Code No: 11394

FACULTY OF ENGINEERING

B.E. (Civil) III – Semester (Main &Backlog) Examination, Nov./Dec. 2018

Subject: Fluid Mechanics – I

Time: 3 Hours **Max. Marks: 70**

Note: Answer all questions from Part A & Any FIVE questions from Part – B.

PART – A (2x10 = 20 Marks)

1) Calculate the density, specific weight and weight of one liter of petrol of specific gravity 0. 75. 2M
2) Find the surface tension in a soap bubble of 40mm diameter when the inside pressure is 2.5 N/m^2 above the atmospheric pressure 2M
3) Define velocity potential function. 2M
4) What is a flow net and what are its uses? 2M
5) A pipe of diameter 250 mm conveys water. The discharge is 0.04 m^3/s, Pressure is 20 KN/m^2 at a section 4 m above the datum line. What is the total head? 2M
6) Differentiate between local and corrective acceleration. 2M
7) How does C_d of a venturimeter vary with Re 2M
8) What is the discharge through an orifice of diameter 40 mm under a head of 2.3m? 2M
9) Give M = ρAV, obtain the form $\frac{d^\circ}{^\circ} + \frac{dA}{a} + \frac{dv}{v} = 0$ 2M
10) Differentiate between isothermal, adiabatic and isentropic processes. 2M

PART – B (5x10 =50 Marks)

11 a) Derive the expression for capillary rise in a glass tube of diameter d. 4M

b) Two coaxial cylinders 10 cm and 9.75 cm is diameter and 2.5 cm high have both their ends open and a viscuous liquid filled in between A torque of 1.2 NM is produced on the inner cylinder when the outer one rotates at 90RPM. Determine the coefficient of viscosity of the liquid. 6M

12 a) Prove that $\nabla x \vec{V} = 0$ for irrotational flow 6M

b) For the velocity components $u = 2xy$ and $v = a^2 + x^2 - y^2$ obtain the stream function. 4M

13 Derive the Euler's equation of motion in 3 – D form and state the limitations on its application. 10M

14 a) Differentiate between forced and free vortex and give examples of each 4M

b) An open cylindrical vessel of 20 cm diameter and 50 cm high contains water to a height of 30 cm. (i) If the cylinder is rotated at 180 RPM, calculate the pressure on the bottom at the centre and edge of the vessel.(ii) What speed would cause the water surface to touch the top rim of the vessel. 6M

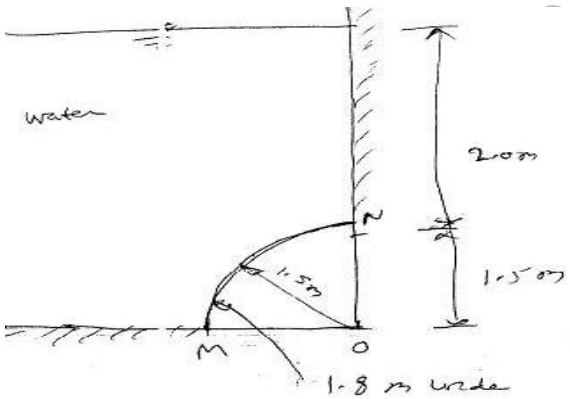
contd..2..

15 a) Derive the Bernoullies equation for isothermal process. 5M

b) In an isentropic flow of air around an immersed body the velocity, pressure and density of ambient air are 140m/s, 101.325Kpa and 1.226 kg/m^3 respectively. If the pressure at a point on the body is 49 kpa, determine the pressure and temperature at that point. 5M

16 a) Draw a neat sketch of Bourdon gauge and explain its working. 4M

b) A door in a tank is in the form of a quadrant of a cylinder of 1.5 m radius and 1.8 m wide. Calculate the resultant force on the door and its location on the gate. 6M



17 Write short notes on the following

a) Notches and weirs

b) Zone of action and zone of silence

c) Flow net and its applications 10M

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Code No. 11400/CBCS

FACULTY OF ENGINEERING

B.E. (EE/Inst.) III-Semester (Main & Backlog) Examination,
November / December 2018

Subject : Electro Magnetic Fields

Time : 3 Hours **Max. Marks: 70**

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

PART – A (20 Marks)

1 Define electric field intensity and electric potential and write the relationship between them.
2 Why Gauss's law cannot be applied to determine electric field due to finite lien average?
3 What is the capacitance of a parallel plate capacitor? When the stored energy is 5V and cane voltage across the plates is 5V?
4 State uniqueness theorem and write its equation.
5 What is a dipole? Write the expression for electric potential due to a dipole.
6 State Biot-savart's law. Give its limitations.
7 A solenoid with air core has 2000 turns and a length of 500 mm. Core radius is 40mm. Find its inductance.
8 Write Maxwell's equations in differential forms.
9 Write continuity equation, potential function for static fields.
10 What is poynting vector? Write its significance.

