

GOVERNMENT POLYTECHNIC, KOLHAPUR – 416004.

(An Autonomous Institute of Govt. Of Maharashtra)

ODD TERM END EXAM NOV./DEC.-2018**EXAM SEAT NO.**

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LEVEL :- FIFTH PROGRAM : CIVIL ENGINEERING**COURSE CODE :- CEE504/CE402****COURSE NAME CONSTRUCTION MANAGEMENT****MAX. MARKS : 80 TIME : 3 HRS. DATE :- 14/12/2018****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	S	Section- I	Ma rks														
Q.1		Attempt any FOUR :	08														
	a)	Define the term Bureaucratic leadership.															
	b)	Give the meaning of 'post tender planning'.															
	c)	Define the term Management.															
	d)	State the importance of planning in construction management.															
	e)	Enlist any four forms of contracting firms.															
	f)	Define the term float and enlist two types of the same.															
Q.2		Attempt any FOUR :	16														
	a)	State the different stages required for 'pre tender planning'.															
	b)	Name any four personnel required on construction site of multistoried building and state any two functions of them.															
	c)	Write any eight desirable qualities of leadership.															
	d)	Explain any four advantages of network tool over bar chart.															
	e)	State any four advantages of management by objectives.															
	f)	Explain any four principles of management.															
Q.3		Attempt any FOUR :	16														
	a)	i) State any four special characteristics of Civil Engg. works. ii) What do you mean by management by exception?															
	b)	Compare CPM and PERT Technique on any four points.															
	c)	For the activity table give below prepare a CPM network.															
		<table><tr><td>Activity</td><td>A (1-2)</td><td>B(2-3)</td><td>C(2-4)</td><td>D(3-5)</td><td>E(4-5)</td><td>F(5-6)</td></tr><tr><td>Duration in days</td><td>3</td><td>5</td><td>4</td><td>2</td><td>4</td><td>5</td></tr></table>	Activity	A (1-2)	B(2-3)	C(2-4)	D(3-5)	E(4-5)	F(5-6)	Duration in days	3	5	4	2	4	5	
Activity	A (1-2)	B(2-3)	C(2-4)	D(3-5)	E(4-5)	F(5-6)											
Duration in days	3	5	4	2	4	5											
	d)	For the network prepared in 3(c) above, calculate EST, LST, EFT, LFT, float and show critical path.															
	e)	Draw organization chart for PWD.															
	f)	Suggest the suitable type of organization for middle scale industry. Explain with a neat sketch.															

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QN	S Q N	Section- II	Ma rks
Q.4		Attempt any FOUR :	08
	a)	Define work measurement.	
	b)	Define Economic Order Quantity.	
	c)	Enlist different methods of training of workers.	
	d)	Define personnel management.	
	e)	Enlist any two factors affecting the job layout.	
	f)	Define accident cost.	
Q.5		Attempt any FOUR :	16
	a)	Write the objectives of method study.	
	b)	State the meaning and objective of inventory management.	
	c)	Explain the importance of Workmen's compensation act in short.	
	d)	Explain 'on job training' method of training of worker.	
	e)	Explain how storing and stacking of materials is done at site.	
	f)	Explain the importance of safety on construction site.	
Q.6		Attempt any FOUR :	16
	a)	Explain the concept of productivity.	
	b)	Enlist various allowances used in work measurement.	
	c)	Explain concept of ABC Analysis in inventory control with the help of graphical representation.	
	d)	What are the provisions made in Factory Act?	
	e)	Prepare the job layout for the construction of small bridge across the river.	
	f)	Write any four causes of accidents on construction site.	

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LEVEL: FIRST**PROGRAM: CIVIL / MECHANICAL****COURSE CODE: CCF103/X109/CCE103****COURSE NAME: CHEMISTRY OF ENGINEERING MATERIALS / ENGINEERING CHEMISTRY****MAX. MARKS: 80****TIME: 3 HRS.****DATE: 14/12/2018****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	S	Question Text	R	CO	Marks
Q.1		Attempt any FOUR			(08)
	a)	State Hund's rule of maximum multiplicity.	R	1	
	b)	Write fundamental particles of atom with respect to charge & mass.	U	1	
	c)	Define i) Conductor ii) Electrolyte	R	2	
	d)	State Faraday's first law of electrolysis.	R	2	
	e)	Define pH & draw a pH scale.	R	4	
	f)	Distinguish between temporary & permanent hardness of water (any two points)	U	4	
Q.2		Attempt any FOUR			(16)
	a)	Write Bohr's theory of atom with diagram.	U	1	
	b)	Distinguish between Atom & Ion (any four points)	U	2	
	c)	With neat labelled diagram explain Galvanizing process of protective coating.	A	3	
	d)	Write four reactions of hard water with soap.	U	4	
	e)	Give disadvantages of hard water for textile Industry & Dyeing Industry.	U	4	
	f)	With chemical reactions explain sterilization of water by using bleaching powder.	A	4	
Q.3		Attempt any FOUR			(16)
	a)	Distinguish between Isotopes & Isobars (any four point)	U	1	
	b)	With labelled diagram explain electrolysis of CuSO_4 solution using platinum electrodes.	U	2	

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	c)	Write factors affecting atmospheric corrosion.	U	3
	d)	Draw a neat labelled diagram & explain metal cladding process.	A	3
	e)	Define scale. Write cause of scale formation in boiler.	U	4
	f)	Explain Ion-exchange process, with neat labelled diagram.	A	4
Q.4		Attempt any FOUR		(08)
	a)	Write the composition of magnetic steel.	R	5
	b)	Classify lubricants with examples.	U	7
	c)	Define insulator.	R	7
	d)	Mention the properties and uses of good adhesive	R	5
	e)	What is vulcanisation of rubber?	R	7
	f)	State two properties & engineering applications of plastic.	R	5
Q.5		Attempt any FOUR		(16)
	a)	Define i) Metallurgy ii) Mineral iii) Ore iv) Gangue.	R	6
	b)	Explain any one method used for the concentration of ore by physical method.	U	6
	c)	With the help of chemical reactions explain how reduction of Haematite takes place in blast furnace.	A	6
	d)	State & explain any four purposes of making alloy.	U	6
	e)	A machine running with high load, explain the type of lubrication used for it.	A	7
	f)	State the properties of lubricant used for gears and sewing machine.	U	5
Q.6		Attempt any FOUR		(16)
	a)	Distinguish between paint and varnish.	U	7
	b)	State the constituents of varnish and write function of each.	U	7
	c)	Give the preparation, properties and uses of thermocole.	U	7
	d)	Write the classification, properties and uses of composition materials.	R	5
	e)	Give the difference between polymerisation by addition and condensation.	U	7
	f)	What are the drawbacks of natural Rubber?	U	7

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LEVEL: THREE

PROGRAM: CIVIL ENGINEERING

COURSE CODE: CEF307/1301/CE210/CEE307 COURSE NAME: Mechanics of Structure

MAX. MARKS: 80

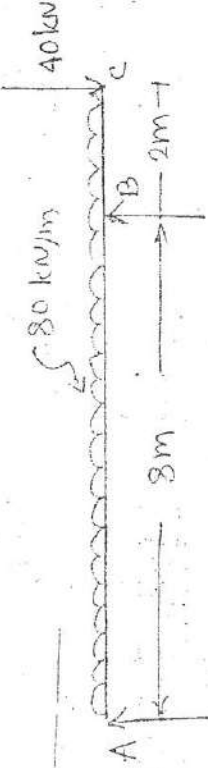
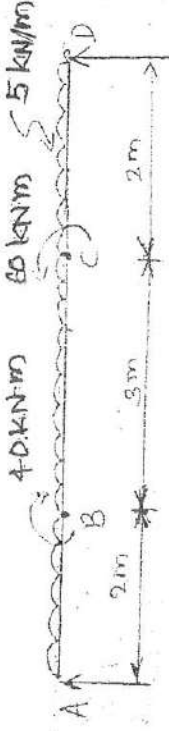
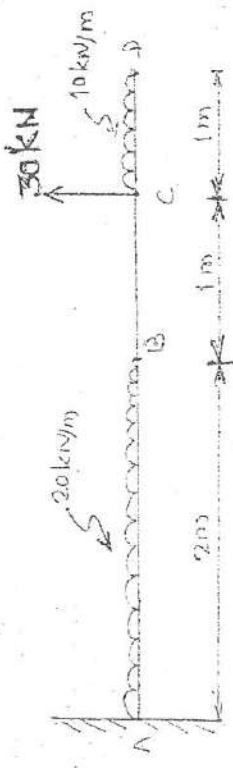
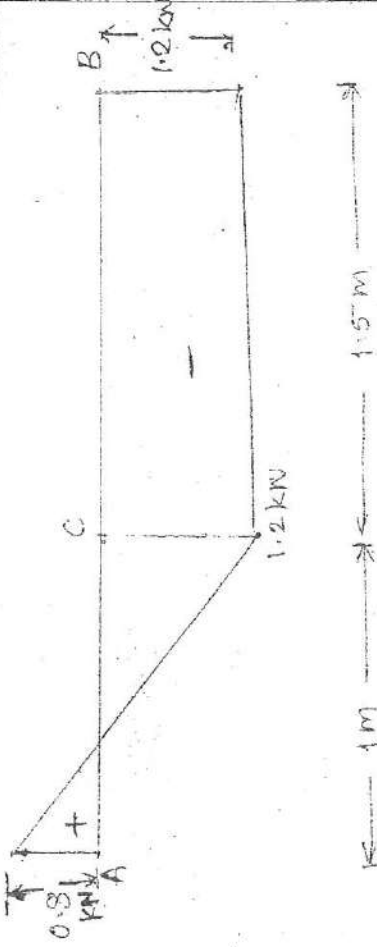
TIME: 3 HRS.

DATE: 13/12/2018

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

QN	S. Q. N	Question Text	Cognition Level	Co Code CEF	Marks
Q.1		Attempt any FOUR		307	(08)
	a)	Enlist any four basic structural actions with example of each action.	R	1	
	b)	Distinguish between the term elasticity & plasticity with examples.	U	2	
	c)	Explain what information we obtain from the shearforce & bending moment diagram.	U	3	
	d)	Define structural analysis & structural design.	R	1	
	e)	Write the relation between modulus of elasticity and modulus of rigidity.	U	2	
	f)	A simply supported beam is overhang on both sides. State how many points of contraflexure occurs in beam.	U	3	
Q.2		Attempt any FOUR			(16)
	a)	Explain types of structural systems.	U	1	
	b)	A railway line is such that, there is no stress in the rail at 8°C then determine. i) The stress in the rails at 50°C , if there is no allowance for expansion between two rails. ii) The stress in the rails at 50°C if there is expansion allowance of 8mm. Take length of rail 30m, $E=205\text{ GPa}$ & $\alpha=11\times 10^{-6}/^{\circ}\text{C}$.	U	2	
	c)	Draw the shear force & bending moment diagrams for a simply supported beam of length 12m with an eccentric point load of 20 kN at distance 3 meter from the left end & 20 kN at the distance 4m from right end.	A	3	
	d)	Draw a neat sketch of stress strain curve indicating all critical points.	U	2	
	e)	A concrete column of 500mm x 300mm rectangular section is reinforced with 6 steel bars of 20mm diameter carries axial compression load 800 kN. Determine the stresses induced in each material. Take $E_{\text{steel}} = 15 E_{\text{concrete}}$.	A	2	

f)	A overhang beam is as shown in figure below. Draw SFD & BMD & also locate point of contraflexure. 	A	3	
Q.3	Attempt any FOUR			(16)
a)	Show labeled diagrams of any two types of structure & also state their functions.	U	1	
b)	In a tension test on a specimen of 20 mm diameter 200 mm long & axial pull of 100 kN produces an elongation 0.32 mm and reduction in diameter is observed 0.0085 mm. Determine Poisson's ratio and three moduli.	A	2	
c)	In a triaxial stress system the stresses along the three directions are $\sigma_x = 100 \text{ N/mm}^2$ (tensile), $\sigma_y = 60 \text{ N/mm}^2$ (tensile) and $\sigma_z = 30 \text{ N/mm}^2$ (Compressive). Determine strains in each direction. Take $E = 2 \times 10^5 \text{ N/mm}^2$ & $\mu = 0.25$.	A	2	
d)	Draw SFD & BMD for the simply supported beam shown in figure below. 	A	3	
e)	A cantilever beam is loaded as shown in figure below. Draw SFD & BMD with calculations. 	A	3	
f)	A simply supported beam of span 2.5 m is subjected to shear force as shown in SFD given below. Determine loading on beam. 	A	3	(2/4)

Q.4	Attempt any FOUR			(08)
a)	Define 'Radius of gyration'.	R	4	
b)	State the radius of gyration of a circle of diameter 'd'.	R	4	
c)	Differentiate between Pure bending and ordinary bending.	U	5	
d)	State shear stress equation and meaning of each term.	R	5	
e)	Define strain energy & proof resilience.	R	6	
f)	Define perfect frame. State condition.	R	6	
Q.5	Attempt any FOUR			(16)
a)	Determine moment of Inertia of a T-section 150mm x 180mm x 40mm about centroidal axis X-X overall depth of the section is 180mm.	A	4	
b)	Calculate M.I. of the section as shown in figure (1) about the axis passing through bottom of rectangle (i)-(i).	A	4	
c)	A timber beam 150 mm wide and 300 mm deep is simply supported over a span of 4m. It carries a udl of 20 kN/m. Determine maximum bending stress induced in it.	A	5	
d)	A simply supported beam of span 3m carries udl of 1000 N/m throughout the span. Calculate the modules of section if the permissible bending stress for the material is 9 MPa.	A	5	
e)	A 230mm x 350mm cross section simply supported beam carries udl of 20 kN/m over entire 8m span. Determine maximum shear stress at a section 1m from the support.	A	5	
f)	A circular beam carries a maximum shear force of 10 kN. Determine the necessary diameter of the beam if the maximum shear stress induced is 2 kN/mm ² .	A	5	
Q.6	Attempt any TWO of following.			(16)
a)	i) A rectangular beam 120mm wide has a shear force 80 kN at a section. The maximum shear stress induced is 8 kN/mm ² . Determine the depth of the beam & calculate minimum radius of guration of the section. ii) A steel rod of 12mm diameter is subjected to a tensile force of 30 kN applied gradually. Calculate the strain energy stored in the rod, if length of rod is 1m. Take $E = 2 \times 10^5 \text{ N/mm}^2$.	A	5	
b)	Determine the forces in each member of truss loaded and supported as shown in figure (2) by method of joints.	A	6	
c)	Determine the forces in members AG, CD, EC, FG of the truss. Use method of section. The truss is shown in figure (3) .	A	6	

(9/4)

5(b)

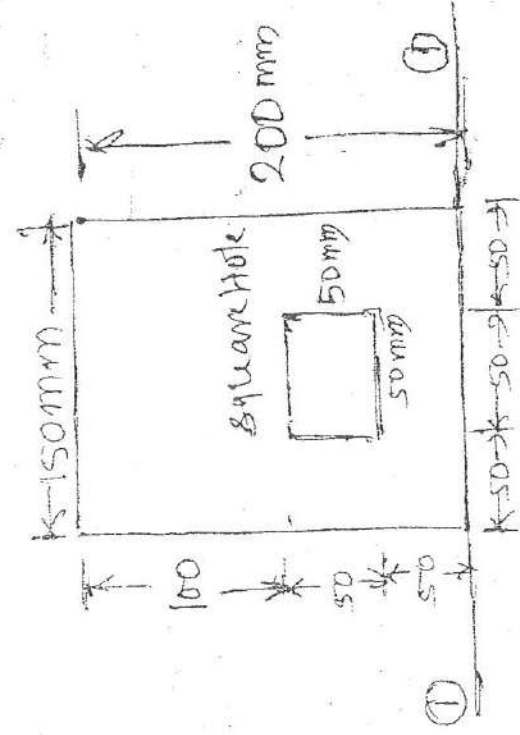


Figure 1

6(B)
(a)

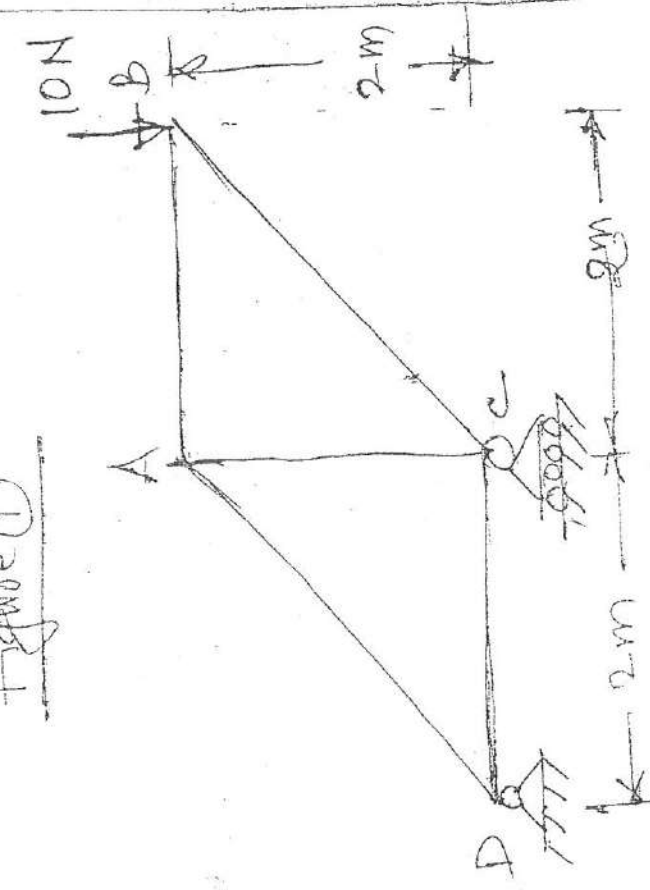


Figure 2

6(B)
(b)

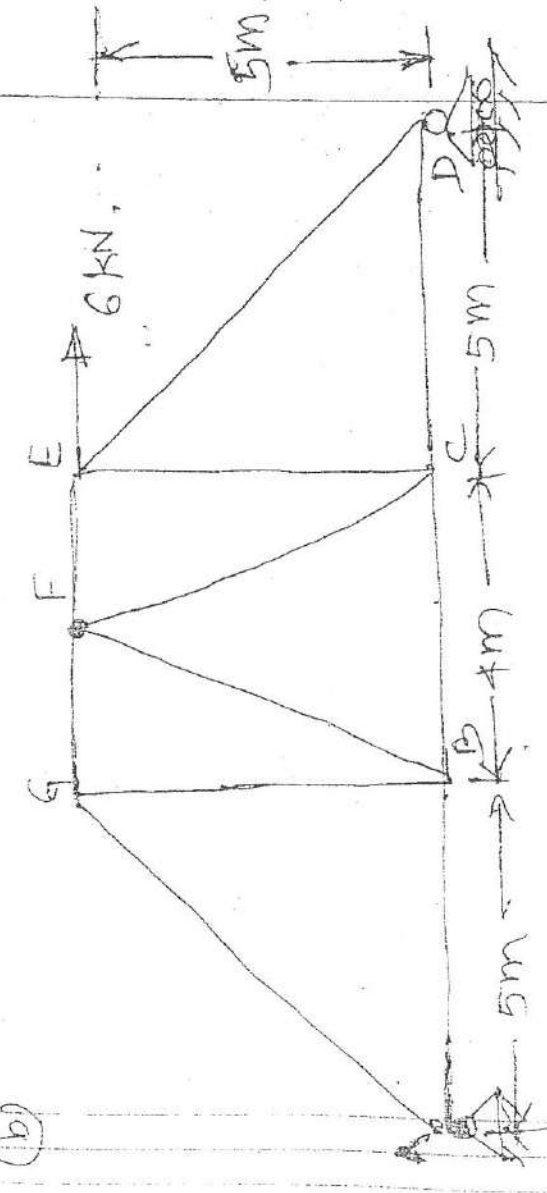


Figure 3

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ODD TERM END EXAM NOV./DEC-2018**EXAM SEAT NO.**

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LEVEL :- FIRST**PROGRAM : CIVIL/METALLURGY****COURSE CODE :- CCF107/CCE107/X105****COURSE NAME :- ENGINEERING DRAWING - I****MAX. MARKS : 80 TIME : 4 HRS. DATE :- 17/12/2018****Instruction :-**

