Code No. 3082

FACULTY OF ENGINEERING

B.E. 2/4 (Civil) II – Semester (Main) Examination, May / June 2017

Subject: Surveying – II

Time: 3 Hours **Max.Marks: 75**

Note: Answer all questions from Part – A and any five questions from Part – B.

PART – A (25 Marks)

1 Differentiate between the terms telescope normal and telescope inverted. 2

2 What are the fundamental line of a Theodolite? 3

3 What is an auxillary point? Where is it used? 2

4 Write briefly about uses of a Theodolite. 3

5 Enumerate the errors in curve ranging. 2

6 what is central angle? 2

7 What is easement curve? Draw a neat sketch of the same. 3

8 What is a clothoid? What are its requirements? 3

9 Differentiate between fixed and movable hair methods of tachometry. 3

10 Explain the use of tachometric alidade in contouring by plane table. 2

PART – B (5x10 = 50 Marks)

11 a) With a neat sketch and a table, explain the procedure for measurement of horizontal angle by reiteration method. 7

b) What is standard? What is its use? 3

12 The following are the particulars of a traverse run in counter-clockwise direction. Calculate the length and bearing of the closing line DA, and the angle CDA. 10

Line	Length (m)	WCB
AB	145.8	$342^{o}24'$
BC	517.2	$14^{o}35'$
CD	31t.9	$137^{o}20'$

13 A reverse curve is to be set out between two parallel tangents 30 m in apart. The line joining the two tangent points is 300 m. The two arcs of the curve have the same radius. Calculate the necessary data to set the curve on the field by offsets from a long chord at intervals of 20 m from the common tangent point. Draw a net sketch of the curve, showing the calculated data. 10

14 A downgrade of 1.2% is followed by an upgrade of 2.4%. The RL of the intersection and its chainage is 360 m. A vertical parabolic curve 120 m long is to be introduced to connect the two grades. The peg interval is 15 m. Calculate the elevation of the curve by tangent corrections. 10

15 Determine the gradient from a point P to a point Q from the following observations. The constants of the instruments were 100 and zero and the staff was held vertically. Draw a neat sketch of the same. 10

Instrument Station	Staff Point	Bearing	Vertical Angle	Hair readings (m)
A	P	140^o	$+10^o45'$	1.350, 1.920, 2.490
A	Q	230^o	$+5^o30'$	1.080, 1.900, 2.720

16 Write a short note about adjustment of traverse by Bowditch rule, Transit rule and Third rule. 10

17 What is GPS? What is its principle? What are its components? Write a note about the types of GPS and their accuracies. 10

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Code No. 3088

FACULTY OF ENGINEERING

B.E. 2/4 (EEE / Inst.) II – Semester (Main & Backlog) Examination, May / June 2017

Subject: Solid Mechanics

Time: 3 Hours **Max.Marks: 75**

Note: Answer all questions from Part – A and any five questions from Part – B.

PART – A (25 Marks)

1 A bar of 50 mm diameter and 3 m long is acted upon by a load of 100 kN. It is found to extend 25 mm, find the str4ess developed, if E =120 GPa. Also find strain energy stored. 2

2 Define the terms ductility and malleability. 2

3 Define shear force and bending moment. 2

4 What is a point of contra flexure? 2

5 Define flexural rigidity and axial rigidity. 2

6 Calculate Torsional rigidity of a circular shaft of 120 mm diameter. Take G = $8x10^4$ MPa. 3

7 Sketch the shear stress distribution of a square cross section with diagonal vertical and also for T-section. 3

8 Define the terms resilience and modulus of resilience. 3

9 A close coiled helical spring is made of 5 mm dia steel wire. Its stiffness is 4 N/mm. If the mean radius of the coils is 25 mm, what is the necessary length of wire? G = 80GPa. 3

10 Distinguish between Bending spring and Torsion spring. 3

PART – B (5x10 = 50 Marks)

11 a) Derive the relationship between modulus of elasticity and shear modulus. 6

b) Draw stress strain curve for a ductile materials and name the salient points on it. 4

12 Construct SFD and BMD for the beam shown in Fig. 1. Mark the salient values therein. Also locate the points of contra flexure, if any. 10