PART – B (50 Marks)

11 Four 300c charges are at corners of a 2m square. The top corner charge positive, where as the bottom corner charges are negative. Find the electric field at the center of the square. Assume permittivity =1.

12 State and explain coulomb's law.

13 A parallel plate capacitor consists of two square metal plates of side 500 mm and separated by a 10 mm slab of Teflon with $\underline{r}$ = 2 and 6 mm thickness is placed on the lower plate leaving on air gap of 4mm thick between it and upper plate. If 100V is applied across the capacitor, find 'D' E, and 'V' in Teflon and air.

14 Show that ∇ x H = J.

15 Derive expression for magnetic flux density at a point due to long current carrying filament.

16 Derive continuity equation.

17 Write short notes on the following:
(a) Faraday's laws of electromagnetic
(b) Amper's current law
(c) Coulomb's law

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Code No: 11406

FACULTY OF ENGINEERING

B.E. III Semester (CBCS) (ECE) (Main & Backlog) Examination,

November/December 2018

Subject: Switching Theory & Logic Design

Time: 3 Hours **Max. Marks: 70**

Note: Answer all questions from Part A & any five from Part B

PART – A (10x2= 20Marks)
(Answer all questions)

1. Find the value of 'X' given$(107)_8=(241)_x$
2. What is an cyclic code? Explain with an example
3. Prove that NAND gate is a Universal gate.
4. Simplify the expression T(x, y, x)=x' y' z+ y+ x by eliminating redundant literals
5. What is Prime implicant and essential prime implicant?
6. Determine the minimal SOP of the function(w,x,y,z)=Σ(0,4,5,7,8,9,13,15)
7. Calculate the frequency of operation of a JK-FF with t_{setup}=1ms and t_{Hold}=1 ms
   Assume t_{pd}=0ms
8. Draw a contact network for transmission function T_{ab}(w,x,y,z)=x'(w+y'+z')
9. Differentiate Synchronous and Asynchronous counters
10. Design a ÷9 counter using 7492 ÷12 counter.

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PART – B (5x10=50 Marks)
(Answer any five questions)

11. (a) State and prove Consensus theorem.
    (b) Determine the prime implicants and simplify the following Boolean function f(A,B,C,D,E,F)=Σ(6,9,13,18,19,25,27,29,41,45,57,61) USING qm(Tabulation) method.

12. (a) Implement the function f=BD+BCD+AB'C'D'+A'BC'D with NAND gates. Assume that both normal and complement inputs are available.
    (b) Implement the function f(a,b,c,d)=Σ(1,2,4,7,8,11,12,15) using 74153

13. (a) Convert an K_K FF to S-R FF.
    (b) Design a 4bit Binary to Gray code convertor and implement using logic gates.

14. (a) Design a 3 bit even parity generator.
    (b) Design a serial adder with inputs x_1, x_2 carrying the two binary numbers to be added produces an output 'z' which represents the Sum.

15. (a) Define the 'distance' between two code words, Give an example? What is the condition for a code to be error detecting code?
    (b) Implement full adder and full subtractor using a, 3 to 8 decoder.

16. Design a sequence detector which produces an output '1' every time the sequence '1001' is detected and an output '0' at all other times.

17. Write short notes on
    a) Carry look ahead adder
    b) Hazards in switching circuits
    c) Shift register application as Ring counters

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Code No: 11416

FACULTY OF ENGINEERING

B.E. III Semester (CBCS)(M/P)(Main & Backlog) Examination, Nov./Dec. 2018

Subject: Fluid Mechanics

Time: 3 Hours **Max. Marks: 70**

Note: Answer all questions from Part A & answer any five from Part B

PART – A (10x2 = 20 Marks)

(Answer all questions)

1. What are the classifications of fluids?
2. Define path line, stream line and streak line.
3. What are the properties of velocity potential function?
4. Discuss the importance of coefficient of discharge in discharge measuring devices.
5. Differentiate between energy and energy head.
6. What do mean by vacuum pressure?
7. What is the difference between Weirs and Notches?
8. Write an expression for boundary shear stress in terms of momentum thickness and explain each term in it.
9. Explain the Phenomenon of flow separation.
10. Obtain an expression in differential form for continuity equation for one dimensional compressible flow.

.PART – B (5x10=50 Marks)

(Answer any five questions)

11. (a) Define acceleration of fluid particle and derive the equation of acceleration in 3D flow.

    (b) Determine the intensity of shear of an oil having viscosity 1 poise, the oil is used for lubricating the clearance between a shaft of diameter 10 cm and its journal bearing. The clearance is 1.5 mm and shaft rotate at 150 r.p.m.

12. (a) State and prove Bernoulli's equation and list the assumptions which are made while deriving Bernoulli's equation.