- 1) Answers must be written in the main answer book provided.(and supplements if required)
- 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	S Q N	Question Text	R/ U/ A	Co CCF 107	Ma rks
Q.1		Attempt any TWO:			08
	a)	Draw centre line and hidden line. Draw figure showing their applications.	U	1	
	b)	Construct a scale of 1cm=0.4metre, to show the metre and decimetre and large enough to measure upto 5 metres. Show a distance of 4 metres and 6 decimetres on it.	U	1	
	c)	Construct a diagonal scale of R.F. = 1/5000, to show single metre and long enough to measure upto 600 metres. On the scale, show a distance of 457 metres.	U	1	
Q.2		Attempt any TWO:			16
	a)	i) The major axis of an ellipse is 100mm long and the distance between foci is 70mm. Find the minor axis and draw an ellipse by Arc's of circle method. ii) The distance of a focus from directrix is 60mm. Construct a parabola by using directrix focus method.	U	2	
	b)	i) Draw an involute of a circle having 30mm diameter. ii) Draw a helix of one turn, given the pitch 40mm and the diameter 50mm of the cylinder.	U	2	
	c)	A circle of 50mm diameter rolls inside on the circumference of another circle having 200mm diameter. Trace the locus of point P on the circumference of the rolling circle for one complete revolution. Name the curve.	U	2	

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Q.3	Attempt any TWO :			16
a)	Draw a hypocycloid when the radius of the directing circle is twice the radius of the generating circle. Take any suitable value for the radius.	U	2	
b)	i) A straight line PQ 60mm long, is in the H.P. and makes an angle of 30° with the V.P. Draw its projection, if end P is 10mm in front of the V.P. ii) The length of the top view of a line AB is 60mm. The line is parallel to V.P. End inclined at 45° to H.P. Its end A is 25mm above H.P. and 30mm in front of V.P. Draw its projections and find its true length.	U	3	
c)	i) A line CD, 100mm long is in the first quadrant. End C is 20mm from V.P. and in H.P. End D is 20mm from V.P. and 45mm from H.P. Draw projection of line CD. Find the inclination of the line with H.P. ii) The front view of a line MN is parallel to XY line, 15mm above it and 60mm in length. The two ends of the line are 15mm and 55mm in front of V.P. respectively. Determine its true length & inclination with V.P.	U	3	
Q.4	Attempt any TWO :			08
a)	A rhombus having diagonals 60mm and 40mm respectively is resting on a corner in H.P. The longer diagonal is parallel to V.P. and inclined to H.P. Such that the front view appears as a square. Draw its views. Determine the angle made by the plate with H.P. (draw three views)	U	4	
b)	A circular plate, 50mm diameter has its centre 30mm above H.P. & 35mm in front of V.P. Draw its views, when its surface is perpendicular to V.P. and inclined at 40° to H.P. (draw three views)	U	4	
c)	A hexagonal plane of side 30mm is kept on the H.P. on one of its corners with the corner opposite to the corner on H.P. 40mm above H.P. diagonal passing through the corner on H.P. is parallel to V.P. Draw three views of hexagonal plane and find its inclination with the H.P. (draw three views)	U	5	

Q.5	Attempt any TWO :			16
a)	A cylinder of base diameter 40mm and axis length 60mm is kept on the V.P. on a point of its base circle, such that its axis is inclined to V.P. at 40° and parallel to H.P. Draw the projection of cylinder.	U	5	
b)	A pentagonal prism, side of base 30mm and axis length 65mm is kept on the V.P. on one of its base edges such that the rectangular face containing that base edge makes an angle of 30° with V.P. Draw the projections of the prism when its axis is parallel to H.P.	U	5	
c)	A hexagonal pyramid, side of base 30mm and axis length 70mm is resting on the H.P. on one of its base edge in such a way that its apex is 55mm above the H.P. Draw the projections of the pyramid when its axis is parallel to V.P.	U	6	
Q.6	Attempt any TWO:			16
a)	A cone of base diameter 40mm and axis length 50mm is kept on the H.P. on its base. It is cut by a section plane inclined at 45° to the H.P. and passes through a point on the axis 30mm above the base. Draw i) Front view (02 marks) ii) Sectional Top view. (03 marks) iii) True shape of section (03 marks)	U	6	
b)	A pentagonal prism, side of base 40mm and axis length 80mm is kept on H.P. on its base with a side of base perpendicular to V.P. It is cut by an Auxiliary inclined plane such that the true shape of section is an isosceles triangle of maximum base and altitude 60mm Draw i) Front views (02 marks) ii) Sectional Top views (03 marks) iii) True shape of section (03 marks)	R	4	
c)	A cube of 60mm edges rests on one of its faces in H.P. An inclined plane cuts the cube, so as to give a true section as a regular hexagon. Measure also the inclination of the section plane with the H.P. Draw i) Front view (02 marks) ii) Sectional Top view (03 marks) iii) True shape of section (03 marks)	U	6	

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LEVEL: FIRST**PROGRAM: COMMON****COURSE CODE: CCF110/CCE110/X111/R112 COURSE NAME: APPLIED MECHANICS****MAX. MARKS: 80****TIME: 3 HRS.****DATE: 15/12/2018****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	S Q N	Question Text	R U A	CO CCF 110	Marks
Q.1		Attempt any FOUR			(08)
	a)	Differentiate between mass & weight.	U	1	
	b)	State the principle of transmissibility of force.	R	1	
	c)	State the Varignon's theorem of moments & its use.	R	2	
	d)	State Lami's theorem & Draw a sketch to explain it with mathematical expression.	R	2	
	e)	State graphical conditions of equilibrium of force system.	R	2	
	f)	Define coefficient of friction.	R	2	
Q.2		Attempt any FOUR			(16)
	a)	A man of mass 50 kg is standing on a roof having an inclination of 25° to the horizontal. Determine the components of his weight along the roof & normal to the roof.	A	2	
	b)	Determine the angle between two equal forces 'p' if their resultant is also equal to p.	U	2	
	c)	Six forces are acting along the lines joining toward the centre of a hexagon. Determine the equilibrant force which keep this hexagon in equilibrium. Refer fig.no.1.	A	2	
	d)	A thread of load carrying capacity 102.2N. is used to hold a sphere of weight 100N, against a smooth, wall, radius of sphere is 100 mm & length of the thread is 200 mm. But it is found that thread fails By calculation find why thread fail. Refer fig.No.3.	U	2	
	e)	ABCD is weightless rod under the action of four forces as shown in figure no.2. Calculate the resultant & locate the position of resultant with respect to point 'A'. Use graphical method.	U	3	
	f)	A body of weight 400N is placed on an inclined plane at an angle 15° to the horizontal. If the coefficient of friction is 0.14. Find the value of force to be applied parallels to the plane to just to move the body up the plane.	A	2	
Q.3		Attempt any FOUR			(16)
	a)	A concurrent force system is as shown in figure no.4. Determine resultant of the given force system & also position from horizontal axis. Use graphical method.	U	3	
	b)	A beam ABC is hinged at A & placed on roller at B. The distance between two support AB is 5m & the overhang BC is 1 m. The beam carries a u.d.l of 2 KN/m over its entire length ABC & a point load of 5 KN is acting at C. Calculate support reaction using analytical method.			

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c)	A simply supported beam of span 4 m is loaded with an u.d.l of 5 KN/m for 2 m from left end support & a point load of 30KN at 1 m from right end. Determine support reactions using graphical method.		
d)	A wooden block is resting on a rough inclined plane whose inclination to the horizontal plane is 10° . The push force 2 N is acting parallel to the inclined plane. The block is just moving down the plane. If coefficient of friction between block & plane is 0.32 estimate the weight of the block.	A	2
e)	A loader of weight 800 N of length 4.5 m is rest against a smooth wall & rough floor. The coefficient of friction between loader & floor is 0.33 will loader stand in 60° positions with respect to the floor.	A	2
f)	i) Explain polygon law of forces with a neat sketch ii) Calculate coefficient of friction if angle of repose is 30°	A A	3 2
Q.4	Attempt any FOUR		(08)
a)	State the centroid of semicircle of radius R.	R	4
b)	Define centroid and center of gravity.	R	4
c)	State Newton's first law of motion.	R	5
d)	State the equation of rectilinear motion & meaning of each.	R	5
e)	Calculate angular velocity of a shaft rotating at 130 rpm.	A	5
f)	State the law of conservation of energy.	R	5
Q.5	Attempt any FOUR		(12)
a)	Determine the centroid of T-section with respect to bottom having flange 120 x 10 mm and web 20 x 150 mm.	A	4
b)	Locate center of gravity of frustum of solid circular cone as shown in fig. Refer fig.no.5. w.r.t to bottom.	A	4
c)	A body starts from rest with a constant acceleration of 0.5 m/s^2 after what time its velocity be 2.5 m/s & How much distance it will be travelled during this time?	A	5
d)	A body falling freely under gravity passes two points 9 m apart vertically in 0.2 sec. Find from what height above the upper point did it start to fall?	A	5
e)	The shaft of motor rotates at 1000 rpm at a particular instant in 10 sec. The speed uniformly decreases to 400 rpm. Find angular retardation.	A	5
f)	A wheel 800 mm diameter starts from rest and accelerates uniformly. After 24 sec, it attains angular velocity of 120 rad/sec. Find the angular acceleration and total angle turned trough.	A	5
Q.6	Attempt any FOUR		(16)
a)	How many litres of water can be lifted in 20 min to a height of 30 m by means of a pump of 100 KW?	A	5
b)	A bullet weighing 3 N leaves the barrel of a ripple with muzzle velocity of 1000 m/s. If the length barrel in 800 mm, Find the impulse and impulsive force.	A	5
c)	Draw the nature of following graphs for a lifting machine. i) Load vs Effort ii) Load vs Ideal effort iii) Load vs Mechanical Advantages iv) Load vs Effort lost in friction	U	6
d)	Calculate efficiency of a machine to lift a load of 1000 N, if the velocity ratio of the machine is 25 and law of machine is $p = (0.01W + 5) \text{ N}$.	A	6
e)	Calculate the effort required to lift a load of 3 KN. If the machine can lift a load of 1 KN by an effort of 56 N. and 2 KN load by an effort of 96 N.	A	6
f)	In a differential axle & wheel, the diameter of effort wheel is 400 mm and the diameter of bigger axle is 100 mm and smaller axle is 80 mm. If an effort of 50 N can lift a load of 1500 N, find velocity ratio and efficiency of the machine.	A	6

Figure No. 1

(Q.2) c)

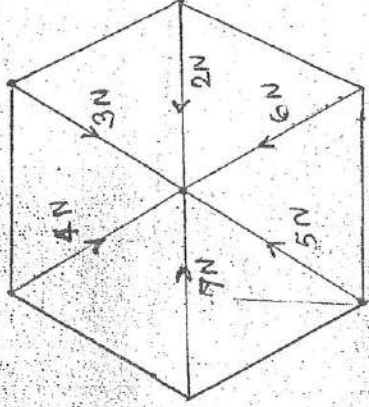


Figure No. 2

(Q.2) e)

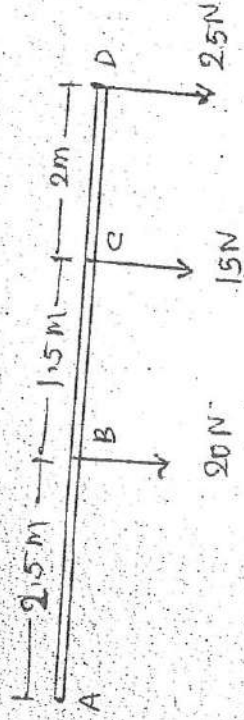
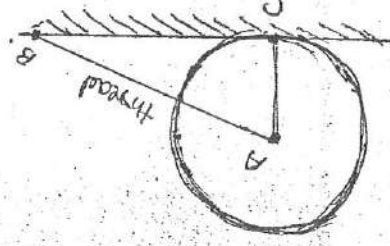


Fig No. 3

(Q.2) d)

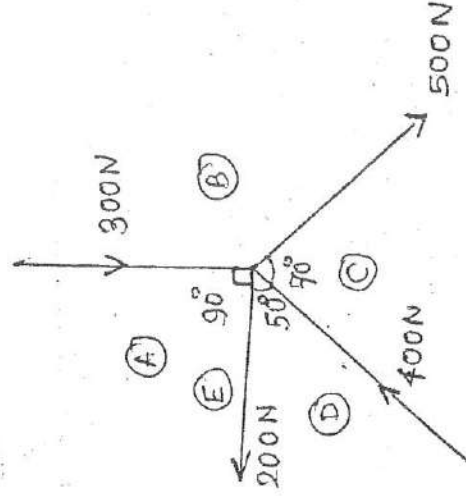


$AB = 200 \text{ mm}$

$AC = 100 \text{ mm}$

Fig No. 4

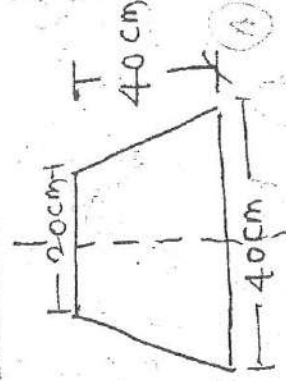
(Q.8) a)



Refer Bow's notations given in figure.

Fig. No. 5

Q.5 (b)



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LEVEL: FOURTH**PROGRAM: CIVIL ENGINEERING****COURSE CODE: CEF401/1302/CE301/CEE401 COURSE NAME: ANALYSIS OF STRUCTURE****MAX. MARKS: 80****TIME: 3 HRS.****DATE: 04/12/2018****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, **SQL**>Sub-Question No, **R**> Remembering, **U**>Understanding, **A**>Application **CO**>Course outcome

QN	S Q N	Question Text	R U A	CO CEF A 401	Mark s
Section -I					
Q.1		Attempt any FOUR			(08)
	a)	Define angle of obliquity.	R	1	
	b)	Define principal stress and principal plane.	R	1	
	c)	Define core of section.	R	2	
	d)	Draw stress distribution at base of chimney of uniform section subjected to lateral wired pressure for no tension.	U	2	
	e)	Differentiate between eccentric load and axial load.	U	3	
	f)	Calculate slenderness ratio for column of dia. 100mm & length 3m with both ends of column hinged.	A	3	
Q.2		Attempt any FOUR			(16)
	a)	A piece of material is subjected to two perpendicular tensile stresses of 100MPa and 60 MPa. Determine the plane on which the stress has maximum obliquity with the normal.	A	1	
	b)	At a point in a strained material there are two mutually perpendicular stresses of 500 N/mm^2 and 300 N/mm^2 both are tensile. They are accompanied by a shear stress of 90 N/mm^2 . Find principal stress, position of principal planes.	A	1	
	c)	Draw Mohr's circle for a point in strained material where two mutually perpendicular stresses are 50 MPa and 100 MPa both are tensile. They are accompanied by a shear stress of 30 MPa. Find principal stress and maximum shear stress.	U	1	
	d)	State different states of principal stresses and give field examples.	U	1	
	e)	Calculate core of a section for following and draw neat sketches. i) Circular section 300mm dia. ii) Rectangular section 250mm x 600mm.	U	2	
	f)	A square pillar of 300 mm side is subjected to an eccentric load of 150 KN at an eccentricity of 50mm in the plane bisecting thickness. Find the maximum and minimum intensities of stress at the base.	A	2	
Q.3		Attempt any FOUR			(16)
	a)	A tall chimney Hollow square in cross section is 2m x 2m externally and 0.5m thickness of wall .It is subjected to uniform horizontal wind pressure of 1.25 KPa on one of its faces. The unit weight of masonry is 20 KN/m^3 . Calculate the maximum height of chimney for no tension anywhere in the base.	A	2	
	b)	A rectangular pier 1000 mm x 1500 mm is subjected to compressive load of 500KN with an eccentricity of 250 mm along the axis bisecting 1000 mm side. Find the resultant stress intensities at the base cross-section of the pier.	A	2	

P.T.O

c)	A short masonry pillar 500mm x 500mm in section is subjected to a point of 8000KN, placed on one of the centroidal axis of the section, so as to produce no tension in the section. Determine eccentricity of point load.	A	2	
d)	A column having diameter 200mm is of length 3.0 m. Both ends of column are hinged. Find Euler's crippling load. $E=2 \times 10^5 \text{ N/mm}^2$	A	3	
e)	Determine crippling load by Rankine's formula for a Hollow circular column of 250 mm external diameter & 150 mm internal diameter. Effective length of column is 50m. $\sigma_c=550 \text{ N/mm}^2$ & $\alpha=1/1600$.	A	3	
f)	Define short and long column, also state classification and end conditions for effective length (any two).	U	3	

Section-II

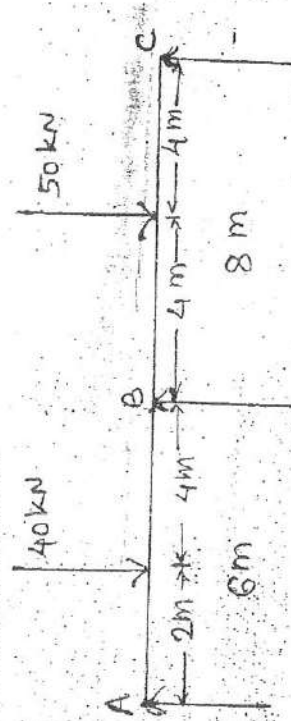
Q.4	Attempt any FOUR			(08)
a)	Define fixed beam.	R	1	
b)	State principle of superposition with respect to fixed beam.	R	1	
c)	State any two advantages of continuous beam.	R	2	
d)	Define distribution factor used in moment distribution method for continuous beam.	R	5	
e)	A continuous beam of uniform section ABCD is supported at A,B,C & D. Where AB=6m, BC=8m, CD=4m. Calculate the distribution factors at joints B&C.	R	5	
f)	State relation between slope & deflection.	U	6	

Q.5	Attempt any TWO			(16)
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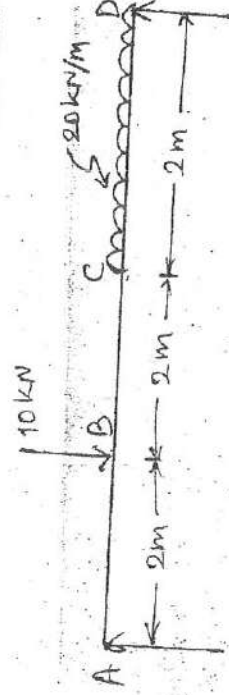
a)	A fixed beam of span 5 m is subjected to loading udl 15 KN/m over entire span & a point load of 20 KN act at 2 meter distance from left hand support using principle of superposition. Determine & Draw bending moment diagram & shear force diagram.	A	1	
b)	A continuous beam of uniform flexural rigidity is fixed at A & simply supported at B & free at end C. Such that AB=4m, BC=3m, A u.d.l of 20KN/m act on entire beam ABC & a point load of 30KN is act at free end. Draw bending moment diagram using three moment theorem (Clapeyron's theorem).			
c)	i) A continuous beam ABC is supported at A,B&C AB=4m, BC=3m, AB & BC carries u.d.l of 30 KN/m. Calculate support moments & Draw BMD using moment distribution method. ii) For a cantilever beam of span 3 m carrying a point load 'w' at the free end, the maximum slope of beam is 0.2 degree. Find maximum deflection of beam.	A U	5 6	

Q.6	Attempt any TWO			(16)
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a)	A continuous beam is loaded as show in fig. below. Draw SFD & BMD using three moment theorem.	A	2	
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b)	For Q.No.5 (b) determine support moments using moment distribution method.	A	5	
c)	For the beam shown in figure below, using Macaulay's method calculate maximum deflection. Take $E=2 \times 10^5 \text{ N/mm}^2$ & $I=8.345 \times 10^6 \text{ mm}^4$.	A	6	



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LEVEL: FIFTH

PROGRAM: CIVIL ENGINEERING

COURSE CODE: CEF506/CE403/CEE505

COURSE NAME: ENVIRONMENTAL ENGINEERING

MAX. MARKS: 80

TIME: 3 HRS.