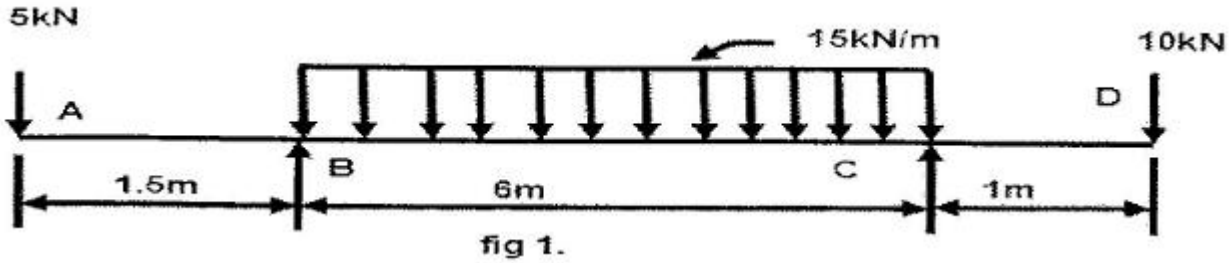

fig 1.

13 a) Derive the general equation of simple bending. 6

b) A girder of uniform section having 200 mm width and constant depth of 400 mm is simply supported over a span of 6 m. Calculate the deflection for a U.D.L. on it such that the maximum bending stress induced is 120 MPa. Take E = 200 GPa. 4

14 An unsymmetrical 1-section beam with 300 mm x 50 mm top flange, 200 mm x 50 mm bottom flange and 300 mm x 60 mm web is simply supported and subjected to a U.D. Load of 10 kN/m over its entire span 6 m. Draw the variation of shear stress across the depth of the beam at supports and compute the maximum shear stress in the section. 10

15 Determine the slope of deflection under points C and D for an overhanging beam as shown in Fig. 2. 10

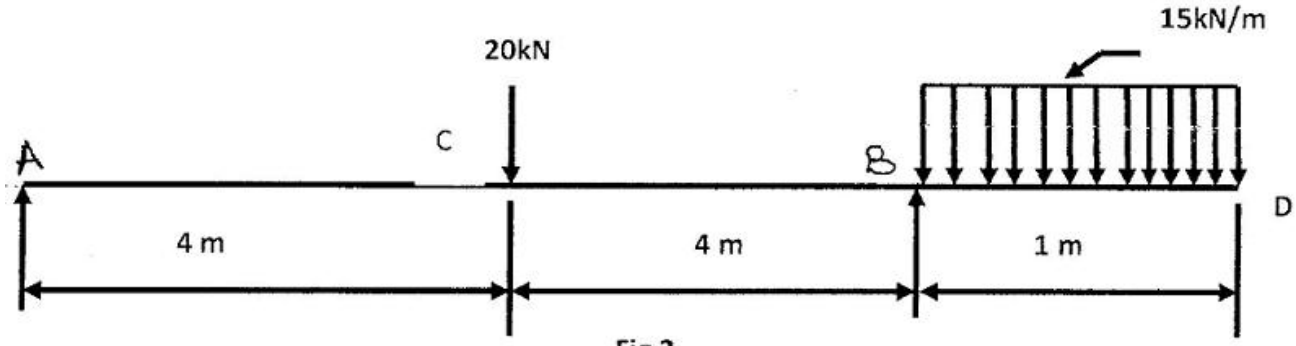

Fig 2.

16 A hollow shaft of diameter ratio 3/8 is required to transmit 650 kW at 150 r.p.m. The maximum torque being 20% greater than mean. The shear stress is not to exceed 63 MN/m^2 and the twist in a length of 3 m is not to exceed 1.4 degrees. Calculate the maximum external diameter satisfying these conditions. Take G = 80 GPa. 10

17 A bar 1.2 diameter gets stretched by 0.3 cm under a steady load of 8 kN. What stress would be produced in the same bars by a weight of 0.8 kN which falls freely vertically through a distance of 8 cm to a rigid collar attached to its end. Also compute elongation of the bar in both the cases. 10

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Code No. 3096

FACULTY OF ENGINEERING

B.E. 2/4 (ECE) II – Semester (Main & Backlog) Examination, May / June 2017

Subject: Analog Electronics Circuits

Time: 3 Hours **Max.Marks: 75**

Note: Answer all questions from Part – A and any five questions from Part – B.