    (b) In a 45^o bend a rectangular air duct of 1 m^2 section is 10 m/s and pressure is 2.543 N/cm^2 take density of air as 1.16 kg/m^3.

13. (a) What is pivot tube? How it is used to measure velocity of flow at any point in a pipe or channel. Derive an expression for measuring velocity of fluid through a pipe with this device.

    (b) A 20 cm x 20 cm venturimeter is inserted in a vertical pipe carrying oil of sp. Gravity 0.8, the flow of oil is in upward direction. The difference of levels between the throat and inlet section is 50 cm. The oil mercury differential manometer gives a reading of 30 cm of mercury. Find the discharge of oil neglect losses.

Cntd..2…

14. a) Derive Darcy's Weisbach equation for the loss of head due to friction in a pipe with a neat sketch.

    b) In a wind tunnel, experiments were conducted with a speed 25km/hr on a flat plate of size1.5m long and 1 m wide. The mass density of air is 1.12 kg/m^3. The plate is kept at such an angle those coefficients of lift and drag 0.7 and 0.1 respectively. Determine i) Lift force ii) Drag force iii) Resultant force. Iv) Power exerted by air stream on the Plate.

15. a) A gas is flowing through a horizontal pipe at temperature of 4^oC. The diameter of the pipe is 8 cm and at this section in the pipe, the pressure is 400 KN/m^2(Absolute). The diameter of pipe changes from 8 cm to 4 cm where pre ssure is 300 KN/m^2(Absolute) . Find the velocities of gas at these sections, assuming an isothermal process, Take R=287.14 J/kg K and atmospheric pressure=100 KN/m^2 .

    (b) Explain how the disturbances are propagated in compressible fluid flows.

16. a) A liquid with sp. gravity 2.8 and a viscosity 0.8 poise, flows through a smooth pipe of unknown diameter, resulting in a pressure drop of 800 N/m^2 in 2 km length of pipe, what is pipe diameter if the mass flow rate is 2500 kg/h.

    (b) For a two-dimensional potential flow, the velocity potential function is given by Θ=x(2y-1), determine the velocity at the point P(4,5), determine also the value of stream function ψ at this point P.

17. Write short notes on the following.

    a) Significance of Moody's Chart.

    b) Types of fluid flows with example.

    c) Pressure measuring devices.

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Code No: 11414

FACULTY OF ENGINEERING

B.E. III Semester (AE)(CBCS) (Main and Backlog) Examination, Nov./Dec. 2018

Subject: Automotive Engineering Drawing

Time: 3 Hours **Max. Marks: 70**

Note: Answer all questions from Part A & any five questions from Part B

PART – A (20 Marks)

1. Sketch the following types of lines: [4]
   (a) Centre lines
   (b) Visible lines
   (c) Hidden lines and
   (d) Hatching lines.
2. What is an eye-bolt and for what purpose is it used? [4]
3. Draw (a) sectional view from the front and (b) view from above, of the single riveted Lap joint, to join plates of thickness 10mm. [6]
4. Draw (i) the view from the front, (ii) the view from the right, of the objects shown in Fig.1 [6]