DATE: 10/12/2018

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**

Q ^N	S Q N	Question Text	R	CO CEF A 506	Marks
Section -I					
Q.1		Attempt any FOUR			(08)
	a)	Enlist any four water –borne diseases.	R	1	
	b)	What do you understand by term ‘Per Capita demand’?	U	2	
	c)	Name any four materials which are used for water pipes.	R	5	
	d)	What do you mean by ‘Residual Chlorine’?	U	4	
	e)	What do you mean by ‘Post Chlorination’?	U	4	
	f)	Define the term ‘Detention period’.	R	4	
Q.2		Attempt any FOUR			(16)
	a)	Enlist and explain the various factors affecting rate of demand of work.	R	2	
	b)	What do you mean by ‘Design period’? What factors should be considered while fixing design period?	U	2	
	c)	Draw the flow diagram showing water supply scheme from source to consumer.	R	1	
	d)	Enlist and explain in brief any four points to be considered while locating intake structure	U	1	
	e)	What is PH value? State its significance in water treatment.	U	3	
	f)	What are the effects which occur on water during filtration? Explain the theory of filtration to explain such effects.	U	4	

P.T.O

Q.3	Attempt any FOUR		(16)
a)	Give the permissible limits of following impurities in water. i) Nitrates ii) Fluorides iii) Hardness iv) Total solids.	R 3	
b)	Define 'Aeration'. What is the effect of aeration on water?	U 4	
c)	How the capacity of sedimentation tank is determined?	A 4	
d)	Draw the labelled sketch of 'Flash Mixer' and explain its working.	A 4	
e)	Enlist the various method of distribution of water and explain any one of it with labelled sketch.	U 5	
f)	What is reflex valve? Draw the labelled sketch of it and explain its working.	U 5	
Section-II			
Q.4	Attempt any FOUR		(08)
a)	Enlist objects of sewage disposal.	R 6	
b)	Draw the neat sketch of one pipe system of plumbing system of drainage.	R 7	
c)	Define i) Soil pipe ii) Rainwater pipe.	R 7	
d)	Define i) Garbage ii) Rubbish	R 8	
e)	What is hazardous waste?	U 8	
f)	Give significance of BOD.	R 10	
Q.5	Attempt any FOUR		(16)
a)	What are the principles of sanitation?	U 6	
b)	Write any eight principle of house drainage.	U 7	
c)	Draw the sketch of Indian type water closed and flushing cistern.	A 7	
d)	Explain methods of collection of solid waste.	A 8	
e)	Draw sketch of drop manhole also mention its purpose.	U 9	
f)	Explain aerobic and anaerobic decomposition.	U 10	
Q.6	Attempt any FOUR		(16)
a)	Explain working of septic tank with sketch.	A 9	
b)	Explain i) self cleansing velocity ii) Non- scouring velocity.	A 9	
c)	Explain street Inlets with sketches.	A 9	
d)	Explain Activated sludge process.	A 11	
e)	Draw the flow diagram of sewage treatment plant for a small town.	U 11	
f)	Enlist functions of i) Grit chamber ii) Skimming tank.	R 11	

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ODD TERM END EXAM NOV/DEC -2018**EXAM SEAT NO.**

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LEVEL: THIRD**PROGRAM: CIVIL ENGINEERING****COURSE CODE: CEF305/CEE305****COURSE NAME: SOIL MECHANICS AND FOUNDATION ENGINEERING****MAX. MARKS: 80****TIME: 3 HRS.****DATE: 11/12/2018****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

S	Q	Question Text	R	CO	Mar ks
Q.1		Attempt any FOUR		CEF A 305	(08)
	a)	Give two methods to improve soil field density.	R	1	
	b)	If specific gravity of soil is 2.58. Determine its density.	A	1	
	c)	When the thread diameter 4mm, cracks were observed. What you say about water content of soil above or below plastic limit?	A	1	
	d)	Which two properties of soil from grain size distribution curve are important?	U	1	
	e)	Enlist four factors affecting permeability.	R	2	
	f)	State four objectives of compaction.	R	3	
Q.2		Attempt any FOUR			(16)
	a)	Calculate coefficient of uniformity and coefficient of curvature for soil having $D_{10}=0.07$ mm, $D_{30}=0.21$ mm, $D_{60}=0.43$ mm	A	1	
	b)	Define liquid limit, plastic limit, shrinkage limit, and plasticity index.	R	1	
	c)	Define flow net and state its characteristics.	R	2	
	d)	State four equipment used for field compaction giving their suitability for different soils.	U	3	
	e)	In a direct shear test, following observations were recorded. Find value of C & ϕ . Normal stress (kg/cm^2) 1.0; 1.50; 2.00; 2.50; Shear stress (kg.cm^2) 0.90; 1.15; 1.40; 1.65.	A	3	
	f)	Write step by step procedure to determine specific gravity of soil in the laboratory.	R	1	

P.T.O

Q.3	Attempt any FOUR		(16)
a)	Calculate the void ratio, porosity and degree of saturation of a soil sample if it is having wet unit weight 20KN/m^3 , dry unit weight 18KN/m^3 and specific gravity 2.7	A	1
b)	State meaning of following symbol. GW, GC, SP, SM.	R	1
c)	A permeameter ($A=3000\text{ mm}^2$, $L=200\text{ mm}$) gave a discharge of 25 ml in 20 minutes under constant head of 1m. Determine the value of co-efficient of permeability	A	1
d)	Determine OMC and MDD by plotting compaction curve. Bulk density (gm/cc) 1.75; 1.95; 2.10; 2.20; 2.15; 2.05; Water content (%) 5.10; 10.20; 15.15; 20.10; 25.20; 30.10 respectively.	A	1
e)	Describe cement stabilisation.	R	1
f)	Explain the method of determining in- situ density with core cutter.	R	1
Q.4	Attempt any FOUR		(08)
a)	State necessity of site investigation.	R	4
b)	State & define lateral earth pressure.	R	4
c)	State any two differences between shallow foundation & deep foundation.	R	5
d)	Define bearing capacity of soil.	R	5
e)	Define distributed and undistributed soil sample.	R	4
f)	State the types of machine foundation.(any two)	R	6
Q.5	Attempt any FOUR		(16)
a)	State criteria for deciding location and number of pits and boxes.	A	4
b)	Explain in brief Rankine's theory of earth pressure.	U	4
c)	Draw a neat sketch of plate load test (gravity loading method) and also draw nature of load-settlement curve in plate load test.	A	5
d)	State the factors deciding the depth of foundation.	U	5
e)	Write note on "Well foundation".	A	5
f)	What are the different types of piles? Explain with sketch.	U	5
Q.6	Attempt any FOUR		(16)
a)	Explain in brief "Raft foundation"	A	5
b)	What are the factors affecting bearing capacity of soil? Explain briefly.	U	5
c)	Explain in brief soil support methods while excavation.	A	6
d)	Write a short note on "Foundation Protection".	A	6
e)	State the requirements of machine foundation.		6
f)	Write a short note on vibration Isolation for machine foundation.	A	6

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EXAM SEAT NO.

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LEVEL: FOURTH

PROGRAM: CIVIL ENGINEERING

COURSE CODE: CEF410/CEE410/CE307 COURSE NAME: TOWN AND COUNTRY PLANNING

MAX. MARKS: 80

TIME: 3 HRS.

DATE: 12/12/2018

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	S	Q	N	Question Text	R	CO	Marks
					U	CEF	A
						410	
Section -I							
Q.1				Attempt any FOUR			(08)
	a)			State any two features of satellite town.	R	1	
	b)			Write any two objects of town planning.	U	1	
	c)			Enlist any four types of surveys.	R	2	
	d)			State any four causes of slum formation.	U	3	
	e)			State the classification of Industries.	R	3	
	f)			Define neighborhood planning.	R	4	
Q.2				Attempt any FOUR			(16)
	a)			State any four principles of town planning.	R	1	
	b)			Explain regional survey.	U	2	
	c)			Explain zoning in country & town planning.	U	2	
	d)			Enlist the steps in the preparation of master plan.	U	3	
	e)			Explain housing problems in India.	A	3	
	f)			State & explain any eight principles of neighborhood planning.	A	4	
Q.3				Attempt any FOUR			(16)
	a)			Explain any one classification of growth of towns.	U	1	
	b)			State the objects of landscape Architecture.	R	2	
	c)			Explain any eight factors to be considered for selecting site for industries.	U	3	
	d)			Explain grouping of public building.	U	3	
	e)			Explain various forms of recreation amenities.	U	3	
	f)			State any four disadvantages of private enterprises for housing schemes.	R	4	

P.T.O

Section-II

Q.4	Attempt any FOUR			(08)
	a) Who will prepare regional plans?	R	5	
	b) Who is the head of village panchayat?	R	5	
	c) Give the minimum plot size required for one domestic unit.	R	6	
	d) Define F.S.I	R	6	
	e) Enlist any two types of agro industries.	R	7	
	f) Define single nucleated settlement type of village, with one example.	R	7	
Q.5	Attempt any FOUR			(16)
	a) Explain any four principles of village planning in brief.	U	7	
	b) Discuss why village planning is necessary?	U	7	
	c) Explain the importance of building bye laws.	U	6	
	d) Give the provision for offset parking for cars in case of i) Collages ii) Secondary school iii) Cinema theater iv) Hospital	R	6	
	e) State any four functions of village panchayat.	R	5	
	f) Enlist any two local authorities in each. i) Rural areas ii) Urban areas.	R	5	
Q.6	Attempt any FOUR			(16)
	a) Explain the concept of low cost housing.	U	7	
	b) Differentiate between rural and urban areas.	U	7	
	c) Explain light plane with a neat sketch.	U	6	
	d) Discuss floating F.S.I with one example.	U	6	
	e) Explain the framework of panchyat samiti.	U	5	
	f) Enlist any four categories of MR and TP act.	R	5	

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EXAM SEAT NO.

LEVEL: FOURTH

PROGRAM: CIVIL ENGINEERING

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

STRUCTURE

MAX. MARKS: 80

TIME: 3 HRS.

DATE: 06/12/2018

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, **SQLN>**Sub-Question No, **R>** Remembering, **U>**Understanding, **A>**Application **CO>**Course outcome

QN	S Q N	Question Text	R U A	CO CEF 403	Marks										
Section -I															
Q.1		Attempt any FOUR			(08)										
	a)	State two advantages and disadvantages of steel structures.	R	1											
	b)	Draw neat sketches of i) Transmission tower ii) Steel bridge.	R	1											
	c)	State IS codes used for load calculations.	R	1											
	d)	State the advantages of bolted connections.	U	2											
	e)	Draw neat sketch of lap joint in two views.	U	2											
	f)	Define i) effective length ii) Throat thickness of fillet weld.	R	2											
Q.2		Attempt any TWO			(16)										
	a)	i) Draw sketches of any four structural steel sections used in steel structures. ii) Define limit state and state differed types of limit state.	U R	1 1											
	b)	A lap joint consist of two plates of 150mm x 12mm connected by means of 20mm dia. bolts of grade 4.6 in single line. Calculate strength of joint & no. of bolts. If members are subjected to factored load 400KN. Assume pitch=50mm & end distance=40mm.	A	2											
	c)	State and explain with figure three modes of failure of axial tension member with formulas.	U	3											
Q.3		Attempt any TWO			(16)										
	a)	Design a tie member using suitable double angle section to carry factored load of 350KN connected back to back on both sides of 10mm thick gusset plate by means of 4 bolts of 20mm dia. in single line.(Assume suitable gauge dist.pitch & edge dist) <table><tr><td>Available sections</td><td>Gross Area(mm²)</td></tr><tr><td>ISA 80x50x8</td><td>978</td></tr><tr><td>ISA 100x75x6</td><td>1014</td></tr><tr><td>ISA 125x75x6</td><td>1160</td></tr></table>	Available sections	Gross Area(mm ²)	ISA 80x50x8	978	ISA 100x75x6	1014	ISA 125x75x6	1160	A	3			
Available sections	Gross Area(mm ²)														
ISA 80x50x8	978														
ISA 100x75x6	1014														
ISA 125x75x6	1160														
	b)	A discontinuous compression member consists of 2 ISA 90x90x16 mm connected back to back on opposite sides of 12mm thick gusset plate with welding. The length of member is 3m between intersections. Calculate design compressive strength of member. If $C_{xx}=C_{yy}=25.9\text{mm}$, $I_{xx}=I_{yy}=126.7 \times 10^4 \text{mm}^4$, $A=1703 \text{mm}^2$. Given values of f_{cd} are <table><tr><td>KL/r</td><td>90</td><td>100</td><td>110</td><td>120</td></tr><tr><td>$f_{cd}(\text{MPa})$</td><td>121</td><td>107</td><td>97.6</td><td>83.7</td></tr></table>	KL/r	90	100	110	120	$f_{cd}(\text{MPa})$	121	107	97.6	83.7	A	3	
KL/r	90	100	110	120											
$f_{cd}(\text{MPa})$	121	107	97.6	83.7											
	c)	i) State whether ISA 80x50x8mm is affected by local buckling or not. ii) Draw neat sketch of two views of double lacing in case of compound column.	U U	3 3											
P.T.O															

Section-II					
Q.4	Attempt any FOUR			(08)	
a)	State two advantages of tubular structures.		U	6	
b)	Enlist any two common types of roof trusses and state their span ranges.		U	6	
c)	State the value of β_b in determination of design plastic moment of resistance of beam w.r.t classification of section.		U	4	
d)	Draw a diagram showing all components of Roof Truss.		U	6	
e)	State the purpose of providing a column base.		R	5	
f)	State formula to calculate allowable and maximum deflection for a beam carrying u.d.l. over its entire span.		A	4	
Q.5	Attempt any TWO				(16)
a)	Check whether ISMB=350 is suitable or not as a simply supported beam over an effective span of 5m carrying UDL of 20KN/m including self weight properties of ISMB=350 $b_f=140\text{mm}$, $t_f=14.2$, $t_w=8.1\text{mm}$, $r_1=14\text{mm}$, $z_p=889.57 \times 10^3 \text{mm}^3$, $Z_{xx}=778.9 \times 10^3 \text{mm}^3$, $I_{xx}=1360 \times 10^4 \text{mm}^4$.	A	4		
b)	A column ISHB 400 carries an axial working load of 1600KN. Design a slab base and concrete pedestal for this column, Take: i) SBC of soil = 200kPa ii) Grade of concrete = M20 iii) $b_f=250\text{mm}$ iv) $t_f=12.7\text{mm}$ v) $r_{mo}=1.10$ vi) $f_y=250\text{MPa}$	A	5		
c)	A truss of 20m span has rise of 4.5m and these trusses are spaced at 5m c/c. The design wind pressure is 1.65KN/m ² and number of panels are 10; coefficient of internal wind actions = -0.5 (for critical case) for this data calculate panel point load for wind load and live load.	A	6		
Q.6	Attempt any TWO				(16)
a)	i) Define laterally supported beam and with suitable sketch state any three methods of providing laterally supported beam. ii) Explain types of column bases and with neat sketch explain slab base (plan and elevation).	R U	4		
b)	Check the suitability of angle purlin for a roof truss with spacing of roof truss is 3m c/c span of truss 12m, rise of truss 2.5m. spacing of purlin 1.35m Dead load = 320 N/m Live load = 700N/m Wind load = 1400N/m Given ISA 75x75x8 having $I_{xx}=I_{yy}=59 \times 10^4 \text{mm}^4$ $C_{xx}=C_{yy}=21.4\text{mm}$	U	5		
c)	Design a suitable ISLB section for a simply supported beam of an effective span 5.0 m subjected to a u.d.l of 30KN/m including self weight over entire span. The beam is effectively restrained for a lateral buckling along its span. Check the section for shear and deflection. $E=2 \times 10^5 \text{MPa}$ Refer table below for properties of available rolled steel beam.				

Desi gnati on	Wt N/m	A mm ²	b mm	t _f mm	t _w mm	I _{xx} mm ⁴	z _p mm ²	z _{xx} mm ³	Root radius s r ₁ mm
ISLB 300	377	4808	150	9.4	6.7	7332 x 10 ³	544.32 x 10 ³	488.9 x 10 ³	15.0
ISLB 325	431	5490	165	9.8	7.0	9874.6 x 10 ⁴	687.76 x 10 ³	607.7 x 10 ³	16.0
ISLB 350	495	6301	165	11.4	7.4	13158 36x10 ³	854.44 x 10 ³	251.9 x 10 ³	16.0

GOVERNMENT POLYTECHNIC, KOLHAPUR 416004.

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ODD TERM END EXAM NOV/DEC -2018

EXAM SEAT NO.

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LEVEL: **THIRD**

PROGRAM: CE/ME /MT

COURSE CODE: CEF301/MEF301/1201/C201/CEE301/2201/ME201/MEE301/MT201/MG201/MTE301

COURSE NAME: APPLIED MATHEMATICS

MAX. MARKS: **80**

TIME: **3 HRS.**

DATE: **03/12/2018**

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	S	Q	N	Question Text	R	CO	U	CEF	Marks
Q.1				Attempt any FOUR					(08)
	a)			Define Indefinite integration.	R	1			
	b)			Show that $\int 3^x 2^x dx = \frac{6^x}{\log 6} + c$	U	1			
	c)			Show that $\int \frac{dx}{3x-2} = \frac{1}{3} \log 4$	U	1			
	d)			State integration by parts rule.	R	1			
	e)			Evaluate $\int_0^{\pi/2} \sin x \cos x dx$	A	1			
	f)			Find the area under the curve $y = x^3$ from $x=1$ to $x=3$	A	1			
Q.2				Attempt any FOUR					(16)
	a)			Evaluate $\int \frac{dx}{5-4\cos x}$	A	1			
	b)			Evaluate $\int x \sin^{-1} x dx$	A	1			
	c)			Evaluate $\int_3^5 \frac{\sqrt{8-x}}{\sqrt{x} + \sqrt{8-x}} dx$	A	1			
	d)			Evaluate $\int \frac{x+2}{\sqrt{x^2+5x+6}} dx$	A	1			
	e)			Evaluate $\int_0^{\pi/4} \log(1+\tan x) dx$	A	1			
	f)			Find the area bounded by the curve $y^2=2x$ and the line $x-y=4$	A	1			
Q.3				Attempt any FOUR					(16)
	a)			Show that $\int \frac{dx}{4\cos^2 x + 9\sin^2 x} = \frac{1}{6} \tan^{-1} \left(\frac{3\tan x}{2} \right) + c$	U	1			
	b)			Show that $\int \frac{(x-1)e^x}{x^2 \cos^2(e^x/x)} dx = \tan \left(\frac{e^x}{x} \right) + c$	U	1			
	c)			Evaluate $\int \frac{\tan x \sec^2 x}{(4+\tan x)(9+\tan x)} dx$	A	1			
	d)			Evaluate $\int_0^e \log x dx$	A	1			

P.T.O.

	e)	Find the R.M.S value of current $I = 10 \sin 80\pi t$ over a complete period.	A	1																			
	f)	Find Mean value of $y = x^2 - x - 12$ between the points where it cuts the x axis.	A	1																			
Q.4		Attempt any FOUR			(08)																		
	a)	Define order and degree of a D.E.	R	2																			
	b)	State the type of the D.E. $(3x^2 + 6xy^2)dx + (6x^2y + 4y^3)dy = 0$ Justify.	R	2																			
	c)	What is the Integrating factor of a D.E. $\cos^2 x \frac{dy}{dx} + y = \tan x$	U	2																			
	d)	The C.V for a series is 40 and S.D is 8. Find the mean.	R	3																			
	e)	Two series X and Y have means 30 and 40 and S.D 10 and 15 respectively. Which series has more variability?	U	3																			
	f)	If A and B are two events such that $P(A) = \frac{1}{2}$, $P(B) = \frac{1}{3}$ and $P(A \cap B) = \frac{7}{12}$ find $P(A' \cap B')$	R	4																			
Q.5		Attempt any FOUR			(16)																		
	a)	Show that the solution of D.E $y \frac{dy}{dx} - \frac{4x}{3} \frac{y^2}{3} = 0$ is $x^2 = c(4x^2 - 2y^2)^3$	U	2																			
	b)	Solve $\frac{dy}{dx} = \frac{\sin x + x \cos x}{y(1 + 2 \log y)}$	A	2																			
	c)	Solve $(1 + e^{\frac{x}{y}})dx + e^{\frac{x}{y}}(1 - \frac{x}{y})dy = 0$	A	2																			
	d)	Solve $\frac{dy}{dx} + y \cot x = x$	A	2																			
	e)	Solve $\sec^2 x \tan y dx + \sec^2 y \tan x dy = 0$	A	2																			
	f)	The mean and the S.D of 100 observations were 40 and 5.1 as calculated by a student. But he took 50 instead of 40 for one observation. Calculate correct mean and correct S.D.	U	3																			
Q.6		Attempt any FOUR			(16)																		
	a)	Show that the mean deviation from the mean for the following data is 10.54																					
		<table><tr><td>Wight in kg</td><td>10-20</td><td>20-30</td><td>30-40</td><td>40-50</td><td>50-60</td><td>60-70</td></tr><tr><td>No. of persons</td><td>4</td><td>6</td><td>10</td><td>18</td><td>9</td><td>3</td></tr></table>	Wight in kg	10-20	20-30	30-40	40-50	50-60	60-70	No. of persons	4	6	10	18	9	3	U	3					
Wight in kg	10-20	20-30	30-40	40-50	50-60	60-70																	
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	b)	Calculate mean and S.D for the following data:																					
		<table><tr><td>C.I</td><td>0-10</td><td>10-20</td><td>20-30</td><td>30-40</td><td>40-50</td></tr><tr><td>Frequency</td><td>14</td><td>23</td><td>27</td><td>21</td><td>15</td></tr></table>	C.I	0-10	10-20	20-30	30-40	40-50	Frequency	14	23	27	21	15	A	3							
C.I	0-10	10-20	20-30	30-40	40-50																		
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	c)	Find S.D and C.V for the data given below.																					
		<table><tr><td>x_i</td><td>10</td><td>11</td><td>12</td><td>13</td><td>14</td><td>15</td><td>16</td></tr><tr><td>f_i</td><td>07</td><td>10</td><td>16</td><td>24</td><td>21</td><td>16</td><td>06</td></tr></table>	x_i	10	11	12	13	14	15	16	f_i	07	10	16	24	21	16	06	A	3			
x_i	10	11	12	13	14	15	16																
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	d)	Find S.D by using step deviations method for the following data																					
		<table><tr><td>Age groups</td><td>20-24</td><td>25-29</td><td>30-34</td><td>35-39</td><td>40-44</td><td>45-49</td><td>50-54</td><td>55-59</td></tr><tr><td>No. of deaths in Town</td><td>5</td><td>3</td><td>2</td><td>6</td><td>5</td><td>13</td><td>16</td><td>30</td></tr></table>	Age groups	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	No. of deaths in Town	5	3	2	6	5	13	16	30	A	3	
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No. of deaths in Town	5	3	2	6	5	13	16	30															
	e)	From 20 tickets marked 1 to 20, one ticket is drawn at random. Show that the probability is 9/20 if it is marked with multiple of 3 or 5.	U	4																			
	f)	A problem is given to three students A, B and C whose chances of solving it are $\frac{1}{2}$, $\frac{3}{4}$ and $\frac{1}{4}$ respectively. What is the probability that the problem will be solved?	A	4																			

GOVERNMENT POLYTECHNIC, KOLHAPUR 416004.