PART – A (25 Marks)

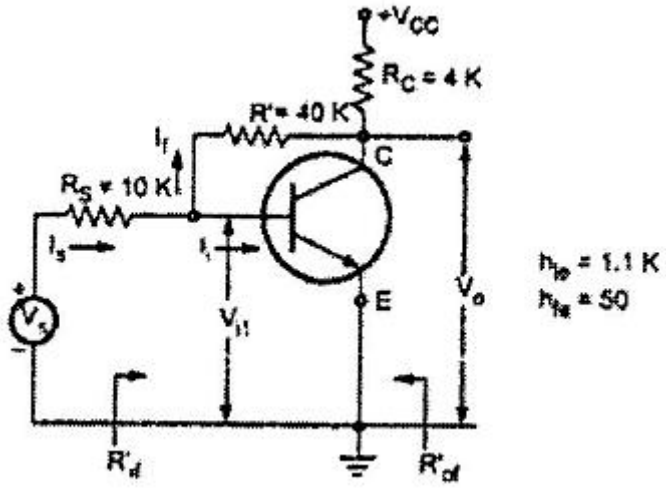
1	Draw high frequency Pi model of BJT.	3
2	Calculate input impedance for a CE amplifier without bypass capacitor, given hie = 1.1 Kohms and hfe = 100 and Re = 1 Kohm.	3
3	Given that gain with feedback is 100, gain without feedback is 1000. Calculate Beta.	2
4	What is effect of negative feedback on stability of amplifier?	2
5	What is Barkhausen's criteria for oscillations.	2
6	Give difference between series and shunt regulators.	3
7	What is a power amplifier, how is it different from voltage amplifier.	2
8	Calculate the efficiency of a Class A direct coupled power amplifier given Vmin = 0.25 V and V max = 2.5 V.	2
9	For a single tuned RF amplifier, calculate Fo if L = 10 mH and C = 0.1 pF.	3
10	What is the effect of Cb'c on an RF amplifier?	3

PART – B (5x10 = 50 Marks)

11	a)	Obtain expression for gain of transformer coupled amplifier at the mid frequency.	5
	b)	Draw a single state RC coupled common emitter BJT amplifier circuit and calculate it's A_1, A_v, R_i, R_o, A_{IS} and A_{vs}. Given R_c=5 Kohm, R_1 = 75 K ohm, R_2 = 15 Kohm, R_s = 1 Kohm, R_s = 1 Kohm, R_L = 5 Kohm. Use approximate model and consider h_{ie} = 2 Kohms and h_{fe} = 100.	5
12	a)	Draw an emitter follower circuit and show that its gain with feedback is unity.	6
	b)	Obtain general expression for R_{if} for current series feedback amplifier.	4
13	a)	Give the circuit of a wein bridge oscillator and obtain its oscillating frequency.	7
	b)	Draw a Hartley oscillator and calculate Fo, given L1=2 mH, L2=5 mH and C=10 nF.	3
14	a)	Explain the operation of class B push pull amplifier and show that even harmonics are cancelled in push pull amplifier.	7
	b)	Compare between Class A, Class B and Class C power amplifier.	3

15 Calculate the gain at resonance and bandwidth of single tuned direct coupled RF amplifier. 10

16 Identify the feedback topology in the following circuit and calculate gain with feedback, input impedance and output impedance with feedback. 10



17 Write short notes on:

a) Darlington amplifier 3

b) Global and local feedback 3

c) Crystal oscillator. 4

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Code No. 3106

FACULTY OF ENGINEERING

B.E. 2/4 (M/P) II – Semester (Main & Backlog) Examination, May / June 2017

Subject: Fluid Dynamics

Time: 3 Hours **Max.Marks: 75**

Note: Answer all questions from Part – A and any five questions from Part – B.

PART – A (25 Marks)

1 What do you mean by velocity gradient? How is the shear stress at a point in a fluid body dependent on the velocity gradient at that point? 2

2 Differentiate between local acceleration and convective acceleration. 2

3 Determine the mass density, specific volume and specific weight of a liquid whose specific gravity is 0.85. 3

4 Differentiate between energy and energy head. 2

5 Sketch the distribution of velocity and shear stress across the flow in a pipe of circular section and write the corresponding equations. 3

6 Differentiate between hydro-dynamically smooth and rough pipes. 2

7 Distinguish between pressure drag and the friction drag. 2

8 A plate is placed at zero angle of incidence in a fluid approach velocity 'V'. The thickness of boundary layer 2.5 m from the leading edge is 0.15 cm. Find the thickness of boundary layer at a distance of 4 m from the leading edge. 3

9 Define Mach number and write its significance. 2

10 Obtain an expression in differential form of continuity equation for one-dimensional compressible flow. 3

PART – B (5x10 = 50 Marks)

11 a) A 2D steady flow is given by the steam function $\Psi = 2xy$. Determine the velocity at a point P (1, 4) in the field. Find out the value of velocity potential function passing through the point 'P'. 5

b) Define the terms:
i) Velocity potential
ii) Stream function.
Show that the stream lines and equipotential lines form a net of mutually perpendicular lines. 5