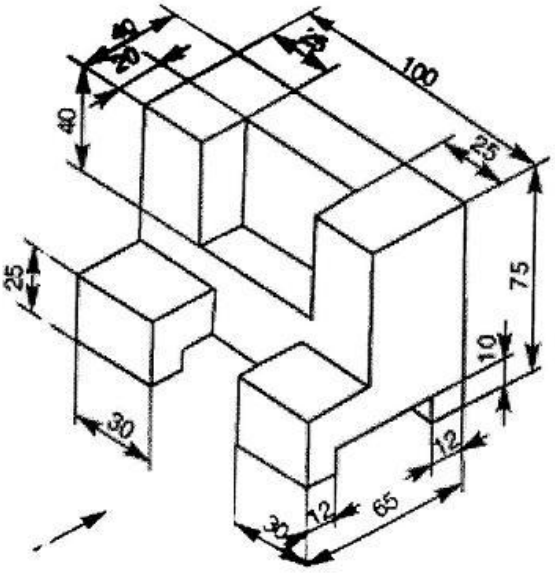


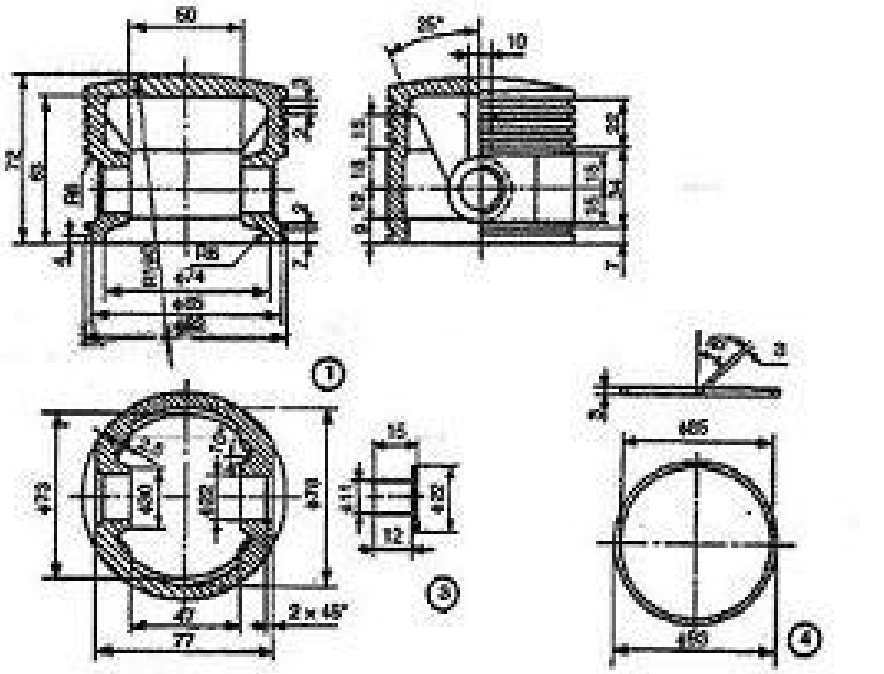
Figure 1

Contd…2…

PART – B (50 Marks)

5. Assemble the parts of the piston, shown in Fig. 2 and draw the following views:
   i) Sectional view from the front, and (20 marks)

   ii) Half sectional view from the left (30 marks)



Parts list

No.	Name	Mat	Qty
1	Piston	Al-alloy	1
2	Piston pin	HCS	1
3	Piston pin plug	HCS	2
4	Piston ring	CI	4

Piston of a petrol engine

Figure 2 All dimensions are in MM

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Code No. 11420

FACULTY OF ENGINEERING

B.E. (CSE) III - Semester (CBCS) (Main & Backlog) Examination,
November / December 2018

Subject : Logic and Switching Theory

Time : 3 Hours **Max. Marks: 70**

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

PART – A (20 Marks)

1 State and prove De Morgan's theorem. (2)
2 Simplify the Boolean function using theorem. (2)
(x′ y′+ z)′ + z + xy + wz
3 Prove that dual of XOR is also its complement. (2)
4 Implement F = (AB′ + A′B)(E(C + D′)) using NOR gates. (2)
5 Realize full subtractor using half subtractor. (2)
6 What is Demultiplexer? Give example. (2)
7 Distinguish between latch and flip flop. (2)
8 Define the terms characteristic equation, characteristic table and excitation table. (2)
9 Draw the 3-bit state diagram for mod-6 counter. (2)
10 Write the differences between synchronous and asynchronous counters. (2)

PART – B (50 Marks)

11 (a) Convert the given function into other canonical form (5)
$F(x, y, z) = \pi(0, 7)$
(b) Express the Boolean function F = xy′ + x′z as a product of maxterms. (5)

12 Realize the function with minimum number of literals using K-map method
F(A, B, C, D, E) = Σm(0, 2, 4, 6, 9, 11, 13, 15, 17, 21, 25, 27, 29, 31) and draw the logic circuit. (10)

13 Simplify the function using tabulation method (10)
F(A, B, C, D) = Σm (4, 8, 10, 11, 12, 15) + Σd (9, 14)

14 (a) Realize full subtractor circuit and draw the circuit using only NAND gates. (5)
(b) Explain about Carry save Adders. (5)

15 Tabulate the PLA programming table for Boolean function listed below and draw the PLA circuit to implement the functions. (10)
F_1 = AB′ + AC + A′BC′
F_2 = (AC + BC)'

16 Design a synchronous decade counter using JK flip flop. (10)

17 Write short notes on the following:
(a) Priority Encoder (4)
(b) Ripple carry Adder (3)
(c) Equivalence function (3)

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Code No. 11426

FACULTY OF ENGINEERING

B.E. (I.T) III – Semester (CBCS) (Main & Backlog) Examination, Nov / Dec. 2018

Subject: Environmental Studies

Time: 3 Hours **Max.Marks: 70**

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

PART – A (10x2 = 20 Marks)

1 Mention few reasons for land degradation.
2 What is wind energy and how it is used?
3 Explain the nitrogen cycle with a neat sketch.
4 Define drought and pollutants.
5 Define biodiversity.
6 Mention few names of endangered species.
7 What is noise pollution?
8 Give a list of major sources of surface water pollution.
9 What is green house effect?
10 Differentiate between climate and weather.