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ODD TERM END EXAM NOV/DEC -2018

EXAM SEAT NO.

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LEVEL: **THIRD**

PROGRAM: CE/ME /MT

COURSE CODE: CEF301/MEF301/1201/C201/CE201/CEE301/2201/ME201/MEE301/MT201/MG201/MTE301

COURSE NAME: **APPLIED MATHEMATICS**

MAX. MARKS: **80**

TIME: **3 HRS.**

DATE: **03/12/2018**

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	S Q N	Question Text	R U A	CO CEF 301	Marks
Q.1		Attempt any FOUR			(08)
	a)	Define Indefinite integration.	R	1	
	b)	Show that $\int 3^x 2^x dx = \frac{6^x}{\log 6} + c$	U	1	
	c)	Show that $\int_2^3 \frac{dx}{3x-2} = \frac{1}{3} \log 4$	U	1	
	d)	State integration by parts rule.	R	1	
	e)	Evaluate $\int_0^{\pi/2} \sin x \cos x dx$	A	1	
	f)	Find the area under the curve $y = x^3$ from $x=1$ to $x=3$	A	1	
Q.2		Attempt any FOUR			(16)
	a)	Evaluate $\int \frac{dx}{5-4\cos x}$	A	1	
	b)	Evaluate $\int x \sin^{-1} x dx$	A	1	
	c)	Evaluate $\int_3^5 \frac{\sqrt{8-x}}{\sqrt{x} + \sqrt{8-x}} dx$	A	1	
	d)	Evaluate $\int \frac{x+2}{\sqrt{x^2+5x+6}} dx$	A	1	
	e)	Evaluate $\int_0^{\pi/4} \log(1+\tan x) dx$	A	1	
	f)	Find the area bounded by the curve $y^2=2x$ and the line $x-y=4$	A	1	
Q.3		Attempt any FOUR			(16)
	a)	Show that $\int \frac{dx}{4\cos^2 x + 9\sin^2 x} = \frac{1}{6} \tan^{-1} \left(\frac{3\tan x}{2} \right) + c$	U	1	
	b)	Show that $\int \frac{(x-1)e^x}{x^2 \cos^2(e^x/x)} dx = \tan \left(\frac{e^x}{x} \right) + c$	U	1	
	c)	Evaluate $\int \frac{\tan x \sec^2 x}{(4+\tan x)(9+\tan x)} dx$	A	1	
	d)	Evaluate $\int_1^e \log x dx$	A	1	

P.T.O.

	e)	Find the R.M.S. value of current $I = 10 \sin 80\pi t$ over a complete period.	A	1																			
	f)	Find Mean value of $y = x^2 - x - 12$ between the points where it cuts the x axis.	A	1																			
Q.4		Attempt any FOUR			(08)																		
	a)	Define order and degree of a D.E.	R	2																			
	b)	State the type of the D.E. $(3x^2 + 6xy^2)dx + (6x^2y + 4y^2)dy = 0$ Justify.	R	2																			
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	d)	The C.V for a series is 40 and S.D is 8. Find the mean.	R	3																			
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	f)	If A and B are two events such that $P(A) = \frac{1}{2}$, $P(B) = \frac{1}{3}$ and $P(A \cap B) = \frac{7}{12}$ find $P(A' \cap B')$	R	4																			
Q.5		Attempt any FOUR			(16)																		
	a)	Show that the solution of D.E. $y \frac{dy}{dx} - \frac{4x}{3} - \frac{y^2}{3x} = 0$ is $x^2 = c(4x^2 - 2y^2)^3$	U	2																			
	b)	Solve $\frac{dy}{dx} = \frac{\sin x + x \cos x}{y(1 + 2 \log y)}$	A	2																			
	c)	Solve $(1 + e^{\frac{x}{y}})dx + e^{\frac{x}{y}}(1 - \frac{x}{y})dy = 0$	A	2																			
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Q.6		Attempt any FOUR			(16)																		
	a)	Show that the mean deviation from the mean for the following data is 10.54 <table><tr><td>Wight in kg</td><td>10-20</td><td>20-30</td><td>30-40</td><td>40-50</td><td>50-60</td><td>60-70</td></tr><tr><td>No. of persons</td><td>4</td><td>6</td><td>10</td><td>18</td><td>9</td><td>3</td></tr></table>	Wight in kg	10-20	20-30	30-40	40-50	50-60	60-70	No. of persons	4	6	10	18	9	3	U	3					
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No. of deaths in Town	5	3	2	6	5	13	16	30															
	e)	From 20 tickets marked 1 to 20, one ticket is drawn at random. Show that the probability is $\frac{9}{20}$ if it is marked with multiple of 3 or 5.	U	4																			
	f)	A problem is given to three students A, B and C whose chances of solving it are $\frac{1}{2}$, $\frac{3}{4}$ and $\frac{1}{4}$ respectively. What is the probability that the problem will be solved?	A	4																			

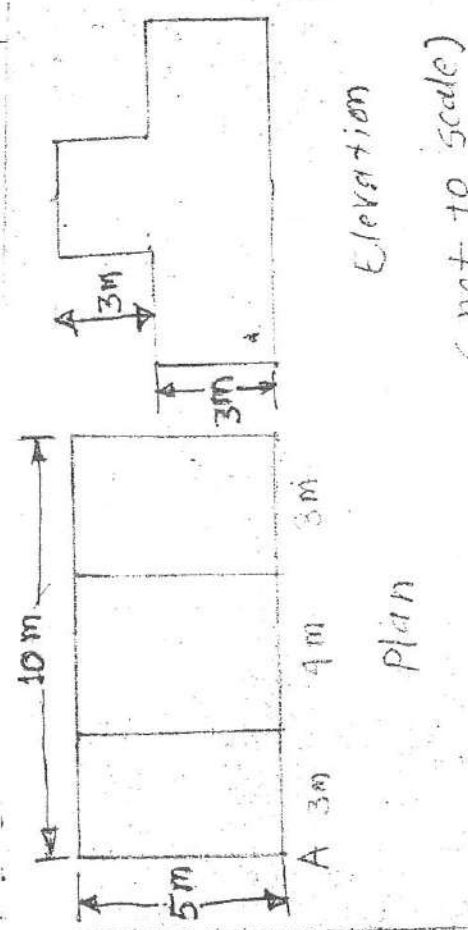
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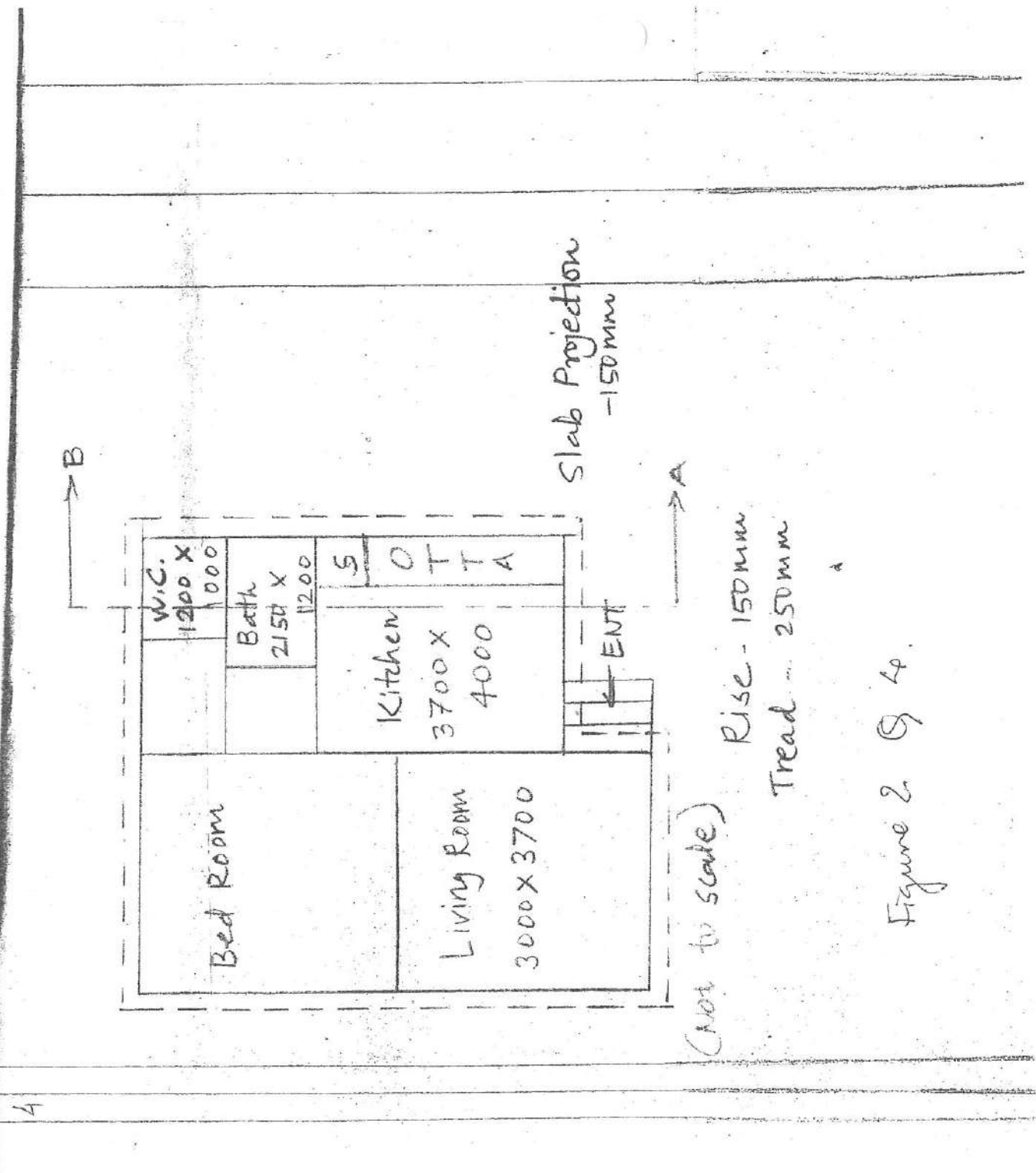
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LEVEL: THIRD**PROGRAM: CIVIL ENGINEERING****COURSE CODE: CEF303/CEE303****COURSE NAME: BUILDING DRAWING****MAX. MARKS: 80****TIME: 4 HRS.****DATE: 07/12/2018****Instruction:-**

- 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**

QN	S. Q. N	Question Text	Cognition Level R/U/A	Co Code CEF 303	Marks
Q.1		Attempt any FOUR			(08)
	a)	What is the purpose of drawing.	R	1	
	b)	Draw symbols for following : i) Single shutter door, ii) Gate	R	1	
	c)	Explain FSI.	R	2	
	d)	Define super built up area.	R	2	
	e)	Define perspective Drawing.	R	5	
	f)	Explain picture plane.	R	5	
Q.2		Attempt any FOUR			(16)
	a)	State preliminary requirements of good drawing.	U	1	
	b)	Explain Role of following agencies in building construction work : i) Structural Engineer, ii) Quantity surveyor.	U	3	
	c)	Explain 'Aspect' principle of planning of building.	U	3	
	d)	Draw to a suitable scale the line plan of a post office building.	A	4	
	e)	State principles of perspective drawing.	U	5	
	f)	Explain following terms in brief : i) Vanishing point, ii) Center of vision.	U	5	
Q.3		Attempt any FOUR			(16)
	a)	Draw following lines. Give its thickness also with its suitability : i) Center line, ii) Section line, iii) Visible line, iv) Hidden line.	U	1	

	b)	Explain procedure for submitting plan for sanctioning.	U	2	
	c)	State space requirements for following units of residential building : i) Hall, ii) W.C., iii) Bath, iv) Kitchen, v) Bedroom, vi) Store, vii) Dining room, viii) Bath and W.C. (combined).	R	3	
	d)	What are various common units required for all types of public buildings (min. Eight). With their min sites also.	R	4	
	e)	Draw to a suitable scale the line plan of primary health center.	A	4	
	f)	The figure shows the plan of an object Longer side of object is inclined at 30° to the picture plane and touches the same at "A". The observer is at distance of 10 m along the central visual ray. Assuming eye level at 1.5 m above G.L.. Draw the perspective view of the object to some convenient scale.	A	5	
	 Figure 1 for Q. 3(f)				
Q.4		Figure 2 shows a line plan of residential building. Draw to suitable scale the following views : i) Detailed plan. (10 marks) ii) Front elevation (06 marks) iii) Section along A-B (12 marks) iv) Schedule of doors and windows. (06 marks) v) Area statement. (05 marks) vi) North line. (01 marks) NOTE : Show all dimensions in plan, elevation and section. Use following data for preparing drawing.	A	6	(40)



(not to scale)

Rise - 150mm
Tread - 250mm

Figure 2. § 4.

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ODD TERM END EXAM NOV/DEC -2018**EXAM SEAT NO.**

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LEVEL: THIRD**PROGRAM: CIVIL ENGINEERING****COURSE CODE: CEF302/CE206/CEE302 COURSE NAME: BUILDING CONSTRUCTION****MAX. MARKS: 80****TIME: 3 HRS.****DATE: 05/12/2018****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	S	Question Text	R	CO	Marks
1		Attempt any FOUR			(08)
	a)	Define substructure. Enlist it's components in building.	R	1	
	b)	Define the term job layout.	R	2	
	c)	Distinguish between load bearing structure and framed structure and framed structure (any 2 points).	U	1	
	d)	Write any two types of scaffolding with its suitability.	U	3	
	e)	Draw a labelled sketch of door frame.	U	4	
	f)	Write the suitability of i) Louvered window. ii) Collapsible door.	A	4	
2		Attempt any FOUR			(16)
	a)	Write the functions of following i) Lintel ii) Foundation iii) Plinth iv) Doors.	U	1	
	b)	A farmer wants to construct his own house in a village. Hard murum is available at 1.2m depth. Suggest the type of structure with economy and draw a neat cross section showing component part of structure. Assume suitable data if any.	A	1	
	c)	Give the conditions, when you will use following type of foundation i) Raft foundation ii) Pile foundation iii) Well foundation iv) Grillage foundation.	A	2	
P.T.O					

	d)	i) State any four precautions to be taken while constructing foundation in black cotton soil. ii) Draw a neat sketch of any two types of tools used for excavation work.	U	2	
	e)	Draw a neat sketch of i) King Closer ii) Half Queen Closer iii) Half Bat iv) Bevelled Closer.	U	3	
	f)	1) Define the term related to scaffolding i) Putlogs ii) Ledger. 2) Suggest the types of scaffolding for following types of work i) Painting work ii) Brickwork for ordinary building.	A	3	
Q.3		Attempt any TWO			(16)
	a)	Suggest the type of mortar for following types of work. i) Fire places like furnace ii) RCC work iii) Plastering work for canals iv) Plastering work for low strength brickwork.	A	1	
	b)	Draw a neat labelled sketch of Rolling steel shutters. Write its suitability also.	U	4	
	c)	With the help of neat labelled sketch describe the box sheeting method of excavation by timbering.	U	2	
Q.4		Attempt any FOUR			(08)
	a)	Define stair now it should be located.	R	5	
	b)	Enlist any four types of stair.	R	5	
	c)	Define skirting.	R	6	
	d)	Define composite flooring.	R	6	
	e)	Define plastering.	R	7	
	f)	Enlist any four defects in plaster.	R	7	
Q.5		Attempt any FOUR			(16)
	a)	State the requirement of good stair case.	U	5	
	b)	Explain the procedure to construct tremix floor.	U	6	
	c)	State the precautions to be taken while plastering.	U	7	
	d)	State the causes of crack in a building.	U	8	
	e)	Describe the method of water proofing for R.C.C slab.	U	8	
	f)	State the necessity of termite proofing treatment used in construction	U	8	
Q.6		Attempt any FOUR			(16)
	a)	Explain with neat sketch doglegged stair.	U	5	
	b)	Compare between flat roof & pitched roof.	U	6	
	c)	State the characteristics of an ideal paint.	U	7	
	d)	State the necessity of rebaring technique.	U	8	
	e)	Explain with neat sketch formwork used for column.	U	8	
	f)	State various types of crack.	U	8	

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ODD TERM END EXAM NOV/DEC -2018

EXAM SEAT NO.

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LEVEL: FIRST

PROGRAM: COMMON

COURSE CODE: CCF105/CCE105/X104/R107/0107 COURSE NAME: BASIC MATHEMATICS

MAX. MARKS: 80

TIME: 3 HRS.