12 a) Derive Bernoulli's equation of motion with assumptions, also discuss about its limitations. 5

b) A pipe bend tapers from 500 mm at the inlet to a diameter of 250 mm at outlet and turns through a 45^o in the horizontal plane. The pressure at inlet is 40 kPa. If the pipe is conveying oil of specific gravity 0.85, find the magnitude and direction of the resultant force on the bend when the oil flow rate is 450 lps. 5

13 a) Explain the working of differential U-tube manometer with the aid of neat sketch. Also state the equation applicable. 5

b) An oil of specific gravity 0.85 and viscosity 0.75 N.s/m^2 flows through a horizontal pipe of diameter 60 mm. If between two sections 150 m apart, the pressure drop is 2750 kPa. Find:
   i) Discharge in the pipe
   ii) Maximum velocity
   iii) Velocity gradient close to the pipe wall
   iv) Frictional resistance for the 150 m length of pipe. 5

14 a) Explain the characteristics of laminar and turbulent boundary layer over a flat plate. 5

b) A truck having a projected area of 6.5 m^2 travelling at 70 KMPH has a total resistance of 1960 N, of this 20% is due to rolling friction and 10% is due to surface friction. The rest is due to form drag. Calculate the coefficient of form drag. Take density of air as 1.25 kg/m^2. 5

15 a) Derive the energy equation for adiabatic flows. 5

b) A gas with a velocity of 300 m/s is flowing through a horizontal pipe at a section where pressure is 78 kN/m^2 absolute and temperature 40^oC. The pipe changes in diameter and at this section, the pressure is 117 kN/m^2 absolute. Find the velocity of a gas at this section if the flow of the gas is adiabatic. Take R = 287 J/kg ^oK and k = 1.4. 5

16 a) A horizontal venturimeter 300 mm x 150 mm is used to measure oil of specific gravity 0.8. The discharge of oil is 0.5 m^3/sec. Find the reading of oil mercury differential manometer if C_d = 0.98. 5

b) Derive and explain Darcy – Weishach equation. 5

17 Write sort notes on the following: 2 ½ x4=10

a) Newtonian and Non-Newtonian fluids

b) Reynolds experiment

c) Different types of Drag

d) Mach Cone.

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Code No. 3108

FACULTY OF ENGINEERING

B.E. 2/4 (A.E) II – Semester (Main & Backlog) Examination, May/June 2017

Subject: Fluid Mechanics & Machinery

Time: 3 Hours **Max.Marks: 75**

Note: Answer all questions from Part – A and any five questions from Part – B.

PART – A (25 Marks)

1 What is manometer? How they are classified?

2 One litre of crude oil weighs 9.6 N. Calculate specific density, specific volume, specific weight and specific gravity.

3 Define the following:
   a) Steady flow
   b) Un-steady flow
   c) Laminar flow and
   d) Turbulent flow.

4 What is the difference between pitot tube and pitot static tube.

5 What do you mean by viscous flow.

6 Define boundary layer, boundary layer thickness and drag.

7 How will you classify the turbines?

8 What is cavitation? How can it be avoided in reaction turbine.

9 Define specific speed of a centrifugal pump and write the expression for it.

10 A single acting reciprocating pump running at 30 rpm, delivers 0.012 m^3/s of water. The diameter of the piston is 25 cm and stroke length is 50 cm.

   Define:
   i) Theoretical discharge and
   ii) C0-efficient of discharge.

PART – B (5x10 = 50 Marks)

11 a) Determine the intensity of shear of an oil having viscosity is 1.2 Poise and is used for lubrication in the clearance between a 10 cm diameter shaft and its journal bearing. The clearance is 1.0 mm and shaft rotates at 200 rpm.

   b) Distinguish between manometers and mechanical gauges. What are the different types of mechanical pressure gauges?

12 a) Explain the terms:
   a) Path line
   b) Streak line
   c) Stream line and
   d) Stream tube.

   b) The diameters of a pipe at the sections 1 and 2 are 15 cm and 20 cm respectively. Find the discharge through the pipe if the velocity at section 1 is 4 m/s. Determine also the velocity at section 2.

13 a) What is Euler's equation of motion? How will you obtain Bernoulli's equation from it?

   b) An oil of special grade 0.9 is flowing through a venturimeter having inlet diameter 20 cm and throat diameter 10 cm. The oil mercury differential manometer show a reading of 20 cm. Calculate the discharge oil through the horizontal venturimeter. Take Cd = 0.9.