PART – B (50 Marks)

11 a) Discuss the environmental impacts of construction of major dams. 5
b) Explain effects of modern agriculture. 5

12 a) With the help of pond ecosystem explain the different components of ecosystems? 5
b) What are ecological pyramids? Why are energy pyramids always upright? 5

13 a) Give a brief account of bio-geographical classification of India. 6
b) Write an account on threats to biodiversity. 4

14 a) Describe the structure and functions of forest ecosystem. 4
b) Define solid waste management. Write the classification of solid wastes and their methods of disposal. 6

15 a) What are the equipment used for controlling pollution in water and air? 5
b) Write short notes on thermal pollution and their mitigating measures. 5

16 a) Write how social values and environmental ethics are useful to improve the existing deteriorating condition of environmental resources. Give examples. 5
b) Write about watershed biodiversity. 5

17 a) Explain the levels of biodiversity. 5
b) Write in detail about soil erosion. 5

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Code No: 11045

FACULTY OF ENGINEERING

B.E 2/4 (Civil) II Semester (Backlog) Examination, November/December 2018

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 (2.5x10 = 25 Marks)

1) Draw the fundamental lines of a transit theodolite.
2) What is balancing in?
3) What is Jeffcoh direct reading tachometer?
4) With the help of neat sketch explain transition curve
5) Calculate the length of curve and length of long chord for a curve with a deflection angle of 53^0 and radius 40m.
6) What is tangential tachometry?
7) Define the term slip.
8) Name the applications of a total station.
9) Define the terms consecutive coordinates and independent coordinates.
10) What are the various applications of GIS in civil engineering?

Part – B(50 Marks)

11. a) Explain the measurement of following with a theodolite 5

    i) Vertical angle ii) Magnetic bearing of line.

    b) What is spire test? What is its use? Draw a neat sketch of the test 5

12. The record of a closed traverse is given below. With one bearing and distance missing. Calculate the bearing and length of missing lines. 10

Line	Length	WCB
AB	?	95^0
BC	140	$27^0\,28'$
CD	163	$317^0 30'$
DE	173	260^0
EA	201	?

13. Calculate all the data necessary for setting out an 8^0 curve by a tangential deflection angles method between two tangents QP and QR with the following information. Angle PQR 150^0 chainage of P.I 1340m and peg interval is 30m

contd…2

14. Calculate the R.L's of various station pegs on a vertical curve connecting two uniform grades of 0.5% and -0.7%. The chainage and R.L of the P.I are 500m and 330.750m respectively. Take the rate of change of grade as 0.1% per 30m.

15. A tachometer was setup at station C and the following readings were obtained on staff held vertically. Calculate the horizontal distance CD the RL of D and the gradient of BD when the constants of the instruments are 100 and Zero.

Inst.St.	Staff St.	Vertical Angle	Hair Reading			Remarks
C	B	$-6^0\ 28'$	1.350	2.000	2.650	RL of B 860.385
C	D	$+9^0\ 16'$	0.800	1.550	2.300	

16. a) What are the different methods of total station survey
    b) Write about adjustment of traversing by transit rule
17. a) What is GIS? What is GPS? Write about the 4 M's of GIS
    b) Write about sources of error in theodolite survey

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Code No: 11051

FACULTY OF ENGINEERING

BE 2/4 (EEE/Inst) II-semester (Backlog) Examination, November / December 2018

Subject : Solid Mechanics

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

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

Part-A (25 Marks)

1) What is meant by ductility of a steel rod? How it is measured by conducting a tension test? 3

2 State the relation between the three moduli E, C and K 2

3 A simply supported beam of span 2m carries a point load at mid span. If the slope at the ends of the beam is 1^0, find the deflection at the mid span. 3

4 Define resilience and modulus of resilience. 2

5 Draw the bending stress and shear distribution across a rectangular section. 3

6 Write the relationship between bending moment, shear force, and rate of loading. 2

7 Define flexural rigidity and calculate the same for a hollow circular section of 200 mm inner diameter and 25 mm thick if E 200 GPa. 3

8 Mention the advantages of hollow circular shafts over solid circular shafts. 2

9 What do you mean by Equivalent Torque and Bending Moment? 3

10 State the uses of springs. 2

Part-B (50 Marks)

1 A 14 mm diameter steel rod passes centrally through a copper tube 30 mm external diameter and 20 mm internal diameter, and 2 m long. The tube is closed at each end by 25 mm thick steel plates which are secured by nuts. The nuts are tightened until the copper tube is reduced in length by 0.498 mm. The whole assembly is then raised in temperature by 45^oC. Calculate the stresses in copper and steel before and after the rise of temperature, assuming the thickness of the plates remains unchanged. Take coefficient of thermal expansion for copper and steel as $\sim_c = 16x10^{-6}$ per ^oC and $\sim_s = 12x10^{-6}$ per ^oC respectively, $E_c = 1.1x10^5$ N/mm^2 and $E_s = 2x10^5$ p N/mm^2