DATE: 19/12/2018

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	S	Q	N	Question Text	R	CO	CCF	Marks
Q.1				Attempt any FOUR			A 105	(08)
	a)			Define n^{th} order determinant.	R	1		
	b)			Resolve into partial fraction $\frac{1}{x^2 - x}$	A	2		
	c)			Define improper fraction with suitable example.	R	2		
	d)			If $A = \begin{bmatrix} 1 & 2 \\ -3 & 4 \end{bmatrix}$, $B = \begin{bmatrix} 4 & 5 \\ 1 & -3 \end{bmatrix}$ find $3A + B$	U	3		
	e)			If $A = \begin{bmatrix} 5 & 4 \\ 4 & 3 \end{bmatrix}$, $B = \begin{bmatrix} -3 & 4 \\ 4 & -5 \end{bmatrix}$ verify that $AB = BA$	U	3		
	f)			Expand using Binomial theorem $\left(\frac{x^2}{2} - \frac{2}{x^2} \right)^4$	A	4		
Q.2				Attempt any FOUR				(16)
	a)			Solve by Cramer's rule $3x + 3y - z = 11$, $2x - y + 2z = 9$, $4x + 3y + 2z = 25$	A	1		
	b)			Solve by Cramer's rule $\frac{1}{p} + \frac{3}{q} = 4$ and $\frac{-2}{p} + \frac{4}{q} = 5$	A	1		
	c)			If $A = \begin{bmatrix} 1 & 2 \\ -2 & 3 \end{bmatrix}$, $B = \begin{bmatrix} 2 & 1 \\ 2 & 3 \end{bmatrix}$, $C = \begin{bmatrix} -3 & 1 \\ 2 & 0 \end{bmatrix}$ verify that $A(B+C) = AB + BC$	U	3		
	d)			If $A = \begin{bmatrix} 1 & 2 & -2 \\ -1 & 3 & 0 \\ 0 & -2 & 1 \end{bmatrix}$ Find A^{-1} by using Adjoint method.	A	3		
	e)			Resolve into partial fraction $\frac{x+3}{(x^2-1)(x+5)}$	A	2		
	f)			Resolve into partial fraction $\frac{x^3+x}{(x^2-9)}$	A	2		

P.T.O

Q.3	Attempt any FOUR			(16)
a)	Resolve into partial fraction $\frac{x^2}{(x+1)(x-2)^2}$	A	2	
b)	Solve the simultaneous equations by using matrix inversion method. $x + 3y + 3z = 12, x + 4y + 4z = 15, x + 3y + 4z = 13$	A	3	
c)	If $A = \begin{bmatrix} 1 & -3 \\ 2 & -1 \end{bmatrix}_{2 \times 2}$ and $B = \begin{bmatrix} 1 & 0 & 1 \\ 2 & -1 & 3 \end{bmatrix}_{2 \times 3}$ verify that $(AB)^T = B^T A^T$	U	3	
d)	If $A = \begin{bmatrix} 2 & 5 \\ 1 & 3 \end{bmatrix}, B = \begin{bmatrix} 3 & -5 \\ -1 & 2 \end{bmatrix}$ show that $AB = BA = I$	U	3	
e)	Prove that $(\sqrt{2} + 1)^8 - (\sqrt{2} - 1)^8 = 82$	U	4	
f)	Expand using Binomial theorem $\left(x - \frac{1}{x}\right)^6$	A	4	
Q.4	Attempt any FOUR			(08)
a)	Express the following angles in radian measures. i) 30° ii) -135°	R	5	
b)	Prove that $\cos(\pi + \theta) = -\cos \theta$	U	6	
c)	Using compound angle formula find $\sin(75^\circ)$	R	6	
d)	If $\sin \alpha = 0.4$ find $\sin(3\alpha)$	R	7	
e)	Express as product : $\cos 4\theta + \cos 8\theta$	R	8	
f)	Find the principal value of $\cos\left[\frac{\pi}{2} - \sin^{-1}\left(\frac{1}{2}\right)\right]$	R	9	
Q.5	Attempt any FOUR			(16)
a)	Prove that $\frac{\cos \theta}{1 - \sin \theta} + \frac{1 - \sin \theta}{\cos \theta} = 2 \sec \theta$	A	5	
b)	Prove that $\cos(A + B) = \cos A \cos B - \sin A \sin B$	A	6	
c)	If $\tan(A + B) = \frac{3}{4}$ and $\tan(A - B) = \frac{77}{36}$ then find $\tan(2A)$	A	6	
d)	Prove that $\sqrt{2 + \sqrt{2}} + 2 \cos 4\theta = 2 \cos \theta$	A	7	
e)	Show that $\tan 3A - \tan 2A - \tan A = \tan 3A \tan 2A \tan A$	A	7	
f)	Show that $\cos 35^\circ + \cos 85^\circ + \cos 155^\circ = 0$	A	8	
Q.6	Attempt any FOUR			(16)
a)	Show that $(\cos A - \cos B)^2 + (\sin A - \sin B)^2 = 4 \sin^2\left(\frac{A - B}{2}\right)$	A	7	
b)	Prove that $\frac{\sin A + 2 \sin 2A + \sin 3A}{\cos A + 2 \cos 2A + \cos 3A} = \tan 2A$	A	8	
c)	Show that $\sin 10^\circ \sin 30^\circ \sin 50^\circ \sin 70^\circ = \frac{1}{16}$	A	8	
d)	Show that $\tan^{-1}\left(\frac{3}{4}\right) + \tan^{-1}\left(\frac{3}{5}\right) - \tan^{-1}\left(\frac{8}{19}\right) = \frac{\pi}{4}$	A	9	
e)	Prove that $\tan^{-1}(x) - \tan^{-1}(y) = \tan^{-1}\left(\frac{x - y}{1 + xy}\right)$, if $x > 0, y > 0$	A	9	
f)	Show that $\sin^{-1}\left(\frac{3}{5}\right) + \cos^{-1}\left(\frac{12}{13}\right) = \sin^{-1}\left(\frac{56}{65}\right)$	U	9	

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ODD TERM END EXAM NOV./DEC-2018**EXAM SEAT NO.**

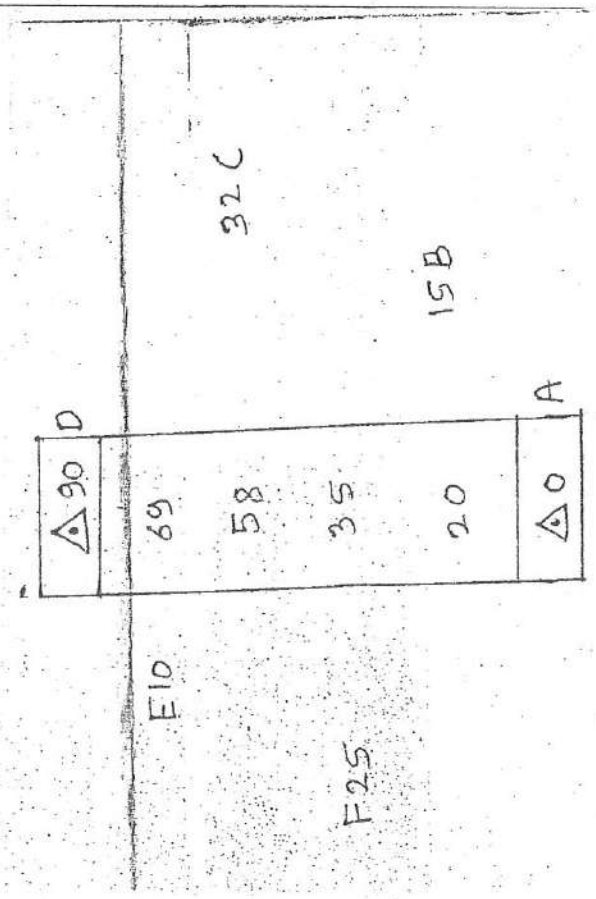
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LEVEL :- THIRD PROGRAM: CIVIL ENGINEERING**COURSE CODE :- CEF308/CE204/CE308****COURSE NAME :- SURVEYING - I****MAX. MARKS : 80 TIME : 3 HRS. DATE :- 20/12/2018****Instruction :-**

- 1) Answers must be written in the main answer book provided. (and supplements if required)
- 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	S Q N	Question Text	R/ U/ A	Co CEF 308	Ma rks
Q.1		Attempt any FOUR :			08
	a)	State any two objects of surveying.	R	1	
	b)	Define chaining.	R	2	
	c)	Write the use of following instruments in survey. i) Ranging rod ii) Arrow.	U	2	
	d)	What is true meridian?	U	4	
	e)	Define base line and check line.	R	3	
	f)	State the function of break pin and horse hair in prismatic compass.	U	4	
Q.2		Attempt any FOUR :			16
	a)	Draw a neat sketch of prismatic compass and label the parts.	U	4	
	b)	Explain the method of chaining on sloping ground.	U	2	
	c)	Convert the following whole circle bearing into reduced bearing. i) $323^{\circ} 00'$ ii) $47^{\circ} 00'$ iii) $179^{\circ} 00'$ iv) $238^{\circ} 00'$	A	4	
	d)	Explain in detail principles of surveying.	R	1	
	e)	Write step wise procedure of temporary adjustment of prismatic compass.	R	4	
	f)	Differentiate between direct ranging and indirect ranging.	U	2	
Q.3		Attempt any FOUR :			16
	a)	What is the principle of optical square? Explain in detail.	U	3	
	b)	Enlist any two instrumental errors and two observational errors in compass surveying. Explain each in brief.	U	4	
	c)	A 20m chain was found to be 6cm too long after chaining 300m. It was found to be 14cm too long after chaining 500m. If the chain was correct before commencement of the work. Find the true distance.	A	2	

P.T.O.

	d)	Enlist the types of obstacles in chaining and explain any one with neat sketch.	U	3											
	e)	The following four bearings were observed in running a compass traverse. Find back bearings and interior angles of the traverse. Apply check. <table><tr><td>Line</td><td>F.B.</td></tr><tr><td>PQ</td><td>$50^{\circ} 30'$</td></tr><tr><td>QR</td><td>$120^{\circ} 15'$</td></tr><tr><td>RS</td><td>$183^{\circ} 00'$</td></tr><tr><td>SP</td><td>$292^{\circ} 45'$</td></tr></table>	Line	F.B.	PQ	$50^{\circ} 30'$	QR	$120^{\circ} 15'$	RS	$183^{\circ} 00'$	SP	$292^{\circ} 45'$	A	4	
Line	F.B.														
PQ	$50^{\circ} 30'$														
QR	$120^{\circ} 15'$														
RS	$183^{\circ} 00'$														
SP	$292^{\circ} 45'$														
	f)	Plot the following cross staff survey of a field and calculate the area.	A	3											
															
Q.4		Attempt any FOUR :			08										
	a)	Define datum surface.	R	5											
	b)	Define change point.	R	5											
	c)	Distinguish between Back Sight and Fore Sight .	U	5											
	d)	State the factors governing contour interval.	U	6											
	e)	Write the steps involved in calculating area by digital planimeter.	R	7											
	f)	The reading taken with polar planimeter is 6.534. From which part this reading is taken?	U	7											
Q.5		Attempt any TWO :			16										
	a)	i) Explain temporary adjustments of a dumpy level. ii) What are the advantages of auto level?	R U	5 5											

b)	The following consecutive readings was taken with a level and a staff. 1.230, 1.765, 2.360, 3.010, 3.570, 1.125, 2.835, 1.950, 2.225, 1.460. The level was shifted after the fifth and eight readings. The first reading was taken on a B.M. of RL 160.00m. Calculate R.L.'s of all the points.	A	5																																																																								
c)	The following is the page of a level field book. Fill in the missing readings (marked by 'X') and calculate the R.L.'s of all the points. Apply usual checks. <table><tr><th>Station</th><th>BS</th><th>IS</th><th>FS</th><th>Rise</th><th>Fall</th><th>R.L.</th><th>Remarks</th></tr><tr><td>1</td><td>2.150</td><td></td><td></td><td></td><td></td><td>101.000</td><td>B.M.</td></tr><tr><td>2</td><td>1.645</td><td></td><td>X</td><td>0.500</td><td></td><td></td><td>CPI</td></tr><tr><td>3</td><td></td><td>2.345</td><td></td><td></td><td>X</td><td></td><td></td></tr><tr><td>4</td><td>X</td><td></td><td>1.965</td><td>X</td><td></td><td></td><td>CP2</td></tr><tr><td>5</td><td>2.050</td><td></td><td>1.825</td><td></td><td>0.400</td><td></td><td>CP3</td></tr><tr><td>6</td><td></td><td>X</td><td></td><td>X</td><td></td><td>101.500</td><td></td></tr><tr><td>7</td><td>1.690</td><td></td><td>X</td><td>0.120</td><td></td><td></td><td>CP4</td></tr><tr><td>8</td><td></td><td></td><td>2.100</td><td></td><td>X</td><td></td><td></td></tr></table>	Station	BS	IS	FS	Rise	Fall	R.L.	Remarks	1	2.150					101.000	B.M.	2	1.645		X	0.500			CPI	3		2.345			X			4	X		1.965	X			CP2	5	2.050		1.825		0.400		CP3	6		X		X		101.500		7	1.690		X	0.120			CP4	8			2.100		X			A	5
Station	BS	IS	FS	Rise	Fall	R.L.	Remarks																																																																				
1	2.150					101.000	B.M.																																																																				
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8			2.100		X																																																																						
Q.6	Attempt any FOUR :		16																																																																								
a)	Explain profile leveling.	R	5																																																																								
b)	Describe characteristics of contours.	R	6																																																																								
c)	Write uses of contour maps.	R	6																																																																								
d)	State the methods of interpolation of contours. Explain any one in brief.	R	6																																																																								
e)	State the sources of errors in leveling.	R	5																																																																								
f)	The following readings were obtained when the perimeter of the figure was traversed clockwise with the anchor point outside and with the tracing arm set to natural scale (M = 100 sq.cm.) the zero mark of the disc passed the index mark once in positive direction : IR = 8.564 FR = 2.157 Calculate area of the figure.																																																																										

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EXAM SEAT NO.

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LEVEL: **FIFTH**

COURSE CODE: **CEE506/CE401**

MAX. MARKS: **80**

PROGRAM: **CIVIL ENGINEERING**

COURSE NAME: **IRRIGATION ENGINEERING**

TIME: **3 HRS.**

DATE: **30/11/2018**

Instruction:-

- 1) Answer to two sections must be written in separate section answer book provided.
- 2) Figure to the right indicates 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.

Section – I

Marks

Q.1 Attempt any **FOUR**

(08)

- a) Define irrigation.
- b) Define rainfall.
- c) Enlist the various methods to improve the duty.
- d) What is crop season?
- e) What is lift irrigation?
- f) What is Kolhapur type weir?

Q.2 Attempt any **FOUR**

(16)

- a) State necessity of irrigation in India.
- b) Explain any four factors affecting run off.
- c) State various cropping pattern season & crops in Maharashtra.
- d) Define i) Gross command area (GCA).
ii) Culturable command area (CCA).
- e) Draw a layout of a Bandhara irrigation scheme showing different components.

- f) State necessity of percolation tank in Maharashtra.

Q.3 Attempt any **FOUR**

(16)

- a) State the advantages of irrigation projects.
- b) Define run off. State the factors affecting run off.
- c) Derive relation between duty, delta, & base period.
- d) What are the advantages & disadvantages of well irrigation?
- e) State the considerations for the selection of site for bandhara.
- f) Write down any four limitations of well irrigation.

P.T.O

Q.4 Attempt any **FOUR****(08)**

- State the purpose of providing galleries in gravity dam.
- Write any two functions of outlet through dams.
- State the purpose of spillways in dam.
- Enlist any four types of canal lining.
- What do you meant by cross drainage work?
- Enlist the classification of canals based on alignment.

Q.5 Attempt any **FOUR****(16)**

- Explain the term ‘Reservoir sedimentation’ with any four different methods used to reduce the entry of slit in the reservoir.
- Fix the F.R.L, HFL & TBL from following data-
 - DSL -100 m
 - Effective live storage level =7000 m³
 - Tank losses -1200 m³
 - Max. Flood discharge =400 m³/sec.
 - Francis formula = $Q=1.8 LH^{3/2}$
 - Free board =150 m.

Contour (R.L.)	100	102	104	106	108	110
Capacity (m ³)	2000	5000	6000	8000	10000	12000

- Write the forces acting on gravity dam with their direction, action and level by giving a suitable sketch.
- Draw a section of earthen dam commonly adopted and label the important components on it.
- Explain with a neat labelled sketch i) Aquaduct ii) Superpassage
- State any four causes of waterlogging and suggest any four common methods adopted for preventing waterlogging.

Q.6 Attempt any **FOUR****(16)**

- Draw a neat sketch of area capacity curve & state its significance.
- Differentiate between theoretical and practical profile of a gravity dam.
- What is the function of an energy dissipater? Where it is located? What will happen if it is omitted?
- State the factors governing the selection of suitable cross drainage work.
- Draw a typical cross section of canal in fully cutting.
- Explain any one type of canal outlet with a neat labelled sketch.

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ODD TERM END EXAM NOV./DEC-2018**EXAM SEAT NO.**

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LEVEL :- FIRST PROGRAM : CE/ME/SM/MT**COURSE CODE :- CCF108/R110/CCE108/X107****COURSE NAME :- ENGINEERING DRAWING - II****MAX. MARKS : 80 TIME : 4 HRS. DATE :- 30/ 11 / 2018****Instruction :-**

- 1) Answers must be written in the main answer book provided.(and supplements if required)
- 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	S Q N	Question Text	R/ U/ A	Co CCF 108	Ma rks
Q.1		Attempt any ONE :			16
	a)	Fig. I shows a pictorial view of an C.I. bracket. Draw to scale full size, the following views by using first angle method of projection. Insert important dimensions. i) An elevation in the direction of X.----- 06 marks ii) Plan and ----- 06 marks iii) End view from left ----04 marks	U	1	
	b)	Fig. II shows pictorial view of an object. Draw following views i) Front view looking in direction X ---06 marks ii) Side view in the direction Y. ----06 marks. iii) Top view. ---4 marks. Insert suitable dimensions.	U	1	
Q.2		Attempt any ONE :			16
	a)	Fig. III shows isometric view of a machine component from following views. i) Sectional front view looking in direction X. ---08 marks (section A-A) ii) Sectional left hand side view (section B-B) – 08 marks	U	2	
	b)	Fig IV shows a pictorial view of an object. Draw to scale full size the following views, by using first angle method of projection. i) An elevation in the direction of arrow X .---06 marks ii) Plan and ---04 marks. iii) Sectional end view, section along A-A ---06 marks.	U	2	
Q.3		Draw proportionate free hand sketches for the following (any FOUR) i) Acme thread ii) Ring Nut. (2 views) iii) Castle Nut (2 views) iv) Lewis foundation bolt. v) Single rivetted (Double strap) butt joint. vi) Internal thread (2 views)	U	3	08

P.T.O 1/7

Q.4	Attempt any TWO :			08
	a) Fig. 5 shows F.V. & S.V. Draw the missing view using first angle method.	U	4	
	b) Using first angle method, draw the T.V. of an object shown in Fig.6.	U	4	
	c) Fig.7 shows F.V. & S.V. of angle. Draw the missing view of the angle.	U	4	
Q.5	Attempt any ONE :			16
	a) Fig. 8 shows F.V. and S.V. of an object. Draw isometric view of an object using natural scale.	A	5	
	b) Fig. 9 shows F.V. & T.V. of an object. Draw isometric view of an object using natural scale.	A	5	
Q.6	Attempt any TWO			16
	a) Develop the lateral surface of funnel as shown in Fig.11	A	6	
	b) Fig. 12 shows a projections of a pentagonal prism with a partial hole as indicated. Draw the development of prism with hole in it.	A	6	
	c) A right circular cone with base diameter 50mm and height 60mm is standing on its base on H.P. It is cut by a section plane as shown in Fig.10. Draw the development of the lateral surface 'P' of cone. Open the cone from 'O'.	A	5	

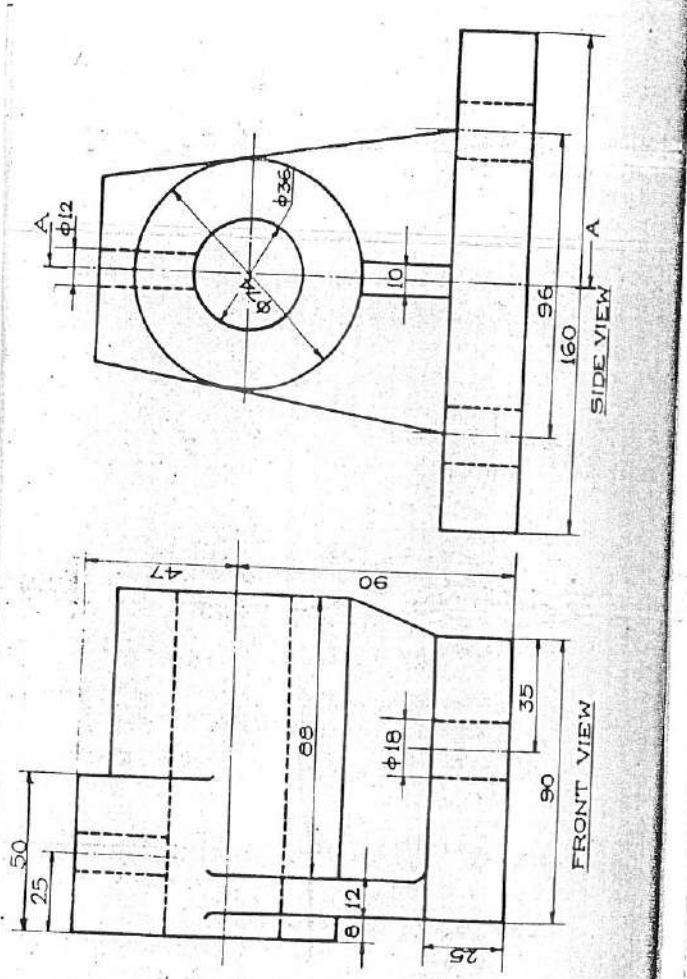


Fig. 5
Q-4(a)

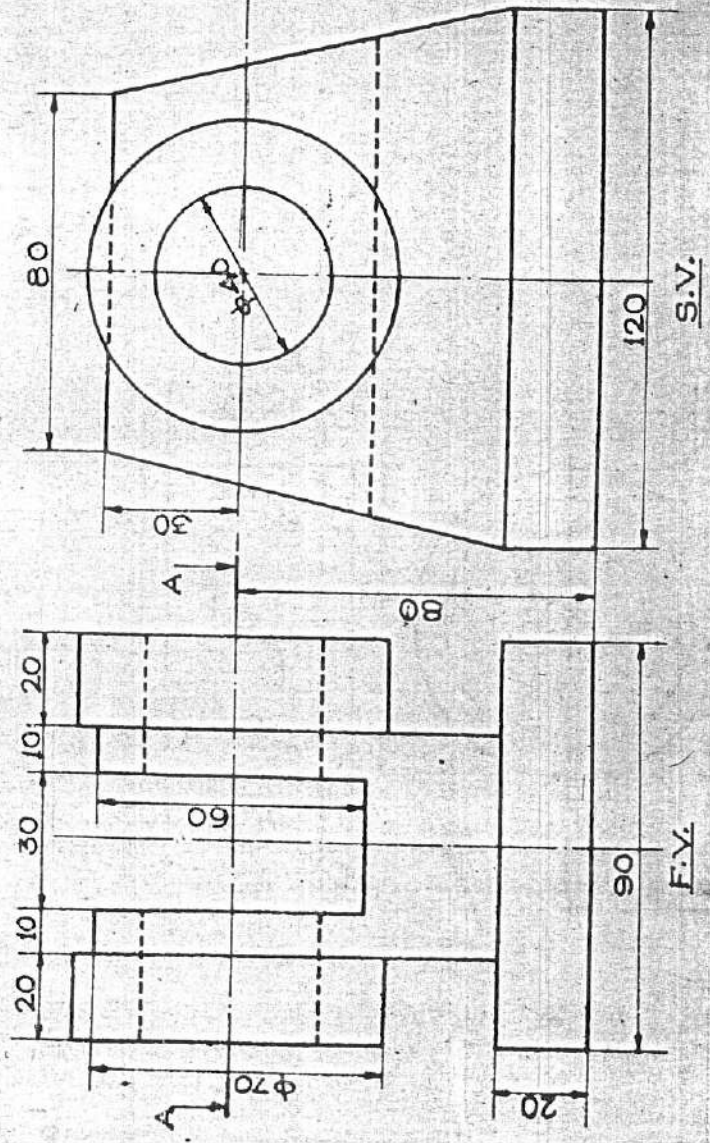


Fig. 6
Q-4(b)

