings			Rise	Fall	RL	Remarks
BS	IS	FS				
2.345					125.350	B.M.I
1.650		----	0.035		129.285	
	2.210			----	----	
		1.850	---		----	
1.850		1.925		0.455	----	
					129.000	B.M.II
1.690		1.140	----		----	
		----		----	128.500	B.M III

	e)	Explain with example establishing grade contour.	A	6	
	f)	The following readings were recorded by a planimeter with the anchor point inside the figure. IR=2.268, FR=4.348, m=100 cm^2 & c=26.43. Calculate the area of the figure when it is observed that the zero mark of the dial passed the index mark once in clockwise direction.	A	7	

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ODDTERM END EXAM NOV/DEC-2019

EXAM SEAT NO. | | | | | | |

LEVEL : - **FIFTH** PROGRAM : **CIVIL ENGINEERING**

COURSE CODE :- **CEE504/CE402**

COURSE NAME **CONSTRUCTION MANAGEMENT**

MAX. MARKS : **80** TIME : **3 HRS.** DATE :- **06/ 12 / 2019**

Instruction :-

1) Answers of two sections must be written in separate section answer book provided.
2) Figure to the right indicate marks.
3) Illustrate your answers with sketches wherever necessary.
4) Use of non-programmable pocket calculator is permissible.
5) Mathematical and other tables shall be made available on request.
6) Assume additional suitable data necessary.
7) Use of Mobile is strictly prohibited.

QN	SQN	**Section- I**	Marks
Q.1		Attempt any **FOUR:**	**08**
	a)	Define leadership.	
	b)	Write the meaning of 'pre tender planning'.	
	c)	State the necessity of management.	
	d)	Define dummy activity.	
	e)	Write any two advantages and any two disadvantages of Line organization.	
	f)	Write any two areas of application of PERT.	
Q.2		Attempt any **FOUR:**	**16**
	a)	State any eight points explaining role of construction industry in national development.	
	b)	State the different stages in post tender planning.	
	c)	Define the term motivation. Explain its importance.	
	d)	Write any two merits and any two limitations of Bar-Chart.	
	e)	State any four advantages and any four disadvantages of management by participation.	
	f)	Explain any four functions of management.	
Q.3		Attempt any **FOUR:**	**16**
	a)	i) Write any four advantages of management by exception. ii) Enlist any four agencies associated with construction work.	
	b)	State any four advantages of critical path method.	
	c)	Draw a network diagram of small construction project consists of following activities.	

Activity	1-2	2-3	2-4	3-5	4-5	5-6	4-6	6-7
Duration	6	2	3	2	8	4	5	8

	d)	For the network prepared in 3© above, calculate EST,LST,EFT,LFT, float and show critical path.	
	e)	Draw organizational chart for PWD.	
	f)	Enlist any four forms of contracting firms. Explain any one.	

P.T.O.

QN	SQN	Section- II	Marks
Q.4		Attempt any **FOUR:**	**08**
	a)	Define method study.	
	b)	Define inventory management.	
	c)	Enlist methods of training for employees.	
	d)	Define personnel management.	
	e)	Enlist factors affecting job layout.	
	f)	Define injury frequency rate.	
Q.5		Attempt any **FOUR:**	**16**
	a)	Enlist the objectives of work study.	
	b)	Explain ABC analysis with a neat sketch.	
	c)	Explain the importance of personnel management.	
	d)	Explain inbrief apprenticeship training method used in training.	
	e)	Enlist the factors affecting the job layout.	
	f)	Explain safety audit.	
Q.6		Attempt any **FOUR:**	**16**
	a)	Give steps involved in work measurement.	
	b)	Write stages involved in method study.	
	c)	Explain importance and meaning of material management.	
	d)	State any four objectives of training for employees.	
	e)	Explain how storing and stacking of material is done at site.	
	f)	Write any four causes of accidents on construction site.	

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