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

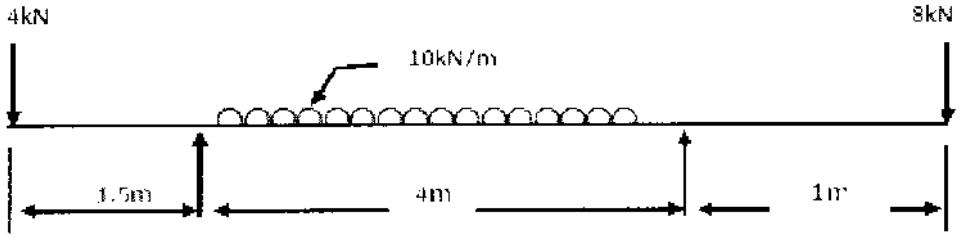

fig 1.

…2

13 A simply supported beam of span 6m is subjected to a UDL. Of 10kN/m over its entire span. The cross section of the beam is with T shape having a flange size 200mm x 50 mm and web 200mm x 50mm. Sketch the bending stress distribution at its span.

11 A simply supported beam of span 3 meters carries point loads of 12kN and 8kN at a distance of 0.6 and 2 meters respectively from the left had support. If 'I' for the beam = $16x10^4$ cm^4 and E = 2 x $10^5 N/mm^2$. Find the deflection under loads, maximum deflection and slopes at supports.

15 Determine the power transmitted by a solid shaft of 100 mm diameter at 150 r.p.m the maximum shear stress is not to exceed 80 MPa. The maximum torque is 30% more than its mean value. If this shaft is replaced by a hollow shaft of same weight with outer diameter to inner diameter ratio of 0.6 What will be percentage increase in the power transmitted by this hollow shaft?

16 a) An unknown weight falls through 10mm on a color rigidly attached to the lower end of a vertical bar 3m long and 600 mm^2 in section. If the maximum instantaneous extension is known to be 2mm, what are the corresponding stress and the value of the unknown weight ? 5

b) A 100mm diameter safety valve is to be designed to blow of at a guage pressure of 2MPa. The valve is held in position by a 180mm diameter close coiled compression helical spring whose initial compression is 25mmm, find the diameter of the rod of the spring and the number of turns required if the shear stress is not to exceed 80MPa. Take C=80MPa. 5

17 a) State the assumptions made in theory of simple Torsion 5

b) A bar of steel is 60 mm x 60 mm in section and 180 mm long is subjected to a tensile load of 800 kN along the longitudinal axis and compressive loads of 200 kN and 500 kN on the lateral faces. Find the changes in the dimensions and the change in volume of the bar. 5

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Code No. 11059

FACULTY OF ENGINEERING

B.E. 2/4 (ECE) II – Semester (Backlog) Examination, November / December 2018

Subject: Analog Electronic Circuits

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

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

PART – A (25 Marks)

1. What is a cascode amplifier, where is it used? [2]
2. Find the value of voltage gain Av, given hfe =100, hie = 1.1 Kohm and Ri=10 Kohm [3]
3. Draw the simplified block diagram of a negative feedback amplifier. [3]
4. Calculate desensitivity, given A =100 Beta = 0.05. [2]
5. What is Barkhausens criteria for oscillations. [3]
6. Give the equivalent symbol of piezoelectric crystal. [2]
7. How is a power amplifier different from a voltage amplifier? [2]
8. Compare the efficiency of CLASS A,B, AB and C power amplifiers. [3]
9. Explain the problem of instability in tuned amplifiers and how it can be eliminated. [3]
10. What is uni-lateralization? [2]

PART – B (50 Marks)

11 a) Obtain the expression for low frequency voltage gain under the effect of emitter capacitor Ce. [4]

b) Obtain the expression for mid frequency gain of transformer coupled amplifier. Find value of mid frequency voltage gain given hfe =100, hie = 1.1 Kohm and Ri=10 Kohm and turns ratio =50. [6]

12 a) Draw an emitter follower circuit such that Rc=5 Kohm, Rs = 1 Kohm and Re = 1 Kohm. Obtain gain with feedback, Rif and Rof. [7]

b) What is the difference between negative and positive feedback? [3]

13 a) Derive the expression for sustained oscillation in Hartley oscillator. [7]

b) Given L1= L2 = 2 micro henry and fo=1 MHz. Calculate value of C. [3]

14 a) Prove that the figure of merit of Class B push pull power amplifier is 0.4 [7]

b) A class B power amplifier drives a 15 ohm load. It has a Idc = 8 Amps. Calculate Pac, Pdc, and efficiency. [3]

15 Give the gain expression of single tuned transformer coupled amplifier. [10]

16 a) Draw the high frequency hybrid Pi model and describe the various components. [5]

b) Show the effect of negative feedback on Ri and Ro of Current Shunt amplifier. [5]