S
Q
N

Question text

Cogni-
tion
Level
RA/UA

CO Code

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out of

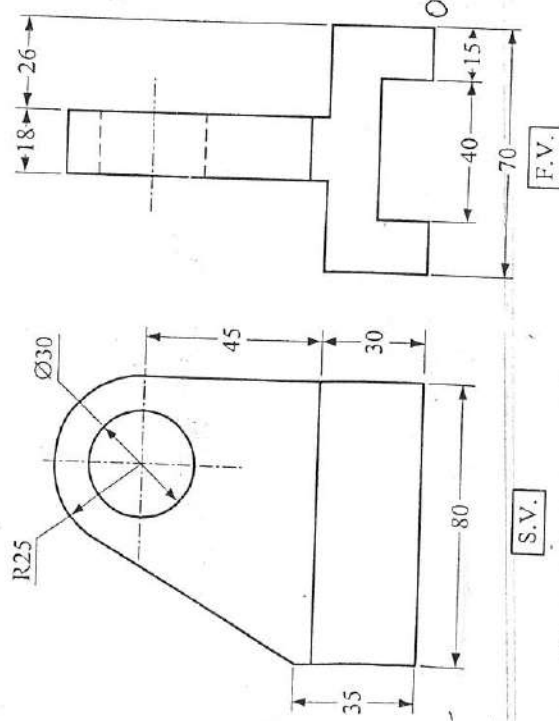


Fig. 8 Q-5 (a)

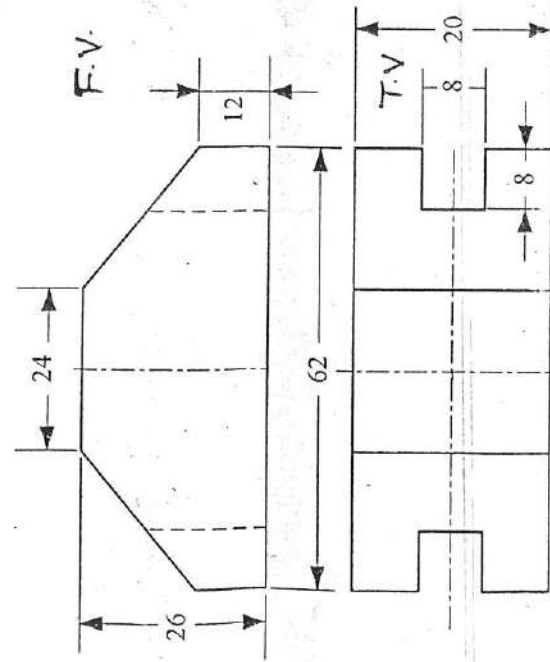


Fig. 9
Q-5 (b)

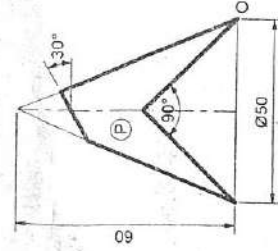


Fig. 10 Q-6 (c)

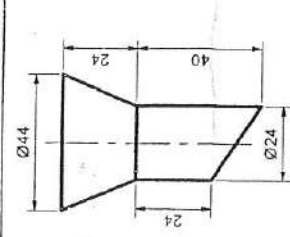


Fig-11 Q-6 (a)

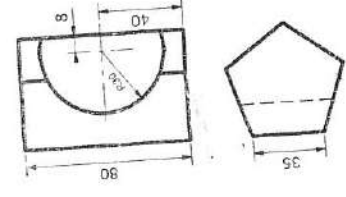


Fig.12 Q-6 (b)

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ODD TERM END EXAM NOV/DEC -2018**EXAM SEAT NO.**

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LEVEL: THIRD**PROGRAM: CIVIL ENGINEERING****COURSE CODE: CEF306/CE304/CEE306****COURSE NAME: HYDRAULICS****MAX. MARKS: 80****TIME: 3 HRS.****DATE: 29/11/2018****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

QN	S. Q. N	Question Text	Cognition Level R/U/A	Co Code CEF 306	Marks
Q.1		Attempt any FOUR			(08)
	a)	Define term specific volume ? State its unit.	R	1	
	b)	State meaning of Capillarity ?	R	1	
	c)	Draw the pressure diagram for water stored in Dam.	U	2	
	d)	What is atmospheric Pressure ? State its value.	R	2	
	e)	Write the meaning of Piezometer.	R/U	3	
	f)	Define term Pressure flow ? Give an example.	R	4	
Q.2		Attempt any FOUR			(16)
	a)	A sphere of radius 0.5m is filled with mercury. Find it's specific weight.	U/A	1	
	b)	What is absolute pressure & gauge pressure ? What is relation between absolute, gauge and atmospheric pressure.	R/U	2	
	c)	Find the magnitude of resultant force exerted upon the side of a box tank. Which is 50 cm square & 1m deep. The tank is filled $\frac{1}{2}$ full with liquid having specific gravity 2, while remaining is filled with liquid of specific gravity 1.	A	2	
	d)	Determine the pressure in kN/m^2 at the depth of 2 m below the free surface of mercury filled tank.	A	2	
	e)	Enlist different types of manometers used to measure pressure. Draw sketch of any two.	U	3	
	f)	A rectangular tank of (3x5)m is filled $\frac{1}{4}$ by a liquid of specific gravity 0.8 & remaining $\frac{3}{4}$ with water. Find the pressure acting at bottom of the tank.	A	3	

P.T.O.

Q.3	Attempt any FOUR			(16)
a)	An isosceles triangular plate of base 3 m & altitude 3 m is immersed in an oil of specific gravity 0.8 with base touching to oil surface & plate is held vertical. Determine the total pressure & centre of pressure of the plate.	A	3	
b)	A hollow circular plate of 2 m external and 1 m internal diameter is immersed vertically in water such that the centre of the plate is 4 m deep from the water surface. Find the total pressure & depth of centre of pressure.	A	3	
c)	Define laminar, turbulent, gravity and unsteady flow.	R	4	
d)	State any four limitations of Bernoulli's Theorem.	U	4	
e)	The diameter of pipe changes from 20 cm at a section 5 m in above datum to 5 cm at a section 3 m below the Datum line. The pressure of water at first section is 50 N/m^2 . If the velocity of flow at the first section is 1 m/s, determine the intensity of pressure at second section.	A	4	
f)	Water is flowing through a pipe of 12 cm diameter with an average velocity of 10 m/s. What is the rate of discharge of the water ? Also determine the velocity at the other end of the pipe. If the diameter of the pipe is gradually changed to 18 cm.	A	4	
Q.4	Attempt any FOUR			(08)
a)	Enlist the component parts of centrifugal pump.	R	8	
b)	Define most economical channel section.	R	6	
c)	What is the use of Pitot tube.	R	7	
d)	State static head in case of centrifugal pump.	R	8	
e)	Explain the effect of water hammer in pipes.	U	5	
f)	Give the use of moody's chart.	R	5	
Q.5	Attempt any TWO			(16)
a)	i) Explain the priming of centrifugal pump. ii) A rectangular channel is 4 m deep and 6 m wide. Find the discharge through channel, when it runs full. Take steps of the channel bed as 1 in 1000 and Chezy's constant as 50.	U	8	
b)	i) Determine the discharge through a 60° triangular notch on liter per second when the head of water over the apex of notch is 0.16 m. Take $C_d=0.6$. ii) The head of water over the center of an circular orifice is 1 m, and diameter of orifice is 0.02m. The actual discharge through the orifice is 0.85 liters/sec. Find the coefficient of discharge.	A	7	
		A	7	

c)	i) A 100 mm diameter pipeline suddenly enlarged to 200 mm diameter. Calculate the discharge if the loss of head is 300 mm of water due to sudden enlargement of pipeline. ii) A compound pipe line 2000 m long is made up of 500 mm diameter for first 500 mts long and 380 mm diameter for next 800 mts long and 300 mm diameter for remaining 700 m long; is required to be replaced by a pipe of uniform diameter. Find the diameter of new uniform pipe.	A	5	
Q.6	Attempt any TWO			(16)
a)	A venturimeter is installed in a pipe line 300 mm diameter. The difference of pressure at entrance and throat read by mercury manometer is 0.05 mts. When water flows at the rate of $0.05 \text{ m}^3/\text{sec}$. If the discharge coefficient of venturimeter is 0.96; determine the diameter at the throat of the venturimeter.	A	7	
b)	Three pipes having the same length and same frictional losses have different diameters as 0.27 mts, 0.12 mts, and 0.03 mts, respectively. When all these three pipelines are connected in parallel gives a total discharge of $0.55 \text{ m}^3/\text{sec}$. Find the discharge in each pipe line.	A	5	
c)	A rectangular channel section has a cross section of 50 m^2. Determine the discharge through the most economical channel section if the bed slope is 1 in 1000. Take Chezy's constant $C=52.5$.	A	6	

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ODD TERM END EXAM NOV./DEC-2018**EXAM SEAT NO.**

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LEVEL :- THIRD PROGRAM : CIVIL ENGINEERING**COURSE CODE :- CEF310/CE208/CEE310****COURSE NAME :- TRANSPORTATION ENGINEERING****MAX. MARKS : 80 TIME : 3 HRS. DATE :- 28/11/2018****Instruction :-**

- 1) Answers must be written in the main answer book provided.(and supplements if required)
- 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	S	Question Text	R/ U/ A	Co CEF 310	Mar ks
Q.1		Attempt any FOUR :			08
	a)	What do you mean by traffic volume study?	R	1	
	b)	Define camber.	R	2	
	c)	Define superelevation.	R	2	
	d)	Explain surface dressing?	R	3	
	e)	State the necessity of tunnels?	R	4	
	f)	state the purpose of shaft?	R	5	
Q.2		Attempt any FOUR :			16
	a)	Classify the roads according to location.	U	1	
	b)	Draw cross section of road in cutting label all the component parts.	A	2	
	c)	Explain construction procedure for bituminous bound macadam.	U	3	
	d)	Define gradient. Explain its various types in brief with IRC values.	U	2	
	e)	Compare Rigid pavements with flexible pavements.	U	3	
	f)	Explain full face heating method of tunneling with neat sketch.	A	6	
Q.3		Attempt any FOUR :			16
	a)	Explain tunneling in hard rock.	U	6	
	b)	Explain procedure for setting out the alignment of tunnel on the ground.	U	5	
	c)	List various shapes of tunnels. Explain any one of them with neat sketch.	A	4	
	d)	What are the advantages and disadvantages of concrete roads?	U	3	
	e)	Explain expansion joint with neat sketch.	A	3	
	f)	Explain i) Stopping sight distance. ii) Passing sight distance with neat sketch.	A	2	

P.T.O.

Q.4	Attempt any FOUR :			08
	a) Define gauge of railway track.		R	7
	b) State any two requirements of ideal permanent way.		U	7
	c) Define points and crossings.		R	8
	d) Define station.		R	9
	e) Enlist the types of bridge alignment.		R	10
	f) Define Afflux.		R	11
Q.5	Attempt any FOUR :			16
	a) Draw a sketch of any two types of rail fixtures and fastening.	R	7	
	b) State any eight requirements of ideal sleeper.	R	7	
	c) Draw a neat sketch of right hand turnout split switch.	U	8	
	d) Enlist any eight factors affecting site selection of railway station.	R	9	
	e) Explain the term i) Substructure of bridge. ii) Superstructure of bridge.	A	11	
	f) Define causeway and explain two situations where causeways are provided.	A	12	
Q.6	Attempt any FOUR :			16
	a) State the four types of materials used as a ballast with their any two merits and any two demerits.	R	7	
	b) Define sleeper density. State the factors on which it depends.	R	7	
	c) State the necessity of points and crossing.	U	8	
	d) State the main requirement of locomotive yard.	U	9	
	e) Explain meaning and suitability of i) Fixed bearing ii) Expansion bearing.	A	11	
	f) Compare RCC bridges with steel bridges with respect of following points. i) Construction ii) Maintenance.	A	12	

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EXAM SEAT NO.

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LEVEL: FIRST

PROGRAM: COMMON

COURSE CODE: CCF106/CCE106/0108/X110/R108 COURSE NAME: ENGINEERING MATHEMATICS

MAX. MARKS: 80

TIME: 3 HRS.

DATE: 29/11/2018

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	S	Question Text	R U A	CO CCF 106	Marks
Q.1		Attempt any FOUR			(08)
	a)	Find the value of k if the slope of line passing through the points (-6,8) and (k, 2) is $-5/4$.	R / U	1	
	b)	Find the equation of circle whose center is as (-1, 2) and radius 5.	R / U	1	
	c)	If (0, 3) is centroid of a triangle whose vertices are (2, 5), (h, 6) and (2, k). Find h, k.	R / U	1	
	d)	Find the area of a triangle whose vertices are (0, 0), (3, 3) and (3, -15).	R / U	1	
	e)	Show that the root of equation $x^3 - 6x + 3 = 0$ lies between 2 and 3.	R / U	2	
	f)	Use Jacobi's method to solve (1 st iteration only) $15x + 2y + z = 18$, $2x + 20y - 3z = 19$, $3x - 6y + 25z = 22$	A	2	
Q.2		Attempt any FOUR			(16)
	a)	Find the equation of a line through (4, -2) and parallel to the line $x-3y-12=0$.	U / A	1	
	b)	Find the equation of a line which passes through the point (2, -3) and the point of inter section of the lines $x+y+4=0$ and $3x-y-8=0$	U / A	1	
	c)	Find the equation of a line making equal intercepts of opposite signs on the axes of coordinates and passes through the point (4, 3).	U / A	1	
	d)	Find the equation of circle which passes through points (-2, -1) (2, 3) and whose center lies on the line $2x+y+1=0$.	U / A	1	
	e)	Show that the circles $x^2 + y^2 - 6x - 2y + 1 = 0$ and $x^2 + y^2 + 2x - 8y + 13 = 0$ touch each other.	A	1	
	f)	PQ is a diameter of circle with center (5, -2) and Q is (3,-8). Find P and diameter form of equation of circle.	U / A	1	
Q.3		Attempt any FOUR			(16)
	a)	Using Bisection method find the approximate root of $xe^x = 1$ (3 iterations).	A	2	
	b)	Find $\sqrt[3]{21}$ by using Regula-Falsi method (3 iterations)	A	2	
	c)	Using Regula -Falsi method solve $x^2 + x - 3 = 0$ (3 iterations)	A	2	
	d)	Solve by Jacobi's method (upto three iterations) $20x + y - 2z = 17$, $2x - 3y + 20z = 25$, $3x + 20y - z = -18$	A	2	

P.T.O

	c)	Solve the system using Gauss-Seidel method upto two iterations $10x + 2y + z = 9, 2x + 20y - 2z = -44, -2x + 3y + 10z = 22$	A	2	
	f)	Solve using Gauss-Seidel method $8x + 2y + 3z = 30, x + 9y + 2z = 1, 2x + 3y + 6z = 31$ (Two iterations)	A	2	
Q.4		Attempt any FOUR			(08)
	a)	Show that $f(x) = x^3 + 3\sin x + x$ is an odd function.	R / U	3	
	b)	Evaluate $\lim_{x \rightarrow 3} \frac{x^3 - 27}{x - 3}$	R / U	3	
	c)	Evaluate $\lim_{x \rightarrow 0} \frac{1 - \cos 2x}{x^2}$	R / U	3	
	d)	Find $\frac{dy}{dx}$ if $y = e^{4x} \cdot \sin 3x$	R / U	4	
	e)	Find $\frac{dy}{dx}$ if $y = \sqrt{x^2 + a^2}$	R / U	4	
	f)	If $f(x) = \frac{x^2 + 2x + 5}{x^3 + 8}$ then find $f(1) + f(-1)$	R / U	3	
Q.5		Attempt any FOUR			(16)
	a)	If $f(x) = \frac{x+3}{4x-5}$ and $t = \frac{3+5x}{4x-1}$ then show that $f(t) = x$	U / A	3	
	b)	Evaluate $\lim_{x \rightarrow 5} \frac{x^2 - 25}{\sqrt{6x-5} - \sqrt{4x+5}}$	U	3	
	c)	Evaluate $\lim_{x \rightarrow \pi/3} \frac{\sqrt{3} - \tan x}{\pi - 3x}$	U	3	
	d)	If $y = \tan^{-1} \left[\frac{a+b\cos x}{b-a\cos x} \right]$ find $\frac{dy}{dx}$	U / A	4	
	e)	If $xy = \sin(x+y)$ find $\frac{dy}{dx}$	U / A	4	
	f)	Find the equation of tangent and normal to the curve $y = x^3 - 2x^2 + 4$ at $(2, 4)$	A	4	
Q.6		Attempt any FOUR			(16)
	a)	If $y = e^{m \cos^{-1} x}$ show that $(1-x^2) \frac{d^2 y}{dx^2} - x \frac{dy}{dx} - m^2 y = 0$	U / A	4	
	b)	If $x = a(\theta + \sin \theta)$ and $y = a(1 - \cos \theta)$ find $\frac{dy}{dx}$ at $\theta = \pi/2$	U / A	4	
	c)	Find the maximum and minimum value of $x^3 - 6x^2 + 9x - 2$	A	4	
	d)	If $y = \sin^{-1} \left[\frac{5 \sin x + 4 \cos x}{\sqrt{41}} \right]$ find $\frac{dy}{dx}$	U / A	4	
	e)	If $y = (\log x)^{\sin x}$ find $\frac{dy}{dx}$	U / A	4	
	f)	Find $\frac{dy}{dx}$ if $x^2 + y^2 + 6x - 4y + 10 = 0$	U / A	4	

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EXAM SEAT NO.

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LEVEL :- FIFTH

PROGRAM : CIVIL ENGINEERING

COURSE CODE :- CEE501/CE406

COURSE NAME :- CONTRACTS AND ACCOUNTS

MAX. MARKS : 80 TIME : 3 HRS. DATE :- 29 / 11/ 2018

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	S Q N	Section-I	Ma rks
Q.1		Attempt any FOUR :	08
	a)	Enlist various methods of execution of construction work in government organization.	
	b)	Enlist various class of contractors.	
	c)	Define security deposit.	
	d)	Differentiate between local and global tender(any two points)	
	e)	Enlist documents required for registration of contractor.	
	f)	What do you mean by 'Escalation of cost'?	
Q.2		Attempt any FOUR :	16
	a)	Enlist departmental methods of execution of work and explain any one with its suitability.	
	b)	Enlist various types of contracts and explain any one with respect to its meaning, suitability and advantage.	
	c)	Define Arbitration and explain its need.	
	d)	Mention check list of points observed by contractor before submitting tender.	
	e)	Draft a tender notice for construction of recreation hall at Kolhapur. Estimated cost construction is Rs.4.5 cror and time limit is 1.0 year (including Manson period). Assume suitable data if necessary and mention it clearly before starting the tender draft.	
	f)	Explain BOT as method of contract with respect to its concept, advantage and one suitable example.	
Q.3		Attempt any FOUR :	16
	a)	Enlist duties and responsibilities of junior engineer of PWD.	
	b)	Enlist and explain the essentials of valid contract.	
	c)	Explain unbalanced Bid with respect to its concept, its effect on costing and one suitable example.	
	d)	Describe in brief i) Liquidated damage. ii) Defect liability period.	
	e)	Explain two envelop method of bidding with respect to its concept and need.	
	f)	Give the classification of work as per P.W.D. and explain in brief.	

P.T.O.