14 A fluid of viscosity 0.7 Ns/m^2 and special grade 1.3 is flowing through a circular pipe of diameter 100 mm. The maximum shear stress at the pipe wall is given as 196.2 N/m^2. Find:
   i) The pressure gradient
   ii) The average velocity
   iii) Reynolds number of the flow.

15 a) What do you mean by gross head, net head and efficiency of turbine? Explain the different types of efficiency of turbine.

   b) Differentiate between impulse and reaction turbines.

16 A pelton wheel is to be designed for the following specifications. Power = 375.75 kW S.p. Head = 200 m, speed = 800 rpm, η_o = 0.86, and jet diameter is not to exceed one-tents of wheel diameter. Determine:
   i) Wheel diameter
   ii) No. of jets required, and
   iii) Diameter of the jet.
   Take C_v = 0.98, and speed ratio = 0.45.

17 A centrifugal pump having outer diameter equal to two times of the inner diameter and running at 100 rpm, works against a total head of 40 m. The velocity of flow through the impeller is constant and equal to 2.5 m/s. The vanes are set back at an angle of 40^o at outlet if the outer diameter of the impeller is 500 mm and width at outlet is 50 mm, determine:
   i) Vane angle at inlet
   ii) Work done by impeller on water/s and
   iii) Manometric efficiency.

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Code No. 3110

FACULTY OF ENGINEERING

B.E. 2/4 (CSE) II – Semester (Main & Backlog) Examination, May / June 2017

Subject: Object Oriented Programming Using Java

Time: 3 Hours **Max.Marks: 75**

Note: Answer all questions from Part A and any five questions from Part B.

PART – A (25 Marks)

1	List the different operators used in JAVA.	3
2	What is the order of constructor call in the multilevel inheritance? Give example.	2
3	Write a code to read a character from the console.	3
4	Differentiate throw and throws clause used in JAVA.	2
5	What is the use of Comparator?	3
6	How to sort set of elements using built-in function. Give example.	2
7	What is the advantage of using adapter classes?	2
8	Write a program to insert buttons in Border Layout.	3
9	Write a code to read an integer through console.	2
10	List the different classes for character streams.	3

PART – B (50 Marks)

11	a)	Write the program to demonstrate the interfaces.	4
	b)	Differentiate method overloading and overriding using an example.	6
12	a)	Write a program for creating and using user-defined exception.	5
	b)	Write a program to demonstrate synchronization.	5
13	a)	Write a program to print the names of a student in the sorted order of the last name if name is in the form of "firstname lastname" using collections.	5
	b)	Write a program to read two dates and find the difference.	5
14	a)	Write a program for Mouse event handling.	5
	b)	Write a program to print numbers in a grid using layout manager.	5
15	a)	Write a program to find the occurrence of a given number in a file.	5
	b)	Write a program to read the 'n' integer values from Console and find the sum of all values.	5
16	a)	Explain creating and using packages in JAVA.	5
	b)	Explain the flow of controls in exception handling programs with example.	5
17	Write a short note on any two of the following:		
	a)	BitSet	5
	b)	Creating menu with submenus	5
	c)	Serialization	5

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Code No. 3117

FACULTY OF INFORMATICS

B.E. 2/4 (IT) II – Semester (Main & Backlog) Examination, May / June 2017

Subject: OOP Using Java

Time: 3 Hours **Max.Marks: 75**

Note: Answer all questions from Part – A and any five questions from Part – B.

PART – A (25 Marks)

1	What is the difference between throw and throws keyboard?	2
2	What are differences between list and set interfaces?	2
3	What is the difference between interfaces and abstract classes?	3
4	Why are swing components called as light weight components?	2
5	What is the difference between byte and character streams?	2
6	Draw a figure depicting states of a thread.	3
7	Explain the life cycle of an applet.	3
8	List the uses of super keyword.	2
9	What is the purpose of garbage collection?	3
10	Byte code is the magic of java. Justify.	3

PART – B (5x10 = 50 Marks)

11	a)	Define a package and explain steps for creating packages with sample code.	8
	b)	What are uses of final keyword?	2
12	a)	List and explain all java buzzwords.	8
	b)	What are inner classes?	2
13	a)	Draw a figure showing the exception hierarchy.	4
	b)	Write a program to demonstrate user-defined exceptions.	6
14		Write a program for accessing a collection using list iterator.	10
15		Write a program for handling mouse events.	10
16		Define serialization. Explain through a program has to serialize an object.	10
17		Write short notes on the following:	
	a)	Dynamic binding	5
	b)	Applets	5

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