17 Write short notes on:

a) Series voltage regulator [4]

b) Distortion in Power amplifiers [4]

c) Stagger tuning. [2]

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Code No.11069

FACULTY OF ENGINEERING

BE 2/4 (M/P) II Semester (Backlog) Examination, November/ December 2018

Subject: Fluid Dynamics

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

Note: Answer all questions from Part – A & any five question from Part – B

PART – A (25 Marks)

1. State and briefly explain Newton's law of viscosity. [3]
2. Write the relation between absolute pressure, atmospheric pressure and gauge pressure. [2]
3. Explain the characteristics of laminar and turbulent boundary layers. [3]
4. Why should circulation superimposed on flow past a body cause a lift? [2]
5. A jet propelled aircraft is flying at 1100 km/hr at sea level, calculate the Mach number at a point on the aircraft where air temperature is 20^{o}C. (R = 287J/kg K and K = 1.4) [2]
6. Differentiate between local acceleration and convective acceleration with equations. [2]
7. Draw a neat sketch of Pitot tube and explain about its working principle. [3]
8. Explain the terms Hydraulic Gradient Line (HGL) and Total Energy Line (TEL). [2]
9. A liquid has a specific gravity of 1.9 and kinematic viscosity of 6 stokes. What is its dynamic velocity? [3]
10. Define Mach number, explain with a neat sketch about Mach Cone. [3]

PART – B (50 Marks)

11. a) Explain briefly the following terms

    i) Mass density ii) Weight density (iii) Specific gravity

    iv) Dynamic viscosity v) Kinematic viscosity [5]

    b) A 2-Dimensional flow is described by the velocity components $u = 6x^3$ and $V = -16x^2y$. Determine the stream function, velocity potential function and acceleration at a point P (1,2). [5]

12. a) Derive Euler's equation of motion for three dimensional flow and obtain Bernouli's equation from it. [5]

    b) A 60^{o} reducing bend is connected in a pipe line, the diameter at inlet and outlet of the bend 50 cm and 25 cm respectively. Find the force exerted by the water on the bend if the intensity of pressure at inlet of the bend is 200 kN/m^2. The rate of flow is 1 m^3/s [5]

contd…2

13. a) Derive Darcy's Weisbach equation for the loss of head due to friction in a pipe with the aid of neat sketch. [5]

    b) In a pipe of 200 mm diameter, the maximum velocity of flow is found to be 1.5 m/s. If flow in the pipe is laminar, find (i) the average velocity and the radius at which it occurs, and (ii) the velocity at 40 mm from the wall of the pipe. [5]

14. a) What do you mean by Boundary layer separation? What is the effect of pressure gradient on boundary layer separation? Explain with the aid of neat sketch. [5]

    b) Experiment is conducted in a wind tunnel with a speed of 50 km/hr. in a flat plate of size 1 m long and 1m wide. The mass density of air is 1.15 kg/m^3. The plate is kept at such an angle that coefficients of lift and drag are 0.75 and 0.15 respectively. Determine (i) Lift force (ii) Drag force (iii) Resultant force (iv) Power exerted by the air stream on the plate. [5]

15. a) Derive Bernoulli's equation for compressible flow when the process is adiabatic. [5]

    b) A supersonic plane flies at 1900 KMPH in air having a pressure of 28.5 KPa (abs) and density of 0.439 kg/m^3. Calculate (i) Temperature (ii) Pressure (iii) density of air at stagnation point on the nose of the plane.[Take K = 1.4 and R = 278 J/kg^{o}K) [5]

16. a) Derive the equation of continuity in One-Dimensional flow by assuming the flow as incompressible. [5]

    b) What is Venturimeter? Derive an expression to estimate the discharge. [5]

17. Write a short note on any three [10]

    i) Symmetrical and unsymmetrical airfoils

    ii) Reynold's experiment

    iii) Circulation and Magnus effect

    iv) Factors affecting boundary layer

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Code No: 11071

FACULTY OF ENGINEERING

BE 2/4 (A.E) II-semester (Backlog) Examination, November / December 2018

Subject : Fluid Mechanics and Machinery

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

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

Part-A (25 Marks)

1 Distinguish between manometers and mechanical gauges
2 The pressure Intensity at a point of a fluid is given 4.9 N/cm2. Find the corresponding height of a fluid it is a) water, and b) an oil of sp.gr.0.8
3 State and express continuity equation for to for 1-D incompressible fluid flow.
4 State the assumptions Bernoulli's theorem for steady flow of on incompressible fluid
5 What do you mean by viscous flow?
6 Define and explain the terms; a) H.G.L and b) T.E.L
7 Differentiate between turbines and pumps
8 What are the efficiencies of the Turbines
9 Differentiate between volute casing and vortex casing for the centrifugal pump.
10 How do you classify the Reciprocating pumps.