QN	SQN	Section- II	Marks
Q.4		Attempt any FOUR :	08
	a)	State the meaning of term 'Financial Management'.	
	b)	Define 'Accounting'.	
	c)	What do you mean by 'Daily diary'?	
	d)	Define i) Salvage value ii) Market value.	
	e)	What is 'first and final payment'?	
	f)	Define 'sinking fund'.	
Q.5		Attempt any FOUR :	16
	a)	Enlist the various functions of financial management and explain any one in brief.	
	b)	What is mean by 'Budget'? Enlist the various types of budget and explain in brief 'operating budget'.	
	c)	Explain in brief i) Muster Roll ii) Measurement book.	
	d)	State and explain the factors affecting 'Valuation of building'.	
	e)	Enlist the methods of calculating depreciation and explain in brief 'constant percentage method'.	
	f)	Define valuation and write any six purposes of valuation of property.	
Q.6		Attempt any FOUR :	16
	a)	List out various types of Taxes in India and explain Capital Gains Tax and Gift Tax in brief.	
	b)	Write the meaning and situation where following payments are made to contractor. I) Secured Advance ii) Mobilization Advance	
	c)	Enlist the various modes of payments to contractor and explain in brief 'Running Account Bills'.	
	d)	Define the terms:- i) Book value ii) Speculative value iii) distress value iv) Sentimental value.	
	e)	State the difference between depreciation and obsolescence.	
	f)	The building was purchased for rupees 6.3 lakhs. Assume life of building 65 years. Calculate the depreciated cost of it, after 16 years. Assume salvage value is 10% of purchase cost. Use straight line method of depreciation.	

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ODD TERM END EXAM NOV/DEC -2018**EXAM SEAT NO.**

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LEVEL: FIRST**PROGRAM: CE/ME****COURSE CODE: CCF101/CCE101/X102 COURSE NAME: ENGINEERING PHYSICS****MAX. MARKS: 80****TIME: 3 HRS.****DATE: 28/11/2018**

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	S Q N	Question Text	R U A	CO CCF101	Marks
Q.1		Attempt any FOUR			(08)
	a)	State Stoke's law of viscosity.	R	1	
	b)	State & explain Hook's law of elasticity.	U	1	
	c)	Define density & compressibility of liquid.	R	1	
	d)	Define capillary action. Given one example.	R	1	
	e)	Define deforming force & restoring force.	R	1	
	f)	Define nanometer & nano particle.	R	3	
Q.2		Attempt any FOUR			(16)
	a)	Define Yong's modulus, Bulk modulus & Modulus of rigidity. Give relation between them.	R	1	
	b)	Define angle of contact. Explain significance of angle of contact.	U	1	
	c)	Give any four points of distinction between longitudinal waves & transverse waves.	U	2	
	d)	State Newton's law of viscosity & hence define coefficient of viscosity. Give its SI unit.	R	1	
	e)	Define the terms- i) Free oscillations. ii) Forced oscillations. iii) Resonance. iv) Periodic motion.	R	2	
	f)	State the applications of nanotechnology in electronics & automobiles (each two)	R	3	
Q.3		Attempt any FOUR			(16)
	a)	Define surface tension. State the effect of temperature & impurities on surface tension.	U	1	
	b)	Derive the expression for coefficient of viscosity using Stokes's method.	A	1	
	c)	Explain the molecular theory of surface tension.	U	1	
	d)	A wire of diameter 1.8mm and length 3m extends by 1.5mm by applying a force of 15N. Find Young's modulus.	A	1	
	e)	State the applications of nanotechnology in medical field.(any four points)	R	3	
P.T.O					

	f) Define the terms. i) Frequency ii) Periodic time iii) Phase iv) Wavelength	R	2	
Q.4	Attempt any FOUR			(08)
	a) State any two laws of refraction of light.	R	4	
	b) Derive SI unit of specific resistance.	A	4	
	c) Write Plank-Einstein equation with meanings of symbols used.	R	5	
	d) State any two applications of photoelectric effect.	R	5	
	e) Explain two properties of laser.	U	5	
	f) State any two applications of X-rays.	R	5	
Q.5	Attempt any FOUR			(16)
	a) Draw neat ray diagrams for i) Refraction of light through prism. ii) Dispersion of white light through prism.	R	4	
	b) Derive balancing condition of Whetstone's network. Draw necessary circuit diagram.	A	4	
	c) i) State and explain Ohm's law. ii) Define resistance and state its SI unit.	R	4	
	d) A light of wavelength $3400 \times 10^{-10} \text{ m}$ is incident on a metal plate having threshold wavelength as $4500 \times 10^{-10} \text{ m}$. Find Kinetic energy of emitted photoelectron if $h = 6.625 \times 10^{-34} \text{ Js}$ and $c = 3 \times 10^8 \text{ m/s}$.	A	5	
	e) Explain population inversion in case of laser.	U	5	
	f) Define reverberation and reverberation time. Write Sabine's formula with meanings of symbols used.	R	6	
Q.6	Attempt any FOUR			(16)
	a) Write any four characteristics of photoelectric effect.	R	5	
	b) Distinguish between spontaneous emission and stimulated emission (any four points.)	U	5	
	c) With the help of a neat diagram, explain construction of X-ray Coolidge tube.	U	5	
	d) The total surface area in a hall is 2000 m^2 and coefficient of absorption is 0.27 OWU. Find reverberation time if volume of hall is 4000 m^3	A	6	
	e) State any four applications of ultrasonic waves.	R	6	
	f) The angles of minimum deviation of a prism for red and violet colours are 36° and 37° respectively. Calculate dispersive power of prism.	A	4	

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EXAM SEAT NO.

LEVEL :- THIRD PROGRAM : CIVIL ENGINEERING

COURSE CODE :- CEF309/CE205/CEE309

COURSE NAME :- SURVEYING - II

MAX. MARKS : 80 TIME : 3 HRS. DATE :- 27/11/2018

Instruction :-

- 1) Answers must be written in the main answer book provided.(and supplements if required)
- 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	S	Question Text	R/ U/ A	Co CEF 309	Mar ks																								
Q.1		Attempt any FOUR :			08																								
	a)	Define Transiting the telescope.	R	1																									
	b)	State desired relationship in between fundamental axis of Theodolite.	R	1																									
	c)	Define Independent co-ordinate.	R	1																									
	d)	State the tachometric constant and their usual values.	R	2																									
	e)	List out various instruments used in tachometric survey.	R	2																									
	f)	State the use of anallaetic lens.	R	2																									
Q.2		Attempt any FOUR :			16																								
	a)	Describe the procedure of measurement of horizontal angle using Theodolite	U	1																									
	b)	Find the length and bearing of line AB from the following detail. <table><tr><th>Point</th><th colspan="2">Co-ordinates</th></tr><tr><td></td><th>N</th><th>E</th></tr><tr><td>A</td><td>975.50</td><td>830.20</td></tr><tr><td>B</td><td>1189.70</td><td>579.30</td></tr></table>	Point	Co-ordinates			N	E	A	975.50	830.20	B	1189.70	579.30	A	1													
Point	Co-ordinates																												
	N	E																											
A	975.50	830.20																											
B	1189.70	579.30																											
	c)	Explain In brief Horizontal circle (lower and upper plates)of the transit the Theodolite.	U	1																									
	d)	Explain the term “closing error” in case of Theodolite closed traverse.	U	1																									
	e)	The following data was obtained for a Theodolite closed traverse ABCDE A which was run in clockwise direction. <table><tr><th>Line</th><th>Length (m)</th><th>W.C.B.</th><th>Observed Interior angle</th></tr><tr><td>AB</td><td>186</td><td>30°25'</td><td><A=118°20'</td></tr><tr><td>BC</td><td>164</td><td></td><td><B=82°10'</td></tr><tr><td>CD</td><td>303</td><td></td><td><C=137°</td></tr><tr><td>DE</td><td>162</td><td></td><td><D=73°44'</td></tr><tr><td>EA</td><td>240</td><td></td><td><E=128°36'</td></tr></table> Calculate bearing of remaining sides.	Line	Length (m)	W.C.B.	Observed Interior angle	AB	186	30°25'	<A=118°20'	BC	164		<B=82°10'	CD	303		<C=137°	DE	162		<D=73°44'	EA	240		<E=128°36'	A	1	
Line	Length (m)	W.C.B.	Observed Interior angle																										
AB	186	30°25'	<A=118°20'																										
BC	164		<B=82°10'																										
CD	303		<C=137°																										
DE	162		<D=73°44'																										
EA	240		<E=128°36'																										

P.T.O.

f)	Calculate latitude, departure for following traverse ABCD															
	<table><tr><td>Line</td><td>Length (m)</td><td>W.C.B.</td></tr><tr><td>AB</td><td>248</td><td>30°</td></tr><tr><td>BC</td><td>320</td><td>140°</td></tr><tr><td>CD</td><td>180</td><td>210°</td></tr></table>	Line	Length (m)	W.C.B.	AB	248	30°	BC	320	140°	CD	180	210°			
Line	Length (m)	W.C.B.														
AB	248	30°														
BC	320	140°														
CD	180	210°														
Q.3	Attempt any FOUR :				16											
a)	Following readings were taken with a transit fitted with stadia hairs. The line of sight was kept horizontal and staff was held vertical <table><tr><td colspan="2">Reading on Staff (m)</td></tr><tr><td>Top Hair</td><td>0.875</td></tr><tr><td>Middle Hair</td><td>1.340</td></tr><tr><td>Bottom Hair</td><td>1.805</td></tr></table> Take K=100, C=0.20. Calculate horizontal distance between staff and instrument. Determine R.L. of staff station if R.L. of instrument station is 201.20m and height of instrument above ground is 1.51m.			Reading on Staff (m)		Top Hair	0.875	Middle Hair	1.340	Bottom Hair	1.805	A	2			
Reading on Staff (m)																
Top Hair	0.875															
Middle Hair	1.340															
Bottom Hair	1.805															
b)	State Bowditch rule and Transit Rule.			R	1											
c)	List the types of errors in Theodolite survey and state any two errors from each type.			A	1											
d)	Describe procedure of measurement of deflection angle using Theodolite.			U	1											
e)	Explain principle of Tachometry with neat sketch.			U	2											
f)	Following are distances of staff position from instrument station and corresponding staff intervals. Calculate tachometric constants. Assume suitable data. <table><tr><td>D(m)</td><td>20</td><td>500</td><td>100</td><td>120</td></tr><tr><td>S(m)</td><td>0.195</td><td>0.495</td><td>0.997</td><td>1.197</td></tr></table>			D(m)	20	500	100	120	S(m)	0.195	0.495	0.997	1.197	A	2	
D(m)	20	500	100	120												
S(m)	0.195	0.495	0.997	1.197												
Q.4	Attempt any FOUR :				08											
a)	Enlist the accessories required for plane table survey.			R	3											
b)	What is orientation in plane tabling?			U	3											
c)	State the different types of horizontal curves.			R	4											
d)	State meaning of Radial shooting.			U	5											
e)	Define the term 'Azimuth Mark' in relation to total station.			R	5											
f)	Define GPS system.			U	6											
Q.5	Attempt any FOUR :				16											
a)	State advantages and disadvantages of plane tabling.			R	3											
b)	Enlist the methods of plane tabling. Describe any one with sketch.			U	3											
c)	Draw a neat sketch of circular curve and show all notations thereon.			R	4											
d)	Define transition curve. Why and where are transition curves provided?			U	4											
e)	Enlist the component parts of digital level and describe the procedure of its setting.			R	5											
f)	Write the component parts of total station and describe its set up procedure.			A	5											

Q.6	Attempt any FOUR:		16
a)	Describe the procedure of setting up the plane table over a station.	U	3
b)	Describe how you would set a circular curve by the method of offsets from the long chord with the help of chain and tape.	A	4
c)	Write the procedure of measurement of vertical angle by digital Theodolite.	A	5
d)	What is total station? State its uses.	U	5
e)	Describe the advantages of remote sensing.	U	6
f)	Describe the process of remote sensing.	U	6

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ODD TERM END EXAM NOV/DEC -2018

EXAM SEAT NO.

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LEVEL: **FOUR**

PROGRAM: **CIVIL ENGINEERING**

COURSE CODE: **CEE404/CE303**

COURSE NAME: **ESTIMATING AND COSTING**

MAX. MARKS: **80**

TIME: **4 HRS.**

DATE: **28/11/2018**

Instruction:-

- 1) Answers must be written in the main answer book provided. (and supplements if required)
- 2) Figure to the right indicates 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.

	Marks (08)
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Q.1 Attempt any **FOUR**

- a) Define Check list
- b) What is District. Schedule of rates. (D.S.R.)
- c) Give the purpose of check list.
- d) Define approximate estimate.
- e) Define centage charges.
- f) State revised estimate.

Q.2 Attempt any **FOUR**

- a) Give the mode of measurement for the following items,
(i) Half brick work in partition, (ii) D.P.C., (iii) Woodwork in door frames,
(iv) R.C.C. in slab.
- b) Enlist any four purposes of approximate estimate.
- c) Explain service unit method of approximate estimate for buildings.
- d) Enlist any four data, required for preparing detailed estimate of buildings.
- e) Explain the provisions made for water supply and sanitary works and electrical works in the detailed estimation of Buildings.
- f) Explain bar bending schedule with tabular format.

Q.3 a) **Fig.1** shows plan of building and section of wall. Work out quantities of any **(16)**

four items with brief description of each item and enter them in standard measurement sheet.

- 1) Excavation in foundation.
- 2) U.C.R. masonry in foundation and plinth in cm 1:5.
- 3) R.C.C. in lintels over doors and windows. Take bearing of lintels into the walls as 15 cms on each side.
- 4) B.B masonry in super structure in c.m. 1:6.
- 5) P.C.C. bed 1:4:8 in foundation.
- 6) mosaic tile, flooring in all rooms.

P.T.O.

Q.4 Attempt any **FOUR** (08)

- Enlist types of specifications.
- Enlist points to be considered while framing specification.
- Define rate analysis.
- Give prismoidal formula along with meaning of abbreviations.
- Enlist methods of calculation of earth work quantity.
- Give the market rates for the following materials.
(i) Brick first class., (ii) A.C. sheet.

Q.5 Attempt any **FOUR** (16)

- Draft detailed specification for P.C.C. M-15 concrete.
- State factors affecting rate Analysis.
- Find out the materials required for the 10 cum RCC work 1:2:4 concrete excluding steel.
- Calculate the quantities of materials required for 25 m³ UCR masonry in CM 1:4.
- Describe in detail mid sectional area method.
- Calculate the quantities of materials required for 20 m³ Burnt Brick masonry for compound wall.

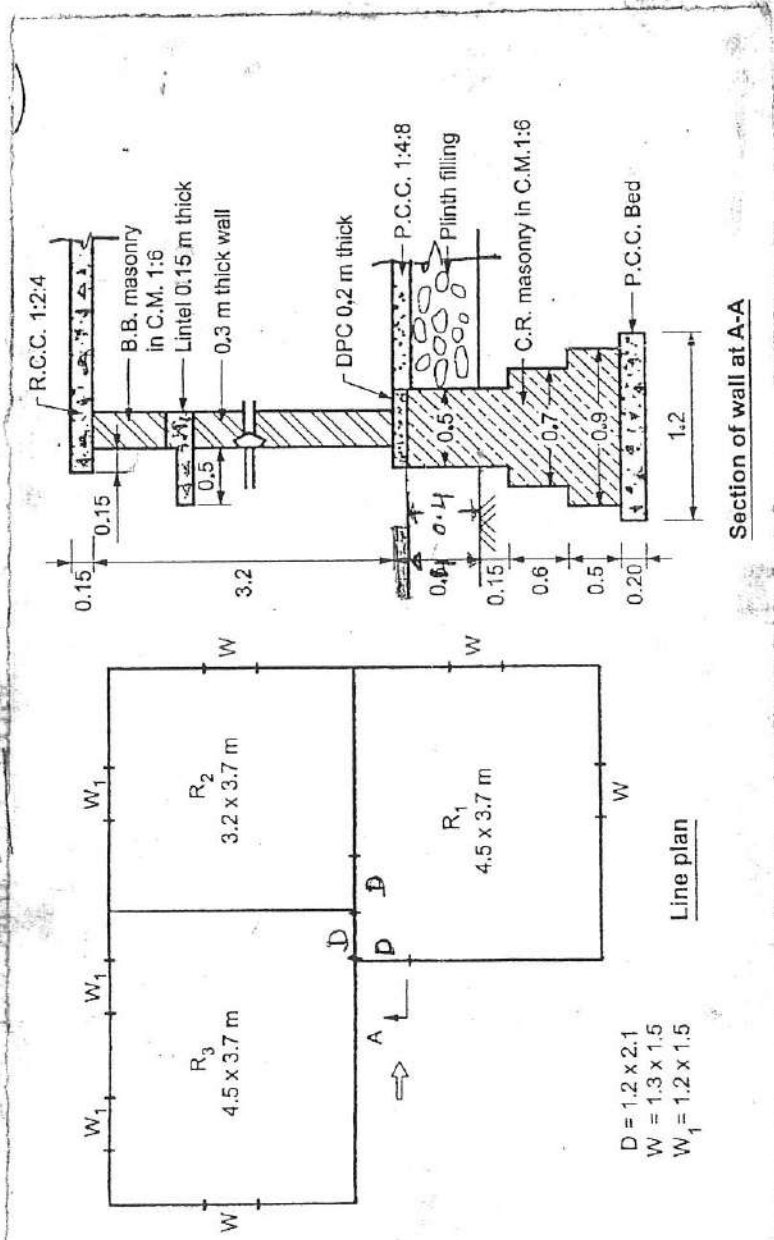
Q.6 Attempt any **TWO** (16)

- Draft detailed specification for 12 mm thick cement plaster (1:5) on B.B. masonry.
- Prepare rate analysis for 12 mm thick plaster in CM 1:4 in superstructure.
- Calculate the quantities of earth work in cutting and banking for a portion of road for 120 m length with following data.

Chainage (m)	0	20	40	50	80	100	120
Ground level (m)	161.5	160.95	160.55	161.55	161.85	162.95	162.35
Formation width of road is 11m, formation level at starting chain age is 161.6 m. The road surface shall be given a rising gradient of 1 in 110. Side slopes are 1 in 3 (V:H) in banking and 1 in 2.5 (V.H.) in cutting.							

Q-3

Fig-1



Note:- All dimensions are in mts.

Fig-1, Q no-3,

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ODD TERM END EXAM NOV/DEC -2018

EXAM SEAT NO.

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LEVEL: THIRD

PROGRAM: CE/ME/MT/SM

COURSE CODE:

MEF313/ME214/MEE313/CEE313/EIF312/IX210/IEE312/ITE312/MG228/EJ210/ETE312/R228

COURSE NAME: HIGHER MATHEMATICS

MAX. MARKS: 80

TIME: 3 HRS.