Part-B (50 Marks)

11 a) Differentiate between simple manometer and differential manometer which neat sketches
   b) Find the guage pressure and absolute pressure in N/m^2 at a point 4m below the free surface of a liquid of sp.gr.1.2 if the atmospheric pressure equaling to 1 bar.
12 a) Distinguish between i) steady and un-steady flow ii) laminar & Turbulent flow
   b) The diameters of a pipe at the section 1 and 2 are 15cm and 20cm respectively. Find the discharge through the pipe if velocity of water at section 1 is 4m/s. Determine also the velocity at section 2.
13 A 30cm x 15cm venturimeter is inserted is a Horizontal pipe. A differential mercury manometer connected to inlet and throat give a reading of 30cm Find the discharge through venturimeter Take. Cd=0.98.
14 a) Write the Importance of Hagen poisenllirs formula and Darcy weighach formula for fluid flows.
   b) A viscous flow is taking place in a pipe of diameter 100mm. The maximum velocity is 2m/s. Find the mean Velocity and the radius at which this occurs. Also calculate velocity at 30mm from the wall of the pipe.
15 A pelton wheel has mean bucket speed of 35m/s with a jet of water flowing at the rate of 1m3/s under a head of 27^om. The bucket deflect the jet through an angle of 170^o Calculate the power delivered to the runner and the hydraulic efficiency of the turbine. Assume co-efficient of velocity as 0.98
16 A centrifugal pump running at 1000rpm. The outlet vane angle of the impeller is 30^o and velocity of flow at outlet is 3 m/s. The pump is working against a total head of 30m and the discharge through the pump is 0.3 m^3/s. if the manometric efficiency of the Pump is 75% determine i) The diameter of the impeller, and ii) The width of the impeller at outlet
17 Write a short note on
   i) Draft Tube used is reaction Turbine ii) Priming in centrifugal pump
   iii) Air vessels in Reciprocating pump.

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Code No: 11073

FACULTY OF ENGINEERING

B.E. 2/4 (CSE) II – Semester (Backlog) Examination, November/December 2018

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. Differentiate static and dynamic polymorphism with an example 3
2. How are data and functions organized in object oriented programming? 2
3. What is a java exception? How it will be handled? 3
4. What is difference between a thread and a process? 2
5. Differentiate comparable and comparator in Java. 2
6. When to use hash code and equals? 3
7. What is a Component class in AWT? 2
8. Differentiate Text field and Text area. 2
9. Define serialization. 2
10. What is Stream? Give an example. 2

PART – B (5 x 10 = 50 Marks)

.11. (a) Explain the usage of java packages. 4

(b) Write a java program to demonstrate

i) Access a package ii) Adding a class to package. 6

12. (a) What does throw do in exceptional handling? 4

(b) What streams are used to read and write binary data? Explain briefly with example. 6

13. (a) Give the two restrictions applied to enumerations. 4

(b) Discuss how primitive types are converted into objects and vice versa with an Example. 6

14. (a) What is event handling? Explain the steps involved in it. 5

(b) Discuss about checkbox group with a program 5

15. (a) Write a program to read an array of bytes from the keyboard 5

(b) What are java's type wrapper classes? What is their use? 5

16. (a) Why does java have two ways to create child threads and which approach is better? 6

(b) How does java pass primitive types? How does it pass objects? 4

17. Write a recursive program that displays the contents of a string backwards. 10

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Code No. 11080

FACULTY OF ENGINEERING

BE. 2/4 (I.T) II-Semester (Backlog) Examination, November / December 2018

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. Explain the significance of each word in public static void main (String args [ ]) 2
2. How local variable is different from an instance variable? 2
3. What is the use of super keyword? 3
4. What are the differences between interfaces and abstract classes? 3
5. What is unchecked exception? Give an example. 2
6. What is the difference between throw and throws clause 2
7. What is the difference between iterator and enumeration? 3
8. Explain the common constructors of FileInputStream and FileOutputStream 3
9. What is a layout manager? What are different layout managers? 3
10. What are the differences between init() and start() methods of an applet? 2

PART - B (50 Marks)

11. a) Define package. How do you create and use packages? Illustrate with an example. 8
    b)Define a two dimensional array of different row sizes? 2

12. a) Write a program to demonstrate dynamic method dispatch and explain? 8
    b) What is the use of final keyword in java 2

13. Describe the complete life cycle of a thread. Write a java program that shows the use of priority in threads. 5+5

14. a) What is serialization? Which type of variables cannot be serialized? 3
    b) Write a program to demonstrate the concept of Serialization? 7

15. Write a program for keyboard event handling. 10

16. Explain the different iterators used for accessing the elements with example. 10

17. Write short notes on following?
    a) string Tokenizer,
    b) Applet,
    c) Checkbor Group 4+3+3

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