DATE: 27/11/2018

Instruction:-

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

QN	S Q N	Question Text	R U A	Co MEF 313	Mark s														
Q.1		Attempt any FOUR			(08)														
	a)	Find the first order partial derivatives w.r.t 'x' & 'y' of the following functions. 1) $\log(ax + by)$ 2) $(y - ax)^{\frac{3}{2}}$	R	2															
	b)	Prove that i) $\Delta^n = \nabla^n E^n$ ii) $(E^{\frac{1}{2}} + E^{-\frac{1}{2}})(1 + \Delta)^{\frac{1}{2}} = 2 + \Delta$	U	1															
	c)	Define the Jacobian of u, v & w w.r.t x, y & z	R	2															
	d)	If $u = xy$, $v = x + y$ Then prove that $\frac{\partial(u, v)}{\partial(x, y)} = y - x$	U	2															
	e)	Define the shift operator E & write the relation between E, Δ & ∇	R	1															
	f)	Write the Lagrange's interpolation formula for unequal intervals for the following data. <table><tr><td>x</td><td>x_0</td><td>x_1</td><td>x_2</td><td>x_3</td><td>x_4</td></tr><tr><td>y</td><td>y_0</td><td>y_1</td><td>y_2</td><td>y_3</td><td>y_4</td></tr></table>	x	x_0	x_1	x_2	x_3	x_4	y	y_0	y_1	y_2	y_3	y_4	R	1			
x	x_0	x_1	x_2	x_3	x_4														
y	y_0	y_1	y_2	y_3	y_4														
Q.2		Attempt any FOUR			(16)														
	a)	Express the polynomial $f(x) = x^4 + 2x^3 - 5x^2 + 3x + 7$ in factorial notation & Hence, Show that $\Delta^4 f(x) = 24$	U	1															
	b)	Using Lagrange's interpolation formula find the value of f(9) from the following data: <table><tr><td>x</td><td>5</td><td>7</td><td>11</td><td>13</td><td>17</td></tr><tr><td>y</td><td>150</td><td>392</td><td>1452</td><td>2366</td><td>5202</td></tr></table>	x	5	7	11	13	17	y	150	392	1452	2366	5202	A	1			
x	5	7	11	13	17														
y	150	392	1452	2366	5202														
	c)	Using Newton's Backward interpolation formula, find the value of f(0.7) from the following data: <table><tr><td>x</td><td>0.1</td><td>0.2</td><td>0.3</td><td>0.4</td><td>0.5</td><td>0.6</td></tr><tr><td>f(x)</td><td>2.68</td><td>3.04</td><td>3.38</td><td>3.68</td><td>3.96</td><td>4.21</td></tr></table>	x	0.1	0.2	0.3	0.4	0.5	0.6	f(x)	2.68	3.04	3.38	3.68	3.96	4.21	A	1	
x	0.1	0.2	0.3	0.4	0.5	0.6													
f(x)	2.68	3.04	3.38	3.68	3.96	4.21													
	d)	If $u = \log(\frac{x^3 + y^3}{x^2 - y^2})$ Then by using Euler's Theorem. Prove that $x^2 \frac{\partial^2 u}{\partial x^2} + 2xy \frac{\partial^2 u}{\partial x \partial y} + y^2 \frac{\partial^2 u}{\partial y^2} = -1$	U	2															

P.T.O

	e)	If $u = \log(\tan x + \tan y + \tan z)$ then. Find the value of $\sin 2x \frac{\partial u}{\partial x} + \sin 2y \frac{\partial u}{\partial y} + \sin 2z \frac{\partial u}{\partial z}$	A	2															
	f)	If $x = v^2 + w^2, y = w^2 + u^2$ & $z = u^2 + v^2$ Then find J & J'	A	2															
Q.3		Attempt any FOUR			(16)														
	a)	If $x = uv, y = \frac{u}{v}$ prove that $JJ' = 1$	U	2															
	b)	Find the missing terms in the following table with the help of a forward difference operator.	A	1															
		<table><tr><td>x</td><td>1</td><td>1.5</td><td>2</td><td>2.5</td><td>3</td><td>3.5</td></tr><tr><td>y</td><td>1</td><td>3</td><td>-</td><td>5</td><td>-</td><td>10</td></tr></table>	x	1	1.5	2	2.5	3	3.5	y	1	3	-	5	-	10			
x	1	1.5	2	2.5	3	3.5													
y	1	3	-	5	-	10													
	c)	Using Newton's forward interpolation formula find the value of f(142) from the following data	A	1															
		<table><tr><td>x</td><td>140</td><td>150</td><td>160</td><td>170</td><td>180</td></tr><tr><td>f(x)</td><td>3.685</td><td>4.854</td><td>6.302</td><td>8.076</td><td>10.225</td></tr></table>	x	140	150	160	170	180	f(x)	3.685	4.854	6.302	8.076	10.225					
x	140	150	160	170	180														
f(x)	3.685	4.854	6.302	8.076	10.225														
	d)	Show that $\Delta^2 \cos 2x = -4 \sin^2 x \cos(2x + 2h)$	U	1															
	e)	If $u = x^3 \phi(\frac{y}{x}) + y^3 \psi(\frac{x}{y})$ Then by using Euler's Theorem find the value of $x^2 \frac{\partial^2 u}{\partial x^2} + 2xy \frac{\partial^2 u}{\partial x \partial y} + y^2 \frac{\partial^2 u}{\partial y^2}$	A	2															
	f)	Verify Euler's Theorem for $u = \sin(\frac{x+y}{x-y})$	A	2															
Q.4		Attempt any FOUR			(08)														
	a)	Evaluate $L[e^{-t} \cdot \cos 2t]$	U	3															
	b)	Evaluate $L^{-1}\left[\frac{6}{2s-3}\right]$	R	3															
	c)	Evaluate $L[\sin^2 2t]$	R	3															
	d)	Solve : $\frac{d^2 x}{dt^2} + 5 \frac{dx}{dt} + 6x = 0$	R	4															
	e)	Solve : $\frac{d^2 y}{dx^2} - 8 \frac{dy}{dx} + 16y = 0$	U	4															
	f)	Solve : $(D^2 + 4)y = 0$	R	4															
Q.5		Attempt any FOUR			(16)														
	a)	Evaluate : $L[\sin 2t \cdot \sin 3t]$	U	3															
	b)	Evaluate : $L[t \cdot e^{-t} \cdot \sin 2t]$	A	3															
	c)	Find $L^{-1}\left[\frac{1}{s^2(s+1)}\right]$	A	3															
	d)	Solve by Laplace transform method $\frac{d^2 y}{dt^2} + y = t$ Given that $y'(0) = -2$ and $y(0) = 1$	A	3															
	e)	Solve : $\frac{d^3 y}{dx^3} - 7 \frac{d^2 y}{dx^2} + 10 \frac{dy}{dx} = 0$	U	4															
	f)	Solve : $(D^4 + 2D^2 + 1)y = 0$	A	4															
Q.6		Attempt any FOUR			(16)														
	a)	Solve : $\frac{d^3 y}{dx^3} - 3 \frac{d^2 y}{dx^2} + 4 \frac{dy}{dx} - 2y = 0$	A	4															
	b)	Solve : $(D^3 + 3D^2 + 3D + 1)y = 0$	A	4															
	c)	Solve : $\frac{d^2 y}{dx^2} + 6y = 0$	U	4															
	d)	Apply convolution theorem to evaluate $L^{-1}\left[\frac{1}{s(s^2+4)}\right]$	A	4															
	e)	Evaluate : $L\left[\frac{1-\cos t}{t}\right]$	A	3															
	f)	Solve : $(D^3 + 1)y = 0$	U	3															

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EXAM SEAT NO.

Instruction :-

- 1) Answer to 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.

P.T.O.

QN		Section- II		Mar ks
Q.4		Attempt any FOUR :		08
	a)	Define development length.		
	b)	State any two necessities to provide distribution steel in oneway slab.		
	c)	State maximum and minimum reinforcement in column as per I.S. criteria.		
	d)	State any four advantages of prestressed concrete over reinforced concrete.		
	e)	State I.S. specifications for minimum shear reinforcement and maximum spacing of stirrups in beam.		
	f)	Define i) Intensity of earthquake ii) Magnitude of earthquake.		
Q.5		Attempt any TWO :		16
	a)	An RCC beam of size 350 X 500mm deep effective with effective cover 40mm. is reinforced with 4 bars of 25mm in diameter simply supported beam is of span 6.5m and subjected to working load 60 KN/m. Grade concrete is M20 and grade of steel is Fe415. Then- i) Design the shear reinforcement if 8mm diameter and two legged stirrups. Assume two bars of 25mm diameters are bent up. $\tau_c = 0.499 \text{ N/mm}^2$ $\tau_c \text{ max} = 2.8 \text{ N/mm}^2$ ii) Take check for development length. If $\tau_{bd} = 1.6 \text{ N/mm}^2$.		
	b)	Design a slab for a Hall of size 5.5m X 4m using M20 grade of concrete and Fe415 steel. Corners of slab are free to lift. Take live load 2 kpa and floor finish 0.5 kpa. Consider effective cover to slab 30mm. Take modification factor =1.4 $\alpha_x=0.0966$, $\alpha_y=0.0526$. consider 10mm Bar. (don't take check for shear, deflection and development length)		
	c)	A cantilever slab is to be designed as a porch, projecting 1.2m from the face of the wall calculate depth of slab, area of tensile steel and distribution steel. if it carries live load 1.5 KN/m^2 and finishing load 1 KN/m^2 . Also draw reinforcement details. Use M20 and Fe415 steel. Take M.F. = 1.7 for Pt assumed =0.2% and effective cover 30mm. Use 10mm and Bars as main steel and 8mm and bars as distribution steel. (Don't take check for shear, deflection and development length)		
Q.6		Attempt any TWO :		16
	a)	An axially loaded column 400mm X 450mm pinned at both ends with an unsupported length 3m. for carrying a factored load 2500 KN. Use M20 grade concrete and Fe 415 steel. i) Take check for minimum eccentricity and slenderness of column. ii) Design longitudinal steel using 25mm and bar. iii) Also take check for minimum and maximum reinforcement for longitudinal steel. iv) Design transverse steel.		
	b)	i) Design the footing of column from bending moment criteria for following data 1) Size of column 400 X 400mm 2) M20 grade concrete and Fe415 steel. 3) Axial service load = 1000kn. 4) Safe bearing capacity of soil = 200 km/m^2 . ii) State any four reasons for providing minimum shear reinforcement in the form of stirrups in beams.		
	c)	i) Explain earthquake damages to RCC building and remedies to overcome damages. ii) State various methods of post- tensioning of concrete & explain any one of it.		

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ODD TERM END EXAM NOV/DEC -2018**EXAM SEAT NO.**

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LEVEL: THIRD**PROGRAM: CIVIL ENGINEERING****COURSE CODE: CEF311/CEE311/CE309 COURSE NAME: ADVANCED CONSTRUCTION****TECHNIQUE AND EQUIPMENTS****MAX. MARKS: 80****TIME: 3 HRS.****DATE: 01/12/2018**

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	S	Question Text	R	CO	Marks
Q.1		Attempt any FOUR		CEF A 311	(08)
	a)	Enlist four methods of pre-tensioning	R	1	
	b)	Define Aspect Ratio.	R	1	
	c)	State uses of formwork in building (any two)	R	2	
	d)	Enlist materials used for grouting.	R	2	
	e)	State any two advantages of slip formwork.	U	4	
	f)	State limitations of Mivan formwork. (any two)	U	4	
Q.2		Attempt any FOUR			(16)
	a)	Explain necessities of soil reinforcing techniques.	A	3	
	b)	Explain slope stabilization techniques in cutting.	A	3	
	c)	State advantages and disadvantage of heavy structure (any four of each)	A	4	
	d)	Enlist types of grouts and explain any one.	U	2	
	e)	Explain procedure for cement grouting.	A	2	
	f)	Explain working of RMC.	U	1	
Q.3		Attempt any FOUR			(16)
	a)	Define Tremix concreting and state it's any three advantages.	R	1	
	b)	Explain 'fibre Reinforced concrete.	U	1	
	c)	Explain procedure of underwater concreting.	A	1	
	d)	Explain post-tensioning method.	U	1	
	e)	Explain briefly "Mivan".	U	4	
	f)	Explain "formwork for bridges".	U	4	
P.T.O					

Q.4	Attempt any FOUR			(08)
	a) Enlist any four types of conveying equipments.	R	5	
	b) What do you mean by hoisting equipments?	U	5	
	c) List any two factors affecting output of scraper.	R	6	
	d) Enlist the equipments used for producing artificial sand.	R	7	
	e) What do you mean by 'Standard Equipment'?	U	8	
	f) State any two uses of hot mix bitumen plant.	U	8	
Q.5	Attempt any FOUR			(16)
	a) Draw a neat labelled sketch of truck, mounted crane and explain its working.	U	4	
	b) Draw a neat sketch of pneumatic roller and explain its working.	U	4	
	c) Explain working and output of scrapers.	U	6	
	d) Write a short note on needle vibrator and screed vibrator with its applications	A	7	
	e) Explain hot mix bitumen plant with neat labelled layout.	A	8	
	f) Explain working of Transit mixer with a neat sketch.	U	7	
Q.6	Attempt any FOUR			(16)
	a) Prepare short note on dumper with a neat labelled sketch.	A	5	
	b) i) Explain working of rammer. ii) Write any four uses of rammer.	U	6	
	c) Explain working of Dragline with a neat labelled sketch.	U	6	
	d) For a concreting of a bridge pier which type of vibrator you will prefer to use. Explain the working with a neat sketch.	A	7	
	e) Describe any two equipments used for production of artificial sand.	U	7	
	f) You are working with a construction company and company has given you a responsibility of purchasing new equipment 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 -2018**EXAM SEAT NO.**

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LEVEL: FOURTH**PROGRAM: CIVIL ENGINEERING****COURSE CODE: CEF406/CE207/CEE406****COURSE NAME: CONCRETE TECHNOLOGY****MAX. MARKS: 80****TIME: 3 HRS.****DATE: 30/11/2018****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, **SQL**>Sub-Question No, **R**> Remembering, **U**>Understanding, **A**>Application **CO**>Course outcome

QN	S Q N	Question Text	R U A	CO CEF 406	Marks
Section -I					
Q.1		Attempt any FOUR			(08)
	a)	State ingredients of concrete.	R	1	
	b)	Define 'Admixture'	R	1	
	c)	Define cement.	R	2	
	d)	Define initial setting time & final setting time of cement.	R	2	
	e)	Define bleeding	R	3	
	f)	Define workability.	R	3	
Q.2		Attempt any FOUR			(16)
	a)	State the importance of batching of concrete ingredients.	U	1	
	b)	'Transportation of concrete plays major role in quality construction', Justify the statement.	A	1	
	c)	Describe the effects of aggregate properties on strength of concrete.	U	2	
	d)	Name any four types of cement & their use.	R	2	
	e)	Describe compaction factor test with a neat sketch of apparatus used.	U	3	
	f)	State the advantages & limitations of slump test.	A	3	
Q.3		Attempt any FOUR			(16)
	a)	Draw the process diagram of concrete.	U	1	
	b)	Enlist methods of transportation of concrete & explain any one.	A	1	
	c)	State precautions to be taken during compaction.	U	1	
	d)	Describe the procedure to determine aggregate crushing volume.	U	2	
	e)	Define 'grading of aggregate. Explain briefly it's importance in concreting operation.	U	2	
	f)	State the precautions to be taken in storing cement at site.	U	2	

P.T.O

Section-II

Q.4		Attempt any FOUR			(08)
	a)	Enlist any four methods used for mix design of concrete.	R	4	
	b)	If grade of concrete is M ₂₅ state meaning of this term.	R	5	
	c)	State significance of water cement ratio in concrete.	R	5	
	d)	Enlist tests used for quantity control of hardened concrete.	R	5	
	e)	Define ready mixed concrete.	R	6	
	f)	Enlist methods used for underwater concreting.	R	6	
Q.5		Attempt any FOUR			(16)
	a)	Explain IS code method of mix design of concrete.	R	4	
	b)	State stripping period of forms for following components. i) Vertical formwork to columns ii) Props of slab spanning upto 4.5m iii) Props of beam spanning upto 6m iv) Soffit formwork to beams.	R	4	
	c)	Define impermeability of concrete & explain factors affecting permeability of concrete.	R	5	
	d)	Explain ultrasonic pulse velocity test method of hardened concrete.	R	5	
	e)	State any two field situations where under water concreting is to be done & also state any two precautions while underwater concreting.	A	6	
	f)	Define ferro-cement & also explain its applications.	A	6	
Q.6		Attempt any FOUR			(16)
	a)	Draw a neat diagram of formwork.	U	4	
	b)	State any four requirement of good formwork.	R	4	
	c)	State necessity of inspection & testing of fresh concrete.	R	5	
	d)	Explain core test method of testing harden concrete.	A	6	
	e)	If water cement ratio is 0.4 then for 1 bag of cement determine requirement of water.	A	5	
	f)	Explain light weight concrete with its any two applications.	R	6	

GOVERNMENT POLYTECHNIC, KOLHAPUR – 416004.

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ODD TERM END EXAM NOV./DEC.-2018

EXAM SEAT NO.

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LEVEL :- FIFTH

PROGRAM : CIVIL ENGINEERING

COURSE CODE :- CEE509/CE408

COURSE NAME :- SOLID WASTE MANAGEMENT

MAX. MARKS : 80 TIME : 3 HRS. DATE :- 01 / 12/ 2018

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.

Section-I			Ma rks
Q.1	S Q N	Attempt any FOUR :	08
		a) Define 'Toxic Waste'.	
		b) What do you mean by 'Construction Waste'?	
		c) How will you use solid waste as raw material in Industry?	
		d) Enlist the transportation vehicles used for transportation of waste.	
		e) Enlist any two health problems arising at the time of segregation of solid waste.	
		f) Enlist types of hospital waste.	
Q.2	S Q N	Attempt any FOUR :	16
		a) Write the composition of solid waste. Draw sketch.	
		b) Give the complete classification of solid waste.	
		c) Explain in brief segregation and salvage recovery in solid waste management.	
		d) Write various transportation equipments used for transporting solid waste with their suitability and capacity as applicable.	
		e) What do you mean by recycling of municipal waste?	
		f) Explain the collection system of hospital waste.	
Q.3	S Q N	Attempt any FOUR :	16
		a) Explain in short Factors affecting solid waste generation.	
		b) Describe in brief problems and issues about the storage of municipal solid waste in India.	
		c) Explain in short organization pattern of solid waste management.	
		d) What precaution should be taken while handling of hazardous waste?	
		e) Explain public participation in solid waste management.	
		f) Explain incineration as a disposal system of hospital waste.	

P.T.O.

Q.N	S Q N	Section- II	Ma rks
Q.4		Attempt any FOUR :	08
	a)	What is mean by 'Leachate'?	
	b)	Give the classification of composting methods.	
	c)	What is mean by composting?	
	d)	Define pyrolysis.	
	e)	Write difference by produces obtained during pyrolysis.	
	f)	What is fly ash?	
Q.5		Attempt any FOUR :	16
	a)	Enlist and explain any four points to be considered during selection of site for land filling operations.	
	b)	How to control the contamination of ground water due to sanitary landfilling operations?	
	c)	Enlist and explain any four factors governing composting process.	
	d)	Describe the process before composting.	
	e)	Explain 'Garrets Flash Pyrolysis system'.	
	f)	Describe the problem of disposal of solid waste from steel plants.	
Q.6		Attempt any FOUR :	16
	a)	Explain in brief the 'Area Method of Landfilling'.	
	b)	Explain with sketch 'Indore method of composting'.	
	c)	Write any four benefits of compost.	
	d)	Enlist the types of incinerators and explain any one in brief.	
	e)	State the responsibility of industry about disposal of industrial waste.	
	f)	Write the process of disposal of waste from fruit processing industry.	

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EVEN TERM END EXAM MAY -2018

EXAM SEAT NO.

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LEVEL :- **THIRD**

PROGRAM : **CIVIL ENGINEERING**

COURSE CODE :- **CEF311/CEE311**

COURSE NAME :- **ADVANCED CONSTRUCTION TECHNIQUES & EQUIPMENTS**

MAX. MARKS : **80** TIME : **3 HRS.** DATE :- **19/05/2018**

Instruction :-

- 1) Answers must be written in the main answer book provided.(and supplements if required)
- 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	S Q N	Question Text	R/ U/ A	Co CEF 311	Ma rks
Q.1		Attempt any FOUR :			08
	a)	Define Grades of concrete.	R	1	
	b)	State any four methods of pre-tensioning.	R	1	
	c)	State any two necessities of grouting.	R	2	
	d)	Enlist any four materials used for grouting.	R	2	
	e)	State advantages of slip formwork. (any two)	R	4	
	f)	State selection criteria for formwork for heavy structures.	A	4	
Q.2		Attempt any FOUR :			16
	a)	Explain briefly any four necessities of RMC.	U	1	
	b)	Explain with neat sketch: Tremy method of underwater concreting.	A	1	
	c)	Explain fibre reinforced concrete. Mention its two advantages.	A	1	
	d)	Enlist any four types of grouting. Explain any one in brief.	R U	2	
	e)	Explain briefly any four necessities of soil reinforcing.	U	3	
	f)	Explain slope stabilisation by soil reinforcing techniques.	A	3	
Q.3		Attempt any FOUR :			16
	a)	Define Tremix concreting and state stepwise procedure of it.	R	1	
	b)	Explain properties of roller compacted concrete. (any four)	U	1	
	c)	Explain any four uses of grouts in tunnels.	A	2	
	d)	Explain Maivan formwork, where it is used.	A	4	
	e)	Explain limitations of Bridges formwork.	A	4	
	f)	Explain process of concreting with slip formwork.	U	4	

(P.T.O.)

QN	S Q N	Question Text	R/ U/ A	Co CEF 311	Ma rks
Q.4		Attempt any FOUR :			08
	a)	What is the principal of crane?	A	5.0	
	b)	Enlist any two belt conveyors.	R	5.2	
	c)	List any two factors affecting output of bulldozers.	R	6.1	
	d)	List any four equipments used for production of artificial sand.	A	7.1	
	e)	What is Bitumen paver?	U	8.1	
	f)	Define standard equipments.	R	8.2	
Q.5		Attempt any FOUR :			16
	a)	Write note on Mast cranes & Derricks.	U	5.1	
	b)	Explain in short Ladder with Back Hoe.	R	6.1	
	c)	Differentiate between plain rollers and sheep footed rollers.	R	6.2	
	d)	Write note on production of artificial sand.	A	7.1	
	e)	Explain about Automatic concrete plants.	A	7.2	
	f)	Explain in detail working of hot mix Bitumen plant and its advantages.	U	8.1	
Q.6		Attempt any FOUR :			16
	a)	Draw a neat sketch of Crawler Crane and label its parts.	A	5.1	
	b)	Explain with neat sketch 'Graders'.	U	6.1	
	c)	Write note on pneumatic rollers.	R	6.2	
	d)	Enlist the equipments with their function for transportation of concrete.	R	7.2	
	e)	Write note on concrete vibrators.	A	7.2	
	f)	Write note on equipment management in construction industry.	A	8.2	
